

MANCHESTER OXFORD ROAD NORTHERN RAIL

CCTV UPGRADE SPECIFICATION NR_P0603_001_T0



SITE: MANCHESTER OXFORD ROAD

CLIENT: NORTHERN RAIL

DOCUMENT TITLE: CCTV UPGRADE SPECIFICATION

DOCUMENT REFERENCE: NR_P0603_001_T0

Rev No	Purpose of Issue	Date
T0	Tender	06/09/2021

Prepared by:
Jason Todhunter Director

For and on behalf of Advanced Security Partners Limited

Introduction to Site	6
Manchester Oxford Road Railway Station	6
Introduction to Tender	7
General	7
Design Development	7
Schedule of Design Information	7
CCTV System Installers Responsibilities	7
General	9
General Guidance	9
Relevant Standards	9
Design Parameters	9
Image Quality	10
Image Capture Rates	10
CCTV Cameras	11
Camera Types	11
Type 1	11
Type 2	11
Type 3	12
Type 4	12
Type 5	12
Type 6	13
Audio Recording	13
Camera Brackets	13
Network Equipment	15
Active Network Equipment	15
Network Notes	15
UPS	15
Network Cabling General	15
Cat6 UTP Cabling	16
Fibre Backbone Cabling	17
Infrastructure Documentation	17
CCTV Recording and Control	18
Introduction	18
CCTV Recording	18
CCTV Control and Monitoring	19
CCTV Operator Workstation	19
Large Format Displays (Videowall)	20

Equipment Cabinets	21
Internal Cabinets	21
Roadside Cabinets	21
CCTV Columns	21
Labelling	23
Introduction	23
Defects Liability and 12 Month Maintenance	25
Warranty	25
Defects Liability Period	25
Software/Firmware Upgrades During Defects Liability Period	25
Project Management Requirements	26
Introduction	26
Fault Rectification	26
Correspondence	26
Authority	26
Progress Meeting	26
Data Protection	27
Introduction	27
Secure Storage of Recordings	27
Signage	27
Privacy	27
Training	28
General	28
Documentation	29
Presentation	29
Format	29
Project Health & Safety File (as Applicable)	30
Materials/Suppliers Information	30
Operating Procedures	30
Repair and Maintenance Procedures	31
Cleaning Procedures	31
Spares	31
Testing & Commissioning	31
Modifications	31
Contact Information	31
Maintenance	31
Configuration Files	32

Drawings	32
Final Version	32

1. Introduction to Site

Manchester Oxford Road Railway Station

The busiest station of all four stations that serve Manchester City centre, Oxford Road was opened in 1849. Undergoing many redesigns through the years, today its 5 platforms see more than 9 million passengers annually. The Grade II listed building has been called remarkable, innovative and unusual for its distinctive design. The sweeping timber and concrete curves are said to echo those of the Sydney Opera House, and it adds to the stunning architecture of Manchester's city centre.

Following on from other recent station improvement works Northern Rail is now embarking on a complete replacement of the existing CCTV system. In addition to serving this site the design approach being used on Manchester Oxford Road will provide the template for CCTV on other Northern sites going forward.

2. Introduction to Tender

2.1. General

Northern Rail invites installers to tender for the installation of a new integrated CCTV system for Manchester Oxford Road railway station.

The scope of this procurement specifically includes:

1. The supply, installation, configuration and signoff of IP CCTV cameras (and limited IP PA speakers) including all fixings and brackets.
2. The supply, installation, configuration and signoff of NVR's / video analytics to support the above cameras and PA speakers.
3. The supply, installation, termination and testing of Cat6 structured cabling and OM3 fibre optic cabling.
4. The supply and installation of cable containment to current Northern Rail installation standards to support the above infrastructure.
5. The supply, installation, configuration and signoff of active POE network switches to meet current Northern Rail requirements. This includes any additional media converters / SFP's etc.
6. The decommissioning, removal and disposal of existing CCTV cameras, DVR's / NVR's and active network equipment in accordance with the WEEE directive. (some equipment may be retained as spares).

2.2. Design Development

The design included as part of this specification is indicative and has been developed to this level of detail through consultation with the end user. The drawings have a stage-appropriate level of detail and show how the detailed OR's (Operational Requirements) need to be delivered. The contractor will take ownership of this design and develop it to a level of detail and coordination, sufficient to give an accurate fixed price to complete the works.

2.3. Schedule of Design Information

The following documents are included with this specification and make up the design to date.

