

**182134 - Residential Development,
Shanganagh Castle, Co. Dublin**

Climate Change Impact Assessment

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1 Introduction

This Climate Change Impact Assessment as required by the Woodbrook - Shanganagh Local Area Plan of Dún Laoghaire-Rathdown County Council, for inclusion in the proposed part 10 application for a new development at Shanganagh, Shankill, Co Dublin.

Climate change is occurring as a result of global warming and encompasses not only rising average temperatures but also extreme weather events, shifting wildlife populations and habitats, rising seas, and a range of other impacts. It becomes necessary to ensure the sustainability of development by incorporating climate change factors to be applied to surface water management and disposal proposals to ensure that networks do not become inundated and fail as a result of increased rainfall (pluvial) or river levels (fluvial) in the future.

The Greater Dublin Strategic Drainage Study, Volume 2, New Development, March 2005 (GSDSDS) sets out the initiatives to be adopted to address this issue. Section 6.3.2.4 titled 'Climate Change' states;

'Climate change is acknowledged as taking place the world over. The GSDSDS Climate Change policy document advises that rainfall event depths should be factored by 10% and that sea levels will rise by 400mm or more over the coming century. There is no specific advice for river flow rates, but the Defra advice in UK suggests a 20% increase in flood flows. The climate change policy also provides advice on the use of Time Series Rainfall.

If these criteria were not applied, and these predictions were found to be correct, then the level of service provided by the drainage system would be less than it was designed to achieve. It is therefore advised that climate change criteria are applied for the design of drainage systems for new developments.'

Table 6.2 of the document, reproduced hereunder details the factors to be applied to the different categories within any new development;

Climate Change Category	Characteristics
River flows	20% increase in flows for all return periods up to 100 years
Sea level	400+mm rise (see Climate Change policy document for sea levels as a function of return period)
Rainfall	10% increase in depth (factor all intensities by 1.1) Modify time series rainfall in accordance with the GSDSDS climate change policy document

Figure 1-1: Climate Change Factors to be Applied to Drainage Design (Source: Table 6.2 of The Greater Dublin Strategic Drainage Study, Volume 2, New Development, March 2005.)

2 Design Proposals

The proposed scheme has been designed such that it is compliant with the requirements of the GSDSDS. The development is not within an area of anticipated fluvial or coastal flooding therefore River Flows and Sea Level increases are not relevant.

The rainfall levels within the site used for the stormwater design for the scheme are empirical data obtained from Met Éireann records. As part of the simulation analysis of the network for the prescribed

1 in 1, 1 in 30 and 1 in 100-year storm events, a 20% increase in rainfall intensities has been applied. No scaling factor has been applied to the adopted Greenfield runoff rate (Q_{bar}) which remains at the original value.

The attenuation storage volume has been designed by means of an iterative modelling process which ensures that the volume provided, and the overall drainage network is sufficient to accommodate the critical storm event without flooding.

It is noted that 5mm interception storage for the site and long-term storage is also provided to further improve river regime protection for the receiving watercourse to the south of the site.

Full details of all design, model and simulation information is included in the Stormwater Impact Assessment Report for the scheme which is included under separate cover.

3 Conclusions

The proposed scheme has been designed in accordance with the recommendations set out in the GSDSDS and an independent Stormwater Audit has been carried out by JBA Consulting Engineers which includes a review of the drainage design in its entirety.

Based on the completed design and the results of the Stormwater Audit the scheme complies with the requirements in relation to Climate Change as it pertains to stormwater design.