Huddersfield Open Market

Electrical Services
Employers Requirements

Section 6, Electrical Services Particular Specification

HMH-KAI-XX-XX-T-E-0006

Febuary 2026
Rev P06

Amendment Record Sheet

Revision	Description	Date	Approved
P01	Stage 4 Preliminary Issue	31.10.25	SP
P02	Comments Incorporated	14.11.25	SP
P03	Comments Incorporated	12.12.25	SP
P04	Comments Incorporated	12.01.26	SP
P05	Lightning Protection Removed	03.02.26	SP
P06	Metering Strategy updated	20.03.26	SP

5.1 INTRODUCTION

This document is intended to provide the specification for the electrical installation at the Huddersfield Open Market, which shall include the refurbishment of the Kirklees Council owned building inclusive of the main market hall, adjacent annex buildings 1, 2 & 3 as well as the proposed new scope to the external trading area and car park to the north of Lord Street/Brook Street. This is the final extent of the proposed works with the omission of any associated works to surrounding Kirklees Council owned buildings.

The site is currently solely owned and operated by Kirklees Council and shall remain this way upon completion of the proposed project works. The market hall and attached annex's will have an element of sub-letting to new fixed pitch, F&B units & café units.

The Market building is situated within Huddersfield Town Centre and can be accessed by road from Northumberland Street and by foot on Byram Street. The market hall is currently home to various traders and food venders who will all be relocated to temporary acomadation as part of these works.

Kaizen Consulting Engineers have initially been appointed to develop the Stage 3 AECOM design intent information at RIBA Stage 3 incorporating tender addendum updates and now further developed through to RIBA Stage 4.

This document should be read in conjunction with all other related specifications and drawings appertaining to the scheme, in particular the Kaizen Consulting Engineers (KCE) Standard Technical Specification.

Where the detailed requirements given in this section are at variance with the Main Contract Documents issues identified are to be raised, by the Tendering Contractor during the Tender period.

The tender documents have been produced in accordance with the requirements of BSRIA document BG6/2018 up to RIBA Stage 3 currently, but will be developed by KCE to Design Development Stage only (RIBA Stage 4a).

In that respect the Contractor shall carry out all detailed design activities as detailed within BSRIA guide BG6 as follows-

Pro-Forma 4 :	Technical Design (RIBA stage 4b & 4c)
Pro-Forma 5 A, B & C:	Production of information (RIBA stage 5)
Pro-Forma 6:	Mobilisation and Construction (RIBA stages 6)
Pro-Forma 7 :	Post Practical Completion (RIBA stage 7)

The contractor shall provide all design information as requested by the Project Manager for checking/ comment. As a minimum this shall include the following-

- Completed detailed design packages at stages 4b, 4c and 5
- M&E services installation and record drawings
- Technical submissions for all plant and equipment.
- Commissioning method statements
- Handover documentation
- All test sheets.

The Contractor shall include for all works and materials allied and incidental, which are not explicitly specified, but, which are necessary to complete the installation as a working whole.

All work shall conform to the best principles of modern practice and shall be carried out by competent tradesmen of the appropriate Construction trades.

By acceptance of the contract the successful Contractor shall accept full responsibility for the successful operation of all the works specified herein.

Inclusion shall be made for transport of all materials, plant and equipment to site, for all necessary off loading unpacking, storage and assembly. The Contractor shall pay for all associated charges for labour, freightage and demurrage.

The Contractor shall, wherever necessary, pay all fees to manufacturers, suppliers, inspectors etc for attendance installation, commissioning and testing of any part of the electrical plant and / or items of equipment, included in this contract.

Where the detailed requirements given in this section are at variance with the Main Contract Documents and Room Data Sheets issues identified are to be raised, by the Tendering Contractor during the Tender period.

The Contractor is responsible for the development of the engineering services detailed design, procurement, installation and setting to work of the services as outlined in this specification and all related documents which are to be read in conjunction.

The Contractor shall include for all works and materials allied and incidental, which are not explicitly specified, but, which are necessary to complete the installation as a working whole.

All work shall conform to the best principles of modern practice and shall be carried out by competent tradesmen of the appropriate Construction trades.

By acceptance of the contract the successful Contractor shall accept full responsibility for the successful operation of all the works specified herein.

Inclusion shall be made for transport of all materials, plant and equipment to site, for all necessary off-loading unpacking, storage and assembly. The Contractor shall pay for all associated charges for labour, freightage and demurrage.

The Contractor shall, wherever necessary, pay all fees to manufacturers, suppliers, inspectors etc. for attendance installation, commissioning and testing of any part of the electrical plant and / or items of equipment, included in this contract.

1. The tender submission shall be sealed and addressed to the following:

Original Documentation to be issued to:

Willmott Dixon Construction
12 Cliffe Park Way,
Bruntcliffe Road,
Morley,
Leeds
LS27 0RY

Refer to preliminaries for full details.

PLEASE NOTE: Under no circumstances shall the tender submission be copied to any third parties.

1. The tender submission shall be complete with the following information as a minimum.

Item	Description
1.	Covering letter detailing the contents of the bid along with any relevant qualifications and indication of specification
2.	The letter shall also detail any deviation(s) from the design intent. Failure to qualify any deviations will not be accepted
3.	Completed Tender Price Summary
4.	Completed Contractor Questionnaire
5.	Schedule of Tender submission suppliers
6.	Details of the project team and how you will approach the project
7.	Indicative programme outlining all aspects of the installation

5.1.1 Project Location

The address of the proposed works is as follows:

Huddersfield Open Market
Brook Street
Huddersfield
HD1 1RY

5.1.2 Scope of Electrical Works

This section sets out the roles and responsibilities, and the limitations of the tender Mechanical and Electrical (M&E) specification and drawings.

The Electrical Services Contract covers the design supply, delivery, off-loading, installation and services co-ordination, cabling, wiring, connecting, making off, testing, commissioning, handing over on completion in a satisfactory working order and replacement of all faulty parts during the defects liability period of all systems, items, parts and apparatus specified in these documents, schedules and drawings.

The Contractor shall include for all works and materials allied and incidental, which are not explicitly specified, but, which are necessary to complete the installation as a working whole.

All work shall conform to the best principles of modern practice and shall be carried out by competent tradesmen of the appropriate Joint Industry Board (JIB grades). (Or equivalent)

By acceptance of the contract the successful Contractor shall accept full responsibility for the successful operation of all the works specified herein.

Inclusion shall be made for transport of all materials, plant and equipment to site, for all necessary off-loading unpacking, storage and assembly. The Contractor shall pay for all associated charges for labour, freightage and demurrage.

The Contractor shall, wherever necessary, pay all fees to manufacturers, suppliers, inspectors etc for attendance installation, commissioning and testing of any part of the electrical plant and / or items of equipment, included in this contract.

The Contractors responsibility in relation to proposed project are as detailed below. The Contractor shall include within their tender to undertake all the duties identified.

The scope of Electrical works to be included for in the Electrical Contractors tender return includes the supply, delivery to site, off-loading, final co-ordination and positioning, installation, setting to work, testing and commissioning of the complete Electrical Engineering systems to the development which is to be completed to the satisfaction of the Client, Architect and Kaizen Consulting Engineers.

The scope of electrical works shall include the following but not necessarily limited to;

- All services & systems detailed design
- Isolation, strip out and diversion of all existing electrical services on site
- Verification of existing services proposed to be retained
- New LV distribution
- New LV distribution boards
- New Earthing installations.
- New lighting, power and controls cabling.
- New Localised lighting control systems.
- New power, communications, fire alarm and data containment systems (Internal & External)
- New complete small power installation (Internal & External)
- All containment, local isolation and final connection to equipment.
- Cat 6A U/FTP data cabling and containment installations.
- Cat 6A U/FTP termination and testing.
- New backbone fibre multimode cabling, termination and testing
- New IT/telecommunication installations detailed on the scheme drawings.
- New internal and external lighting design and installation.
- New escape/Emergency lighting design and installation.
- New fire alarm system design and installation (Contractors Design Portion)
- New Intruder alarm system design and installation. (Contractors Design Portion)
- New CCTV system design and installation. (Contractors Design Portion)
- New Access Control System design and installation. (Contractors Design Portion)
- New Public Address (PA) System
- New Audio Frequency Induction Loop System (Accessible Hearing)
- New Accessible call systems
- Complete electrical installation including mains cabling and containment to all Mechanical Services equipment.
- New Lightning protection system (Contractors Design Portion)
- Temporary site power
- Services identification
- Contractors own site working drawings
- O&M manuals
- As fitted drawings
- Testing and commissioning
- Training and Demonstration to Client

In the event that approved O+M manuals, as Installed drawings and commissioning documents are not handed over on the contract completion date, the Contractor shall provide 24 hour maintenance cover for all the engineering services until the approved handover documents and staff training is given.

The contractor shall include for full maintenance and breakdown cover for a period of 12 months from completion, provided in addition to defects liability.

5.1.3 Technical Queries

Should any doubt exist to the interpretation of this specification and extent of work covered hereby, any technical queries should be addressed to:-

Sam Sugden
Kaizen Consulting Engineers
Unit 2B Spence Mills,
Bramley
Leeds
LS13 3HE

Tel. 07734389212
Email. sam.sugden@kaizen-ce.com

5.1.4 Responsibility

The contractor shall make reference to and include within the tender return for all duties listed in the Schedule of Responsibilities included in this document. Typical project responsibilities can be apportioned as detailed below.

5.1.5 Consultant Responsibilities

The consultant shall be responsible for the identification, clarification, and production of tender documentation necessary to enable the Mechanical and Electrical Contractor to provide a complete tender return package for the project.

5.1.6 Contractor Responsibility

This section sets out the roles and responsibilities, the limitations of the tender M&E specification and drawings, and also specific requirements of the project. The M&E performance specification and drawings are for services up to and including RIBA Stage 4 “Detailed Design”. The Contractor shall be responsible for developing the scheme from RIBA Stage 4 onwards.

The KCE tender drawings indicate the design of the primary electrical services. There are specialist packages for certain systems such as Fire alarm, Security systems, Lightning Protection which are to be developed by the contractor to finalize quantities, devices and equipment relating to specialist packages. The contractor shall assess and make due allowance for this within their tender.

The contractor's responsibility in relation to proposed project are as detailed below. The contractor shall include within their tender to undertake all the duties identified.

- Undertake the design, supply and installation of a complete and functional electrical services installation, adhering to the KCE Performance specifications and drawings, incorporating any necessary changes to the installation due to final site co-ordination.

- Complete the installation in order to ensure that the contract services are properly and fully co-ordinated with the building fabric and structure to the Client's satisfaction.

- Following design comment, provide working drawings and any co-ordination deemed necessary due to satisfy the constraints of the structure, finishes and other services.

- Include for all costs associated with providing working drawings and any co-ordination deemed necessary due to satisfy the constraints of the structure, finishes and other services.

- The co-ordination and preparation of the appropriate working drawings shall be carried out in accordance with an agreed contract programme.

- The design of contractor's design portion items, supply, delivery, off-loading, storage, installation, testing and commissioning of the full installation.

- Demonstration of operation of all electrical systems to the clients chosen representative.

- Attend co-ordination meetings with other sub-contractors arranged by the main contractor and agree co-ordination, not only relating to the sequence of operation but also to the preparation of working drawings which will fully reflect the agreed scheme.

- Liaise with all necessary sub-contractors and others as necessary to ensure co-ordination of the works in relation to building elements and services.

- Install all services in such a manner so as to ensure correct performance and adequate fixing to the structure to avoid conflict in the positioning of the various electrical and mechanical services installed by others.

- Fixing and correctly installing all plant, equipment and materials.

- Inspecting all plant, equipment and materials as delivered or where specified at the manufacturers works.

- Demonstrate that the equipment is capable of the method of operation, as specified to the satisfaction and acceptance of Kaizen Consulting Engineers.

- Demonstrate that the overall and complete systems perform correctly in the required manner and as intended by the specifications and drawings to the satisfaction and acceptance of Kaizen Consulting Engineers.

- Provide record drawings of the complete installation.

- Provide 1No. Bound Operating and Maintenance manual and 1No. digital copy for the complete installation.

- Provide a full set of test results in an approved format for all tests and commissioning operations to the satisfaction of Kaizen Consulting Engineers.

- The contractor shall include for all exclusions identified by the specialised sub-contractor to be incorporated in the works.

- All diversions, Isolations, strip out works and all statutory authority liaisons.

- The Contractor shall allow for attending any meetings necessary to provide full design and co-ordination of the services installation with all other trades.

- The Contractor shall assess all plant room sizes, riser sizes, void depths and service routes and shall make reference to the accompanying detailed plant and switchroom detailed drawings to ensure that the Architect and Principal Contractor is fully aware of their requirements and can accommodate them.

- The Contractor shall provide a complete schedule of rates for all electrical service elements upon appointment to the project.

5.1.7 Standards of Workmanship

The workmanship and materials of the installation shall be of the highest standard in accordance with this specification and associated documents, which shall be to the complete satisfaction of KCE and the Clients Engineer or representative. Should any section of work or materials fail to meet the required standard, it shall be replaced by the Contractor at no extra cost to the contract.

5.1.8 Electrical Services Technical Design Drawings

Please refer to the electrical services drawing issue register for the complete list of design drawings to be issued as part of the Tender package. Further reference shall be made to the contractor design portion layouts for specialist packages.

