

C3 Group

YIF Schemes – MEP Design

N-Gage

SUSTAINABLE ESTATES MADE SIMPLE.

M&E DESIGN

Project: YIF Schemes MEP Design

Location: N-Gage **Date**: 14.11.25

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Revision Control		
Revision	Author	Date
001	EF	14/11/25

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Schedule of Electrical Abbreviations

Measurement		Unit Abbreviation
Power	Kilowatt	kW
Power	Watt	W
Current	Ampere	A
Voltage	Volt	V
Frequency	Hertz	Hz
Noise	Decibel	dB
Illumination	Lux	Lux

British Approvals for Fire Equipment	BAFE
Building Management System	BMS
British Standard	BS
British Standard adopted European Norm	BS EN
Conformité Européenne (European Conformity Mark)	CE
Construction (Design and Management) Regulations 2015	CDM
Continuing Professional Development	CPD
Disability Discrimination Act (referenced via Building Regs Part M)	DDA
Distribution Network Operator	DNO
Electrical Installation Certificate	EIC
European Standard	EN
Fire Alarm Panel	FAP
Fire-resistant cable type (Prysmian FP200 Gold or equivalent)	FP200
IET Guidance Note 3: Inspection and Testing	GN3
Ingress Protection rating	IP
Institution of Engineering and Technology	IET
International Organisation for Standardisation/ International Electrotechnical Commission	ISO/EIC
Light Emitting Diodes	LED
Low Smoke Zero Halogen (cable sheath type)	LSZH
Low Voltage	LV

Miniature Circuit Breaker	MCB
Moulded Case Circuit Breaker	MCCB
Microgeneration Certificate Scheme	MCS
Operation and Maintenance	O&M
Passive Infra Red	PIR
Residual Current Circuit Breaker with Overcurrent Protection	RCBO
Residual Current Device	RCD
Risk Assessment and Method Statement	RAMS
Operation and Maintenance	O&M
BAFE Scheme for Fire Detection and Alarm Systems	SP203-1
Steel Wire Armoured (cable type)	SWA
Earthing arrangement type (separate neutral and earth conductors)	TN-S
Earth system using local electrodes	TT
Unshielded Twisted Pair (data cable type)	UTP
Water Closet (toilet)	W/C
Earth fault loop impendence (as per BS 7671)	Zs

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1.0 General Description of Systems

1.1 General Requirements

At N-Gage, enabling works shall include the connection and termination of the DNO incoming electrical supply, providing a fully operational and tested incoming service point complete with isolator and metering, ready for the installation and commissioning of all subsequent electrical services.

As part of the works, the emergency lighting installation shall be fully compliant with BS 5266-1 and BS EN 1838, with all associated works tested and commissioned to confirm operational integrity.

The contractor shall undertake the full design, manufacture, supply, delivery to site, installation, testing, commissioning, performance verification and certification of all systems described within this specification. The contractor shall supply all labour, plant, equipment, and materials necessary to deliver a complete and functioning installation, whether or not specifically referenced in this document. All defects arising during the liability period shall be rectified, with comprehensive 'as-installed' drawings, operating and maintenance manuals, test certificates and associated documentation provided at handover.

This specification shall be read in conjunction with the conditions of contract, tender drawings, schedules, and all other documentation issued as part of the invitation to tender. Where discrepancies or omissions are identified, the Contractor shall immediately notify the contract administrator for clarification. No deviation from the specification shall be made without written approval.

