FLOOD RISK ASSESSMENT

AT

186, WHITEHALL ROAD
TERENURE
DUBLIN 12

Prepared for
Daniel Leong

Prepared by
Traynor Environmental Ltd

Reference Number
23.236TE

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Issue	Date	Details	Prepared by	Checked/Approved by
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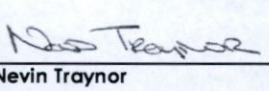
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CONTENT

1.0 INTRODUCTION

Traynor Environmental Ltd have been appointed to carry out a flood risk assessment for the proposed development. The proposed development consists of permission for a single storey extension with flat roof and 2 storey extension to rear of existing house. Roof alterations to existing rear extension; removal of pitched roof and replacement with flat roof to match the proposed single storey block linking the 2 storey to existing house. Extension includes 3 bedrooms, 1 ensuite, WC and bathroom, open plan kitchen / living area. Demolition of shed in rear garden. The site is in 186, Whitehall Road, Terenure, Dublin 12.

This report is intended to satisfy the requirements of item 2 of the additional information request from South Dublin County Council relating to flood risk assessment.

Item 2: *"The subject site is located within Flood Zones A and B as identified on Map 14 Strategic Flood Risk of the South Dublin County Development Plan 2022-2028. The County Development Plan states that proposals for minor development to existing buildings, such as the proposed extension, in areas of flood risk should include a flood risk assessment of appropriate detail. Insufficient information is currently submitted to satisfy the Planning Authority that the proposed development would not be liable to flooding or give rise to flooding in other locations. The applicant is requested to submit additional information in relation to this including a flood risk assessment".*

1.1 Flood Risk Management Guidelines (2009)

As per the Flood Risk Management Guidelines (2009), where flood risk may be an issue for any proposed development, a flood risk assessment (FRA) should be carried out that is appropriate to the scale and nature of the development and the risks arising. The flood risk assessment outlined herein is intended to be sufficiently detailed to quantify the risks and effects of any flooding, necessary mitigation measures, together with recommendations on how to best manage any residual risks.
As per the document 'The Planning System and Flood Risk Management (2009)' the flood risk assessment will consist of the following sections:

- Site description
- Site layout
- S-P-R model; sequential approach; justification test
- Determination of flood level
- Mitigation measures
- Conclusions

Traynor Environmental carried out the site inspections and surveys in May 2023 to identify potential sources and pathways for floodwater to enter the site. The inspection consisted of a walkover and visual inspection of the site and in the vicinity of the site.

1.2 Methodology

The methodology used for the flood risk assessment is based on *'The Planning System and Flood Risk Management Guidelines for Planning Authorities' (2009)' and also incorporating the Strategic Flood Risk Assessment*. The FRM Guidelines require the planning system at national, regional, and local levels to:

- Avoid development in areas at risk of flooding, particularly floodplains, unless there are proven wider sustainability grounds that justify appropriate development;
- Adopt a sequential approach if applicable to flood risk management when assessing the location for new development based on avoid, substitute, justify, mitigate, and proceed; and
- Incorporate flood risk assessment into the process of making decisions on planning applications and planning appeals.

1.3 Stages of the Flood Risk Assessment

The detail and complexity of the study required should be appropriate to the scale and potential impact of the development. For the purposes of this study, the following have been considered:

- Available information on historical flooding in the area;
- Site level information;
- Details of structures, which may influence hydraulics of the watercourse and consideration of the effect of blockage of structures;
- Estimates of design levels when works have been completed;

Structure of the Flood Risk Assessment

The Planning System and Flood Risk Management-Guidelines for Planning Authorities (Department of the Environment & Local Government November 2009) recommend that a staged approach is adopted when undertaking a Flood Risk Assessment (FRA). The recommended stages are briefly described below: -

• Stage 1 – Flood Risk Identification

To identify whether there may be any flooding or surface water management issues that will require further investigation. This stage mainly comprises a comprehensive desk study of available information to establish whether a flood risk issue exists or whether one may exist in the future.

• Stage 2 - Initial Flood Risk Assessment

If a flood risk issue is deemed to exist arising from the Stage 1 Flood Risk Identification process, the assessment proceeds to Stage 2, which confirms the sources of flooding, appraises the adequacy of existing information, and determines the extent of additional surveys and the degree of modelling that will be required. Stage 2 must be sufficiently detailed to allow the application of the sequential approach within the flood risk zone.

• Stage 3 - Detailed Flood Risk Assessment

A detailed FRA is carried out where necessary to assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk.

1.4 Development Plans and Policy Context

Dublin is covered by the Eastern River Basin District and a number of policies relate to the proposed development and flooding. The SDCC Development Plan (2022-2028) have been considered in this FRA.

1.5 Assessment of Minor Proposals in Areas of Flood Risk

Paragraph 5.28 of the Planning Guidelines deals with minor proposals, such as *'small extensions to houses, and most changes of use of existing buildings and or extensions and additions to existing commercial and industrial enterprises'*. The Guidelines state that such proposals are *'unlikely to raise significant flooding issues, unless they obstruct important flow paths, introduce a significant additional number of people into flood risk areas or entail the storage of hazardous substances.'* The Guidelines go on to explain that *'since such applications concern existing buildings, the sequential approach cannot be used to locate them in lower-risk areas and the Justification Test will not apply. However, a commensurate assessment of the risks of flooding should accompany such applications to demonstrate that they would not have adverse impacts or impede access to a watercourse, floodplain or flood protection and management facilities. These proposals should follow best practice in the management of health and safety for users and residents of the proposal.'*

It is therefore evident that this proposed development which is a minor development to an existing building falls into the category of a small-scale development, and therefore a Justification Test does not apply. A commensurate assessment as described in section 5.28 was necessary to be demonstrated.