5.1.9 Standards and Regulations

The design and installation of the materials shall conform to the requirements of the following documents current at time of agreement of contract:

Installation	*Statutory Regulations, Standards and other system design guidance*
General	• Building Regulations • The Health and Safety at Work Act • Construction, Design and Management Regulations 2015 • The Care Standards Act 2001 • Equality Act 2010 • Electricity at Work Regulations • The Fire Precautions (Workplace) Regulations 1997 • The Electricity Safety, Quality and Continuity Regulations 2002 • The Electricity Supply Regulations Pt2 1998 • British Standards Specifications and British Standard Codes of Practice • BSRIA Design Guides • CIBSE Design Guides • Secure by design Requirements • British council of offices guidelines
Electrical Distribution: HV Distribution LV Distribution Electrical Metering Surge Protection (Lightning and Electrical network surges)	• IET Wiring Regulations 18th Edition; Requirements for Electrical Installations BS 7671: 2018 Including Latest Amendments. • BS7430 – Code of Practice for Earthing • Building Regulations Part L2 • CIBSE Technical Memoranda TM39 – Building Energy Metering • Electricity Council Engineering recommendations G5/3 and G5/9. • BS EN 62305 Pt4 – Protection against lightning. Electrical and electronic systems within structures
Life Safety Systems: Automatic Fire Alarm System	• Building Regulations Part B • BS9999 – Code of practice for fire safety in the design, management and use of buildings • BS 5839 Pt1 – Fire detection and alarm systems for buildings. Code of practice for system design, installation, commissioning and maintenance • BS5839 Pt9 - Fire detection and alarm systems for buildings. Code of practice for system design, installation, commissioning and maintenance of emergency voice communication systems • BS8300 – Design of buildings and their approaches to meet the needs of disabled people; Code of practice • BSEN54-20:2006 – Fire detection & Fire Alarm Systems. Aspirating Smoke Detectors • FIA Code of Practice – Best practice design, installation, commissioning &maintenance of aspirating smoke detector systems • LPCB Approvals and Requirements

Systems for the Disabled	• BS8300 – Design of buildings and their approaches to meet the needs of disabled people; Code of practice
Security: Intruder Detection CCTV Access Control	• BSEN50131 Pt1 – Alarm systems; Intrusion and hold-up systems. System requirements • BSEN50132 Pt5 - Alarm systems; CCTV surveillance systems for use in security applications. Application guidelines • BSEN50133 Pt1 – Alarm systems; Access control systems for use in security applications. System requirements • BS8418 - Alarm systems; CCTV surveillance systems for use in security applications. Application guidelines • BS 7758 – Closed Circuit Television (CCTV) Management & Operation • National Security Inspectorate (NSI) • BS EN 62676 Video surveillance systems for use in security applications.
Lightning Protection	• IEC/EN62305 Pt1 - Protection against lightning. General Principles • IEC/EN62305 Pt2 – Protection against lightning. Risk Management • IEC/EN62305 Pt3 – Protection against lightning. Physical damage to structures and life hazard • IEC/EN62305 Pt4 – Protection against lightning. Electrical and electronic systems within structures • NF C 17-102 ESE Product Standard

Although the above document list does not intend to be exhaustive, it is intended to give the contractor an indication of the likely related standards and regulations applicable to a scheme of this nature.

Although every effort has been made to harmonise all information, should any contradiction exist, then the Project Engineer should be informed at Tender stage in order to determine precedence.

5.1.10 Tender Return Documentation

The contractor shall return the tender documentation as contained in Section 7, of this Specification. The mechanical and electrical summaries must be completed in their entirety; failure to complete the summaries may render the Contractor's tender invalid.

5.1.11 Site Waste Management

The Contractor shall comply with the Site Waste Management Plan and ensure that all removed and redundant materials are correctly segregated into material type, temporarily stored on site and arrange for its collection by an appropriate Licensed Waste Disposal Company.

5.1.12 Fire Stopping

Fire compartments and fire stopping shall be provided in line with the projects fire strategy document and associated drawings. During construction the risers will be built without floors and the contractor will be responsible for providing a walk on fire stopped floor at each floor level within the riser to achieve as a minimum the same fire rating of the adjacent floors in that compartment following the installation of services.

All pipework, ductwork, electrical containment etc passing through fire compartment walls etc shall be fire stopped. The services will be provided with proprietary installation frames and fire dampers for ductwork services, pipe sleeves for all pipework services that will be chalked etc generally in accordance with the standard specification

Firestops are to achieve or better the fire rating of the compartment in which they pass in full accordance with the materials listings.

At all fire stop locations the Contractor shall install reference tags to aid maintenance which are to be installed on each side of the firestop, containing the information necessary to reference to documents indicating the approved procedures for the installation.

The O&M documentation shall include an inventory of all firestops, with drawings indicating location and the certification listings of each firestop

The contractor shall appoint a specialist approved fire stop specialist contractor to undertake the associated fire stopping around penetrations on their behalf, other than those around electrical containment by the approved electrical contractor.

5.1.13 Building Manual and Building User Guides

The Contractor shall provide separate building manuals and building user guides in accordance with BSRIA document BG26/2011. The standard templates within BG26/2011 shall be used. The Building Manual is in addition to the O&M manual. This document will also incorporate the Building Regulation log book requirements, all contained within a single building manual.

5.1.14 Existing Services / Strip Out

The site currently has a number of existing services such as small power supplies, ancillary supplies, cameras, lighting etc. and internal services which are currently supplying the live and operational Market Hall facilities. Reference shall be made to the accompanying tender drawings for the refurbishment works, strip out information and also temporary accommodation tender drawings.

Redundant plant will be made safe, safely isolated and removed. All other plant will remain for removal by demolition contractor.

Survey and strip out works are to be carried out under the agreed access times with Kirklees Council when the market is closed to the public and no longer operational, the contractor shall ensure they have allowed for these strip out requirements as part of their tender.

The strip out of the existing services will be completed to suit the Contractors programme and in accordance with any Kirklees Council waste management plan.

Where redundant installations cannot be removed due to being buried within structure or the like they shall be reasonably cut back as far as possible, sealed and made safe, and provided with labels as appropriate to describe the presence of redundant work.

In the event of existing installations of services being damaged or modified, other than as excepted, the Contractor shall allow to repair fully or reinstate as appropriate at no additional charge to approval including from the appropriate statutory authority or any other organisation as may be affected.

Any strip out works associated with the removal of existing physical electrical infrastructure shall be in line with Greig & Stephenson Architects' Restoration Method Statement. The appointed contractor responsible for the strip out of existing electrical infrastructure shall familiarise themselves with this document take specific note of any standard/particular heritage requirements involved as denoted.

5.1.14.1 Market Building Existing Services

LV Infrastructure

The existing main market LV Panel board is located within the main switch room. The existing main switch room is to be demolished and rebuild and all associated LV distribution equipment shall be stripped out and made redundant as part of these works. No part of the existing LV panel board or associated infrastructure within the main switch room shall be retained or reused as part of these works.

All distribution boards within the LV switch room shall also be made redundant by these works. The redundant distribution boards and contactor boards will be stripped. No part of the existing Distribution boards or associated infrastructure shall be retained or reused as part of these works.

All redundant sub main cables will be disconnected and removed, disconnected submains cabling shall not be reused to supply any of the proposed arrangements as part of the proposed works. All final circuit cabling to redundant accessories and final circuits will be stripped back and removed.

All distribution board charts shall be made redundant.

Cable Containment System

Redundant cable containment systems will be removed during the strip out. No allowance to retain or re-use any existing cable containment has been made as part of the proposed works.

Small Power & Data Ancillary Outlets

Existing small power and data outlets within the area of works shall be safely stripped out, isolated and provided with new as indicated on the proposed small power and data plans.

Lighting & Emergency Lighting System

All existing luminaires and lamps will be stripped out and disposed of in accordance with WEEE recycling directive.

Lighting shall be replaced with new energy efficient LED lighting therefor all existing light fittings stripped out will be made redundant as part of these works.

Fire Alarm System

Existing fire alarm panel to be isolated, stripped out and replaced with new as specified on accompanying drawings.

PA System
All existing PA circuits and speakers shall be stripped out and made redundant by theses work. All associated equipment shall also be stripped out.

No equipment or cabling associated with the existing comms infrastructure or data racking will be retained.

Access Control
All existing Access Control readers and controllers shall be stripped out and the central system will be made redundant. No accessories, cabling or equipment shall be re-used as part of the revised CCTV strategy for the new layout proposal.

CCTV System
All existing CCTV shall be stripped out and the central system shall be made redundant. No accessories, cabling or equipment shall be reused as part of the revised access control strategy for the new layout proposal.

Any strip out works associated with the removal of existing physical electrical infrastructure as mentioned above shall be in line with Graig & Stephenson Architects' Restoration Method Statement. The appointed contractor responsible for the strip out of existing electrical infrastructure shall familiarise themselves with this document take specific note of any standard/particular heritage requirements involved as denoted.

5.2 INCOMING UTILITIES

5.2.1 Electrical Supply

It is proposed that as part of the refurbishment of the Market Building, the existing site transformer and associated TP&N supply shall be upgraded to **265kVA TP&N** to accommodate the new fit out requirements and associated equipment.

The supply increase is subject to limitations of the existing on site transformer due to also serving other buildings within the surrounding area. Therefor the noted increased figure of 265kVA to the market hall is an absolute maximum allowance and cannot be increased due to the existing LV infrastructure limitations.

A budget estimate has been obtained for this from Northern Powergrid (NPG), however in line with the project programme, a firm connection offer has been submitted and awaiting receipt back from NPG.

PLEASE NOTE – Current NPG advised lead times on new substations is currently approx. 6 months from order, this would need a firm quotation providing beforehand which may also be another circa 1 month from application to receipt of quotation.

The current budget estimate received allows a new LV supply to be provided from the existing on site transformer room into the adjacent newly formed LV switch room. Further details on the overall design, trenching works and coordination with other services shall be confirmed up on receipt of the firm quotation.

The new upgraded LV supply is limited due to the existing infrastructure and therefor the project has had to be descoped to accommodate the limited supply increase.

The option to upgrade the existing on site transformer would require the existing transformer room to be fully demolished and rebuilt to accommodate firstly the physically larger transformer and secondly to adhere to northern power grids latest standards from transformer room sizes, clearance zones and access/maintenance requirements. As this is an existing heritage, listed building this would incur considerable architectural changes that are not obtainable for the project.

Due to budget constraints this option has been identified completely financially unfeasible for the project to be able to progress, therefore the above limitations have been defined.

5.2.2 Telecomms BT Openreach

The incoming BT comms infrastructure is believed to currently enter the building withing the lower end of Annex 2. It is understood that the rack within the existing office has a dedicated line / BT DP point which shall be stripped out and made redundant by the proposed works.

The CCTV rack and associated equipment and main ICT/General Comms rack is currently within the market building annex office. As part of the refurbishment works, it is proposed for this to move due to architectural general arrangement layout updates to the new comms room within annex 1 to accommodate the new rack, it is proposed for a new incoming fibre supply to be brought into the comms room at heigh level on dedicated containment.

Through review of legacy below ground services record drawings, it has been identified that the existing supply is being taken from a connection point outside the annex in the roadway on Byram street market annex access.

After liaising with Openreach, survey work has been instructed to identify the exact entry point and details where the new cable shall entre the building. The works associated with providing a new fibre cable connection into the building shall be defined by the result of scheduled Openreach survey work.

Subsequently a formal quote shall be provided by Openreach to the client for instruction by the main contractor when the final extent of the works has been identified.

The contractor shall be responsible for co-ordinating this installation with the construction programme.

Any strip out works associated with the removal of existing physical electrical infrastructure as mentioned above shall be in line with Greig & Stephenson Architects' Restoration Method Statement. The appointed contractor responsible for the strip out of existing electrical infrastructure shall familiarise themselves with this document take specific note of any standard/particular heritage requirements involved as denoted.

5.3 TEMPORARY WORKS

The market hall trading shall remain operational at a reduced capacity during the refurbishment of the main market hall and Annex's. The outlined scope to maintain the operation of the market hall during these refurbishment works is to relocate a number of traders to the external trading/car park space for a set period. There shall be a temporary market building for sheltered trading as well as external trading spaces also.

The external market building shall be prefabricated and shall come with all internal power and lighting requirements fitted out by the temporary market provider.

A temporary single phase and neutral 15kVA electrical connection shall be provided to the temporary market building by northern power grid. All associated digging, trenching and connection of the temporary supply shall be undertaken solely by Northern Power Grid. Further details for the temporary market and associated electrical supply shall be detailed within drawing number' HOM-KCE-XX-00-DR-ME-1002 - Temporary Services'.

5.4 LV DISTRIBUTION

Scope of Works

The Contractor shall design, supply, install, test, commission and set to work a complete low voltage electrical distribution system throughout the market Building refurbishment as indicated on the scheme drawings.

Design Parameters

Read in conjunction with the Codes of Practice, Standards and Guidelines outlined within section 5.1.9 of this document and the appropriate sections of the Kaizen Consulting Engineers Standard Electrical Specification.

System Description

The Contractor shall be responsible for the design, supply, installation, testing and commissioning of all LV switch boards in accordance with the IET Wiring Regulations BS 7671 18th Edition + A3 and this particular specification.

The existing supply arrangement has a main LV switchboard for the Market Hall and Annex's to serve dedicated supplies and final circuit distribution boards. The main panel is metered from the individual incoming electrical supply that enters the building, provided by NPG to a heavy duty cut out and meter.

The design intent is for the existing Kirklees Council owned main LV panel board to be stripped out, removed and made redundant. No Part of the main LV panel arrangement shall be retained or re-used for the refurbishment of the Market Hall.

It is understood that the LV Panelboard is a manufactured by Square D with 400A Copper Busbars achieving Form 3b Type 2.

As part of the upgrade in the existing utility supply works, the existing isolator and busbar chamber shall be replaced with bespoke custom build panel board for supply of all landlord and tenanted sub-metered supplies throughout the market hall, annex's and external areas.

The Contractor shall allow for providing this panel board and all associated protective devices, metering and downstream cabling to all outgoing supplies, sub main and final circuit.

Existing LV Panelboard

The existing MCCB Panel Board is currently installed and complete with all components, it is understood that the system currently provides a complete and safe panel board installation to the existing arrangement on site on site and is suitable for the existing demands of the site.

While the existing infrastructure is in good working order and suits the requirement of the existing site, it is noted that the physical infrastructure is well aged and is nearing the end of its lifespan, thus no part of the existing panelboard or MCCB's shall be retained or reused as part of the proposed works.

Existing Main Panel Board – Located within Main Switch Room

It is understood that the existing MCCB Panel board installed within the LV Switchroom is provided in accordance with the following:

- Segregation / Form: BS EN 61439 Form 3b Type 2
- Minimum Ingress Protection: IP3X
- Type: Wall mounted enclosure
- Access: Front access
- Incoming cables: Bottom entry
- Outgoing cables: Top exit
- Incoming supply circuit breaker: MCCB (Non-Auto)
- Fault rating: Minimum 50kA, 1s
- Metering: Incoming
- Material: Steel
- Finish: Grey colour Powder coated

There is a lot of redundant legacy electrical distribution infrastructure within the existing switch room that has been identified as unused and redundant, this equipment shall also be stripped out along with the main LV panel board and active outgoing supplies.

Sub-main cables are generally XLPE insulated, Steel Wire Armoured, Low Smoke Zero Halogen (LSZH) to BS 6724, 600/1000V grade insulation, manufactured by a BASEC approved manufacturer.

Any strip out works associated with the removal of existing physical electrical infrastructure as mentioned above shall be in line with Greig & Stephenson Architects' Restoration Method Statement. The appointed

contractor responsible for the strip out of existing electrical infrastructure shall familiarise themselves with this document take specific note of any standard/particular heritage requirements involved as denoted.

Proposed LV Panelboard

The new LV switch board shall be installed at ground floor within the existing LV switch room and shall be provided with the following general specification.

General Specification:

- Manufacturer — GR Electrical
- Installation — floor mounted
- Form of Separation — Form 4 Type 2
- Incoming Device — 4 Pole MCCB
- Outgoing Devices — MCCB
- Access — Front
- Cable Entry — Incoming at the top
  Outgoing at the top

The main LV switchboard shall be able to accommodate the following connections and systems;

1. Incoming MCCB protection from the LV supply.
2. TVSS protection.
3. Schneider NSX MCCB / MCB devices throughout on outgoing supplies.
4. Equipped (with larger devices for the cubicle) spare ways.
5. Equipped with metering for all outgoing occupied ways.
6. Equipped with metering for all spare ways.

