



## Flood Risk Assessment Report

### Project:

Proposed Strategic  
Housing Development,  
Kenelm, Deer Park,  
Howth, Co. Dublin

## Document History

**Project** Proposed Strategic Housing Development, Kenelm, Deer Park, Howth, Co. Dublin

**Project No.** 19.196

**Document Title** Flood Risk Assessment Report

**Document No.** 19.196 – IR – 02

Issue	Date	Description	Orig.	PE	Issue Check
P1	21.06.2020	Issued for Pre-Application	DO'R	SO'C	SO'C
P2	20.05.2021	Issued for SHD Application	DO'R	SO'C	GH

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## 1. EXECUTIVE SUMMARY

- Barrett Mahony Consulting Engineers has been commissioned by GLL PRS Holdco Limited to undertake a Site Specific Flood Risk Assessment (SSFRA) to support the application for the proposed residential development at Deer Park, Howth, Co.Dublin.
- The Flood Risk Assessment (FRA) considers the current policy relating to flood risk, including the Operation of Public Works (OPW) publication “The Planning System and Flood Risk Assessment Guidelines for Planning Authorities”.
- The site is located in Flood Zone C for coastal flooding - “Irish Coastal Protection Strategy Study Phase III - North East Coast Flood Extent Map”
- The site is located in Flood Zone C for fluvial flooding – “RPS Strategic Flood Risk Assessment – Fluvial Flood Zone Mapping pg. 22”
- There is a stream located outside the site – The Bloody Stream – approx. 100 m from the site. The OPW list two flood events for that area, both a result of system blockage rather than system capacity.
- The development is classified as “less vulnerable”, as safe exit points from the building are above the 0.1% AEP plus HEFS. Office of Public Works (OPW) publication - Clause 2.16 of the OPW guidance document states:  
*‘The classification of different land uses and types of development as highly vulnerable, less vulnerable and water-compatible is influenced primarily by the ability to manage the safety of people in flood events and the long-term implications for recovery of the function and structure of buildings’.*
- The minimum finished floor levels for living and sleeping accommodation area must be above the 1 in 1000 year event HEFS (High End Future Scenario – OPW), which equals 3.340m plus 1 metre freeboard. In the proposed development habitable areas start at 8m OD, providing a freeboard of 4.66m.
- Groundwater was noted in all boreholes with levels ranging from 2.75m OD at the Howth Road side up to 6.50m OD at the higher southern end adjacent to the golf course. Boreholes 01 to 04 lie within the proposed building footprints, the ground water levels are noted at 2.75m OD to 5.25m OD which correlate to 5.25m and 2.75m below the proposed finished floor level at ground floor.
- The proposed development will utilize green roofs and perforated pipes to slow down the discharge of storm water into a proposed attenuation tank.
- In conclusion, this SSFRA demonstrates that the proposals are consistent with the aims of the Office of Public Works (OPW), Fingal County Council Development Plan 2017-2023 and are appropriate in the context of the flood guidelines.



## 2. INTRODUCTION

### 2.1 GENERAL DESCRIPTION

Barrett Mahony Consulting Engineers has been commissioned by GLL PRS Holdco Limited to undertake a Site Specific Flood Risk Assessment (SSFRA) to support the application for the proposed residential development at Deer Park, Howth, Co. Dublin.



Figure 2.1 - Site Location (indicative site boundary)



Figure 2 - Site Plan

## 2.2 DEVELOPMENT PROPOSAL

The proposed development will occur at a site bounded to the south by the Deer Park Golf Course, to the east by an access road that leads to Howth Castle, to the north by the Howth Road, and to the west by Private dwellings.

The proposed development currently sits on an undeveloped greenfield site. The proposed development will comprise of residential units, over a basement for parking. Blocks A, B and C with a height up to a maximum of six storeys of apartments over a basement for car parking. The development will consist of 162 no. residential units. The proposed development includes the provision for one vehicular entrance on to Howth Road, a separate pedestrian entrance to Howth Road, excavation of basement to provide for car parking, plant, waste storage and ancillary use. A total of 132 no. car parking spaces and 325 no. bicycle parking spaces are to be provided in the underground basement. One vehicular access is located to the northwest side of the development, serving the underground car parking spaces.

A publicly accessible walkway/cycleway to the northeast of the site shall be provided at podium level. Landscaping and walkways will be provided between Blocks.

The apartment blocks consist of 162 no. residential units, which includes 29 no. one bed, 104 no. two bed and 29 no. three bed apartments. The units will be served by balconies or terraces on west and east elevations.

The proposed development includes the provision of public and communal open space, green roofs, landscaping, boundary treatments, substations, meter rooms, waste management and all ancillary site works.

### 2.3 SCOPE OF THIS REPORT

The flood risks associated with the proposed development are addressed in this report and area based on existing available information at the time of writing the report. This report should be read in conjunction with the following drawings submitted with the application.

<b>PROJECT DELIVERABLE REGISTER (QPF06.01)</b>	
<b>Sheet 1</b>	
Drg. Ref.	Drawing Title
HOW-BMD-00-ZZ-DR-C1000	Proposed Site Layout
HOW-BMD-00-ZZ-DR-C1001	Proposed Road Layout / Sightlines
HOW-BMD-00-ZZ-DR-C1002	Proposed Basement Layout
HOW-BMD-00-ZZ-DR-C1010	Watermain Layout
HOW-BMD-00-ZZ-DR-C1020	Extended Site Plan: Foul & Surface Water Drainage Layout
HOW-BMD-00-ZZ-DR-C1021	Site Plan: Foul & Surface Water Drainage Layout
HOW-BMD-00-ZZ-DR-C1022	Roof Drainage Layout
HOW-BMD-00-ZZ-DR-C1023	SUDS Strategy Layout
HOW-BMD-00-ZZ-DR-C1040	Autotrack - Car
HOW-BMD-00-ZZ-DR-C1041	Autotrack - ESB Van
HOW-BMD-00-ZZ-DR-C1043	Autotrack - Refuse Vehicle
HOW-BMD-00-ZZ-DR-C1045	Autotrack - Fire truck
HOW-BMD-00-ZZ-DR-C1050	Site Sections
HOW-BMD-00-ZZ-DR-C1051	Basement Excavation Analysis
HOW-BMD-00-ZZ-DR-C1052	Basement Excavation Analysis Site Sections
HOW-BMD-00-ZZ-DR-C1100	Drainage Schematic Sections
HOW-BMD-00-ZZ-DR-C1101	Drainage Sections Sheet 1
HOW-BMD-00-ZZ-DR-C1102	Drainage Sections Sheet 2
HOW-BMD-00-ZZ-DR-C1210	Standard Road Details
Doc. Ref.	Document Title
19.196-IR-01	Infrastructure Report
19.196-IR-02	Flood Risk Assessment Report
19.196-IR-03	Mobility Management Report
19.196-IR-04	Traffic Assessment Report
19.196-IR-05	DMURS Statement of Compliance
19.196-IR-06	Construction Environmental Management Plan

### 3. SITE SPECIFIC FLOOD RISK ASSESSMENT

#### 3.1 INTRODUCTION

The main focus of this report is to investigate the flood risk associated with the Irish Sea and the Bloody Stream.