1.2 Statutory Compliance and Legislation

The contractor shall comply with all statutory, regulatory and government requirements, together with recognised industry good practice. This includes, but is not limited to:

- Health and Safety at Work Act 1974
- Management of Health and Safety at Work Regulations 1999
- The Construction (Design and Management) Regulations 2015
- Electricity at Work Regulations 1989
- PUWER Regulations
- WEEE Directive
- Control of Asbestos Regulations (where applicable)
- Building Regulations (Parts L2, F, P and other applicable sections)

1.3 Standards of Work

All installation and commissioning shall conform to the latest editions of:

- BS 7671 – IET Wiring Regulations (18th Edition + Amendments)
- BS 5266-1 / BS EN 1838 – Emergency Lighting
- BS EN 60598 – Luminaires
- BS 5839-1 – Fire Detection and Fire Alarm Systems (non-domestic premises)
- CIBSE Commissioning Codes C, M and L
- CIBSE TM39 – Building Energy Metering
- Regulatory Reform (Fire Safety) Order 2005

All equipment shall be CE/UKCA marked and conform to the relevant BS/EN standards. Electrical works shall only be undertaken by suitably accredited installers (e.g. NICEIC, NAPIT, MCS).

1.4 Approvals and Performance

Where systems, layouts, or equipment are to be coordinated, designed, or detailed by the contractor (including but not limited to emergency lighting, metering, ventilation, and updated M&E layouts), the contractor shall move design from stage 4 to stage 6.
Prior to procurement or installation, the contractor shall obtain written approval from the contract administrator for all major equipment selections and system layouts.
Submissions shall include, where requested, detailed performance data, manufacturer's technical literature, compliance certificates, calculations, and drawings.
Where alternatives or substitutions are proposed, the contractor shall demonstrate equivalence or superiority of performance and confirm compatibility with existing systems. Approval of such proposals shall not relieve the contractor of responsibility for compliance, integration, or long-term functionality.
All approvals shall be formally documented. Verbal or informal approvals shall not be accepted. Approval of submissions by the contract administrator shall signify no objection but shall not imply acceptance of liability for design accuracy, product quality, or system performance.

The contractor shall allow sufficient time in the programme for submission, review, and resubmission of design information. No procurement or installation shall commence until the relevant approvals have been formally issued.

1.5 Health and Safety

The contractor shall prepare and submit detailed Risk Assessments and Method Statements (RAMS) prior to commencement of works. All activities shall comply with CDM Regulations 2015 and other applicable health and safety legislation. Appropriate PPE, site signage, exclusion zones and protective measures shall always be in place. Where life-safety systems such as fire alarms or security installations are affected, isolation and reinstatement shall be carried out under the supervision of specialist contractors. Temporary arrangements (e.g. fire watch, protective covers for detectors) shall be implemented to maintain compliance with the building's fire strategy.

1.6 Clarifications

In the event of conflict between this specification, drawings, or referenced documents, the contractor shall adopt the most stringent requirement and notify the contract administrator immediately for resolution. Approval of a proposed solution shall not relieve the contractor of responsibility for compliance or performance.

1.7 General Scope of Works

Electrical services shall be designed, installed, and commissioned to serve the N-Gage building in accordance with all current standards and Building Regulations.
The installation shall include but not be limited to:

- Low voltage (LV) distribution network
- General and emergency lighting systems
- Small power circuits and dedicated supplies
- Fire detection and alarm system (including assistive WC alarms)
- Security and intruder alarm system
- Structured data cabling infrastructure
- Final testing, certification, and O&M documentation

All systems shall be fully tested, commissioned, and handed over complete with O&M manual and as-fitted drawings.

1.8 Design Parameters

All electrical works shall be carried out in accordance with current regulations and standards including but not limited to:

- BS 7671 – IET Wiring Regulations (18th Edition + Amds)
- BS 5839-1:2017 – Fire Detection and Alarm Systems
- BS 5266-1 – Emergency Lighting
- BS EN 50131 – Intruder Alarm Systems
- BS EN 60839 – Access Control Systems
- CIBSE Lighting Guide LG7
- Building Regulations Parts L, M, and P
- Electricity at Work Regulations 1989

Design data:

- Supply voltage: 230/400V, 50Hz
- Prospective short-circuit current: 6 kA minimum
- Maximum voltage drop: in accordance with BS 7671 Table 4Ab
- Maximum Zs values: as per Appendix 3 of BS 7671

2.0 Low Voltage Distribution

A new 125A DNO supply shall serve the main distribution board within the plant area, providing isolation for all downstream systems. The contractor shall coordinate with the DNO to confirm connection arrangements, metering, and service isolation in accordance with BS 7671 and the Electricity at Work Regulations 1989.

