

Mount Vernon Hospital Car Park Hillingdon Hospital Decant - Redevelopment Works Lighting and CCTV Specification

THHR-ACM-MV-ZZ-SP-E-6001

The Hillingdon Hospitals NHS Foundation Trust
RIBA Stage 4

28th May 2021

Quality information

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Revision History

Revision	Revision date	Details	Authorized	Name	Position
P01	28/05/2021	First Issue	DB	David Buick	Regional Director
P02	18/06/2021	Access Road to Chapel Car Park Added	DB	David Buick	Regional Director

Distribution List

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1. Introduction

1.1 Project Overview

To provide additional car park spaces for the Hillingdon hospital decant services, the existing Mount Vernon Hospital South Overflow and Chapel car parks have been identified to be re-open for the additional 51 parking spaces required. The Trust have advised that Lighting and CCTV coverage are fully required in these two car parks for staff safety.

Site Address: Mount Vernon Hospital
Rickmansworth Rd,
Northwood
HA6 2RN



Chapel Car Park (Left) and Access Road and South Overflow Car Park (Right)

1.2 Design Scope of Works – General

AECOM MEP have been appointed by the Trust to provide electrical design recommendation on the lighting and CCTV elements involved in this project. Note that CCTV systems are a performance specified design only therefore the final design will be completed by the Trust's incumbent CCTV specialist – iC2 CCTV and Security.

For clarification, AECOM's design scope of works shall exclude:

- Any works associated with the new power requirements to support the internal decant works for departments relocated from Hillingdon to Mount Vernon i.e. fit-out of new ward \ treatment areas etc.
- Any disconnection works
- Any strip-out and removal works
- Any underground services diversion
- Any surveys other than non-intrusive visual survey
- Any work associated with parking control such as vehicle barriers
- Any work associated with
- parking payment machines.

1.3 Contractor's Responsibilities Overview

Overview of Contractors Responsibilities			
Contractors responsibility	Deliverables	Required at stage	Status
Tender Stage			
Fully understand the tender documents. These consist of this specification and the tender drawings		Tender Stage	
Visit site to make themselves fully aware of the project and site specific issues		Tender Stage	
Request any technical clarifications. Note that any questions raised will be confirmed in writing and issued to all tenderers.	Tender clarification documents	Tender Stage	Required
Carry out initial design work to enable cost estimation for tendering purposes and satisfy themselves of accurate tender.		Tender Stage	
Submit tender. The tender should be broken down into each system as listed in this scope of works. Confirm on the tender that any technical clarifications issued have been taken into account and that the tender is fully compliant (or list any clarifications). Note that it will be assumed that the tender is fully compliant with the tender documents unless specifically stated.		Tender Stage	Required
Pre-start on site Stage			
Visit site to carry out any surveys necessary.	Survey notes	Pre-start on site Stage	Required
Fully understand the remaining mechanical and electrical systems and any temporary works required to allow the rest of the site to continue to operate during the contract.	RFI's as required	Pre-start on site Stage	Required
Test, commission and document existing services including pipework, ductwork and electrical containment to assess current provisions within the site boundary.	Commissioning report	Pre-start on site Stage	Required
Carry out full detailed design of all systems ensuring requirements as detailed in the tender documents are met along the requirements of the individual work sections	Design report. Design Drawings	Pre-start on site Stage	Required
Formulate and issue technical submissions for each item of equipment and each system – agree the list of submissions with the Engineer. Note that all technical submissions should list any deviations from the specification – any items not specifically mentioned will be assumed to be fully compliant with specification. Submissions will be reviewed and given a status: (Status A – no comments, Status B – proceed but taking into account comments or Status C – rejected – re-formulate and re-submit.)	Technical submissions	Pre-start on site Stage	(See Work Sections)
Formulate and issue working drawings for all systems. Note that the use of AECOM drawings on site is NOT acceptable – all drawings used for installation must be working drawings produced by the contractor. To assist in this, AutoCad format AECOM construction issue drawings can be provided but the Contractor must enhance these as required so they are suitable as installation drawings. Working drawings will be reviewed and given a status: (Status A – no comments, Status B – proceed but taking into	Working drawings	Pre-start on site Stage	(See Work Sections)

account comments or Status C – rejected – re-formulate and re-submit.)			
Produce builderswork drawing and schedule indicating all holes / supports requirements etc	Builderwork drawings Builderswork schedules	Pre-start on site Stage	Required
Produce a commissioning method statement	Commissioning statement	Pre-start on site Stage	Required
Produce all Health and Safety and other method statements as required by the Main Contractor, Client and Engineer.	Health and safety method statements	Pre-start on site Stage	Required
Where temporary works are required to allow a system to be removed, document and agree these with the Client prior to carrying these out.	Temporary works Scope document	Strip-out stage	Required
Isolate and make safe the systems to be removed.		Strip-out stage	
Where Client has no use for the material or plant, remove from site and dispose.		Strip-out stage	
Installation Stage			
Install systems as listed in this scope of works and specification		Installation Stage	
Carryout snagging and rectify snags	Snagging status list	Installation Stage	Required
Offer systems for Engineer review prior to commissioning start	Completion certificate for each system	Installation Stage	Required
Commission all systems and produce report	Commissioning report	Commissionng Stage	Required
Offer results to Engineer for review and sample witnessing of the results	System acceptance sheet	Commissionng Stage	Required
Completion Stages			
Update working drawings to full record drawings taking account of any changes during the installation	Record drawings	Handover Stage	Required
Compile Operating and Maintenance manuals in the format required by the Client	O&M Manuals	Handover Stage	Required
Offer O&M manuals and Record drawings to Engineer for review and comments (status A, B or C will be given)	Electronic copy of documents for review	Handover Stage	Required
Attend site to provide familiarisation sessions with the Users for all M&E systems	Video of training sessions	Handover Stage	Required
Attend handover meetings as required – note that snag free handover is a pre-requisite for the PC certificate to be issued.		Handover Stage	