NR_P0603_002 CCTV_OR_Camera Schedule_T0	OR and Camera Schedule
NR_P0603_003_Station_Layout_T0	Station Layout
NR_P0603_004	High Level System Schematic

2.4. CCTV System Installers Responsibilities

The CCTV system installer will:

Satisfy themselves that the brief, in this specification and associated drawings and schedules is sufficient to allow them to develop and complete the design

Take responsibility for undertaking the full detailed design and coordination of the entire engineering services to comply with the performance requirements set out in this specification. The contractor will be fully responsible for developing this to form a complete design and installation

The security installer will liaise with the end user on the following:

Landlord Consents

Listed buildings consents

Site specific Health and Safety requirements

Northern specific electrical installation requirements

Northern specific IT installation requirements

The installer will ensure that all current and recurrent software licence fees (Including maintenance upgrades) for the various systems are included within the tender return related to the client's use of any software supplied (for 5 years) . The installer will transfer the licences to the client at the end of the defect's liability period

3. General

3.1. General Guidance

This specification and the drawings are indicative of the CCTV system requirements and are intended to demonstrate the design intent of the system for pricing purposes. The specification and drawings will be further developed according to the design intent as part of the specialist contractor's designed portion responsibility. The specification and drawings are not fully developed construction documents.

This specification should be read in conjunction with the security layouts, schematics and relevant schedules. All and any equipment locations are provisional at this stage.

3.2. Relevant Standards

CCTV Code of Practice published by the Information Commissioner General Data Protection Regulation (GDPR)

BS EN 62676-4:2015 Video surveillance systems for use in security applications standards.

ONVIF Open Network Video Interface Forum (ONVIF) specifications and protocols

BSIA Form No.191 Code of Practice for the digital recording systems for the purpose of image export to be used as evidence.

NACP 20 Code of Practice for Planning, Installation and Maintenance of Closed Circuit Television Systems.

BSIA Form No.109 Planning, Design, Installation and Operation of CCTV Surveillance Systems, Code of Practice and Associated Guidance.

BSIA Form No.210 An Installer's Guide to Internet Protocol (IP) in the security industry.

The BSIA 'A Planning, design, installation and operation of CCTV surveillance systems code of practice and associated guidance' document.

NCP 104.3 November 2017 NSI code of practice for design, installation and maintenance of CCTV surveillance systems

BS 7958 Closed-Circuit Television (CCTV). Management and operation. Code of practice.

BS7671 Requirements for electrical installations. IET Wiring Regulations

NR/L2/TEL/30135 Issue 6 Level 2 Specification Video Surveillance Systems (VSS) for general installation standards. For camera coverage, Image quality, frame rate and retention policy follow the Northern Rail OR, layouts and specification.

3.3. Design Parameters

The contractor will design, supply, install and commission a video surveillance system designed for use in a professional security environment. The system will allow an operator to observe persons / vehicles

and their actions in specified areas of the station and its surroundings. The system will fulfil the Operational Requirements listed in the detailed (OR) schedule where the following definitions are used.

3.4. Image Quality

The OR and camera schedules identify what level of coverage and what resolution is required in any given area. The three levels identified in the schedules utilise Pixels per Metre as a measure of resolution of images taken of a target over any given area. The aim is to capture the minimum number of pixels per Metre of the specified area of coverage. For Observation 62ppM will be used, for Recognition 125ppM will be used and for Identification 250ppM will be used. (detection is noted in the schedules but this is for thermal imaging only). It is accepted that 100% coverage cannot be achieved due to the complex architectural nature of the station, the security installer is however expected to flag any significant blind spots during the detailed design stage and to bring these to the clients attention for further consideration.

Observation 62 pixels per Metre. These images give characteristic details of an individual, such as distinctive clothing, while allowing a view of activity surrounding an incident.

Recognition 125 pixels per Metre. These Images determine with a high degree of certainty whether an individual shown is the same as someone that has been seen before.

Identification 250 pixels per Metre. These images enable the identity of an individual to be determined beyond a reasonable doubt.

Compression Type H264/H265 compression level low.

Image Retention 31 Days. Images automatically overwritten unless archived or manually write protected.

Recording Strategy

24/7 Continuous recording with increased frame rates during periods of video motion detection.

3.5. Image Capture Rates

All Cameras. Frame Rate *6PPS continuously increasing to 12PPS during motion detection. Pre and Post event buffering at 12PPS for 10 Seconds.

*As per NR/L2/TEL/30135 Issue 6 Section 9.4 "Motion Sensor enabled cameras are to be considered to prevent Hard Disk Drive (HDD) storage space being used up unnecessarily".

Images will be captured and compressed using H264/H265 utilising minimal compression to maintain high quality images.

Camera / camera sensors will have a native resolution of no less than 1080P. Single sensor Hemispheric cameras will have a native resolution of no less than 6MP. Multi sensor Panoramic cameras will have a native resolution not less than 12MP. All CCTV cameras will use Megapixel progressive scan CMOS sensors and will encode images in H264/5 for transmission by means of TCP/IP. Cameras will be capable of transmitting multiple differing image streams with complete flexibility regarding image quality and frame rate (per stream).