The assessment is carried out in accordance with guidelines outlined in the OPW publication “The Planning System and Flood Risk Assessment Guidelines for Planning Authorities”. The stages involved in the assessment of flood risk are listed in that publication as follows:

Stage 1: Flood Risk Identification

Stage 2: Initial Flood Risk Assessment

Stage 3: Detailed Flood Risk Assessment

The OPW publication also outlines a Sequential Approach for determining whether a particular development is appropriate for a specified location in terms of flood risk. The categorization of the subject site in terms of the OPW’s sequential approach is further outlined in section 3.3 below.

#### 3.2 STAGE 1: FLOOD RISK IDENTIFICATION

Stage 1 identifies whether there are any flooding or surface water management issues related to the site i.e. it identifies whether a flood risk assessment is required.

- 1) Irish Coastal Protection Strategy Study Phase III - North East Coast Flood Extent Map identify the site as Flood Zone C – the lowest probability of coastal flooding. (Appendix II)
- 2) RPS Strategic Flood Risk Assessment – Fluvial Flood Zone Mapping (Appendix II) – Identify the site as Flood Zone C- the lowest probability of fluvial flooding.
- 3) The OPW map report for the site area (included in Appendix I) identifies 2 flood events near the site in recent history, both between October and November of 2002. One report discusses flooding in the old Techrete grounds approximately 200m north east across from the site. The other reports flooding of a nearby pub, The Bloody Stream Pub, which is approximately half a kilometer to the north east of the site. Both incidents are a result of system blockages rather than system capacity. There have been no further reports of flooding. It must be noted that these flood events occurred at an approximate level of 5.000m OD, the proposed site has a ground floor FFL level of 8.000m OD, approx 3m higher than the events.

#### 3.3 STAGE 2: INITIAL FLOOD RISK ASSESSMENT

Clause 2.16 of the OPW guidance document ‘The Planning System and Flood Risk Management’

*“The initial Flood Risk Assessment should ensure that all relevant flood risk issues are assessed in relation to the decisions to be made and potential conflicts between flood risk and development are addressed. It should assess the adequacy of existing information and any flood defenses.”*

As outlined in the OPW publication, new developments are divided into three categories which are as follows:

- ‘Highly Vulnerable Development’ – hospitals, schools, houses, student halls of residence etc.;

- ‘Less Vulnerable Development’ – retail, commercial, industrial, agriculture etc.; and
- ‘Water-compatible Development’ – docks, marinas, amenity open space etc.

The proposed development can be categorized as a highly vulnerable development. The ground floor and basement are above the 1 in 1000 year event, 3.341m OD. The proposed level of the basement is 3.95 OD. The ground floor level will provide direct access to the Howth Road and is set at 8m OD, providing a freeboard of 4.66m. These units are not seen as a flood risk as they have direct access to Howth Road which varies around 7.0m OD. The escape route is higher than the 1 in 1000 year event, 3.34m OD and therefore not seen as a flood risk.

This rationale is allowed in Clause 2.16 of the OPW guidance document ‘The Planning System and Flood Risk Management’ which states;

*‘The classification of different land uses and types of development as highly vulnerable, less vulnerable and water-compatible is influenced primarily by the ability to manage the safety of people in flood events and the long-term implications for recovery of the function and structure of buildings’*

The later part is not a concern in the context of the overall site, given that the lower areas are parking facilities.

Geographical areas are similarly divided into three categories, based on their risk of river and tidal flooding. The three categories are as follows:

- Flood Zone A – where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding).
- Flood Zone B – where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding).
- Flood Zone C – where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding i.e. all areas which are not within zone A or B).

Irish Coastal Protection Strategy Study and the RPS Fluvial Flood Risk Assessment both put the Site in the Flood Zone C category. (Appendix II)

The matrix below, which is an extract from the OPW document, states whether a project is deemed ‘Appropriate’ for a geographical location. This development falls into the “Appropriate” category and a justification test is not required.

	<b>Flood Zone A</b>	<b>Flood Zone B</b>	<b>Flood Zone C</b>
<b>Highly vulnerable development</b>	Justification Test	Justification Test	<b><u>Appropriate</u></b>
<b>Less vulnerable development</b>	Justification Test	Appropriate	Appropriate
<b>Water compatible development</b>	Appropriate	Appropriate	Appropriate

Figure 3 –Matrix of vulnerability versus flood zone

### 3.3.1 Appraisal of the availability and adequacy of existing information

- 1) Flood Zone - The possibility of Fluvial flooding on the site is considered utilizing the guidelines outlined in Chapter 3 of the OPW publication referenced in section 3.1,



Strategic Flood Risk Assessment for Fingal Development Plan. The relevant map is contained in Appendix I and shows that the site is located outside of the 1 in 1000 year event.

- 2) Good data is available on possible flooding of the surrounding area to the site in the Irish Coastal Protection Strategy Study – Phase III. The map details the North East Coast Flood Extent and is also included in Appendix I and shows the site is located outside the 1 in 1000 year event.
- 3) Ground Water Level – A site investigation has been carried out to determine existing ground water levels. The site investigation report is included as a standalone report in this application.

The above information meets the standards required for a detailed assessment.

### 3.3.2 Determination of what technical studies are appropriate

Given the comprehensive nature of the existing information available regarding flooding, it is not considered necessary to carry out further analysis of fluvial or tidal flooding or of the sewer network serving the area.

### 3.3.3 Examination of potential flooding sources that can affect the site

The possible sources of flood water are assessed in the following tables below using the “**Source – Pathway – Receptor Model**” for the existing site and proposed scheme.

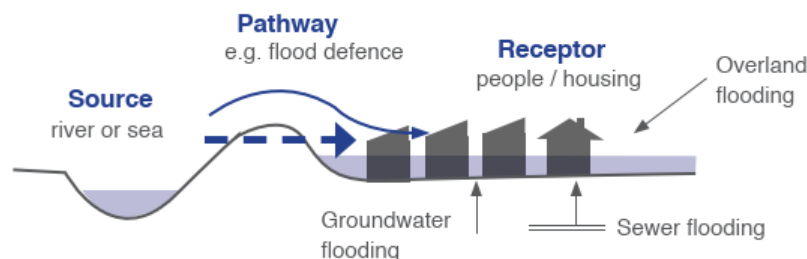


Figure 4- Source Pathway - Receptor Model (OPW)

#### 3.3.3.1 Proposed Scheme

##### **Possible sources of flood water**

Source	Pathway	Receptor	Likelihood	Consequence	Risk
Tidal	Overtop Breach	People Property	Very unlikely	High	Low
Fluvial	Overtop Breach	People Property	Possible	High	Low
Pluvial Surface water Snow Melt	Overflow/ Blockage	People Property	Possible	Low	Low
Groundwater	Rising groundwater levels	People Property	Unlikely	medium	Low
Embankment Breach	Bank Failure/Slippage	People Property	Unlikely	Low	Low

Watermain Burst	Excavation Works	People Property	Likely	Low	Low
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Table 2 - Existing Site Sources of flood Water

Tidal

The closest location of the coast to the site is approximately 150m to the north. The coast itself is protected by the existing promenade and DART line defense wall. The promenade is at 2.8m OD and the defense wall at 5.1m OD, therefore providing a freeboard of 2.3m. (Figure 5 – Current Sea Defense). The proposed site itself is on higher ground and has a ground floor level FFL of 8.0m OD. Therefore, the current likelihood of flooding on the proposed site is very unlikely.