This development is bordered to the West, East and South by residential housing units. The northern site boundary adjoins the public road.

1.6 The Planning System and Flood Risk Management (FRM), Guidelines for Planning Authorities

The FRM Overview states:
"Flood risk assessments (FRAs) aim to identify, quantify and communicate to decision-makers and other stakeholders the risk of flooding to land, property and people. The purpose is to provide sufficient information to determine whether particular actions (such as zoning of land for development, approving applications for proposed development, the construction of a flood protection scheme or the installation of a flood warning scheme) are appropriate. "

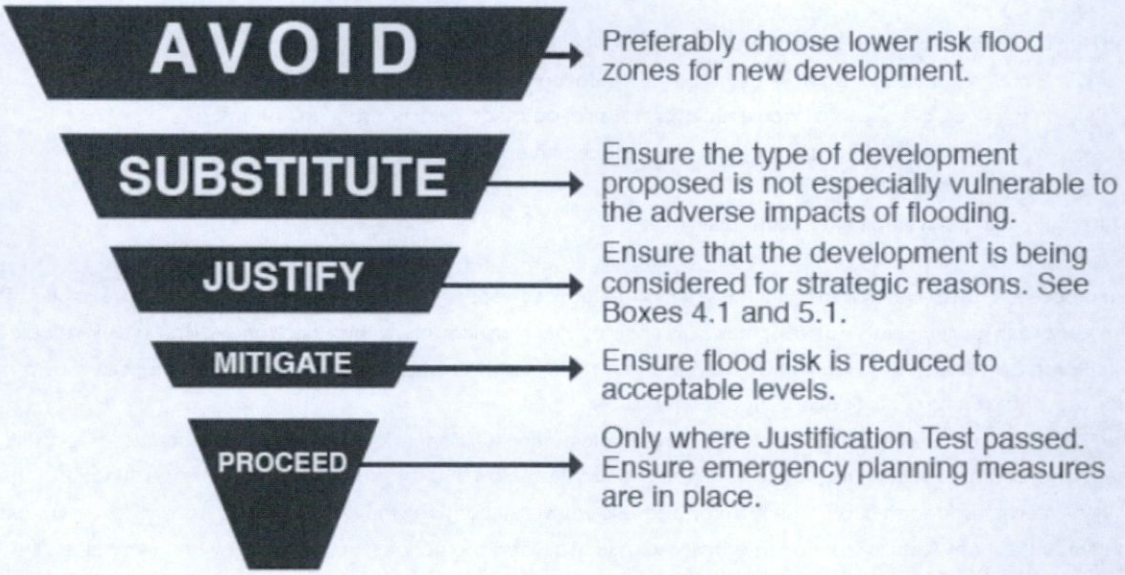
The FRM Guidelines provide "mechanisms for the incorporation of flood risk identification, assessment and management into the planning process ....". They ensure a consistent approach throughout the country requiring identification of flood risk and flood risk assessment to be key considerations when preparing development plans, local area plans and planned development.
The core objectives of The FRM Guidelines are to:

- Avoid inappropriate development in areas at risk of flooding;
- Avoid new developments increasing flood risk elsewhere;
- Ensure effective management of residual risks for development permitted in floodplains;
- Avoid unnecessary restriction of national, regional, or local economic and social growth;
- Improve the understanding of flood risk among relevant stakeholders; and
- Ensure the requirements of EU and national law in relation to the natural environment and nature conservation are complied with for flood risk management."

The key principles of The FRM Guidelines are to apply the Sequential Approach to the planning process i.e.;

- Avoid the risk, where possible,
- Substitute less vulnerable uses, where avoidance is not possible, and
- Mitigate and manage the risk, where avoidance and substitution are not possible."

Figure 1 - Sequential Approach Principles in Flood Risk Management



Where the Sequential Test's avoid and substitute principals are not appropriate then the FRM Guidelines propose that a Justification Test be applied to assess the appropriateness, or otherwise, of particular developments that are being considered in areas of moderate or high flood risk.

1.8 Flood Risk Assessment

The assessment of flood risk requires an understanding of where water comes from (the source), how and where it flows (the pathways), and the people and assets affected by it (the receptors). The principal sources are rainfall or higher than normal sea levels. The principal pathways are rivers, drains, sewers, overland flow and river and coastal floodplains and their defence assets. The receptors can include people, their property, and the environment. All three elements are examined as part of the flood risk assessment including the vulnerability and exposure of receptors to determine potential consequences. Mitigation measures typically used in development management can reduce the impact of flooding on people and communities e.g. by blocking or impeding pathways. The planning process is primarily concerned with the location of receptors and potential sources and pathways that might put those receptors at risk.

Risks to people, property and the environment should be assessed over the full range of probabilities, including extreme events. Flood risk assessment should cover all sources of flooding, including effects of run-off from a development locally and beyond the development site.

1.9 Flood Zones

The FRM Guidelines use flood zones to determine the likelihood of flooding and for flood risk management within the planning process. The three flood zones levels are:

- Flood Zone A - where the probability of flooding from rivers and the sea is highest (greater than 1 % AEP (Annual Exceedance Probability) or 1 in 100 for river flooding;
- Flood Zone B - where the probability of flooding from rivers and the sea is moderate (between 0.1 % AEP or 1 in 1000 and 1 % AEP or 1 in 100 for river flooding); and

- Flood Zone C - where the probability of flooding from rivers and the sea is low (less than 0.1 % AEP or1 in 1000 for both river and coastal flooding). Flood Zone C covers all areas outside zones A and B.

