

APPENDIX 8.1 SITE SPECIFIC FLOOD RISK ASSESSMENT

Development at Mount Avenue, Dundalk

Site Specific Flood Risk Assessment Report

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Contents

1	Introduction.....	5
1.1	Background	5
1.2	Objectives	5
1.3	Flood Risk Assessment Scope	6
1.4	Site Characteristics	6
2	Planning and Guidelines & Flood Risk Assessment	8
2.1	The Planning System and Flood Risk Management, Guidelines for Planning Authorities ..	8
2.2	Flood Risk Appraisal & Assessment	9
2.3	Vulnerability vs. Flood Zone	10
3	Flood Risk Identification	12
3.1	Information Sources Consulted.....	12
3.1.1	OPW ECFRAMS Flood Extent Mapping.....	13
3.1.2	Louth County Council Flood Mapping.....	13
3.1.3	Flood History	13
4	Initial Flood Risk Identification.....	14
4.1	Sources of Flooding.....	14
4.1.1	Fluvial.....	14
4.1.2	Pluvial	14
4.1.3	Coastal.....	14
4.2	Source-Pathway-Receptor Model	15
4.3	Stage 2 – Initial Flood Risk Assessment	15
4.3.1	Initial Fluvial Flood Risk Assessment	16
4.3.2	Initial Pluvial Flood Risk Assessment.....	18
4.3.3	Initial Groundwater Flood Risk Assessment.....	19
4.3.4	Initial Tidal Flood Risk Assessment.....	19

4.3.5	Flood Zone Category	19
5	Drainage Design	20
5.1	Surface Water Drainage & SuDS.....	20
5.1.1	Surface Water Attenuation & Storage.....	21
5.2	Flood Risk Exceedance	21
5.3	Climate Change.....	22
5.4	Foul Drainage	22
5.5	Maintenance.....	22
5.6	Impact on Adjacent Areas.....	22
5.7	Access and Egress During Flood Events	23
5.8	Residual Risks.....	23
6	Conclusion	25
7	Response to Louth Council Opinion	26
Appendix A :	Louth County Council Flood Maps.....	27
Appendix B :	OPW Past Flood Event Local Area Summary Report	28
Appendix C :	Overland Flow Route	29
Appendix D :	Initial CFRAM Flood Maps	30

Figures

Figure 1-1	Site Location	6
Figure 1-2	Site Location with existing watercourses	7
Figure 2-1:	Sequential Approach Principles in Flood Risk Management (Extracted from the FRM Guidelines)	8
Figure 2-2	Source-Pathway-Receptor Model (Extracted from FRM Guidelines)	9
Figure 2-3	Sequential Approach & Justification Test Mechanism in the Planning Process (FRM Guidelines)	11

Figure 4-1 Updated LCC Flood Maps at Cunnicar Stream	16
Figure 4-2 Updated LCC Flood Maps at Castletown Stream.....	17
Figure 4-3 Initial flood maps obtained from www.floodmaps.ie	18
Figure 5-1 Flood Exceedance (>1% AEP) Overland Flow Paths.....	22

Tables

Table 2-1 Matrix of Vulnerability versus Flood Zone to illustrate where development appropriate for flood zone or where justification test required (Extract from FRM Guidelines)	11
Table 3-1 Information Sources Consulted	12
Table 4-1 Source-Pathway-Receptor Analysis	15

1 Introduction

1.1 Background

DBFL were commissioned to undertake a Site-Specific Flood Risk Assessment for a residential development in Mount Avenue, Dundalk, Co. Louth.

The proposed development comprises 1058no. dwellings (10no. 2 bedroom bungalows, 34no. 2 bedroom 2-storey houses, 547no. 3-bedroom 2-storey houses, 174no. 4-bedroom 2-storey houses (765no. houses total), 33no. 1 bedroom duplex units, 75no. 2 bedroom duplex units, 42no. 3 bedroom duplex units (150no. duplex units total), and 78no. 1 bedroom apartment units, 65no. 2 bedroom apartment units (143no. apartment units total) across 4no. apartment blocks) including 2no. duplex units (unit type Q) with an option to accommodate a childcare facility at ground floor level

The proposed development is located on a site 38.89 Ha in size with a net developable area of approximately 29.53 Ha, in the Townlands of Newtownbalregan, Castletown and Farrandreg, at Mount Avenue, Castletown, Dundalk, Co. Louth.

The application will include all infrastructure associated with the development including road/streets layout, footpaths, cycle lanes, and all site services including foul drainage networks, surface water and SuDS drainage networks and systems, and watermains.

All infrastructure has been developed in accordance with Louth County Council's Development Plan (2024-2030), National Cycle Manual, Uisce Éireann's Code of Practice for Water & Wastewater infrastructure (July 2020), CIRIA SuDS manual, and best practice for surface water, The Planning System and Flood Risk Management – Guidelines for Planning Authorities.

1.2 Objectives

The objective of this report is to inform the planning authority regarding flood risk associated with the site. This report assesses the lands and zoning proposals in accordance with the requirements of *"The Planning System and Flood Risk Management Guidelines for Planning Authorities"*. This report clarifies the lands flood zone category, presents information which would facilitate an informed decision of the planning application in the context of flood risk, and appropriate flood risk mitigation and management measures for any residual flood risk.

1.3 Flood Risk Assessment Scope

This SSFRA relates only to the proposed development lands in Mount Avenue, Dundalk and its immediate surroundings.

This SSFRA uses information obtained from various sources in order to carry out an assessment of flood risk for the existing land and proposed development.

1.4 Site Characteristics

The development is located to the northwest of Dundalk town centre in Co. Louth. The site is bound by existing agricultural land to the south and west, existing residential development to the east and Castletown Road to the north.

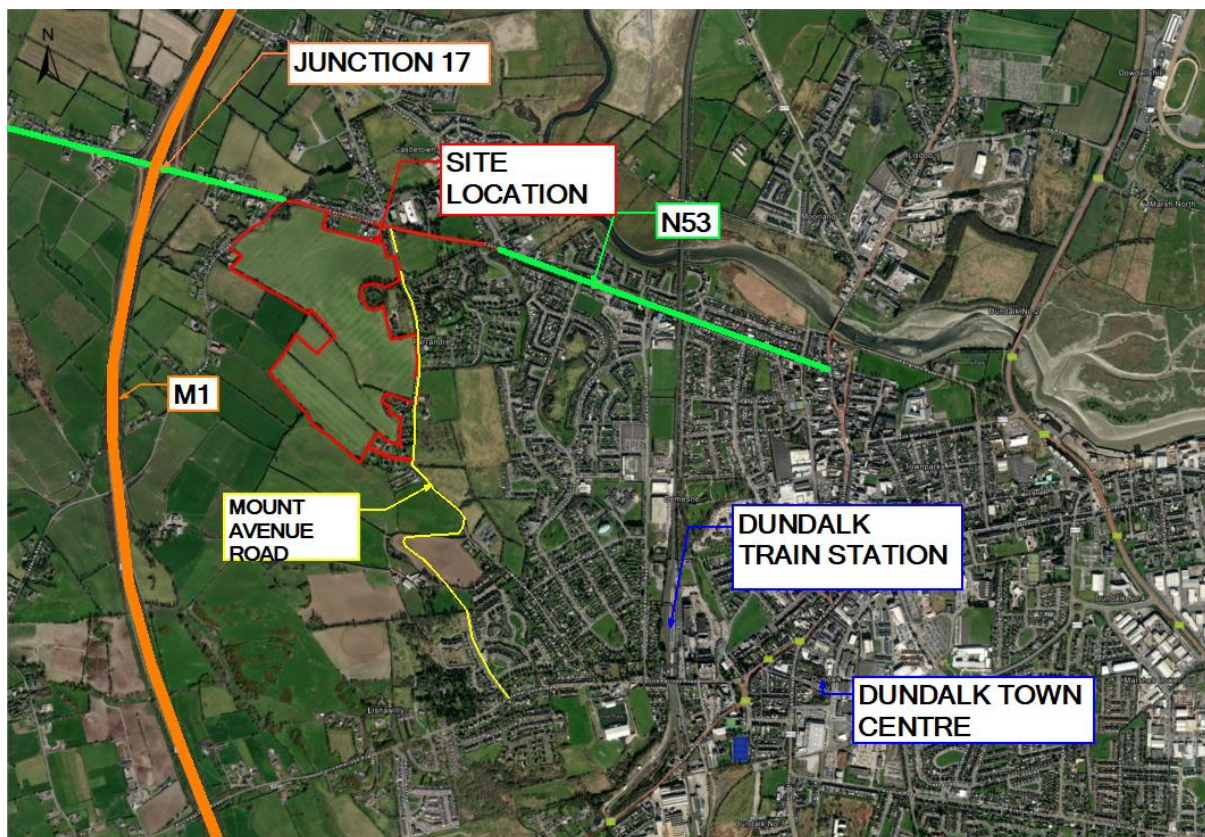


Figure 1-1 Site Location

The Cunnigar stream runs along the site's northwestern boundary, and the Castletown stream runs along the site's southern boundary. Both streams discharge to the Castletown River which ultimately discharges to the sea via Dundalk's harbour, approx. 5km to the east of the site. Refer to the figure below for further information.

