Proposed Portobello Harbour Redevelopment

Utilities – Performance Specification

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This document has been prepared and checked in accordance with
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Comments

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Content

1. Introduction

1.1 General Clauses

Each section of this specification has a sub-section covering general clauses that are only pertinent to each different section. However, there are general clauses that are relevant to all sections and they are consequently included in this introductory section.

1.2 General Clauses Common To All Sections

- The term "Engineer" in this Specification refers to Waterman Moylan Engineering Consultants.
- The term "Architect" in this Specification refers to n/a
- The term "Landscape Architect" in this Specification refers to n/a
- The term "Authority" refers to "Dublin City Council and Irish Water as appropriate".
- The term "Contractor" refers to the Trade Contractor appointed for a particular section of the works.
- The term “PSDP” in this Specification refers to the Project Supervisor Design Process.
- The term “PSCS” in this Specification refers to the Project Supervisor Construction Stage and shall be the Contractor appointed to carry out the works.
- The term “he” refers to the Contractor and should be read as he or she as appropriate.
- The term Contract Document refers to the contract agreement document which may be in the form of conditions of contract or a lump sum agreement.
- The Engineer will produce most or all of his drawings by computer. The Contractor must ensure that all his personnel can view the latest version of Adobe Acrobat.
- Where any item of this Specification is subject to the Engineer's comment, the Contractor may proceed with this item only after all matters arising from such comment have been fully taken into account by the Contractor, and when authorised in writing by the Engineer.
- The approval of a sample of materials and/or workmanship does not constitute approval of the actual materials and/or workmanship employed in the works, but only approval of the particular sample.
- The Contractor shall be responsible for co-ordinating the works to ensure all interface details are in accordance with the specifications for the contract.

2. Scope of Works

The works shall consist of the complete Public Lighting installation associated with Portobello Harbour as described here-in.

Refer to Engineers site utilities layout drawings for indicative site wide utilities infrastructure requirements. All utilities to be installed in accordance with individual utility provider's drawings and details.

Refer to the following drawings:

23-035-E1000 – Public Lighting

23-035-E1001 – Existing ESB

23-035-E1002 – Existing Gas

23-035-E1003 – Existing EIR

2.1 Complete Public Lighting Installation

Provide trenching, ducting, backfilling and lighting column bases to serve all public spaces on the site including all:

Roped ducts for all mains cable runs.

Lighting Column Bases

Lighting Columns complete with light fittings as specified.

Bases/Vaults for Micro Minipillars

All works to be carried out in accordance with the requirements detailed in Section 4.

2.2 Existing Utility Services

The Contractor shall liaise with all utility providers prior to work commencing in order to co-ordinate construction with existing below ground services within the development boundary. Refer to Waterman-Moylan Design Risk Assessment and Utility maps for existing services.

3. Public Lighting

All works associated with the Public Lighting installation shall be completed in accordance with the Local Authority Lighting Section requirements and to the agreement of the specialist lighting contractor.

The Contractor shall provide all necessary works and attendances in relation to the public lighting service as shown on Waterman Moylan Utilities Layout drawings.

Provide attendances for the following in relation to the Public Lighting service as per Local Authority standards for residential developments. Provide trenching to include 100mm diameter Local Authority approved ducting for installation of public lighting power supplies. The ducting to be laid approximately 600mm below finished ground level in pathways and 750mm below ground in roads with warning tapes at 300mm below ground level. The duct shall be laid on 150mm fine sand bedding with 150mm fine sand surround the ducting. The trench shall be back filled with compacted CL 808 or reinstated with soil in accordance with Local Authority requirements. Surface made good to architects details.

All ducts shall have 12mm polypropylene draw ropes provided.

Lighting columns shall be of the “rooted” variety and base details shall be as indicated on the drawings and in accordance with the public lighting suppliers installation instructions.

All light fittings shall be as indicated on the drawings or equivalent and chosen from the Local Authority list of approved fittings. If alternative poles and/or fittings to those specified are proposed, it shall be the Contractor’s responsibility to complete lighting calculations and to seek Local Authority approval for the revised proposals.

There should be a separation **of at least 2 metres** between ESB Networks’ minipillar and the public lighting system micropillar, public lighting column or any other private micro pillar.