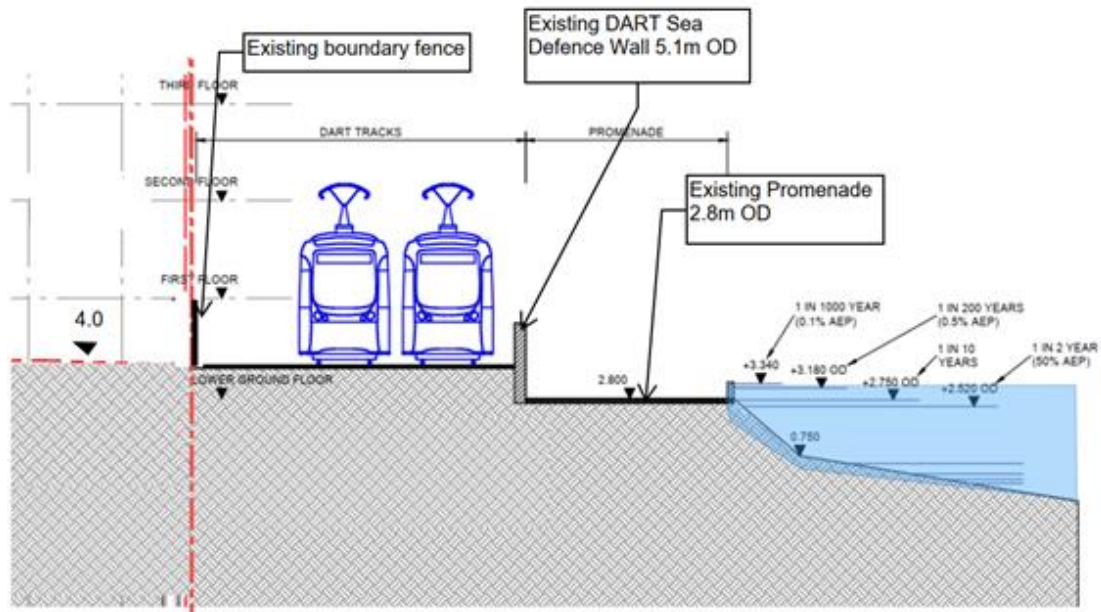


Figure 5 – Current Sea Defense

Fluvial/Pluvial

The Bloody stream route as shown in Figure 6 below, does not culvert across the proposed site. Site boundary shown indicatively in red.



Figure 6 – Approximate Bloody Stream Route (source [gis.epa.ie/EPAMaps](http://gis.epa.ie/EPAMaps))

Surface water drainage is designed for a 1 in 100-year event and a factor of 20% has been added for climate change. To minimise flooding due to blockage, regular maintenance will be carried out by the management company. Drainage design is detailed in the Civil Infrastructure Report completed by Barrett Mahony Consulting Engineers, document no. 19.196-IR-01.

#### Ground Water

The site is approximately 150m away from the Irish Sea to the north, some tidal response in respect to rising sea levels is expected to influence the water table. The borehole logs that are located within the proposed building footprint (BH 01, 02 & 04), which are included in the standalone site investigation report identifies that groundwater levels were noted to range from 2.75m OD to 5.25m OD, therefore, with the proposed ground floor FFL set at 8.00m OD, current freeboard varies between 2.75-5.25m. In order to protect the basement car park from ground water ingress, it is proposed to provide a tanking system to the reinforced concrete retaining walls.

#### Embankment

Refer to Tidal

#### Watermain Burst

Excess water would disperse throughout the external landscape area that contains the permeable paving and landscape build ups. The water would then enter the surface water drainage infrastructure.

### **3.4 STAGE 3: DETAILED FLOOD RISK ASSESSMENT**

A detailed Site Specific Flood Risk Assessment involves the estimation of the level of flooding on the site and the performance of the development under these conditions so that a “fit for purpose” development can be delivered. Once the likely maximum flood level has been estimated, the design should be developed so that as much floor area as possible



is above this level. Residual flood risk will remain in other areas that for operational reasons have to be below the maximum flood level (street access, bin stores, etc.) and these areas will have to incorporate flood resilient design features and flood risk management procedures so that the risk is mitigated in so far as possible.

#### 3.4.1 Blockage of the surface water drainage system on site

In the unlikely event of a full blockage of the surface water system before or during a storm event, the water will build up in the pipe system and discharge back into the ground level SuDS devices – permeable paving, rain gardens, bio-retention areas and soft landscaping.

#### 3.4.2 Overland flows from adjacent areas.

The site is bounded by Howth Road to the north, Deer Park Golf Course to the south, a private dwelling to the west and the existing access road to Howth Castle to the east. The ground levels within the development are approximately 1m higher than the adjacent public road, Howth Road, preventing any water from these roads entering the development. The areas directly adjacent to the south, east and west are green areas where no overland flows are expected.

#### 3.4.3 The Bloody Stream

The Bloody Stream route is located approximately 100m to the east and does not interact with the proposed site, therefore any flooding of this stream would not enter the site as it is separated by the west boundary of St. Marys Church and the access road to Howth Castle which would divert any flood water towards Howth Road.

#### 4. CONCLUSION

The Site Specific Flood Risk Assessment has been carried out in accordance with the OPW publication “The Planning System and Flood Risk Assessment Guidelines for Planning Authorities”.

The site according to the OPW and RPS for fluvial and Coastal flooding show the site to be in Zone C.

The development is to be a residential development with sleeping and living quarters starting at 8.00m OD. The living areas can safely be evacuated at podium level (8.00mOD) and have direct access to Howth road. The proposed development is designated as a ‘highly vulnerable development’ and is located within Flood Zone C. Therefore, as per the matrix stated in the OPW document, the proposed development would be deemed ‘Appropriate’ for its geographical location and a justification test is not required.

The site is approximately 150m away from the Irish Sea to the north but protected by the existing DART Sea defence wall and the promenade.