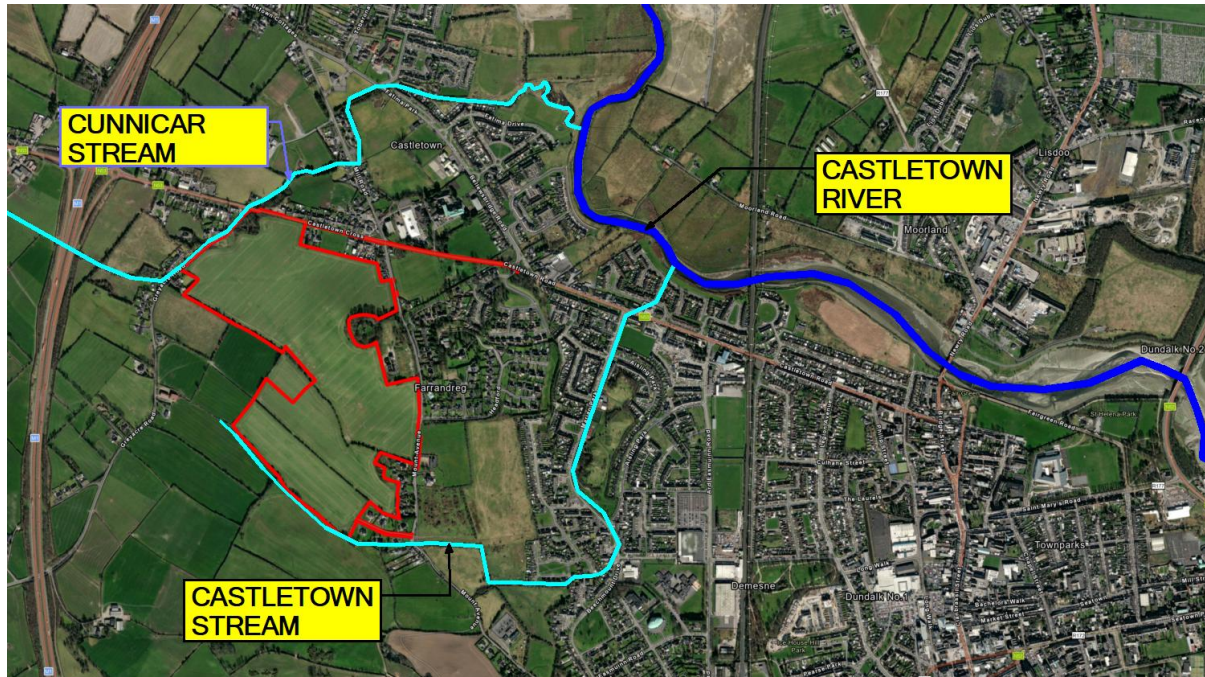


Figure 1-2 Site Location with existing watercourses

The site is very steep with the high point located at the eastern boundary (Cu Culhainns Castle) and falls towards the western boundary at a slope of 1:8 for approximately 150m before flattening to a gradient of 1:80 until it meets the Cunnicar stream.

It also falls towards the southern boundary at a gradient of 1:3 for approximately 80m before flattening into a shallow valley.

A second high point is located at the sites south-western boundary and slopes towards the southern and northern boundary. From its crest, it falls at a gradient of 1:8 to the north where it flattens out into a shallow valley, formed with the other hill. It also slopes at a gradient of 1:8 to the south until it meets the Castletown stream along its boundary.

Existing topography survey information is shown in the background of the Roads Layout Plan, drawing no. 240102-X-04-Z00-DTM-DR-DBFL-CE-1200.

2 Planning and Guidelines & Flood Risk Assessment

2.1 The Planning System and Flood Risk Management, Guidelines for Planning Authorities

The Flood Risk Management (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, including that which may arise from surface water run-off;
- 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 FRM Guidelines outlines the key principles that should be adopted by regional and local authorities, developers and their agents as follows

- 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.”

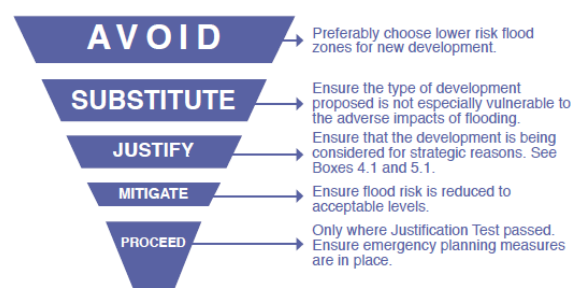


Figure 2-1: Sequential Approach Principles in Flood Risk Management (Extracted from the FRM Guidelines)

The Sequential Approach in the Management of Flood Risk is included in the figure above, Where the avoid and substitute principles of the sequential approach are not appropriate, then the Guidelines allow application of a Justification Test to assess the appropriateness or otherwise, of developments under consideration in areas of moderate or high flood risk.

2.2 Flood Risk Appraisal & Assessment

General

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). Refer to the figure below.

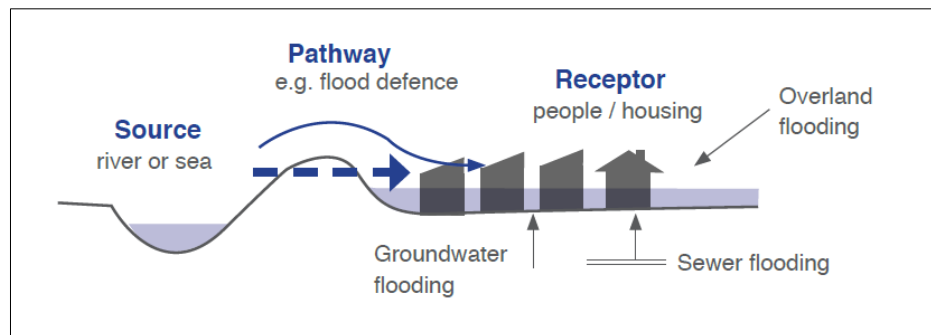


Figure 2-2 Source-Pathway-Receptor Model (Extracted from FRM Guidelines)

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.

The Guidelines further state that “A staged approach should be adopted, carrying out only such appraisal and or assessment as is needed for the purposes of decision-making at the regional, development and local area plan levels, and also at the site-specific level. The stages of appraisal and assessment are”:

Stage 1 Flood risk identification – to identify whether there may be any flooding or surface water management issues related to either the area of regional planning guidelines, development plans and LAP’s or a proposed development site that may warrant further investigation at the appropriate lower level plan or planning application levels;

Stage 2 Initial flood risk assessment – to confirm sources of flooding that may affect a plan area or proposed development site, to appraise the adequacy of existing information and to scope the extent of the risk of flooding which may involve preparing indicative flood zone maps. Where hydraulic models exist the potential impact of a development on flooding elsewhere and of the

scope of possible mitigation measures can be assessed. In addition, the requirements of the detailed assessment should be scoped; and

Stage 3 Detailed flood risk assessment – to assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk to a proposed or existing development or land to be zoned, of its potential impact on flood risk elsewhere and of the effectiveness of any proposed mitigation measures.

This SSFRA includes Stages 1, 2 and 3 Flood Risk Appraisal and Assessments related to the planned development.

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 1% AEP (Annual Exceedance Probability) for rivers and 0.5% AEP for coastal;
- 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 or 1 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,
- Vulnerable e.g. retail, commercial or industrial buildings, local transport infrastructure,
- Water Compatible e.g. flood infrastructure, docks, amenity open space.

2.3 Vulnerability vs. Flood Zone

The FRM Guidelines states that *"a sequential approach to planning is a key tool in ensuring that development, particularly new development, is first and foremost directed towards land that is at low risk of flooding"*.

The Sequential Approach restricts development types to occur within the flood zone appropriate to their vulnerability class, as outlined below in Table 2-1. Alternatively, a Justification Test can be completed to justify development in higher risk areas, (refer to figure 2-3 below).