The LV panel board Shall be manufactured by GR Electrical to accommodate all outgoing occupied/spare ways TVSS and spare for power factor correction connections. The physical dimensions for the main LV panel are as follows: 3310mm wide x 2200mm Heigh x 550mm Deep.

Power Factor Correction

As part of the Value Engineering (VE) process, the requirement to provide a power factor correction unit within scope is not to be included for on the main LV MCCB panel board. The physically spatial allowance within the panel and the LV switch room shall subsequently be omitted. Spare ways on the panel board shall offer future connectivity should this be deemed necessary in the future to install.

Surge Protection

The Contractor shall install test and commission a coordinated surge protection installation for the facility, in accordance with BS EN 62305 and in conjunction with the lightning protection installation design and relevant risk assessments.
Surge Protection Devices (SPD's) shall generally be provided but not limited to the following:

- Integrally within the LV panel board.
- Integrally within LV TP&N distribution boards
- Integrally within LV SP&N distribution boards
- IT systems and incoming IT infrastructure.
- Fire Alarm Panel
- All below ground incoming and outgoing LV infrastructure

Metering

The existing main panel board has no integral incoming metering device arrangement typically seen in modern electrical panel board installations. The outgoing ways from the integral MCCB's also have no integral metering arrangement within the panel. No outgoing self contained separately metered enclosures of the outgoing ways were identified on site within the existing plantroom.

The main incoming DNO meter is noted as owned by and installed by Northern Power Grid reference NG14K01484. The existing DNO meter is of Elster A1700 type and is also noted as aging physical infrastructure. The MPAN reference number for the DNO meter is as follows: MPAN 2322631645010. As a result of the existing DNO meter being identified as aging it is recommended that the Meter be fully replaced with new meter suitable for the proposed outgoing installation.

Existing Incoming DNO Meter – Located within Main Switch Room

Any strip out works associated with the removal of existing physical electrical infrastructure as mentioned above shall be in line with Greig & Stephenson Architects' Restoration Method Statement. The appointed contractor responsible for the strip out of existing electrical infrastructure shall familiarise themselves with this document take specific note of any standard/particular heritage requirements involved as denoted.

The proposed new LV panel board shall be capable of metering all outgoing supplies, single phase and three phase, to landlord and tenant sub distribution boards and equipment.

Energy and utility metering monitoring shall be provided in accordance with the requirement of CIBSE TM:39. Metering the main LV switch board, incoming and outgoing ways, including spares, and all specialist supplies.

The energy monitoring shall be TM39 in terms of split and type of load measurement, and also building regulations. The Contractor shall produce a full energy metering strategy document for the electrical installations.

Dedicated tenanted distribution boards shall all be suitably sub-metered to allow for accurate billing by the landlord

The Contractor shall produce and comprehensive meter strategy schematic drawing with connection, usage and consumption estimates provided.

The instrumentation and metering for the main LV panels shall comprise of Integral, Multi function, digital system monitor units, DIN rail mounted, the following Class 1 IEC1036 measurement functions shall be available.

- Volts
- Amps
- Watts
- PF cos Ø
- VAr
- VA
- Hz
- kWh
- kVArh
- VA Peak
- W Peak
- Average Kw
- Average Kva
- Average kVar
- Date
- Time

Each digital meter shall include integral battery back up to retain its memory for 48 hours in the event of a supply failure.

All meters, instrumentation and protection devices shall be ergonomically positioned to ensure that displays and controls are easily accessible and viewable.

All meters shall be located at heights in compliance with the DDA, The Building Regulations Approved Document M and BS 8300.

Metering shall be used to enable a recording of usage for billing purposes to each tenant demise. Dedicated metered distribution boards shall be provided to each tenant area in order to establish the usage within the tenants area and shall have the ability to measure consumption for landlord billing to individual tenants.

Due to there being no proposal for a BMS system on the refurbishment of the market, originally a manual metering assessment strategy was progressed. The metering strategy for the billing of tenants was to be managed by Kirklees council and the market team by manually accessing the dedicated meter readings for the individual tenanted distribution boards at the main LV panel. However, AECOM have now requested some form of remote billing capabilities on behalf of the council, therefore the following installation shall be proposed.

As a means of remote monitoring for billing purposes a Schneider Electric EnerlinX Series Gateway Server shall be installed within or adjacent the main LV switch panel. The gateway server shall utilize a an RS485 cable daisy chained into each meter within the panel as a means of collecting the information on the outgoing electrical usage. The gateway server shall then be hard wired to a PC within the main staff office with an RJ45 cable as a means of reading the data.

Schneider Electric EnerlinX Series Gateway Server

This will provide a facility for collecting data on tenants electrical usage for the purpose of providing a bill without the need to physically access the panel within the LV switchroom.

Sub-main Distribution

Sub main cabling to new distribution boards and fixed items shall be fed via XLPE/SWA/LSF multicore cabling to BS 6724, 600/1000V grade insulation, manufactured by a BASEC approved manufacturer and shall be run on dedicated medium duty return flange cable tray.

All sub main cables shall be XLPE/SWA/LSF type cables, having copper stranded conductors, unless stated otherwise. Each sub main cable shall have full size phase and neutral conductors.

Typically, Sub-mains cabling shall be provided to serve a minimum of, but not necessarily limited to, the following items of equipment:

1) All large Items of mechanical plant
2) Tenanted distribution & landlord distribution boards
3) Final circuit lighting and power distribution boards
4) Fire alarm panel (FP200 Enhanced or soft skin equivalent)

All armoured cables shall be installed on a minimum of medium duty return flange mild steel galvanised perforated cable tray, following the general routes indicated on the drawing. Cables shall be supplied and installed in accordance with the requirements of this specification and the cable manufacturer.

The final route of all cable and containment systems shall be agreed on site with the project Architect prior to installation.

All cables shall be terminated in manufactured glands complete with manufactured earth tag (as recommended by the cable manufacturer).

The Contractor shall be responsible for providing and installing “Critchley” type cable marker identification to both ends of sub main cables to reflect the notation of the LV Schematic.

Distribution Boards

The Contractor shall be responsible for the design, supply, installation, testing and commissioning of all distribution boards in accordance with BS 7671 18th Edition Including Latest Amendments and this Particular Specification.

Due to restrictions on the electrical supply capacity, there is no spare allowance in the electrical load for the site, therefore, all distribution boards are sized accurately with no specific allowance to a minimum spare capacity % figure for electrical capacity and physical spare ways being provided on all distribution boards. Any unused ways shall be provided with manufactured blanking pieces.

Distribution boards shall comply with BS EN 60439-3, and be supplied and installed complete with lockable MCB’s, blanking pieces, integral isolating switch and flush lockable doors. External protection shall be IP3X to BS EN 60529.

The existing Distribution Boards will be safely isolated, stripped out and removed from site and replaced with new throughout to suit the requirements of the proposed refurbishment.

Any strip out works associated with the removal of existing physical electrical infrastructure as mentioned above shall be in line with Greig & Stephenson Architects’ Restoration Method Statement. The appointed contractor responsible for the strip out of existing electrical infrastructure shall familiarise themselves with this document take specific note of any standard/particular heritage requirements involved as denoted.

New MCB’s, RCBO’s, cabling and protective devices shall be fitted as part of the refurbishment works to facilitate all new circuiting.

Distribution boards shall provide a means where final circuits shall be connected to the loads through the protective device, located as close as practicable to the final circuits in order to minimise the amount of final circuit wiring and cable containment systems. The distribution boards shall be of three-phase & single-phase configuration, metal clad and lockable complete with main isolator switch rated at the required current rating. In addition, distribution boards shall be surface wall mounted at a suitable mounting height. Distribution boards located externally shall be located within a suitably rated weatherproof enclosure. Anti-condensation measures shall be allowed for to any distribution boards or control panels located externally.

To provide circuit and earth leakage protection Residual Current Breakers with Overcurrent protection (RCBOs) shall be provided within the distribution boards. Consideration shall be given to the manufacturer to ensure the RCBO unit occupies a single outgoing way on the distribution board and not multiple outgoing ways.

TP&N distribution boards will utilise BS EN 60947-2 MCB’s to type B or C and BS EN 61009 RCBOs with a minimum 10kA rating. Spare ways will be provided with blanking covers throughout and will not be populated with devices. The breaking capacity will be adequate for the maximum prospective short circuit current where they are installed. All devices will discriminate with other protective devices in the installation.

Each distribution board will be provided with type written circuit charts contained within a fixed plastic sleeve. The schedule will be complete with circuit protective device ratings and appropriate description of final circuit served.

Surge Suppression

Surge Suppression equipment shall be provided within the main LV panel to provide protection from heavy externally generated impulse transients. The unit shall take the form of an integral flush unit within the main LV panel and all new distribution boards as required by design. All new distribution boards shall be provided with a Type 1 / 2 device.

Final Circuit Distribution

The Contractor shall be responsible for the design, supply, installation, testing and commissioning of all necessary final circuit cables in accordance with BS 7671 18th Edition Including Latest Amendments and this Specification to provide a complete and functional installation.

Within the main Market Hall and Annex's, three compartment galvanised steel cast in screed trunking shall be provided to distribute power and data cabling throughout the site. 13Amp switched socket outlets and single RJ45 outlet shall be provided in accordance with identified requirements. 25mm galvanised steel metal flexible conduits shall be provided to tee off cabling into the final wiring accessories as identified on the main sitewide lighting and power drawings. Contractor to fully co-ordinate secondary containment 25mm galvanised steel metal flexible conduits on site.

All cabling is to be contained throughout its length. In areas where conduit serves a moveable accessory the conduit shall be within 500mm of the outlet. PVC conduit shall be utilised for ELV systems unless present on a fire wall. Any conduit for cabling emanating from a basket are to utilise a female brass brush or proprietary conduit take off plate.

Final circuit cabling to wall mounted accessories on finished walls will be recessed within the building fabric to provide a flush finished installation unless noted otherwise. Final circuit cabling to accessories on fair face or exposed walls are to be cabled in surface galvanised steel conduits to final accessory location.

Circuit protective, equipotential and supplementary bonding conductors will be LSF/Cu (green/yellow) cables installed in conduits and trunking.

All final circuit cables will be sized to suit the ratings of the individual circuits with full allowance being made for grouping factors, voltage drop thermal conditions and disconnection times given in the IET Wiring Regulations, 18th Edition including the latest amendments. The minimum final circuit conductor size permitted will be 1.5 mm² for lighting and 2.5mm² for small power, whilst ensuring that the voltage drop at full load current, on any final circuit, does not exceed 3% of the nominal voltage for lighting and 5% for other circuits (including sub-mains).

Appropriate segregation of electrical systems will be maintained throughout. 400-volt potential will be avoided where practical, otherwise appropriate warning labels will be provided. Separation within trunking will be provided by either a sufficient space between banded services, or the introduction of a steel divider sheet within the trunking.

External lighting cables to locations remote from the building shall be buried underground enclosed in PVC ducted where not installed in soft dig areas via XLPE/SWA/LSF cables.

Every phase conductor shall be numerically identified by a plastic sleeve(s) at each termination. Within electrical equipment when more than one circuit is present the neutral and circuit protective conductors shall be identified as per the phase conductor.

All 32A final ring circuits shall be fed via a conventional ring with no spur connections. All socket outlet circuits shall be RCBO protected with rated tripping current of 30mA and in accordance with BS 7671 18th Edition including latest amendments.

Final Circuit Wiring Methodology

The contractor shall design, supply and install to the following wiring methodologies throughout the scheme:

- All final circuits for lighting and power systems will be wired using LSOH (halogen free low smoke and fume) single-core 4D1 cables rated at 70°C within a dedicated galvanised steel conduit and trunking containment system.

- Sub main cables will be steel wire armoured cables grade 600/1000V XLPE/SWA/LSZH with the exception of incoming cabling to the panelboard from the DNO incoming fuses and metering which will be XLPE/LSZH single core cables run in galvanised trunking.

- Fire alarm cabling will be fire enhanced performance category of wiring as defined by BS5839 with red LSZH oversheath, for fire cabling fixed to dedicated cable tray/trunking or where in runs of two cables or less, clipped to the building structure using metal cable fixings.

- Separate C.P.C. cables will be copper stranded conductors with LSZH yellow/green insulation, 6491B type cables.

- DALI Control Cabling where separate will be tinned copper twisted pair control cable with LSZH pink oversheath. DALI cabling will be capable of being ran in the same containment as the final circuit wiring where combined with power cabling and ensured to be mains rated.

- All Mechanical control cabling will be provided and specified by the Mechanical Control Contractor as part of CDP. All Controls cabling will be secured to the ICT / Comms cable trunking or within galvanised steel conduit.

- All electrical wiring shall be rated & sized based on a maximum current carrying capacity at 70°C.

5.5 CABLE CONTAINMENT

Scope of Works

The Contractor shall design, supply, install, test, commission and set to work the cable containment throughout the Market Building refurbishment in accordance with this specification.

Design Parameters

Read in conjunction with the Codes of Practice, Standards and Guidelines outlined within section 5.1.9 of this document and the appropriate sections of the Kaizen Consulting Engineers Electrical Specification.

System Description

The contractor shall allow for all new primary and secondary cable containment systems for all cable types which are to be installed under this project.

Containment systems shall be as follows for all the electrical installations:

- LV Sub Main Cables - MDRF Galvanised Steel Cable Tray
- Final Circuit LV (L&P) - Galvanised Steel Trunking & Conduit
- Fire Alarm cables - MDRF Galvanised Steel Cable Trunking & Clipped Direct
- Security Cables - Galvanised Steel Cable Tray
- ICT/Comms/ELV - Galvanised Steel Cable Tray & Conduit
- Recessed Cables - Galvanised Steel Conduit
- Surface Installed Cables - Heavy Gauge Galvanised Steel Trunking/Conduit

The primary cable containment system including risers will all be sized allowing for 10% future capacity.

The secondary cable containment systems will be sized allowing for 10% future capacity.

The size and quantity of cables installed in any trunking will be such that having taken into account the necessary grouping / rating factors and overall space factor of 10% is not exceeded.

The Contractor shall have deemed to have fully co-ordinated all the services including taking into account all other services, structures, and any other obstructions.

All containment passing through fire compartments shall be intumescent sealed with proprietary transit.

The Contractor shall supply and install proprietary fire stopping where the building services pass through a fire compartment.

All containment passing through fire compartments shall be intumescent sealed with proprietary transit. The Contractor shall supply and install proprietary fire stopping where the building services pass through a fire compartment. Reference shall be made to the Willmott Dixon Yellow Book manufacturers details and recommendations on all fire stopping requirements for different internal and external penetrations.

Different types of service penetrations (cables, trays, conduits, trunking etc) have their own specific requirements, the specified fire stopping manufacturer must be contacted for specific advice i.e. spacing (ideally 100mm apart and 100mm from the edges) and maximum distance from the penetration to the first service support.

