Clifton Scannell Emerson Associates

Flood Risk Assessment

DUB 54 - Darndale 110kv Sub-Station

Client: ADSIL

Date: 8th February 2019

Job Number: 17_181

CONSULTING ENGINEERS

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1 Introduction

The purpose of this report is to carry out a Flood Risk Assessment for the Belcamp to Clonshaugh 110kV Transmission Cable Installation Scheme. This is required under The Planning System and Flood Risk Management Guidelines for Planning Authorities (DoEHLG & OPW, 2009) in order to ensure sustainability and effective management of flood risk.

2 Project Background

Figure 1 presents a site layout plan showing the route of the proposed underground cable installation. A cable installation will be installed from the permitted 110kV Substation (Darndale Substation) to the existing Belcamp 110kV and 220kV Substation located c.2.1 km to the north-east of the site.

Travelling away from the approved Darndale 110kV substation the underground cable follows the periphery of the greenfield site, initially north for a distance of approximately 180m, before realigning east for a further distance of approximately 430m. From here it enters the road reserve on the west side of the roundabout adjacent to the Clayton Hotel. The proposed route then turns eastwards and runs along the M50/R139 before entering the Belcamp Substation site from the south.

Figure 1 Proposed Route of the underground cable installation

The design of the underground cable will comprise a double 110kV circuit installed underground in HDPE ducting. The 110kV cables will be a standard XLPE (cross-linked polyethylene) copper cable. XLPE does not contain oil, therefore there is no risk of migration of oil into ground in the event of a failure.

The installation of the HDPE ducting will require the excavation of one or two trenches along the route; the trench will contain two 110kV circuits. The trench will typically run parallel to each other along the length of the route, the separation of the 2 circuits will vary from 500mm to c. 3m depending on the existing ground conditions and existing underground services. Between

five and ten separate ducts will be installed in each trench. For the purposes of this assessment, reference to the 'cable installation' includes both circuits.

The optimum depth of excavation required to facilitate installation of the ducting is 1.25m below ground level (bgl) but may increase to up to c. 3m at utility crossings and where the route goes under the River Mayne. The optimum width of each trench is 0.6m, however this may vary depending on ground conditions and existing services. A typical cross section of the trench is illustrated in Figure 2.

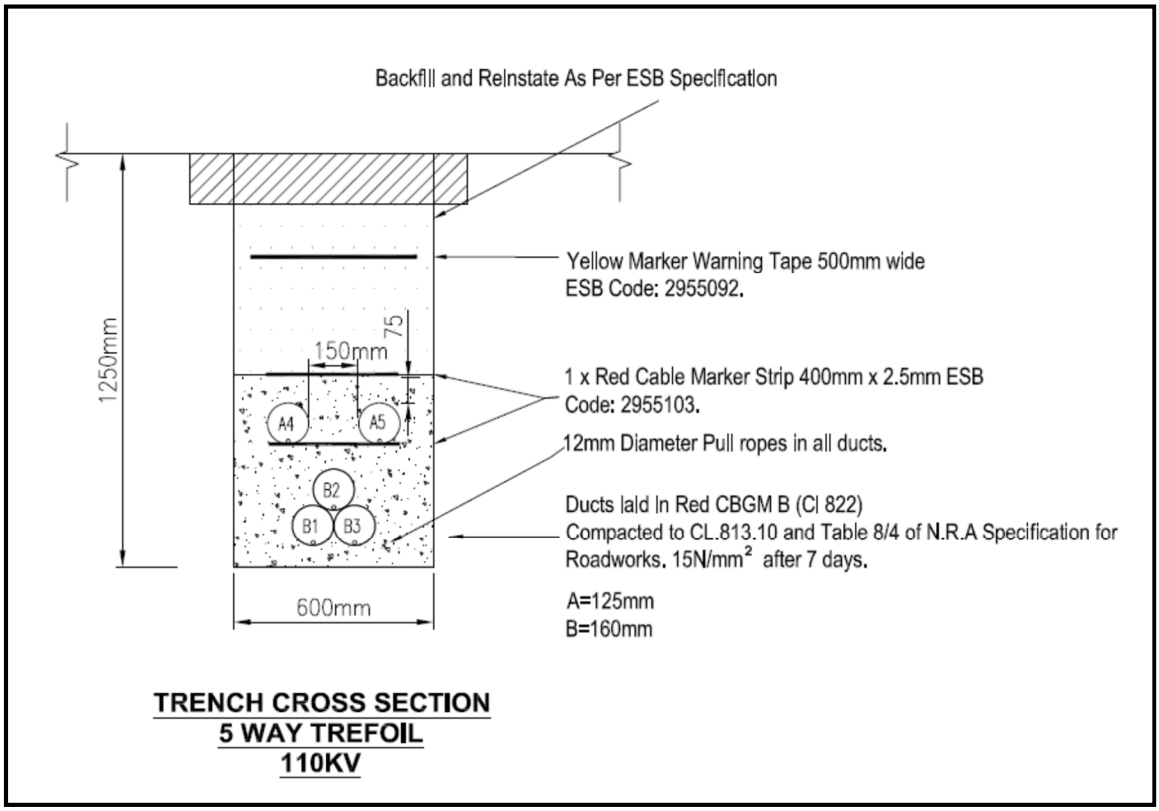

Figure 2 Typical Cross Section of Trench for Underground Cable (Source: CSEA, May 2018)

The existing construction compound (including construction parking) within the Diamond Innovations site (Unit 1C), Clonshaugh Business & Technology Park and adjacent lands will be utilised by contractors during this development.

Once constructed, the route will be reinstated at current ground level, grassed in greenfield area and appropriate hard stand elsewhere. Six joint bays will be installed along the route with associated link and communications boxes. These will be covered by manhole covers. There is no requirement for lighting. The proposed cable installation is below ground and will have no overall impact on the natural landscape.

3 Review of Flood Risk Guidelines

3.1 OPW Flood Guidelines for Planning Authorities

Catchment-based Flood Risk Assessment and Management (CFRAM) program has been implemented by the Office of Public Works (OPW) as a competent authority in Ireland for the EU floods directive. Over 29 Flood Risk Management Plans FRMPs have been prepared in coordination with the implementation of the Water Framework Directive (WFD). The FRMPs involved undertaking detailed engineering assessment and producing flood protection measures. The assessment addressed the potential impact of the proposed measures on waterbodies hydromorphology and quality status.

The purpose of The Planning System and Flood Risk Management Guidelines for Planning Authorities published by DoEHLG and the OPW in 2009 (OPW Guidelines) is to introduce comprehensive mechanisms for the incorporation of flood risk identification, assessment and management into the planning process.

