

PL2650 ENNISTYMON COMMUNITY SCHOOL MUGA FLOODLIGHTING SPECIFICATION

PL2650-MEC-HIG-SWI-SP-EO-T01

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Project Name:	PL2650 ENNISTYMON COMMUNITY SCHOOL MUGA FLOODLIGHTING		
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1.0 Project Description

The works comprise the supply, installation, testing and commissioning of the proposed MUGA floodlighting installation at Ennistymon Community School, Ardnaculia North, Co. Clare.

The floodlighting scheme shall comprise 8 No. Veelite Sportslite 6 400 W LED floodlights, 5000 K, asymmetric wide beam Optic A, mounted on 4 No. 10 m floodlighting columns, with 2 No. floodlights per column. The connected lighting load is approximately 3.2 kW. The design shall achieve the maintained illuminance and uniformity in accordance with the approved photometric design and drawings.

The system shall be supplied from the existing school plant room / MDB-01 via a MUGA pitch lighting control cabinet. The installation shall include all floodlighting columns, luminaires, brackets, internal column wiring, pitch lighting control cabinet, switchgear, controls, underground cabling, ducting, earthing, bonding, surge protection, testing, commissioning, final aiming and as-built documentation required for a complete working installation.

The Contractor shall provide all necessary information pertaining to groundworks, ducts, foundation design, setting out and all other builders' work required to complete the floodlighting installation.

2.0 Relevant Drawings and Documents

The works shall be read in conjunction with the following drawings and documents:

Document	Title
PL2650-MEC-HIG-SWI-DR-EO-00001	MUGA Floodlighting Layout
PL2650-MEC-HIG-SWI-SP-EO-T01	MUGA Floodlighting Specification
Veelite / Manufacturer's Photometric Design	MUGA lighting calculation and luminaire data
Manufacturer's Data	Luminaire, column, cabinet, switchgear and control equipment data

The Contractor shall review all drawings and documents prior to commencing works. Any discrepancies shall be referred to the Engineer for clarification before ordering equipment or commencing installation.

3.0 Key Design Standards

The installation shall comply with the current editions of all relevant Irish, British and European Standards, including but not limited to the following:

Item	Description	Standard
1	Lighting Design - Light and lighting for sports areas	BS EN 12193:2018; CIBSE LG04
2	Measurement and Presentation of Photometric Data	EN 13032 series

3	Electric Wiring Regulations	I.S. 10101:2020, including current amendments
4	Luminaires - Floodlights / LED Luminaires	BS EN 60598-1; BS EN 60598-2-5
5	Lighting Columns	EN 40 Series; ILP Technical Report No. 7 where applicable
6	Column Foundations and Wind Loading	IS EN 1991-1-4, Irish National Annex
7	Structural and Corrosion Protection of Steelwork	BS EN ISO 1461
8	Low Voltage Fusegear and Switchgear	IS EN 60947 series
9	Cables and Flexible Cords	BS 5467; BS 6007; BS 6231
10	Fuses	BS 88; IS EN 60269
11	Earthing and Protective Conductors	I.S. 10101:2020
12	Surge Protection for Exterior Lighting Installations	I.S. 10101:2020 and ILP GN13 guidance where applicable
13	Safety Legislation	Safety, Health and Welfare at Work Act 2005; Construction Regulations 2013

4.0 Floodlighting Key Performance Requirements

All key performance requirements must be achieved. Failure to meet or exceed the floodlight key performance requirements may result in a non-compliant installation.

Item	Requirement
Maintained average horizontal illuminance	Approximately 200 lux nominal design level, or as per approved photometric design
Uniformity	To the approved lighting design
Luminaire type	Veelite Sportslite 6 400 W LED, 5000 K, asymmetric wide beam Optic A, or approved equivalent
Number of luminaires	8 No. total
Number of columns	4 No.
Mounting height	10 m
Fittings per column	2 No.
Colour temperature	5000 K
Ingress protection	Minimum IP66
Impact protection	Minimum IK08
Spill light	To match or improve upon the approved lighting model
Upward light	As per approved lighting model and luminaire data

Lighting calculations shall be based on the approved photometric design. Maintained average illuminance shall be achieved using the approved maintenance factor and luminaire data. Spill calculations, where required, shall demonstrate compliance with the approved lighting model.

