



HAYES HIGGINS PARTNERSHIP
CHARTERED ENGINEERS • PROJECT MANAGERS

2-4 Dublin Street Balbriggan Refurbishment



Mechanical and Electrical Engineering

Stage 2A Report

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1.0 INTRODUCTION

An inspection of No. 2-4 Dublin St., Balbriggan was carried out on April 21st, 2022. The weather was fine and dry.

The 2 storey building faces west onto the Dublin Road and dates from the 1860's and is a protected structure. A 1960's single storey lean-to retail building is attached to the southern gable.

2.0 SCOPE

This report has been prepared by Hayes Higgins Partnership (2HP) as part of the Stage 2 Submission for the Fingal County Council for the 2-4 Dublin Street, Balbriggan Co Dublin Refurbishment Project.

3.0 Proposed Mechanical Services

3.1 Drainage

An above ground, gravity fed, soils and wastes system will be installed to EN12056-2. Toilets should be arranged in close proximity to each other where possible to reduce the number of drop locations. Generally, waste and vent pipework will be hidden in service risers and voids. Intumescent fire collars will be incorporated on all soil stacks where passing between fire barriers horizontally or vertically. Height adjustable sinks will be provided in some spaces with flexible wastes to accommodate movement.

3.2 Water Distribution

The new mains supply will feed drinking water points throughout the building. External drinking water taps will be provided where required. These will have isolating valves located in an easy to access location internally to ensure the taps can be switched off outside normal hours as required. In addition, the mains water supply will feed a new cold water storage tank, located at high level. All mains and cold water pipework will be insulated (and labelled) with aluminum foil clad rigid mineral wool insulation to prevent freezing in external or un-insulated building areas and to prevent condensation in internal ceiling voids and similar areas. Valves will have proprietary jackets with Velcro fixings. Drinking taps which do not have any metal in contact with mains water will be considered on the Mains

Water Distribution System. They will be selected with care. In particular having regard to their potential to leach metals after periods of stagnation.

3.2.1 Cold Water Storage

The cold water storage will be an insulated water tank to format 30 specification. This supply will feed all sinks and wash hand basins in the building. The tanks will be sectional GRP type to Format 30. The tank will be complete with light weight cover, overflow and warning pipes, drain down connection and drip trays. The tanks will be fully insulated to prevent freezing. Cold water will be pressure fed to all appliances. The water will be stored under 20°C to ensure legionella prevention. The tank area will be ventilated with a temperature controlled motorized damper ensuring legionella prevention. Location of cold water storage tank is within the plant room on GF

3.2.2 Hot Water

The hot water generator is incorporated into the heat pump system.

The hot water flow manifolds will be provided in the plantroom areas. The manifold and the pipework feeding the manifold will be copper. Pipe-work from the manifold to each outlet will be insulated multilayer pipe with no joints and allowing easy replacement if required. In single storey units final pipe-work to outlets will run in the attic above (or floor of unit above) dropping at outlets. Where composite pipework exits concealment, In two-storey or higher units final pipe-work to water services will run at high level drop in stud walls where allowed , where final water services are located on block walls there is to be a chase installed by the contractor and pipework located in chase , cost of chase is by contractor. In single storey units final pipe-work to outlets will run in the attic above (or floor of unit above) all immediately transition back to copper.

All main pipework runs will be fully insulated with aluminium foil clad insulation. All pipework will be concealed where allowed, where pipework has to be buried this will run in un-jointed cross-linked polyethylene with oxygen diffusion barrier.

HEATING SYSTEM

Air to Water Heat Pump

Heat pumps shall be provided by the mechanical contractor with wiring carried out by the electrical contractor. The heating pump system comprising of an outdoor unit and an indoor heat pump which incorporates a hot water store. The two units will be connected by connecting pipework. The full installation is to be supplied, installed, tested and commissioned by a single point heat pump system specialist under the mechanical contractor's contract.

Underfloor heating is proposed throughout all of Ground Floor with the upper floor to comprises of radiators within the studio rooms, Timed scheduled zones, controlled through the heating controls system will be provided via the motorized valves and thermostats described above.

3.3 Ventilation, Air Conditioning

MHRV

A mechanical ventilation heat recovery system is to be installed to cater for the studio within the existing building and also for the new building, The supply and extract ventilation unit shall be installed in accordance with the particular specification. Supply air to the room shall be pre-heated by the extract air via the integrated composite plastic counter flow heat recovery cell

Space cooling will be provided within the gallery and also within the server room via wall-mounted cassettes and outdoor condensing units located externally on the roof space.