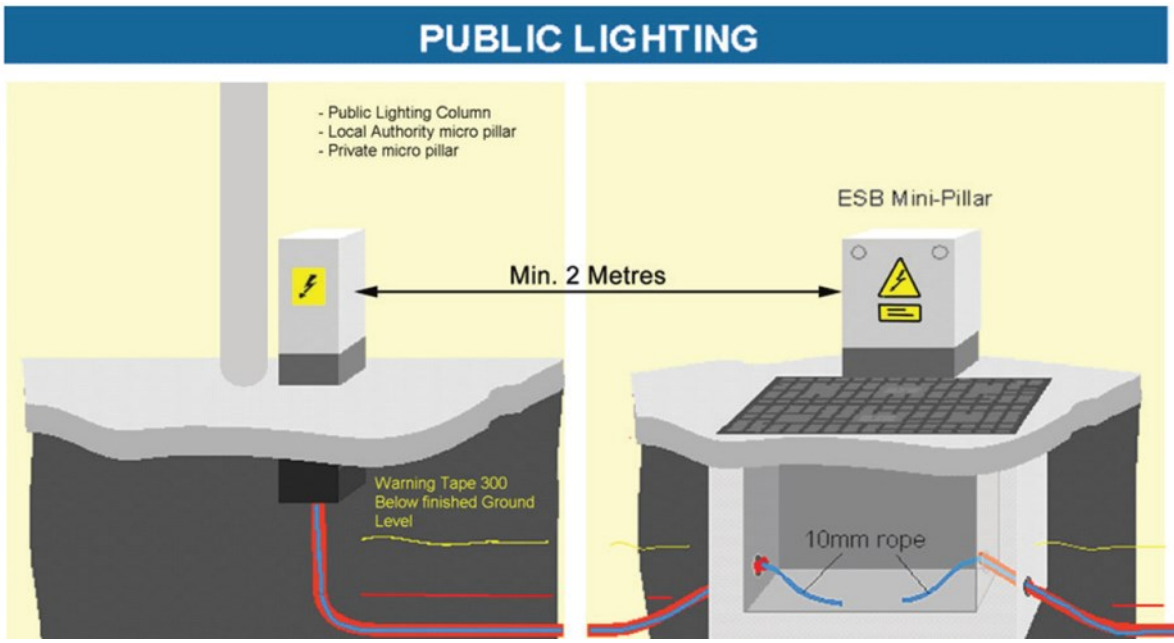

Figure 1 Micropillar details[1]

4. General

4.1 Duct Handling and Storage

Care should be taken when loading/unloading ducts to avoid damage to the ducts. Any damaged or defective ducts shall be marked in a conspicuous manner and removed from site.

Ducts shall be stored on a smooth flat horizontal surface, supported by side supports at intervals of not more than 1.5m and fully in accordance with the manufacturer's recommendations. Ducting supplied in factory strapped bundles may not require side supports, however care should be taken when removing strapping when tension may be released.

Socket ducts shall be stacked in layers in accordance with manufacturer's recommendations and with the socket at alternate ends of each layer. The socket on one layer should project beyond the duct spigots on the layer below so that the ducts are evenly supported along their length.

Duct stacks shall not exceed 7 layers with a maximum height of 2m.

The method of stacking shall be such as to ensure that the integrity of the ducts is maintained and that distortion is avoided.

Ducts shall not be stored in a place where they are likely to be in contact with surface water or other foreign matter which could make its way into the ducts.

Ducts shall not be stored in total (builders providers yard and site etc.) for a period longer than 1 year.

4.2 Duct Laying

Each duct shall be carefully examined immediately prior to laying and any damaged or defective ducts shall be marked in a conspicuous manner and removed from site.

All duct systems shall be installed so that no undue strain is placed on cables when pulled. Cable manufacturer's recommendations shall be followed.

Ducts shall be aligned as straight as possible in the horizontal and vertical directions. All sweeps shall be gradual as possible and jointed above ground prior to installation.

The location and arrangement of the various duct banks shall generally be as indicated on the Contract Drawings, but the precise positions/lines of the duct banks shall be agreed between the Contractor and the Engineer on commencement of the works. Ducts shall not be laid in trenches where water is lying in the bottom.

Every effort must be made to prevent dirt ingress into the ducts. Allowing dirt to enter ducts on the basis that the dirt should be removed later during the duct cleaning process is not acceptable.

Bricks or other hard packings shall not be used as temporary duct supports.

For ducts in trefoil formation, the ducts shall be bound together with duct ties at 3m intervals or more frequently as required to maintain the duct formation.