	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development (including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less vulnerable development	Justification Test	Appropriate	Appropriate
Water-compatible development	Appropriate	Appropriate	Appropriate

Table 2-1 Matrix of Vulnerability versus Flood Zone to illustrate where development appropriate for flood zone or where justification test required (Extract from FRM Guidelines)

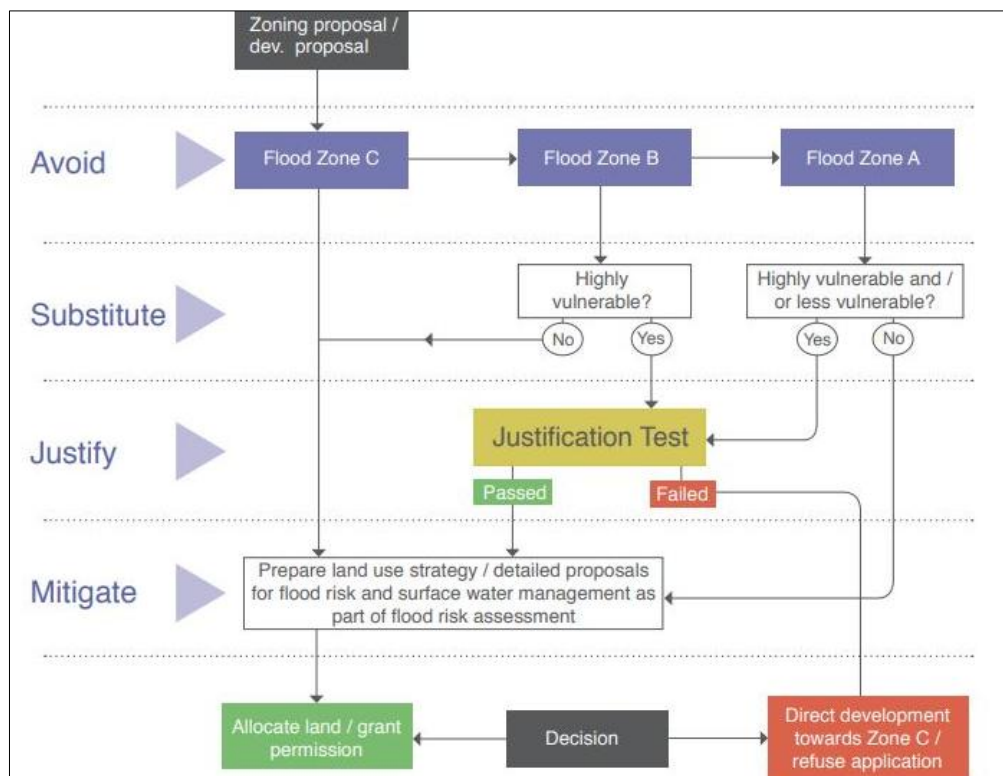


Figure 2-3 Sequential Approach & Justification Test Mechanism in the Planning Process (FRM Guidelines)

3 Flood Risk Identification

The initial flood risk identification stage uses predictive and historical information to identify and confirm whether there may be flooding or surface water management issues for the site in question which may warrant further investigation. Findings from the flood risk identification stage are outlined in the table below:

3.1 Information Sources Consulted

Information Source	Comments
Predictive and historic flood maps, and Benefiting Lands Maps, such as those at http://www.floodmaps.ie	Information obtained (and reviewed) from www.floodmaps.ie (OPW website).
Louth County Council Development Plan (2024 – 2030) Strategic Flood Risk Assessment.	Louth County Council Draft SFRA and updated flood maps obtained (and reviewed)
Expert advice from OPW who may be able to provide reports containing the results of detailed modelling and flood-mapping studies, including critical drainage areas, and information on historic flood events, including flooding from all sources;	Information obtained (and reviewed) from www.floodmaps.ie (OPW website).
Predictive fluvial flood maps;	CFRAM flood extents map consulted.
Previous Strategic Flood Risk Assessments;	Eastern CFRAM Study consulted.
Topographical maps, in particular digital elevation models produced by aerial survey or ground survey techniques;	OSI Maps consulted & Site topographic survey undertaken.
Information on flood defence condition and performance;	No flood defence information available.
Maps of the Geological Survey of Ireland (which would allow the potential for the implementation of source control and infiltration techniques, groundwater and overland flood risk to be assessed). These maps, while not providing full coverage, can indicate areas that have flooded in the past (the source of the alluvium) and may be particularly useful at the early stages of the FRA process where no other information is available;	GSI maps consulted.
Walkover survey to assess potential sources of flooding, likely routes for flood waters and the site's key features, including flood defences;	Walkover survey conducted. No flooding or groundwater observed
National, regional & local spatial plans, such as the National Spatial Strategy, regional planning guidelines, development plans & local area plans provide key information on existing and potential future receptors.	Louth County Council Development Plan consulted.
'Liable to flood' markings on the old '6 Inch' maps;	Historic OSI maps consulted.

Table 3-1 Information Sources Consulted

3.1.1 OPW ECFRAMS Flood Extent Mapping

As part of the EU Floods Directive, the OPW is undertaking a Catchment Flood Risk Assessment and Management (CFRAM) Study. An initial part of this Study was a national Preliminary Flood Risk Assessment (PFRA) to identify areas at risk of significant flooding.

The initial CFRAM Fluvial Flood Extents Map, indicate that the vast majority of the site is located within Flood Zone C apart from a small portion in the south-eastern and north-western parts of the site. These areas in Flood Zone A/B are designed as open space which is compatible. All finished floor levels throughout the development are set at a minimum 500mm above this existing flood level. Refer to Appendix D with initial flood maps obtained from www.floodmaps.ie

3.1.2 Louth County Council Flood Mapping

As of the 15/09/2025 DBFL have received updated flood mapping from Louth County Council. Updated modelling indicated reduced flood levels at the Cunnicar stream located at the northwestern boundary of the site and indicated no flooding at the Castletown stream, located along the southern boundary of the site. Refer to Appendix A with updated flood maps from Louth County Council

3.1.3 Flood History

OPW's Summary Local Area Report is included in Appendix B. This report has been obtained from the OPW website (www.floodmaps.ie) and summarizes all flood events within 2.5km of the subject site.

The report identifies 26 previous flood events within 2.5km of the proposed site, however this event did not cause flooding within the subject development lands.

4 Initial Flood Risk Identification

4.1 Sources of Flooding

4.1.1 Fluvial

The risk of fluvial flooding is considered very low as the vast majority of the subject site is located in Flood Zone C with a small portion being located within Flood Zone A/B. These areas are noted as being open space areas.

4.1.2 Pluvial

Pluvial or surface water flooding is the result of rainfall-generated flows that arise before run-off can enter a watercourse or sewer.

The proposed development may be subject to pluvial flood risk from the developments proposed surface water drainage system. The comprehensive and detailed design of the surface water system, design of road, ground levels, finished floor levels, and SuDs measures will mitigate pluvial flood risk to a site.

4.1.3 Coastal

The site is located approximately 5km west of Dundalk Bay. From review of CFRAM maps, coastal flooding poses no threat to the site as it is outside the 0.1% AEP (Annual Exceedance Probability). Therefore coastal flooding is not considered a source of flood risk to the site.

4.2 Source-Pathway-Receptor Model

Source		Pathway	Receptor	Likelihood	Consequence	Risk
Tidal	T1	Tidal flooding from coast, circa 5km away.	Residents (people), dwellings, apartments, vehicles, roads	Low	Medium	Low
Fluvial	F1	Overbank From Cunnigar river and Castletown River along the southern and northern boundary.	Residents (people), dwellings, apartments, vehicles, roads;	Possible	Medium	Medium
Surface Water Drainage (Pluvial)	P1	Flooding from the surcharging of the development's drainage systems	People and property (of the proposed development)	Possible	Medium	Medium
Groundwater Flooding	G1	Rising GWL on the site	People and property (of the proposed development)	Low	Medium	Low
Human or Mechanical Error (Pluvial)	H1	New drainage network blocks	People and Property	Possible	Medium	Medium

Table 4-1 Source-Pathway-Receptor Analysis

4.3 Stage 2 – Initial Flood Risk Assessment

Flood risks identified during Stage 1 – Flood Risk Identification, are outlined in Table 2 (Source Pathway Receptor Analysis) and noted below. These risks are assessed further in this section of the SSFRA.

- Low risk of tidal flooding
- Low risk of fluvial flooding
- Medium risk of pluvial flooding (surface water and human/mechanical error)
- Low risk of groundwater flooding
- Medium risk of flooding due to mechanical or human error.

The information sources identified in Section 3 are considered adequate for the purpose of an Initial Flood Risk Assessment for the site and no further technical studies are proposed.

4.3.1 Initial Fluvial Flood Risk Assessment

The Source-Pathway-Receptor model identified a low risk of fluvial flooding.

Initial CFRAM maps indicated the site was predominately within flood C with a section of the site being in flood zone A and B. These areas in flood zone A and B were preserved as open space. See figure 4-3 below and Appendix D showing the initial CFRAM Maps. The latest Louth County Council (LCC) Fluvial Flood Extents map identifies the extents of the predicated 1% AEP and 0.1% AEP fluvial flood events associated with the Cunnicar River which is located along the north west of the site and the Castletown River which is located along the south of the site. The vast majority of the site is still located within Flood Zone C with a small section of the development located within Flood Zone A and B. please refer to Appendix A with updated flood maps. The sections of the site located within flood zone A and B have been preserved for open space only and as such will not have any impact on the residential dwellings. Updated flood modelling does not indicate flooding at the Castletown stream which was originally showing on older CFRAM maps. Refer to the figure below of most up to date flood maps received from LCC.