All main and sub-distribution boards shall be metal-clad, type-tested to BS EN 61439-2, with a minimum IP30 rating. Boards shall include main isolators, MCB or RCBO protection, and clearly labelled circuits matching the drawings and schedules. A printed circuit directory shall be fixed within each board, and at least 20% spare ways shall be provided for future expansion.

All cabling shall be LSZH type, sized in accordance with BS 7671 Appendix 4, and installed neatly within galvanised or PVC containment. Penetrations through fire-rated elements shall be sealed with approved fire-stopping systems tested to BS EN 1366-3.

The earthing and bonding system shall comply with BS 7671 Chapter 54, with a main earthing terminal at the intake position connecting all main and supplementary bonding conductors. All metallic services, containment, and exposed parts shall be bonded and clearly labelled.

On completion, all circuits shall be inspected and tested to IET Guidance Note 3, and full test results, as-fitted drawings, and certificates shall be provided within the completion documentation.

3.0 Lighting Systems

Lighting shall be installed as shown in the associated drawing and the lighting schedule in Section 4.00 of this document.
All works shall comply with the requirements of BS 7671, BS EN 60598, BS 5266-1, and BS EN 1838, as well as the design intent indicated on the C3 Group electrical layouts.

3.1 General Requirements

All luminaires shall be LED type, with a minimum luminous efficacy of 100 lumens per watt and a rated operational life not less than 50,000 hours (L80/B10). The standard colour temperature shall be 4000 K (neutral white), unless otherwise specified on the drawings or room data sheets. Luminaires shall be suitable for their installed environment, with ingress protection and impact resistance ratings appropriate to each area. Fittings shall be supplied complete with compatible drivers, control gear, and optical diffusers as specified by the manufacturer. Prior to installation, all luminaire mounting positions shall be confirmed and coordinated with ceiling systems and other building services to ensure there are no conflicts. Each luminaire shall be labelled to identify the distribution board and circuit reference in accordance with the final as-fitted drawings.

3.2 Emergency Lighting

Emergency lighting shall be of the integral or self-contained three-hour duration type, installed in accordance with the requirements of BS 5266-1 and BS EN 1838. The system shall provide adequate illumination along all escape routes, final exits, staircases, and high-risk task areas, in compliance with the building's fire strategy. Where applicable, maintained exit signs shall be installed in accordance with the emergency lighting layout drawings. Wiring for emergency lighting shall utilise low-smoke, zero-halogen cabling, segregated from normal lighting circuits wherever practicable. Local key-switch test points shall be provided for each emergency lighting circuit to facilitate functional and duration testing, and the results of all tests shall be recorded in the emergency lighting logbook prior to handover.

3.3 Lighting Controls

Lighting controls shall incorporate passive infrared (PIR) occupancy sensors, daylight-linked dimming where specified, and manual key-switches for the testing of emergency circuits. PIR sensors shall be CP Electronics type or equal approved, pre-set to achieve the design occupancy time delay and sensitivity levels suitable for each space. Manual control points shall be grid-mounted, clearly labelled, and positioned in accordance with

the room data sheets or reflected ceiling plans. All lighting control circuits shall be installed and commissioned in accordance with CIBSE Commissioning Code C and the relevant sections of BS 7671.

