

Drainage Department  
Dun Laoghaire Rathdown County Council  
2 Marine Road Dun Laoghaire  
Co. Dublin

To whom it may concern,

We are writing in response to the pre-planning application for the development at the Former Europa Garage, Newtown Avenue Blackrock, Co. Dublin (DLR file Reference: SHD/PAC/398/19).

Please see below responses to queries raised in relation to drainage and flood risk to the site.

**1. The applicant proposes to limit the outflow from the site to 3.24l/s. using the information supplied by the applicant the discharge rate is higher than expected for this site. The discharge rate for the site must be limited to Qbar (calculated using site specific data) or 2l/s/ha, whichever is greater, subject to the orifice size of the flow control device not being less than 50mm in diameter. The applicant has also used a lower than expected contributing area in their calculations. The applicant is required to resubmit their calculations using the correct contributing area and site specific or local data, such as SAAR, Soil Type, Rainfall Return Period Table (available from MET Eireann), rainfall intensity and other hydrological parameters. The applicant must clearly state and justify all inputs used and agree these with Drainage Planning prior to submission of the final application.**

1. Qbar calculation determined for site area of 50 hectares and extrapolated to applicant site area of 0.5ha. The calculation for Qbar has been revised to 2.62l/s and relevant location data added. Please Refer to Water Services report Appendix G for updated calculations.

**2. The information provided in the Water Services & Flood Risk report appears to vary from the information provided on the accompanying Surface Water Drainage Drawings. The applicant shall ensure that engineering drawings and engineering reports provide accurate information and are compatible with other disciplines' drawings, including landscape drawings.**

2. Please refer to attached updated Water Services Report and CORA civil drawings.

**3. The applicant has proposed an offline attenuation system, which is not acceptable. The applicant is required to alter their design to provide an online attenuation system.**

3. The attenuation tank has been reviewed and updated to an online system. The attenuation tank will include duty and standby pumps to accommodate the difference in invert levels. The footprint of the attenuation tank has been maximised at 142m<sup>2</sup>. The required attenuation volume of 374m<sup>3</sup> has necessitated the invert level of the tank to be lower than the outlet invert which has resulted in the need for a pumped system.

**4. The applicant is required to alter their design to prevent surface water runoff from the ground level entering the basement level car park.**

4. An ACO drain provided at basement entrance. An additional ACO drain has been added provided on ramp to intercept run off from surface. Refer to CORA drawing CORA-1953-C.002. An upstand will be installed to remaining sides of the basement ramp to prevent surface runoff from entering the ramp.

**5. The applicant is required to submit the complete Site Investigation Report and results, including Infiltration tests, and a plan showing the trial pits/soakaway**

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**test locations across the site. The report should address instances where groundwater, if any, was encountered during testing and its impact.**

5. Please refer to site Investigation report from Site Investigations Limited. Appended to Construction Management Plan.

**6. As standard, the applicant is required to submit long-sections of the surface water drainage system, clearly labelling cover levels, invert levels, pipe gradients and pipe diameters.**

6. Long sections of surface water drainage have been added to drawings. Please refer to CORA drawing CORA-1953-C.008.

**7. The Green roof provision appears to be significantly less than the required 60% coverage. The applicant is required to demonstrate by calculation and by representation on a drawing that the proposed green roof extents are in accordance with the Council's Green Roof Policy such that the minimum coverage requirement of 60% is achieved. The 60% must be based on the entire roof area for the development and not just on the flat roof area. 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. A detailed cross section of the proposed build-up of the green roof should be provided, including dimensions. The applicant should comment on the compatibility of the green roof with PV panels if they are to be incorporated into the design.**

7. Proposed Bauder Bio-solar Green roof system allows for installation of PV panels on flat roof surfaces with a green roof finish. Maintenance access for the majority of the green roofs and solar panels will be provided via lift and stair cores. The proposed development maintains a minimum 1.2m pathway around the footprint of the buildings. This will allow for a cherry picker to access the smaller sections of green roof for maintenance and upkeep. Sectional details of the green roof build up are added to CORA drawing CORA-1953-C.004.

The proposed scheme has maximised the green roof area that can be applied. The Architectural design utilises pitched roof surfaces which have been developed through conversations with the local authority, to better tie in with the local architecture and produce a high quality development. In conjunction with the green roof areas proposed, additional SuDS measures in the form of bioretention, permeable pavements and attenuation have all been adopted to filter, treat and ultimately discharge the surface water to the public combined sewer.

**8. As standard, the applicant is required to show a penstock in the flow control device chamber and ensure that the flow control device provided does not have a bypass door. The applicant shall also clarify whether a silt trap is being provided in the flow control device chamber and if not to make provision for same. The applicant is required to indicate clearly on the surface water layout where the flow control device is to be located.**

8. A Penstock valve has been added to flow control device chamber. Sectional details on surface water manholes has been added to drawings, please refer to CORA drawings CORA-1953-C.003 & C.008.

