OSL Butler

Site Specific Flood Risk Assessment

Ross Road , Killarney, Co. Kerry

July 2025

IE CONSULTING
WATER-ENVIRONMENTAL-CIVIL

Site Specific Flood Risk Assessment

Client: OSL Butler

Location: Ross Road , Killarney, Co. Kerry

Date: 25th July 2025

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1. Introduction

IE Consulting was requested by OSL Butler, to undertake a Site Specific Flood Risk Assessment (SSFRA) in support of a planning application for a Large Scale Residential Development (LRD) at Ross Road , Killarney, Co. Kerry.

The proposed development will consist of a largescale residential development (LRD), comprising of 134no. residential dwellings as follows: 65no. houses consisting of 10no. 4-bed dwellings and 55no 3-bed dwellings; 51no. townhouses consisting of 32no. 3-bed units and 19no. 2-bed units; and 18no. apartments consisting of 12no. 2-bed units and 6no. 1-bed units. The proposed development also includes crèche (585sqm) with capacity to accommodate 102no. children, and all ancillary site development works including 2no. vehicular and pedestrian accesses onto the Ross Road.

Following a Section 247 meeting with Kerry County Council on 18th December 2024, it was requested that a SSFRA be provided in support of this development proposal. In respect of potential flood risk, the main points raised by Kerry County Council were;

"It would be important that the level of the proposed access road is maintained to the level of the existing ground to the east so as not to restrict or alter the overland flow path from this direction, assuming these indicated flow paths materialise. The flow paths indicated in CFRAM do not account for boundary walls etc which may redirect it. The predicted flood depths in this area for the 0.1% AEP flood event (excluding the local depression) are in the low (0 to 0.25m) range. The predicted shallow depths and flow velocities along the access road would not hinder emergency vehicle access and egress during an event. Any infilling of the local depression at the entrance/access in the site would need to be designed to ensure that the existing overland flow paths remain substantially unchanged or at least redirected without negative impacts to adjoining landowners and road."

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The purpose of this SSFRA is to assess the potential flood risk to the proposed development site and to assess the impact that the development as proposed may or may not have on the hydrological regime of the area. In particular the impact of the proposed access road on the existing overland flow path has been accessed along with ensuring emergency vehicle access to and egress from the development as proposed in the event of an occurrence of an extreme fluvial flood event.

Quoted ground levels or estimated flood levels relate to Ordnance Datum (Malin) unless stated otherwise.

This flood risk assessment study has been undertaken in consideration of the following guidance document:

'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' DOEHLG 2009.'

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2. Proposed Site Description

2.1. General

The proposed development site is located along Ross Road, Killarney, Co. Kerry. The site is bounded to the north by the Ross Road, and to the east, south and west by existing residential development. The total area of the proposed development site is approximately 3.886 hectares.

The location of the proposed development site is illustrated on *Figure 1* below and shown on *Drawing Number IE3115-001-A*, *Appendix A*.

