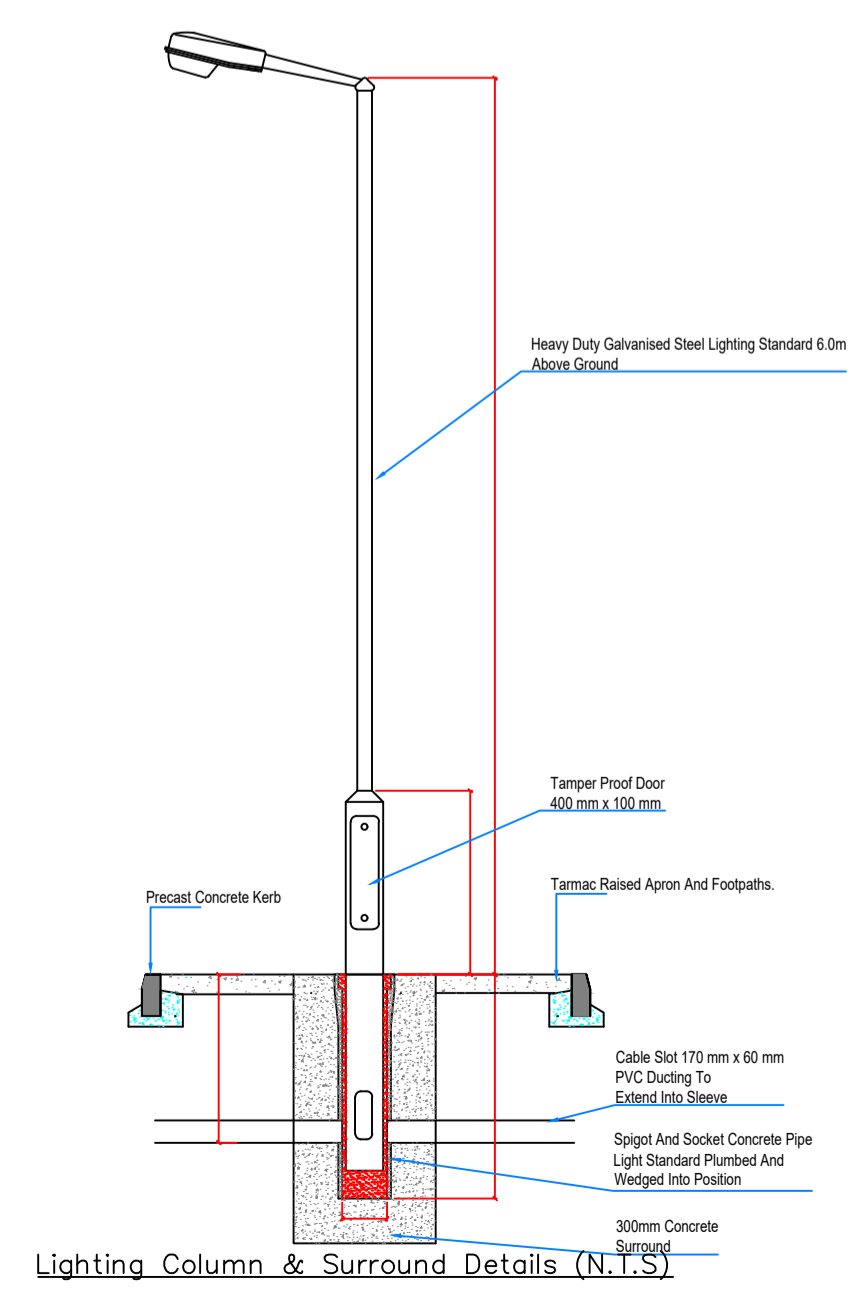



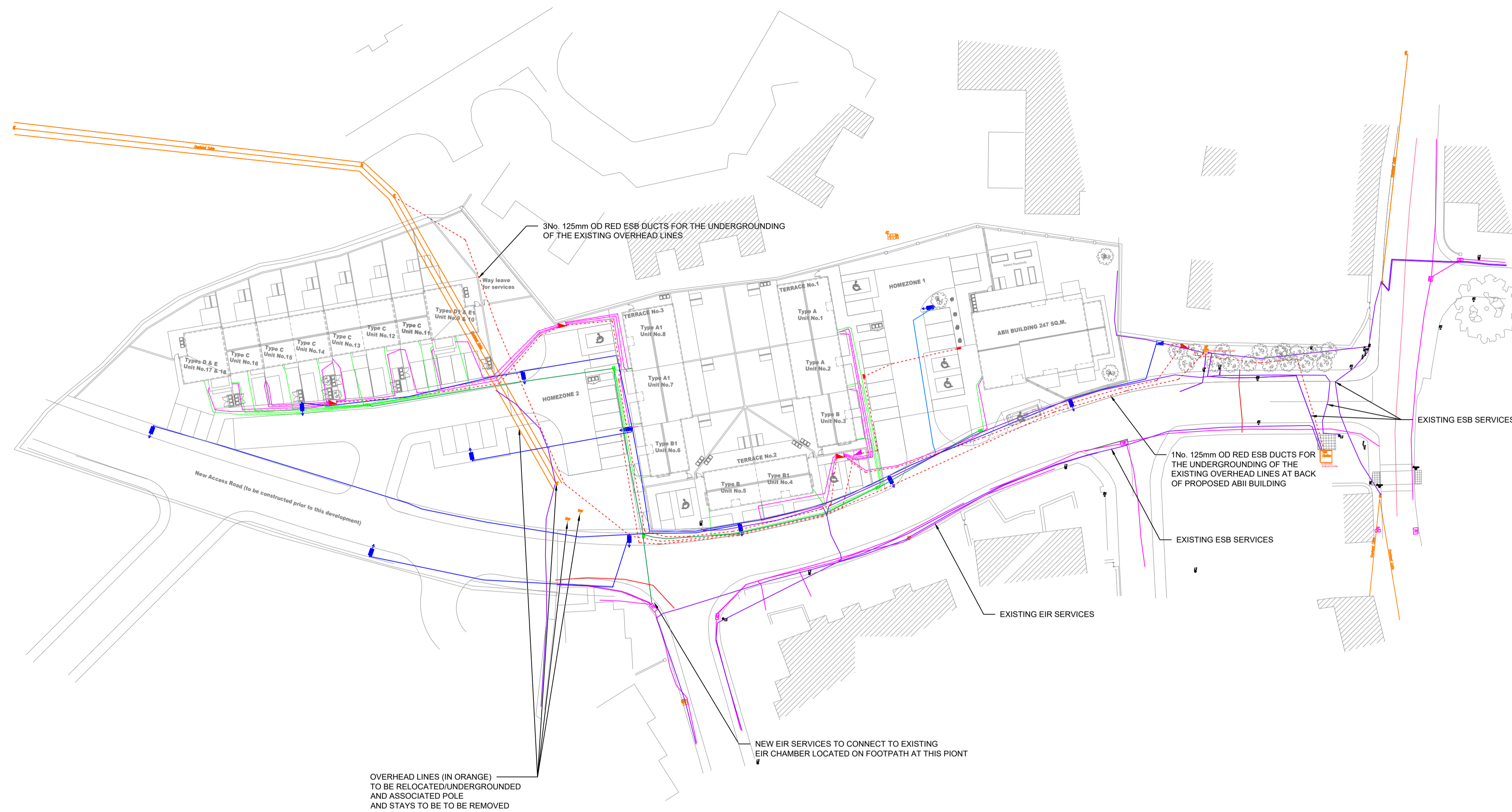
- LEGEND**
- 50mm OD RED PVC FROM MINI-PILLAR TO MICRO-PILLAR
 - 100mm OD RED PVC STREET LIGHTING DUCT
 - - ESB MINI-PILLAR C/W VC2 VAULT
 - - PUBLIC LIGHTING MICRO-PILLAR
 - - PHILIPS LUMISTREET GEN2 MINI BGP292_DW50-8000m, 40LED 47W, 3000K, C/W PHOTOCELL, MOUNTED ON 8M GALVANISED STEEL HEXAGONAL COLUMNS

Calculation Area
1540 points at z=0, sp 1.5m by 1.5m

HORIZONTAL LUX	
Average	8.0
Maximum	17.8
Minimum	1.9
Min/Avg(Uo)	0.236
Min/Max	0.107
Cost Var	0.476