Where fixings are made directly into exposed CLT and timber structures, the specifier of the fixing must consider the char rating and the impact of the loss of timber in a fire. This is typically achieved by specifying longer fixings and discounting the thickness that is expected to char in a fire for the required period of time.

For fire alarm cables, and other fire safety systems, cable supports must be steel or copper and have a fire survival time equal to the cable, at centres specified by BS 7671 and/or the cable manufacturer.

Where cables are not installed on a dedicated containment system and are surface fixed, cabling shall be supported using steel or copper cable clips, saddles, or ties as such to ensure the cabling will not be liable to premature collapse in accordance with BS 7671 18th Edition + A2.

The Contractor shall co-ordinate the containment layout with the building GA`s, FF&E layout, mechanical services layout, and provide a fully designed, dimensioned, co-ordinated installation drawing for approval prior to the installation of any containment systems.

The Contractor shall allow for tender to use the manufacturers stated within the specification. The main Contractor shall provide the fire stopping to relevant penetrations.

The contractor shall install all the containment required for the IT installation. The containment shall be installed as to provide segregation from other electrical services. Main arterial runs of containment shall be by a dedicated IT containment, or containment section with steel divider on an electrical services containment. To achieve the following separation, as detailed on the containment drawings.

RECOMMENDED CABLE SEPARATION DISTANCES				
TYPE OF INSTALLATION	WITHOUT A DIVIDER	WITH A NON-METALLIC DIVIDER	ALUMINIUM DIVIDER	STEEL DIVIDER
UNSCREENED POWER CABLE & UNSCREENED IT CABLE	200mm	200mm	100mm	50mm
UNSCREENED POWER CABLE & SCREENED IT CABLE	50mm	50mm	20mm	5mm
SCREENED POWER CABLE & UNSCREENED IT CABLE	30mm	30mm	10mm	2mm
SCREENED POWER CABLE & SCREENED IT CABLE	0mm	0mm	0mm	0mm

FOR HORIZONTAL CABLING OF MORE THAN 35m THEN NO SEPARATION IS REQUIRED FOR THE FINAL 15m.

Conduit

All conduits shall be heavy gauge hot dip galvanised steel class 4 where surface fixed, recessed or installed in plant and external areas.

Where conduits are to be installed in the floor screed they shall be installed at a depth and in a manner that will not reduce the strength of the floor or cause cracking of the screed.

Where flexible conduit is required, PVC covered steel flexible conduit shall be used and limited to a maximum length of 600mm.

Trunking Installation

Steel cable trunking installations shall be galvanised steel throughout. All routes and methods of installation to be agreed on site with the Project Engineer.

All tee joints shall be flanged and, where tee or crossover bridge accessories are required, the Electrical Contractor shall ensure the same effective wiring space per compartment as the main trunking run.

Where cable trunking passes through fire compartment walling a fixed section of lid shall be installed extending 300mm either side of the wall with the interior of the trunking fitted with intumescent pillows of sufficient volume to occupy all spare space for the length of the fixed lid.

Cable Tray / Ladders / Basket

All cable tray / ladder / basket shall be complete with 45-degree gusseted corner pieces at tee junctions, crossovers, and changes of direction. This is a requirement to achieve minimum bending radii of cables.

Within suspended ceilings/bulkhead areas the cable tray/basket/trunking shall be supported from purpose made Unistrut channel and drop rods or wall mounted top hat brackets. Where cable tray / baskets pass through fire compartment walling, the Contractor shall be responsible for fire sealing around the tray / basket with proprietary cable transits.

Dado Trunking

Perimeter dado trunking shall be used to deliver power and date to the desks where indicated.

Power and data cabling entering the perimeter trunking systems shall be accommodated by either a vertical section of complimentary containment or via routing cables through new stud partitions to meet perimeter systems.

Screening shall be included within perimeter containment systems to maintain cable category separation requirements.

Manufactured bends and accessories shall be used throughout; the provision of site fabricated bends is prohibited.

Site applied protection shall be applied to all installed trunking during the construction phase to prevent damage to finishes. Damaged or scratched finishes will not be accepted at completion.

5.6 GENERAL LV SMALL POWER

Scope of Works

The Contractor shall design, supply, install, test, commission and set to work a small power distribution system serving general power outlets and dedicated items of equipment throughout the Market Building refurbishment in accordance with this specification.

Design Parameters

Read in conjunction with the Codes of Practice, Standards and Guidelines outlined within section 5.1.9 of this document and the appropriate sections of the Kaizen Consulting Engineers Electrical Specification.

System Description

A new complete general low voltage small power installation shall be provided to the refurbished market Building. Reference shall be made to the accompanying drawings for the quantities of small power outlets required within each end user defined space.

A complete electrical distribution system consisting of submain and low voltage cables shall be provided to Ring final and radial power circuits shall be provided for socket outlets and fixed equipment including the following:

- General purpose 13A twin switched socket outlets
- ICT 13A single and twin switched socket outlets - twin switched socket outlets serving ICT or any other items of equipment likely to induce above average earth leakage in the normal course of operation, shall be wired in accordance with BS 7671 with dual earth terminals and outboard rocker switches
- 13A cleaner's socket outlets (Lockable within public areas)
- Mechanical engineering services equipment
- Public health engineering services equipment
- All specialist systems, including but not limited to fire detection and alarm, data and communication systems and infrastructure (ICT), access control, intruder detection, CCTV, audio visual systems (i.e. screens and equipment for TV or information) where not supplied via POE+, PA.
- Plant areas switched socket outlets and power supplies, generally as surface mounted metal clad IP rated accessories
- Server/data cabinet power supplies as required by the ICT specialist
- Outlets to equipment and accessories
- Fixed Induction Loop Systems
- Disabled Toilet Alarm Systems
- Automatic Doors
- Access Control Systems

All ring final circuits shall to be protected by a 32A/30mA Residual Current Circuit Breaker with over current protection (RCBO).

All socket outlets and fixed equipment shall be fitted with a dymo label indicated a circuit reference of the distribution board supplying each outlet.

Final quantities of ancillary power supplies which form part of Contractor Design Portion packages shall be confirmed, the contractor shall liaise with the specialists for each CDP item to confirm the final quantities and locations.

All new circuits will be wired as a conventional final ring/radial circuits. All power circuits' minimum cable size will be 2.5mm². All accessories will be manufactured by MK or equal and approved.

The small power electrical services finishes shall be confirmed with the project architect and client prior to ordering. Samples shall be provided.

External wiring accessories and external plant area outlets shall be surface type with an IP rating suited to the environment.

All wiring accessories should be installed a minimum of 300mm from the edge of kitchen sinks and draining boards to reduce the risk of being splashed and 100mm from the edge of the hob.

Putty pads must be fitted inside the backbox, not on the rear face where they cannot be inspected or installed to both sides of a wall.

Ensure fire test evidence from putty pad manufacturers covers the onsite conditions (included but not limited to wall rating, linings, depth of backbox, socket spacing, proximity to other sockets, acoustic requirements, conduit entry)

The use of recessed plastic backboxes is not acceptable.

Cleaning Socket Outlets

Cleaning sockets shall comprise single switched socket outlets. These shall be lockable to prevent unauthorised use within public areas. Cleaners' sockets shall be provided at suitable locations such that any room, corridor, or ancillary area of the building is no more than 20m maximum from a socket outlet (subject to Architects approval). In individual rooms a minimum of one outlet shall be provided. All sockets designated for cleaner's use shall engraved 'CLEANERS' and provided on a dedicated circuit.

Switched Socket Outlets

The Contractor will supply and install switched socket outlets with finish front cover plates in line with the agreed proposed finishes agreed with the architect and outboard rocker switches, white plastic where flush fitting and metal clad range where surface fixed. Metal clad standard type outlets will be used in plant areas for both power and data outlets. Colour contrasting faceplates from the background they are installed on shall be provided in accordance with the Approved Document Part M where required and agreed with the project architect.

All socket outlets will be installed to comply with Section 543.7 of BS 7671. The Contractor will therefore install separate duplicate protective conductors, having independent connections each having a cross sectional area not less than 4.0mm² for areas of heavy ICT usage.

Access Control/Door Hold Open Supplies

Power supplies and containment will be provided for the access-controlled doors, door hold open devices and equipment as indicated on the drawings. 13A fused connection units at high level within the ceiling void or at high level to the secure side will be provided at each location.

All access control doors and door hold open devices will be linked to the fire alarm system via a fire alarm interface unit. On activation of the fire alarm, the doors will automatically release until the fire alarm has been reset. All access-controlled doors will release on fire alarm.

Mechanical Plant

The Contractor shall be responsible for the design, supply, installation, testing and commissioning of all necessary supplies to the entire mechanical services installation in accordance with BS 7671 18th Edition including latest amendments, and the project mechanical performance specification. Refer to the mechanical services performance specification and drawings for details.

The Contractor shall be responsible for verifying all equipment loadings, supply ratings and specialist wiring requirements with the Mechanical Services Contractor (via the Main Contractor). Final locations of all isolators and switches etc. to be agreed on site.

All electrical services from the mechanical services control panels to mechanical equipment to be by the mechanical control's contractor.

In-Ground Units

Power to the demountable trading pitches within the market hall shall be via in ground floor dedicated in-ground floor boxes, suitably sized for the location and quantity of demountable pitches it is intended to supply. The in-ground floor boxes shall by Pop-up Power type and from the PUPS02 5050 range. The quantity of outlets for each floor box are denoted on small power drawing 6200, in line with identified demountable pitches.

Hand Dryers

The Contractor shall supply and install new hand dryers and associated electrical supplies to every toilet and changing facility where required by the architectural plans. Power supplies shall terminate in a high level switched fused connection unit located at 200mm below the ceiling height cabled to an outlet plate at the rear of the hand dryer. Hand dryers shall be mounted at heights suitable for the proposed environments.

Electric Vehicle Charging (EVC)

No provision for electric vehicle charging has been allowed for as part of the proposed refurbishment works. This is mainly due to the lack of suitable locations to situate LV charging points around the market Hall and also due to the restrictions regarding upgrading the existing incoming LV supply.

External Market Yard Services

The Market Yard area has undergone a large scale descope from previous revisions and has been stripped down to a demountable market trading area with a small car park and bin store.

A ducted supply from the main Market Hall shall cross the road on Brook Street and terminate within a feeder pillar. The feeder Pillar shall house a TP&N distribution board to supply all external Market Yard services.

The extent of the external services is now as follows:

- External lighting in the form of column mounted luminaires

- External power in the form out power bollard commando sockets
- Power to Amazon lockers
- Power to waste compound glass crusher
- Power to waste compound compactor

Locations for the above equipment is as detailed on the external services drawings.

A fibre cable shall also be provided to a to the feeder pillar and terminate inside from a separated dedicated in ground duct. The scope for Wi-Fi and dedicated data supplies has been omitted as a result of budget constraints however the fibre cable shall be provided for any future development to the market yard area and for the potential use in Kirklees Council events.

5.7 SOLAR PHOTOVOLTAICS (PV)

Scope of Works

The previous allowance for PV defined within AECOMS's stage 3 design had been descoped and omitted during the stage 4 design development process after the omission of the market yard buildings. This is primarily due to budget restrictions for the project as a whole.

Therefore, there shall be no allowance for PV array or associated equipment as part of the stage 4 detailed design works.

5.8 GENERAL LIGHTING

Scope of Works

The Contractor shall design, supply, install, test, commission and set to work a complete general lighting system throughout the Market Building refurbishment in accordance with this specification.

Design Parameters

Read in conjunction with the Codes of Practice, Standards and Guidelines outlined within section 5.1.9 of this document and the appropriate sections of Kaizen Consulting Engineers Standard Electrical Specification.

Area / Room:	*Maintained Average Illuminance:*	*Uniformity:*	*Working Plane (m)*
Store Rooms	100 lux	0.4	0.00
Circulation Routes	100 lux	0.4	0.00
Market Hall	300 lux	0.4	0.75
Toilets	200 lux	0.4	0.00
Plant Rooms	200 lux	0.4	0.00
Kitchen	500 lux	0.6	0.75
F&B Units	500 lux	0.6	0.75
Offices	500 lux	0.6	0.75
Fixed Pitches	300 lux	0.4	0.75
Annex Cafe	200 lux	0.4	0.00
Comms Room	200 lux	0.4	0.00
Multifaith Room	200 lux	0.4	0.00

System Description

The Contractor shall design, supply, install, test and commission a complete internal lighting system that meets the design criteria of this specification, BS 7671 IET Wiring Regulations Including Latest Amendments, Building Regulations Part L, SLL Lighting Handbook, CIBSE Codes for Lighting and CIBSE Lighting Guide 7 “Lighting for Offices” – for areas where computer screens are regularly used.

The Contractor shall supply and install all luminaires complete with fixings, suspensions, louvres, diffusers, reflectors, control gear and lamps together with all ancillary components, accessories and attachments where necessary as indicated on the accompanying drawings.

General lighting will be provided within the Market Building in line with the agreed design parameters indicated on the drawings and in this document.

The lighting design for the area will conform to the following parameters:

- Use of low energy lighting sources and LED technology
- Provide a minimum luminaire efficacy of 80 lumens per watt in accordance with the latest building regulations.
- Provide sufficient illumination for tasks and appropriate ambience for area required as detailed in CIBSE guide.
- Limit the number of lamp type/luminaires and sizes used for ease of maintenance and fault finding.
- Utilise daylight available within each space.
- Achieve recommended levels of illuminance and luminance and line with design parameters.
- Achieve good colour appearance and colour rendering.
- Control and limit glare.
- All controls are selected to be compatible with the environment in which they are installed.

Lighting will be LED type and rated with a colour temperature of 3000/4000K dependant upon the area of the area of use. Publicly accessible areas shall generally be 3000K with 4000K utilised in kitchen/office areas. The lighting will be integrated and coordinated with the architectural ceiling detail to ensure aesthetics are maintained. Final selections and colour temperatures including finishes clours of luminaires shall be agreed with the architect prior to ordering and installation.

Luminaires selected will comply with the following:

- Manufactured to meet the requirements of BS EN 60598
- Manufactured to provide Class 1 protection against electric shock.
- Protected to a suitable ingress class as referred to in BS EN 60598 of IP20 minimum or to that stated for the particular environment.
- Suitable for operation at 230V, 50Hz, SPN
- Manufactured to meet the requirements of the appropriate electromagnetic compatibility (EMC) directive of the European Council and appropriately CE marked.
- Luminaires will be equipped with DALI dimmable drivers to allow for an upgraded lighting system to the Market Building and better control of luminaires.
- Luminaires will be selected to compliment the décor of the area and will meet clients’ approval. Samples of all luminaire selections will be provided to the client prior to ordering.