The FRM Guidelines categorises all types of development as either;

- Highly Vulnerable e.g. dwellings, hospitals, fire stations, essential infrastructure,
- Less Vulnerable e.g. retail, commercial or industrial buildings, local transport infrastructure.
- Water Compatible e.g. flood infrastructure, docks, amenity open space.

1.10 Proposed Development's Vulnerability

The proposed type of development for this site is a residential extension to an existing dwelling and is categorised by the Guidelines as highly vulnerable developments and appropriate to be located within Flood Zone A. However, in accordance with Paragraph 5.28 of the Planning Guidelines deals with minor proposals, the development is categorised as a minor proposal and as such a Justification Test does not apply.

The FRM Guidelines require a SSFRA to "gather relevant information sufficient to identify and assess all sources of flood risk and the impact of drainage from the proposal". It should "quantify the risks and the effects of any necessary mitigation, together with the measures needed or proposed to manage residual risks". It considers the nature of flood hazard, taking account of the presence of any flood risk management measures such as flood protection schemes and how development will reduce the flood risk to acceptable levels.

1.11 SSFRA Key Outputs

Key outputs of an SSFRA are:

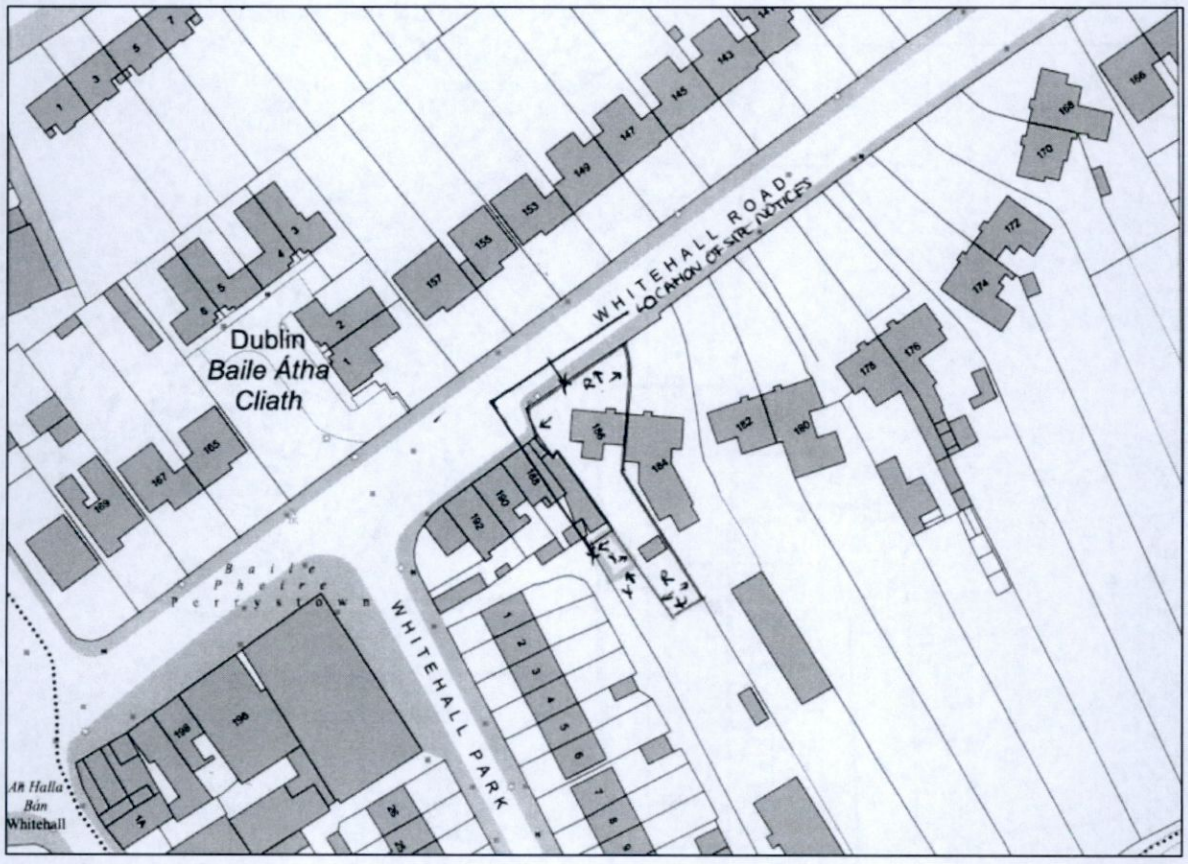
- Plans showing the site and development proposals including its relationship with watercourses and structures which may influence local hydraulics;
- Surveys of site levels and comparison of development levels relative to sources of flooding and likely flood water levels;
- Assessments of;
    - Potential sources of flood risk;
    - Existing flood alleviation measures
    - Potential impact of flooding on the site.
- How the layout and form of the development can reduce those impacts, including arrangements for safe access and egress.
- Proposals for surface water management and sustainable drainage.
- The effectiveness and impact of any mitigation measures.
- The residual risks to the site after the construction of any necessary measures and the means of managing those risks; and
- How flood risks are managed for occupants / employees of the site and its infrastructure.

2.0 SITE DESCRIPTION & LOCATION

2.1 Site Description

The surrounding area is predominantly residential. The development is located in an existing residential area. The River Poddle is located 80m south of the site boundary.