Attend site as required to rectify defects that are reported.	Defects completion report	1 st year	Required
Carryout soft landings requirements	Soft landings report		
At the end of the 12 months defects period, attend site to rectify all remaining defects.	Defects completion report	End of 12 months	Required

2. External Lighting

2.1 Scope of Works

2.1.1 General

The Contractor shall supply, install, connect, test, commission and set to work the lighting and electrical installations detailed within this work section of the specification and drawings including any builder's work.

Incorporate all equipment, accessories, controls, supports and ancillaries implicitly or explicitly required either by the specification and drawings, or in accordance with accepted current practice, and procedures, which after assembly, testing and commissioning shall enable that section of the Works to function correctly and to achieve the specified performance.

Supply and install all luminaires complete with lamps/light sources, attachments, lenses, etc and fixings as indicated on the drawings and within the luminaire schedule and as necessary to form a complete installation.

2.1.2 Design Standards and Guidance Documents

The following Design Standards and Guidance Documents have been followed for the lighting design of the 2 car parks:

- LG2 - Lighting for Healthcare Premises_2019
- BS5489-1 2013 Code of Practice for the Design of Road Lighting
- BSEN 12464-2-2014 Lighting of Workplaces - Part 2 outdoor workplaces
- ILP-Guidance-Note-1-for-the-reduction-of-obtrusive-light

Lighting design is based on the design criteria set out in *BS 5489-1, Table 5 – Maintained Lighting Level for Outdoor Car Park*:

Table 5 Maintained lighting levels for outdoor car parks

Type of area and usage	$\bar{E}$ lx	U_o
Light traffic, e.g. parking areas of shops, terraced and apartment houses; cycle parks	5	0.25
Medium traffic, e.g. parking areas of department stores, office buildings, plants, sports and multipurpose building complexes	10	0.25
Heavy traffic, e.g. parking areas of schools, churches, major sports and multipurpose sports and building complexes	20	0.25

2.1.3 South Overflow Car Park

External lighting for the South overflow car park is currently provided with 4no existing lighting columns with column top LED floodlights installed recently. The power is derived from the newly installed Feeder Pillar in front of the Chapel. The lighting installation shall be retained.

One of the column top luminaires has an old sodium discharge lamp which shall be replaced with a 100W LED floodlight Trust's estate has recently installed which matches the other existing columns. Details of the floodlight as below:

Aurora EN-FL100A/40 (4000k)

The existing lighting circuit for the overflow car park shall be extended to add new lighting columns on the opposite side of the car park as well as car park entrance to provide a complete coverage as indicated on the design drawing. The additional cabling shall be XLPE/SWA/PVC cables laid direct in the soft around the perimeter of the car park. With the absence of the record information, the contractor shall allow for site survey and multiple trial holes to identify the exact underground cable route for these existing lighting columns. The contractor shall safely isolate the existing lighting circuit before the extension of the new lighting columns can be added on.

Refer to design drawing for proposed lighting layout and Appendix A – Schedule of Luminaires in this specification for proposed lighting column details.

2.1.4 Chapel Car Park and Access Road

External lighting for the Chapel car park is currently provided with 2no existing lighting columns near the chapel. The power to the existing lighting columns is from the chapel which has been switched off and isolated. Therefore a new lighting circuit shall be derived from one of the spare ways within the existing Feeder Pillar to provide lighting for the chapel car park.

The 2no existing lighting columns and associated cabling shall be removed and cabling shall be stripped back as far as possible and made safe. New lighting columns shall be installed around the perimeter as indicated on the design drawing.

Access road west to the chapel car park currently has poor lighting coverage, therefore it has been instructed by the Trust that new lighting shall be provided. New lighting columns shall be installed as detailed on the design drawing and a second new lighting circuit shall be derived from the existing feeder pillar.

Cable shall be as XLPE/SWA/PVC type and laid direct in the soft.

Contractor shall also make allowance to undertake trial pits and report findings back to client team for the existing buried services within the access road island prior to commencement of works on site.

2.1.5 Lighting Control

Lighting control for the existing lighting columns in the overflow car park is via individual photocell daylight sensor mounted at the top of each column to enable the lighting to be switched on when there is not sufficient daylight available regardless of the hours throughout the day. And the lighting will be switched off if there is sufficient daylighting available.

It has been confirmed with Trust that this is the preferred lighting control method for both car parks hence the same principle shall be adopted with each new lighting column luminaire incorporating its own photocell daylight sensor at the top to switch on/off the lighting for both car park.