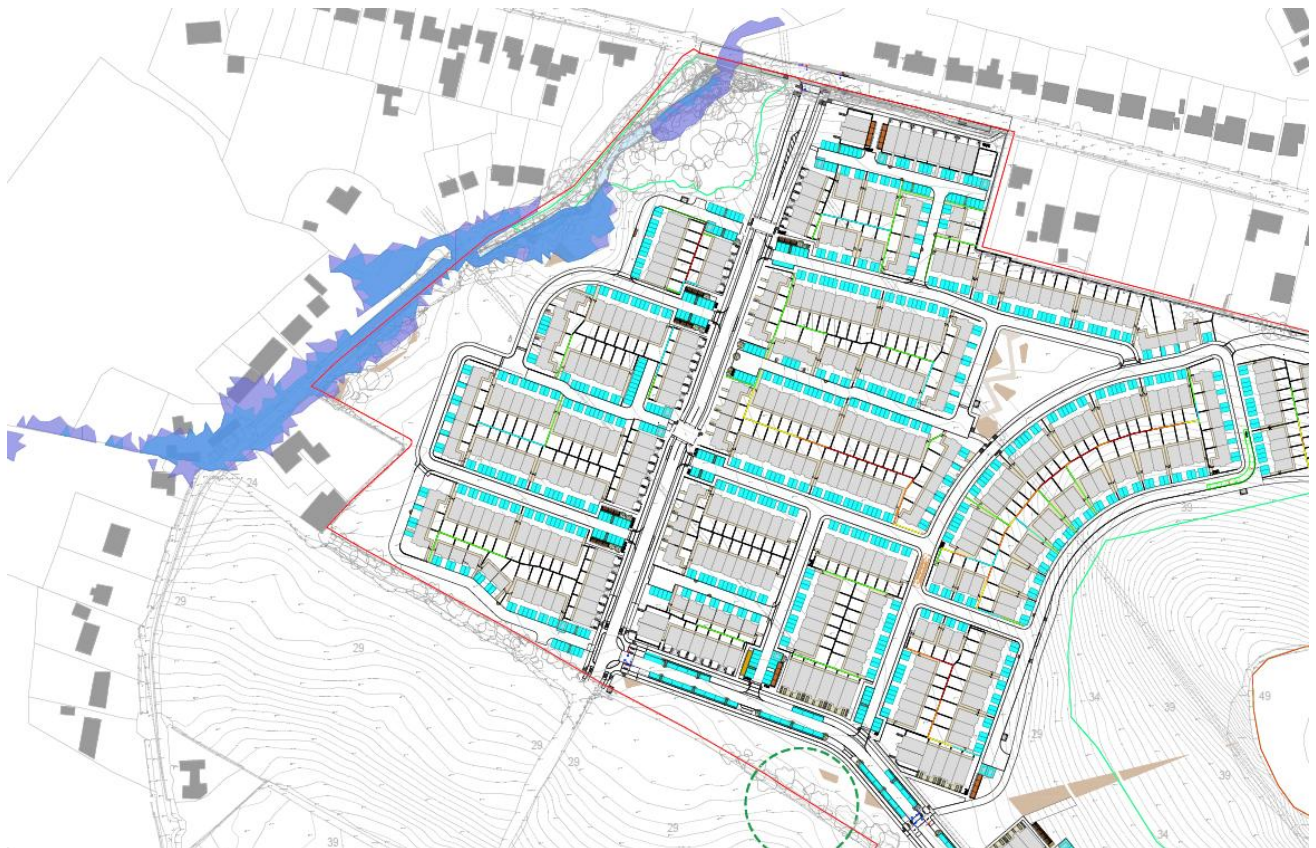


Figure 4-1 Updated LCC Flood Maps at Cunnicar Stream



Figure 4-2 Updated LCC Flood Maps at Castletown Stream

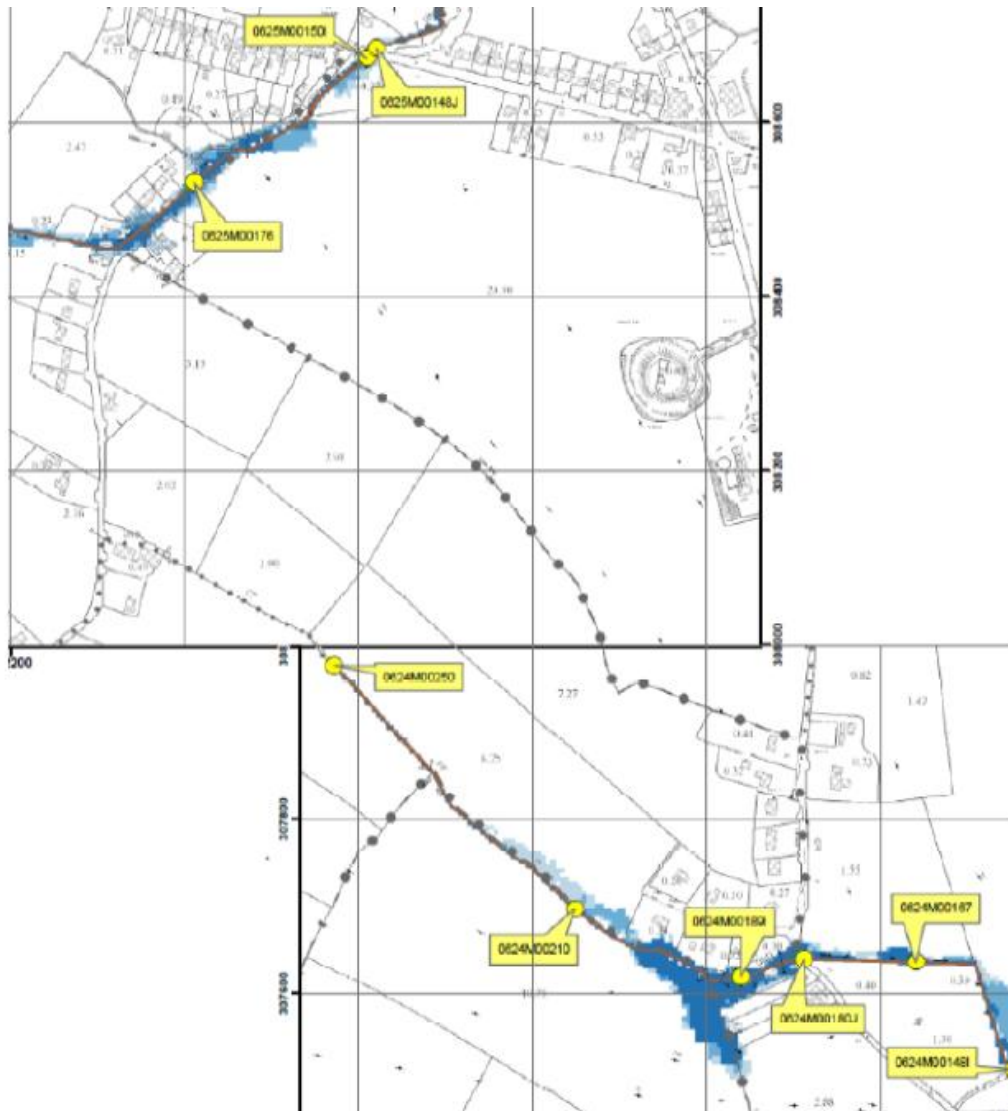


Figure 4-3 Initial flood maps obtained from www.floodmaps.ie

4.3.2 Initial Pluvial Flood Risk Assessment

The Source-Pathway-Receptor model identified a medium risk of pluvial flooding relating to the proposed surface water drainage network and human / mechanical error. This risk can be mitigated by designing the surface water network in accordance with the Greater Dublin Strategic Drainage Study (GDSDS) including attenuation of the 1% AEP storm event and implementation of SuDS methodologies.

Proper operation and maintenance of the drainage system should also be implemented to reduce the risk of human or mechanical error causing pluvial flood risk from blockages, fuel / oil interceptor operation problems etc.

4.3.3 Initial Groundwater Flood Risk Assessment

If the groundwater level rises above ground level, it can pond at local low points and cause periods of flooding. Given that the site sits at a natural high point and the absence of a historic record of flooding at the site, the risk of groundwater flooding is low. No groundwater wells, springs or marsh areas are located within the site (based on review of information available on the GSI and OSI websites and a walkover survey of the site).

Therefore, the risk of groundwater flooding occurring at the site is considered negligible.

4.3.4 Initial Tidal Flood Risk Assessment

The site is circa. 5km from the coast and is therefore not at risk of flooding.

4.3.5 Flood Zone Category

On completion of Stage 2 – Initial Flood Risk Assessment, the vast majority of site is considered to be located in Flood Zone C with a small portion of the site located within Flood Zone A/B as defined by the requirements of “The Planning System and Flood Risk Management, Guidelines for Planning Authorities” and its Technical Appendices. The areas located within Flood Zone A/B are noted as being in open space areas which are compatible with this flood zone. All residential dwellings are to be set a minimum of 500mm above the existing flood levels.

5 Drainage Design

5.1 Surface Water Drainage & SuDS

A new surface water drainage system will be constructed to accommodate surface water runoff from the proposed development. The drainage system will be designed in accordance with the recommendations of the GDSDS (Greater Dublin Strategic Drainage Study) and EN752 and will include traditional drainage features and SuDS/ nature-based SUDS features, including the attenuation of surface water runoff and storage of runoff from a 1% AEP event.