The core objectives of the OPW Guidelines include:

- 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;
- Improve the understanding of flood risk among relevant stakeholders; and
- Ensure that the requirements of EU and national law in relation to the natural environment and nature conservation are complied with at all stages of flood risk management.

Floods can have broad range of impact on people, property, infrastructure and the environment. Flood can cause damage to the infrastructure including electricity and other utilities with significant detrimental impacts on local and regional economies. This may also future cause long-term closure of businesses leading to so called flood loss other than the damage.

The key concept in flood management is the *"Flood Risk"*. it is "the combination of the likelihood of flooding and the potential consequences arising". Consideration of flood risk must be addressed in terms of:

- The likelihood of flooding. Expressed as percentage probability or exceedance each year; and
- The consequences of flooding as the associated hazard e.g. flood depth and velocity.

Flood risk is then expressed with the relationship:

Flood Risk = Likelihood of flooding x Consequences of flooding

Flood Zone is the spatial inundation area that fall within a particular range of likelihood of flooding. The OPW Guidelines specified three levels of flood zones:

- **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). Flood Zone C covers all areas of the plan which are not in Zones A or B.

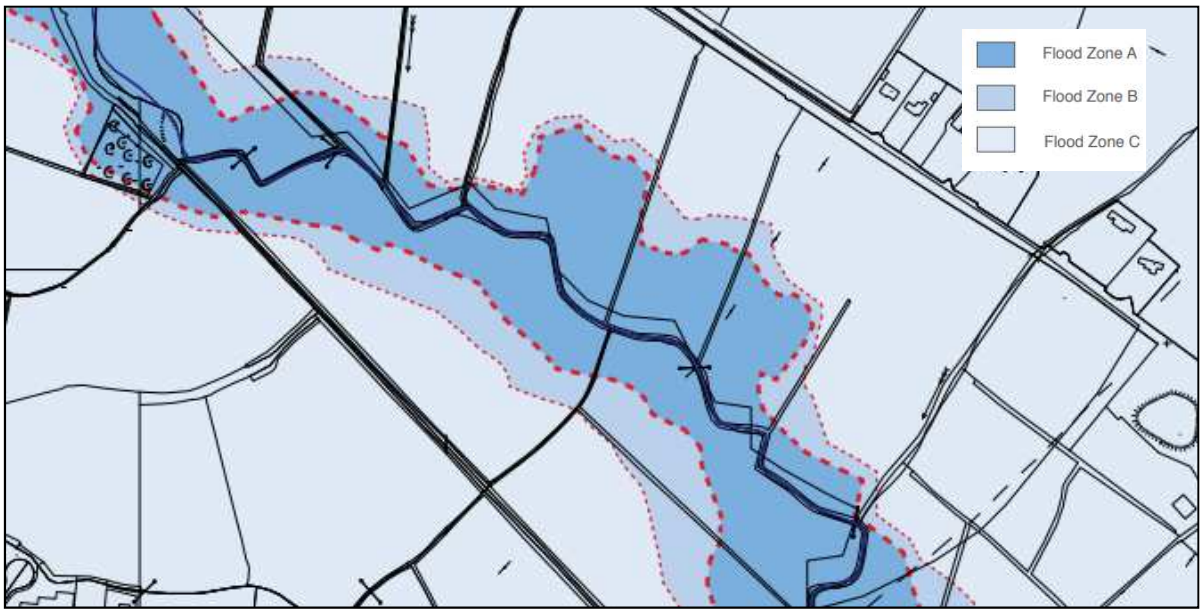

Figure 3 Example of the three flood risk zones. From (OPW,2009)

According to the OPW Guidelines, the planning implication of each of the zones mentioned above are:

- **Zone A** - High probability of flooding. Most types of development would be considered inappropriate in this zone.
- **Zone B** - Moderate probability of flooding. Highly vulnerable development, such as hospitals, residential care homes, Garda, fire and ambulance stations, dwelling houses and primary strategic transport and utilities infrastructure, would generally be considered inappropriate in this zone
- **Zone C** - Low probability of flooding. Development in this zone is appropriate from a flood risk perspective (subject to assessment of flood hazard from sources other than rivers and the coast) but would need to meet the normal range of other proper planning and sustainable development considerations.

The OPW Guidelines provided three vulnerability categories based on the type of development which are:

- Highly vulnerable: This includes essential infrastructure, such as primary transport and utilities distribution, electricity generating power stations and sub-stations
- Less vulnerable: This category includes Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans;
- Water compatible: Includes water-based flood control and recreational developments and other amenity open space, outdoor sports and recreation and essential facilities such as changing rooms.

3.2 Dublin City Flood Management Plan

Further to the recommendation of OPW Guidelines, Dublin City Council (DCC) has developed a Strategic Flood Risk Assessment (SFRA) as part of the overall Dublin City Development Plan 2016-2022. The SFRA has adopted the recommended the staged approach as per the OPW Guidelines. The stages approach comprises flood identification stage, initial assessment stage and detailed assessment stage.

For decision support purposes for such development, Flood Risk Assessment (FRA) is undertaken at different stages: from regional, to strategic to site-specific scale.

The Dublin SFRA 2016-2022 placed great emphasis on the key source of flooding in the city, including coastal and fluvial flooding as described below:

Coastal (Tidal) Flooding: Storms or other extreme weather conditions combined with high tides can cause sea levels to rise above normal, and force sea water on to the land thus causing coastal flooding.

Fluvial (River) Flooding: There are three main rivers in Dublin City, the Tolka, the Liffey and the Dodder. There are also many smaller rivers (underground) including the Wad, Poddle, Santry, Mayne and the Camac.

3.3 Fingal East Meath Flood Risk Assessment (Fingal Catchment)

In 2008, Fingal County Council FCC, Meath County Council MCC and the OPW commenced work on a Flood Risk Assessment and Management Study for the Fingal and East Meath area (FEM-FRAMS), as a mean of addressing existing flood risk in the study area and the potential for significant increases in this risk in the future. FEM-FRAMS was one of four pilot CFRAM studies for the new Flood Risk Assessment and Management Programme.

The main stated objectives for FEM-FRAMS were included:

• assess flood risk, through the identification of flood hazard areas and the associated impacts of flooding;

• build the strategic information base necessary for making informed decisions in relation to managing flood risk

• identify viable structural and non-structural measures and options for managing the flood risks for localised high-risk areas. Recommendations which impact on the adjacent Mayne River are discussed in Section 3.3.1 of this report.

3.3.1 FEM-FRAMS Recommendations regarding Mayne River

There is a number of existing flood defence and control structures in Mayne River. The final FEM-FRAMS report indicates that there are no structural measures proposed as part of flood management plans for Mayne River. The only management option proposed by FEM-FRAMS study is to develop a Flood Early Warning System FEWS for Mayne main river as the study concluded that there is limited risk to properties along this river floodplains.