4. CCTV Cameras

4.1. Camera Types

The CCTV system will consist of a range of different camera types and technologies. All cameras will be designed to operate in the environment in which they are installed and to meet the requirements outlined in the OR and camera schedules.

4.2. Type 1

This camera type makes up the bulk of the cameras on the system. Cameras will be building / soffit or existing camera column mounted wherever possible to achieve the best view whilst remaining discreet.

Bullet and Dome versions required

Units installed in open air environments to be bullet type wherever possible. Units to be fitted with weathershields.

Image sensor: Colour/Monochrome –IP Camera 1080P. Progressive scan CMOS 1/2.8"

Lens: Vari-Focal lens (to suit location). Focal Length (REMOTE FOCUS AND ZOOM)

Video compression: H.264, H265

Resolution: 1920x1080 (HDTV 1080p) up to 50/60 fps (50/60 Hz) multiple 3D privacy masks. Wide Dynamic Range.

Video Analytics: Advanced video motion detection, loitering detection

Infrared illumination: Not required. Low light colour image capability required.

Casing: IP66,IK10 resistant fitted with sun / weather shield

Integration: ONVIF® Profile S and ONVIF® Profile T

Format: Surface / Pendant / Wall / Corner / Pole / Flush mount supported

Cameras will be capable of being orientated to deliver vertical images in areas with a narrow field of view such as the station frontage.

4.3. Type 2

A limited number of multi-sensor 180 degree seamless image panoramic cameras will be installed in designated areas to provide a greater level of situational awareness than can be achieved by installing multiple standard HD cameras.



Image sensor: 4 x 5 MP 1/2.5" progressive scan RGB CMOS
Lens: Fixed
Video compression: H.264, H265
Resolution: =>12MP multiple 3D privacy masks. Wide Dynamic Range.
Video Analytics: Advanced video motion detection, loitering detection
Infrared illumination: Not required.
Casing: IP66,IK10
Integration: ONVIF® Profile S and ONVIF® Profile T

4.4. Type 3

A limited number of single sensor 360 degree Hemispheric cameras will be installed in ticket barrier / staircase areas to provide a greater level of situational awareness than can be achieved by installing standard HD cameras.

Image sensor: 6 MP (3072x2048) 1/1.8" progressive scan RGB CMOS"
Lens: 1.6 mm, F2.0 Horizontal field of view: 185° Vertical field of view: 185° Fixed iris, IR corrected
Video compression: H.264, H265
Resolution: Overview: 2016x2016 to 160x160 (1:1) Panorama: 2560x1440 to 192x72 (8:3, 16:9 or 32:9)
Double panorama: 2560x1920 to 256x192 (4:3 or 16:9)
Video Analytics: Advanced video motion detection, loitering detection,
Infrared illumination: Not required. Low light colour image capability required.
Integration: ONVIF® Profile S and ONVIF® Profile T
Format: Surface / Pendant / Wall / Corner / Pole / Flush mount supported

4.5. Type 4

A limited number of dual head multidirectional dome cameras will be installed in identified areas to provide a greater level of coverage whilst utilising a single network interface.

Image sensor: 2x2 MP 1/2.8" progressive scan RGB CMOS
Lens: Varifocal, 3 - 6 mm, F1.8 -2.6
Video compression: H.264, H265
Resolution: 2 x 1920x1080 (2 x HDTV 1080p)
Video Analytics: Advanced video motion detection, loitering detection,
Infrared illumination: Not required. Low light colour image capability required.
Integration: ONVIF® Profile S and ONVIF® Profile T
Format: Surface / Pendant / Wall / Pole / Flush mount supported
Casing: IP66,IK10 resistant fitted with sun / weather shield

4.6. Type 5

A number of thermal imaging cameras will be installed to view platform ends as per the layout diagrams. Use of thermal imaging and object analytics instead of standard CCTV will reduce false activations from common sources such as severe weather, shadows and sunlight, poor lighting and train headlights. The units will work in conjunction with a 'person' detection / classification application and be linked to IP based PA speakers (one per camera). The unit will be configured to identify individuals loitering at platform ends or crossing lines and will trigger a local audio warning announcement at that location. At the same time a single PA speaker in the station management office will announce an activation and location to alert station staff to a possible issue. This configuration can be achieved either by means of functionality within the cameras / speakers or via the NVR / CCTV management platform.

Thermal sensor: Uncooled Micro bolometer
Lens: Fixed to suit field of view
Video compression: H.264, H265
Resolution: 384x288
Video Analytics: Advanced video motion detection, loitering detection, object identification
Infrared illumination: Not required. Low light colour image capability required.
Integration: ONVIF® Profile S and ONVIF® Profile T
Format: Surface / Pendant / Wall / Pole
IP Rating: IP66,IP67

The contractor will supply all hardware, software, application licences and configuration to make the above functionality operate reliably.