Any proposed equivalent luminaire shall include full photometric files, technical data sheets, lumen depreciation data, luminaire maintenance information, glare and spill diagrams and revised calculations demonstrating equality or superiority to the reference fitting. Optical distribution, light spill and aiming shall match the planning-approved lighting model. The Engineer's decision on equivalence shall be final.

The Contractor shall not alter column positions, mounting heights, luminaire quantities, aiming angles, optical distribution, LED engine, colour temperature, control gear or luminaire type without written approval from the Engineer.

5.0 Scope of Works

The Contractor shall include for the complete MUGA floodlighting installation, including but not limited to:

1. Site survey, setting out and verification of existing services.
2. Coordination of cable routes, ducts, foundations and pitch lighting control cabinet location.
3. Supply and installation of 4 No. 10 m floodlighting columns.
4. Supply and installation of 8 No. LED floodlights.
5. Supply and installation of all luminaire brackets, fixings, aiming hardware and internal column wiring.
6. Supply and installation of column-base electrical equipment, isolators and protective devices as required.
7. Supply and installation of the MUGA pitch lighting control cabinet.
8. Supply and installation of the submain cabling from the existing school plant room / MDB-01 to the MUGA pitch lighting control cabinet.
9. Supply and installation of final circuit cabling from the MUGA pitch lighting control cabinet to Columns 1 to 4.
10. Supply and installation of new underground ducts, draw ropes, warning tape and cable markers where required.
11. Verification and use of the existing underground duct route between the plant room and MUGA pitch lighting control cabinet.
12. Supply and installation of earthing and bonding.
13. Surge protection as required by I.S. 10101 and equipment manufacturer's requirements.
14. Testing and certification of the electrical installation.
15. Floodlight aiming, commissioning and night-time verification.
16. As-built drawings, test certificates, O&M manuals and handover documentation.

6.0 Floodlight Columns and Foundations

6.1 General

Columns shall be 10 m flanged-base type hot-dip galvanised steel to BS EN ISO 1461 and designed to the EN 40 Series, suitable for two LED floodlights per column. Each column shall include flange plate, anchor bolts, earthing stud and suitable provision for local isolation and wiring termination.

Masts shall be fabricated from steel manufactured to BS EN 10025, graded as required and hot dip galvanised to BS EN ISO 1461. The Contractor shall submit column calculations and manufacturer's certification for review prior to installation. Calculations shall take into

account the weakening effect of any doorways and the complete bracket and luminaire assembly.

The column and bracket assembly shall be designed to maintain luminaire aiming alignment under normal operating conditions and shall be suitable for the wind loading and exposure conditions at the site. Brackets shall allow means of adjustment and shall be hot-dip galvanised to BS EN ISO 1461.

6.2 Foundations

Mast foundations shall be constructed at the positions shown on the drawings to the details and instructions provided by the mast manufacturer and shall be approved by the Engineer prior to installation.

Anchor bolts shall be carefully set in place using the anchor plates and templates supplied by the mast manufacturer. The threads of the anchor bolts shall be protected during construction to prevent fouling by wet concrete or other substance.

Each mast foundation block shall have a cable duct running through it, from the trench system through the mast base and into the lighting pole enclosure. The Contractor shall confirm that foundation locations are clear of underground services before excavation. CAT scanning, GPR review and trial holes shall be carried out as required.

6.3 Protection of Steelwork Against Corrosion

Protection of surfaces shall be hot dipped galvanised to BS EN ISO 1461 for both internal and external faces. Damaged galvanising shall be repaired in accordance with manufacturer's recommendations and to the approval of the Engineer.

7.0 Floodlighting Luminaires

Luminaires shall be Veelite Sportslite 6 400 W LED, 5000 K, asymmetric wide beam Optic A, or equivalent approved. Each fitting shall achieve a minimum of IP66 and IK08 and carry CE certification where applicable. The reference luminaire has a stated output of approximately 57,384 lumens.