All luminaires will be located in accordance with details prepared by the Architect and selected to meet the clients’ approval. All luminaires mounted within areas of suspended ceiling will form an integral part of the

false ceiling. Recessed luminaires will be fixed via proprietary clamping pieces to the Tee Bar and independently suspended from structural load bearing members. Recessed downlighter luminaires will be further supported via suitably reinforced ceiling tile, with backing pattress units.

Lighting sub-circuits will be protected by MCB's no greater than 10 amps with a design load of no more than 2/3 nominal trip rating of the protective device.

Where luminaires are wall mounted the wiring will terminate direct into each luminaire by means of a back entry conduit box.

Where grid switch assemblies are used with voltages exceeding 230 volts the assemblies shall be supplied complete with phase barrier and cover plates. Labelled “Warning 400 Volts” in red 5mm high lettering.

All switch positions and heights shall be in accordance with the Building Regulations.

On site coordination will be necessary to determine the precise points of suspension. Drilling through timbers will not be permitted without Architects approval and clamping round the beams with proprietary brackets will be the preferred method of fixing.

Switching and controls strategy is as indicated on the scheme drawings. Luminaires are mostly controlled under presence detectors and manual switches.

The Electrical Contractor shall include within his tender for all fixing arrangements and any special requirements for supporting of luminaires.

All luminaires shall be supplied complete with lamps/control gear/transformers as appropriate.

Final cable terminating in transformers, down-lights and Led luminaires shall be protected throughout their length with 150oC heat resistant sleeving and shall be terminated using only proprietary glands and retainers to the manufacturer’s recommendations.

Through wiring of luminaires shall not be permitted. This is typically undertaken on soffit fixed linier fittings where conduits run between light fittings. The through wiring of cables through fittings introduces issues with temperature effects on cables running next to hot transformers, earth continuity and future complications on light fitting replacement.

Surface mounted luminaires shall be mounted on conduit boxes and cabling shall enter the luminaires via BESA boxes. Lighting circuit contactors, where shown, shall be housed within an extension enclosure close coupled to the respective distribution board.

Mechanical Maintenance Lighting

Mechanical maintenance lighting shall be provided to the Annex Warm Box plant deck for the purpose of maintaining mechanical equipment only. This lighting will not operate as part of the general lighting arrangement within the Annex Warm Box and shall be controlled via a local light switch at high level within the plant deck out of access to the general public.

Within the Annex 2 & 3 loft space there shall be lighting provided for the purpose of access and maintenance of mechanical equipment in the absence of natural daylight. This lighting shall be manually controlled via 2-way switching local to the access and maintenance hatches from below.

With the exception of an external emergency bulkhead fitting above the external access door, no lighting shall be provided to the external plant deck on the roof of Annex 3. This has been proposed to reduce the impact of light pollution to the surrounding areas given the plant deck is only 1 story from external footfall level. For the purpose of maintaining mechanical equipment, it is envisaged that the appointed competent person shall undertake general scheduled maintenance within daylight hours. In the instance of emergency maintenance being required to mechanical equipment a suitably rated IP65 socket shall be provided to the plant deck for emergency maintenance lighting to be connected.

Luminaire Proposals

As indicated on the 63000 series accompanying drawings.

Switching & Controls Strategy

The Contractor shall design, supply and install a new DALI lighting control system to the refurbished Market Building.

The lighting control system will be an open protocol DALI system configured through a network of devices which includes luminaires, control devices & sensors. The DALI control system will be linked for remote monitoring using the ICT / Data network.

The lighting control system will consist of, but will not be limited to, the following components:

- Field Devices – presence/absence detectors, photocell / daylight (lux) sensors and switch input units.
- Relay output modules
- DALI dimming control units
- Momentary retractive type switches.

The main Market Hall lighting shall be controlled via a bank of manual override switches located within the Annex store room as indicated on the General lighting and emergency lighting drawings 6300 series.

The market hall lighting shall be provided with a daylight dimming arrangement in the form of a photocell mounted at high level on the internal wall adjacent the LV switch room/store. The photocell shall be linked to a DALI dimming controller arrangement within the store which will allow all the Market Hall lighting circuits to dim down in periods of excessive daylight.

The following control methodologies shall be applied in the following areas:

Area Name	*PIR / Operation*	*Photocell Control*	*Notes*
Market Hall	N	Yes	Manually controlled from switch bank within Annex Store room. Override controlled via DALI system with daylight dimming controller arrangement compatible with market hall wall mounted photocell. In periods of excessive natural daylight. Fittings shall be capable

			of dimming down to as low as 20% output. Photocell shall operate to provide the market hall with a minimum of 300 lux to the trading area at any time during operational hours.
Circulation	Presence	No	
Store Rooms	Presence	No	
Toilets	Presence	No	
Plant Rooms	Manual	No	
Comms Room	Manual	No	
Multifaith Room	Presence		
Shower / WC's	Presence	No	
Office	Absence	No	
F&B Units	Manual	No	
Kitchen	Manual	No	
Annex Cafe	Presence	Yes	Microwave detectors with integral photocell to control DALI daylight dimming fittings in times of excess natural light.
Fixed Pitches	Absence	No	

5.9 EMERGENCY LIGHTING

Scope of Works

The Contractor shall design, supply, install, test, commission and set to work a complete emergency lighting system throughout the Market Building refurbishment in accordance with this specification.

Design Parameters

Read in conjunction with the Codes of Practice, Standards and Guidelines outlined within section 5.1.9 of this document and the appropriate sections of the Kaizen Consulting Engineers Standard Electrical Specification and all relevant ICEL Publications.

System Description

The Contractor shall design, supply, install, test and commission a complete and functional emergency lighting installation to all areas as required by design to the refurbished Market Building.

The emergency lighting system will provide coverage to all escape routes to allow safe movement towards and through all exits.

All emergency escape lighting will be LED type, generally via combined mains luminaires complete with emergency 3Hr integral conversions.

Emergency lighting shall be provided with an electrical supply from the general lighting circuits.

The Emergency Lighting system will be configured as a network of devices with all equipment interconnected using appropriate fire rated cabling.

The emergency lighting system will consist of, but not be limited to, the following components:

- Emergency luminaires (generally non-maintained)
- Illuminated emergency exit signs (generally maintained)

The emergency lighting will be provided in accordance with BS 5266 and the requirements for each area are as follows:

	Emergency Lighting Type		
Area Name	Escape Route	Open Area	High Risk
Store Rooms		X	
Circulation Routes	X		
Market Hall		X	
Toilets		X	
Plant Rooms			X
Kitchen			X
F&B Units			X
Offices		X	
Fixed Pitches		X	
Annex Cafe	X		
Comms Room		X	

Multifaith Room		X	

Testing of the emergency luminaires will be through a self-testing and self-reporting system within the DALI method of control and operation.

Exit signs will be provided at final exit points in agreement with the fire strategy as well as strategic positions to ensure maximum viewing distances are not exceeded. Exit luminaires shall be LED illuminated and complete with a "Running Man Eurogram" as detailed by the Safety Signs Directive, all in accordance with the requirements of BS EN 1838, BS5266 Part 1 and the recommendations of the local Fire Officers.

At final exit points, bulkhead luminaires will be positioned externally to illuminate the immediate vicinity outside the exit, final locations shall be co-ordinated with the final fire strategy layout.

The Contractor shall produce a hard covered permanently bound log book for testing and maintaining the emergency lighting system at practical completion. The Contractor shall complete all relevant sections of the logbook in typed text.

LED illuminated exit signs shall be maintained and provide the same duration (M/3). External emergency lighting installation shall be supplied and installed to meet the dictates of all applicable standards, local authority and landlord demands to provide for safe egress away from the building. Typically, LED type IP65 luminaries shall be used for external installations over doors.

The Contractor shall be responsible for testing and commissioning of the completed emergency lighting installation in accordance with BS 5266-1 2016 and issue all relevant test certificates and test log sheets prior to completion of the project.

The emergency lighting illumination levels shall be designed in accordance with the following design criteria:

Area / Room:	*Minimum Illumination Level*	*Minimum Duration:*	*Position of Measurement:*
Open Areas (Anti-Panic)	0.5 lux	3 hours	Horizontal at finished floor level
Escape Routes	1 lux	3 hours	Horizontal at finished floor level
Plant Rooms	15 lux	3 hours	In plane of visual task

5.10 EXTERNAL LIGHTING

Scope of Works

The Contractor shall design, supply, install, test, commission and set to work an external lighting scheme in the areas shown on the external services layout. A typical external lighting luminaire schedule is featured on the scheme drawings.

Design Parameters

Read in conjunction with the Codes of Practice, Standards and Guidelines outlined within section 5.1.9 of this document and the appropriate sections of the Kaizen Consulting Engineers Standard Electrical Specification.

System Description

The Contractor shall design, supply, install, test, commission and set to work a column mounted external lighting installation to cover external market trading area and external car park. The design shall be in full compliance with Table 2 of the ILP Guidance notes for the reduction of obtrusive light.

The drawings indicate the design intent and in particular the luminaire theme to be used around the building perimeter and external areas. The following average illuminance levels shall be achieved at the measured floor level:

Area	*Maintained Average Illuminance:*	*Uniformity:*	*Working Plane (m)*
Market trading area	50 lux	0.25	0.00
Car Park	10 lux	0.25	0.00

The external lighting shall be provided with functional column mounted and building mounted external lighting only to provide sufficient illumination for safe pedestrian movement around the external market trading area during hours of darkness.

External building mounted lighting is not intended to provide a particular level of illuminance for external movement and is for aesthetic purposes. Responsibility for sufficient external lighting levels to the footways & roadways is provided by the Kirklees Council's highways lighting and is not part of this installation.

No external building mounted lighting has been provided to the 'back street' annex elevation as this area has been identified as out of this scope of works given it is not considered as an accessible route for the market facilities.

The Contractor shall include for all necessary liaison and coordination with the main Contractor to ensure the works are completed to an acceptable standard in accordance with this specification.

Luminaires shall be controlled via photocell for switch on at dusk and digital timeclock integrated into the external lighting distribution board for switching off at a designated time of 00:00am. A manual override switch for the external lighting shall be provided adjacent to the external services distribution board within the external feeder pillar adjacent the external services distribution board, and adjacent the landlord lighting distribution 'DB/LL' board to allow the automatic controls to be overridden.

The final mounting position of the luminaires and photocell shall be agreed on site with the Project Architect prior to installation.

The Contractor shall design and install a cable of XLPE/SWA/LSF type cables in ground directly into column bases as identified. All cables shall be protected from weather and mechanical damage. All external lighting circuits to be protected by a suitable Type C miniature circuit breaker from the respective distribution board. All external joints shall be suitably sealed to IP67 minimum.

The Contractor shall co-ordinate with the Main Contractor during the tender period the builders work requirements associated with the external lighting layouts. In general, column luminaires to the external market and car park area shall be supplied via existing below ground ductwork. New circuiting shall be provided to the columns from the identified external feeder pillar distribution board.

New external lighting columns provided shall be hinge type to allow for ease of future access and maintenance of column heads without the requirement for lifting equipment.

Exact column positions for the proposed external lighting development have been defined by the architect and have been deemed as suitable locations, in-keeping and co-ordinated with the nature and use of the external space.

Suitably IP rated LED batten lighting has also been provided to the external waste compound located at the lower end of the proposed market car park. Lighting has been provided to this area for general access in periods of insufficient natural daylight. The waste compound lighting shall be manually controlled at the main access gates.

5.11 FACILITIES FOR THE DISABLED

Scope of Works

The Contractor shall design, supply, install, test, commission and set to work all required facilities for the disabled within the Market Building refurbishment in accordance with this specification.

Design Parameters

Read in conjunction with the Codes of Practice, Standards and Guidelines outlined within section 5.1.9 of this document and the appropriate sections of the Kaizen Consulting Engineers Standard Electrical Specification.

System Description

Disabled Toilet Alarm System

A dedicated disabled WC call system shall be provided to cover every disabled WC throughout the building. Within each disabled WC, a ceiling mounted pull cord shall be installed with a reset unit mounted on the wall space adjacent and power supply. The reset unit shall incorporate a reassurance lamp.

An overdoor sounder / light mounted immediately outside the WC shall indicate where assistance is required.

On activation of the WC alarm a signal shall be sent to the main panel located within the Market buildings main office in the lower Annex. The control panel shall have the ability to indicate from which WC the call emanates.

Induction Loop System

The Contractor shall design, supply and install an Audio Frequency Induction Loop system to the following areas:

- Main Market Hall
- Annex Warm Box Cafe

The system will consist of a fixed loop amplifier, microphone and loop cable and power supply units in installed discrete accessible locations local to the coverage.

The induction loop shall operate as follows:

- A hearing aid user must switch their hearing aid earpiece to the T or transducer position.
- The hearing aid user must make sure that they are within 1.5m of the cable loop.

Loops will be provided in positions ensuring that there is minimal impact of cross talk between adjacent loops.

Self-adhesive Induction Loop Fitted stickers shall be displayed in areas covered by the Audio Frequency Induction Loop System.

5.12 CCTV, ACCESS CONTROL & INTRUDER ALARM SYSTEMS

Scope of Works

The Contractor shall design supply, install, test, commission and set to work the security systems within the Market Building refurbishment in accordance with this specification.

Design Parameters

Read in conjunction with the Codes of Practice, Standards and Guidelines outlined within section 5.1.9 of this document and the appropriate sections of the Kaizen Consulting Engineers Standard Electrical Specification.

System Description

5.12.1 CCTV System Description

The Contractor shall be responsible for the design, supply, installation, integration, testing and commissioning of a closed-circuit television system, utilising an NSI certified Specialist CCTV Contractor. The installation shall comply with NACP20 “Code of practice for planning, installation and maintenance of Closed-Circuit Television Systems”.

All equipment and materials used shall be standard components that are regularly manufactured and utilised in the manufacturer’s system and all systems and components shall have been thoroughly tested and proven in actual use.

A new CCTV system will be provided for the refurbished of the Market Building where required and as indicated on the accompanying drawings. The system shall comprise of a full new system CCTV system with no infrastructure retained or reused from existing market building.

External CCTV coverage shall be provided to the market yard and car park as indicated on the external proposed utility services drawing. CCTV shall provide a ‘general coverage’ of these areas with no identified areas of particular interest specified. CCTV cameras shall be post top mounted out of reach from the general public and shall be suitable IP rated for the external environment. The wiring method for these CCTV cameras shall be fibre optic cable due to the total cable length from the comms room to final connection locations

The specification of the CCTV system shall be as follows:

Internal CCTV Cameras

New internal CCTV cameras shall be provided as indicated on the tender drawings. All internal fixed CCTV cameras shall be a PoE Network CCTV cameras and shall:

- Be 4MP Fixed Dome Network Camera.
- Have a IK09 or IK10 impact rating.
- Be IP66 Minimum.
- Have a minimum CMOS Colour/Mono 1/3” image sensor.
- 120dB Wide Dynamic Range.
- Day and Night ICR cut filter.
- 850nm IR Wavelength.