4.7. Type 6

Cameras located in the passenger lift cars will be vandal resistant discrete modules with wide angle fixed lenses to avoid any blindspots. Equipment will be expected to have the same video analytics technology and functionality as other internal cameras. The contractor will supply and install additional media conversion equipment and interconnects where only coaxial cables are available in the existing umbilical cables.

Image sensor: 1/3" progressive scan RGB CMOS
Lens: fixed focus, fixed iris 1.8 mm, F2.4 Horizontal field of view: 130° Vertical field of view: 95°
Video compression: H.264, H265
Resolution: 1920x1080
Video Analytics: Advanced video motion detection
Infrared illumination: Not required. Low light colour image capability required.
Integration: ONVIF® Profile S and ONVIF® Profile T
Format: Surface / Pendant / Wall / Pole / Flush mount supported
Casing: IP66,IK10 resistant

4.8. Audio Recording

Audio recording capability is required on the ticket gate line and other locations identified in the camera schedule. The system must allow for remote microphones (and not rely solely on those that may be built into cameras as they may be too distant to accurately record an event) and incorporate a local stop start button and a visual indicator that recording is underway. The system will have an automatic timeout capability configurable during commissioning. Audio will be encoded along with the nearest relevant camera image. This may require a temporary change of framerate to achieve. The system will utilise the same infrastructure as the CCTV system. The functionality will be tested and commissioned but not enabled without the client's written consent.

4.9. Camera Brackets

Where possible cameras will be wall, existing pole or ceiling / soffit mounted. Cameras replacing existing positions will where possible be located over the old fixings. Camera locations identified on the site plans are approximate and must be reviewed and agreed on site with the client team. The security installer will provide a snapshot from the chosen camera in the location proposed prior to final installation going ahead. All brackets will be installed in accordance with the manufacturer's instructions and approved by the design team prior installation. Allowance will be made by the security installer for all

cameras to be professionally re-coloured (to multiple RAL colours provided by the client) to ensure they blend into the surroundings as much as possible.

5. Network Equipment

5.1. Active Network Equipment

The CCTV contractor will replace all existing active networking hardware with new POE switches to meet the current Northern Rail specification. Existing equipment cabinets will be cleaned out and re-used where possible

The subcontractor will identify the number and type of active POE ports required in any existing or new node location. The client will free issue active network equipment for installation by the CCTV contractor.

5.2. Network Notes

1. Where new switch / hub locations are to be created interconnects between cabinets will utilise OM3 fibre at Gbit speeds.
2. Where possible new network nodes will be located in existing plant room areas to reduce the need for additional power supplies and containment.
3. The CCTV contractor will liaise with the clients IT department with regard to switch configuration and IP configuration of the system as a whole.
4. A minimum of 10% spare active ports distributed across the network will be available at handover.
5. The contractor will consider and make suitable allowance for network switch POE budgets based upon the CCTV equipment that has been selected.
6. The CCTV contractor will supply and install any specialist media converters where necessary. e.g passenger lift cameras.

5.3. UPS

Existing UPS units in hub locations are to be assessed by the contractor for capacity and suitability during the detailed design phase and the findings to be reported to the client for further instruction.

5.4. Network Cabling General

It is proposed that a large proportion of the existing structured cabling can be reused for the new camera installation. The contractor will re-test each existing cable to confirm suitability prior to use.

All new cabling will be installed into appropriate cable tray, basket tray or trunking, (in accordance with the manufacturer's instructions and Northern's standards). The supplier will provide and install suitable containment where it does not currently exist.

Particular care will be taken in not kinking or bending cabling past acceptable radius curves. Cables will not be subjected to any weight, tension, heat or other pressures / forces. The weight of the cabling will be supported by the tray-work and be clipped at regular intervals.

All CAT6 cables installed will be 90 Metres or less in length (to conform to CAT6 performance standards). Clipping of cables will be tight enough to provide support but not too tight as to deform / damage cables.

Holes drilled through walls will be sleeved to avoid damage to cables. No sharp surfaces will be left on tray-work or trunking that could potentially cause damage to the cables. If cable sheaths become

damaged or torn during installation, the whole length of cable will be replaced. All cables will be continuous. The practice of joining cables is not acceptable.

5.5. Cat6 UTP Cabling

CAT6 UTP cabling is required from the location of each CCTV camera / PA speaker to the appropriate existing or new hub location. At the hub location, termination will be onto 24 / 48-way 1U patch panels.

