CHH
Civil & Structural
Consulting Engineers

Innisfree House,
44-45 High Street,
Sligo,
F91 RFN1

071 9161844 Email: info@chh.ie Web: www.chh.ie

Paul Henry BSc (Eng) Dip Eng Eur Ing CEng MIEI FConsEI

PROPOSED EXTENSION TO GLEN ABBEY, NATIONAL AMBULANCE SERVICE FOR THE HEALTH SERVICE EXECUTIVE (HSE), TALLAGHT, Co. DUBLIN

FLOOD RISK ASSESSMENT

Project Title:	Glen Abbey National Ambulance Service
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1.0 Summary

CHH Engineers were appointed to provide a Flood Risk Assessment and Civil Design for a proposed development at Glen Abbey Complex, Belgard Road, Cookstown Industrial Estate, Dublin 24. The site area is approximately 3,258 m^2 (0.33Ha).

The existing site is currently occupied by a single building which is currently surrounded by hardstanding & landscaping areas and accessed from the Belgard Road.

The site is also surrounded by commercial and industrial buildings to the north and west, residential properties to the south at Colberts Fort and Belgard Road to the east.

The development proposal includes an industrial/office building with Ambulance Parking and would therefore be considered a *'Less Vulnerable'* Development (Table 4.2). According to the OPW flood maps, the site is located within Flood Zone C (Table 4.1) and therefore it does not require flood prevention measures. Refer to the table below for levels.

Level [m AOD]	Fluvial Risk [1%AEP]*	Tidal Risk [0.5%AEP]**	Climate Change ***	Comment
98.60	●	●	●	The finish floor levels for the buildings are above the levels obtained for fluvial flood risk, tidal flood risk and climate change simulation.

Table 1.1 – Flood risk and levels

* 1 %AEP is the 100-year returning period event (1 in 100 chance in any given years)

** 0.5 %AEP is the 200-year returning period event (1 in 200 chance in any given years)

*** Potential climate change (increase in rainfall of 20% and sea level rise of 0.5m as recommended by OPW).

2.0 Introduction

2.1 Project Background

CHH Engineers were appointed to provide a Flood Risk Statement and Drainage Strategy for the proposed development at the Glen Abbey Complex, Belgard Road, Cookstown Industrial Estate, Dublin 24 (D24 TD73 and D24 H267).

The report provides a brief assessment of flood risk to the site. The assessment follows Government guidance with regard to development and flood risk.

The report is based on currently available information and preliminary discussions.

Proposals contained or forming part of this report represent the design intent and may be subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design and are deemed a material deviation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.

2.2 Scope of Assessment

The planning application site area is approximately 3258m^2 and following scrutiny of the Office of Public Works flood maps it has been identified that the existing site lies within an area classified as Flood Zone C indicating that the risk of flooding from rivers and sea is low.

The assessment is to be undertaken in accordance with the requirements of the Planning System and Flood Risk Management System document.

The assessment will:

- Investigate all potential risks of flooding to the site
- Consider the impact the development may have elsewhere with regards to flooding.

The Assessment reviews the following information:

- The Office of Public Works online flood maps for rivers and sea flooding
- Planning System and Flood Risk Management System
- National Preliminary Flood Risk Assessment
- Geological Survey Ireland (GSI) online mapping

3.0 Existing Site Details

3.1 History and Current Use

The site is located off the Belgard Road at Glen Abbey in the Cookstown Industrial Estate, Dublin 24. The existing site is currently occupied by a single building formally office units surrounded by hardstanding and landscaped areas and accessed from the Belgard Road.

The site is also surrounded by commercial and industrial buildings to the north and west, residentialproperties to the south at Colberts Fort and Belgard Road to the East its Site Boundary.

3.2 Existing Watercourses

The closest existing watercourse is Whitestown Stream which is located approximately 1.4km south ofthe site.

Dublin Bay is located approximately 12.2km East of the site.

3.3 Existing Drainage

From the available information, there have been no identified underground services in the area. Adjacent to the site in Belgard Road there is an existing ø375mm combined sewer.

It is recommended that a drainage CCTV survey is carried out for all on site drainage to be reused to confirm exact location, depth, route, condition and outfall.

3.4 Topography

A topographical survey has been carried out at the site. The levels along the southern boundary vary east to west from 97.86m to 98.03m respectively whilst the levels along the northern boundary vary east to west from 97.80m to 98.23m respectively. The existing building floor level is approximately 98.30m. Refer to topographical survey in Appendix A. The finished floor level will be set at 98.60m.