External CCTV Cameras

New External CCTV cameras shall be provided as indicated on the tender drawings. All External CCTV cameras shall be a PoE Network CCTV camera and shall:

- Be 8MP PTZ type Network Camera.
- Have a minimum resolution of 3840 x 2160
- Have a IK09 or IK10 impact rating.
- Be IP66 Minimum.
- Have a minimum CMOS Colour/Mono 1/3" image sensor.
- 130dB Wide Dynamic Range.
- Day and Night ICR cut filter.
- 850nm IR Wavelength.

Head End Network Recorder

The NVR shall be:

- 19" Rack mounted.
- Have 2No LAN interface connections.
- Have a maximum peak bitrate of up to 24Mbps per input.
- Internal HSCP Server.
- And operating temperature of 0OC to 40OC
- 30 days of storage (Storage to be sized based on continuous recording at full resolution,
- maximum image quality, frame rate (25 frames per second), FOV activity level and VA
- Metadata).
- Raid 5 Array configuration.
- Hot swappable HDD bays.
- VA Meta data recording.
- USB Export medium.

The recording equipment shall be capable of recording images at 25 frames per second and shall have enough storage to record video continually 24hrs per day from all cameras for a 30-day period.

CCTV Monitor

A CCTV monitor shall be provided and installed within the ground floor annex main office and shall be wall mounted. The CCTV monitor shall be a minimum of:

- Colour LCD with back lit LED.
- 24" diagonal in size.
- 1920 x1080 resolution or higher.
- 16:9 aspect ratio.
- 1000:1 contrast.
- 5ms response time.
- The CCTV Monitor shall be connected to the NVR Via a HDMI/DVI Digital input.

To control the CCTV system, operator controls shall be provided, this shall include a Front-End GUI, Monitor, keyboard, Mouse. This equipment shall be provided within the Market Building Annex office to allow on site staff to view the CCTV footage.

The management software shall be provided and shall allow access to live viewing, playback, forensic search, export and system configuration settings to be assigned on an individual basis for each unique user. All live

viewing and playback shall be at full resolution and frame rate. All necessary software and licences shall be provided/pre-installed.

The wiring off the CCTV system shall be category 6, 4pair, U/UTP Class E, CCA, LSZH cable, run on galvanised steel cable baskets/trunking and drawn in heavy duty galvanised steel conduits. CAT 6 data outlets for CCTV RJ45 data outlets shall be provided at each CCTV camera location throughout the building. All data points for the CCTV shall be wired back the main communications cabinet / PoE Switches.

Power over ethernet network switches shall be provided as required to support the CCTV Installation and to connect all network cameras back to the NVR Via the LAN Network. POE+ Switches shall meet the 802.3at Type 2 (PoE+) standard or where higher power is required switches shall be provided to the 802.3bt Type 4 or similar standard.

A rack mounted uninterruptable power supply shall be provided to serve the CCTV recording equipment in the event of power failure the UPS shall be located within the CCTV data cabinet and be sized to have an autonomy of 10 minutes.

The CCTV system shall be fully commissioned and set to work by the CCTV Specialist, in accordance with the Employer's requirements. All cameras shall be commissioned to account for all light conditions. Home Office Centre for Applied Science and Technology (CAST) test targets shall be used to demonstrate resolution density compliance for Field of view (FOV). Commissioning certificates shall be provided to verify the installation and operation of the CCTV system.

The CCTV installation in each building shall be connected to the Kirklees Council Alarm Receiving Centre (ARC), and encrypted Web access. The remote access shall allow operators to view and interact via the CCTV system at each site via AV communication. The offsite monitoring equipment shall be interfaced with the CCTV system and shall notify the ARC/ County Hall of person/vehicle movement/ via line/ zone crossing within each facility, and for general security purposes. The off-site monitoring shall be fully encrypted to ensure data transfer is safe. The remote access strategy for either the ARC or remote web shall utilise Hypertext Transfer Protocol Secure (HTTPS) to ensure complete encryption is maintained for secure communication over the network when accessing via the web via an authorised laptop / ipad or phone.

The Named approved CCTV Specialist shall be appointed to undertake the design, supply, installation, testing, commissioning and setting to work of the CCTV installation. Allowance shall be made within the tender for the making of all enquiries, the placing of all orders, the paying of all bills and overseeing of all works associated with the CCTV works.

The Contractor shall allow to carry out all necessary liaison on site to ensure that the CCTV system specialist element of works is fully coordinated with all other electrical services.

Any external CCTV cameras which exceed 90 meters shall be allowed for the be wired in fibre. Final specification TBC with BT.

5.12.1.1 Electromagnetic Compatibility

The Contractor shall ensure all equipment is compatible, and does not adversely affect, nor is adversely affected by, any other equipment installed in the same location.

The Contractor shall ensure all systems are designed and installed with due consideration to good EMC practice, and in line with EMC requirements of relevant standards including: BS 7671, BS EN 50310, and BS EN 50174.

Ensure all equipment complies with the EMC Regulations (2006), carries the CE Mark, and is suitable for the EM environment in which it is to be used, for the service to which it is to be put.

5.12.2 Intruder Alarm System

The Contractor shall design, supply, install, test and commission a new intruder alarm system to cover the whole Market Hall Building, designed and installed by a NSI "Gold" approved sub-contractor to meet all current British Standards, BS4737 and DD243 and PD6662: 2004 and as indicated on the scheme drawings.

A specialist intruder alarm Sub-Contractor shall be appointed to carry out a risk assessment and design a system to meet the appropriate grade as detailed in the above standards. The intruder alarm system indicated on the scheme drawings is a minimum standard and provision to be adhered to and any additional protection deemed necessary to satisfy the Contractors own risk analysis shall be included for in the tender return. Any enhancements to that shown shall be separately identified in the appropriate section of the tender return documentation.

The intruder alarm system shall meet Grade 3 as a minimum (Subject to confirmation at next design stage), anything proposed which offers less than a grade 3 system will be rejected unless confirmed otherwise by Kirklees Council.

The Contractor shall include for all associated power supplies, containment, testing, commissioning and demonstration to the client.

The main intruder alarm panel shall be located as indicated on the scheme drawings within the store room adjacent the annex warm box café and comms room.

The intruder alarm system shall be a stand alone system and provide the following functionality:

- Fully Addressable, high security control panel with multi circuit microprocessor control unit with LCD display. The digital communicator shall be mounted within the panel.
- The digital communicator will be mounted within the panel.
- 72 hour battery back up.
- Text printer interface with facility for printing events over the last 7 days.
- Minimum of 100 Zones.
- Multiple remote keypad facility.
- Display system indicating number of alarms, number of faults.
- Multi-level password protection.
- 1000 Event viewing log.
- Be an open protocol system.

All security and door access cabling shall be protected from interference, accidental damage and vandalism by running within the building fabric or protected through their entire length by steel galvanised conduit and trunking.

The system shall comprise of door contacts to the doors of the above areas and dual technology motion sensors mounted internally at high level to all externally accessible at ground floor level.

All perimeter fire doors shall be alarmed 24/7 with simple local isolation facility to allow the door to be opened for other uses.

The complete building system shall be armed/disarmed from keypads with integral proximity reader located as indicated on the scheme drawings within the annex staff office entrance lobby. A 3 minute period shall be allowed for to enable staff to enter / exit the building before the alarm is activated.

The security system will have the flexibility to enable the building to be zoned so that areas can be locked outside of normal hours whilst still allowing access to other areas.

5.12.3 Access Control System

The Contractor shall design, supply, install, test and commission a new door access control system for the building as indicated on the scheme drawings.

The access control system shall be provided across the Market Hall Building to the areas as identified on the accompanying scheme drawings.

A new Access Control system will be provided throughout the Market Building to restrict & prevent unauthorised access to restricted areas and minimise access by the public.

The access control system will be networked with the councils centrally managed system. In order to be comparable, the PAC512 system will be used throughout and paired with HID iclass card readers operating MiFare/Weigand Protocols. Involvement from Kirklees Council is required to facilitate and co-ordinate the installation. The Kirklees Council representative has been identified as Peter Lloyd.

All access control doors will be provided with a local door controller in which all components for the door link back. The door controller will be provided with an RJ45 connection to link the system into the network. All required programming and controls associated with the system shall be integrated into a PC head end to allow for monitoring and control of the system.

Access to all none public areas shall be controlled by card to record who has entered what areas and what times. Cards shall be programmed to restrict access to certain rooms.

Upon completion, 30No. cards shall be provided to satisfy the requirements of the council and a further 88No. cards shall be provided for the market hall traders, fixed pitch tenants, F&B unit Tenants & Café Tenants. The contractor shall liaise with the Kirklees Council and ensure cards are configured for handover.

The system shall be programmable to allow for cards having the ability to be programmed for Kirklees Council staff to have access to all areas and only access to certain areas for market hall traders, fixed pitch tenants, F&B unit Tenants & Café Tenants.

The access control system shall consist of but is not limited to the following items;

1. Proximity card readers allow 118No. for tender
2. Proximity readers throughout
3. Flush mounted door contacts
4. Electro-magnetic locking devices
5. Emergency break glass units
6. Request to exit buttons
7. Door Controllers
8. Power supply units and batteries
9. System control equipment.

At each door there will be a proximity reader mounted on the secure side of the door with monitored electro-magnetic locking installed and flush mounted security door contacts on all door leafs.

On the unsecure side of the door there will be an emergency breakglass unit and colour contrasting, oversize push to exit release button.

Internal access-controlled doors shall be provided with door held open / force open alarms.

Other internal and external which require card access are as indicated on the accompanying security drawings. All equipment used within the access control system shall be suitably IP rated for the external environment which it is installed.

All internal doors will fail open on activation of the fire alarm system when in Market Building hours of operation. Local stand by battery packs will be fitted to each door control unit.

A video intercom system shall be provided to the Market Building Office Annex too facilitate communication between the public and market traders. A suitably rated external intercom shall be provided at the entrance lobby door of the Annex Office. The external video intercom shall be linked to an internal unit within the Annex office for staff.

5.13 FIRE DETECTION & ALARM SYSTEMS

Scope of Works

The Contractor shall design, supply, install, test, commission and set to work the automatic fire alarm system within the refurbished Market Building.

Design Parameters

Read in conjunction with the Codes of Practice, Standards and Guidelines outlined within section 5.1.9 of this document and the appropriate sections of the Kaizen Consulting Engineers Standard Electrical Specification.

Reference shall be made to the Architects Fire Strategy Drawings and Fire Consultants Report/Drawings for the project.

System Description

The Contractor shall design, supply, deliver, off-load, protect, position, install, connect, test, commission and set to works a monitored automatic analogue addressable fire detection and alarm system including all necessary power supply/transformers, control and indicating panels (COIP's), sensors, detectors, manual call points, sounders, beacons, zone isolators, interfaces, power supplies, fixings, co-ordination, electrical circuit distribution, connection, protection and all necessary ancillary items to provide a complete functioning installation in accordance with Electricity at Work Regulations 1989, EMC Regulations 2006, BS 7671, relevant Building Regulations (England and Wales) and the standards listed below.

The new Fire Detection system shall be designed and installed in accordance with BS 5839 to provide a level of automatic detection coverage consistent with L2 as a minimum as prescribed by BS 5839 Part 1: 2025 and the Black Cat fire consultants project specific Stage 4 fire strategy report.

General Installation

The Contractor shall be responsible for the design, supply and installation of a complete and functional automatic fire alarm system for the complete building including:

- Manual Call Points (Type A & B)
- Automatic Fire Detection
- Electronic Fire alarm sounders / Voice Enhanced Sounders
- Fire Alarm Beacons – VAD compliant
- Fire alarm interfaces
- Fire Alarm Panel / Repeater Panels
- Aspiration Detection

All cabling shall be selected in accordance with BS 5839-1:2025.

On completion of the works, the contractor and their specialist equipment supplier shall allow to fully demonstrate and prove the system, including works undertaken by any nominated specialists. The Contractor shall be responsible for the programming of these works and co-ordination of the same with other services.

On completion of works the contractor shall issue for approval the following documents:-

i) Record Drawings and Maintenance and Operation Manuals which shall incorporate copies of comprehensive "As Fitted" drawings operating instructions, maintenance instructions and schedule of materials and equipment installed duly identified by catalogue numbers and manufacturers details.

ii) Completion and Commissioning Certification for the complete systems with final certification at completion of the project.

The location, quantities and spacing of detection, sounders and manual call points are indicative only at this stage, showing the “design intent”. The Contractor shall appoint a specialist to develop the fire alarm drawings to full RIBA Stage 5 “installation drawings” detail as part of the contractor’s design package (CDP). This shall be allowed for in the contractor’s proposals.

All new areas within the scope of works will require fire detection and the system shall be replaced with new in accordance with the accompanying fire alarm and detection layout drawings. The system shall have as a minimum the following key criteria:

- The system shall be open protocol.
- Ensure fire alarm interfaces are provided to all plant and associated equipment deemed necessary.
- Market Hall automatic doors shall open upon activation of the fire alarm.
- Manual lockable override against doors locking.
- Fire Alarm Repeater panels provided as indicated.
- Updated fire alarm system plans and zone charts to suit the updates to the scheme.

Fire alarm test points shall be key operated.

The evacuation strategy is based on a simultaneous evacuation in accordance with the Black Cat Fire Strategy report and associated drawings. When a single smoke detector is triggered, simultaneous evacuation will be implemented.

If operational difficulties arise due to false alarms, consideration may be given to implementing an investigation period of up to 6 minutes. However, if a second device activates or a call point is triggered, then the Market Hall must proceed to full evacuation.

Upon activation of the fire alarm system, the market management shall have a system in place that automatically informs the Fire Service, in the form of a GSM signal.

Control Panel

A new 4 loop Advanced MX5 Pro Fire Alarm Panel will be provided in the Market Hall western entrance side to replace existing Fire Alarm System made redundant by these refurbishment works. Any existing loops shall be stripped out, no existing cabling shall be retained or reused as part of the refurbishment process.

A fire alarm repeater panel will be provided at the eastern entrance side to allow for immediate visibility to the fire authority in the event of a fire. The repeater panel will be loop powered and supplied direct from the main fire alarm panel.

Fire Alarm zone charts will be provided adjacent to all panels.

The proposed MX5 Pro Fire Alarm Panel shall have the ability for a remote monitoring connection by Kirklees council. The appointed contractor shall liaise with Kirklees council to understand the remote monitoring requirements and provide infrastructure to facilitate these needs. Exact details of remote monitoring are to be confirmed by Kirklees council.

Redcare GSM connection shall be allowed for at the main fire alarm panel at the western elevation of the market hall creating a dual-path communication system for the transmission of alerts.

Detection loops will be provided with minimum 20% spare capacity to facilitate future expansion.

The main panels shall employ a means of isolating mechanical, services and other selected interfaces for test purposes via a local key switch. The panel shall give a permanent audible warning of any system isolations.