UnifGrad	2.08



P01	09/11/22	ISSUED FOR PART VIII PLANNING	JS	FF
REV	DATE	DESCRIPTION	BY	APP
PROJECT: MACROOM HOUSING				
TITLE: SITE LIGHTING LAYOUT				
CLIENT: TUATH HOUSING				
 MWP ENGINEERING AND ENVIRONMENTAL CONSULTANTS CORK TRALEE LONDON LIMERICK mwp.ie				
DRAWN:	J.S.	CHECKED:	F.F.	APPROVED:
PROJECT NUMBER:	20918	DATE:	08/11/22	SCALE @ A1:
STATUS DESCRIPTION:	FOR INFORMATION			STATUS:
DRAWING NUMBER:	20918 - MWP - ZZ - ZZ - DR - E - 9000			REV:
				P01



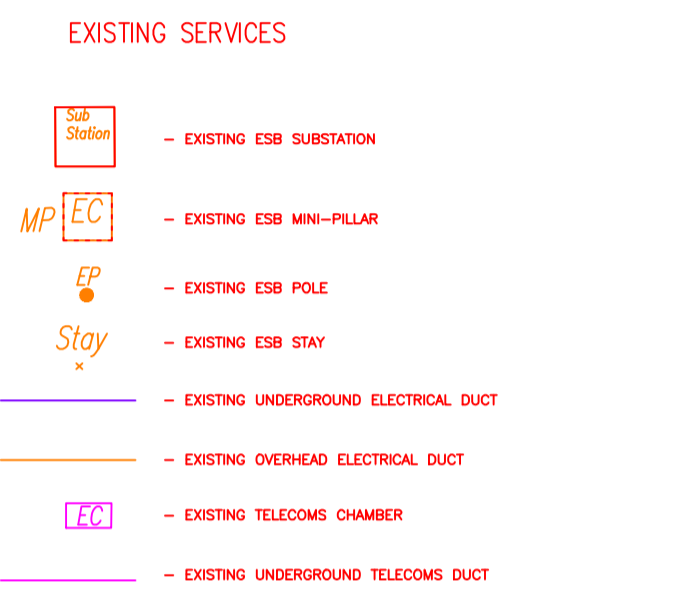
GENERAL NOTE ON SITE SERVICES:

- MAINS CABLE DUCTING:**
- ESB WILL SPECIFY THE ROUTE, SIZE AND PURPOSE OF ALL DUCTS ON THE SITE LAYOUT PLAN.
 - THE CONTRACTOR IS REQUIRED TO SUPPLY AND INSTALL ONLY ESB APPROVED 125mm RED ELECTRIC CABLE DUCT. NO OTHER DUCT IS ACCEPTABLE. ENSURE DUCT JOINTS ARE PROPERLY MADE AND SECURE AND DUCTS ARE INSTALLED AS STRAIGHT AND LEVEL AS PRACTICABLE WITH ONLY GRADUAL CHANGES IN DIRECTION AND LEVEL. WHERE BENDS ARE NECESSARY, PROVIDE EACH DUCT WITH A STRONG CONTINUOUS 10mm POLYPROPYLENE DRAW ROPE FREE OF KNOTS AND SECURELY ANCHORED AT EACH END.
 - CLEAN EACH DUCT AND SEAL THE ENDS USING END CAPS OR FOAM AND PLASTIC BAG SO AS TO AVOID INGRESS OF GRIT, STONES etc.
 - ENSURE DUCTS ARE INSTALLED AS PER THE REQUIRED STANDARDS.
 - INSTALL DUCTS SO AS TO ENSURE THE REQUIRED MINIMUM CLEARANCE OF 300mm FROM ALL OTHER SERVICES IS MAINTAINED.
 - INSTALL ESB CABLE WARNING 300mm BELOW GROUND LEVEL ALONG THE FULL LENGTH OF THE

- NOTES**
- BEFORE CALLING ON ESB TO INSTALL CABLES, PROVE THE INTEGRITY OF DUCTS WITH AN ESB MANDREL AND REPAIR ANY FAULTS. APPROVED MANDREL IS AVAILABLE FROM LOCAL ESB OFFICE.
 - APPROVED DUCT IS RECOGNISABLE BY ITS DISTINCTIVE RED COLOUR AND WARNING MARKED ALONG THE SIDES OF THE DUCT. USE ESB APPROVED BENDS ONLY.
 - CABLE WARNING TAPE IS AVAILABLE FREE FROM LOCAL ESB OFFICE.

SAFETY WARNING
 TRIAL HOLES (AT CONTRACTORS EXPENSE) MAY BE REQUESTED TO CONFIRM DUCTING AND TAPE CONFORM TO ESB REQUIREMENTS. FAILURE TO CONFORM WILL RESULT IN RE-EXCAVATION OF ALL TRENCHES TO INSTALL THEM CORRECTLY.
 TRENCH SURFACES TO BE RETURNED TO PREVIOUS, OR NEWLY SPECIFIED AS PER ARCHITECTS DETAILS.

CARE SHOULD BE TAKEN TO ENSURE ALL SERVICES ARE DECOMMISSIONED PRIOR TO REMOVAL.
 THE SERVICES SHOWN ON THE DRAWING FOR INDICATIONAL PURPOSES ONLY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LIASE WITH THE RELEVANT SERVICE PROVIDERS (i.e. ESB, EIRCOM (TELECOMS) ECT. ESTABLISH THE EXACT LOCATION OF ALL UNDERGROUND SERVICES