Figure 2 - Site Location



2.2 Development Proposal

Planning permission is sought from SDCC for the permission single storey extension with flat roof and 2 storey extension to rear of existing house. Roof alterations to existing rear extension; removal of pitched roof and replacement with flat roof to match the proposed single storey block linking the 2 storey to existing house. Extension includes 3 bedrooms, 1 ensuite, WC and bathroom, open plan kitchen / living area. Demolition of shed in rear garden.

Figure 3 – Existing Site Layout Plan

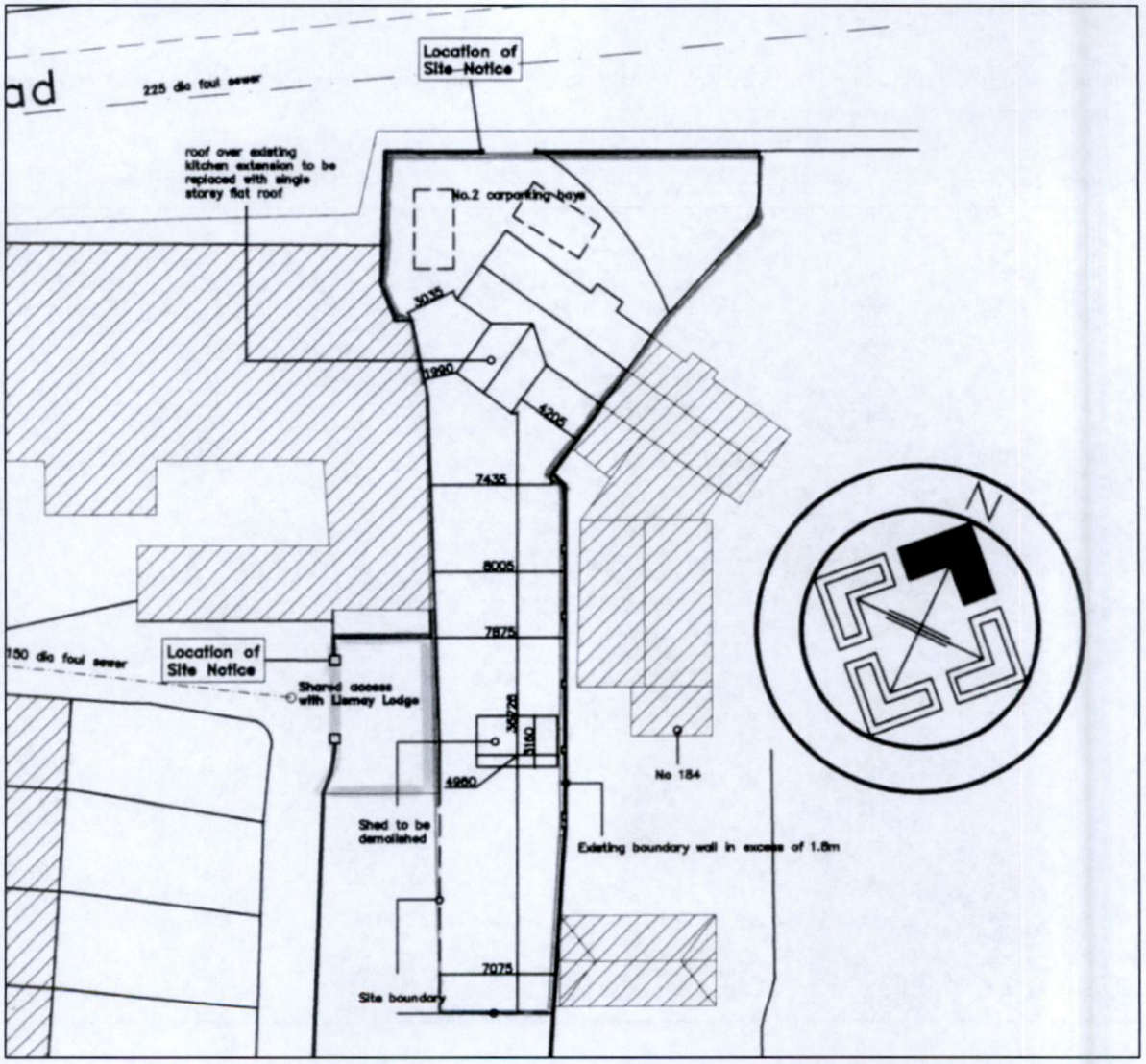


Figure 4 – Proposed Site Layout Plan

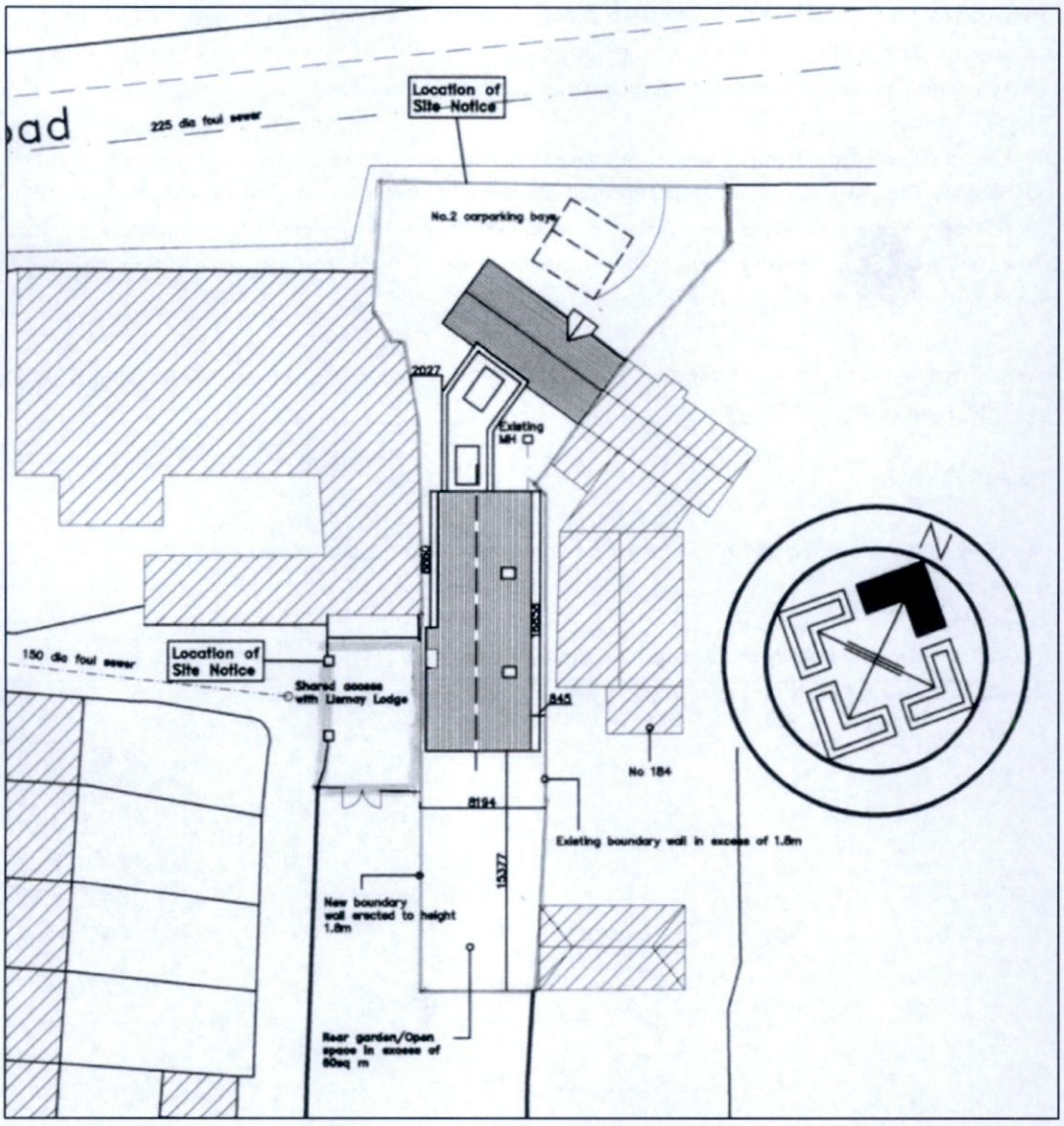


Figure 5 – Long Section Through the Proposed Development Site

3.0 GEOLOGY & HYDROGEOLOGY

The hydrogeology of the site was assessed by means of a desk study of relevant literature. This included available geological and hydrogeological information and maps from the Geological Survey of Ireland (GSI) and the EPA. Groundwater can be defined as water that is stored in, or moves through, pores and cracks in subsoils.

