

One Albert Quay
Cork
T12 X8N6
Ireland
www.arup.com

t +353 21 422 3200

Project title	HQ Horgan's Quay Residential Quarter	Job number	252901-00
cc		File reference	HQDPR-ARUP-ZZ-XX-RP-C-0001 P03
Prepared by	David Fitzpatrick	Date	09 August 2019
Subject	Site Infrastructure Technical Note - Planning Application		

1 Introduction

Arup has been commissioned by HQ Developments Ltd. to prepare a planning application for an amendment to the proposed Residential Quarter building at its HQ Horgan's Quay Development in Cork City. Planning permission for this residential block has previously been granted by Cork City Council as part of the overall mixed-use development application, planning reference number TP 17/37563.

The Residential Quarter development will be located on an existing 3ha brownfield site at Horgan's Quay Cork City as part of an overall mixed-use development, other parts of which are currently under construction.

This technical note accompanies the engineering planning drawings. It relates the changes to the site infrastructure brought about by this planning application to those outlined in the Site Infrastructure Report (Rep001, September 2017), submitted as part of the original planning application for the development, TP 17/37563.

The technical note sets out the site infrastructure requirements for the overall development taking account those of the revised residential block:

- Surface Water Drainage
- Foul Water Drainage
- Potable Water Supply

Irish Water has reviewed our pre-connection enquiry for a water connection for the revised Residential Quarter and has confirmed that it is feasible. Please refer to the letter from Irish Water to Mr Ronan Downing of HQ Developments dated 2 April 2019.

On 26 June 2019 Irish Water issued a Statement of Compliance for the Horgan's Quay Development based on Arup's design submission. This demonstrates compliance with Irish Water's

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Standard Details and Codes of Practice for water and/or wastewater infrastructure proposals (designs, layouts, etc.).

2 Phasing for water demand or wastewater collection

It is proposed to construct the wet services (surface water, foul and potable water) in three phases for the HQ Horgan's Quay development as detailed on drawing HQDPR-ARP-ZZ-XX-DR-C-0011.

- Phase 1: HQDNQ Northern Quarter Retail and Hotel, HQDOQ Office Quarter
- Phase 2: HQDRQ Residential Quarter (subject of this planning application)
- Phase 3: HQDNQ Northern Quarter Residential

Phase 1 is currently under construction. The wet services infrastructure that has been designed for this phase also caters for the design requirements of the buildings that will be constructed during Phases 2 and 3.

Arup will continue to liaise with Irish Water and Cork City Council as required with respect to design matters throughout future Phases 2 and 3 of the development.

3 Proposed Surface Water

Details of the surface water drainage system for the overall development have been agreed with Cork City Council under the previous application. Having taken account of the changes to the surface water discharge rate from the overall site, we do not propose making any changes to these already agreed details.

Drawing HQDPR-ARP-ZZ-XX-DR-C-1300 details the overall surface water drainage layout for the overall development including the amended Residential Quarter block.

3.1 Design Criteria

The following design standards and guidelines have been followed in the design of the surface water drainage for the site:

- BS EN 752 – Drains and sewer system outside buildings.
- Greater Dublin Strategic Drainage Study (GSDSDS) Volume 2 – New Developments
- An additional 10% has been allowed for climate change in relation to rainfall intensities
- Surface water attenuation designed based on 20-year rainfall event coinciding with 200-year tidal flood level, 3.0m, for the Horgans Quay area
- Proposed design velocities – 1.0m/s to 3.0m/s
- Colebrook White roughness value of 0.6mm for all pipework

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- Met Eireann rainfall data for site:
 - M5/60 = 16.90mm
 - Ratio $r = 0.22$

3.2 Surface Water Runoff

The surface water network has been design assuming a worst-case scenario of both a 200-year tidal level coinciding with a 20-year rainfall event happening at the same time. Onsite storage is provided in the form of a 500m³ underground tank to prevent flooding on the site if both the tidal and rainfall scenario occurs.