There is no risk of flooding affecting the site from the 1 in 1000 year fluvial flood zone mapping and coastal flood map extent.

The surface water attenuation system has been designed for a 1 in 100 year storm with an allowance of 20% for climate change.

All of the above ensures the risk of flooding is reduced and measures have been incorporated to ensure excess water is handled correctly and diverted away from the development.

The likelihood of flooding on site is low from either Tidal, Fluvial, Pluvial Surface Water or Groundwater.

Therefore, it can be seen from the above the proposed development is in a low risk flood zone and is acceptable for residential development.

APPENDIX I

Flood Reports – OPW

(A)

## FLOODING IN NORTH COUNTY ON 20<sup>TH</sup> & 21<sup>ST</sup> OCT '02

### Weather Conditions:

Met Eireann issued a weather warning with the following:

- 30mm – 60mm of rainfall from Sun 20<sup>th</sup> – Tue 22<sup>nd</sup> Oct.
- Winds of 55-70 mph.
- Leinster & Munster will worst affected.

### Drainage Areas Affected by Surface Water:

#### *Swords Area*

##### 1) Pinnock Hill:

The surface water screens in \_\_\_\_\_ property are unable to take the volume of surface water and overflowed (see Area Engineer report 10/2/01), this in turn floods the Little Chef. In order to prevent flooding of Little Chef the surface water is diverted on to Dublin/Belfast Road as can be seen from photographs. The Drainage Section provided sandbags to the Little Chef.



Flooding of Dublin/Belfast Roundabout at Little Chef

2) The Drive, Melrose Park, Swords.

It appears that the development in Organon has stopped the progress of a surface water ditch. This then overflows and floods wasteland between Organon and Melrose Park and resulted in the flooding of No.18 The Drive.

*Malahide Area*

1) Biscayne, Coast Road.

Surface water run off flowed into sea, with large quantities of silt. This also caused the Coast Road to be flooded in areas.



Surface water run-off in vicinity of Biscayne, Coast Road.

*Portmarnock Area*

1) Strand Road.

Flooding occurred on the Strand Road because gullies did not function properly. The gullies are connected to soakaways, as a gravity system is not available, which have become blocked.

### *Kinsaley Area*

#### 1) Cul-de-sac off Kinsaley Lane.

Two houses on this road were flooded due to the overflowing of the Sluice River. The Drainage Section provided sandbags, but were unable to prevent river water entering the houses.



Flooding of houses just off Kinsaley Lane

The level of the floodwater from the river was over a foot in the houses. The river also flooded the following roads:-

- (a) Chapel Road
- (b) Kinsaley Lane
- (c) Junction of Drimnigh Road/The Hill
- (d) Station Road

### *Howth Area*

#### 1) The Bloody Stream Pub.

The pub is built over a culvert with a manhole at ground floor level. The culvert is blocked solid with material (silt, debris, etc.) to the outfall, some 200meters. There does not appear to be any manholes other than the one under the pub. For this reason it is extremely difficult to clean or even identify the line of the culvert. The Drainage Section tried, with sandbags and a 6" pump, but were unable to prevent surface water from the manhole entering the pub on the night of Monday the 21<sup>st</sup> Oct.

2) Techcrete

This is located close to The Bloody Stream Pub and the surface water line surcharged and flooded the entire yard. S.W entered the building, but the Drainage Section provided sandbags to prevent water from entering offices. The Drainage Section are carrying out an investigation as to the cause of surcharging, but as records of drainage layout are poor it may be sometime before we have results.

*Baldoyle Area*

1) The Grange Road

The surface water screens in Seagrang Park were obstructed with material, which contributed to the flooding of the Grange Road. The main cause of the flooding was blocked gullies. The Drainage Section provided sandbags to some houses on Brookstone Road to prevent surface water from the road entering the house.



Surface Water Screen at Seagrang Park, Baldoyle.



### *Drainage Areas Affected by Foul Sewer:*

#### *Swords Area*

1) Dubber Cross, Meakstown

The pumping Station in Dubber Cross was flooded with surface water from a nearby ditch. The S.W. entered the sump via the overflow and flooded the garden and around house with foul sewer. The Drainage Section provided a tanker to remove loads from the sump in an effort to lower the level.

#### *Malahide Area*

1) The Coast Road.

Manhole covers lifted due to the surcharging of the foul sewer. The Coast Road was flooded and due to the fact that the gullies were blocked. The Drainage Section used a 6" pump in an effort to reduce F.S. from the system and pumped into the sea. They also unblocked gullies, which eliminated the flooding on the road.

2) Seabank Court.

The gardens of 3 No. houses (in gardens) were flooded with F.S. as a result of the surcharging of the Coast Road. A clean up was carried out on all premises.

3) 14A Parnell Cottages.

The F.S. in this area became surcharged. The manhole from this house is at a low point and was a release for the F.S. The Drainage Section carried out a clean up of the flooding around the house.

4) The Bawn.

This is upstream of Parnell Cottages and the rising mains from Connelly Ave. & Castlefield Manor. The lines surcharge and cause F.S. flooding around a number of houses, the Drairage Section carries out clean ups.

#### *Howth Area*

1) The Gem Shop, Harbour Road.

The F.S. became surcharged and caused flooding around the outside of shop. The Drainage Section provided sandbags. The flooding may have been prevented if an overflow on the F.S. was in operation outside the St. Laurence Hotel. This overflow has been damaged for a number of months, by a private contractor and the Drainage Section are to carry out a repair immediately.



*Skerries Area*

1) Hoar Rock

Due to the volume of F.S. being pumped from the pumping station in Kelly's Bay, a section of the gravity line in Hoar Rock surcharged. This caused flooding around a house, which is located at the low point. The Fire Brigade pumped the F.S. from around the house and the Drainage Section provided sandbags.