4.0 Development and Flood Risk

4.1 Planning System and Flood Risk Management Guidance

In November 2009 the Planning System and Flood Risk Management System document was produced which provides guidance on how flood risk should be assessed during the planning and development process.

The development site area is approximately 3258 m^2 and following scrutiny of the Office of Public Works flood maps it has been identified that the existing site lies within an area classified as Flood ZoneC indicating that the risk of flooding from rivers and sea is low.

Zone A - High probability of flooding. Most types of development would be considered inappropriate in this zone. Development in this zone should be avoided and/or only considered in exceptional circumstances, such as in city and town centres, or in the case of essential infrastructure that cannot be located elsewhere, and where the Justification Test has been applied. Only water-compatible development, such as docks and marinas, dockside activities that require a waterside location, amenity open space, outdoor sports and recreation, would be considered appropriate in this zone.

Zone B - Moderate probability of flooding. Highly vulnerable development, such as hospitals, residential care homes, Garda, fire and ambulance stations, dwelling houses and primary strategic transport and utilities infrastructure, would generally be considered inappropriate in this zone, unless the requirements of the Justification Test can be met. Less vulnerable development, such as retail, commercial and industrial uses, sites used for short-let for caravans and camping and secondary strategic transport and utilities infrastructure, and water-compatible development might be considered appropriate in this zone. In general however, less vulnerable development should only be considered in this zone if adequate lands or sites are not available in Zone C and subject to a flood risk assessment to the appropriate level of detail to demonstrate that flood risk to and from the development can or will adequately be managed.

Zone C - Low probability of flooding. Development in this zone is appropriate from a flood risk perspective (subject to assessment of flood hazard from sources other than rivers and the coast) but would need to meet the normal range of other proper planning and sustainable development considerations.

Table 4.1 – (Extract Planning System and Flood Risk Management Guidance) Flood Zone Classification

According to the OPW flood maps, the area where the site is located was not deemed to require furtherinvestigation for the Preliminary Flood Risk Assessment and because of this there are no flood maps on OPW website. Therefore, the site can be considered within Flood Zone C which is defined as an area within the lowest risk of flooding from rivers and the sea.

Vulnerability class	Land uses and types of development which include*:
Less vulnerable development	Buildings used for: retail, leisure, warehousing, commercial, industrial and non-residential institutions; Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans; Land and buildings used for agriculture and forestry; Waste treatment (except landfill and hazardous waste); Mineral working and processing; and Local transport infrastructure.

Table 4.2 – (Extract Planning System and Flood Risk Management Guidance) Classification of vulnerability of different typesof development

4.2 Site Specific Flood Zone Compatibility

The development proposals are for warehousing/industrial units and would therefore be considered a *'Less Vulnerable'* Development in reference to Extract Planning System and Flood Risk Management Guidance) Matrix of Vulnerability versus Flood Zone The site is located within Flood Zone C and therefore the development is appropriate for this flood zone.

4.3 Justification Test

As the site is located within Flood Zone C the justification test is not required to be undertaken.

5.0 Hydrological Assessment

5.1 Sources of Flood Risk

This study briefly assesses the risk from different types of flooding to the development and the risk of flooding from the development, taking into consideration climate change, as well as how flood risks should be managed.

5.2 Fluvial Flooding (Rivers and Streams)

As previously mentioned, the site is located within Flood Zone C and is therefore regarded to be at lowrisk from fluvial flooding.

5.3 Tidal Flooding (Coastal or Estuarine)

As above, the site is located within Flood Zone C and is therefore regarded to be at low risk from tidal flooding.

5.4 Reservoir Flooding

It has not been possible to undertake predictive mapping of flooding due to breaches of reservoirs with any reliability, as the relevant necessary information is not currently available or readily-derivable.

Taking the absence of past reservoir failures, and the number and average age of reservoirs in Ireland(many hundreds of reservoirs nationally, with an estimated average age of over 30 years), it may be deduced that the likelihood of flooding due to a reservoir breach is very low.

5.5 Canal Flooding

There are no canals within the vicinity of the site and therefore considered to be at low risk of canal flooding.

