

RESPONSE TO DRAINAGE RELATED ITEMS
OF DUN LAOGHAIRE RATHDOWN COUNTY
COUNCIL REPORT TO AN BORD PLEANALA
FOR

RESIDENTIAL DEVELOPMENT AT

GLENCAIRN,
MURPHYSTOWN WAY, DUBLIN 18

AUGUST 2018

Job Title: Residential Development at Glencairn, Murphystown Way,
Dublin 18

Report Title: Response to drainage related items of Dun Laoghaire
Rathdown County Council report to An Bord Pleanala

Job Number: p170074

Author: John Keogh

Checked by: Kealan Donagher

Date: August 2018

Distribution: John Spain Associates

DBFL Consulting Engineers
Ormond House
Ormond Quay Upper
Dublin 7

Tel 01 4004000
Fax 01 4004050
Email info@dbfl.ie
Web www.dbfl.ie

Revision	Issue Date	Description	Prepared	Reviewed	Approved
-	9th Aug 2018	Issue to Comment	JBK	PMF	JBK
A	29th Aug 18	Issue for Planning	JBK	PMF	JBK

1. INTRODUCTION

This report relates to the proposed residential development at Glencairn House, Murphystown Way. ABP Reference ABP-301715-18.

In May 2018, a pre-application submission was made by the Applicant to An Bord Pleanála, in response to this pre-application, Dun Laoghaire Rathdown County Council (DLRCC) submitted a report to An Bord Pleanála pursuant to section 6(4)(b) of the Planning and Development (Housing) and Residential Tenancies Act 2016 which included a drainage planning report prepared by DLRCC Municipal Services Department – Drainage Planning. The following is a response to each item raised in the DLRCC Drainage report and describes any amendments that may be required. In addition, these items were discussed in a meeting with DLRCC dated 9/8/18 where each approach was agreed.

The below text is the full statement of items to be considered, relating to drainage, as raised in Dun Laoghaire Rathdown County Council (DLRCC) Municipal Services' response to the pre-application submission by the applicant.

“Following an iterative process of constructive engagement by the applicant and their Consultants with Municipal Services on Drainage issues, the applicant has submitted a report that addresses a number of key drainage issues for this site.

While many of the issues regarding design principles have been addressed the following more detailed supporting information will be required:”

2 DLRCC ISSUES RAISED AND DBFL RESPONSE

2.1 Item 1

The applicant has chosen soil type 4 in their calculations for this site however the soil type for this site is borderline between type 3 and 4. To provide a robust design and taking cognisance of the existing flooding issues downstream of this site, the applicant is requested to use soil type 3 in their calculations. This may lead to a decrease in allowable outflow and an increase in attenuation volumes required.

DBFL Response

The existing greenfield site consists of a mixture of SOIL type 3 and SOIL type 4 as defined using the Flood Studies Report - Winter Rainfall Acceptance Maps (WRAP). The applicable areas for each SOIL type are shown on DBFL drawing 170074-3070 and this indicates that approximately 42% of the existing site catchment area is SOIL type 3 with the remaining 58% being SOIL type 4.

It has been agreed with DLRCC that a combination of these existing greenfield SOIL types will be used for the determination of the permissible site discharge rate, and outflows from the development have been restricted accordingly.

It should be noted that although a combination of the existing greenfield SOIL types will be used for the determination of the permissible site discharge rate, a conservative approach is being applied whereby only SOIL type 4 (higher runoff rate) has been used as the runoff coefficient for grassed areas for the post-development site conditions although the runoff rate would likely be lower in reality.

2.2 Item 2

All of the surface water drainage elements will have to be constructed in advance of future phasing and protected from potential damage during construction of future phasing of the development. Municipal services consider that the protection of the surface water elements in later phases will best be achieved by the construction of below ground works scheduled for Phase 2 as part of the Phase 1 works, specifically the outfall to the watercourse. Municipal services would request that the Bord consider conditioning this requirement when considering any future application. Whatever the outcome the applicant will be required to provide significant detail in the Construction Management Plan, the measures proposed to construct and protect the surface water drainage elements.