The surface water drainage network is designed for a 50%AEP (1 in 2-year return period) storm event and is “flood checked” for a 1%AEP (1 in 100-year return period plus 20% climate change) event, i.e. it is designed to accommodate runoff from a 1%AEP rainfall event under surcharged conditions. The surface water drainage system was modelled using the ‘NETWORK’ module of ‘Microdrainage’, for a range of storms with returns periods of 1 in 30 and 1 in 100 years (1% AEP). For a 1% AEP event, while the surface water drainage system surcharges there is no ‘out of system / pipe’ flooding.

Surface water runoff from the proposed development is managed using both traditional drainage (i.e. a standard gully and pipe-work collection system) and Sustainable Urban Drainage Systems (SuDS) where appropriate.

The following methodologies are being implemented as part of a SuDS treatment train approach:

- Permeable parking and permeable surfaces in amenity areas.
- Road surfaces draining to tree pits, swales and Bioretention/ Rain gardens (with high level overflow to the piped surface water network)
- Surface water runoff from house and duplex roofs will be routed to the proposed surface water pipe network via the stone reservoir beneath the permeable paved. Note, this detail does not rely on infiltration, the stone reservoir is intended to provide an additional element of attenuation storage.
- Attenuation of the 1 in 100 year return period storms in above ground attenuation basins / underground geo-cellular attenuation systems (Stormtech or similar).
- Installation of a vortex flow control device (Hydrobrake or equivalent).
- Surface water discharge will also pass via a bypass separator.

5.1.1 Surface Water Attenuation & Storage

Surface water runoff from the development is attenuated to “Greenfield Runoff”, Qbar with runoff exceeding this allowable outflow rate stored on site for up to a 1% AEP plus 20% climate change (Annual Exceedance Probability). Circa 6690m³ of storage is provided to accommodate runoff from a 1% AEP event for road, footpaths, parking areas, and roofs in an underground geo-cellular attenuation system and approximately 1216m³ of storage in above ground attenuation basins.

Surface water storage is provided in ‘Stormtech SC740’ and ‘Stormtech MC3500’ underground storage units. In accordance with the recommendations of the GDSDS, a minimum 500mm buffer is provided between the top water level in the storage system and the lowest floor level within the catchment.

Refer to DBFL *Infrastructure Design Report* for further details of surface water management.

The proposed surface water drainage network will collect surface water runoff from the site via a piped network prior to discharging off site via the attenuation tank, flow control device and petrol interceptor. The minimum pipe diameter for public surface water sewers is 225mm. Private drains within the proposed development will be 100mm diameter and collector drains will be 150mm diameter.

5.2 Flood Risk Exceedance

During storms greater than the 1% AEP pluvial event, the development’s drainage network design may be exceeded and areas with low ground levels will begin to flood.

Designed site levels vary across the site and fall towards 3 separate locations. The northern catchment of the site has been designed so levels fall from the north-eastern boundary (location of Cú Chulainn’s castle) to an existing watercourse running along the north-western boundary of the site.

The southern catchment levels have been designed so a portion of the catchment falls towards the eastern boundary of the site (towards the Mount Avenue Road). The other portion of the southern catchment site then falls towards an existing watercourse running along the southern boundary of the site. Refer to the figure below for the direction of the overland flow.



Figure 5-1 Flood Exceedance (>1% AEP) Overland Flow Paths

5.3 Climate Change

The potential impact of climate change has been allowed for in the design of the surface water drainage network and storage system, with an allowance for a 20% increase in rainfall intensities.

5.4 Foul Drainage

A new foul drainage system will be constructed to collect flows from the proposed development.

5.5 Maintenance

The proposed drainage system is to be maintained on a regular basis by Louth County Council to reduce the risk of blockages. Maintenance of SuDS features should also be carried out in accordance with the recommendation of the "The SuDS Manual" (CIRIA).

5.6 Impact on Adjacent Areas

The proposed development would not result in increased risk of flooding upstream or downstream of the site as the surface water runoff from the development is attenuated to greenfield runoff, Qbar in accordance with the recommendations of the GDSDS.

It should be noted that there would not be any displaced surface water associated with the development, as surface water runoff exceeding the surface water allowable runoff rate will be retained on site.

Also, taking into consideration the management of surface water runoff from extant permissions and from the subject site, all of which limit surface water runoff to greenfield runoff (Qbar), the development of the site would not increase flood risk elsewhere.

5.7 Access and Egress During Flood Events

The proposed development (including essential infrastructure such as roads) is in flood zone 'C'. where the capacity of the drainage system is exceeded for storm events exceeding a 1% AEP event, there would not be surface ponding of stormwater within the site as water would runoff towards open space areas.

5.8 Residual Risks

Remaining residual flood risks, following the detailed assessment include the following.

1. Pluvial flooding from the drainage system related to a pipe blockage or from flood exceedance.
2. Pluvial flooding from the developments drainage system for storms exceeding the design capacity.

Mitigation measures to address residual flood risks are as follows:

1.0 Pluvial flooding from the drainage system related to a pipe blockage or from flood exceedance:

- **Mitigating Measure M1:** The proposed drainage system to be maintained on a regular basis to reduce the risk of a blockage.
- **Mitigating Measure M2:** Overland flow routes for pluvial events should not be built on or become blocked off. Overland flow routes should be designed to direct to grassed areas and away from dwellings. Refer to Appendix C for Overland flow route

2.0 Pluvial flooding from the development's drainage system for storms exceeding the design capacity:

Mitigating Measure M3:

- The drainage network is designed in accordance with the recommendations of the GSDSDS and provides attenuated outlets and associated storage up to the 1% AEP (1 in 100-year return period event). The drainage network for the site has been designed to ensure that it can accommodate the 1% AEP Storm event with no out of system flooding.

- **Mitigating Measure M4:** Overland flow routes for pluvial events should not be built on or become blocked off. Overland flow routes should be designed to direct to grassed areas and away from dwellings. Refer to Appendix C.
- **Mitigating Measure M5:** At detailed design stage, the location of all dropped kerbs to be fully reviewed to ensure all overland flow paths are not impeded.

Effectiveness of mitigation measures:

It is considered that the flood risk mitigation measures once fully implemented are sufficient to provide a suitable level of protection to the proposed development. A regularly maintained drainage system will ensure that it remains effective and in good working order should a large pluvial storm occur.

6 Conclusion

We consider that the proposed development, can be delivered on the site in the context of flood risk to same and that the implementation of mitigation measures, as outlined in this report, can be accommodated by the site's detailed design and the surface water drainage design.

The OPW document "The Planning System and Flood Risk Management Guidelines (November 2009)" requires that the proposed development be compatible with flood risk for the site. In accordance with these guidelines, the vast majority of the subject site is located within Flood Zone 'C'. Flood Zone "C" lands are suitable for all types of land use, including residential developments which are classified as "highly vulnerable" in the "Guidelines". A small portion of the lands are located in Flood Zone A/B however it is noted that these lands are all within open space areas which we note are compatible with these flood zones. All floor levels are to be set a minimum of 500mm above the existing flood level as outlined by the GDSDS. Therefore, the proposed development is suitable for the subject site, and the Planning Guidelines Sequential Approach is passed.

The proposed development layout was assessed, and it was concluded that it can be delivered on the site in the context of flood risk to same and that the implementation of the proposed mitigation measures, by the developments detailed design will address the remaining residual risks.

Taking into consideration the management of surface water runoff from existing neighbouring permissions their discharge rates are all limited to greenfield runoff and they would not increase flood risk elsewhere. The developments surface water runoff will be limited to Qbar (greenfield runoff rate). Therefore, the development complies with the requirements of the GDSDS and does not increase the risk of flooding elsewhere and does not result in displaced waters.

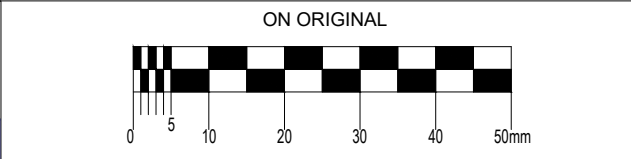
the development meets all the requirements of The FRA Guidelines and is therefor appropriate to this flood zoning and does not required a justification test.