5.6 Groundwater Flooding

Groundwater flooding tends to be more persistent than other sources of flooding, typically lasting for weeks or months rather than hours or days. Groundwater flooding does not generally pose a significantrisk to life due to the slow rate at which the water level rises; however, it can cause significant risk to property.

A site-specific intrusive ground investigation report has not yet been carried out at the site; therefore, site specific groundwater levels are unknown.

5.7 Public Sewers or Road Drainage Flooding (Infrastructure Failure)

There are no records of road drainage flooding according to the Office of Public Works website

Sewerage flooding are typically localised and hence would generally cause limited damage. Sewer flooding would typically arise from blockage or other unpredictable incidents, and so it cannot be readily projected where they would be likely to occur, and hence where significant flood risk due to this source might exist.

Providing Irish Water and South Dublin County Council maintain their drainage networks, it is assumed that the site will remain at low risk from public sewer and road drainage and infrastructure failure.

5.8 Surface Water Flooding to the site

Surface water flooding can be caused when rainwater during extreme rainfall events does not drain away through the normal drainage system or soak into the ground with flooding occurring, principally from manholes and gullies. Surcharging sewers can result in overland flows which if originating at a higher elevation than a development site can potentially pose a flood risk.

Reviewing online flood mapping, the mapping does not note any historic flooding at the site.

Considering the above and the topography discussed in section 2.4 (where the local area falls away from the building with levels remaining as-is), the residual risk from this source can be considered low.Also, SuDS proposals will reduce risk generated by the site.

Please refer to CHH Drawings & CHH SW Attenuation Proposal report for Details on SuDS.

5.9 Surface Water Flooding from the site

Developers are responsible for ensuring that new development does not increase the flood risk elsewhere. The proposed surface water drainage network shall be designed to provide adequate capacity to convey all flows arising from the proposed development so as not to cause damage to buildings, essential services or adjoining developments and services.

Please refer to CHH Drawings & CHH SW Attenuation Proposal report for Details on SuDS.

5.10 Historical Flooding

Historical flood events are recorded on the Office of Public Works website. These land maps have beenconsulted regarding recorded flood events in the vicinity of the subject site There have been no flood events in the proximity of the site. This confirms that there is a low flood riskfrom the surrounding areas of the proposed development.

6.0 Flood Type

6.1 Fluvial/Tidal Flood

The development site lies within Flood Zone C and therefore there is low risk of fluvial and tidal flooding.

6.2 Groundwater Flood

Groundwater flooding tends to be more persistent than other sources of flooding, typically lasting for weeks or months rather than hours or days. Groundwater flooding does not generally pose a significant risk to life due to the slow rate at which the water level rises; however, it can cause significant risk to property.

The groundwater flood risk to the site is currently unknown due to the lack of site-specific groundwater levels. It is therefore recommended that groundwater levels are monitored during ground investigation works to determine site specific groundwater levels. Typically, groundwater levels are recorded during gas monitoring over a 3-month period. Fluctuations in groundwater levels should be assessed during ground investigation works and floor levels proposed based on being above the maximum levels recorded where possible.

The risk from groundwater flooding would be considered to be low post development.

6.3 Surface Water Flooding to the site

There are no records of previous surface water flooding incidents at the site or within the vicinity therefore is considered low.

It is however recommended that existing ground and floor levels are maintained or increased as part of the works to ensure the risk is not increased.

Providing the above measures are implemented the flooding risk to the development site from the surface water is therefore considered low post development.

6.4 Surface Water Flooding from the site

The development will not be increasing flood risk as a result of the works. The residual risk can be considered low. Please refer to CHH Drawings & CHH SW Attenuation Proposal report for Details on SuDS.

The final design of the drainage networks shall be in accordance with the legislation set by the Office of Public Works, South Dublin County Council and Irish Water.

7.0 Conclusion

This Flood Risk Assessment has been prepared for the proposed Glen Abbey National Ambulance Service.

In summary:

- The online flood mapping illustrates the site in Flood Zone C (Lowest Risk)
- In accordance with the Extract Planning System and Flood Risk Management Guidance document, the site/development is appropriate for these proposals
- The groundwater flood risk to the site is currently unknown due to the lack of site-specific groundwater levels. It is therefore recommended that groundwater levels are monitored during ground investigation works to determine site specific groundwater levels.
- Subject to the items discussed within this report, the site can be considered:
  - to be at low or appropriate risk of suffering from any form of flooding
  - to be proved to not increase the probability of flooding elsewhere.