2.1.6 Lighting Performance and General Guidelines

All luminaires shall be installed with lamps, attachments, lenses, etc and fixings as indicated on the drawings and within the luminaire schedule as necessary to form a complete installation.

All luminaires shall be provided with DALI drivers.

All LED luminaires shall have a colour temperature of 4000K and a colour rendering index of > 80, a light loss factor of L90 and a demonstrated life of not less than 50,000 hours based on the normal anticipated operating temperature and conditions.

All LED luminaires shall be provided with 5 year warranties.

Refer to schedules for details of luminaires and accessories.

3. Closed Circuit Television (CCTV)

3.1 Scope of Works

3.1.1 General

This section describes the performance specification requirement for CCTV which has been completed by AECOM. The Trust CCTV Specialist Contractor shall complete the detailed design, supply, install, connect, test, commission and set to work the CCTV installations set out within this work section of the specification and drawings.

Incorporate all equipment, accessories, controls, supports and ancillaries implicitly or explicitly required either by the specification and drawings, or in accordance with accepted current practice, and procedures, which after assembly, testing and commissioning will enable that section of the Works to function correctly and to achieve the specified performance.

3.1.2 System Description

General

The Trust's incumbent CCTV installer is iC2 CCTV and Security (Contact: Patrick Besley 07881098385). The contractor shall employ iC2 CCTV and Security to design, supply, install, test and commission the CCTV system for the two car parks.

Currently there is no existing CCTV coverage or infrastructure available for the two car parks. Following the site walk around with iC2 CCTV and Security on 17th May 2021, it has been agreed that a total of 7no new CCTV cameras shall be installed on existing/new columns to cover both car parks. These CCTV cameras shall be linked back to 2no new local network switches via underground CAT5/6 cabling within dedicated 100mm diameter cable ducts as indicated on the design drawing. The switches that are collecting the CCTV signals shall then be linked back to a new wireless transmitter that is to be fitted onto an existing lighting column in front of the Chapel. The location and height of this existing lighting column provides a good line of sight for the signal to transmit towards the adjacent Batchworth building roof top, where a new wireless signal booster shall be installed to eventually feed the signal back to the main hospital building control room. - Refer to design drawing for details.

All cameras shall be installed externally on new or existing columns where indicated on the design drawing. The cameras themselves and associated fixing shall be specified, supplied and installed by iC2 CCTV and Security. All cameras shall be positioned to avoid glare from the lighting columns. All cameras shall be wired to the new network switches via CAT5/6 data cabling in underground ducts provided.

The contractor shall ensure a complete and fully functional CCTV system including all control equipment, hardware and software, cabling and ancillary services are provided.

Systems to be designed installed and maintained to all current British and European standards.

All systems will be unique to the development and be able to link to the Trust's site wide CCTV system.

System to be designed to minimize risk of equipment damage by vandalism or deliberate attempt to render the equipment inoperable.

The electrical contractor shall allow for meetings between iC2, the design team and the Trust estate team to present the final CCTV scheme for discussion and approval at an early stage and prior to any procurement and installation works.

CCTV Images

iC2 CCTV and Security shall provide on completion of the CCTV installation CD/DVDs with sample images of camera view and recorded data.

Responsibility

The division of responsibilities shall follow the below split:

The following shall be supplied and installed by iC2 CCTV and Security:

- CCTV cameras
- Network switches and associated IP rated enclosures
- CAT5/6 cabling
- Wireless signal transmitter and booster
- Fixing and bracketry
- Weather proofing
- Any other CCTV equipment

The following shall be supplied and installed by Main Contractor / Electrical Contractor:

- Underground cable ducts and duct entries to existing / new columns for CCTV equipment
- New lighting / CCTV columns
- All civil works for columns used to mount CCTV equipment
- All power supplies for CCTV equipment including cabling, containment and protective devices.

CCTV Signage

The CCTV installer shall provide CCTV signage in line with the CCTV code of practice within the Data Protection Act 1998.

A sample of the signage shall be issued to the Trust for approval; this shall be agreed prior to any signage being made and shall form part of the same family of signage for entire security package, to be agreed with the Trust prior to installation.

3.1.3 Data Protection

Introduction

The subcontractor shall recognise that the use of CCTV system is for the purpose of surveillance and therefore encompassed by the requirements of the new Data Protection Act.

The subcontractor, in conjunction with the client, must notify the Data Protection Registrar.

Time and Date Stamping

The correct time and date shall be encoded with the image to provide a definitive time and date for the event. The location of the camera should also be displayed within the relevant camera frame.

Signage

Signs should be placed so that the public are aware that they are entering a zone which is covered by surveillance equipment. The signs should be clearly visible and legible to members of the public (First Data Protection Principle)

The signs should contain the following information:

- The identity of the person or organisation responsible for the scheme.
- The purposes of the scheme.
- Details of whom to contact regarding the scheme.

All signage is to be coordinated with and approved by the Project Manager.

In exceptional and limited cases, if it is assessed that the use of signs would not be appropriate, the user of the scheme must ensure that they have:

- Identified specific criminal activity.
- Identified the need to use surveillance to obtain evidence of that criminal activity.
- Assessed whether the use of signs would prejudice success in obtaining such evidence.
- Assessed how long the covert monitoring should take place to ensure that it is not carried out for longer than is necessary.