"Flood risk management options (1): Flood forecasting and warning system for the Mayne River Flood Risk (1% AEP event): There is limited economic flood risk to properties in the AU for the 1% AEP event with the majority of the risk confined to small clusters of properties at Balgriffin and Streamstown. Elsewhere, the risk is limited to isolated properties along the rivers." (ref: Halcrow Barry p74, 2011)

"A FFWS for the Mayne River would provide advance flood warning to properties at risk along the Mayne River in St Margaret's, Dublin Airport, Belcamp and Balgriffin areas APSR." (ref: Halcrow Barry p75, 2011).

4 Identification of Potential Flood Risk

Identification of the potential and scale of flood risk is conducted using historical and predictive information. This identifies any sources of potential flood risk to the site and reviews historic flood information.

4.1 Flood History

The most important source of information of historic floods is the OPW flood Hazard Mapping website http://www.floodinfo.ie which provides an abundance of historic flood information throughout Ireland. From looking at past flooding events occurred in Mayne River floodplains, there are 3 flood events recorded along Mayne Stream as shown in figure 4 below.

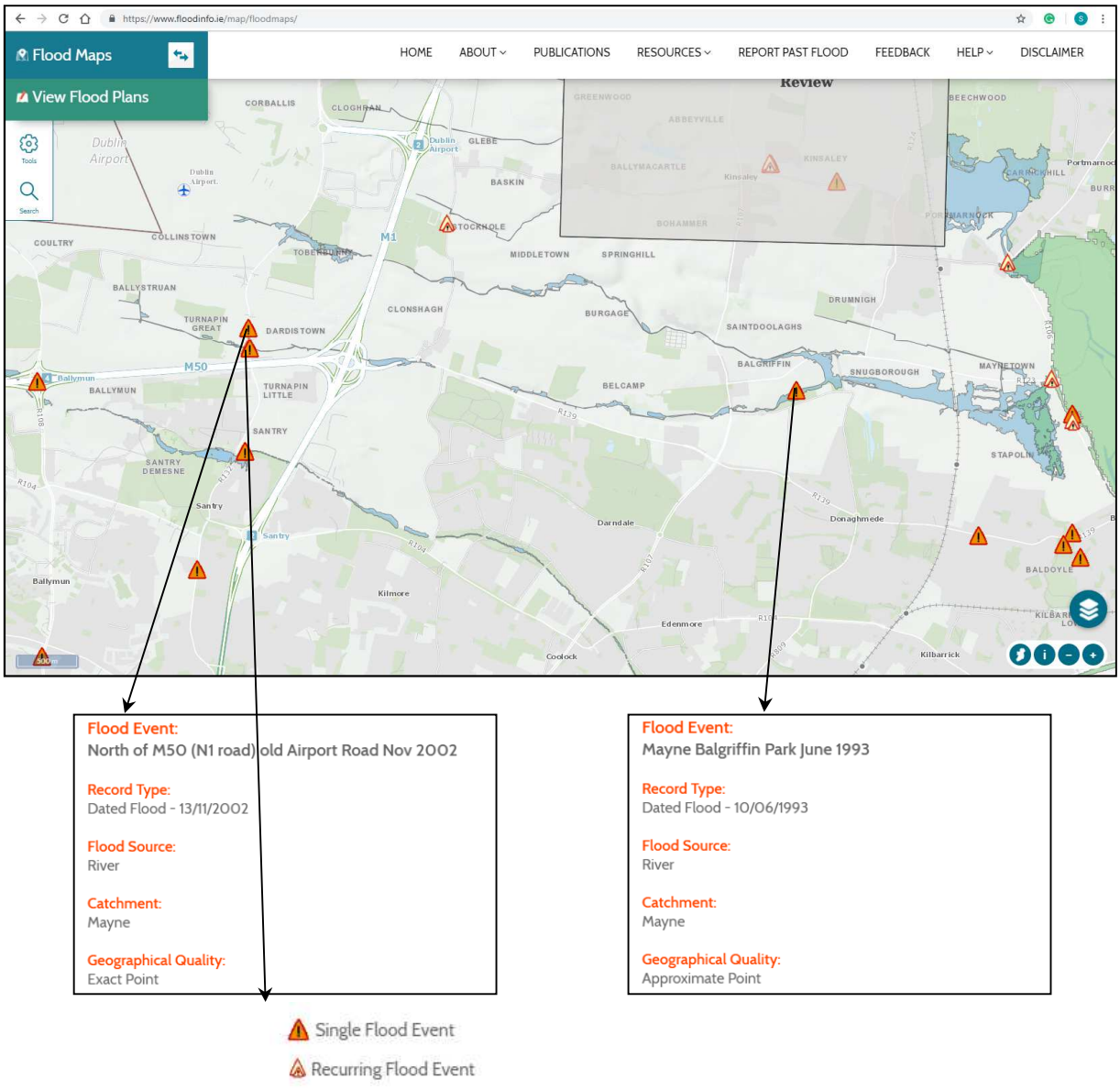

Figure 4 Screen view of pas flood events from floodinfo.ie records of Mayne River

The most significant flood events in the study area have also included in FEM-FRAMS report (Flood Risk Management Plan, 2014), these events are shown in Table 1 below.

Flood Event Date	Flooding Mechanism	River/coast affected	Areas affected
1924*	Tidal	Coastal	Coastal area of Fingal and Meath counties
June and October 1993	Fluvial	Mayne River, Nanny River	Balgriffen, Duleek
February 2002	Tidal	Ward River, Mayne River, Turvey River, Sluice River	Swords, Portmarnock, Maynetown, Skerries, Portrane, Bettystown, Malahide, Rush
November 2000/ November 2004	Fluvial/tidal	Sluice River, Brooks Stream, Mayne River	Bettystown, Rush, Skerries

Table 1 Past flood events that affected Mayne River extracted from (FEM-FRAMS, 2014)

4.2 Mayne River Catchment Description

The Mayne River has its source near Dublin airport; it flows in an easterly direction until it reaches the Baldoyle estuary. The map in Figure 5 below provides an overview of the extent of the Mayne River and its tributaries. The main channel length is 8.4km and has four tributaries that have a combined length of 8.6km. There are no gauging stations on this river.