*Sutton Area*

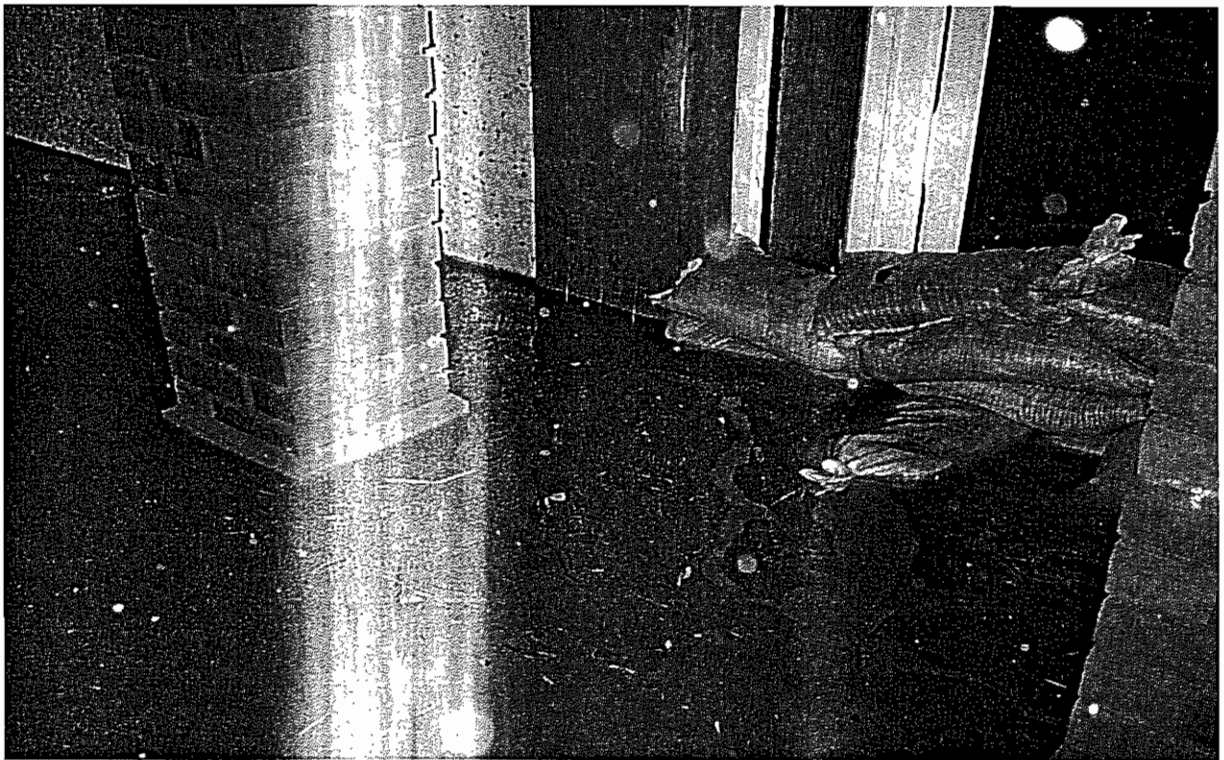
1) No.17 Dublin Road.

There appears to have been some F.S. flooding in the drive of this premises and the Drainage Section are carrying out an investigation as to its cause.

**ADDITIONAL PHOTOGRAPHS OF**  
**FLOODED AREAS**



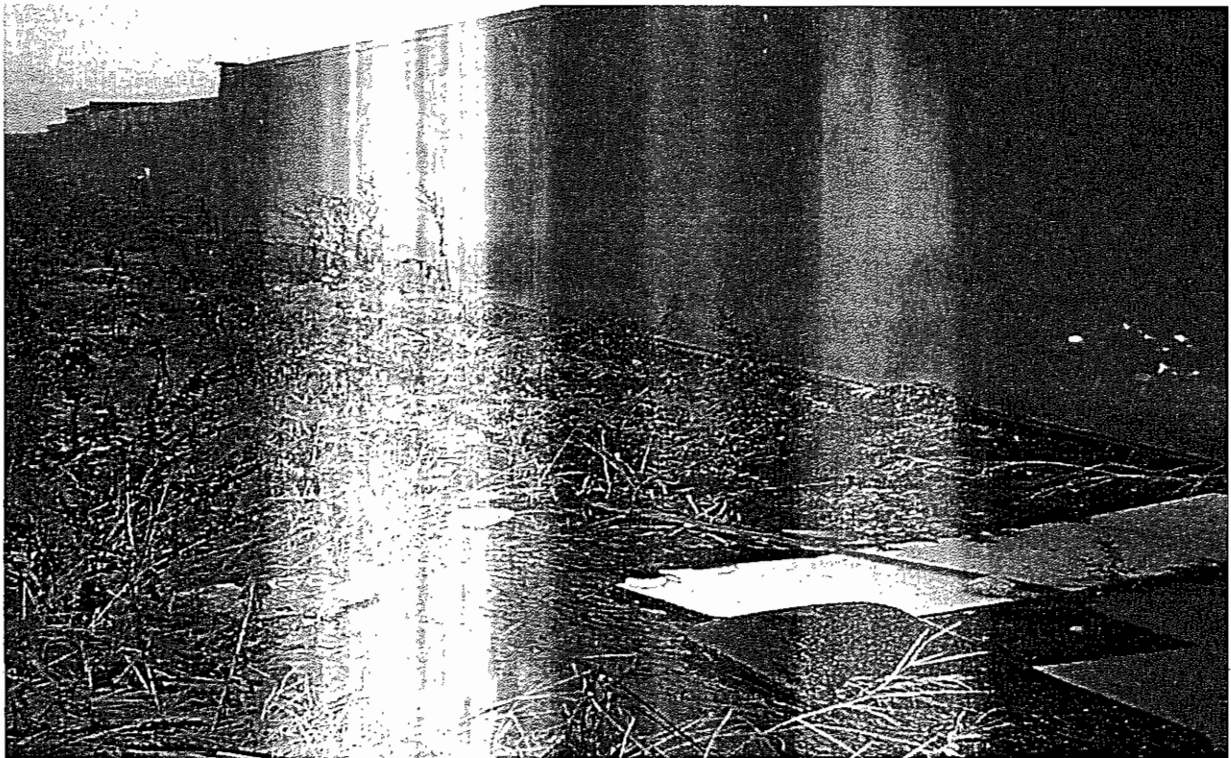
Flooding at Little Chef



Flooding at house off Kinsaley Lane



Flooding at Wasteland between Organon & Melrose Drive



Flooding at Wasteland to Rear of No.18 The Drive, Melrose Park

**Report on Flooding in North County Dublin**  
**November 14<sup>th</sup> & 15<sup>th</sup>, 2002**

Weather Conditions:

Met Eireann issued a weather warning with the following:

- Up to 50mm of rainfall from Thurs 14<sup>th</sup> – Fri 15<sup>th</sup> Nov, 2002.

Drainage Areas Affected by Surface Water:

*Swords Area*

1) North Street:

At approximately 11:30pm on Thursday night The Ward River overflowed into the park adjacent to North Street and flooded the Road between North St. and Watery Lane.

The flooding of the premises occurred instantly and although the Drainage Section were present on Thursday night, but could not prevent the flooding occurring. On Friday morning a crew pumped the water from the road to the river and unblocked the road gullies.

**Flooding in Estuary Pub & two other premises.**



Flooding at North Street/Watery Lane, Swords.



2) Pinnock Hill:

The surface water screens in \_\_\_\_\_ property are unable to take the volume of surface water and overflowed (see Area Engineer report 10/2/01), this in turn floods the Little Chef. In order to prevent flooding of Little Chef the surface water was diverted on to Dublin/Belfast Road.

3) Santry Close:

The culvert on the Santry River at the Old Swords Road was unable to take the quantity of water in the river and overflowed. It flowed from the Old Swords Road into Santry Close, which was under one and a half feet of water.