Information so obtained must only be obtained for prevention or detection of criminal activity, or the apprehension and prosecution of offenders. It should not be retained and used for any other purpose. If the equipment used has a sound recording facility, this should not be used to record conversations between members of the public.

Privacy

Cameras should be set to only record the areas they were intended in order to achieve the objectives of the system. Should this not be possible without including a domestic area the owner of this space should be consulted. Where cameras afford a view of such areas these should be mechanically or electronically restricted to avoid recording areas not intended.

4. Feeder Pillar and Distribution Board

The existing Feeder Pillar in front of the Chapel was recently installed to provide the adjacent car park lighting and future Chapel power. There is a Schneider 4 way Three Phase and Neutral Distribution Board located within the feeder pillar with 1no TPN and 2no SPN ways used. The contractor shall utilise one of the spare ways available to provide power to the new lighting and CCTV power supplies, and a second spare way to provide power to all the new CCTV equipment.

Within the Batchworth building roof plantroom, there is an existing 13 way Eaton MEM SPN Distribution Board available. The contractor shall utilise one of the spare ways to power the CCTV signal booster.

Refer to Appendix B – Distribution Schedule for all new circuiting and protection devices details.

5. Containment and Wiring

All new external lighting circuits shall be radial circuits wiring back to the existing feeder pillar. All cables shall be XLPE/SWA/PVC type, to be laid directly in the soft dig area and contained within cable ducts if it crosses under hard standing. All internal cable to the column and bollard shall be flexible singles with heat resistant type and suitably mechanically fixed to internal of the column.

6. Circuit Protection Devices

All external lighting and CCTV circuits shall be protected with suitable circuit protection devices at the Distribution Board within the feeder pillar and the adjacent Batchworth building roof plant Distribution Board.

Circuit details can be found in Appendix B - Distribution Board Schedule

Within all lighting columns, fused cut-out fitted with HRC fuse shall be installed for the supply cable looped in and out of each of the column or bollard aperture. In addition, the column shall also be fitted with a double pole switch to manufacturer's recommendation to allow local isolation.

7. Earthing and Bonding

The electrical installer shall provide earthing and bonding system for all new external lighting and CCTV works as defined in BS 7671 and Base Standards. The new installation shall be referenced back to the existing system within the existing distribution feeder pillar and the roof plantroom DB.

All lighting columns shall have an earth stud, which shall be directly connected to the incoming supply cable CPC. The door of the lighting column shall also be earthed.

The electrical installer shall bond and connect to earth all exposed conductive parts of the electrical installation and all extraneous conductive parts so that in the event of a fault of negligible impedance, disconnection will take place in a manner and in such time as to ensure no danger arises.

8. Workmanship

8.1 Lighting

PERFORMANCE OBJECTIVES

To provide sub-circuit installations from the sub- distribution boards to provide general illumination and, where appropriate, emergency escape lighting.

DESIGN PARAMETERS

Standard

BS EN 12464-2 – Outdoor work places

BS 5489-1 - Roads and public amenity areas

Illuminance levels

Where not stated in the Schedule of Common Design Criteria (Schedule A13), ensure that the maintained illuminance levels meet but do not significantly exceed the CIBSE Code for Lighting.

- Ensure minimum colour rendering (R_a) is as CIBSE Code for Lighting.
- Ensure limiting glare rating is as CIBSE Code for Lighting.
- Ensure luminance limits as Table 2.4 of CIBSE Code for Lighting are not exceeded on DSE.
- Ensure the illuminance levels in offices achieve but do not significantly exceed 350-400 lux.
- Ensure the initial circuit luminous efficacy for fixed internal lighting installations is in excess of the following;
- Ensure that the installed lighting has an average initial (100 hour) lamp plus ballast efficacy of not less than 50 lamp lumens per circuit-Watt.
- Ensure the installed load for lighting does not exceed 12 W/m².

Contractor to commission the lighting installation in accordance with CIBSE Commissioning Code L : *Lighting* and allow for measuring illumination levels of installation prior to Handing Over, Measurements shall be carried-out in accordance with the SLL Code for Lighting, sections on Instruments and Field Surveys. Commissioning and measurements of lighting installations shall be performed by persons who have demonstrated their competence by passing the 'lighting industry commissioning scheme' operated by the Society of Light and Lighting, Electrical Contractors' Association or National Inspection Council for Electrical Installations.

GENERAL

SYSTEM REQUIREMENTS:

Select lighting equipment suitable to meet system objectives and as indicated on the drawings and schedules.

ELECTROMAGNETIC COMPATIBILITY

Ensure all equipment and systems are installed to provide electromagnetic compatibility within the systems and with any other systems installed in the same location.

INTEGRATED SYSTEM:

Where indicated provide integrated system as detailed in the scope of works.

PRODUCTS/MATERIALS

LUMINAIRES AND FIXTURES

Provide luminaires as scheduled and detailed in Luminaire Schedule complete with means of fixing or supporting.

LIGHTING CONTROL EQUIPMENT

Where lighting control equipment is specified engage a lighting controls specialist to develop the design, supply, install, commission and set to work the lighting control system.

Infrared systems to comply with BS 7693.