The Room Air-Conditioning Unit for split-type air-conditioning systems shall be of the heat pump type, with duties as specified and suitable for mounting horizontally below the ceiling void. The unit shall comprise of a casing; DX cooling coil; inlet filter; fan; internal condensate tray; linear type diffusers and remote controllers.

3.3.2 Extracts

Extract systems shall be provided to all toilet & kitchen areas

4.0 Proposed Electrical Services

The electrical services installation will be designed in compliance with, but not limited to, prevailing Irish and European standards and regulations and Local Authority By-Laws.

4.1 Electrical Site Services

4.1.1 Ducted External Power Services and Supplies

The Maximum Import Capacity (MIC) will be adjusted upwards to reflect the increase in requirement.

The facility will be served by a supply from ESB via underground cable in suitable ducts.

4.1.2 External Lighting

Soffit lighting to the colonnade and uplighters or wall mounted lights to the perimeter of the courtyard. Luminaries outside exit doors will be complete with 3-hour emergency pack. Separate 24-hour, 7-day timers will be specified for the building –mounted and security, with separate ‘Hand-Off-Auto’ switches in the administration office. Photocell and time-clock control will also be provided.

4.2 Power

4.2.1 Power Distribution Services

The new CNU will be provided with a 400V, three-phase supply by ESB Networks.

Small power and general services within the facility will be installed throughout. Socket outlets shall be 13 Amp type and shall be wired in 20 Amp radial circuits and carried in galvanised steel conduit and cable trunking. uPVC dado trunking is used for arrays of sockets and data points. Sockets for computers stations are unswitched type. Metal clad finishes are used for surface mounted fittings and white plastic for recessed units.

4.2.2 Electricity Centre

The main meter is located externally. The main low voltage switchboard in the new build. The Main Board will be designed to provide for 30% expansion capacity.

4.2.3 Earthing

The objective of the system is to provide an effective system to minimise danger to life and equipment arising from:

- Faults between line conductors and non-current carrying metal work
- Atmosphere discharges
- Accumulation of static charges
- The design parameters are defined within the ETCI National rules and ESB Regulations for Electrical Installations.

This system will be detailed and included as part of the building services electrical specification at Stage 2b.

4.2.4 Main Distribution

From the main Distribution Board dedicated sub mains cables will be distributed throughout the building. These SWA cables shall be routed on a system of galvanised steel cable ladders and trays as appropriate.

A system of galvanised steel cable ladder, tray and trunking will be designed to distribute sub-mains, general & emergency lighting, power, fire alarm, access control, security and mechanical services control wiring throughout the building. Separate basket and trunking will also be provided for data. Separate systems shall be segregated in accordance with the NSAI IS 10101:2020.

4.2.5 Power Distribution Services

Socket outlets shall be 13 Amp type and shall be wired in 20 Amp maximum radial circuits and carried in galvanised steel conduit and cable trunking. Quantities and locations of outlets will be detailed at Stage 2b

All mechanical plant shall be wired through the heating plant room control panel.

Fixed items of equipment will be supplied via fused, switched cable outlets and isolators, suitably rated.

4.2.6 Earthing

The objective of the system is to provide an effective system to minimise danger to life and equipment arising from:

- Faults between line conductors and non-current carrying metal work

- Atmosphere discharges
- Accumulation of static charges
- The design parameters are defined within the IS10101:2020 and ESB Regulations for Electrical Installations.

This system will be detailed and included in the building services specification at a later stage.

4.3 Lighting

4.3.1 Internal Lighting System

The internal lighting system will be designed to provide the levels of illumination appropriate to each type of activity within the building as recommended in the room data sheets and the EN12464.

All lighting will be surface mounted LED lighting where plasterboard ceilings are provided; the LED lighting may be surface or recessed where suspended grid ceilings are provided. The LED provision will reduce the primary power requirements and in turn the amount of renewable energy required.

The internal lighting system will be designed to provide the levels of illumination appropriate to each type of activity within the facility as recommended in the current edition of the chartered institute of building services engineers interior lighting guide.

4.3.2 Lighting Control

An automatic lighting control system will be specified for areas where such control will not interfere with the tasks. Combined daylight/absence sensors shall be provided that shall automatically dim lighting to off when there is sufficient daylight in the room, dim lights to take advantage of daylight harvesting and also dim to off if the room is vacant for more than three minutes.

A manual push switch will be provided in the offices and other 'owned' areas to allow the lighting to be switched from off to auto mode. The automatic sensors shall have specified to have adjustable lux and time elements.