Luminaire beam configuration, positioning and orientation shall be in accordance with the approved design. Each column shall carry two fittings wired as a single-phase final circuit from the MUGA pitch lighting control cabinet. Column circuits shall be distributed across phases at the pitch lighting control cabinet where practicable.

The reference luminaire has been used as the basis of the approved lighting design, cable sizing, connected load assessment, aiming schedule and spill assessment. Any alternative fitting shall be treated as a design change and shall require a complete resubmission of photometric calculations, spill calculations, electrical loading, driver inrush data, surge protection requirements and compatibility with the nominated controls.

All exposed components including brackets and fixings shall be constructed of corrosion resistant material. All wiring shall be enclosed within the bracket, pole or electrical components enclosure.

8.0 Column Base Equipment and Pitch Lighting Control Cabinet

8.1 Column-Base Equipment

Each column base shall include local isolation, fusing/protection and termination equipment as required. All components shall be rated for LED inrush and outdoor conditions. Equipment shall be indelibly labelled and suitably glanded.

Outdoor enclosures attached to lighting poles shall be suitable for external use and shall provide a minimum IP55 rating for all electrical switching and fusing within the enclosure.

8.2 Pitch Lighting Control Cabinet

A MUGA pitch lighting control cabinet shall be provided adjacent to the MUGA as shown on the drawings. The cabinet shall house the required incoming isolator, protective devices, contactors, controls, terminals, earthing bar, surge protection and associated equipment for the MUGA floodlighting installation.

Standalone enclosures shall be manufactured from 3 mm steel hot dip galvanised to BS EN ISO 1461 after manufacture, or from GRP where approved. The door shall be set within a frame and hinged with stainless steel hinges. An electrical hazard warning label shall be fitted to the front face of the door. The door shall seal with gasket to give protection to IP54 minimum as in BS EN 60529. Ventilation shall be provided where required without compromising the enclosure rating. Provision for earthing shall be provided on both the cabinet body and door.

The pitch lighting control cabinet shall include the following as required:

1. Main isolating switch as per drawings.
2. AC4 or LED-rated contactors as required.
3. Protective devices suitable for LED driver inrush.
4. Timer / key switch / manual control arrangement as agreed with the Client.
5. Earthing and bonding.
6. Surge protection device.
7. Clearly labelled terminals and circuits.
8. Suitable gland plates and cable management.

9.0 Switchgear, Fuses and Controls

Circuit breakers shall comply with IS EN 60947-2 Low Voltage Switchgear and Control Gear. Protective devices shall be suitable for LED driver inrush and shall be selected to achieve discrimination, earth fault loop impedance, volt drop and disconnection time requirements.

The submain from the existing school plant room / MDB-01 to the MUGA pitch lighting control cabinet shall be protected by a suitably rated MCCB, MCB or gG fuse arrangement coordinated with the existing electrical installation. All switchgear shall comply with IS EN 60947-1/2/3 as applicable.

Column circuits shall be protected by suitably rated single phase protective devices, typically 6 A or 10 A MCBs/RCBOs suitable for LED driver inrush, unless otherwise agreed with the Engineer and Contractor following final equipment selection.

Controls shall provide safe switching of the complete MUGA floodlighting installation. Controls shall include manual isolation and switching facilities and shall be arranged so that the installation can be safely operated and maintained. Where automatic controls, remote switching, dimming, scene control or time control are provided, these shall be agreed with the Client and Engineer prior to installation. All controls shall be clearly labelled.

10.0 Existing Supply and Plant Room Connection

The MUGA floodlighting installation shall be connected from the existing school plant room / MDB-01 as shown on the drawings. The Contractor shall confirm the final point of connection, protective device, available spare capacity, isolation requirements, fault level and earthing arrangement prior to installation.

The final connection arrangement shall be coordinated with the school, electrical contractor and Engineer. Any shutdown requirements, access requirements or temporary works required to complete the connection shall be agreed in advance with the Client.

The connected lighting load is approximately 3.2 kW. Cable sizing has allowed for a design load of approximately 3.5 kVA. Final protective device selection, disconnection times, volt drop and earth fault loop impedance shall be verified prior to energisation.