INSTALLATION

Install, commission and set to work lighting equipment in accordance with manufacturer's recommendations, BS 7671, BS 5266-1, BS 5266-7, ICEL 1003 and CIBSE Commissioning Code L : *Lighting*.

Install infra-red transmission systems and co-ordinate the installation of infra-red systems in the same area in accordance with BS 7693.

Ensure luminaires are not installed where temperatures are likely to exceed manufacturers recommended maximum.

QUALITY CONTROL

Handle, store and install equipment and components of the lighting system in accordance with manufacturers recommendations. Obtain all equipment and components from a single source.

Inspect all equipment and components on delivery, before fixing and after installation, and reject and replace any that are defective. Record all commissioning, measurements and tests.

8.2 Lighting Column

Lighting columns (and bollards) shall be root planted in pre-prepared concrete sockets which shall be backfilled in accordance with the manufacturer's instructions. Cable entry shall be allowed with in the base to enable electrical installation. Columns and outreach arms shall be factory finished as manufacturer's specification

8.3 Trenches, Cable Ducts and Pits for Buried Services

Performances Objectives

To provide excavation, backfill, beds and surrounds for buried cables and ducts.

To provide access chambers, draw pits and inspection chambers and the like.

To permanently reinstate roads and paths affected by excavations.

All work on underground services shall be in accordance with the guidance in HSG47 – Avoiding danger from underground services

Volume 1: NJUG Guidelines on Positioning and Colour Coding of Underground Utilities

Volume 2: NJUG Guidelines On The Positioning Of Underground Utilities Apparatus for New Development Sites

Volume 3: NJUG Guidelines on the Management of Third Party Cable Ducting

Volume 4: NJUG Guidelines for The Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees

Volume 5: NJUG on-site environmental good practice guidelines

Ensure all system components are approved by the appropriate Supply Authority and installed in accordance with their requirements. Arrange for them to inspect and approve installations as they proceed.

Routes of Services below Ground:

Based on the approximate locations indicated on the drawings, agree precise locations with the CA. Set out trenches clearly and accurately. Locate with temporary marker posts. Excavate trenches taking due care of existing services in the vicinity, carefully setting aside any materials required for backfilling or reinstatement. Ensure that the minimum cover for services is achieved at all times taking into account the location and levels of existing services.

Trench

Allow common trench for all underground services where appropriate.

Grade trench bottom to a maximum slope of 1:12.

Clear trench bottom of loose stones and place bedding to full width of trench.

Service Cable Ducts:

Lay ducts in the formation shown, on newly prepared bedding. Joint ducts in accordance with the manufacturer's instructions.

Ensure that ducts slope no more than 1:60 vertically and 1:30 horizontally.

Ensure that pre-formed duct bends used at ends of duct routes meet the requirements of the cable manufacturer for bending radii.

Prove alignment of completed duct run by drawing through a mandrel 7mm diameter less than nominal duct bore for minimum length 250mm. Clean completed duct run by drawing through a circular wire brush 12mm diameter more than nominal duct bore.

Install a draw wire of corrosion resistant material and minimum breaking strength 550N in each empty duct.

Plug and seal all ducts with proprietary duct plugs, on completion.

Structures

Ensure pipes in and out of structures are as short as possible. Surround by concrete at least 150mm thick. Set pipes sufficiently steep to prevent the possibility of differential settlement causing a backfall.

Backfilling over Concrete

Do not start backfilling within 24 hours of placing concrete. Do not use heavy compactors and prevent imposition of traffic loads within 72 hours of placing concrete.

Temporary Bridges

Provide temporary bridges over trenches as necessary to prevent construction traffic damaging pipes after backfilling.

Services Trenches

Provide service trenches to allow the services to be installed in accordance with;

BS 7671

Width to be as small as practicable with sides vertical.

Remove mud, rock projections, boulders and hard spots from trench bottom and trim level.

Carry out walk over survey of trench route, trial hole any area considered to be potentially difficult. Submit report of survey and trial holes.

Establish locations of any other underground service adjacent to cable route. Carry out any indicated work to adjacent services.

Clear trench bottom of loose stones and place bedding to full width of trench.

Cable Trenches

A 100mm depth tolerance shall be included when digging trenches, therefore all services shall be at the depth indicated below plus 100mm. This will allow for the possibility of the ground level being reduced by 100mm.

Haunch cables or ducts in bedding material to a minimum depth of 75mm above highest cable or duct. Install PVC marker tapes to all trenches as detailed below.

300mm below the finished surface level

Where the depth of the roadway or paved area base exceeds 300mm, the tape shall be laid immediately below the base.

Mark each change of direction of cables with pre-cast concrete 300x300x150 thick impressed with LV or HV CABLE, laid level with finished ground level.

Installation to be in accordance with latest revision of NJUG Guides:

Defence Estate Specification 034

Utilities Guidelines on Positioning and Colour Coding of Apparatus (Vol 1)

Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees. (Vol 4)

Backfilling General:

Laid and well compacted in layers not exceeding 300 mm thick. Do not use heavy compactors before there is 600 mm depth of backfill.

Backfilling under Roads:

Laid and compacted in 150 mm layers.

Identification Tapes

During backfilling lay continuous colour coded, heavy gauge polythene identification tapes, below surface along the route of each service. Warning tapes to be to BS EN 12613 and DE Spec 034.