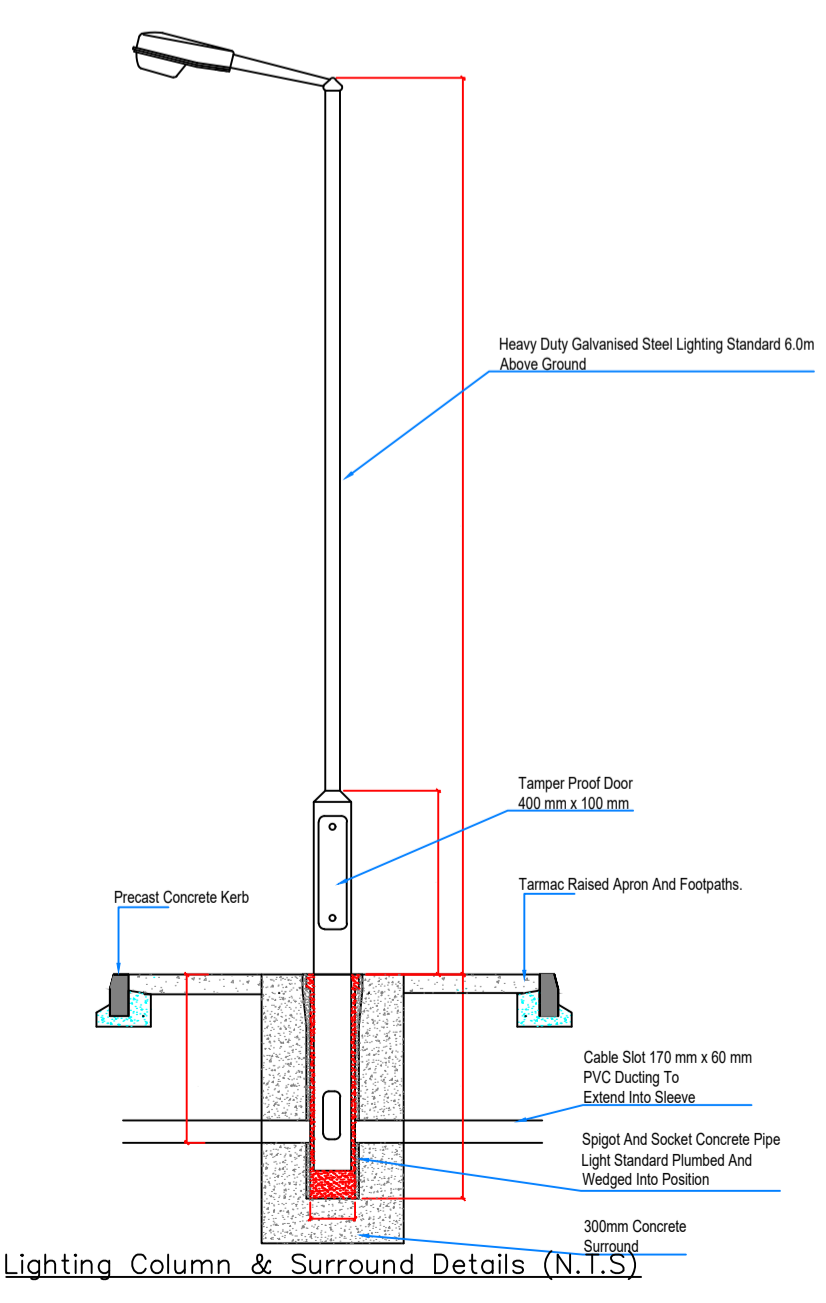
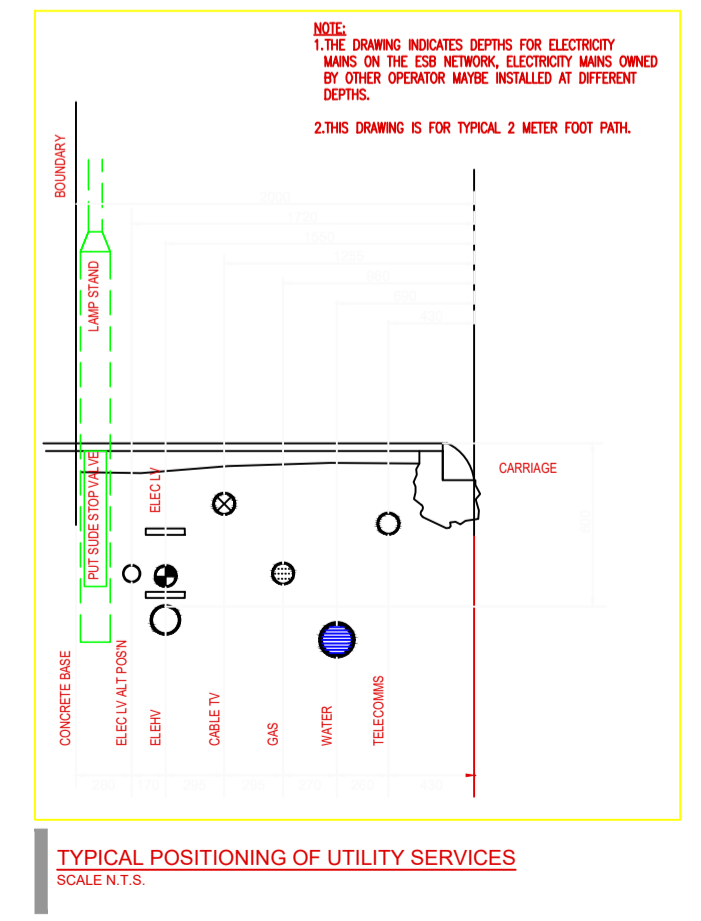
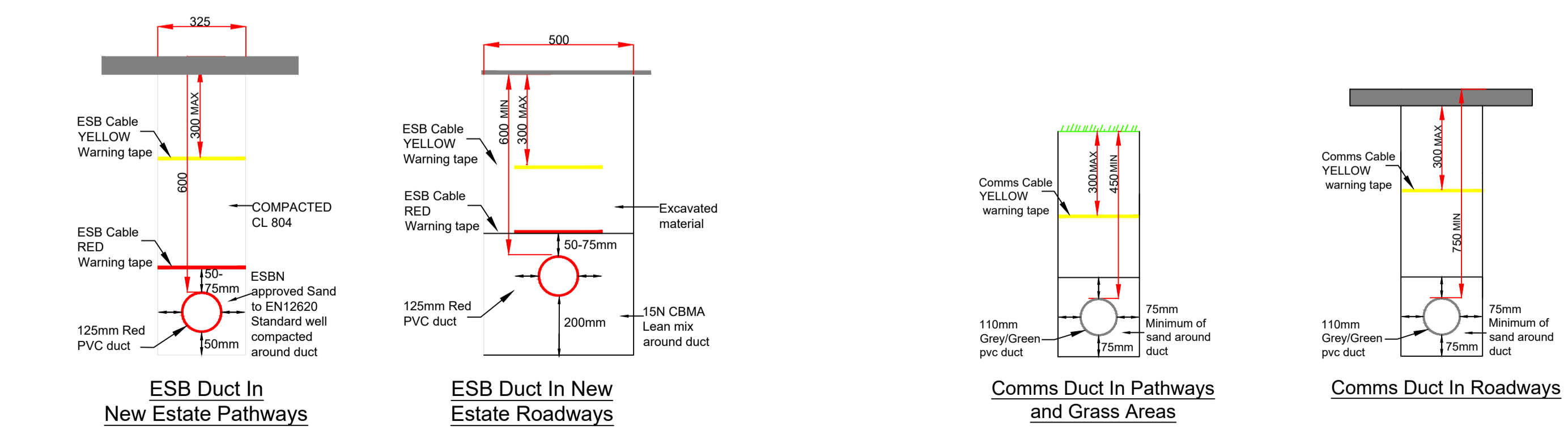
THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE NATIONAL CODE OF PRACTICE FOR CONSUMER INTERFACE ISSUED BY THE ESB