The Drainage Section provided a 6" Whispa pump and hoses to Santry Close at approximately 8:30pm on Thursday. The Roads Section provided a crew to man the pump.

**1No. house flooded internally, flooding in grounds of several houses.**

4) Ballyboughal Road:

A stream runs through a new Golf course adjacent to the Ballyboughil Road. The culvert under the road was unable to cater for the volumes of water and flooded the main road, which in turn caused flooded around 1No. house.

5) *Dubber Cross, Meakestown:*

The ditch adjacent to the pump station overflowed into the station. The volume of water in the ditch was unable to flow through the pipes under the road. The Drainage Section had a gully sucker to reduce the level in the ditch.

*Donabate/Portrane/Rush Areas*

1) Portrane Treatment Plant:

The Treatment Plant in Portrane was unable to take the large quantities of material from Donabate/Portrane catchment. Pumping Station No.4, which comes from the hospital was shut off and put into overflow.



S.W. flooding at Railway in Ballisk.

2) Ballisk, Donabate:

Surface water floods the road under the main Dublin-Belfast railway line. The S.W. is overflowing from ditch onto the road and also causes the foul sewer to surcharge. The Drainage Section cut an open channel from the road to a dry ditch, with a J.C.B, which solved the problem. The drives of a number of houses were flooded and the use of toilets was not possible.

3) Hearst Road, Donabate:

There was major flooding on the Hearst Road.

**4No. houses on Hearst Road, flooded.**

4) Beaverstown:

A large number of fields in the Beaverstown Area were flooded due to the heavy rains.

5) Rush:

Road Flooding

- Spout Road: Very bad flooding; Impossible.
- Whitestown Road at Graveyard: Very bad flooding.
- Skerries Road: Very bad flooding; Impossible.
- Lusk-Rush Road: Very bad flooding; Impossible.
- Ministers Lane/Killhedge Lane Very bad flooding; Impossible.



### *Malahide Area*

#### 1) Coast Road:

The foul sewer on St. James Terrace and Coast Road was surcharged, which caused F.S. flooding around shop & a number of houses in Seabank Court. The Drainage Section provided a 4" pump at St. James Terrace to pump F.S. from system to sea, to reduce pressure on system. A clean-up was carried out at Seabank Court.

### *Howth Area*

#### 1) The Bloody Stream:

The surface water culvert at the Bloody Stream Pub was surcharged and was in danger of flooding the pub. The Drainage Section provided a 6" pump to keep the level in the culvert down.

### *Balbriggan Area*

#### 1) Covetown:

The foul sewer on Drogheda Street became surcharged and caused F.S. flooding on the roads and drives of Covetown. The overflow on the foul sewer at the Stream at St. Moliga's National School was in full operation. The F.S. was close to overflowing in the toilet of house opposite National School.

#### 2) Bath Road:

There was surface water flooding in the vicinity of the Railway bridge on Bath Road. The S.W. drainage was unable to take the water away.

### *Skerries Area*

#### 1) Millers Lane:

Millers Lane was closed due to surface water flooding. The foul sewer became surcharged, but it is not known if this is as a direct result of the road flooding. In the past No.2 Millers Lane was flooded with F.S. when the main sewer became surcharged, but it did not occur on this occasion as a result of network improvements by the Drainage Section. The Drainage Section had a J.C.B. removing pond weed from the Mill Stream and clearing the outfall on the beach.

## ***Drainage Operations on Thursday 14<sup>th</sup> November***

### **Staff:**

8:30am – 5:00pm	8No. Drainage Maintenance crew
8:30am – 12:00am	4No. Drainage Maintenance Crew 7No. Direct Labour Crew
8:30am – 3:00am	2No. Drainage Maintenance Crew
8:30am – 4:00am	3No. Drainage Maintenance Crew

### **Works:**

1. Sewer Crew	Clearing blockages & chokes
2. Crew	Delivering sandbags & clearing screens
3. Crew	Delivering sandbags & clearing screens
4. Crew	With 6” pump at The Bloody Stream, Howth
5. Crew	Filling Sandbags
6. Gullysucker	Dubber Cross Pumping Station
7. Jetter	Forest Road, Swords; Portrane
8. J.C.B.'s	No.1 North County clearing outfalls, culverts. No.2 South County clearing outfalls, culverts & screens. No.3 Filling sandbags in Depot.