Identification tapes shall be of polythene not less than 150mm wide and 0.1mm thick. They shall be yellow in colour and bear the continuously repeated legend "CAUTION ELECTRIC CABLE BELOW", or similar in black letters not less than 30mm high.

Access/Inspection Chambers Construction

As indicated on the drawings.

Access Cover and Frame Installation

Bed frame solidly in 1:3 cement: sand mortar over its whole area, centrally over opening, level with surrounding finishes and square with joints in surrounding finishes or with building. Where frame is in soil or grassed areas, haunch back edge of bedding so that it is not visible.

Temporary Draw Pit Construction

Fill pit with clean dry sand on completion of services installation.

8.4 Earthing and Bonding

The electrical installer shall provide an earthing and bonding system as defined in BS 7671 to fully connect to the existing earthing and bonding system on site.

The electrical installer shall bond and connect to earth for all exposed conductive parts of the electrical installation and all extraneous conductive parts so that in the event of a fault of negligible impedance, disconnection will take place in a manner and in such time as to ensure no danger arises.

The electrical installer shall provide the earthing system as shown on the drawings and in accordance with the requirements of BS7671 and BS7430.

Completion

On Completion of the works the Specialist Lightning Protection installer shall inspect and test the entire system in accordance with BS EN 62305. All results shall be recorded in a logbook; the logbook shall be handed to the client.

The Specialist Lightning Protection installer shall ensure that the overall resistance of the lightning protection system is less than 10 Ohms.

Prior to handover the Electrical installer / Specialist Lightning Protection installer shall be required to provide all requisite Completion and Test Certificates, otherwise Practical Completion cannot be recommended.

8.5 Closed Circuit Television

PERFORMANCE OBJECTIVES

Specialist installer to undertake detail design and provide, install, test and commission a fully functioning CCTV system capable of interfacing with other IT systems in the building(s).

On healthcare projects the closed circuit television system and components provided in compliance with it, will deliver the whole hospital policies and be compliant with all Department of Health (NHS Estates) documentation, including, but not limited to HTM's and HBN's pertinent to the nature of this project.

SPECIFICATION CLAUSES SPECIFIC TO W42

CLOSED CIRCUIT TELEVISION (CCTV) SYSTEM:

Standards

- BS 7958.
- BS 8418.
- BS 8495.
- BS EN 50132-7.
- BS EN 62676 series

Third party quality assurance standard

National Security Inspectorate (NSI)

Design CCTV system as detailed in the scope of works / system description

CCTV system coverage.

Ensure system provides effective and adequate viewing of areas indicated on the drawings at light levels Bright sunlight down to

- 4.0 lux unless detailed otherwise in the scope of works.

- Internal daylighting down to 100 lux.

- Artificial illumination provided at indicated area.

- Night viewing using camera mounted infrared projectors.

- Night viewing down to 0.5 mlux if necessary with use of image intensifier.

- National Security Inspectorate (NSI) approved

- Video transmission system

- BS EN 62676 series as applicable, BS EN 50132-5-3

CCTV system monitoring

- Ensure all human-machine interfaces and displays to comply with the Disability Discrimination Act, BS 8300-1 and BS 8300-2.

- Provide means of selection and recording for system monitoring

Ensure digital CCTV streams are encrypted

Ensure protection system displays and controls to be installed in control rooms are designed, located and commissioned taking into account the requirements of the following standards and the operational needs of users.

- BS EN ISO 11064-1

- BS EN ISO 11064-3

- BS EN ISO 11064-5

- BS EN ISO 11064-7

- BS EN 29241-2, and relevant parts of BS ISO 9241 and BS EN ISO 9241.

Where described in the scope of work s/ system description, provide an integrated system operating with the systems described.

CCTV SYSTEM SPECIALIST:

Engage a CCTV specialist to develop design, supply, install, commission and set to work a complete CCTV system.

Ensure the CCTV specialist is approved by the National Security Inspectorate

Gold Standard unless detailed otherwise in the scope of works.

ELECTROMAGNETIC COMPATIBILITY:

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

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.

SOFTWARE:

Obtain on behalf of the end users all appropriate licences, permissions, copyright waivers, rights of use and the like from the owners of the software rights. Ensure that the end user is properly registered with the software supplier for support and appropriate updating. Provide documentation for application software in accordance with BS ISO/IEC 26513 and BS ISO/IEC 26514.

Ensure that, as far as practicable, all software is commercially available off-the-shelf.

Ensure that any programmable configuration, customisation, and bespoke software, is developed, tested and commissioned using relevant processes and procedures complying with BS EN ISO 12207 or BS ISO/IEC/IEEE 15288, supported by a quality management system meeting the requirements of BS EN ISO 9001.

SAFETY:

For equipment mounted at height, ensure that there is a safe method of access to facilitate installation and maintenance in accordance with applicable health and safety legislation.

Ensure that there is an accessible means of isolation for safe maintenance of electrical equipment, in accordance with the Electricity at Work Regulations 1989.

PRODUCTS/MATERIALS

CCTV CAMERAS:

Standard · BS 8418.

CAMERA CONTROL EQUIPMENT:

Standard BS 8418.

CCTV MONITORS:

Display compatible with BS EN ISO 9241-303.

Standby/Off power consumption conforms to BS EN 50564.