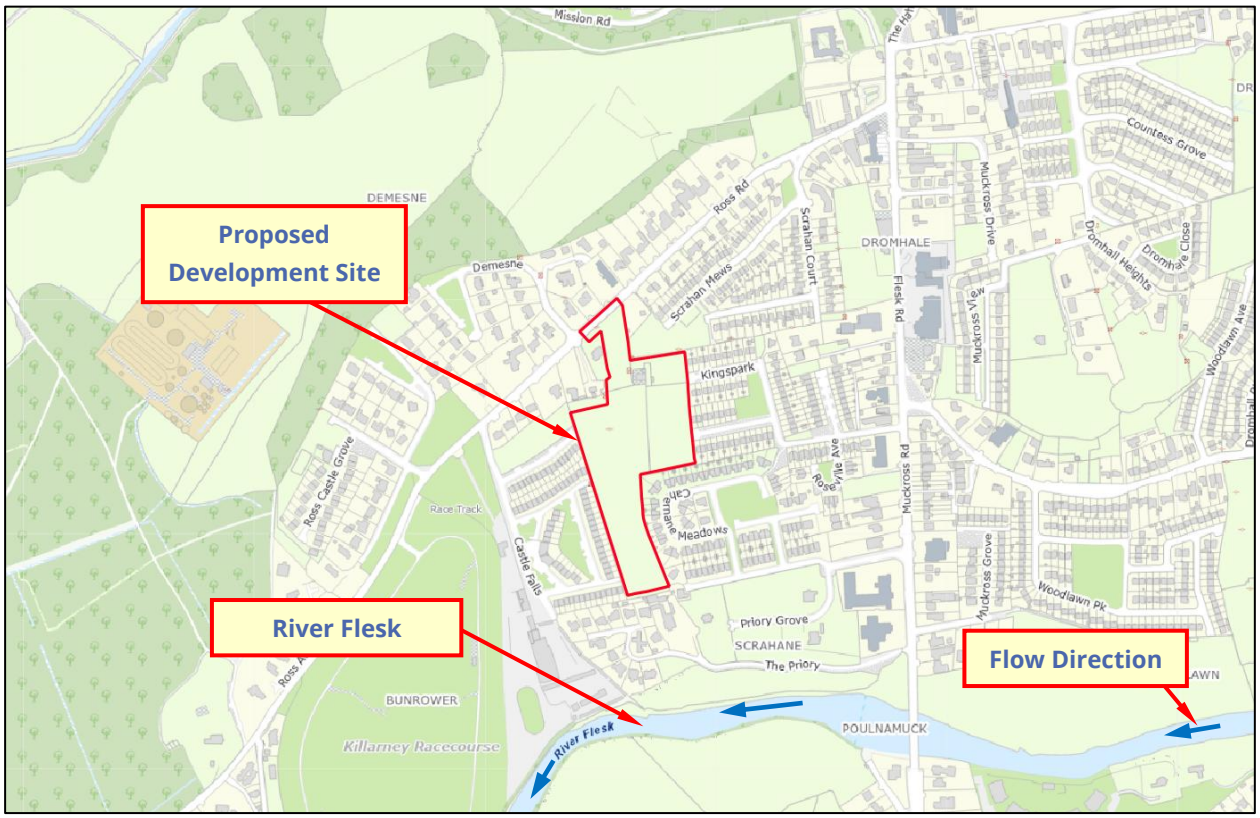

Figure 1 – Site Location

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2.2. Existing Topography Levels at Site

The proposed development site slopes gently from the south to the north at an average gradient of approximately 0.049% (1 in 206).

Existing ground elevations range from approximately 26.25m OD (Malin) within the southern area of the site to 22.22m OD (Malin) in the northern area of the site.

2.3. Local Hydrology, Landuse & Existing Drainage

As illustrated in *Figure 1* above, the most immediate and significant hydrological feature in the vicinity of the proposed development site is the River Flesk, located 175m beyond the southern boundary of the site.

At this location the River Flesk generally flows in an east to west direction. The catchment area of the River Flesk was delineated and was found to be approximately 329.49km^2 to a point located immediately downstream of the proposed development site. Assessment of the upstream catchment area indicates that the catchment is predominantly rural in nature with the urban fraction accounting for approximately 0.66% of the upstream catchment area.

There are no mapped or recorded surface hydrological features within or in the immediate vicinity of the proposed development site.

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3. Initial Flood Risk Assessment

The flood risk assessment for the proposed development site is undertaken in three principal stages, these being 'Step 1 – Screening', 'Step 2 – Scoping' and 'Step 3 – Assessing'.

3.1. Possible Flooding Mechanisms

Table 1 below summarises the possible flooding mechanisms in consideration of the proposed development site:

Source/Pathway	Significant?	Comment/Reason
Tidal/Coastal	No	The site is not located within a coastal or tidally influenced region.
Fluvial	Yes	The River Flesk is located 175m beyond the southern boundary of the proposed development site.
Pluvial (urban drainage)	No	There is no significant urban drainage or water supply infrastructure located within or in the immediate vicinity of the proposed development site.
Pluvial (overland flow)	No	The proposed development site is not surrounded by significantly elevated lands and does not provide an important surface water discharge point to adjacent lands.
Blockage	No	There are no significant or restrictive hydraulic structures located on the River Flesk immediately downstream of the proposed development site.
Groundwater	No	There are no significant springs or groundwater discharges mapped or recorded in the immediate vicinity of the proposed development site.

Table 1: Flooding Mechanisms

The primary potential flood risk to the proposed development site can be attributed to an extreme fluvial flood event in the River Flesk located 175m beyond the southern boundary of the proposed development site.

In accordance with 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities - DOEHLG 2009' the potential flood risk to the proposed development site is analysed in the subsequent 'Screening Assessment' and 'Scoping Assessment' section of this study report.

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4. Screening Assessment

The purpose of the screening assessment is to establish the level of flooding risk that may or may not exist for a particular site and to collate and assess existing current or historical information and data which may indicate the level or extent of any flood risk.