## ***Drainage Operations on Friday 15<sup>th</sup> November***

### **Staff:**

Not at work (worked late Thursday) 5No. Drainage Maintenance

8:30am – 3:00pm 6No. Drainage Maintenance crew

4:00am – 4:00pm 2No. Drainage Maintenance crew

8:30am – 12:00pm 5No. Drainage Maintenance crew

8:30am – 6:00pm 6No. Direct Labour Crew

8:30am – 12:00am 1No. Direct Labour Crew

3:00pm – 12:00am 2No. Environment Section

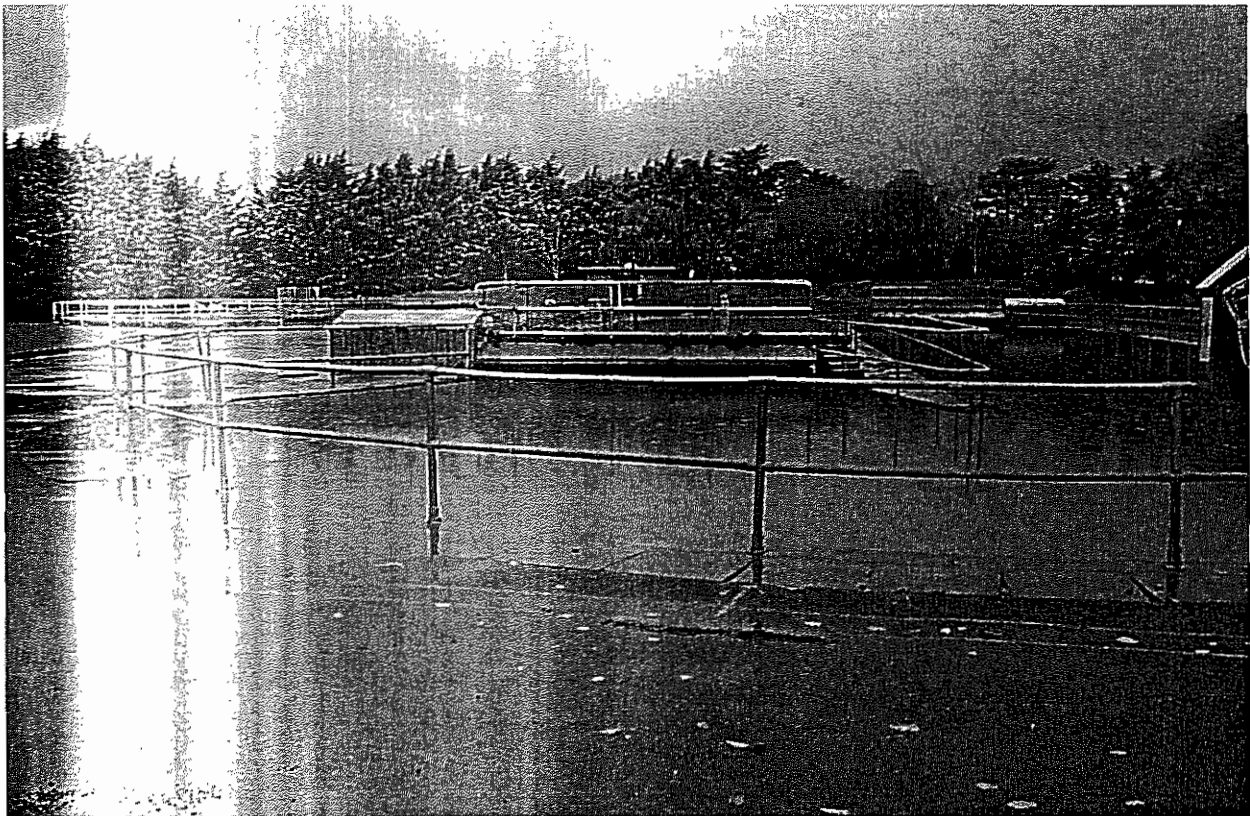
### **Work:**

1. Sewer Crew Clearing blockages & chokes
2. Crew Clearing screens & clean-ups
3. Crew With 6” pump at The Bloody Stream, Howth
4. Crew 4” pump at Estuary Pub, North Street.
5. Crew Delivering sandbags
6. Crew Filling sandbags
7. Jetter Main sewer chokes
8. J.C.B. No.1 Portmarnock Bridge Sluice Gates  
No.2 Clearing outfalls

*Photographs of Flooding Areas*



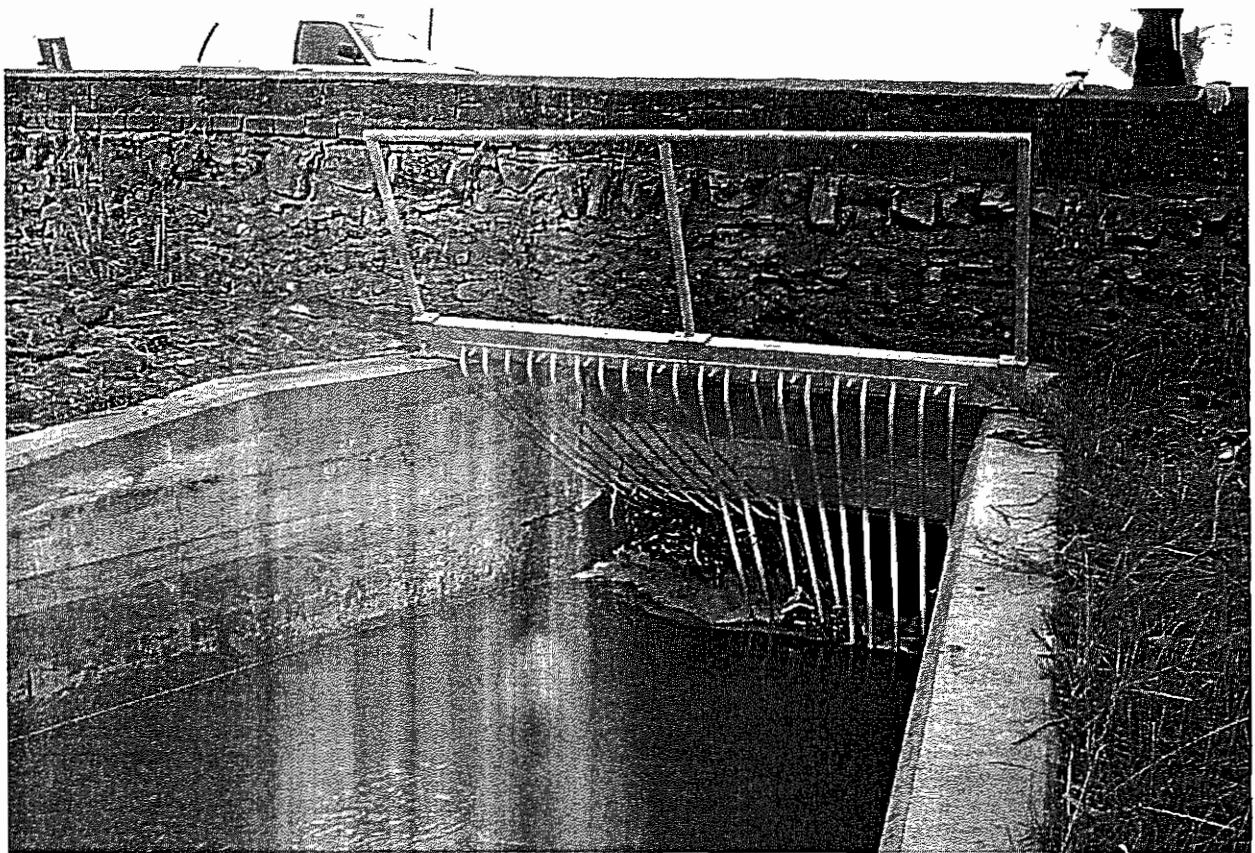
Sluice Gates at Portmarnock Bridge



Flooding of Ditch in Portrane Treatment Plant



Surcharging of Foul Sewer on Kinsaley Lane



Damaged Second Screen at Moyne Bridge

## APPENDIX II

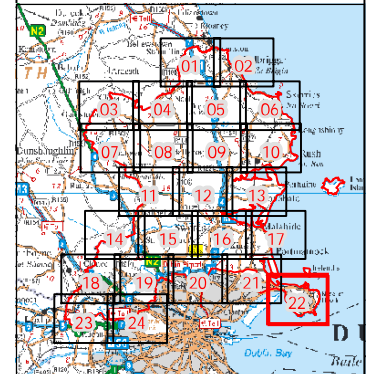
### Fluvial Flood Plan & Coastal Flood Plan





### Legend

- Fingal County Boundary
- Watercourse Centreline
- Defended Area
- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Indicative Flood Extents