11.0 Underground Cables and Ducts

11.1 General

Cables shall be Cu XLPE/SWA 600/1000 V to BS 5467 or approved equivalent. Cable routes shown on the drawings are diagrammatic. The Contractor shall set out on site and verify all dimensions, route lengths, existing services, duct locations and installation constraints prior to installation.

No underground joints are permitted without the Engineer's written approval. All underground cables shall be installed with suitable glands, shrouds, cleats, warning tape, marker tape and cable route markers as required.

11.2 Cable Schedule

Circuit	Route	Length	Cable	Duct
1.0	Plant room / MDB-01 to MUGA pitch lighting control cabinet	Approx. 150 m	5 core 10 mm ² Cu XLPE/SWA/PVC	Existing underground duct route
1.1	MUGA pitch lighting control cabinet to Column 1	Approx. 42 m	3 core 6 mm ² Cu XLPE/SWA/PVC	New 100 mm red ESB/power duct
1.2	MUGA pitch lighting control cabinet to Column 2	Approx. 74 m	3 core 6 mm ² Cu XLPE/SWA/PVC	New 100 mm red ESB/power duct
1.3	MUGA pitch lighting control cabinet to Column 3	Approx. 18 m	3 core 6 mm ² Cu XLPE/SWA/PVC	New 100 mm red ESB/power duct

1.4	MUGA pitch lighting control cabinet to Column 4	Approx. 46 m	3 core 6 mm ² Cu XLPE/SWA/PVC	New 100 mm red ESB/power duct
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The Contractor shall confirm existing duct size, condition, route continuity and draw-in facilities prior to installation of Cable Type A. Any blockages, damage or requirement for new ducting shall be reported to the Engineer prior to works.

New ducting shall be installed at suitable depth with red electrical warning tape above. Ducts shall be smooth bore, heavy duty, red ESB/power duct or equivalent, with draw rope and suitable draw pits where required. Duct entries to columns and the pitch lighting control cabinet shall be sealed after cabling.

12.0 Earthing, Bonding and Surge Protection

Earthing and bonding shall comply with I.S. 10101:2020. The Contractor shall confirm the site earthing arrangement prior to installation and shall ensure that all exposed conductive parts, column bases, cabinet bodies, doors and associated metallic equipment are bonded as required.

Protective conductor sizing shall be verified by the Contractor based on the final protective devices, fault levels and disconnection times. The use of cable armour as protective conductor shall be verified and supplemented with core CPC where required by the design.

Surge protection shall be provided where required by I.S. 10101 and equipment manufacturer's requirements. External LED floodlighting circuits shall include appropriate surge protection at the pitch lighting control cabinet and/or column equipment where required.

13.0 Testing, Commissioning and Handover

The complete electrical installation shall be inspected, tested and certified in accordance with I.S. 10101:2020 prior to energisation. Certification shall be provided by a Safe Electric / RECI-registered electrical contractor.

Testing shall include continuity of protective conductors, insulation resistance, polarity, earth fault loop impedance, RCD/RCBO operation where applicable, functional testing of controls, verification of protective device ratings and confirmation of labelling.

Floodlights shall be aimed and commissioned in accordance with the approved photometric design. Final aiming shall be carried out at night or under suitable low ambient light conditions. No adjustment of aiming angles or column positions shall be made without approval where this would alter the approved lighting design.

The Contractor shall provide as-built drawings, cable test certificates, product data sheets, commissioning records, aiming records, O&M manuals and warranties prior to handover.

14.0 Health and Safety

The Contractor shall comply with the Safety, Health and Welfare at Work Act 2005, Construction Regulations 2013 and all applicable site rules. The Contractor shall be

responsible for temporary works, traffic/pedestrian management within the school site, safe excavation, lifting operations, working at height and electrical isolation procedures.

Excavations shall be protected, signed and made safe at all times. Work adjacent to the school buildings, MUGA, footpaths and pedestrian routes shall be coordinated with the Client to minimise risk to pupils, staff and the public.