Table 1 below details the surface water discharge rates for the development for the original planning application.

Original Contributing Area (m2) Planning Ref. TP 17/37563	5 Year Discharge Rate (L/Sec)	20 Year Discharge Rate (L/Sec)
22800	208	296

Table 1 - Original Surface Water Discharge Rates

Table 2 details the overall surface water discharges from the site taking account of the changes proposed to the residential block under this planning application. The contributing area has reduced and as a result, the discharge rates for both the 5 and 20-year storm events have reduced.

Proposed Contributing Area (m2)	5 Year Discharge Rate (L/Sec)	20 Year Discharge Rate (L/Sec)
22300	199	290

Table 2 - Proposed Surface Water Discharge Rates

3.3 Surface Water Quality

It is proposed to treat the surface water runoff from the Residential Quarter's undercroft carpark for both silt and possible hydrocarbon contamination. All road gullies and drainage channels will incorporate sumps to intercept suspended solids from entering the network. Hydrocarbon treatment will be carried out using a Class 1 by-pass hydrocarbon interceptor located in the undercroft.

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4 Proposed Foul Water Drainage

It is proposed to increase the number of apartment units in the Residential Quarter as follows:

- Original Application – 216 units
- Proposed Application – 302 units

All sanitary waste generated in the Residential Quarter shall be collected and conveyed to the outfall on Horgan's Quay in a new foul water drainage network which is currently under construction. The proposed outfall for the foul network shall be made to an existing foul manhole on the Cork Main Drainage interceptor sewer located on the south side of Horgan's Quay.

Drawing HQDPR-ARP-ZZ-XX-DR-C-1400 details the foul water drainage layout for the overall development including the amended Residential Quarter.

4.1 Design Criteria

The following design criteria were used for the design of the proposed foul network:

- BS EN 752 – Drains and sewer systems outside buildings.
- Part H Building Regulations.
- Irish Water Code of Practice for Wastewater Infrastructure
- Minimum self-cleansing velocity – 0.75m/s.
- Colebrook-White roughness value of 1.5mm for all pipework.
- Peak flow – 6DWF

4.2 Foul Water Discharge Rates

The original and proposed discharge rates for the development are as follows:

DWF (L/Sec)	Peak Flow (L/Sec)
7.51	45.08

Table 3 - Original Foul Flow Rates

DWF (L/Sec)	Peak Flow (L/Sec)
8.24	49.44

Table 4 - Proposed Foul Flow Rates

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5 Proposed Potable Water Supply

Under this planning application it is proposed to increase the number of units in the residential block from 216 units to 302 units. It is proposed to supply the potable water for the block from a new 180mm O.D. HDPE watermain which will run parallel to the residential block and is being constructed as part of the overall project.

Drawing HQDPR-ARP-ZZ-XX-DR-C-1500 details the overall potable water supply for the overall development including the amended Residential Quarter building.

5.1 Design Criteria

The watermain has been designed in accordance with the following guidelines and standards:

- Irish Water Code of Practice for Water Infrastructure
- CIRIA Report 128 – Guide to the design of thrust blocks for buried pressure pipelines
- IS EN 12201: Part 1, Part 2 and Part 3 (Plastic Systems for Water Supply, Drainage and Sewerage Under Pressure)

5.2 Potable Demand

The watermain has been sized to cater for the following demand for the overall development including the proposed demand from the amended Residential Quarter building. Table 5 outlines the original demand for the overall site under the original application while Table 6 outlines the proposed demand for the overall development including the updated residential block.

Average Demand (L/Sec)	Peak Demand (L/Sec)
7.51	37.55

Table 5 - Original Potable Demand for the Overall Site

Average Demand (L/Sec)	Peak Demand (L/Sec)
8.24	41.20

Table 6 - Proposed Potable Demand for the Overall Site

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DOCUMENT CHECKING (not mandatory for File Note)

	Prepared by	Checked by	Approved by
Name	David Fitzpatrick	Feargal O'Sullivan	James Duggan
Signature			