3.4 Coordination and Installation

All luminaires and control devices shall be verified for compatibility with ceiling and wall systems before procurement. Penetrations through any fire-rated or acoustic ceiling shall be detailed and installed to maintain the integrity of the ceiling performance. The contractor shall confirm ceiling void temperatures and ensure that all luminaire drivers and fittings are suitable for the thermal environment in which they are installed. Sufficient access shall be provided for the maintenance and replacement of lamps, drivers, and emergency batteries. All cabling associated with the lighting system shall be low-smoke, zero-halogen type, neatly installed and adequately supported. The completed installation shall present a uniform and coordinated appearance, with luminaire rows and grids aligned within ±5 mm of the design setting-out points.

3.5 Testing and Commissioning

Testing and commissioning of the lighting installation shall be undertaken in accordance with BS 7671, BS 5266-8 (EN 50172), and CIBSE Commissioning Code L. All lighting circuits shall be tested for continuity, insulation resistance, polarity, and earth fault loop impedance, and all emergency lighting shall be subjected to functional and duration tests. Lighting control devices shall be commissioned to ensure correct operation of presence detection, time delay, and daylight dimming functions. All test certificates and commissioning results shall be included within the operation and maintenance manuals submitted at project completion.

4.0 Small Power Systems

4.1 General Requirements

Small power systems shall be installed as shown on the associated electrical drawings and coordinated with the architectural layouts. The installation shall include all socket outlets, fused connection units, isolators, and fixed equipment connections required to serve the building. All materials, wiring, and accessories shall comply with BS 7671 and relevant British Standards. The system shall be designed and installed to provide a reliable and safe distribution of power to all general and dedicated loads, with appropriate circuit protection, containment, and labelling.

4.2 Socket Outlets

Socket outlets shall be MK Logic Plus or equal and approved, twin-switched type, complete with engraved or printed circuit identification. Outlets shall be installed at standard mounting heights of 450 mm to underside in general areas and 1,000 mm in kitchens, unless otherwise noted. Final locations shall be agreed with the client and coordinated with furniture layouts prior to installation. All socket outlets shall be protected by 30 mA RCD or RCBO devices and wired in LSZH twin and earth cable from local distribution boards.

4.3 Dedicated Circuits and Fixed Equipment

Dedicated radial or ring circuits shall be provided to serve fixed equipment, including kitchen appliances, cookers, hand dryers, water heaters, panel heaters, showers, and mechanical ventilation units. Each circuit shall be individually protected and clearly labelled at the point of supply and at the distribution board. Local isolation shall be provided adjacent to each fixed appliance by means of a fused connection unit, key switch, or local isolator, as indicated on the drawings. Circuit ratings and cable sizes shall be selected in accordance with BS 7671 Appendix 4 to ensure compliance with voltage drop and thermal limits.

4.4 Extract Fans

Extract fans in sanitary accommodation shall be interlinked with the lighting circuits within those spaces so that operation occurs automatically upon light switch activation. Where delayed run-on is required, time-delay fan isolators shall be provided in accessible locations outside the room, clearly labelled, and installed in accordance with manufacturer’s recommendations.

4.5 Labelling, Coordination, Testing and Certification

All small power circuits and accessories shall be labelled to match the final as-fitted drawings and distribution board schedules. Accessories shall be securely mounted, aligned, and fitted with white moulded plates unless otherwise specified. Wiring shall be neatly routed and supported within the containment systems, maintaining adequate segregation from data, fire alarm, and security cables. On completion, all small power circuits shall be tested, labelled, and recorded in the final electrical certification documentation.

5.0 Fire Alarm & Assistive Systems

5.1 General Requirements

The fire alarm system shall be designed, supplied, installed, and commissioned in accordance with BS 5839-1:2017, providing a Category L1 level of protection. The installation shall ensure automatic detection and alarm coverage to escape routes, circulation areas, and all identified fire risk zones, as indicated on the associated fire alarm layout drawings. The system shall deliver clear and reliable audible and visual alarms throughout the building to facilitate safe evacuation.