Any strip out works associated with the removal of existing physical electrical infrastructure as mentioned above shall be in line with Greig & Stephenson Architects' Restoration Method Statement. The appointed contractor responsible for the strip out of existing electrical infrastructure shall familiarise themselves with this document take specific note of any standard/particular heritage requirements involved as denoted.

Automatic Detection

A selection of automatic smoke and heat detectors shall be provided throughout the building. The choice of detector shall be selected to best suit the location and installation environment.

In accordance with BS 5839-1 automatic detection is to be provided within ceiling voids where they are greater than 800mm. In addition, structural beams that have a depth of 10% or more of the void height are to be classes as a partition within the void.

At the time of stage 4 issue the architect's model does not show coordinated accurate ceiling heights. Ceiling voids are generally considered to be less than 800mm through detailed design discussions. However, this shall be confirmed prior to installation.

All detectors shall be fully addressable and shall be manufactured to comply with BS5445.

Aspirating System

An Aspirating Smoke Detection system shall be provided to the Main Market Hall Area.

Aspirating smoke detection systems shall be EN 54 compliant and provided in accordance with BS 5839-1.

Aspirating smoke detection system shall typically comprise:

- Aspirating smoke detection panels.
- Aspirating smoke detection pipework.
- Aspirating smoke detection sampling points.
- Aspirating smoke detection test points.

The Contractor shall ensure that good workmanship is employed when installing the aspirating system pipework to ensure that all joints do not produce excess noise.

Aspirating units shall only be activated once all areas are clean and free of dust and debris to prevent damage and 'clogging' of the system.

Aspirating smoke detection panel(s) shall wherever possible sit on the fire detection loop, rather than via an interface, to give greater diagnostics and control.

Aspirating smoke detection pipework shall be concealed behind ceilings where possible or at high level within the services zone. Key consideration to be taken for the heritage building and existing structure for careful routing of pipework within the open market hall area.

The aspirating smoke detection panels shall operate continuously, including periods when the building is unoccupied; they shall also be supported by a dedicated standby battery to maintain the systems in the event of power failure. Battery autonomy shall be 72 hours.

Dedicated power supplies shall be provided to aspirating smoke detection panels off local distribution boards. Fused double pole key switches shall be provided adjacent aspirating smoke detection panels for the purposes of local isolation by authorised persons in accordance with BS 5839-1. The status of the power supplies to aspirating smoke detection panels shall be monitored by and reported on the fire alarm panel.

Manual Break Glass Units

Manual break glass call points shall be located at all final exits and strategic locations throughout the building to comply with BS 5839. A quantity of spare glass shields shall be provided equal to 5% of the total number of units. All call points shall be flush mounted.

In all plantroom, external locations MCPs shall be fitted with an alarmed polycarbonate protective cover.

Sounders

Fire Alarm sounders shall be provided to achieve sounder level coverage in line with BS5839. Where practical in all areas the sounder modules shall be incorporated within the detection module.

Sounder Beacons

Electronic sounders beacons shall be provided to plant areas and all areas with high ambient noise levels. Sounders shall be provided to give sounder level coverage in line with BS5839.

In accordance with BS8300 sounders and flashing beacons shall also be provided to areas where people are likely to be in relative isolation such as toilet areas, changing rooms, isolated offices and any areas where a person hard of hearing could be working alone.

Sounders shall be used to provide an audible alarm of either 65 dB or 5bB above the normal background noise in all areas of the building.

In areas detailed on the drawings the detection module shall also comprise a sounder and flashing beacon module and the VADS (Code of Practice for Visual Alarm Devices).

External beacons will be installed at main entrances to alert incoming members of the public on any fire alarm situation within the building and shall be red in colour.

Cabling

All cabling shall be a minimum of 1.5mm^2 2-core LSF “firetuf” or equivalent enhanced category soft skinned cabling. The outer covering of the cables shall be coloured red for fire alarm equipment and appropriately labelled or banded to differentiate from other services.

All cables shall be run on cable tray, clipped direct and run within voids. Where more than two cables are routed together, they shall be installed on cable basket.

Mechanical protection shall be provided to cabling installed below 1.2m.

Fire Alarm Outputs and Interfaces

The fire alarm system shall provide a number of outputs and monitoring interfaces to internal and external equipment, which shall be affected on receipt of a fire alarm signal.

Typically, interfaces shall be provided for the following as a minimum:-

- Mechanical Plant Operations – All designated mechanical services plant shall be shut down on receipt of a fire alarm signal via a designated interface unit. An override switch shall be provided within the main fire alarm panel which shall give manual override facility of the mechanical services plant interface in order to isolate plant shut down when the system is being tested.
- Fire Doors – Designated fire doors shall close.
- Access Control Doors – To release to open on alarm
- Auto doors – To release on receipt of alarm.
- Local PA System

The contractor is to include for all necessary fire alarm interfaces, as indicated within this document and on the drawings for a complete and compliant installation.

Power Supplies

The Contractor shall install all associated power supplies to serve all fire alarm equipment and interfaces. Main panel power supplies shall be derived from dedicated outgoing way on the main LV panels and shall be suitably identified, painted red and labelled 'FIRE ALARM DO NOT SWITCH OFF’. Additional supplies shall be terminated adjacent to the respective equipment via an un-switched fused connection units suitably labelled with the equipment served and secret key switch. The contractor shall include for power supplies to all fire alarm ancillary equipment e.g. door Mag-Locks etc.

Test and Commissioning

The Contractor shall produce commissioning certification for the fire alarm system to be submitted to the engineer and client before handover of the building. The certification shall be in the format laid out within Appendix G of BS5839. It shall be the contractor’s responsibility to provide all certification for the fire system as given in BS5839 Appendix G.

5.14 Public Address (PA) System

Scope of Works

The Contractor shall design, supply, install, test, commission and set to work the new Public Address (PA) system within the refurbished Market Building.

Design Parameters

Read in conjunction with the Codes of Practice, Standards and Guidelines outlined within section 5.1.9 of this document and the appropriate sections of the Kaizen Consulting Engineers Standard Electrical Specification.

5.14.1 PA System Description

The Contractor shall employ a specialist Sub-Contractor to design, co-ordinate, supply, deliver, off-load, protect, install, connect test, commission and set to works a complete Public Address system. This shall include all necessary speakers, loop amplifiers, cabinet rack, microphone module, mountings, cabling, containment, and all necessary ancillary items to provide a complete functioning installation in accordance with BS 6259.

A full new PA shall be provided to facilitate voice communication for the project. No existing PA speaker, amplifiers, accessories, amplifiers or associated cabling shall be retained or reused from the existing market building system.

Within the Market Hall the PA system speakers shall be of horn type for increased amplification in the large open spaces.

Within annex and encloses spaces general wall mounted/ceiling mounted speakers shall be shall be installed. Wall mounted speakers shall be installed at high level out of reach from the public.

The PA system shall be interfaced with the main fire alarm system to mute on alarm.

5.14.1.1 PA Amplifiers

A new PA amplifier shall be provided within the store room within the warm box annex café adjacent the comms room as indicated on the accompanying drawings. This shall provide the head end to the following items:

- PA Amplifiers
- PA Audio System
- PA Speakers
- Microphone Station

Local test facilities will be provided within the Kirklees council staff office to allow for local testing of the components of the system.

5.14.1.2 PA Speakers & Speaker Circuits

The proposed PA speakers used in the system shall be a combination of ceiling and wall mounted speakers. The speakers new speakers proposed are as follows:

- Wall mounted loudspeakers – TOA Electronics BS-678
- Wall mounted wide range horn speakers – TOA Electronics BS-304
- Wall mounted loudspeakers – TOA Electronics PC-1868-EB

5.14.1.3 Microphone Stations

A PA microphone station shall be provided in the Kirklees Council staff office for relaying of messages through the PA system throughout the Market Hall and Annex's. This location is subject to final confirmation with Kirklees Council.

5.15 DATA – STRUCTURED CABLING INSTALLATION

Scope of Works

The Contractor shall design, supply, install, test, commission and set to work the structured cabling installation for the data and telecommunication systems within the Market Building refurbishment.

Design Parameters

Read in conjunction with the Codes of Practice, Standards and Guidelines outlined within section 5.1.9 of this document and the appropriate sections of the Kaizen Consulting Engineers Standard Electrical Specification.

System Description

General Installation

The Contractor shall be responsible for the design, supply and installation of a complete and functional data/telecommunications copper structured cabling and containment installation to provide a horizontal structured cabling solution in Cat 6A U/FTP cabling complete with low smoke zero halogen covering (LS0H) which will terminate in RJ45 outlets at each location identified on the scheme drawings.

The new IT infrastructure should be capable of passing Voice, Data, Video and multimedia files without derogation.

A new incoming fibre connection shall be provided to suit the proposed location of the new equipment within the comms room identified on the associated drawings. The upgraded incoming supply shall be provided as required to accommodate the refurbishment works and amendments to the architectural general arrangement layout. The existing IT comms cabinet is currently wall mounted in the staff office of the market hall. Due to the increased ICT provision planned as part of the refurbishment, it is proposed for a new 42U 600mm x 600mm floor standing lockable cabinet shall be provided to replace the existing.

The proposed location for the new rack is within the dedicated comms room located within the warm box annex café. The existing BT fibre which supply the cabinet shall be disconnected with a new supply to the identified location to supply the new comms cabinet. Survey work is currently underway to identify the extent of the works required to relocate the incoming fibre connection.

All existing wiring from the existing rack shall be stripped out and shall not be reused as part of the proposed refurbishment works. All new supplies are as indicated on the accompanying small power and data drawings.

All ICT systems being supplied and installed must be fully installed including all required software, hardware and re-configurations needed for the systems to fully operate as intended.

Any strip out works associated with the removal of existing physical electrical infrastructure as mentioned above shall be in line with Greig & Stephenson Architects' Restoration Method Statement. The appointed contractor responsible for the strip out of existing electrical infrastructure shall familiarise themselves with this document take specific note of any standard/particular heritage requirements involved as denoted.

Summary of Contract Works

It will be the responsibility of the contractor to provide the following in relation to the passive IT installation, as follows;

- Provide a detailed data design LAN proposal for approval, including number, rack layouts and tech submissions
- Supply and installation of the cabinet (42U), 600mm x 600mm
- Supply and installation of CAT 6A LSOH CCa (Excel) UTP LSOH (colour Blue Sheath) for data, wifi and equipment as shown on the tender drawings
- Installation of APs
- Terminating, testing and labelling of fibre
- Terminating, testing and labelling of copper
- Detail all final positions, mounting heights and number of cabinets and sub racks for the project
- Confirm the number and size of power supplies and connections required from the electrical contractor
- Attend regular progress meetings and provide updated information to reflect changes as required
- Follow separation guidelines as per the table below

Type of installation	Separation distance		
	Without a divider or with a non-metallic divider	Aluminium divider	Steel divider
Unscreened power cable and unscreened IT cable	200-mm	100-mm	50-mm
Unscreened power cable and screened IT cable	50-mm	20-mm	5-mm
Screened power cable and unscreened IT cable	30-mm	10-mm	2-mm
Screened power cable and screened IT cable	0-mm	0-mm	0-mm
Note that EN 50174 permits no separation for the final 15 metres of the horizontal cable run.			

- Provide cable tray / trunking requirements in raised for all data cabling.
- All data cabling and fibre will be installed on dedicated data compartment containment provided by the contractor.
- External grade cabling for external routes.
- Provide cabling proposals a tech sub for all cabling, connections, UPS and equipment / cabinets and racks, including proposed patch / cabinet / rack layout
- Provided colour (Blue TBC) patching leads of varying length
- Final patching schedule and patching through to be undertaken
- Confirm all cabinet specifications and sizes prior to ordering.
- Confirm cable colouring prior to ordering
- Terminate and test all data outlets.
- Install data cabling to all camera positions (Refer to security drawings)
- Install data cabling to CCTV monitor positions (Refer to security drawings)
- Install data cabling to CCTV recording position. (Refer to security drawings)
- Communications cabling to Fire alarm panel
- Communications cabling to Intruder alarm panel
- Electrical distribution boards

All cabinets shall be provided with 25% spare capacity on the system.

The cable installation methods will be adopted to ensure that none of the cables exceed an installed length of 90m from the patch panels to the final outlet position.

Final connection from RJ45 outlet to the end equipment shall be included by the contractor.

The installation shall be installed to accommodate all outlets indicated on scheme drawings with 20% spare capacity allowed for on all arterial containment routes.

The Contractor shall include for the following:

- All cable containment systems following routes identified on the scheme drawings installed on galvanised steel cable Trunking allowing for segregation and separation of separate site specific systems as detailed on system drawings.
- All conduits drops to final outlet positions.
- All conduit/trunking/basket to ceiling, wall and floor box mounted power outlets.
- All power supplies associated with the data system equipment, to include Servers, amplifiers, computers, printer, monitors and other active equipment.
- All flush mounted final outlet positions shall be served by flush mounted high impact PVC conduit to outlet boxes installed by the Contractor.
- Supply and installation of all Cat 6A data cabling, utilising the dedicated containment system to locations indicated.
- Termination and identification of all cabling and any necessary patching to allow for a complete tested and working data installation.
- Testing and commissioning of the complete data installation, providing all necessary test results and demonstration to client.
- Unique Identification of individual site-specific systems, cabling and outlets via proprietary coloured system specific banding and tie-wraps.
- Supply and installation of all accessories back boxes and RJ45 face plates.
- Labelling of all terminations as agreed with client.

Data Cabling Test Results

All horizontal cables are to be fully tested to ISO/IEC Cat 6A Specifications using a programmable tester (Fluke DSP4000) or similar. All tests to be conducted in accordance with current regulations and documented for inclusion in the site documentation together with “as fitted” drawings.

Once all labelling and testing has been completed, a site specific documentation wallet will be compiled comprising of:-

Site Details.

Details of all Enhanced Category 6A tests carried out.
Details of Single / Multi Mode Fibre tests carried out.
Details of Voice Multicore tests carried out.

A copy of the test results shall be included within the O&M manuals for the complete installation.

Copper & Fibre Cabling Requirements

LS0H Category 6A U/FTP cables will be installed throughout the new building from the data cabinet and shall generally conform to the following requirements:

- The numbering and colour coding of wire pairs will confirm to the EIA/TIA 568B standard throughout the installation.
- All data cabling will be installed with no intermediate splices.
- A minimum of 300mm slack will be left at each end of the cable run to allow re-termination in the future, if required.
- All data cables will be installed in continuous runs of less than 90m.
- All cabling exceeding 90m shall be installed in fibre.
- All patch panels and RJ45 outlets will be labelled appropriately.
- All data cables will be low-smoke, zero halogen type.
- Fly leads and patch leads will be provided for each data point.
- On completion of the works, a 20 year manufacturer's warranty will be handed over to the client.
- The horizontal cabling will be installed in accordance with the manufacturer's instructions and will be 100% performance tested on completion of the installation.
- On completion of the works, all relevant documentation, including cable test results & certificates, will be handed over the client.