Circulation lighting will be designed to be controlled by manual switching with absence detection turning lights off if circulation areas are vacant for more than 5 minutes. In circulation areas where there is adequate daylight daylight-harvesting is incorporated in the same manner as offices. Dedicated key-operated isolating switches will also be provided at the main admin office.

Lighting control in toilet areas will be controlled via manual switch on/off with absence detection only.

All internal lighting systems will be detailed fully in drawings at a later stage.

4.3.2 Emergency Lighting System

A system of escape route emergency lighting will be designed within the building in compliance with IS 3217 and will utilise self-contained, non-maintained, inverter units installed in general luminaires and exit signs. Also, emergency lighting will be provided in all habitable rooms in compliance with IS 3217 and will also utilise separate non-maintained LED emergency lights.

The layout and details of the emergency lighting design will be provided in drawings at Stage 2b.

In the event of power failure each emergency fitting or exit sign will illuminate for a period of 3 hours.

4.4 Communications

4.4.1 IT Installation

A new central Data Communication Centre (DCC) or Comms Hub shall be provided where all cabling shall be terminated. 1No. 2000mm high x 800mm wide x 600mm deep cabinet shall be provided for housing patch panels and active equipment. Data cabling shall be specified as being terminated in RJ45 outlets at both ends.

Separate broadband lines from the service provider's main incoming termination frame to the DCC frame shall be specified for Internet (WAN) connection

The DCC room will be provided with appropriate cooling via a split unit to maintain suitable operating conditions in the space.

HHP will specify that all data cabling be installed in a separate ELV basket and/or trunking system and room points shall generally be installed on the dado trunking.

A networked Local Area Network (LAN) cabling system shall be installed for all areas. The system will be specified as a Category 6a.

4.4.2 Telephony

A separate cabling system shall be provided for a PABX system, which shall not be provided under the electrical services contract. All cabling shall be category 6a and shall terminate in RJ45 outlets. All telephone cabling shall be terminated in a wall mounted 'Krone' frame. From this frame, CAT 6a cabling shall link to either the PABX, or directly to the service provider's main incoming termination frame for direct external lines.

4.5 Security & Protection

4.5.1 Access Control System

Access will be controlled to all non-public areas through the use of access cards and/or keypad controls with a full access group management system to allow levels of access to be easily assigned and controlled.

Entry and exit to the building will also be controlled as per the site requirements.

4.5.2 Intruder Alarm System

A Security Alarm System will be installed throughout the building. Dual tech passive infrared detection will be provided to the ground floor perimeter rooms and to ground and first floor corridors facing external points of entry. New high level external lighting will be interlinked to the security alarm system and will be activated during darkness if there is a security alarm activation.

4.5.2 CCTV System

A fully digital closed circuit television system shall be provided to ISEN50132 and IS199. The system shall comprise of a digital recording and monitoring facility. The CCTV system installation shall not be covert but rather be visible, if requested by client.

We would recommend an IP CCTV system which will operate over a network providing more flexibility for expansion, cheaper expansion, much higher quality images/recording and cloud recording services. This would also allow the client or a security firm to review footage on a remote computer or smart phone. Cameras will be carefully chosen to suit local conditions. This installation will complement the new external lighting installation.

A 21-inch high-resolution colour display monitor shall be provided.

The system shall be fully compatible with the intruder alarm system and access control system and shall form an integrated security system.

The number and location of CCTV cameras to be installed is to be evaluated at a later stage in line with the particular site security requirements.

4.5.3 Fire Detection and Alarm System

A fully addressable fire alarm system consisting of a fire alarm panel, automatic detectors, manual call points and alarm sounders will be designed in throughout the building in accordance with the Irish Standard IS 3218: 2013.

All wiring shall be carried out in 2 core MICC cable in HGSW conduit/trunking. The sensors and manual call points shall be in the same loop circuit.

The entire system will be controlled from the fire alarm panel located in the entrance area.

4.5.4 Lightning Protection

Lightning protection will be designed in accordance with EN 62305 consisting of roof top air terminal network, down conductors and earth pits. Use shall be made of metal elements of the roof and structural steel. All extraneous metal parts on or above the roof level shall be bonded to the lightning protection system. Internally all metal parts including cable tray and trunking, heating and ventilation pipework and ductwork, radiators, sinks, etc. shall be bonded to the building's main earth terminal. All metal incoming services shall also be bonded to the main earthing terminal.

This document takes into account the particular instructions and requirements of our Client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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