Where possible termination at the CCTV camera location end will be onto a standard module (with faceplate), mounted on a surface-mounted back-box. It is accepted that in many instances, it may not be practical to install a back-box because of physical constraints. In this case, the cable can be terminated with a CAT6 plug module for direct connection into the camera. In all cases, the cabling / patch lead, and back-box must not be visible, or accessible by the public. Suitable patch leads into the network switch will also be provided and installed at the hub room end.

All components and cable must be fully CAT6 compliant to ANSI/TIA/EIA-568-B.2-1-2002 standards. (including all later amendments) and provided from one single cabling manufacturer's system to ensure maximum compatibility (even though it is now widely recognised that CAT6 cabling can consist of multi-vendor components).

All CAT6 cabling will be fully tested to CAT6 standards. The testing of all outlets will identify any faults due to open circuits, short circuits, crossed or split pairs. A series of performance tests (in line with manufacturer's standards) will also be conducted.

Tests will include:

- Length Test
- Wire Map
- Resistance
- Mutual Capacitance
- Near End Cross Talk (NEXT)
- Far End Cross Talk (FEXT)
- Equal Level Far End Cross talk (ELFEXT)
- PowerSum of Equal Level Far End Cross talk (PSELFEXT)

The test results will display the worst-case value of any tests, the frequency that the worst-case value appeared, and the margin at that frequency. This data will be compliant with the manufacturer's guidelines and the cabling standards. Pass results from accepted test equipment will be presented in both hardcopy and electronic formats.

Proof of current calibration for all testing equipment will be available for inspection at any time.

5.6. Fibre Backbone Cabling

OM3 multimode fibre optic connections will be provided between any new hub locations and the primary hub location on Platform3.

Where necessary a minimum of 8 fibre cores in a loose tube duct grade LSZH cable format will be installed terminated and tested. Terminations at both ends will be LC connectors mounted on 1u patch panels.

Each fibre core will be tested and hard copies of full OTDR test results will be provided to the client for inspection. All performance characteristics must be within specified tolerances for running 10 Gigabit Ethernet speeds.

The Supplier will supply patch leads as required. All cables must be continuous runs from end-to-end. The practice of joining / splicing cables is not acceptable.

5.7. Infrastructure Documentation

Following the completion of installation and testing, the results will be provided for inspection and will form part of the documentation on handover. As a minimum, the documentation will comprise of the following content:

- As fitted drawings showing the location of all outlets / cabling terminations.
- CAT6 Test Results
- Fibre Test Results
- Cabinet Layout Diagrams

6. CCTV Recording and Control

6.1. Introduction

The Manchester Oxford Road CCTV upgrade will act as the template for CCTV upgrades across the Northern network going forward. The Northern portfolio varies greatly in scale and complexity but will require a common CCTV recording and control platform by which any station can be connected to and controlled. With that in mind the CCTV contractor needs to consider carefully the following when selecting a CCTV recording / control platform.

Affordability	The system will need to represent value for money and have low maintenance and licence costs
Reliability	Have a proven track record in a relatively industrial environment. Have high availability options such as dual PSU'S, NIC's etc.
Availability in the marketplace	Be widely available in the UK market not limited to channel partners
Manufacturers support	Be supported in the UK.
Scalability:	Hardware versions need to be available to support 8 cameras to 150 cameras but using the same front end.
Flexibility:	The ability to work with new technologies including Video Analytics
Interoperability	Be ONVIF compliant but also provide direct integrations to a wide range of camera third party device manufacturers.
Secure	The unit will satisfy all requirements under GDPR
Functionality	Ability to support mobile apps, Image distribution and management

6.2. CCTV Recording

The security installer will provide a server-based network video recorder (NVR) solution complete with client hardware and software designed for 24/7/365 operation in a professional security environment. The servers will be designed to manage and control the entire video surveillance system without affecting the performance of the NVR servers or the system. The CCTV Recording platform can be a standalone solution or form part of the wider SMS Security Management System. Either way the system must integrate seamlessly to allow operators a streamlined and efficient means of monitoring, controlling and reviewing images from the system. The solution should operate on a licence free linux based operating system.

The security installer will ensure that the system has the processing and throughput capability of recording video and audio from all of the video surveillance cameras at full camera resolution and upto 25 frames per second per stream.

The security installer will provide hard disk digital recording equipment with enough capacity to record surveillance data based on the camera streams as specified, plus 10% built-in spare capacity. The

installer is required to provide documentary evidence of how storage has been calculated against the design.

The system will record images and (and audio where required) captured using H.264. or H265 compression by the cameras. The system will not apply additional compression when images are exported.

The recording solution will be delivered on a minimum of two servers for this site to ensure a degree of redundancy. Servers will use dual redundant power supplies, dual NIC cards and to be configured as RAID5 for resilience.