NOTE: ALL MINIPILLARS MUST HAVE A VC2 VAULT INSTALLED IMMEDIATELY TO THE FRONT

NOTE: SUPPLY & INSTALL A STRONG CONTINUOUS 10mm POLYPROPYLENE DRAW ROPE FREE OF KNOTS AND SECURELY ANCHORED AT EACH END OF ALL DUCTS

NOTE: CONTRACTOR TO INSTALL ACCESS CHAMBER AT EVERY CHANGE OF DIRECTION AND AT 50 METER INTERVALS FOR TELECOM SERVICES

ESB Duct In Pathways and Grass Areas in New Estate Roads and Paths : HOUSING SCHEMES:GUIDEBOOK FOR ESB NETWORKS STANDARDS FOR ELECTRICAL SERVICES Rev.5 2014



P03 16/11/22	ISSUED FOR PART VIII PLANNING	JS	FF
P02 22/04/22	ISSUED FOR INFORMATION	JS	FF
P01 14/01/22	ISSUED FOR COSTING	JS	FF
REV	DATE	DESCRIPTION	BY

PROJECT: MACROOM HOUSING			
TITLE: ELECTRICAL SITE SERVICES			
CLIENT: TUATH HOUSING			
MWP ENGINEERING AND ENVIRONMENTAL CONSULTANTS CORK TRALEE LONDON LIMERICK mwp.ie			
DRAWN: J.S.	CHECKED: F.F.	APPROVED: D.A.	
PROJECT NUMBER: 20918	DATE: 06/01/22	SCALE @ A1: 1:500	
STATUS DESCRIPTION: FOR INFORMATION			STATUS: S2
DRAWING NUMBER: 20918 - MWP - ZZ - ZZ - DR - E - 9100			REV: P03

LiAS Design Notes

This preliminary design is produced by the Lighting Application Specialist (LiAS) team of Signify Ireland based on information supplied by the Customer for the purpose of identifying suitable products and costing the proposal. This design cannot be used for Construction, as this design does not purport to eliminate health and safety risks as a CDM Regulation risk assessment has not been undertaken.

Depending on the level of information received, a number of assumptions may have been applied in order to create an indicative lighting proposal and costing model, according to lighting industry guidelines and incorporating industry best practice methods. These assumptions are documented below and will require confirmation by the Principle Designer (which is not Signify Ireland) during the detailed design phase.

Project Specific Assumptions

- Where 'Lighting Classes' have not been provided/specified, the calculations have been produced using lighting class P3.
- Where column heights have not been provided/specified, these have been assumed to be 6m.
- It has been assumed that luminaires will be mounted post-top.

Generic Assumptions (unless specifically informed differently)

- Preliminary Design proposals produced by the Signify LiAS Team are not to be used for installation purposes. It is the responsibility of the Principle Designer and/or Principle Contractor to ensure all Installation and Maintenance can be done in a safe manner, carried out by competent persons, based on their agreed Risk Assessments and Method Statements.
- The Luminaire Maintenance Factors have been based on 6-year cleaning intervals within an E3/E4 Environmental Zone and it is assumed that lamp/luminaire failures will be replaced on a 'spot replacement'.
- Energy consumptions have been based on the luminaire/s having Constant Light Output (CLO) enabled and the quoted wattage/s are the average over 100,000 hours (without dimming).
- The design calculations produced by Signify do not account for the effect obstructions, such as trees, will cause.
- Signify has not been provided with utility plans showing Buried, Above Ground or Overhead utilities. Therefore, all column/luminaire locations are indicative and are subject to review/verification by the Principle Designer.
- Unless stated otherwise, Signify has not visited site. Therefore, all column/luminaire locations are indicative and are subject to an onsite verification arranged/performed by the Principle Designer.
- Signify has not produced any Private Cable Network electrical calculations or reviewed the DNO network to confirm power supplies to the proposed lighting.
- Signify has not performed any asset condition testing and therefore assumes that any existing lighting columns/wall mounted brackets are structurally capable of supporting the weight & windage of the proposed luminaire/s. This must be verified by the Principle Designer before installation works commence.
- Unless stated otherwise, Signify is not supplying the new lighting columns (including brackets etc) and therefore it is the responsibility of the Principle Designers to confirm that all proposed equipment is suitable for the intended locations (e.g. raise & lower, ground condition, foundation type, saline environment, etc).
- Unless stated otherwise, luminaires will be supplied in their standard colour.

Luminaire Schedule



LumiStreet BGP292 8KLM DW50 WW
 lamp(s): LED-HB 5.2S 730
 candela file 'LumiStreet Gen2 Mini_BGP292_DW50_8000_40LED_5.2S_CLO_L90_730.ies'
 1 lamp(s) per luminaire, 8000 initial lumens per lamp
 Maintenance Factor = 0.760, watts per luminaire = 47
 Outreach (from mounting axis to photometric center)= 400 mm
 tilt angle= 5 deg
 mounting height= 6 m
 number locations= 9, number luminaires= 9
 kw all locations= 0.4

Grid Design results

Calculation Area
 1540 points at z=0, sp 1.5m by 1.5m
 HORIZONTAL LUX

Average	8.0
Maximum	17.8
Minimum	1.9
Min/Avg(Uo)	0.236
Min/Max	0.107
Coef Var	0.476
UnifGrad	2.08



Lighting Proposal Terms and Conditions of Use

These terms apply to the use of this preliminary proposal produced by Signify UK. This "Proposal" is understood to mean this document, a CAD drawing, lighting calculations, written documents, verbal conversations or any medium used to demonstrate or communicate the proposed lighting scheme using products from Signify's brands. A "Customer" is the person or organisation for whom the Proposal is intended. The "CDM Regulations" means The Construction, Design and Management Regulations 2015, the Safety, Health & Welfare at Work Act 2005, The Construction (Design & Management) Regulations (Northern Ireland) 2015.