The potential of rock to store and transport water is governed by permeability of which there are two types, intergranular and fissure permeability. The GSI, EPA and the Department of Environment, Heritage, and Local Government (DOEHLG) have developed a Programme of Groundwater Protection Schemes (GPWS), with the aim of maintaining the quality and quantity of groundwater in Ireland, and in some cases improving groundwater quality, by applying a risk assessment approach to groundwater protection and sustainable development.

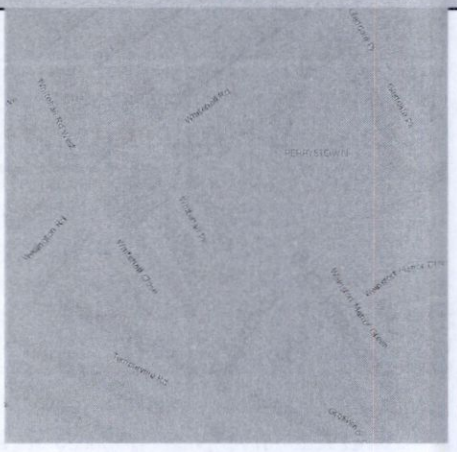
From the GSI maps for the area it can be seen that the bedrock aquifer underlying the site is located within an area of moderate/high groundwater vulnerability.

3.1 Soils

The site is shown in GSI mapping is derived by Dinantian Upper Impure Limestones (DUIL).