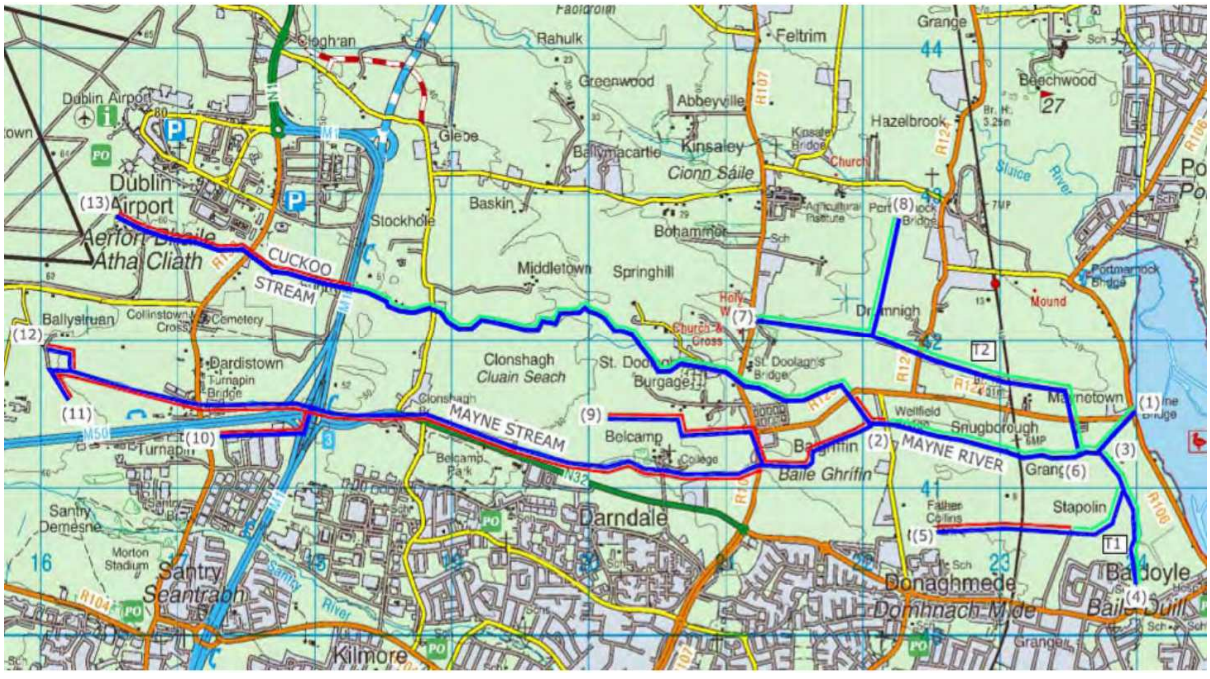

Figure 5 Mayne River and its tributaries. (extracted from FEM-FRAMS hydraulic report, 2001)

The two principle tributaries of the Mayne River are listed below:

- **Cuckoo Stream:** originates from Dublin airport area and flows east. The steam crosses the M1 and joins main Mayne River in Snugborough area.
- **Mayne Stream:** originates from Ballystruan area south of Dublin airport and flows east with the M50 / R139. It crosses the M1 and R107 before joining the main Mayne river.

The whole Mayne river system is included in Fingal catchment as part of FEM-FRAMS study.

The estimated catchment area of Mayne River is c. 19.5 km2 based on Flood Studies Update (FSU) Web Portal at outlet point 09_1428_1 (see figure 6a). The Mayne Stream appears to be the largest among the other tributaries with a catchment area of c. 9.5 km2 (see figure 6b).