5.2 System Components

The system shall comprise an addressable fire alarm control panel complete with integral power supply, standby batteries, and monitored circuits. Devices shall include manual call points at all final exits, smoke and heat detectors (standard and with integrated sounder bases), and sounder beacons positioned to achieve compliance with BS 5839-1 audibility and visibility criteria. An external sounder shall be installed adjacent to the main entrance to provide external alarm indication.

All wiring shall be FP200 Gold or equivalent enhanced fire-resistant cable, installed in red containment where exposed. Cable supports shall be metallic and secured to prevent premature collapse in accordance with BS 7671 Regulation 521.10.202. Circuits shall be segregated from LV and data cabling, and all joints shall be accessible and suitably enclosed.

5.3 Assistive Alarm Systems

A Toilet Assist Alarm shall be installed within each accessible WC, comprising a ceiling pull cord, wall-mounted reset button, and over-door indicator with sounder. The system shall comply with BS 8300, providing clear visual and audible alerts upon activation and allowing reset only from within the WC.

5.4 Commissioning and Certification

All works shall be carried out and commissioned by a competent specialist certified to BAFE SP203-1 or equivalent. Full functional testing, including cause-and-effect verification and standby power assessment, shall be undertaken to confirm system performance. On completion, the contractor shall provide as-fitted drawings, commissioning certificates, and BS 5839-1 installation documentation within the

O&M manual. The system shall be left fully operational, energised, and clearly labelled with user instructions at the control panel.

6.0 Security & Data Systems

6.1 General Requirements

Security and data systems shall be installed as shown on the associated drawings and coordinated with the building layouts. Installations shall comply with the relevant British Standards and be carried out by competent, approved personnel. All cabling shall be concealed, neatly installed, and segregated from low-voltage circuits to prevent interference.

6.2 Intruder Alarm System

An intruder alarm system shall be installed in accordance with BS EN 50131, providing coverage to all circulation spaces, access doors, and vulnerable areas. The system shall comprise PIR detectors, door contacts, keypads, and an external sounder with strobe, positioned as shown on the drawings.

The control panel shall be located in a secure, accessible area and include integral power supply and standby batteries providing a minimum 12-hour backup. All cabling shall be screened and terminated using suitable connectors. Devices shall be clearly labelled and recorded on a zone schedule.

Commissioning shall be completed by a specialist security contractor, confirming correct operation and zoning. Full documentation, including commissioning certificates and user instructions, shall be included in the O&M manual.

6.3 Data and Communications Systems

A structured cabling system shall be installed using Cat6 LSZH UTP cable, compliant with BS EN 50173 and ISO/IEC 11801. Data outlets shall be twin RJ45 type and installed as indicated, connected to patch panels within a suitably sized comms cabinet fitted with cable management and power supplies.

All outlets and patch panel ports shall be clearly labelled to correspond with the as-fitted drawings. Each cable run shall be tested and certified using calibrated test equipment, with results demonstrating full Cat6 channel performance.

6.4 Documentation

On completion, provide as-fitted drawings, zone and outlet schedules, test results, and manufacturer data sheets within the electrical O&M manuals.

7.0 Schedule of Manufacturers

7.1 Lighting

NVC Lighting

Address: NVC Park 201, Hollymoor Way, Rubery, Birmingham, B31 5HE

Phone: 01214 576340

CP Electronics

Address: Brent Crescent, London, NW10 7XR

Phone: 03339 000671

7.2 Small Power

MK Electric

Address: Paycocke Road, Basildon, Essex, SS14 3EA

Phone: 01268 563563

7.3 Fire Alarm and Security

Apollo Fire Detectors

Address: 36 Brookside Road, Havant, Hampshire, PO9 1JR

Phone: 02392 492412

Honeywell

Address: Honeywell House, Bracknell, RG12 1EB

Pyronix

Address: Secure House, Braithwell Way, Hellaby, Rotherham, S66 8QY

Phone: 01709 700100

7.4 Data Outlets

Excel

Address: Excel House, Junction Six Industrial Park, Electric Avenue, Birmingham, B6 7JJ