Servers must be power loss resilient and must recover normal operation without third party involvement should a major outage occur. Location of NVRs to be agreed.

The NVRs must be compliant with the latest ONVIF standards and the manufacturers must be active ONVIF members.

The installer will set up the system to ensure that images and data are recorded for 31 days and are automatically overwritten or deleted after that time. Manual overwrite or deletion of recorded images or data will not be possible without full engineering rights.

The system will provide authentication, such as a digital signature and offer encryption on all exported surveillance data suitable for use in legal proceedings in a Court of Law.

The system will allow users to configure the performance parameters of each individual camera, notably separate frame rates for display, alarm, and recording, activity detection coverage and sensitivity, picture quality, and separate alarm, recording, and viewing resolutions.

The system will allow any authorised user to configure system and equipment settings and add and modify user data as described in this specification. The installer will ensure that the system is set up to be intuitive and easy to use and requires no special knowledge.

6.3. CCTV Control and Monitoring

The security installer will provide all monitoring and control equipment as specified or shown on the drawings complete with all hardware, software and software licences. The hardware will be designed and built for 24/7/365 operation in a professional security environment.

6.4. CCTV Operator Workstation

The installer will supply and install an operator workstation designed for 24/7/365 operation in a professional security environment.

The workstation will be a dedicated Windows 10/11 Pro 64bit personal computer (PC) with a video output card and sufficient processing power and onboard memory to run 3no 4K LED displays and an associated keyboard and mouse. The workstation will be locked down to prevent unrestricted access to USB ports.

The installer will supply, install and configure 2off power efficient 24" 16:9 4K LED displays (one unit as a minimum to have integrated loudspeakers). The units will be height adjustable and also be suitable for

desk or wall mounting as required. Connectivity will be via HDMI / DisplayPort. Units to be suitable for 24/7 operation. The installer will supply and install all interconnecting cables and additional bracketry / cable management where necessary.

6.5. Large Format Displays (Videowall)

The installer will supply, install and configure 1 off 55" LED 16:9 4K ready business class display for the Station management suite. The unit will be wall mounted. Connectivity will be via HDMI / DisplayPort. Unit to be suitable for 24/7 operation. The installer will supply and install all interconnecting cables and additional bracketry / cable management where necessary. The installer will take responsibility for determining the quantity and specification of computer equipment required to drive the monitors. The videowall display will be configured to operate as an integral part of the overall CCTV system

7. Equipment Cabinets

7.1. Internal Cabinets

The cabinets for use internally at staffed locations should be a U-rack design, either wall or floor mounted.

Cabinet location will be determined by a number of factors including but not limited to:

ventilation around the cabinet;
staff requirements;
size of room where located;
number of NVR's to be installed;
ease of access for maintenance

All cabinets must have front and rear openings and be capable of being locked. All cables within the cabinet must be tidy, loomed where necessary and clearly labelled.

7.2. Roadside Cabinets

These cabinets are for use at unstaffed locations only, or locations where the staff on site do not need, or are not permitted to have access to the CCTV.

No specific manufacturer is required although the size of the cabinet is mandated as a minimum.

The cabinet must be a U-Rack design and be sited in a convenient location for both installation and maintenance. The location will form part of Form SMSP 2.23-B Location Design and Specification.

The cabinet must contain a thermostatically controlled heater and cooling fans.

The NVR(s) and POE Switches will be installed in the cabinet as well as the cabinet being available for future Customer Information Screens (CIS), Long Line Public Address Systems (LLPA) and/or a router.

Cable entry into the cabinet must be via ducting into the base of the cabinet or side/back entry via galvanised conduit. All cables within the cabinet must be loomed and clearly labelled.

7.3. CCTV Columns

Where new CCTV columns are required these must be from the Altron Square ACC range or equal and approved.

Embedded column mount is preferred over bolt down columns. Bolt down units must only be used when the column is situated in a non-public area i.e. behind a fence line off platform, or in a car park area, where no trip hazard can be created by the use of the column.

Post mounted columns will be used on platforms or anywhere the public have access. 4.5 Metre columns to be used wherever possible.

All columns will wind down to allow ease of installation and maintenance, ensuring at the design stage that when winding down the column it does not interfere with any other structure, such as fences, lighting columns.

If situated on platforms, the column must run parallel with the tracks and it must be installed in line with relevant Railway Group Standards.

8. Labelling

8.1. Introduction

All devices to be labelled with Silver Fox (Fox-Flo) LSZH labels displaying the full device prefix, glued with VHB double sided tape,

All cables to be labelled with Silver Fox (Fox-Flo) LSZH tie wrap labels (printed stickers are not allowed).

All cables in duct chambers to be labelled with Silver Fox (Fox-Flo) LSZH tie wrap labels.