7 Response to Louth Council Opinion

Item 5 - Site Specific Flood Risk Assessment

Draft Flood Risk Assessment shall be revised to take account of the latest flood maps	
Response	As of 15/09/2025 DBFL received updated flood maps from Louth County Council (LCC). These maps have been added to Appendix A of the Site-Specific Flood Risk Assessment (SSFRA), 240102-X-00-Z00-XXX-RP-DBFL-CE-0002 and can also be found on standalone drawing no. 240102-X-05-Z00-DTM-DR-DBFL-CE-1311
The proposed development on this site will result in an alteration of the existing ground levels which the Draft Flood Risk Assessment has not sufficiently addressed. The Flood Risk Assessment shall demonstrate that the proposed alterations in site level/contours will not give rise to flooding issues elsewhere. The applicant shall therefore be requested to submit details to demonstrate that the proposed development: (i) Will not exacerbate flooding in the immediate vicinity or wider area. (ii) Will not obstruct or impede important flow paths (iii) Any residual risks to the area and/or development can be managed to an acceptable level (iv) The FRA shall also clearly demonstrate proposed management of any residual risks.	
i.	Revised flood modelling within the red line boundary has indicated a reduction in flooding at the Cunnigar stream and has indicated no flooding at the Castletown stream. Road levels in the vicinity of these areas have been set to match the existing ground levels. Revised flood modelling results can be found on standalone drawing no. 240102-X-05-Z00-DTM-DR-DBFL-CE-1311 and in Appendix A of the SSFRA (240102-X-00-Z00-XXX-RP-DBFL-CE-0002)
ii.	Levels on site have been set to match existing gradients as to not obstruct or impede important flood paths so flood events exceeding the 1% AEP will follow a natural drainage regime towards the existing streams. An overland flow route diagram can be found in Appendix C of the SSFRA, 240102-X-00-Z00-XXX-RP-DBFL-CE-0002.
iii	Proposed ground levels have been set to match existing ground levels in areas of possible future flooding, removing any residual risk to the area and development. See proposed levels set against existing ground levels on drawing no. 240102-X-04-Z00-DTM-DR-DBFL-CE-1200 and revised flood mapping on drawing no. 240102-X-05-Z00-DTM-DR-DBFL-CE-1311
iv.	Road and finished floor levels within the vicinity of existing flooding have been set to match existing ground levels as not to impose on existing flood levels. The only residual risks to arise on site will be from pluvial flooding. Management of this residual risk has been demonstrated in section 5.8 of the SSFRA (240102-X-00-Z00-XXX-RP-DBFL-CE-0002).
The Flood Risk Assessment shall be in accordance with the methodologies outlined in the latest flood risk guidance.	
Response	The SSFRA has been constructed in accordance with The Planning System and Flood Risk Management – Guidelines for Planning Authorities.
All floor levels in areas identified as flood risk in the proposed development to be set at a minimum of 800 mm above the existing flood level which for 1% AEP (1 in 100) is 21.16 – (500mm for freeboard and 20% increase for flow volume in rivers which equates to approximately 300mm).	
Response	All floor levels in areas identified as flood risk in the development have been set at a minimum of 800mm above the existing flood level. The closest, lowest finished floor level to an area identified as flood risk is 22.775m A.O.D. See drawing no. 240102-X-04-Z00-DTM-DR-DBFL-CE-1200 indicating set road and finished floor levels. See drawing no. 240102-X-05-Z00-DTM-DR-DBFL-CE-1311 indicating revised flooding within the site.

Appendix A : Louth County Council Flood Maps



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NO CHANGES OF WATERSHED NATURE ARE TO BE MADE TO ANY DETAILS SET OUT OR CONTAINED IN ANY CIVIL SPECIFICATION OR DRAWINGS UNLESS THE EXPRESS CONSENT HAS BEEN OBTAINED IN ADVANCE, IN WRITING, FROM DBFL.

NOTES

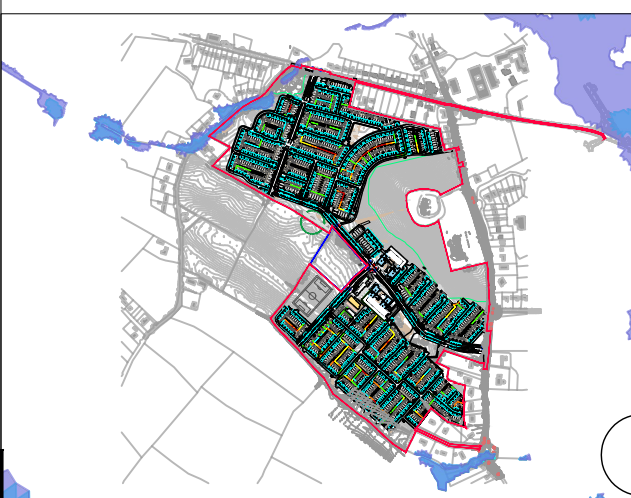
GENERAL NOTES

1. ALL WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE WORKS REQUIREMENTS.
2. ALL DIMENSIONS IN METRES UNLESS SPECIFIED OTHERWISE.
3. ALL COORDINATES ARE TO IRISH NATIONAL GRID.
4. ALL LEVELS ARE TO DRAINAGE DATUM (DA) IN HEAD.
5. ALL TEMPORARY TRAFFIC MANAGEMENT SHALL COMPLY FULLY WITH THE WORKS REQUIREMENTS. REFER TO APP 111.
6. THE CONTRACTOR MUST LIAISE DIRECTLY WITH LOCAL AUTHORITY SUPERVISORS AS LIAISON IS THE WORKS REQUIREMENTS.
7. ALL VEHICULAR, PEDESTRIAN & CYCLE ROUTES WITHIN AND SURROUNDING THE WORKS EXTENT MUST BE MAINTAINED THROUGHOUT THE WORKS IN ACCORDANCE WITH THE CONTRACTORS APPROVED TEMPORARY TRAFFIC & OPERATIONS MANAGEMENT PLAN.
8. ALL PERMANENT TRAFFIC MANAGEMENT TO BE CONCEALED REMOVED OR INCORPORATED INTO THE CONTRACTORS TEMPORARY TRAFFIC MANAGEMENT PLAN THROUGHOUT WORKS AND TRANSFERRED ONLY WHEN AGREED WITH LOCAL AUTHORITY TRAFFIC DEPARTMENT.
9. THE CONTRACTOR IS RESPONSIBLE FOR THE ONGOING MAINTENANCE OF TRAFFIC SIGNALS FROM THE STARTING DATE TO SUBSTANTIAL COMPLETION. THIS INCLUDES ALL TEMPORARY TRAFFIC SIGNALS WHILE IN TRANSITION BETWEEN THE CURRENT TRAFFIC MANAGEMENT REGIME AND THE PROPOSED TRAFFIC MANAGEMENT REGIME.
10. ALL ADDRESSSES PROPOSED FOR USE ON THIS SCHEME SHALL MEET FULLY THE REQUIREMENTS OF THE CONTRACT SPECIFICATION AND IN ADDITION THE REQUIREMENTS SET OUT IN STANDARD RECOMMENDATION 25.10.2014 GUIDANCE ON THE USE OF I.S. EN 1042:2002 - ALL 2007 ADDRESS DATA FOR LIAISON AND PHYSICALLY PLANNED LIAISON FOR USE IN CIVIL ENGINEERING WORK AND ROAD CONSTRUCTION. FURTHER DETAIL IS PROVIDED IN ADDITIONAL CLAUSE 14.4K OF THE CONTRACT SPECIFICATION.

DRAWING SPECIFIC NOTES

1. ALL FOLIO GENERALISING MAPS, MANHOLES AND CONNECTIONS TO BE CONSTRUCTED IN ACCORDANCE WITH IRISH WATER CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE AND IRISH WATER WASTEWATER INFRASTRUCTURE STANDARDS DETAILS. REFER TO SPECIFICATION APPENDIX 51 FOR FURTHER DETAILS.
2. ALL FOLIO PIPES TO BE SPECIFIC AND TO COMPLY WITH THE IRISH DRAINAGE CODE OF PRACTICE FOR WASTEWATER.
3. ALL SURFACE WATER SEWERS, CONNECTIONS, MANHOLES AND GULLIES TO BE CONSTRUCTED IN ACCORDANCE WITH SPECIFICATION APPENDIX 51.
4. ALL EXISTING GULLY LEADS AND SEWERS SHALL BE JETTED CLEAR FOR FUTURE USE WHETHER ADJUSTED, REPLACED OR RETAINED.
5. LOCATION AND INVERT LEVELS OF EXISTING MANHOLES OR OUTFALL POINTS, WHERE APPLICABLE, TO BE IDENTIFIED BY CONTRACTOR PRIOR TO COMMENCEMENT OF DRAINAGE WORKS.
6. ALL COVERS AND FRAMES TO BE CLASS D400 TO IS EN 124:1996 MINIMUM FRAME DEPTH REFER TO SPECIFICATION APPENDIX 51 FOR FURTHER DETAILS.
7. MANHOLE PORTS AND FITTINGS ARE TO BE PROVIDED IN ACCORDANCE WITH IRISH WATER STANDARD DETAIL STD 01-27.
8. REFER TO SPECIFICATION APPENDIX 51 FOR DETAILS OF REINSTATEMENT OF EXISTING ROADS.
9. EXISTING AND PROPOSED DRAINAGE NETWORKS WITHIN SCHEME EXTENTS TO BE JETTED CLEAR FOLLOWING COMPLETION OF DRAINAGE WORKS AND CIVIL SURVEY TO BE UNDERTAKEN AND PROVIDED TO THE EMPLOYERS REPRESENTATIVE.
10. DRAINAGE DRAWINGS SHOULD BE READ IN CONJUNCTION WITH DRAINAGE LONG SECTIONS AND SCHEDULES.