This Proposal is for guidance only and cannot be relied upon for purposes of installation or Health and Safety.

The supply and installation of this lighting scheme are subject to a contract being agreed between Customer and Signify.

PROPOSAL
 (NOT FOR CONSTRUCTION)

Rev	DSR no.	Comment	Date	LiAS	KAM	Project Number	Project Name
0	D-438069	INITIAL PROPOSAL	21.12.21	CBJ	SC	0400690794	20918 Macroom Housing
1	D-455657	NEW LAYOUT	22.04.22	CBJ	SC		
						Scale & Sheet Size	Drawing Name
						NTS @ A3	LiAS DESIGN NOTES & LUMINAIRE SCHEDULE
						Sheet No	
						DWG 00	

MWPs Mechanical & Electrical Part viii Report

1. Introduction

Malachy Walsh and Partners have reviewed the mechanical and electrical (M&E) services requirements for the proposed residential housing development at Massey Town, Macroom, Co. Cork. Having considered various service options for the development, the following mechanical and electrical systems are proposed which incorporate sustainable elements that will reduce annual energy costs, provide an effective building environment and which are compliant with the Nearly Zero Energy Building Compliance (NZEB). These proposals are also compliant with the Building Regulations and all relevant mechanical and electrical regulations. The guidelines contained within 'Building for Everyone – A Universal Design Approach' will also be incorporated and form part of the M&E services design.

2. Electrical Installation

The electrical installation will be provided to meet all current Irish and European standards and Building Regulations. The electrical systems will comprise of Low Voltage Distribution, Cable Containment, Earthing System, Lighting, Small Power Services, Fire Alarm and cabling to mechanical systems.

2.1 LV Distribution

A meter cabinet of standard E.S.B. size not less than 600 mm. high x 400 mm. wide 170 mm. deep shall be installed to accommodate ESB cut-out, Meter and Isolator. The Electrical Meter cabinet shall be located to the front of each house on the gossip wall in the front garden (or gable wall), and contained in an ESN standard meter cabinet, securely fitted and fixed in accordance with ESB guidelines.

The domestic main distribution board (MDB) in all houses will be located in an accessible location. The distribution board will be mounted at a height not exceeding 2.25m when measured from the floor to the top surface of the board or 1.4m when measured from the floor to the bottom of the board. There will be a minimum clearance of 1.2m in front of the board in compliance with IS10101.

The MDB shall be populated with protective devices and include 25% additional spare capacity to facilitate future work. Earthing and bonding will also be provided as per IS10101.

Supply Characteristics:

Nominal low voltage supply	230V
Nominal supply frequency	50 Hz
Three-phase alternating current	AC
Earthing	TN-C-S system

System Voltages:

Motive Power	230V AC
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Lighting	230V AC
Small Power	230V AC

2.2 Cable Containment

Cable containment for all sub-mains cabling will generally be in PVC conduit. All drops to wall mounted services will be via PVC conduit. All cabling is to comply with ET101:2008 Amendment 2.2 (This amendment requires the protective conductor to be insulated (green/yellow) and be the same cross-sectional area as the phase conductor). To satisfy the requirements of Part E – ‘Sound’ of the Building Regulations, care will be taken to avoid running services ‘back-to-back’ on internal walls and services will not be chased into any party walls between houses.

2.3 Lighting Installation

All lighting will be of LED type with a minimum warranty of 5 years. Typically, pendant type lighting will be utilised throughout with the exception of WC’s, bathrooms and attic spaces where sealed type lighting will be used. Energy efficient LED IP65 Bulkheads to be installed outside the front, back and side doors of all housing. Energy efficient Lighting Pendants to be installed over water tank in attic. All light fittings to be fitted with energy efficient c/w LED bulbs. All bathrooms shall contain IP44 light fittings including an over-sink strip light complete with shaver point. All lighting will be switched with two way switching in certain locations (i.e. at top and bottom of stairs for landing light etc.). All switches will be positioned at a height between 900mm and 1200mm above finished floor level. Cabling for the entire general lighting installation will be suitably sized and will be a minimum of 2.5sq.mm.

2.4 External Lighting

External lighting will be provided where necessary and typically will be mounted above front and rear access doors. Lights will be switched and will also be photocell controlled.

2.5 General Services Installation

Adequate numbers of sockets will be provided in all locations and will be positioned to suit the design layout. All socket outlets will be located at appropriate heights between 400mm and 1200mm from finished floor level in accordance with Part M of the Building Regulations (this only applies to convenience socket outlets and does not apply to dedicated socket outlets not readily accessible and used for appliances that are intended to be continuously connected in normal use). Any appliance supplied from a socket outlet will be controlled by an accessible double pole switch or switched fused connection unit.

Wall mounted sockets above a kitchen worktop will be spaced at not more than 1m intervals. Kitchens are to have a minimum of 6 No. twin 13A sockets, living rooms a minimum of 6 No. twin 13A sockets, utility rooms a minimum of 3 No. twin 13A sockets and bedrooms are to have a minimum of 3 No. twin 13A sockets.