ALL tie wraps used are to be LSZH and UV resistant.



Labeling Index

CAM- Camera

CC1- Cabinet

CL1- Column

FPTC- Fibre Patch Panel

NVR- Network video Recorder

P1- Port number

PSU- Power Supply Unit

PTC- Patch Panel

SWT- Switch

(If there is only one cabinet on site, CC1 section is not needed and can be erased)

Example labelling

NVR

Station Prefix/Cabinet/Recorder/No of device

ATN/CC1/NVR/1

Ethernet Switch

ATN/CC1 or CL1/SWT/P1

Camera on a Column

ATN/CAM/1/CL1/NVR/1/P1

Camera on a wall etc.

ATN/CAM/1/NVR/1/P1

Patch Panels

ATN/CC1/PTC/1

Cable Between Column Switches

ATN/CL1/SWT/P2/CL2/SWT/P1

9. Defects Liability and 12 Month Maintenance

9.1. Warranty

All new equipment will be supplied with a minimum of three years (Five years for cameras) warranty from the date of handover. Any additional extended manufacturer's warranties will be valid until expiry.

The installer is responsible for equipment registration in order to validate warranty. Manufacturer's and installer's warranty certificates will be provided as part of the documentation.

9.2. Defects Liability Period

The Defects Liability Period will be for twelve months following practical completion.

This defect liability will cover all aspects of the work and will include all parts and labour.

The Defects Liability cover will be a 24 hour on-site response for the CCTV and NVR outages. The cover will be fully comprehensive of labour and replacement of faulty parts, with a service replacement of similar standard which will be within one working day. Two preventative maintenance visits will be carried out a year.

During the Defects Liability Period, any defects/faults of whatever nature will be repaired or corrected by the installer free of any charge. The installer will undertake the following:

- Provide bi-annual preventative maintenance checks of all equipment.
- Provide an on site response as detailed above to all faults reported.
- Repair of all faults that occur on the system both hardware and software.
- Replacement of equipment that fails and is uneconomical to repair
- All labour and parts

Prior to commencing any maintenance repair work or service work, the installer will report to the client and record the nature of the visit. Following a service or repair visit to site, the installer will report to the client and record details of the visit and the work carried out.

9.3. Software/Firmware Upgrades During Defects Liability Period

The installer will allow in the pricing for the installation of all software and firmware upgrades or patches released during the defects liability period, any necessary retraining consequent on this and the thorough updating of all relevant documentation held by the client.

10. Project Management Requirements

10.1. Introduction

The security installer will appoint a project manager to take overall responsibility for all works executed by the installer on the project, from award of contract through to completion and issue of final certificates. A pre-construction Health and Safety plan will be submitted for approval. This must include the details of the contract management including names of site supervisors and site operatives and their respective responsibilities e.g. Health & Safety representative, site works manager, etc.

10.2. Fault Rectification

The security installer will complete all rectification works identified by the client within 7 days from written notification.

10.3. Correspondence

All written communications on the project will be between the installer's Project Manager and the Principal contractor.

10.4. Authority

The client will not accept financial responsibility for any works that have been undertaken without prior written authority.

10.5. Progress Meeting

The Project Manager will visit the site on a regular basis, and will be available with reasonable notice to attend site meetings at the request of the Principal contractor or the client's representative.

11. Data Protection

11.1. Introduction

The security installer will recognise that the use of a CCTV system is for the purpose of surveillance and therefore governed by the requirements of the Data Protection Act's 2018 CCTV code of practice and GDPR.

11.2. Secure Storage of Recordings

The installer will ensure that access to recorded images and audio is restricted by password or other security measures to those suitable with training and authority.

Recordings and recording/processing equipment must only be accessible to those directly concerned with achieving the objectives of the system and must be located in a formal secure CCTV control room environment.

11.3. Signage

No new installer CCTV signage is required. the client will produce and deploy CCTV signage as part of the wider site signage strategy. The installer will support the client with regard to minimum requirements regarding size format and wording.

11.4. Privacy

The installer will ensure that where means are available i.e. video masking, the system is configured to ensure an individual's right to privacy where the law requires i.e. keypads at cash points, windows of nearby residential dwellings.

12. Training

12.1. General

Training for system operators and the end user is seen as a vital component of the success of any electronic security system. The installer will make an allowance for 2 days training. Training sessions will be delivered as 4 half days with upto 3 people per session.

13. Documentation

13.1. Presentation

All documents supplied under this requirement must conform to the following:

All documentation will be issued to the client for inspection 1 week prior to handover. Rectification works on the manuals will be completed and issued to the client's agent prior to completion.

The O&M manual will demonstrate a good knowledge of the scope and purpose of the documents which make up the Manual, together with the ability to readily identify how to locate and expedite information. This will not only enhance the efficient running of the system - but could prove to be a valuable asset in the event of an emergency.