DBFL Response:

Where drainage infrastructure serving a previous phase of development is located within a current phase of development, the drainage infrastructure will be constructed and protected through the detailed measures described in detail in the Construction Management Plan, section 11.

The Construction Management plan includes the following items:-

- Hoarding/fencing to be provided to cordon-off completed infrastructure works
- Contractor to produce as-built construction records of drainage infrastructure
- Marker tape to be provided on top of sewers running through live areas of site
- Site personnel to be informed of works already completed and commissioned
- Monitoring of excavation and prevention of undermining of infrastructure
- Water quality control of discharges to drainage network
- Protection of services from breakage or crushing

2.3 Item 3

The applicant has proposed to outfall directly to the watercourse adjacent to the development. However, the location for the outfall is in a wooded and sloped area which may hinder DLRCC access to the outfall for future maintenance when the development is taken in charge. The applicant is requested to outfall to the culvert to the east corner of the site, if feasible, as access to the culvert will need to be provided for maintenance. The Bord should note that this has not been raised by the DLRCC during meetings with the applicant to date, and it is not been addressed in their current submission.

DBFL Response:

DBFL met with DLRCC drainage department and the Project Ecologist on site in July 2018 to agree the outfall route for the surface water drainage. The revised agreed route is shown on DBFL drawing 170074-3000.

2.4 Item 4

The applicant shall confirm if sections of road adjacent to swales are sloped across the full width towards the swale, as this is not clear from the drawings.

DBFL Response:

Road sections adjacent to swales will be sloped towards the swale across their full width. Road crossfalls are shown on DBFL drawing 170074-2000.

2.5 Item 5

The attenuation storage tanks operate in series. As standard, the applicant shall identify the sections of the Microdrainage reports where the outflow value from the upstream catchment is input to the downstream attenuation store in volume calculations.

DBFL Response:

The surface water drainage system is not modelled in the format described by DLRCC above, instead a more detailed MICRODRAINAGE Simulation model has been created for the entire site which includes both catchments served by the attenuation tanks in one model.

MICRODRAINAGE Simulation uses the Wallingford Procedure, time/area full hydrograph methodology, including energy and momentum equations for dynamic analysis of surface water networks. The site drainage network is therefore modelled as one system where all flows, capacities, water levels, surcharged manholes etc are determined throughout the network for each critical storm duration.

Notwithstanding this, the results of the MICRODRAINAGE Simulation will be annotated to identify the most significant parameters and outputs from the model.

To provide additional clarity, the MICRODRAINAGE SIMULATION results has been annotated to highlight discharge from each attenuation system.

2.6 Item 6

As standard, the applicant is required to demonstrate by calculation and by representation on a drawing that the proposed green roof extends are in accordance with the Council's green roof policy such that the minimum coverage requirement of 60% is achieved. The applicant shall also provide details of maintenance access to the green roofs and should note that, in the absence of a stairwell type access to the roof, provision should be made for alternative maintenance and access arrangements such as external mobile access that will be centrally managed.

DBFL Response:

Green roofs will be provided on a minimum of 60% of apartment roof areas, the extents and areas are shown on DBFL drawing 170074-3000. For maintenance purposes, green roofs will be accessed from stairwells within the apartment buildings themselves. The extensive green roof filter bed depth will be 150mm, in addition, some areas of intensive green roof will be provided on podium slabs and will have filter bed depths deeper than 150mm.

2.7 Item 7

As standard, a surcharge analysis of the surface water drainage system will be required with commentary on the significance, if any, of possible surcharges with reference to the freeboard

used in the calculations. A further analysis to determine the impact of the 50% blockage in the surface water drainage system will be required and shall be referenced in the Site Specific Flood Risk Assessment.