All WC’s/bathrooms will be provided with mechanical extract fans in bathroom (extract fan to be operated via light switch and have integrated run-on timer with humidity stat). An over mirror strip light with integrated electric shaver socket will be provided. In all rooms containing a bath or a shower every circuit will be protected by a dedicated RCD.

An infra-red lamp c/w frost stat shall be installed over the water tank in attic.

Each dwelling shall be provided with a doorbell system.

2.6 Intruder Alarm

Intruder alarm system to be wired only allowing for future installation.

2.7 Television Installation

All television outlets will be cabled with a CT100 coaxial cable and with a Cat6a cable with all cables brought back to a single location to allow for a flexible distribution of free-to-air and digital subscription services.

2.8 Fire Detection & Alarm Installation

The fire alarm and detection system must be designed, installed, tested and commissioned in accordance with Part B. Each house will be provided with self-contained mains powered smoke and/or heat alarms each provided with an integral standby power supply. All smoke/heat detectors will be interconnected so that detection of fire by any one detector will provide an audible alarm from each detector. The fire alarm category will be a Category LD2 System in accordance with IS3218:2013 + A1:2019 and detectors will be located in all circulation areas that form part of the escape route within the dwelling (typically ground floor hallway and first floor landing), in all high-risk fire areas/rooms (kitchen, living room, utility room, attic spaces where DCV fans are located) and in all bedrooms.

2.9 ABII Building

The electrical systems within the ABII Building shall comprise of Low Voltage Distribution, Cable Containment, Earthing System, Lighting, Small Power Services, Fire Alarm and cabling to mechanical systems.

All lighting within the creche shall be LED. A complete emergency lighting installation in accordance with I.S. 3217-2013 + Amendment:2017 shall be installed and the distribution board shall be fitted with relay's incorporated for central test facility on the emergency lighting installation. External lighting will be provided on access routes to and from the creche building and typically will be mounted above front and rear access doors. Lights will be switched and will also be photocell controlled.

Adequate numbers of sockets will be provided in all locations and will be positioned to suit the design layout. All socket outlets will be located at appropriate heights between 400mm and 1200mm from finished floor level in accordance with Part M of the Building Regulations (this only applies to convenience socket outlets and does not apply to dedicated socket outlets not readily accessible and used for appliances that are intended to be continuously connected in normal use). Any appliance supplied from a socket outlet will be controlled by an accessible double pole switch or switched fused connection unit.

A fire alarm system in accordance with the fire certificate documentation shall be installed.

2.10 EV Charging

The electrical contractor shall allow for a suitably sized RCBO in the Consumer Units and conduit from the Consumer Unit to a point on the gable wall of the house for the future installation of an electric car charging point. The Termination Point of the wall of the house shall be suitably blanked off and a draw rope shall be provided in the

conduit for ease of drawing the future cable through.

Ducting (only) locally from the mini pillar shall be provided to cover a further 1 in 5 of the parking bays, to facilitate the future installation of additional charging posts as demand requires (ducting layout to be based on double charge posts). All provision for EVC shall be located in the same area of the carpark to minimise installation costs and maximise supervision.

1 No. dual Electric Vehicle Charging Point shall be supplied and installed in the Visitors Car Parking spaces.

All recharging points shall be in accordance with the EU Regulations 2018 (SI No. 414 of 2018)

All recharging points shall be installed in accordance with the general wiring rules and safety requirements as outlined in the current version of the National Rules for Electrical Installation I.S. 10101:2020/ET101 Fifth Edition. Each dual outlet charger post shall be of robust design and vandal resistant and be suitable for use in an unsupervised environment and feature the following:

- i. The dual outlet charger and associated wiring, isolation and control devices shall be installed and wired in accordance with I.S. 10101: 2020.
- ii. The dual outlet charger shall be capable of delivering 7 kW (32amp) single phase per outlet complete with galvanised steel ground mounting base and protection barrier.

2.11 Mechanical Services

The Electrical Contractor shall allow for all Electrical works associated with mechanical plant installation including all power and control wiring to temperature stats, humidity stats, actuators, timeclocks, heat pumps, water pumps. VSD's, extract fans, ventilation etc

2.12 Utilities Ducting

Ducts for E.S.B services shall be 50mm and 125mm uPVC complying with BS 3506:1969 or High-Density polythene pipe and couplers to IS 135:1975 Class B and shall be RED in colour, in accordance with IS 370:2007, and have "electric cable" stamped on them. Ducts shall be laid in fully coupled unbroken lengths, and a drawing wire provided for pulling through. A suitable indicator (eg. marked tape) shall be placed the length of the duct at 300mm below finished ground level. Attention to the ESB document, 'Housing schemes electrical services standards guidebook' Revision 4, November 2013. All requirements should meet with the E.S.B. latest Codes of Practice.

Ducts for supply to Lighting Standards shall be 50mm uPVC complying with BS 3506:1969 or High-Density polythene pipe and couplers to IS 135:1975 Class B shall be RED in colour, in accordance with IS 370:2007, and have 'public lighting duct' stamped on them, all in accordance with the latest ETCI Rules and the Public Lighting specifications of Cork County Council. Provide 125mm PVC ducts for road crossings as above. Ducts shall be laid in fully coupled unbroken lengths and a draw-wire provided for pulling through.