KEY PLAN



PROPOSED SERVICES LEGEND	
—	PROPOSED EXTENT OF WORKS BOUNDARY
—	1% ANNUAL EXCEEDANCE PROBABILITY (APP) PRESENT DAY
—	0.1% ANNUAL EXCEEDANCE PROBABILITY (APP) 1890'S

0	25-08-25	House Connections Added		JMG	JSC
rev	date	description		by	chkd

STATUS CODES	
proposed	scope
P1 - INFORMATION	S - ISSUED

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CONSULTING ENGINEERS

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DUBLIN | CORK | GALWAY | WATERFORD

project ref
MOUNT AVENUE DUNDALK

drawing title
ANNUAL EXCEEDANCE PROBABILITY
FLOOD MAPS

client
GRANDSPECT LTD.

designed by	author	scale	sheet size
BOH	GMC	VALUE	A0
drawing no	240102-X-05-Z00-DTM-DR-DBFL-CE-1311		
			0

Appendix B : OPW Past Flood Event Local Area Summary Report

Past Flood Event Local Area Summary Report

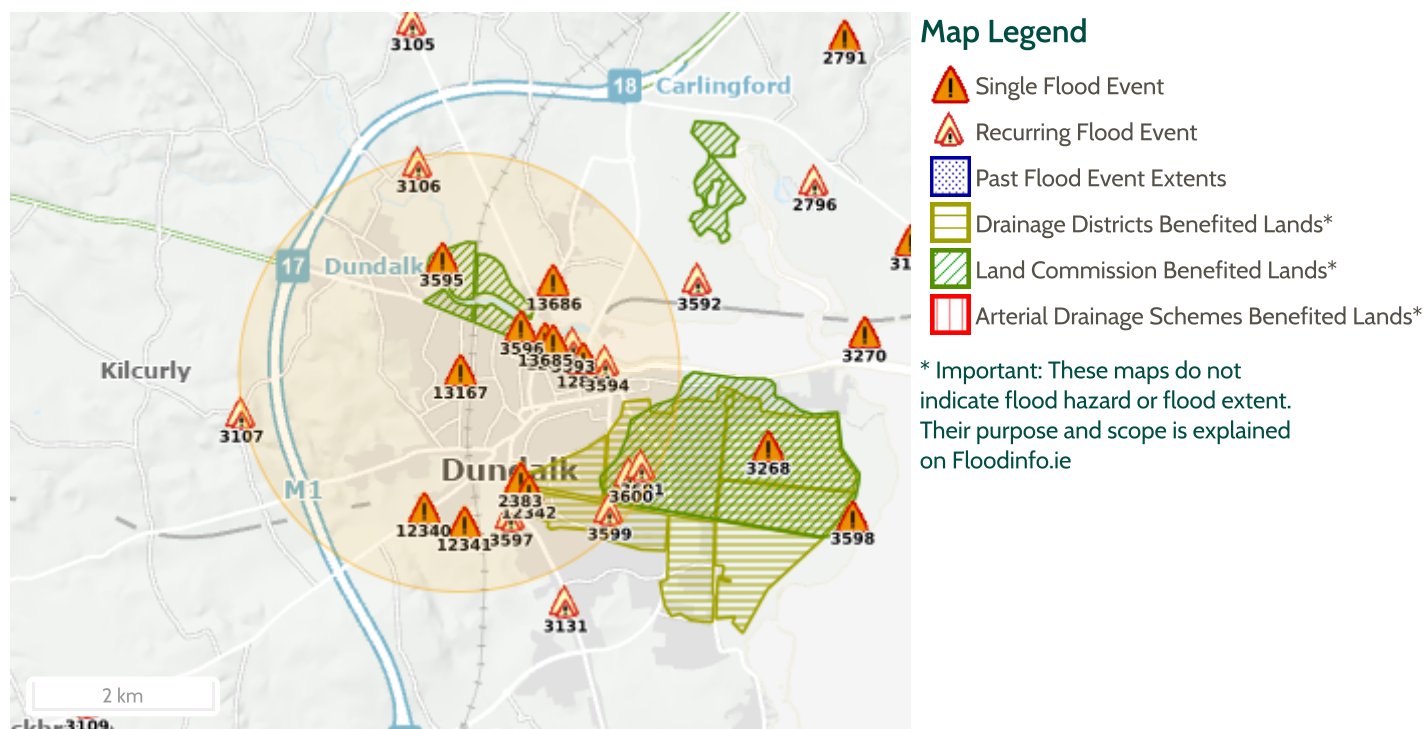


OPW Oifig na nOibreacha Poiblí
Office of Public Works

Report Produced: 9/4/2025 12:01

This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.

This report has been downloaded from www.floodinfo.ie (the "Website"). The users should take account of the restrictions and limitations relating to the content and use of the Website that are explained in the Terms and Conditions. It is a condition of use of the Website that you agree to be bound by the disclaimer and other terms and conditions set out on the Website and to the privacy policy on the Website.



26 Results

Name (Flood_ID)	Start Date	Event Location
1. Flood event at Mounthamilton Housing Estate, Co.Louth on the 14th of November 2014 (ID-12340) Additional Information: Reports (1) , Press Archive (0)	14/11/2014	Approximate Point
2. Flood event at Mounthamilton Ind. Estate 14th November 2014 (ID-12341) Additional Information: Reports (1) , Press Archive (0)	14/11/2014	Approximate Point
3. Flooding at Fairgreen, Dundalk on 13/01/2020 (ID-13685) Additional Information: Reports (0) , Press Archive (0)	13/01/2020	Approximate Point
4. Flooding at Dundalk, Manorhamilton Residential on 14/11/2014 (ID-13150) Additional Information: Reports (0) , Press Archive (0)	14/11/2014	Approximate Point
5. Rampart Dundalk February 1977 (ID-2383) Additional Information: Reports (1) , Press Archive (0)	01/02/1977	Approximate Point
6. Flooding at Newry Road, Dundalk on 13/01/2020 (ID-13686) Additional Information: Reports (0) , Press Archive (0)	13/01/2020	Approximate Point

	Name (Flood_ID)	Start Date	Event Location
7.	 Moorland Road, Dundalk, Co. Louth February 2002 (ID-3595) Additional Information: Reports (2) . Press Archive (5) .	01/02/2002	Approximate Point
8.	 River Rampart Dundalk December 1978 (ID-233) Additional Information: Reports (1) . Press Archive (0) .	27/12/1978	Approximate Point
9.	 Rampart Dundalk Winter 1966 (ID-2386) Additional Information: Reports (1) . Press Archive (0) .	n/a	Approximate Point
10.	 Rampart Dundalk Winter 1959 (ID-2385) Additional Information: Reports (1) . Press Archive (0) .	n/a	Approximate Point
11.	 Rampart Dundalk Winter 1957 (ID-2384) Additional Information: Reports (1) . Press Archive (0) .	n/a	Approximate Point
12.	 Castletown River, Barleyfield Recurring (ID-3106) Additional Information: Reports (2) . Press Archive (0) .	n/a	Approximate Point
13.	 Donaghmore Recurring (ID-3107) Additional Information: Reports (2) . Press Archive (0) .	n/a	Approximate Point
14.	 Castletown River Dundalk Co Louth Undated (ID-3596) Additional Information: Reports (2) . Press Archive (0) .	n/a	Approximate Point
15.	 Fairgreen Road, Dundalk, Co Louth Recurring (ID-3593) Additional Information: Reports (2) . Press Archive (0) .	n/a	Approximate Point
16.	 Quay St, Dundalk, Co. Louth Recurring (ID-3594) Additional Information: Reports (2) . Press Archive (6) .	n/a	Approximate Point
17.	 Balmers Bog, Dundalk, Co. Louth Recurring (ID-3597) Additional Information: Reports (3) . Press Archive (1) .	n/a	Approximate Point
18.	 Lismore, Dundalk, Co Louth Recurring (ID-3599) Additional Information: Reports (2) . Press Archive (0) .	n/a	Approximate Point
19.	 Thomas St./Rampart Rd Dundalk Co Louth Recurring (ID-3600) Additional Information: Reports (2) . Press Archive (1) .	n/a	Approximate Point
20.	 Long Avenue Dundalk County Louth Recurring (ID-3601) Additional Information: Reports (2) . Press Archive (2) .	n/a	Approximate Point
21.	 Flooding at Regans Terrace, Dundalk. 14th November 2014 (ID-12342) Additional Information: Reports (1) . Press Archive (0) .	14/11/2014	Approximate Point
22.	 Flooding at Dundalk, Manorhamilton Industrial on 14/11/2014 (ID-13149) Additional Information: Reports (0) . Press Archive (0) .	14/11/2014	Approximate Point
23.	 Flooding at Mounthamilton Industrila Estate on the 14th November 2014 (ID-12501) Additional Information: Reports (1) . Press Archive (0) .	30/12/1899	Exact Point

Name (Flood_ID)		Start Date	Event Location
24.	 Flooding at Dundalk - 2015 (ID-12838)	n/a	Approximate Point
Additional Information: Reports (Q) , Press Archive (Q) .			
25.	 Flooding at Dundalk - 2017 (ID-12844)	n/a	Approximate Point
Additional Information: Reports (Q) , Press Archive (Q) .			
26.	 Flooding at Dundalk on 15/11/2014 (ID-13167)	15/11/2014	Approximate Point
Additional Information: Reports (Q) , Press Archive (Q) .			