Any fibre optic cables installed within buildings shall be EuroClass Cca, s1,d2,a2 as a minimum.

RJ45 Outlets

Faceplates will normally be modular single or double gang, fitted with shielded RJ45 modules; two number for single gang boxes and four number for dual gang boxes. The data module shall be category 6A compliant, and shuttered. Faceplates shall be fitted flush to the wall, floor box or on dado trunking.

All outlets shall be mounted on a recessed back box no less than 45mm deep. All faceplates shall be MK range to match small power accessories.

Data Outlets within the plant room areas or exposed brickwork areas shall be provided within metal clad logic.

Wireless Access Points

The Clients ICT Provider shall be required to carry out a wifi mapping survey to determine the final quantity and location of wireless access points throughout the building for the market building Wi-Fi requirements. These are reflected on the proposed layouts. The contractor shall be responsible for informing the ICT provider when all walls and ceiling supports are in place, at which point the final survey can be carried out to determine coverage and also verify beforehand the public Wifi points which were not included on the original assessment.

Wireless coverage shall be provided by the supply and installation of all data outlets installed at high level, the final locations are subject to confirmation by the clients ICT team during the next design stage.

The contractor shall engage with a wireless consultant/specialist, who shall recommend both the number and placement of the wireless base stations.

The installation of the base stations will be carried out by the clients ICT Provider. The contractor shall liaise with the ICT Provider to arrange their presence on site in accordance with the construction programme.

Testing & Commissioning

All work shall be tested. This shall include visual inspections and appropriate mechanical and electrical tests.

Each outlet shall be tested, and a report presented in a format which is acceptable to the client.

Labelling and Documentation

Cables shall be labelled with an agreed coding system, to the clients' standards and with agreed cable types. Bundles of cables shall be labelled at a maximum of every 15 metres. Cables should be labelled where they pass through walls on either side; and out of trunking and at both termination points.

Final Outlet labelling shall be numbered in a continuous range, which is related to the room number of the rack, rack number, and patch panel outlet number.

UTP cables shall be grouped to form manageable cable bundles.

~~5.16 LIGHTNING PROTECTION & ELECTRONIC SURGE PROTECTION~~

~~Scope of Works~~

~~Lighting protection and a complimentary surge protection system shall be provided to the building / project.~~

~~A lightning protection design has been provided by Santon LPS. The Contractor shall provide a lightning protection classification study from Santon LPS for the scheme for approval.~~

~~The lightning protection systems shall comprise of roof mounted RAL / PVC covered copper tape bonded to the building structure and steelworks to act at the LPS down conductor.~~

~~At low level the ETN shall comprise of lock bond and test point to the building columns, with concrete earth pits suitable located around the building perimeter.~~

~~The LPS shall be bonded / connection to the follow;~~

- ~~Building electrical earth bar~~
- ~~Bonds to roof mounted mechanical equipment~~
- ~~Expose extraneous part on the roofs~~
- ~~Cladding rails and the like~~

~~In addition, surge protection shall be provided to the LV switchboard, external cabling and systems ie FP, external DB and the like, in additional to internal surge protection to UPS and comms equipment, all to complete with the classification and assessment provided by the specialist.~~

Lightning protection Omitted from scope at Kirklees Council request.

5.17 EARTHING & BONDING

Scope of Works

The Contractor shall design, provide, install, test, commission and set to work the complete earthing system to the Market Building refurbishment.

Design Parameters

Read in conjunction with the Codes of Practice, Standards and Guidelines outlined within section 5.1.9 of this document and the appropriate sections of the Kaizen Consulting Engineers Standard Electrical Specification.

System Description

The earthing installation shall be in accordance with BS 7671 and BS 7430 and will be required for the LV distribution system and all associated works within this project.

The Contractor shall replace the existing main earth bar with a new 16 way bar allocated for the proposed works. Any existing main earth bonds to retained structures and services shall replaced and tested to ensure compliance with BS 7671.

All metal structures, metal pipes, ducts, and other metalwork which shall be in or may come into electrical contact with other earthed metal or with the general mass of earth and can be touched at the same time as any non-current carrying metalwork of the installation shall be cross bonded so that no appreciable voltage shall be apparent under fault condition.

Earthing and bonding shall be provided in line with the 18th Edition IET Wiring Regulations, BS 7430: Part 1 2011 which shall consist generally of the following:

- Main earth cables to incoming water and telecoms services, where required;
- Ventilation ductwork main earth bonding connections.
- Main earth cable from the main electrical distribution boards to all mechanical pipework in the "Plant" space where required;
- A main cable earth bar shall be provided in the "Plant" space on insulated supports, labelled main earth bar.
- Connections shall be made to this earth bar to the main low voltage switchgear and to all outgoing cables and CPCs of sub-mains cables from the LV Panel.
- Individual CPCs shall be installed in all new sub-circuits where calculations warrant this, connected individually to the earth bar of the relevant distribution board.
- Supplementary bonding.

All main CPC and equipotential bonding conductors shall be connected to the main earth bar and each shall be numbered with proprietary cable markers.

Adjacent to the main earth bar shall be provided and permanently fixed, a plastic label having a yellow background and bearing in black a warning triangle and wording "WARNING – SAFETY ELECTRICAL CONNECTIONS - DO NOT REMOVE".

In addition, the label shall identify from the numbered cable markers, each of the CPC and bonding connections, clearly identifying each bond for each service.

The earthing system will be provided in conjunction with the lightning protection system and will be achieved by:

- Circuit protective conductors
- Protective equipotential bonding
- Supplementary bonding.

The earthing system will be designed to provide sufficiently low impedance values to facilitate operation of the electrical system protective devices such that all earth faults are cleared within the timescales specified in BS 7671.

Main and supplementary bonding installations will be provided as required to create an equipotential zone of protection within all areas supplied by the associated electrical system.

All bonding conductors will be LS0H insulated copper core cables, coloured green and yellow in accordance with BS 7671.

Mechanical protection will be provided to all bonding conductors, i.e., conductors will be enclosed within metallic conduit / trunking or installed on cable tray.

Protective Conductors for Armoured cables

All main and sub-main armoured cables shall be provided, where called for, with a separate green/yellow LSF insulated protective cable which shall run alongside the cable and be connected to the cable to provide a parallel earth path. The auxiliary supplementary protective conductors shall be adequately sized in accordance with the IET Wiring Regulations BS7671.

Circuit Protective Conductors

An efficient protective conductor shall be provided throughout every part of every circuit of the installation. The size of the protective conductor shall be at least in accordance with the minimum requirements of the IET Regulations but where the protective conductor comprises a cable not forming part of a composite cable, no cable smaller than 2.5 sq. mm if mechanical protection is provided, or 4.0 sq. mm where mechanical protection is not provided, shall be used. Such cables shall have copper conductors with green/yellow insulation of the same type as specified for the sub-circuit cables for that part of the installation, (e.g. LSF, etc.).

The earth terminal of every socket outlet and minor power accessory shall be connected to the protective conductor. Where the protective conductor is formed by a conductor and auxiliary i.e. metal conduit, trunking, duct or metal sheaths of cables, the earth terminal shall be connected by means of a green/yellow LSF insulated copper earth tail to an earth terminal incorporated in the associated box or enclosure.

Supplementary Bonding Conductors

Supplementary bonding conductors shall be provided to ensure effectual equipotential earthing throughout the building. Extraneous conductive parts in any room which contain an electrical accessory shall be bonded. All hot and cold pipework, showers, sinks and wastes shall be directly and independently bonded to the protective conductor.

5.18 TESTING & COMMISSIONING

General

All building services and equipment shall be commissioned by the contractor and/or their commissioning specialist to ensure that they are compliant with the quality and performance specifications, including manufacturer's recommendations, and that all systems operate to the clients satisfaction.

A Commissioning and Handover procedure shall be produced to outline the above in conjunction with the Commissioning Manager.

The Contractor shall demonstrate and certify to the client all commissioning, testing, and certification complying with all relevant standards. The appropriate client representatives shall be invited to witness the testing and commissioning. System demonstrations, training and handover sessions will be held with the appropriate client staff.

A comprehensive set of Operation and Maintenance Manuals (in hard and electronic forms) for all installed and commissioned equipment shall be provided to the client in an agreed format.

The Contractor shall advise the clients consultant one week prior to commencement as to the programme of testing, so that the Engineer can undertake any necessary witnessing of testing deemed necessary.

Snagging and Defects

The Contractor shall undertake their own snagging and defects inspection to ensure that the Particular specification is met. The client's consultant shall be invited to snag the works and agreed regular inspections as the works proceed to avoid all snagging at completion of the project and to set quality standards as early as possible. All certification shall be handed to the clients consultant, signed and dated before PC will be given by the clients consultant.

Electrical Testing

Testing and commissioning of the LV installation shall be undertaken by the Contractor.

The Contractor shall undertake testing in accordance with BS7671 and fully complete and sign NICEIC completion certificates.

The Contractor shall allow for the client representative to witness 10% of all final circuit and LV cabling testing.

Fire Alarm Testing

The Contractor shall undertake testing in accordance with BS5839 and BS7671 a complete installation and commissioning certificate in addition to issuing the engineer with the servicing report.

The contractor shall allow for the client representative to witness 25% of the fire alarm system.

Emergency Lighting Testing

The Contractor shall undertake testing in accordance with BS 5266 and complete an installation and commissioning certificate in addition to issuing the engineer with the servicing report and all luminaire log sheets duly completed.

The Contractor shall retain overall responsibility for the testing and commissioning and provision of completion and test certificates for all specialist services. This shall still apply if The Contractor employs the services of specialist contractors.

The contractor shall allow for the client representative to witness 25% of the emergency lighting system.

Data Comms Testing

All data / telecoms circuits shall be tested by light source and also OTDR for fibre and CAT6a test for copper. All certification shall be presented and any defects corrected prior to commencement of the specialist contract works. This is to ensure that the contract works are 100% completed and testing before handing over to a third party. All testing shall be undertaken as stated in the specification.

The contractor shall allow for the client representative to witness 10% of the Data system.

General Lighting Testing

All general lighting with automatic controls from either scene setting, presence detection, photocell dimming etc, shall be commissioned and tested to ensure that the lighting, dimming, daylighting compensation are configured correctly in accordance with the manufacturer's recommendations, CIBSE commission codes and the BRE Commissioning Guides.

Services Identification

The following service identification requirements are in addition to those described elsewhere.

Cabling Trunking

Labels shall be fixed to each cable trunking to identify the services contained, i.e. LIGHTING AND POWER on each compartment. Each label shall be 100mm x 80mm white Traffolyte labels with 4.75mm high black lettering fixed with round head brass bolts and nuts fixed in a prominent position at regular intervals.

Cable Tray and Basket

Labels as described above shall be fixed at regular intervals and describe the services supported on the cable tray.

Cables Enclosed in Cable Trunking and Conduits

Shall be individually coloured throughout their length in accordance with IET Wiring Regulations or provided with slide-on sleeve identification tags at every termination.

SWA and MICC Cables

A non-corrosive metallic or substantial plastic label shall be securely fixed to the cable adjacent to the cable glands at each end of the cable. The label shall be dymo printed to indicate the size and type of cable and the origin.

Accessories
All accessories shall be labelled to indicate the circuit reference number they are served from i.e. 2D-E-9-2/1L1.

All multigang switches, isolator switches, 13A fused connection units and double pole switches shall be dymo labelled or other recognised appropriate labelling methods to indicate the equipment they serve. Lighting Override Switches within the electrical riser for the corridors, store rooms etc, shall be engraved to indicate their function.

Notices and Schematics

The following notices and schematics shall be provided by the Contractor in the LV switch room:

i) Treatment for electric shock notice
iii) Distribution Schematic

Switchgear and Distribution Boards

All switchgear and distribution boards rated at 400V shall be labelled with purpose made "DANGER 400V" labels.

Instruction to Staff

The Contractor shall provide all necessary co-ordinated instruction to include where applicable from respective manufacturers to the employer to enable safe operation of the plant. The instruction is to be carried out prior to handover with the O&M manuals available for reference and for use in the instruction provided by the Contractor to the employer.

Refer also to main contract documentation.

Samples

Samples to be submitted at the request of the Client shall include but not be limited to:-

All general luminaires for approval prior to ordering
All emergency luminaires for approval prior to ordering
All external luminaires for approval prior to ordering
Electrical Accessories including socket outlets, switches, and scene select switches
Fire Alarm Accessories including Combined Detection / Sounder / Beacon units, BGUs
CCTV & Intruder Alarm on show devices

Building User Guide

The Contractor shall be responsible for liaising with the Main Contractor in providing a simple building user guide covering information regarding the use of the building. This shall include but not be limited to the following:

- Building Services Information – This shall contain general user information on mechanical and electrical services within the building and how these can be adjusted, e.g. use of security systems. It shall also contain a non-technical summary of the operation and maintenance of the building systems and an overview of all systems controls.

- Emergency Information – This shall include information on the location of fire exits, muster points, alarm systems and firefighting systems

- Energy & Environmental Strategy – This shall include information on energy-efficient features and strategies relating to the building, and also provide an overview of the reasons for their use, e.g. economic and environmental savings. Information could include: Information on the operation of innovative features such as automatic blinds, lighting systems etc.

- Water Use – This shall include details of water saving features and their use and benefits. For example, operating taps, low flush toilets, leak detection, metering etc.

- FM – As above, plus details of main components (including controls) and operation.

- Recommendations for system maintenance and its importance, e.g. risk of legionella.

Building Log Book

The Contractor shall be responsible for producing a building log book for the building in accordance with the CIBSE TM31 Building Log Book toolkit.

5.19 SCHEDULE OF MANUFACTURERS

The Contractors design and tender shall be prepared on the basis of the following (Or equal and approved):

Item	**Manufacturer**
Main LV Panel	GR Electrical
Electric Meters	Schneider Electric
LV Switchgear / Protective Devices	Schneider Electric
Distribution Boards	Schneider Electric
LV Mains Cables	BICC, Pirelli or AEI (BASEC Approved)
Fire Rated Cables	Draka or Pirelli
Cable tray and Basket and trunking	Unitrunk, Legrand, MK (Or Equal Approved)
Data Cabling	EXCEL (Or Equal Approved)
Data Racks	EXCEL (Or Equal Approved)
Electrical Accessories	MK (Or Equal Approved)
Lighting & Emergency Lighting	Whitecroft / Dextra Lighting / LEC Lyon (Architectural)
Automatic Lighting Controls	CP Electronics
External Lighting	DW Winsor/Fagerhult Lighting
Fire Alarm Panel	Advanced MX5 Pro
Fire Alarm Field Devices	Hochiki / Apollo
CCTV	Bosch
Access Control	PAC
Intruder Alarm	Pyronix
Disabled WC Alarms	C-Tec
Induction Loops (Accessible)	C-Tec
PA	TOA Electronics
Aspirating System	Wagner Pro-Sens
Hand Dryers	Dyson Airblade V