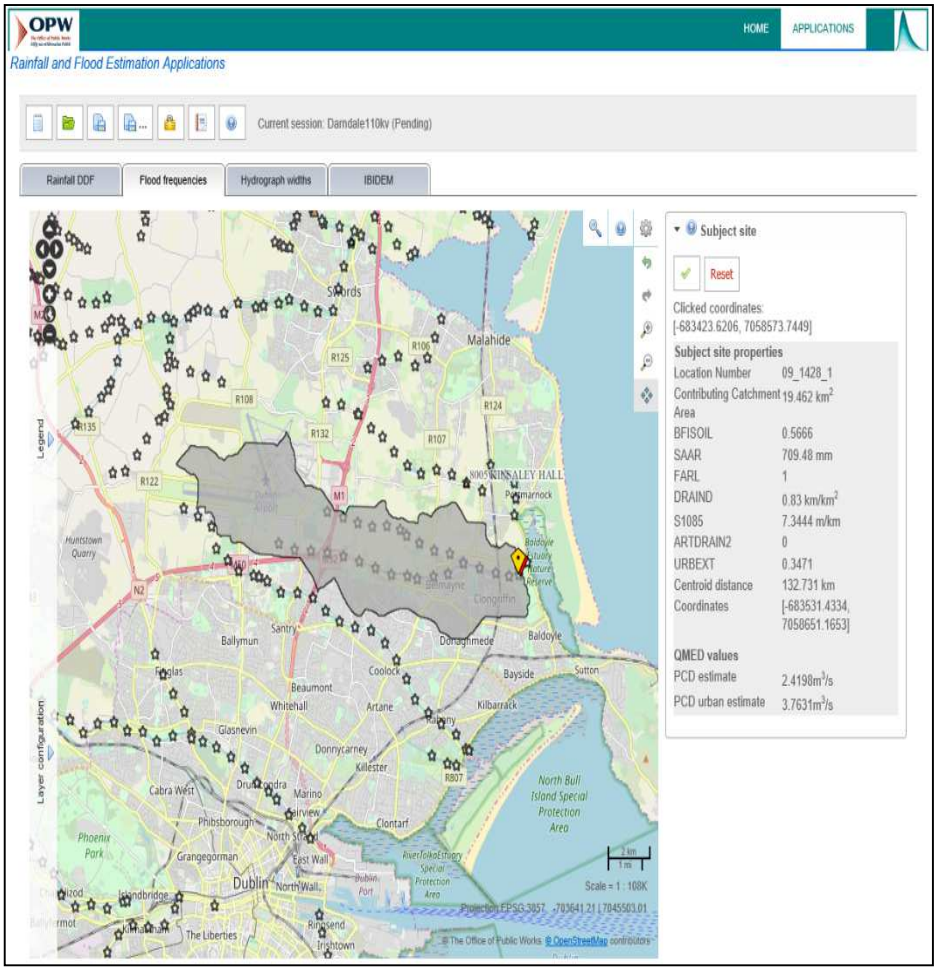

Figure 6a Screen view from FSU web portal, Mayne River catchment characteristics

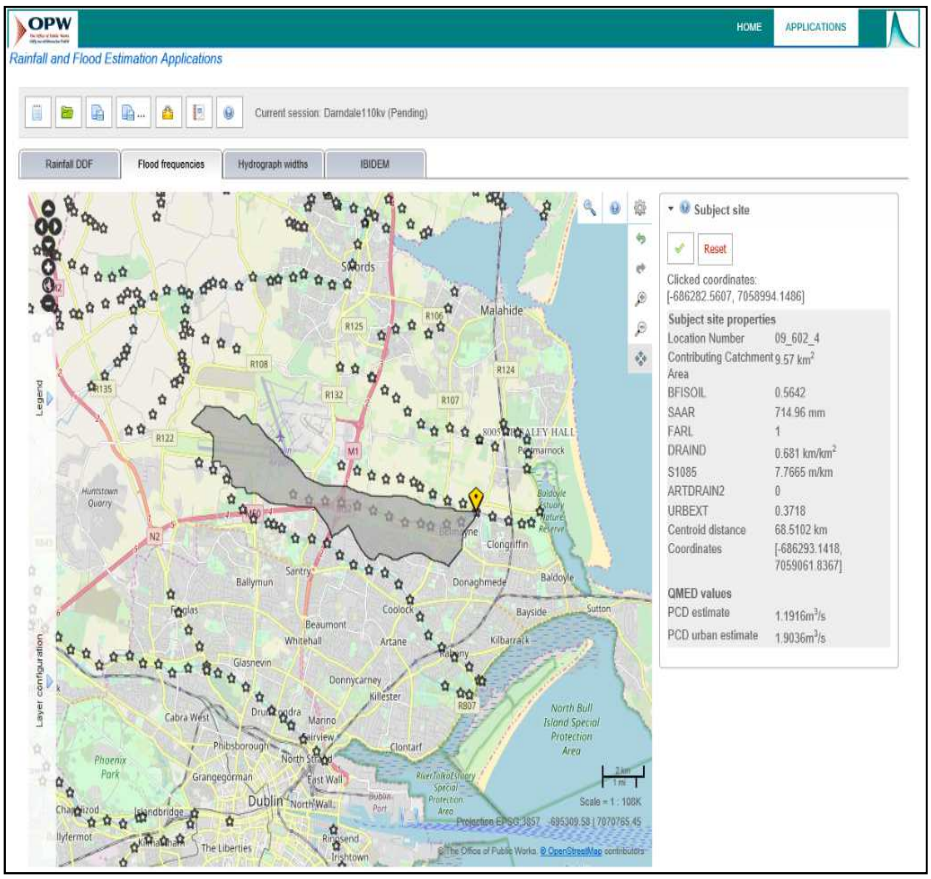

Figure 6b Screen view from FSU web portal, Mayne Stream catchment characteristics.

4.3 Flood Risk Identification

The FEM-FRAMS has identified two flood hazard areas along Mayne river where there is a significant risk to properties and infrastructure (see table 2 below).

Areas of potential significant risk	**Description of fluvial/tidal flood hazard**
St Margarets, Dublin Airport, Belcamp and Balgriffin areas	This area is exposed to fluvial flooding. Fluvial flooding for the 1% AEP flood event mainly affects pockets of agricultural land in the area and small section of Swords Road in the Toberbunny area and the R132 at Turnapin. At Balgriffin, a significant number of properties are at risk of flooding from a tributary of the Mayne River. The tributary starts to flood upstream of Balgriffin Road (R123) for a 2% AEP fluvial event. This flooding spills over the R123 and flows into the housing development located downstream of the R123.
Baldoyle area	Baldoyle is affected by both fluvial and tidal flooding. There is a large area of agricultural land at risk from out of bank flooding from the Mayne River.

Areas of potential significant risk	Description of fluvial/tidal flood hazard
	The Mayne River has a flapped outfall that acts as a defence against tidal events. The flood maps indicate that tidal flooding at Maynestown and Stapolin is reduced with the flapped outfall. The fluvial flood extent map indicates that the flapped outfall has no effect on the fluvial flood extents.

Table 2 Identified APSRs around the study area (Extracted from FEM-FRAMS, 2014)

As described in Table 2, most of the adjacent floodplains on the tributaries of Mayne River are affected by fluvial (river) flooding mechanism as the tidal effect is reduced by the flapped outfall downstream. Therefore, it is appropriate to examine the available fluvial flooding maps that covers the study area found in www.floodinfo.ie.The attached maps in Appendix A *(Map No. MAY/HPW/EXT/CURS/001 & MAY/HPW/EXT/CURS/002)* indicate the flood extend for the current scenario (CURS) for the Mayne River floodplain within the project area. Scenarios for the different flood flows as shown on the attached maps are for the following events;

- 10% AEP event (10 years return period): High Risk
- 1% AEP event (100 years return period): Medium Risk
- 0.1% AEP event (1000 years return period): Low Risk

The flood maps indicate that flooding in the study is entirely fluvial type with limited presence of high-risk inundation area. Medium risk zone appears in several areas along Mayne stream, mostly in the upper reach in Ballystruan and Dardistown. The medium flood risk also shown further down to M1 on R139 near to Clayton Hotel roundabout. The model also shows several High-Risk Flooding spots further downstream along Mayne Stream before the confluence with Mayne River. The low-risk zone has a broad coverage and tend to inundate the entire R139 between the Clayton Hotel roundabout all the way to Belcamp area. The best model's node that indicates the hydraulic flood variables for the study area is point 1Ma5284 with a flow and flood level data as given in table 3 below:

Variable	10% AEP	1% AEP	0.1% AEP
Flow (m3/s)	38.26	38.36	38.38
Water Level (mOD)	3.68	4.44	7.06

Table 3 Flood data for node 1Ma5284 (Extracted from flood extent map no. MAY/HPW/EXT/CURS/002)

5 Assessment of Impact on Proposed Development

5.1 Site Specific Flood Risk Assessment

Approximately 67% of the scheme parallels the Mayne Stream and is located along its natural floodplain. CSEA examined the flood extent maps presented in (Section 4.3) as a basis for assessing the proposed route in terms of flood risk.

Appendix B shows the proposed scheme overlaid on the flood extent maps. The proposed cable system design has six joint bays at three separate locations. The map indicates the following:

- Two of the Joint Bay locations fall outside of all Flood Risk Zones (at scheme chainage 465m and 1420m approx).
- One joint bay (located at scheme chainage 1000m approx.) falls within Flood Zone C (Low Risk) which is equivalent to 1:1000 year return period event.
- The overall proportion of the scheme located in each Flood Zone is outlined in Table 4 below:-

Flood Zone	**Flooding Probability**	**Risk Level**	**Proportion of Scheme within Flood Zone**
Zone A	1 in 10 year	High Risk	13.4%
Zone B	1 in 100 year	Moderate Risk	3.4%
Zone C	1 in 1000 year	Low Risk	36.5%
No Zone	-	No Flood Risk	46.7%

Table 4 Percentage of cable length under each flood Zone based on FEM-FRAMS flood map

The assessment outlined in Table 4 indicates that approximately 83% of the proposed scheme are located within areas which are either within Flood Zone C or area where no flood risk zoning applies. The assessment indicates that approximately 17% of the scheme is located within Flood Zones A and B.