3.2 Hydrology

Figure 6 - Groundwater Vulnerability and Aquifer Classification Map

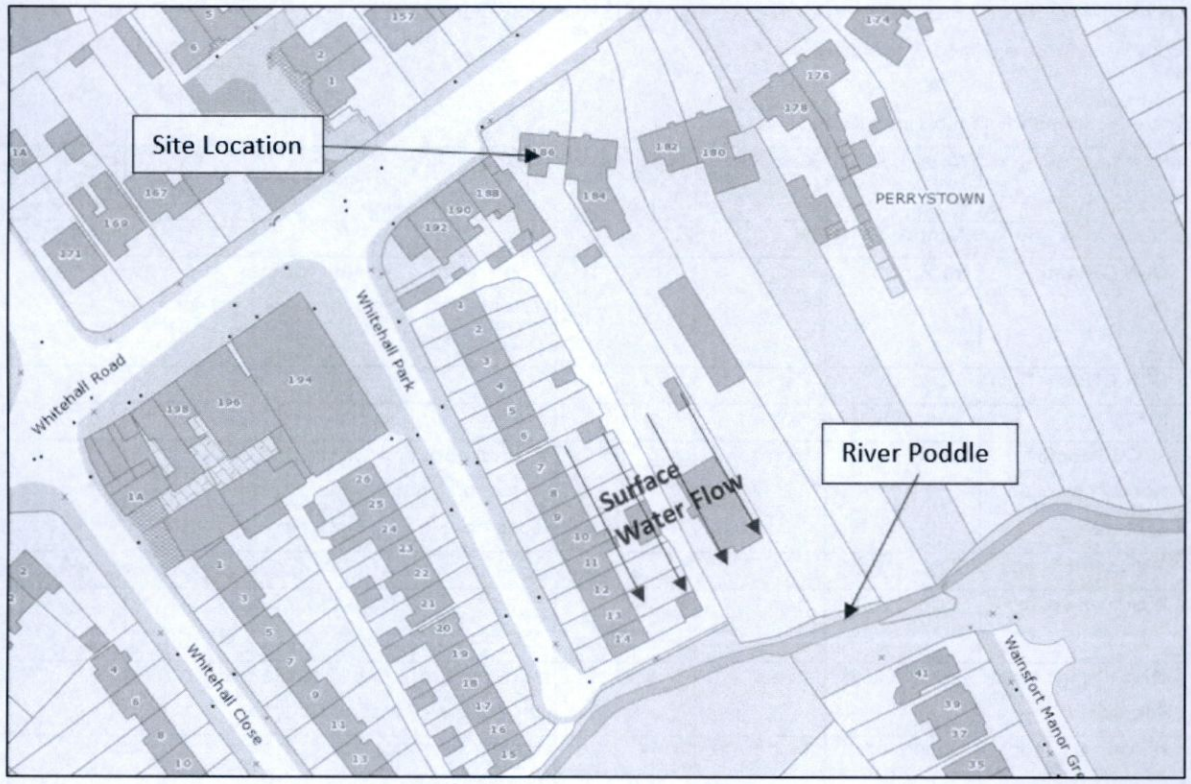
Groundwater Vulnerability Map (Moderate/High)	Aquifer Classification Map (Ll – Locally Important Aquifer)
	
Moderate/High Vulnerability	Locally Important Aquifer - Bedrock which is Generally Moderately Productive

(Source GSI mapping)

3.3 Affected Water bodies

During the survey carried out by Traynor Environmental Ltd of the existing site the following hydraulic features were noted. These hydraulic features are shown in Fig 6.0.

Figure 7 – Hydraulic Features in relation to proposed site.



4.0 STAGE 1 FLOOD RISK IDENTIFICATION

4.1 Available Flood Risk Information

The initial flood risk identification stage uses existing information to identify and confirm whether there may be flooding or surface water management issues for the lands in question that may warrant further investigation.

To initially identify potential flood risks for the existing site and surrounding area a number of available data sources were consulted, these are listed in table below.

Table 3 - Identify Potential Flood Risks

Information Source	Coverage	Quality	Confidence	Identified Flood Risks	Flood Risk
Primary Data Source & Modelled Data					
OPW CFRAM-Fluvial	Regional	High	High	Flood maps indicates that the extension is in Flood Zone A & B (at risk of fluvial flooding)	Yes
OPW CFRAM- Tidal	Regional	High	High	N/A	N/A
ICPSS	Nationwide	High	High	N/A	N/A
SDCC Poddle Flood Alleviation Scheme	Local	High	High	Floods maps indicate that the extension is not at risk of fluvial flooding following the works.	No
Secondary Data Source					
Walkover Survey	Local	High	High	River Poddle located to the south of the proposed site.	No
OPW Historic Flood Records	Nationwide	Varies	Varies	No records of flooding on site since the flood wall was constructed.	N/A
Historic OSI Maps	Nationwide	Moderate	Low	Historic OSI maps do not show flooding onsite	No
Drainage	County	Moderate	High	None	No
GSI Maps	Nationwide	Moderate	Low	Ground on site cohesive deposits (CLAY and SAND) groundwater table between 0.8m and 1.2m BGL.	N/A
Topographic Survey	Local	High	High	Site relatively flat with slight fall from north to south.	N/A

4.2 IDENTIFIED FLOOD RISKS/FLOOD SOURCES

3.2.1 OPW Predictive, Historic & Benefiting Lands Maps & Flood Hazard Information

From consultation of flood information from the Floodinfo.ie website the site vicinity of the site suffered from flooding in the past.

Fluvial Flood Risk

The OPW's Eastern CFRAM study, completed in October 2016, produced flood risk maps and the assessment of fluvial flood plains over the eastern region of Ireland. as part of this study the River Poddle was assessed, the site falls in the predicted fluvial flood model of the water course, as indicated in figure below.

Figure 8 - CFRAM Fluvial Flood Risk Map

Tidal Flood Risk

After reviewing the OPW ECFRAM coastal flood risk analysis, it can be seen that the subject site is not within the modelled flood extent.

Irish Coastal Protection Strategy Study (ICPSS)

After reviewing the ICPSS coastal flood extents analysis, it can be seen that the subject site is not within the modelled flood extent.

3.2.2 Walkover Survey

Following a walkover of the site and the localised stretch of the River Poddle it is clear that flood defences have been constructed along the fluvial bank of the River Poddle. These works were carried out since the completion of the CFRAM model and the 1 in 100 probability rainfall event of October 2016.