CCTV RECORDING, PLAYBACK AND PRINTING:

Standard

BS EN 62676-4

BS EN 55020.

BS EN 55032

CCTV NOTIFICATION SIGNS:

Provide CCTV notification signs as current legislation and industry recommendations.

Standard

BS ISO 3864-1

BS ISO 3864-3

BS ISO 3864-4

S ISO 17398

BS EN ISO 7010

LOUDSPEAKERS:

Standard

BS EN 60268-5

BS 6840-13

CCTV SYSTEM INSTALLATION:

Install the CCTV system in accordance with the manufacturers' recommendations, BS 7958 and National Security Inspectorate (NSI) approved requirements, codes of practice and guidance.

CCTV SYSTEM COMMISSIONING:

Demonstrate that the CCTV system meets the specified requirements and record results. Provide documented CCTV demonstration, as part of the operation and maintenance manual.

Carry out demonstration using test objective as:

NSI approved standards and codes of practice.
BS EN 50132-7 Annex A

QUALITY CONTROL:

Handle, store and install equipment and components of the radio/TV system in accordance with the manufacturer's recommendations.

Inspect all equipment and components on delivery, before fixing and after installation and reject and replace any which are defective.

Record all commissioning tests and site modifications to hardware and software, and revise operating and maintenance instructions accordingly.

Manage configuration of software, settings, data and design, in accordance with an appropriate Configuration Management Plan complying as necessary with BS EN ISO 9001, BS ISO 10007, BS ISO/IEC/IEEE 12207 and BS ISO/IEC/IEEE 15288.

Provide configuration details along with the operation and maintenance manual on hand-over.

Manage information security of systems, software and data during design, implementation and commissioning in line with BS EN ISO/IEC 27001

CCTV SYSTEM DOCUMENTATION:

Prepare National Security Inspectorate (NSI) approved certification on completion, as part of the operation and maintenance manual.

TRAINING:

Provide operator training for the CCTV system operators.

Provide training for CCTV system maintenance staff.

9. Testing and Commission

9.1 Inspection and Test Procedure

Comply with BS 7671 Requirements for Electrical Installations (the IET Wiring Regulations), IET Guidance Notes Number 3 Inspection & Testing and other British Standards as indicated.

9.2 Design Information

Obtain all design assumptions, calculations and any other information to enable compliance with BS 7671 to be verified.

9.3 Incorporated Equipment Characteristics

Obtain and use information from manufacturers of equipment provided.

Use information provided, for equipment supplied by others and incorporated into installation.

9.4 Initial Verification

Carry out detailed inspection to verify the requirements of BS 7671 Section 642 in the order given in clause 642.3.

Carry out post installation lighting level verification on site in accordance to BS 13201-4-2003 Road Lighting - Part 4 Methods of measuring lighting performance

9.5 Test Equipment and Consumables

Provide test equipment and consumables in accordance with BS EN 61557 to complete tests satisfactorily, and to retest any failed installations following corrective measures.

Test equipment quality assurance requirements to BS EN ISO 10012.

9.6 Testing

Carry out in the same order as published the tests required by BS 7671 Section 643.

9.7 Continuity of Protective Conductors

Confirm continuity. Use ac or dc source

9.8 Earth Fault Loop Impedance (Zs)

Use 25 A test current. Measure and record source impedance (Z_e)

Where necessary obtain from supply undertaker value of Z_e at the origin of the installation taking into consideration any alternative supply arrangement giving rise to the highest Z_e value.

Measure Z_s with main equipotential bonding conductors connected. Do not summate values of several parts of each loop.

9.9 Settings and Adjustments

Confirm characteristics and settings of protective devices are within maximum and minimum specified tripping times.

Check correct operation of devices.

Confirm interlocks and sequences operate safely and as indicated.

9.10 LV Switchgear

Perform works tests on LV switchgear in accordance with BS EN 62271-200 and relevant parts of BS EN 61439 as appropriate and provide test certificates.

Allow for attendance by the Engineer to witness works tests.

Carry out special tests where indicated in the Work Sections.

9.11 Certification and Reporting

Complete and hand over to the Client a Completion or Periodic Inspection Certificate to BS 7671 Appendix 6 as appropriate.

9.12 Installation Certificates

Provide installation certificates for electrical installations in accordance with BS 7671 (IET Regulations).

Certificates shall be accompanied by a complete schedule of test result:

Record details of departures from BS 7671 (IET Wiring Regulations) on certificate.

Where appropriate provide copies of calculations justifying departure from BS 7671 (IET Wiring Regulations) and attach to certificates.

9.13 Records

Record all results and instrument readings on approved Record Sheets and hand over to the client two copies for each inspection and test, as soon as possible after such inspection and test.

9.14 Conductive Parts

Test for protection against direct and indirect contact in accordance with BS 7671 (IET Wiring Regulations) dependent on the method of protection.