Horizontal and vertical separation between ducts shall be maintained through the use of manufactured injection moulded plastic duct spacers. 300mm or 600mm horizontal spacers shall be used to achieve horizontal spacing from other utilities as required. Spacers shall be installed at intervals as recommended by the manufacturer or at minimum intervals of 2m, whichever is lower. The Contractor shall ensure that backfill is installed and compacted correctly around the spacers to eliminate any point loading of ducts.

Vertical spacers shall not be used for installation of ESB Networks ducting in accordance with their standard specification for network ducting.

Where duct routes are located within the loading zone of influence of existing structures the trench shall be filled with concrete of minimum strength 10N/mm^2 in order to ensure the structural integrity of the adjacent structure, as may be directed by the Engineer.

Ducts shall be laid on the trench bed with the sockets towards the duct layer. The spigot end and inside of the duct to be joined shall be thoroughly cleaned with a dry rag. A duct shall be temporarily inserted to prevent ingress of soil or foreign material prior to jointing.

Ducts shall be laid so as to drain naturally towards one or both ends, where adequate provision for drainage shall be made. Adequate precautions shall be taken to prevent the cable duct system acting as a storm-water or ground water drainage system. A minimum fall of 1 in 200 shall be provided for drainage purposes.

Ducts shall be laid with the legend facing upwards.

The spigot end of the duct shall be pushed into the socket initially by hand and then driven in to achieve proper engagement by tapping with a hammer against a suitable wooden batten placed across the remote socket. Full engagement is when the indicator on the duct seals properly. Joints shall be made in such a manner as to avoid any sharp internal edges that may interfere with cabling operations.

Cutting of ducts shall be with a suitable non-electrical hand cutting tool. All cut ends shall be square to the axis of the duct and all burrs removed before use. Cutting of occupied ducts, if required, shall be carried out with extreme care.

Ducts not required to enter a jointing chamber shall by-pass the chamber either to the side or beneath the chamber. In certain circumstances and with the approval of the Engineer, ducts may pass through the chambers uninterrupted

Ducts for road crossings shall be straight and, wherever possible, perpendicular to the axis of the road.

4.3 Duct Cleaning & Testing

Immediately following the installation of any duct run, the interior of the duct shall be thoroughly cleaned by twice drawing an approved brush through the ducts, once in each direction. The cleaning procedure shall be in accordance with the manufacturer's recommendations and to the approval of the Engineer.

Following cleaning and prior to backfilling, the ducts shall be tested by drawing a cylindrical wooden/iron mandrel through them in accordance with the NRA 'Specification for Road Works'.

The mandrel shall be cylindrical, polished hardwood or iron, 300mm long having spherical ends and a diameter equal to the internal diameter of the ducts -10% or the internal diameter of the ducts -10mm, whichever is larger. See NRA detail RCD 500/52.

Mandrels should pass through the whole length of the completed ducts when testing.

4.4 Draw Ropes and Duct Plugs / Caps

Immediately after cleaning and testing, each individual duct run shall be fitted with a single strong continuous piece of polypropylene draw rope free of knots with a design life of not less than 20 years.

Draw ropes used in ESB ducts shall be 12mm polypropylene rope with a certified safe breaking load of 1.5 tons.

Draw ropes in all other ducts shall be 10mm diameter polypropylene rope free of knots with a minimum 8kN breaking strength. The types of draw ropes used shall be approved by the Engineer prior to installation.

A surplus of 2 meters of draw rope shall be left neatly coiled at each end of each duct run, with the ends suitably and effectively secured to prevent accidental withdrawal of the rope.

After installation of the draw ropes a plastic purpose-made plug or cap shall be placed in/overall open ends of ducts to prevent ingress or water and/or foreign matter. Duct plugs/caps shall be approved by the Engineer prior to installation.

All ducts are to be sealed by this method until cables are installed. Any unused ducts shall remain sealed by this method.

4.5 Marker Tape and Identification

Marker tape should be laid directly above each section of duct at a depth of 300mm above the top of the duct. ESB Networks yellow marker tape shall be laid at a maximum depth of 300mm.

Marker tape should provide full lateral cover over the ducts and should be in vertical alignment with the duct run. For large duct configurations, more than one width of tape may be necessary to cover the extra width of the duct section.

Marker tape shall be manufactured from high quality material to an approved international or national standard in order to assure its long-term performance with regard to physical integrity and readability.

Marker tape should be not less than 200mm wide and coloured high visibility yellow.

Marker tape shall be marked with the relevant lettering detailed above for individual services in large black block capitals continuously along its length.