Client

**Comhairle Contae Fhine Gall**  
Fingal County Council

Project  
**Strategic Flood Risk Assessment**

Title  
**Fluvial Flood Zone Mapping**

Figure  
Map 22 of 24

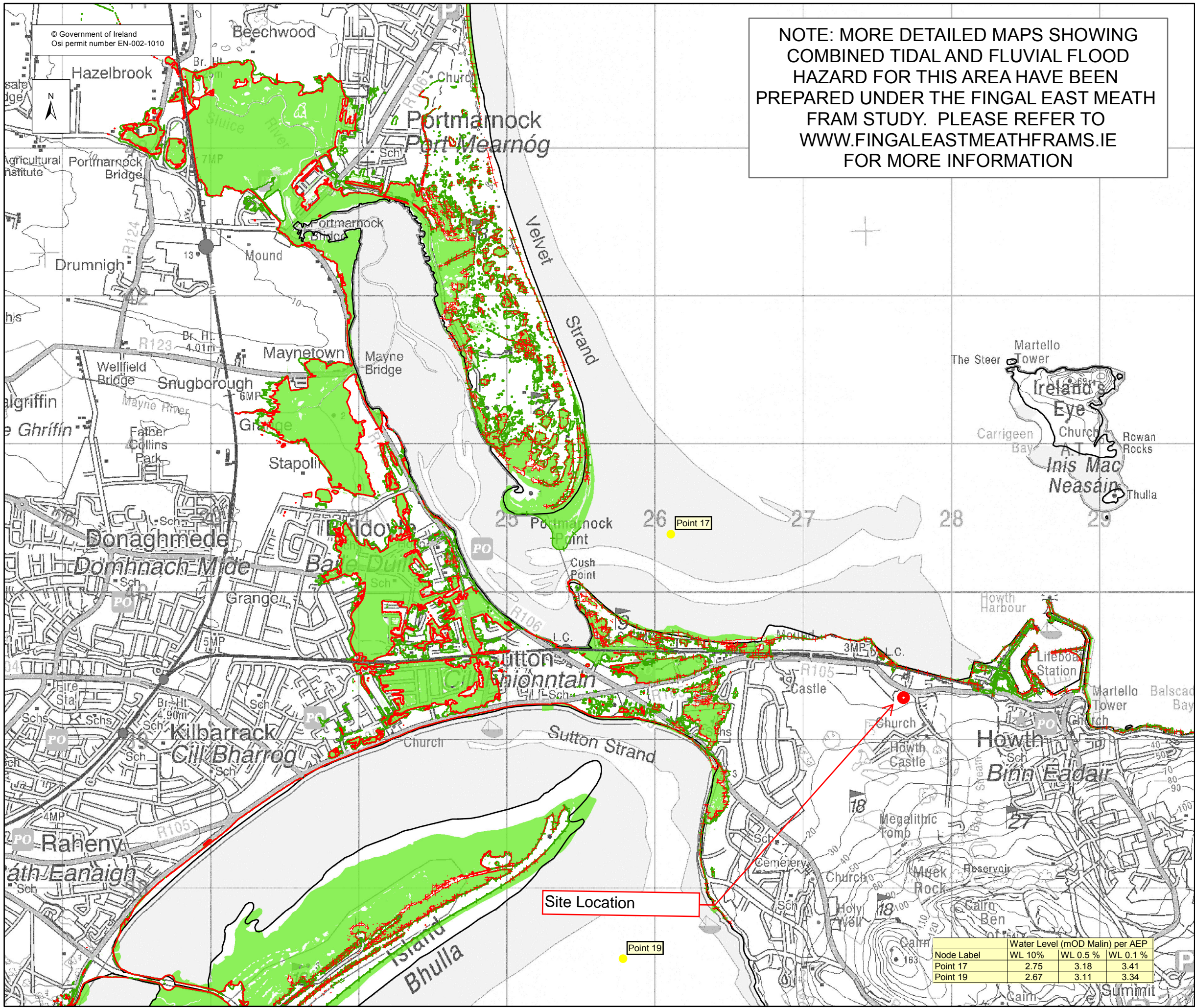
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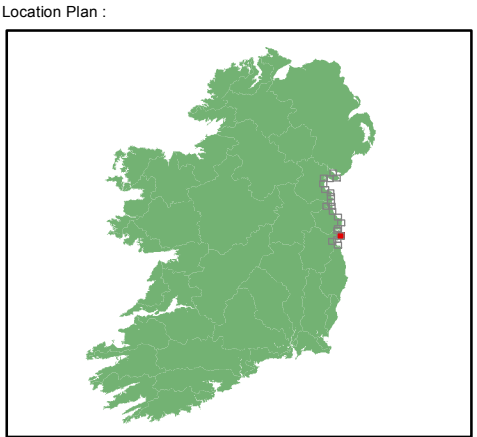
Issue Details			
Drawn By: HF	Project No. MDW0716		
Checked By: BT	File Ref:		
Approved By: SK	MDW0716:001D02	Drawing No.	Rev:
Scale: 1:20,000 @ A3		Arc0001	001
Date: 02/12/2015			

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2. All levels are referred to Ordnance Datum, Mean High.  
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NOTE: MORE DETAILED MAPS SHOWING COMBINED TIDAL AND FLUVIAL FLOOD HAZARD FOR THIS AREA HAVE BEEN PREPARED UNDER THE FINGAL EAST MEATH FRAM STUDY. PLEASE REFER TO [WWW.FINGALEASTMEATHFRAMS.IE](http://WWW.FINGALEASTMEATHFRAMS.IE) FOR MORE INFORMATION



**EXTENT MAP**

Legend:

- 0.5% AEP FLOOD EXTENT (1 in 200 chance in any given year)
- 0.1% AEP FLOOD EXTENT (1 in 1000 chance in any given year)
- Very High Confidence (0.1% AEP)
- High Confidence (0.1% AEP)
- Medium Confidence (0.1% AEP)
- Low Confidence (0.1% AEP)
- Very Low Confidence (0.1% AEP)
- Very High Confidence (0.5% AEP)
- High Confidence (0.5% AEP)
- Medium Confidence (0.5% AEP)
- Low Confidence (0.5% AEP)
- Very Low Confidence (0.5% AEP)
- High Water Mark (HWM)
- Node Point
- Point 34 Node Label (refer to table)

**USER NOTE:**  
 USERS OF THESE MAPS SHOULD REFER TO THE DETAILED DESCRIPTION OF THEIR DERIVATION, LIMITATIONS IN ACCURACY AND GUIDANCE AND CONDITIONS OF USE PROVIDED AT THE FRONT OF THIS BOUND VOLUME. IF THIS MAP DOES NOT FORM PART OF A BOUND VOLUME, IT SHOULD NOT BE USED FOR ANY PURPOSE.



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Office of Public Works  
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Dublin 2  
Ireland

Project:  
 IRISH COASTAL PROTECTION STRATEGY STUDY - PHASE III

Map:  
 NORTH EAST COAST FLOOD EXTENT MAP

Map Type: FLOOD EXTENT  
 Source: TIDAL FLOODING  
 Map area: RURAL AREA  
 Scenario: CURRENT

Figure By: PJW Date: Jan 2010  
 Checked By: JMC Date: Jan 2010

Node Label	Water Level (mOD Malin) per AEP		
	WL 10%	WL 0.5%	WL 0.1%
Point 17	2.75	3.18	3.41
Point 19	2.67	3.11	3.34

Figure No.: NE / RA / EXT / 17 Revision: 1  
 Drawing Scale: 1:25,000 Plot Scale: 1:1 @ A3