Phone: 01213 267557

Connectix

Address: 500 Avenue West, Skyline 120, Braintree, Essex, CM77 7AA

Phone: 01376 346600

7.5 Cabling and Containment

Prysmian

Address: Chickenhall Lane, Eastleigh SO50 6YU

Phone: 02380295555

Doncaster Cables

Address: Millfields Industrial Estate, Arksey Lane, Bentley, Doncaster, DN5 0SJ

Phone: 01302 821700

Legrand

Address: Great King Street North, Birmingham, B19 2LF

Phone: 03456 054333

Marshall-Tufflex

Address: 55-65 Castleham Road, St Leonards on Sea, East Sussex, TN38 9NU

Phone: 01424 856600

8.0 Lighting Schedule

Ref	Part Code	Description	Image
E001	NFU/UGR19/66/840	NVC Lighting - Fulton - Bulkhead - 28.9W - 3475lm	
E002	NFU/UGR19/66/840/M3	NVC Lighting - Fulton - Em Bulkhead - 28.9W - 3475lm	
E003	NDE15/ELID/M3L/840	NVC Lighting - Denali - Bulkhead - 17.1W - 1295lm	
E004	NDE15/ELID/M3L/840/M3	NVC Lighting - Denali - Bulkhead - 17.1W - 1295lm	
E005	Lexington LiFe	NVC Lighting - Lexington - Em Bulkhead - 2.1W	
E006	NWA6-18/840	NVC Lighting - Washington - Em Bulkhead - 18.99W - 2643lm	

9.0 Wiring, Containment, Controls & Fire

9.1 Safety Measures

All wiring and containment works associated with lighting, power, controls and emergency systems shall comply in full with BS 7671 (IET Wiring Regulations, 18th Edition with Amendments) and all other relevant British Standards. Installations shall be safe, robust, coordinated with other building services, and fully compliant with statutory fire safety requirements.

9.2 Cabling Standards

Cables shall comply with the relevant British Standards appropriate to the application and installation environment. PVC insulated and sheathed Twin and Earth cable of not less than 1.5 mm^2 and rated at 300/500 V shall be installed to BS 6004. Steel Wire Armoured (SWA) XLPE insulated, LSZH sheathed cable rated at 600/1000 V shall be installed to BS 6724. Fire-resistant cable, such as FP200 Gold or equivalent, shall be installed to BS 7629-1. Cable type shall be selected based on installation conditions, routing and the system served, including general power, metering and building management systems. Cable routes shall avoid thermal insulation wherever practicable and shall not compromise other services or the building structure.

9.3 Containment Systems

Containment systems shall consist of heavy-duty PVC conduit in low-risk internal partitions and galvanised steel conduit in corridors, sports halls, plant rooms and other high-traffic or high-risk areas. All internal containment shall be securely fixed using fire-resistant metallic clips and fixings. Steel cable ties or P-clips shall be used within trunking to prevent premature collapse of containment in the event of fire.

9.4 Installation Coordination

Cable routes and containment shall be installed neatly, uniformly and in parallel. Adequate clearances from hot services shall be maintained, and all routes shall allow access for future inspection and maintenance. Containment shall be coordinated to avoid clashes with other building services including ductwork, sprinkler pipework and ceiling grids.

9.5 Controls

Each lighting zone shall be controlled by PIR sensors providing occupancy and daylight detection, with manual key-switches incorporated for emergency lighting

test circuits. All emergency luminaires shall include integral three-hour batteries with local “EM TEST” key-switch facility. The security system shall provide local arm/disarm functionality and control of external sounders.

9.6 Fire Integrity & Structural Penetrations

Fixing of containment to fire-rated partitions or ceilings shall not reduce the fire performance of the element. All penetrations through fire barriers shall be sealed using certified intumescent products in strict accordance with the project fire-stopping drawings and fire strategy.