5.2 Development Classification

The OPW Guidelines, as described in Section 2 of this report, sets out a sequential approach which makes use of flood risk assessment and classifies vulnerability of flooding of different types of development. Table 3.1 of the OPW Guidelines classifies essential infrastructure such as primary transportation and utilities distribution as highly vulnerable development.

Table 3.2 of the OPW Guidelines illustrates those types of development that would be appropriate to each flood zone and those that would be required to meet a Justification Test (See Table 5 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 5 Matrix of vulnerability versus flood zone (extracted from OPW Guidelines)

As indicated in Table 5, the OPW Guidelines state that highly vulnerable development is deemed appropriate within Flood Zone C. When highly vulnerable development is proposed within Flood Zone A and B a Justification Test for Development Management is required.

5.3 Justification Test

The OPW Guidelines acknowledges that there is need for development with established urban centres, which will continue to be at risk of flooding.

In order to rigorously assess appropriateness of such development Section 5 of the OPW Guidelines outlines the criteria for Justification Test for Development Management in areas at high or moderate risk of flooding that include types of development that are vulnerable to flooding.

As noted in Section 5.1 approximately 17% of the proposed scheme is located within Flood Zones A and B which are at moderate to high risk of flooding. As noted in Section 5.2 the scheme is classified as highly vulnerable. Accordingly the Justification Test for Development Management has been carried out and the assessment is outlined in Table 6 overleaf:-

Ref	Criteria	Assessment
1.	The subject lands have been zoned or otherwise designated for the particular use or form of development in an operative development plan, which has been adopted or varied taking account of these Guidelines.	The scheme is located within lands zoned for Enterprise and employment creation, research and development and high technology.
2.	The proposal has been subject to an appropriate flood risk assessment that demonstrates:	
2 (i)	The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk.	The proposed scheme will not increase flood risk elsewhere as there will be no alternations to the existing ground profile.
2 (ii)	The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible	Measures to minimise flood risk to people, property, the economy and the environment are not required as there will be no alterations to existing ground profile and no resultant increase in flood risk.
2 (iii)	The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access	As there is no impact on the existing flood plain there are no residual flood risks to the area as a result of the proposed scheme.
2 (iv)	The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.	The development provides key infrastructure linkage which supports the zoning objectives of the area. As the scheme is below ground and has no impact

Ref	Criteria	Assessment
		on the natural landscape impact on urban design and streetscape are not applicable.

Table 6 – Justification Test Criteria Assessment

Based on the above assessment the proposed scheme satisfies the Justification Test criteria for Development Management.

6 Conclusion

As demonstrated in Section 4 of this report there is no history of flooding within the vicinity of the proposed scheme and, as the scheme does not result in any alterations to existing ground profiles, there will be no impact the existing Mayne River and its associated floodplain.

In addition this Flood Risk Assessment has comprehensively reviewed predictive flood studies, specifically the FEM-FRAMS study pertaining the Mayne River and its associated tributaries which has concluded that the proposed scheme does not result in an increased flood risk to surrounding properties and the development.

The Flood Risk Assessment was undertaken in accordance with 'The Planning System and Flood Risk Management Guidelines' and the proposed scheme has satisfied the Justification Test for Development Management.

List of Appendices

A-1: FEM-FRAMS Map, No. no. MAY/HPW/EXT/CURS/001

A-2: FEM-FRAMS Map, No. no. MAY/HPW/EXT/CURS/002

B-1: Drawing No. 000-000-000-000

References

- Dublin City Council (2016) Strategic Flood Risk Assessment (SFRA), Volume 7. Dublin City Development Plan 2016-2022 [Online]. Available at: http://dublincitydevelopmentplan.ie/documents (Accessed: 15 January 2019)

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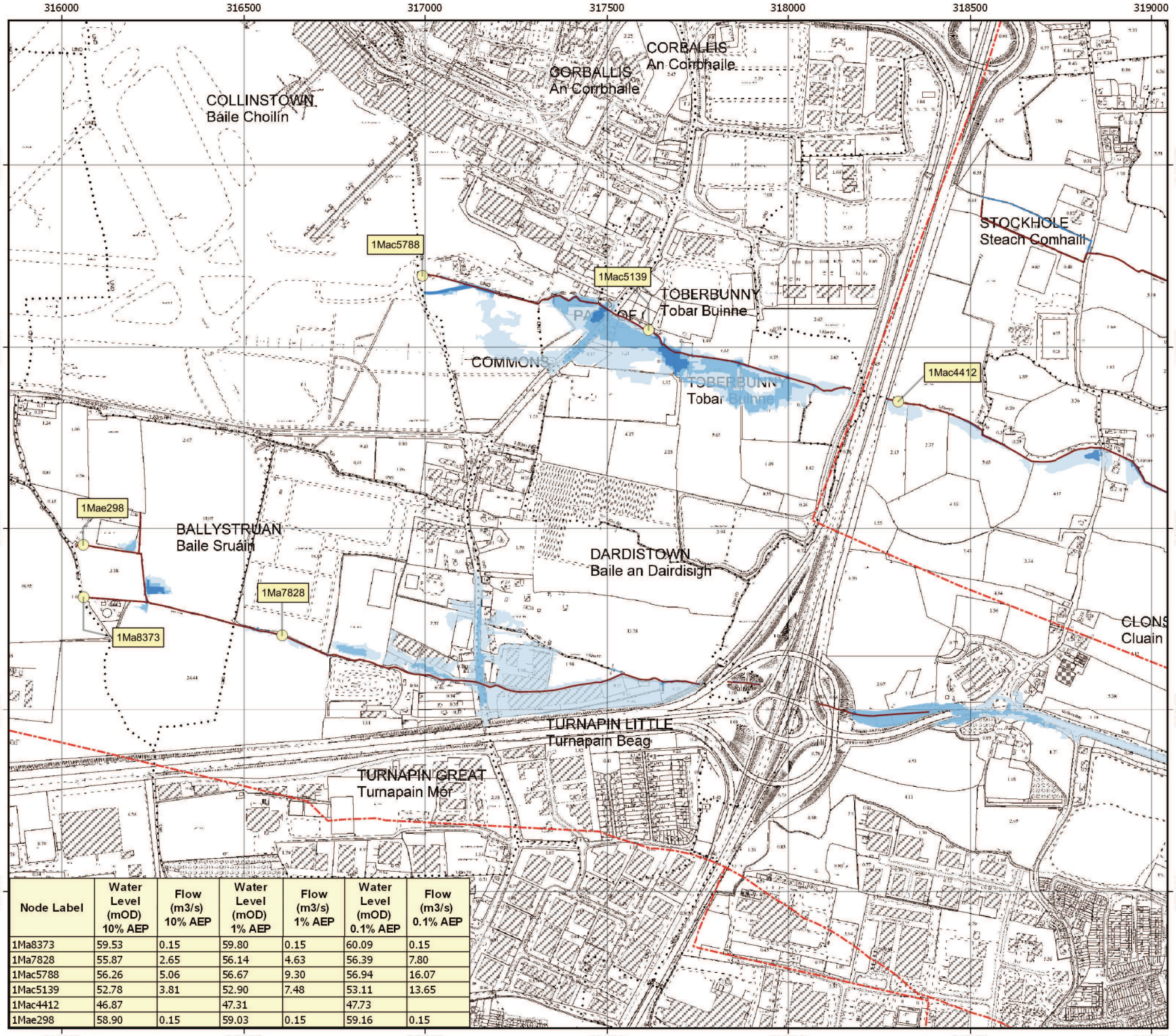
Appendix A: FEM-FRAMS Map