DBFL Response:

A MICRODRAINAGE Simulation model has been created for the entire site which determines maximum water levels in pipes and attenuation systems for extreme rainfall events. The results of this assessment, along with a detailed list of pluvial flood risk areas and the mitigation measures in place to combat any flooding in extreme storm events, is included within the Site Specific Flood Risk Assessment report under separate cover. It should be noted that the simulation output of the MICRODRAINAGE analysis is set such that surcharged water levels within 300mm of the top cover level of a manhole are flagged in the software as a 'flood risk'. Any pipes or manholes which are surcharged in a critical duration storm event for the 1 in 100 year return period, but water levels remain below 300mm from the top cover level of a manhole, are not considered a flood risk and are not addressed in the Site Specific Flood Risk Assessment.

Furthermore, as agreed with DLRCC, the Site Specific Flood Risk Assessment report analyses flood risks caused if hydrobrakes and pipes located at low spots were blocked by 50%.

2.8 Item 8

As standard, the applicant is required to provide penstocks in the Hydrobrake chambers and ensure that the Hydrobrakes provided do not have bypass doors.

DBFL Response:

A hydrobrake manhole detail, including penstocks, is shown on DBFL drawing 170074-3012.

2.9 Item 9

As standard, the applicant shall ensure that landscape drawings are compatible with engineering drawings i.e. above ground drainage features as shown and labelled in the key, planting is located so as not to hinder the effectiveness of drainage features, etc.

DBFL Response:

BSM landscaping drawings have been co-ordinated with DBFL engineering drawings.

2.10 Item 10

As standard, the applicant is required to provide fully dimensioned plans and sections of the storage system. All relevant inlet and outlet levels, dimensioned clearances between other utilities and actual depth of cover to the tanks shall be provided. The applicant shall include confirmation from the chosen manufacturer of the storage systems that the specific model chosen with a depth of cover being provided, has the required load bearing capacity to support vehicle traffic loading that may be imposed upon it. It should be noted that the preferred attenuation storage solution for the site is Stormtech system. Any alternative proposals require the approval of the DLRCC prior to the submission of a full planning application.

DBFL Response:

DBFL drawing 170074-3000 shows the proposed 'Stormtech' attenuation system plan layout with inlet and outlet pipes, water depths/elevations, invert levels, cover levels and maximum attenuation storage volumes provided. DBFL drawing 170074-3000 shows the proposed 'Stormtech' attenuation system cross-sections with dimensions and depths to cover.

Neither attenuation system is located in a trafficable areas (both are located in open space), however the 'Stormtech' manufacturer's specifications are included in appendix L which show the maximum depth of cover achievable for each system type proposed on site. In addition to the above, attenuation system 2 (north-east of the site) has been designed such that no flotation of the system will occur. This ballast will be provided by including a structurally designed concrete slab above the system to weigh down the tank and counteract any potential hydrostatic uplift from water present in the subsoil. Furthermore, this slab will span over the 'Stormtech' system and will be supported on intermediate concrete walls within the Stormtech system (as required by Structural Engineer). This structural slab will ensure that the weight of soil overburden and any vehicle loading is supported and does not affect the structural capacity of the 'Stormtech' system.

2.11 Item 11

As standard, the applicant is required to provide cross sections detailing all utilities and showing vertical and horizontal separation distances to be provided at critical locations. Minimum separation distance should be in accordance with applicable codes of practice.

DBFL Response:

DBFL drawing 170074-3018 shows typical road and shared surface cross-sections with locations and spacing of foul, surface and water services and utilities. Furthermore, DBFL drawing 170074-3000 shows interactions between surface, foul and water services at critical locations.

2.12 Item 12

A stormwater audit will be required for this application. In accordance with the stormwater audit policy, the audit shall be forwarded to DLRCC prior to lodging the planning application. All recommendations should be complied with unless agreed in writing otherwise with DLRCC.

DBFL Response:

Punch Consulting Engineers have undertaken a surface water audit on the proposed scheme. The results of this audit have been submitted and agreed with DLRCC.

DBFL CONSULTING ENGINEERS
AUGUST 2018