10.0 Inspection, Testing and Commissioning

10.1 General Requirements

All inspection, testing and commissioning activities shall be carried out by competent and suitably qualified personnel holding the appropriate certifications and demonstrating up-to-date training relevant to the systems being tested. The contractor shall be fully responsible for ensuring that all works are inspected, tested and commissioned to recognised industry standards, and that safe operation is confirmed prior to handover.

10.2 Inspection and Verification

Inspection and testing shall be undertaken in full accordance with the latest edition of BS 7671 (IET Wiring Regulations), IET Guidance Note 3: Inspection & Testing, and all applicable manufacturer installation and commissioning requirements.

Testing shall be carried out both during installation and on completion. Pre-completion, or “dead” testing, shall be undertaken progressively during installation to identify and rectify faults at the earliest possible stage. Live testing and final verification shall then be carried out prior to energisation, confirming that the systems perform as designed and that safety requirements are fully satisfied. All test results shall be provided in a clear and referenced format, enabling traceability to individual circuits, panels, and systems.

10.3 System Certification

The contractor shall provide separate electrical certification for each major system. Certification shall be issued for the emergency lighting installation, including both functional and full-duration tests. Additional certification shall be provided for the general lighting and small power systems, all distribution boards and final circuits, and for metering circuits, energy monitoring devices and lighting control networks.

10.4 Functional Testing and Commissioning

Commissioning shall extend beyond simple verification and shall include functional testing of all control devices and interfaces. This shall cover, as appropriate, lighting controls, presence detection systems, timers, dimmers, and Building Management System (BMS) interfaces. The contractor shall carry out all necessary programming of control systems and provide demonstrations to the Employer or their representative. Verification shall confirm correct operation across all modes, default states, overrides and fail-safe conditions.

10.5 Documentation and Handover

All test results, commissioning certificates and associated records shall be provided in both printed and digital formats. These shall be collated into the Operation and Maintenance (O&M) manuals to ensure that the employer has a complete and permanent record of system performance, compliance and configuration.

11.0 As-Fitted Drawings, Manuals and Handover Documentation

Prior to practical completion, the contractor shall provide a complete package of documentation covering all modified and newly installed systems. This information shall be comprehensive, coordinated with other disciplines, and sufficient to allow the employer to operate, maintain, and manage the systems with confidence.

11.1 As-Fitted Drawings

As-fitted drawings shall be prepared to show the final installed configuration of all systems, including power and lighting circuits, emergency lighting, metering layouts, photovoltaic arrays and inverters, control cabling and interfaces, and ventilation services with associated electrical supplies. Drawings shall be clearly marked “As-Fitted” and shall accurately represent the completed installation. They shall be coordinated with mechanical, architectural and other relevant disciplines to ensure consistency and ac curacy across the project documentation set.

11.2 Operation and Maintenance Manuals

Comprehensive Operation and Maintenance (O&M) manuals shall be compiled by the contractor and submitted to the Employer. These shall contain all relevant electrical certification, including Electrical Installation Certificates (EICs), minor works certificates, emergency lighting certificates, and photovoltaic/G99 compliance certificates. Manuals shall also include full manufacturer datasheets and technical literature, installation instructions, system schematics, warranty documentation, and details of supplier and manufacturer contact information.

In addition, user guides shall be provided for all systems, covering general lighting, emergency systems, control interfaces, and photovoltaic installations. Where applicable, recommended maintenance schedules shall be included, setting out inspection frequencies and routine tasks required to maintain compliance and performance.
All documentation shall be submitted in digital format, provided as both PDF and DWG files. Where requested by the Employer, one complete hard copy set shall also be supplied in printed form.

11.3 Handover Conditions

No final account payment or release of retention shall be authorised until all required documentation has been submitted, reviewed and accepted by the contract

administrator. The contractor shall ensure that all drawings and manuals accurately reflect the installed systems and that all handover documentation is delivered in accordance with the agreed contract programme.