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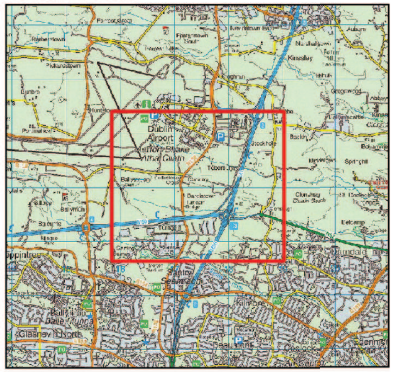
1Ma7828	55.87	2.65	56.14	4.63	56.39	7.80
1Mac5788	56.26	5.06	56.67	9.30	56.94	16.07
1Mac5139	52.78	3.81	52.90	7.48	53.11	13.65
1Mac4412	46.87		47.31		47.73	
1Mae298	58.90	0.15	59.03	0.15	59.16	0.15

250 0 250 500 750 1000 Meters

Location Plan:



LEGEND

- AFA Boundary
- Defended Area
- Modelled River Centreline
- Node Point
- 10% AEP Fluvial Extent (High Risk)
- 1% AEP Fluvial Extent (Medium Risk)
- 0.1% AEP Fluvial Extent (Low Risk)
- Flood Defence - Embankment
- Flood Defence - Wall
- Gate
- NODE123 — Node Label
- x.x% AEP — Standard of Protection of Flood Defence

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

The Office of Public Works
Jonathan Swift Street
Trim
Co. Meath

Project:
FINGAL EAST MEATH FRAM STUDY

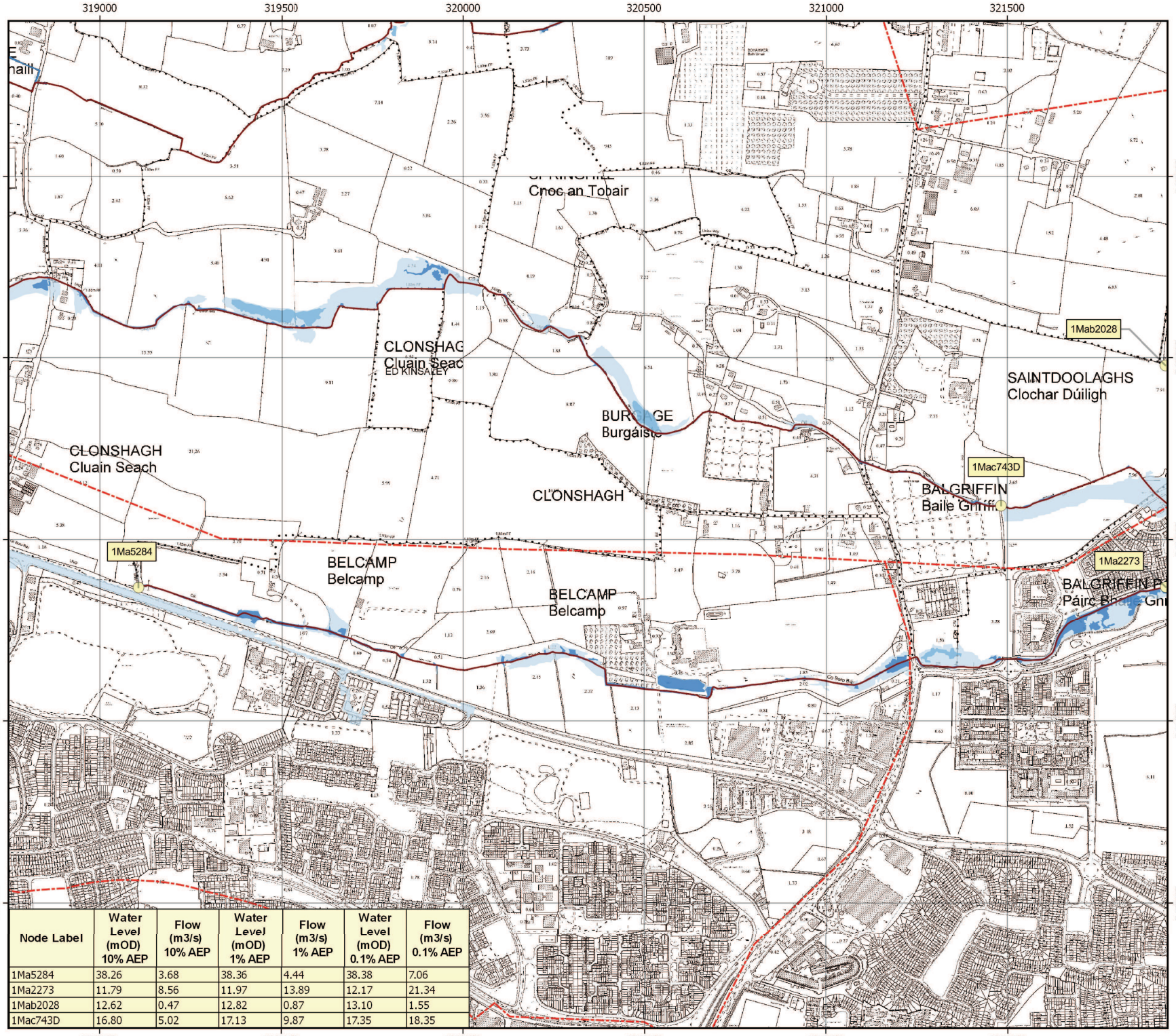
Map: **Mayne Model**
FLUVIAL FLOOD EXTENT MAP