9.15 Phase Sequence

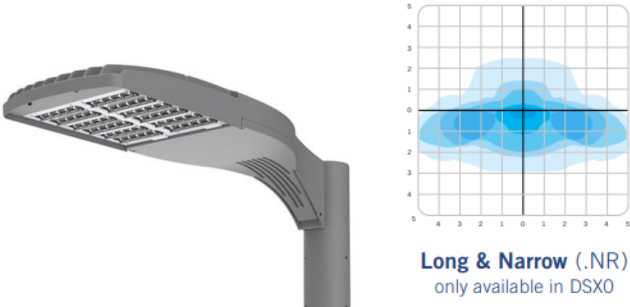
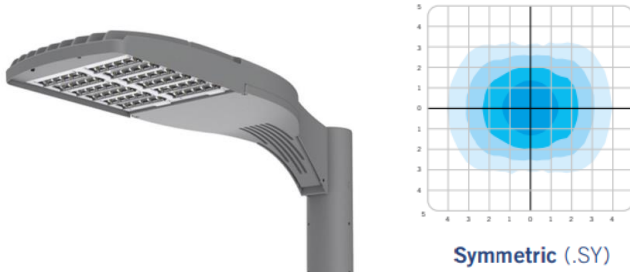
Check and confirm correct polarity of all conductors in all circuits.

9.16 Cable

Test continuity and insulation of buried cables immediately after back-filling.

10. Appendices

10.1 Appendix A - Schedule of Luminaires

Luminaire Ref.	Description	Light Source / Mounting Height	Image
A1	LED luminaire with Die-cast aluminium housing. Column mounted with long and narrow road distribution optics. DALI enabled, IP65 Locations: Car Park Entrance Road Manufacturer: Holophane Range: D-Series Integrated with its own photocell daylight sensor Article No: DSX0.1.LA064.NR	5956lm, 45W, 4000K Mounting Height: 6m	 Long & Narrow (.NR) only available in DSX0
A2	As A1 with Forward Through distribution optics Locations: Car Parks Manufacturer: Holophane Range: D-Series Integrated with its own photocell daylight sensor Article No: DSX0.1.LA054.FW	5033lm, 37W, 4000K Mounting Height: 6m	 Forward Throw (.FW)
A3	As A1 with Symmetric distribution optics Locations: Car Parks Manufacturer: Holophane Range: D-Series Integrated with its own photocell daylight sensor Article No: DSX0.1.LA054.SY	5133lm, 37W, 4000K Mounting Height: 6m	 Symmetric (.SY)

EX	Existing luminaire		
	All lighting columns and accessories to be provided according to manufacturers' specification		

10.2 Appendix B - Schedule of Distribution Boards

10.2.1 Existing Chapel Feeder Pillar DB

Project		Mount Vernon Hospital Car Park Redevelopment						Job No:		
								Date:		May 2021
DB Ref: DB-EX-01 (DB-C58900)		Ways: 4 Way TPN			Location: Within FP outside of Chapel		Type: Type B		Incoming Switch: 125A TPN	
Way No.	Protective Device				Circuit Description	Cable Details			Notes	
	Rating Amps	Desc'n	Type (BSEN 60898)	Isc kA		Size (mm²)	Type	Inst Method BS7671		
1L1					Existing Circuit – Payment Machine					
1L2	10	MCB	C	10	New – CCTV Equipment power supplies	2.5	3 core (P+N+E) XLPE/SWA/PVC	Direct Buried		Radial Circuit
1L3	10	MCB	C	10	New – Chapel Car Park Lighting	2.5	3 core (P+N+E) XLPE/SWA/PVC	Direct Buried		Radial Circuit
2L1					Existing Circuit – Car Park Lighting (To be extended to add new lighting columns as detailed on drawing)	2.5	3 core (P+N+E) XLPE/SWA/PVC XLPE/SWA/PVC	Direct Buried		Radial Circuit
2L2	10	MCB	C	10	New – Chapel Car Park Access Road Lighting	2.5	3 core (P+N+E) XLPE/SWA/PVC	Direct Buried / Ducted below Hard Standing		Radial Circuit
2L3					Spare					
3L1					Existing Circuit – Chapel Supply					
3L2										
3L3										
4L1					Existing Circuit – Socket					
4L2					Spare					
4L3					Spare					

10.2.2 Existing Batchworth House Roof Plantroom DB

Project		Mount Vernon Hospital Car Park Redevelopment						Job No:		
								Date:	May 2021	
DB Ref: DB-EX-02		Ways:13 Way SPN			Location: Batchworth Roof Plantroom		Type: Type A		Incoming Switch: 125A SPN	
Way No.	Protective Device				Circuit Description	Cable Details				Notes
	Rating Amps	Desc'n	Type (BSEN 60898)	Isc kA		Size (mm²)	Type	Inst Method BS7671		
1					Existing Circuit					

Project		Mount Vernon Hospital Car Park Redevelopment						Job No:		
								Date:		May 2021
DB Ref: DB-EX-02		Ways:13 Way SPN			Location: Batchworth Roof Plantroom		Type: Type A		Incoming Switch: 125A SPN	
Way No.	Protective Device				Circuit Description	Cable Details			Notes	
	Rating Amps	Desc'n	Type (BSEN 60898)	Isc kA		Size (mm²)	Type	Inst Method BS7671		
2					Existing Circuit					
3					Existing Circuit					
4	16	MCB	C	10	New - CCTV signal booster power supply	2.5	6491B singles	In Metal Conduit		Radial Circuit
5					Spare					
6					Spare					
7					Spare					
8					Spare					
9					Spare					
10					Spare					
11					Spare					
12					Spare					
13					Spare					