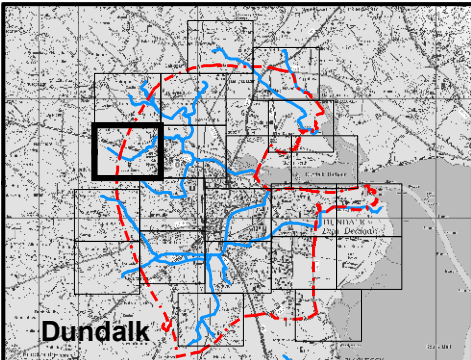
Appendix C : Overland Flow Route

[illegible]

Appendix D : Initial CFRAM Flood Maps

Node Label	Water Level (OD) 10% AEP	Flow (m³/s) 10% AEP	Water Level (OD) 1% AEP	Flow (m³/s) 1% AEP	Water Level (OD) 0.1% AEP	Flow (m³/s) 0.1% AEP
0625M00253	29.40	2.08	30.05	3.87	30.28	6.58
0625M00221I	26.35	2.16	26.53	3.98	26.78	7.06
0625M00214J	26.12	N/A	26.26	N/A	26.41	N/A
0625M00176	20.94	N/A	21.16	N/A	21.38	N/A
0625M00150I	17.54	N/A	18.64	N/A	19.35	N/A
0625M00148J	16.50	N/A	16.77	N/A	17.10	N/A
0625M00109I	8.06	N/A	8.18	N/A	8.23	N/A
0625M00103J	5.60	N/A	5.67	N/A	5.71	N/A
0625M00085I	4.42	N/A	4.53	N/A	4.64	N/A
0625M00084J	3.78	N/A	3.98	N/A	4.12	N/A

Fluvially influenced flooding does not extend downstream of this point.
Please refer to tidal flood maps Figure No. N06DDK_EXCCD_F0_06.



IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

- Legend**
- 10% Fluvial AEP Event
 - 1% Fluvial AEP Event
 - 0.1% Fluvial AEP Event
 - Modelled River Centreline
 - AFA Extents
 - Embankment
 - Wall
 - Defended Area
 - 1% AEP Standard of Protection of Flood Defence (Walls / Embankments)
 - 1% AEP
 - Node Point
 - Node ID

FINAL

REV:	NOTE:	DATE:
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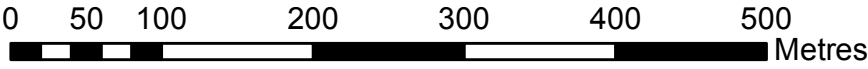


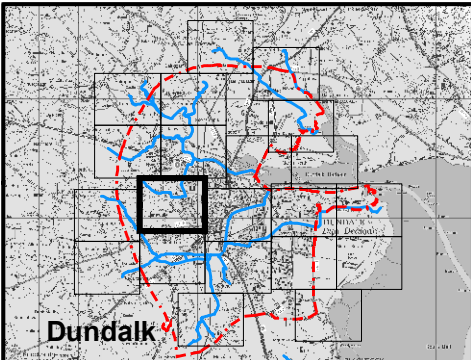
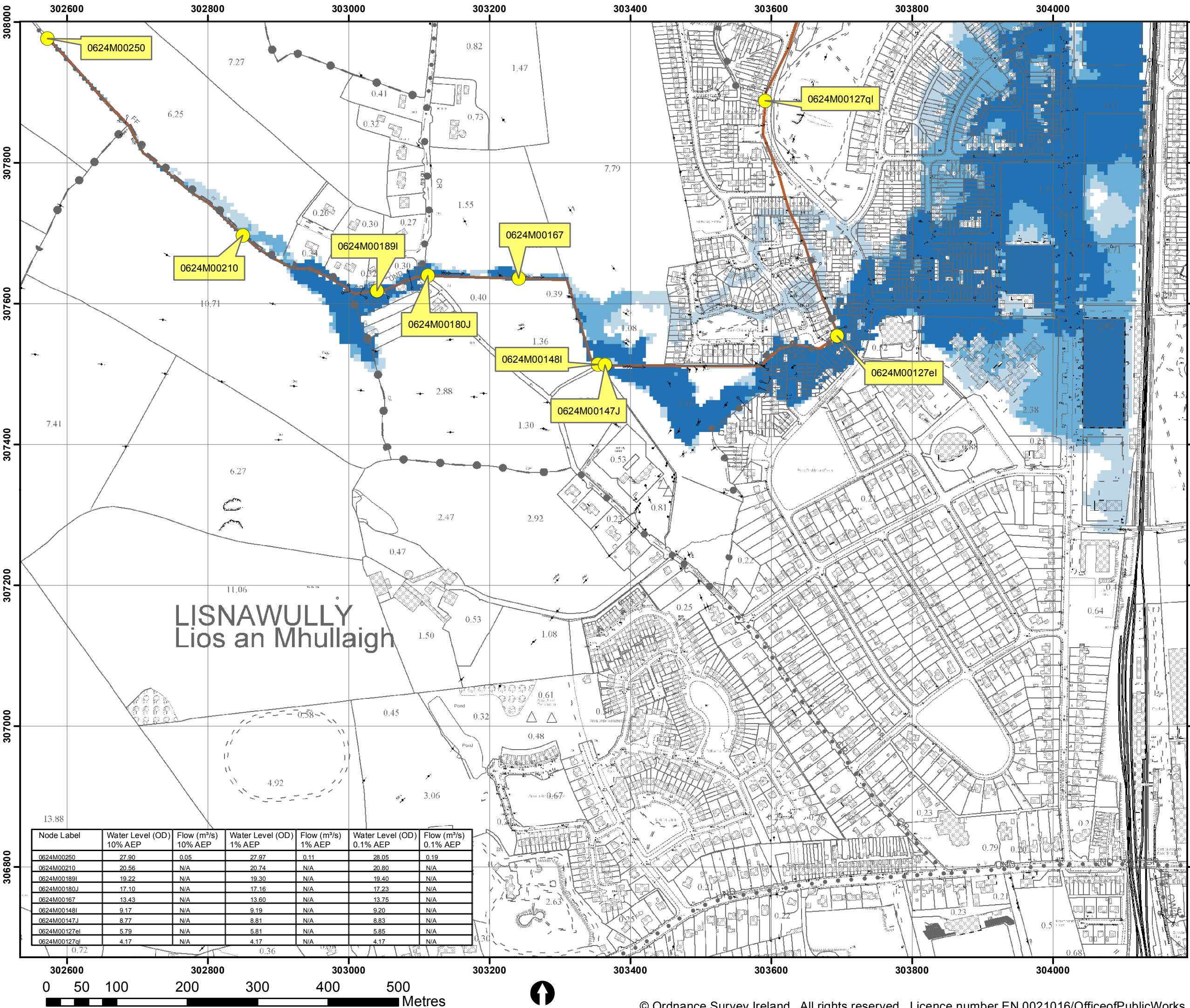
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Map:
Dundalk Fluvial Flood Extents
Map Type: EXTENT
Source: Fluvial
Map Area: HPW
Scenario: CURRENT
Drawn By : C.C. Date : 4 August 2016
Checked By : E.H. Date : 4 August 2016
Approved By : S.P. Date : 4 August 2016
Drawing No. : N06DDK_EXFCD_F0_06
Map Series : Page 06 of 21
Drawing Scale : 1:5,000 @A3





IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER
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AND CONDITIONS OF USE THAT
ACCOMPANY THIS MAP.

- Legend**
- 10% Fluvial AEP Event
 - 1% Fluvial AEP Event
 - 0.1% Fluvial AEP Event
 - Modelled River Centreline
 - AFA Extents
 - Embankment
 - Wall
 - Defended Area
 - 1% AEP Standard of Protection of Flood Defence (Walls / Embankments)
 - 1% AEP
 - Node Point
 - Node ID

FINAL

REV:	NOTE:	DATE:
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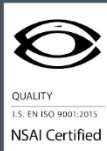


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Node Label	Water Level (OD) 10% AEP	Flow (m³/s) 10% AEP	Water Level (OD) 1% AEP	Flow (m³/s) 1% AEP	Water Level (OD) 0.1% AEP	Flow (m³/s) 0.1% AEP
0624M00250	27.90	0.05	27.97	0.11	28.05	0.19
0624M00210	20.56	N/A	20.74	N/A	20.80	N/A
0624M00189I	19.22	N/A	19.30	N/A	19.40	N/A
0624M00180J	17.10	N/A	17.16	N/A	17.23	N/A
0624M00167	13.43	N/A	13.60	N/A	13.75	N/A
0624M00148I	9.17	N/A	9.19	N/A	9.20	N/A
0624M00147J	8.77	N/A	8.81	N/A	8.83	N/A
0624M00127el	5.79	N/A	5.81	N/A	5.85	N/A
0624M00127ql	4.17	N/A	4.17	N/A	4.17	N/A

Map:	
Dundalk Fluvial Flood Extents	
Map Type: EXTENT	
Source: Fluvial	
Map Area: HPW	
Scenario: CURRENT	
Drawn By : C.C.	Date : 4 August 2016
Checked By : E.H.	Date : 4 August 2016
Approved By : S.P.	Date : 4 August 2016
Drawing No. :	
N06DDK_EXFCD_F0_07	
Map Series : Page 07 of 21	
Drawing Scale : 1:5,000 @A3	



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