Figure 9 – Floods Defences at rear of Lismay Lodge along Bank of the River Poddle

Figure 10 – Floods Defences at rear of Lismay Lodge along Bank of the River Poddle

Figure 11 – Floods Defences at rear of 184 Whitehall Road along Bank of the River Poddle

3.2.3 – Other Sources

Other information sources were consulted to determine if there was any additional flood risk to the subject site, these included;

Existing Local Authority Drainage Records

Existing local authority records indicate that the fluvial bank of the River Poddle (at the rear of Limore Lodge, numbers 182 to 186 Whitehall road), as referenced above, was traditionally the pathway of the source receptor flood water onto Whitehall road as indicated in figure below.

Figure 12 Pathway of the Source Receptor Flood Water Onto Whitehall Road

There are two recent rainfall events of note.

September 2009: this rainfall event had an annual probability of 1 in 30. SDCC records indicate that only numbers 176, 178, 182 and 184 Whitehall road were flooded during this event. Figures below are photos taken during the 1 in 30 probability rainfall event of September 2009. They indicate the traditional pathway of source receptor flood water through the rear of 184 Whitehall Road.

Figure 13 - Front of Number 184 Whitehall Road in 2009 rainfall event

October 2011: This rainfall event had an annual probability of 1 in 100. SDCC records indicate that only numbers 3, 9, 19, 31, 106, 153, 176, 178 and 184 Whitehall Road were flooded during the event.

Historic Maps

no evidence of flooding or marsh areas within the site.

Soil Data From GSI

the entire site consists of made ground soils on gravels on clay.

Site Investigation

A groundwater table was recorded on site, ranging between 0.8m and 1.2m BGL.

Groundwater Information From GSI

There are no records of any karst features in the locality and there is no record of evidence of groundwater flooding for the proposed site.

Groundwater Information From OPW's Draft Preliminary Flood Risk Assessment

The flood risk map indicates no groundwater flood risk to the site or to the surrounding area.

5.0 Stage 2 Flood Risk Assessment Stage

The main sources of flood risk identified from stage I are:

- A high fluvial flood risk as per the opw's eastern CFRAM study, completed in 2016.
- A negligible groundwater flood risk associated with the groundwater levels encountered in the site investigation.
- A negligible risk of tidal flooding associated with an extreme sea level rise.

5.1 Justification Test

As per Paragraph 5.28 of the Planning Guidelines deals with minor proposals, referenced above, a justification test does not apply to minor developments such as 'extensions to existing houses'.

5.2 Mitigation Measures

5.2.1 Existing Localised Private Flood Defences:

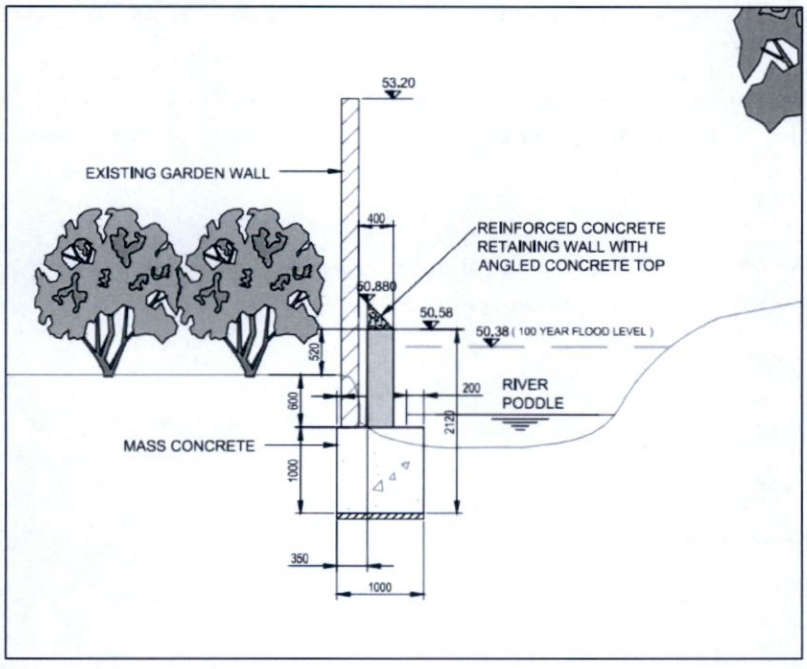
Construction of the private flood defence wall along the fluvial bank of the River Poddle (at the rear of numbers 182 to 186 Whitehall Road) since the completion of the OPW's eastern CFRAM study has greatly reduced the risk of surcharging flood waters.

5.2.2 RIVER PODDLE FLOOD ALLEVIATION SCHEME:

Please find attached an email from david grant, south Dublin county council's project resident engineer for the River Poddle flood alleviation scheme will provide fluvial protection to Whitehall Road and its environs". In particular, the scheme includes a flood defence wall along the River Poddle and to the rear of Whitehall Road, Whitehall Gardens and Whitehall Close. Figure below indicates the works.

Figure 14 - Lay Out Of River Poddle Flood Alleviation Scheme

Figure 15 – Section Through Proposed Retaining Wall



5.0 CONCLUSIONS

The SSFRA concludes the following;

- This Site-Specific Flood Risk Assessment for the proposed extension to an existing house was undertaken in accordance with the requirements of the "Planning System and Flood Risk Management Guidelines for Planning Authorities", November 2009 and the Paragraph 5.28 of the Planning Guidelines deals with minor proposals.