Map Type:	EXTENT		
Source:	FLUVIAL		
Map Area:	HPW		
Scenario:	CURRENT		
Drawn by:	IH	Date:	Dec - 2017
Checked by:	JM	Date:	Dec - 2017
Approved by:	JM	Date:	Dec - 2017

Map No.:
MAY/HPW/EXT/CURS/001

Revision: F1

Map Scale: 1:10,000 Plot Scale: 1:1 @ A3



Node Label	Water Level (mOD) 10% AEP	Flow (m3/s) 10% AEP	Water Level (mOD) 1% AEP	Flow (m3/s) 1% AEP	Water Level (mOD) 0.1% AEP	Flow (m3/s) 0.1% AEP
1Ma5284	38.26	3.68	38.36	4.44	38.38	7.06
1Ma2273	11.79	8.56	11.97	13.89	12.17	21.34
1Mab2028	12.62	0.47	12.82	0.87	13.10	1.55
1Mac743D	16.80	5.02	17.13	9.87	17.35	18.35

Location Plan:

LEGEND

- AFA Boundary
- Defended Area
- Modelled River Centreline
- Node Point
- 10% AEP Fluvial Extent (High Risk)
- 1% AEP Fluvial Extent (Medium Risk)
- 0.1% AEP Fluvial Extent (Low Risk)
- Flood Defence - Embankment
- Flood Defence - Wall
- Gate
- NODE123 — Node Label
- x.x% AEP — Standard of Protection of Flood Defence

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

The Office of Public Works
Jonathan Swift Street
Trim
Co. Meath

Project:
FINGAL EAST MEATH FRAM STUDY

Map: **Mayne Model**
FLUVIAL FLOOD EXTENT MAP

Map Type:	EXTENT		
Source:	FLUVIAL		
Map Area:	HPW		
Scenario	CURRENT		
Drawn by:	IH	Date:	Nov - 2017
Checked by:	JM	Date:	Nov - 2017
Approved by:	JM	Date:	Nov - 2017

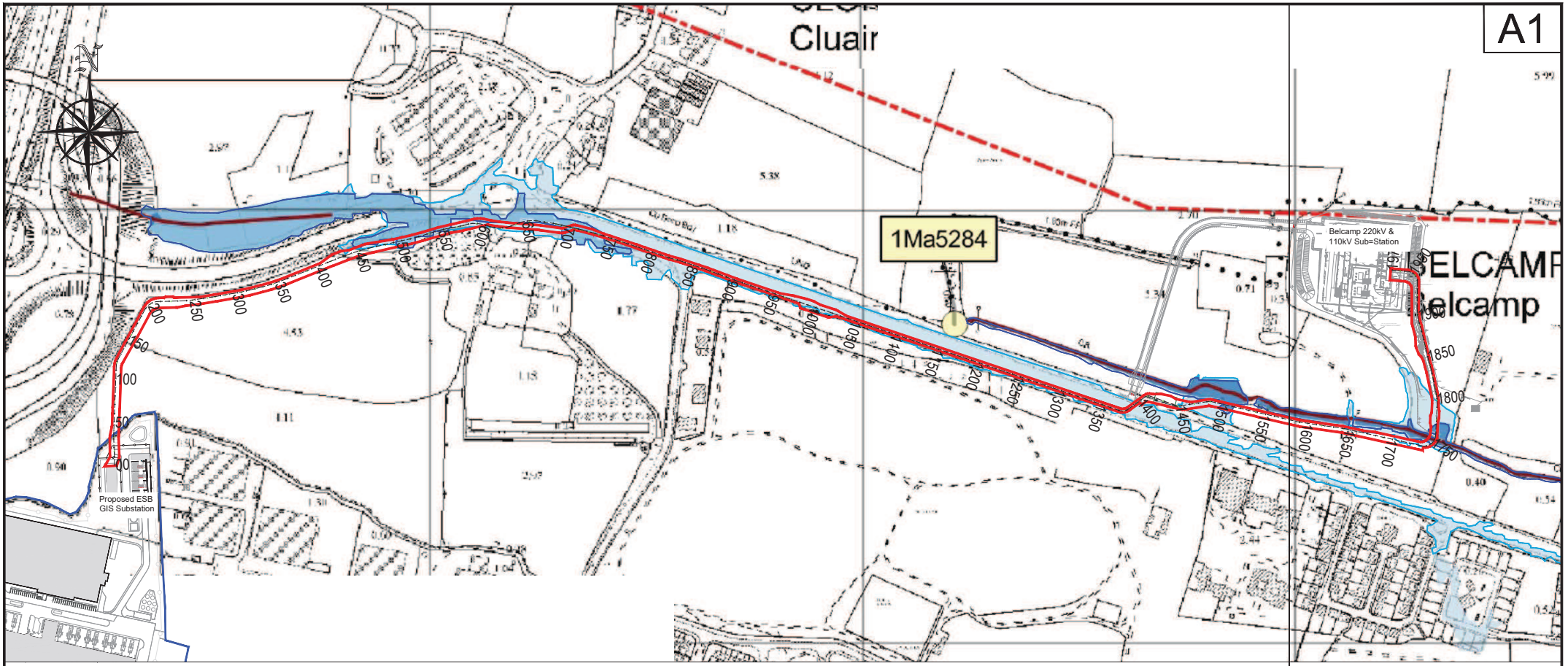
Map No.:
MAY/HP/W/EXT/CURS/002

Revision: F1

Map Scale: 1:10,000 Plot Scale: 1:1 @ A3

Appendix B: Drawing No. 17181-CSE-00-XX-DR-C-1100

A1



LEGEND

- Application Site Boundary
- AFA Boundary
- Defended Area
- Modelled River Centreline
- Node Point
- 10% AEP Fluvial Extent (High Risk)
- 1% AEP Fluvial Extent (Medium Risk)
- 0.1% AEP Fluvial Extent (Low Risk)
- Flood Defence - Embankment
- Flood Defence - Wall
- Gate
- NODE123 — Node Label
- X.X% AEP — Standard of Protection of Flood Defence
- Lands in Applicants Control

Revision	Description	Drw'n	Chk'd	Date
P01	ISSUED FOR PLANNING	PH	CD	01-02-2019

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Client: ADSIL

Project: Darndale to Belcamp Grid Connection

Flood Risk Map

Dwg. Title

Drawn By: LT — Date: 06/04/2018

Checked by: HF — Scale: 1:2500 @ A1

Project Code	Originator	Zone/ Phase	Level	Type	Role	Dwg. No.
17181	-CSE-	00	-XX-	DR	-C-	1100

Status Code	Suitability Description	CSEA Job No.
S2	ISSUED FOR INFORMATION	17_181
P01	PLANNING	

Revision — Project Status

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