Ducts for telecoms services shall be 100mm or 50mm high uPVC complying with BS 3506:1969 or High-Density polythene pipe; and couplers to IS 135:1975 Class B and shall be GREY or GREEN in colour in accordance with IS 370:2007. Ducts shall be laid as in fully coupled unbroken lengths, and a drawing wire provided for pulling through. All laid in trenches not less than 600mm below finished ground level and all to Eircom requirements.

2.13 Electrical Utilities

There are overhead ESB lines on the site which will be diverted and undergrounded, the detail of which will be finalised through detailed design. There is an existing ESB substation across from the site and it is envisaged that the electrical

supply for this development will be provided from the existing substation. ESB's exact requirements shall be agreed with ESB Networks once the ESB applications are submitted.

2.14 Site Lighting

The Public Lighting scheme within the development was designed using the Signify Lumistreet 8,000 lumen 3000K LED fitting mounted on 6m galvanised steel columns. This scheme is designed to be a Class P3. The lighting design complies with Cork County Council's Public Lighting Policy. Attached is the design report by Signify.

3. Mechanical Installation

The mechanical installation will be designed to meet all current Irish and European standards and Building Regulations. The mechanical systems will comprise of domestic water services installation, sanitary ware installation, heating installation via heat pump efficient systems, mechanical ventilation installation and soils & waste installation.

3.1 Domestic Water Services Installation

A new cold water storage tank shall be located within the attic space for each dwelling (approx. 230L). Each dwelling shall be served by an air to water heat pump, the internal unit shall come with a pre-insulated hot water cylinder for serve each dwelling's hot water requirements. The pre-insulated cylinder shall also have a standby electrical immersion.

The domestic water services are to be installed to service the kitchen, utility and all WC's and bathrooms.

All wash hand basins are to have thermostatic controlled mixing valves on the hot supply limiting the maximum temperature to 42°C. All sinks are not to be thermostatically limited. Generally, the mains, cold and hot pipe work is to be distributed in voids and risers as detailed on the drawings serving each outlet or appliance. All drops are to be insulated and dropped in the stud partitions or concealed in box-out adjacent solid walls as necessary - the contractor shall make every effort to rationalise surface mounted pipe work and keep such pipe work to a minimum.

All MWS, WWS, CWS and HWS water services branch off's from main service pipe runs must be valved, (using ¼ turn lever valves). Additionally all water services are to be provided with isolation "penny" valves at every outlet connection for isolation of individual outlets. All domestic water pipe work is to be in 'copper, insulated, labelled and bracketed securely. Each section of pipe work is to be thoroughly cleaned and flushed through before any new connections are made.

The new installation shall be fully flushed, sterilised and chlorinated prior to handover.

3.2 Sanitary Ware Installation

The mechanical contractor shall be free-issued the sanitary ware for the project – installation of same is to be included for.

3.3 Soil & Waste Installation

Above ground foul water drainage installation includes for the following:

- A system of above ground pipe work to convey all soil and waste from new fittings to connect into the below ground drainage installation.
- All works required to make a complete and working installation.
- All final connections to sanitary ware, appliances and traps.
- Access to stacks for rodding purposes at every floor level, at each branch connection into the stack and at the foot of each stack.
- Rodding access points to each branch from the stacks.
- Fire collars where required
- Air or water tests to the above ground drainage installation to be recorded and forwarded to the services engineer.

3.4 Heating Services Installation

An Air to Water heat pump shall provide heating & hot water to each Unit. Heating will be provided via either radiators or under floor heating zones located as per the design drawings. Final heating zones are to be coordinated with the Architect, Client, Engineer, and Main Contractor.

A 28mm flow and return shall be supplied from each heat pump unit. A 22mm take off shall feed both levels. All LPHW pipe work shall be Copper.

Each floor will have an individual zone controller. The hot water storage tank will also have its own zone control. A heating control panel shall be provided to allow each resident the ability to set time schedules and etc.

The location of the heating control panel shall be positioned within the Kitchen / Living space for ease of access.

The outdoor heat pump unit shall be located at high level via wall bracket. The unit shall be mounted on anti vibration mounts. The final location of the external unit shall be agreed by the Architect/Client.

Please see the below list of Heating zones per dwelling:

- Domestic hot water generation
- Ground floor heating circuit (Living Spaces)
- First floor heating circuit (Bedrooms Spaces)

3.5 Ventilation Installation

Each dwelling shall be served by a central demand control ventilation system. A central extract fan shall be located within the attic. All wet rooms (bathrooms, WC's, utilities & kitchens) shall be ducted to the central extract fan. The system shall operate 24/7 in trickle mode. The system will go into boost mode based on the humidity levels within each wet room.

Each habitable room (living room & bedrooms) shall be served by a background vent which shall have a minimum free area of 2,500mm². Each background vent shall be acoustically treated. All internal doors shall have an undercut of 10mm to allow the transfer of air from the living spaces to the wet rooms.

A ducted kitchen hood extract system shall serve each cooker within each dwelling. All exhaust outlets shall be double air brick units.

3.6 Conclusion

The mechanical systems discussed have been nominated to ensure Part F and Part L (NZEB) compliance is achieved within each dwelling. The air to water heat pump system is a renewable energy system which will deliver each dwellings renewable energy ratio required to achieve NZEB compliance.

The fabric U-Values required shall meet Part L backstop values at a minimum as well achieving an overall air tightness result of 3m³/hr/m² @ 50Pa is proposed. ACD's shall also be follow for all thermal junctions. The exact target values to achieve compliance shall be confirmed by completion of preliminary BER's at the detail design stage.