- The type of development is categorised as a minor proposal for a residential extension to an existing house and as such a Justification Test does not apply in accordance with Paragraph 5.28 of the Planning Guidelines deals with minor proposals.

- The proposed development will not have adverse impacts or impede access to a watercourse, floodplain or flood protection and management facilities in accordance with Paragraph 5.28 of the Planning Guidelines deals with minor proposals.

- Localised flood defences have been constructed since the completion of the OPW's Eastern CFRAM study and the 1 in 100 probability rainfall event of October 2011.

- The River Poddle Flood Alleviation Scheme is designed to alleviate a 1 in a 100 probability rainfall event and provide fluvial protection to Whitehall Road and its environs. Works to commence in 2020.

- The net surface water run off created by the proposed development will be diverted to an on-site soakaway. Integrating this Sustainable Drainage System (SuDS) will have the beneficial effect of not reducing the capacity of the existing combined public sewer.

- It is considered that the flood risk mitigation measures once fully implemented are sufficient to provide a suitable level of protection for the proposed development.

Signed:

Nevin Traynor

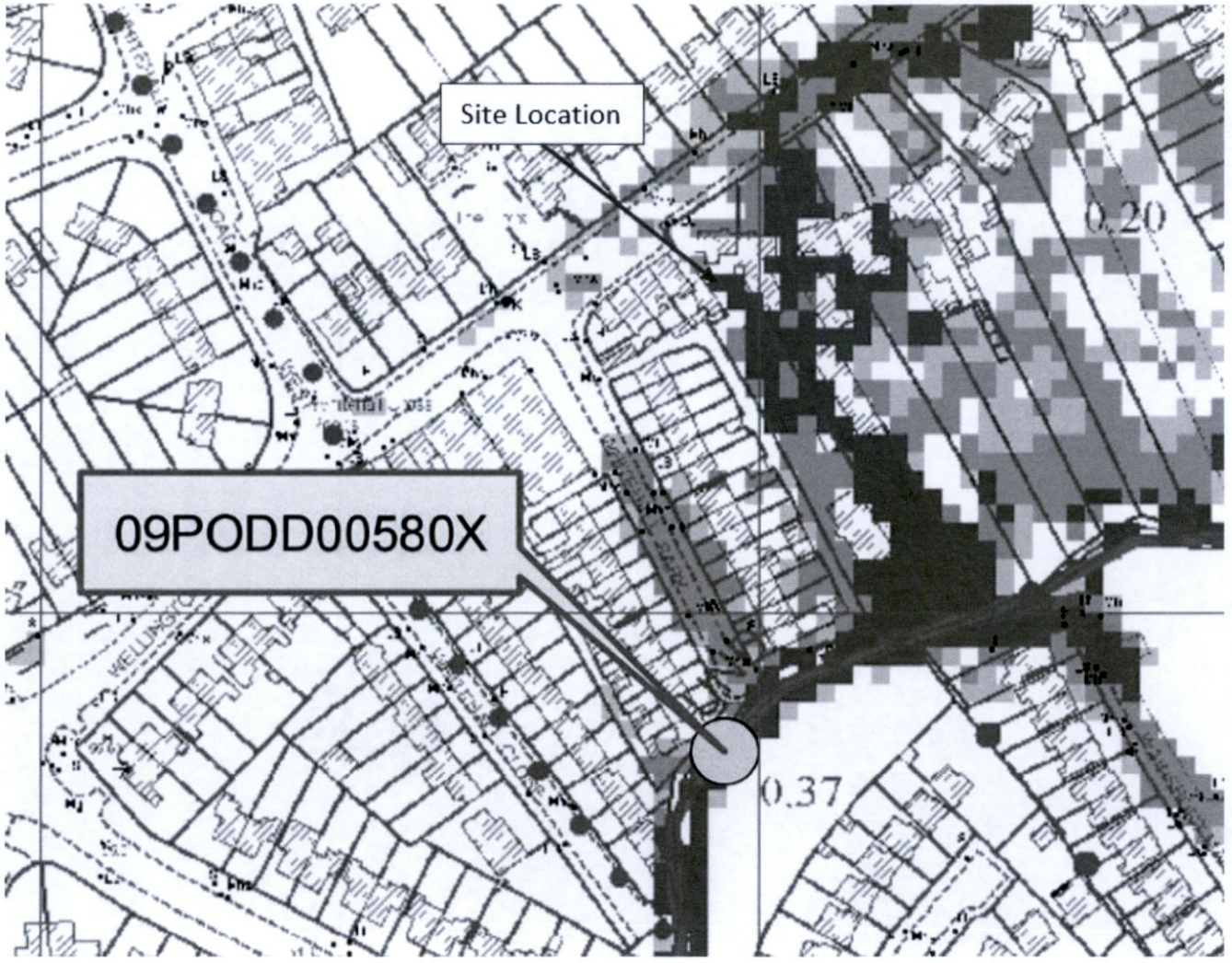
BSc. Env, H.Dip I.T, Cert SHWW.

For Traynor Environmental Ltd

FLOOD RISK ASSESSMENT
COMPLETED BY
TRAYNOR ENVIRONMENTAL LTD

APPENDIX A – CFRAM FLOOD MAPPING

Traynor Environmental Ltd.


Site Location
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FLOOD RISK ASSESSMENT

COMPLETED BY

TRAYNOR ENVIRONMENTAL LTD

APPENDIX B –OFFICE OF PUBLIC WORKS HISTORIC FLOOD REPORT

Traynor Environmental Ltd.


Site Location