Marker tape including a metal foil strip shall not be used.

Permanent marker blocks and location posts shall be installed as required in accordance with NRA RCD/500/50.

ESB Networks marker tape or strip should not be laid over any other services ducts.

Should any tape other than ESB Networks approved marker tape be installed overlying ESB networks ducts, the Contractor will be required to remove the unapproved marker tape and install approved material in its place.

4.6 Cable Pulling

All trenches excavated for the laying of cable ducts shall be completely backfilled and compacted before cable installation work is commenced.

Prior to cable installation, each duct shall again be proved by drawing a mandrel through it to the same specification as detailed in section 11.

If two or more cables are to be installed in the same duct, the aggregate of their cross-sectional areas shall not exceed 30% of the cross-sectional area of the duct.

4.7 Duct Sealing

After cables are installed, all ducts shall be sealed where they enter buildings or service tunnels using a multi-cable transit sealing system. This shall include rubber split insert sleeves to ensure cable separation and a high-quality silicone-based sealant layer. The system shall have the following characteristics:

- Suitable for both horizontal and vertical ducts
- Flexible seal which resists movement, shock and vibration
- Watertight
- Gastight
- Fire retardant
- Rodent resistant
- Easy re-entry for adding, removing or replacing cables.
- No frame required.
- Can seal irregular shaped openings.
- Suitable for trefoil cables
- Resistant to methane, hydrogen sulphide and chlorine
- Resistant to submersion and contact with petrol and diesel.
- Age tested to 50 years.
- No maintenance required.

The system used shall be the RISE Duct Seal system by CSD Sealing Systems or equal and approved.

Polyurethane expanding foam is not acceptable as a duct sealing system.

4.8 As Laid Drawings

During and on completion of the works, the Contractor shall engage a specialist survey company approved by the Engineer to undertake a survey of installed services to provide accurate as-built drawings showing the exact layout of all duct runs and cable chambers with co-ordinates to National Grid. The drawings shall also show the correct cover levels, invert levels and sizes of all services.

Special features such as crossings and pinch-points with other services shall be included in the records.

Duct locations shall be recorded before trenches are backfilled.

The information shall be provided in an agreed electronic format on CD (AutoCAD) and in hard copy format.

5. References

1. Guidebook for ESB Networks Standards for Electrical Services Revision 5 January 2014
2. National code Practice for customer interface 5th Edition 2021
3. Builders specification for Open eir Telecoms.
4. Virgin Media Guide to Installation Components.
5. Gas Networks Ireland (Bord Gais Networks) Guidelines for Designers and Installers – Booklets 1 to 3
6. National Roads Authority (NRA) 'Specification for Road Works' and 'Road Construction Details'
7. I.S. EN 61386 'Conduit Systems for Electrical Installations'
8. I.S. EN 50086-2-4 'Conduit systems for electrical installations – Particular requirements for conduit systems buried underground'.
9. I.S.370:2007 'Colour code for buried plastics piping'
10. I.S. EN 124 'Gully tops and manhole tops for vehicular and pedestrian areas – Design requirements, type testing, marking, quality control'.
11. I.S. EN 12620 'Aggregates for concrete'
12. BS 3506 'Specification for unplasticized PVC pipe for industrial uses'
13. Standard Specification for ESB Networks MV/LV Networks Ducting (Minimum Standards)
14. ESB Networks Duct Specifications of LV Cable for Non-Domestic Connections
15. Recommendations for Underground Telecommunications Cable Works for Road, Commercial and Residential Schemes, Department of Public Enterprise.
16. Public lighting services, General specification for the public lighting design and installation in housing, industrial and commercial developments in the Dublin city council area, Dublin City Council
17. Safety advice for working in the vicinity of natural gas pipes, Bord Gais networks DO/SQ/IS/002
18. Code of Practice for Avoiding Danger from Underground Services, Second Edition 2010, by the Health and Safety Authority
19. Volume 1 of NJUG Guidelines on the Positioning and Colour Coding of Underground Utilities Apparatus by the National Joint Utilities Group (NJUG)
20. Volume 2 of NJUG Guidelines on the Positioning of Underground Utilities Apparatus for New Development Sites
21. Volume 3 of NJUG Guidelines on the Management of Third-Party Cable Ducting
22. Volume 4 of NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees
23. Volume 5 of NJUG On-Site Environmental Good Practice Guidelines

UK and Ireland Office Locations