The Manual will be written and compiled specifically for the site and as such, the use and application of its contents is only permitted for works related directly to this system. Its existence will assist the maintenance engineers in familiarising themselves with the systems installed.

The installer will supply method statements detailing procedures for servicing and maintenance of the system.

13.2. Format

All manuals, instructions, drawings and similar materials will be submitted in A4 format. Where the size of a drawing requires that it be larger than A4 it will be neatly folded to A4 size and each will be presented in a separate wallet in the manual.

Documentation will be in MS Word for operation and maintenance manuals in the format outlined by the client, Excel for equipment schedules and MS Project for programme of works.

The manual will contain the information detailed below:

- **Introduction**

The introduction will include a brief description of the site.

- **The Installation**

This section will include a brief written description of the systems installed on the project. The description will give brief details of the various systems and how if at all they interact with one another.

- **Commencement of Installations**

This will include a program of the works as proposed and as undertaken.

- **Practical Completion – Handover**

Practical completion certificate signed on behalf of the client and on behalf of the installer Data protection reference number.

- **Expiry of Defects Liability Period**

Details of the defects liability expiry.

- **Guarantees and Warranties**
Details of any guarantees or warranties.
Software licences and licence keys.
- **Contact Names and Numbers**
Installation installers and associated sub-installers
External services and authorities (if applicable)
Main Consultants

13.3. Project Health & Safety File (as Applicable)

- Introduction To The Regulations
- What Is The Health & Safety File?
- Clients Responsibility
- Register Of Design Issue Construction Drawings
- Design Information
- Register Of Hazardous Materials Incorporate Within The Project
- Register Of Survey Information Affecting Health & Safety
- Register Of Construction Method Statements
- Health & Safety Hazard Inventory
- Schedule Of Emergency & Fire Fighting Systems
- Schedule Of Building Services/Utilities
- Procedures & Precautions
- Form F10
- Additional Design Information
- Equipment servicing method statements

13.4. Materials/Suppliers Information

- **Asset Register**
Detailed list of all component parts including serial numbers
- **Record Drawings**
Including copies of as built schematic drawings, site plans and equipment locations (including joint box locations).
Drawing schedule detailing all drawings and drawing revisions
- **Suppliers**
Including contact details and addresses
- **Manufacturers' Literature**
Including manufacturer's installation and operation manuals
Warranty certificates

13.5. Operating Procedures

- Introduction
- Recommended Strategy For Operation & Control
- Start Up Procedures

- Normal Operation
- Emergency Operation
- Shut Down

13.6. Repair and Maintenance Procedures

- Introduction
- Fault Finding
- Common Defects
- Associated Hazards
- General Maintenance Procedures
- Planned Preventative Maintenance Program

13.7. Cleaning Procedures

- Cleaning & Inspection

13.8. Spares

- Policy
- Schedule of Spares
- Details of Ordering

13.9. Testing & Commissioning

- Method Statement
Description of how testing will be undertaken
- Index of Test Sheets
- Shot Book

The 'shot book' is a compilation of all camera views, which can be used for reference. The 'shot book' included in the O&M manual should include both 'Day' and 'Night' images from each camera, to prove depth of field in low light conditions; it should include at least one of each camera shot with the Rotakin or NORMAN Test target and a 1Metre calibration pole included at the target reference point and or a Rotakin / NORMAN Test target.

The 'shot book' will also include a photograph of the camera location to aid future identification.

- Factory Test Certificates
Signed copies of test documentation.

13.10. Modifications

- Modifications To The Building Design
- Modifications To The Manual And Other Documentation

13.11. Contact Information

All folders and other material will contain contact information for key personnel within the contractor's organisation.

13.12. Maintenance

It will be the contractor's responsibility to properly maintain all records relating to the system during the term of the warranty and maintenance period; the contractor will be responsible for ensuring that the manuals and all other documents are kept fully up to date, including copies that are held in other locations. Equipment serial numbers are to be included.

13.13. Configuration Files

The contractor will backup up and compile a complete set of network equipment configuration files onto a USB drive. These files must represent the complete setup at handover and enable recovery in case of system failure.

13.14. Drawings

All CAD drawings supplied will be submitted as paper copies and also as .dwg files on CD ROM. The contractor will provide a site plan, system schematic, electrical schematic, and connection details. The Manual will be accompanied by a set of "As Built" drawings to which reference should be made for information relating to the precise location of equipment and the routing of cables and or ducted services.

13.15. Final Version

Two copies will be supplied in bound paper format and on USB Drive. Serial numbers are to be provided for all security equipment. The final version(s) of all documents including all as-built drawings and schematics will be issued on completion of handover.