**9. As standard, the applicant is required to submit supporting standard details, including cross-sections and long-sections, and commentary that demonstrates that all proposed SuDS measures, i.e. permeable paving and green roofs, have been designed in accordance with the recommendations of CIRIA C753 (The SuDS manual).**

9. Details on surface water manholes, attenuation tank and permeable paving have been added to drawings, please refer to CORA drawings CORA-1953-C.004 and C.010

to C.013. The CORA Water services report has been updated with information on proposed green roof surfaces and paving surfaces.

**10. As standard, the applicant is required to provide fully dimensioned plans and sections of the attenuation storage system. All relevant inlet and outlet levels, dimensioned clearances between other utilities, and actual depths of cover to the tank shall be provided. The applicant shall include confirmation from the chosen manufacturer of the storage system that the specific model chosen, with the depth of cover being provided, has the required load bearing capacity to support the loading that may imposed upon it.**

10. Sectional details of surface water manholes/attenuation tank have been added to drawings, Please refer to CORA drawing CORA-1953-C.008. The attenuation tank is to be constructed from in-situ concrete to align with the proposed form of construction of the basement. The tank will be designed with sufficient load bearing capacity for the proposed paved pedestrian area over.

**11. As standard, the applicant is required to confirm that a utilities clash check has been carried out ensuring all utilities' vertical and horizontal separation distances can be provided throughout the scheme. The applicant should demonstrate this with cross-sections at critical locations such as junctions, site thresholds and connection points to public utilities. Minimum separation distances shall be in accordance with applicable Codes of Practice.**

11. The proposed location for foul water outlet is the East if the site onto Newtown Avenue. Survey information indications water main and gas located to East side of Newtown Avenue and therefore outfall pipe will not clash. Services entering site are proposed to enter from the North from Maretimo Terrace and will avoid clashes with foul and surface water drainage. The exact locations and routes will be coordinated during detail design phase.

**12. As standard, the applicant is required to show the options being proposed for interception and treatment with contributing areas on a drawing together with an accompanying text and tabular submission showing the calculations, to demonstrate that the entire site is in compliance with GSDS requirements. The applicant should note that over-provision in one location does not compensate for under provision elsewhere.**

12. Calculations have been provided in the CORA water services report identifying interception and treatment volumes in line with GSDS requirements. Calculations are to be read in conjunction with CORA drawings C.004 & C.009 identifying roof and landscape finishes and intended path from roof and ground level surfaces.

**13. If the applicant proposes SuDS measures that incorporate the use of infiltration, the applicant is required to provide details of each SuDS measure and confirm whether it will be lined/tanked or not. If lined/tanked systems are to be used, then the applicant will be requested to explain the rationale behind this. If unlined systems are to be used then the applicant is requested to demonstrate on a drawing that all infiltration SuDS proposals, including the attenuation system, have a 5m separation.**

13. Initial site investigation determined site unsuitable for large scale infiltration through the use of soakaways. As such attenuation and green roofs have been proposed to meet SuDS requirements. The attenuation tank is proposed to be impermeable as minimum separation distances cannot be met for infiltration.

**14. 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 shall be complied with, unless agreed in writing otherwise with DLRCC.**

14. JBA Consulting were engaged to complete a stormwater audit. Recommendations from the audit have been incorporated into the submission.

**Flood Risk Assessment.**

**1. The applicant is requested to comment on the proposed surface water drainage system in the event of blockage or partial blockage of the system, commenting on any surcharging or flood risk that may be identified. The applicant is requested to submit a drawing identifying and showing details of safe overland flow routes both within and without the site. The overland flow route plan should identify drop kerbs or ramps required for channelling the flow, should address low point areas in the site and should detail how properties, both within the development and on adjacent lands, will be protected in the event of excessive overland flows.'**

1. The proposed surface water network on site has been reviewed to ensure the properties within the site and adjoining sites will not flood for a storm event coinciding with a blockage of the surface network.

Should there be a blockage in the surface water system, it is proposed that surface water exiting falling on the podium will be directed away from the centre of the podium to the boundaries of the site. The levels of Newtown Avenue and Maretimo Terrace indicate a fall from East to West at road level which will direct water away from the site to the West. The footpath is raised from the road level which with the curb preventing flood water re-entering the site.

The Surface water network will be fitted with non-return valves on the exit of the basement soffit hung pipe sections. This will prevent water surcharging and entering the basement pipes and the basement.

Overland Flow Routes have been indicated on CORA drawing CORA-1953-C.015

Please do not hesitate to get in touch if you have any queries,

Kind Regards,



Alan Garvey BSc, ME, CEng, MIEI

for CORA Consultant Engineers