If there is a potential flood risk issue, then the flood risk assessment procedure should move to 'Step 2 – Scoping Assessment' or if no potential flood risk is identified from the screening stage, then the overall flood risk assessment can end at 'Step 1'.

The following information and data was collated as part of the flood risk screening assessment for the proposed development site.

4.1. OPW/EPA/Local Authority Hydrometric Data

Existing sources of OPW, EPA and local authority hydrometric data were investigated. This assessment has determined that there is one hydrometric gauging station located on the River Flesk in the vicinity of the proposed development site. Hydrometric Gauge (22006) is located approximately 600m upstream of the N71 bridge as illustrated below in *Figure 2*.

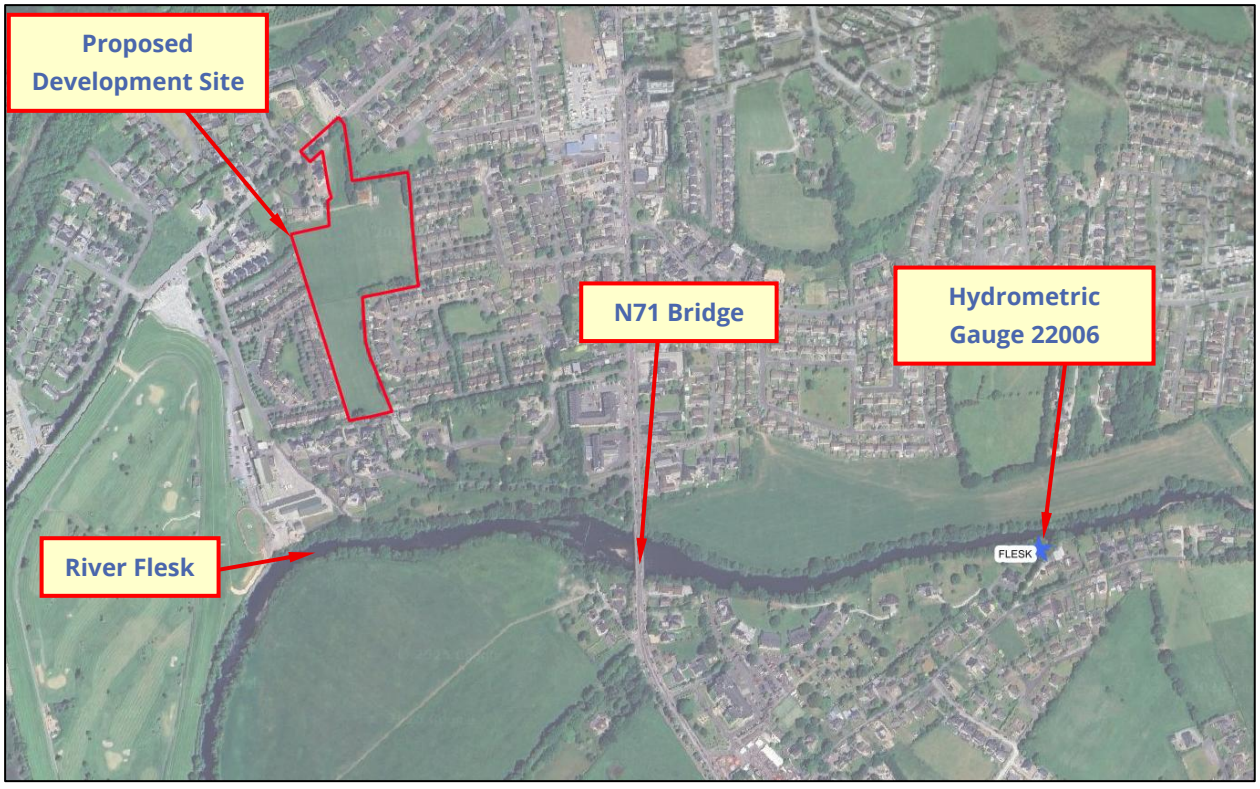

Figure 2 - Location of Hydrometric Gauge

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Hydrometric Gauge 22006 measures both level and flow in the River Flesk and is in the ownership of the OPW. Flow and level data is available for this station for 08th January 1947 to the current hydrometric year.

4.2. OPW PFRA Indicative Flood Mapping

Preliminary Flood Risk Assessment (PFRA) Mapping for Ireland was produced by the OPW in 2011. OPW PFRA flood map number 2019/MAP/46/A illustrates indicative flood zones within this area of County Kerry.

Figure 3 below illustrates an extract from the above indicative flood map in the vicinity of the proposed development site.

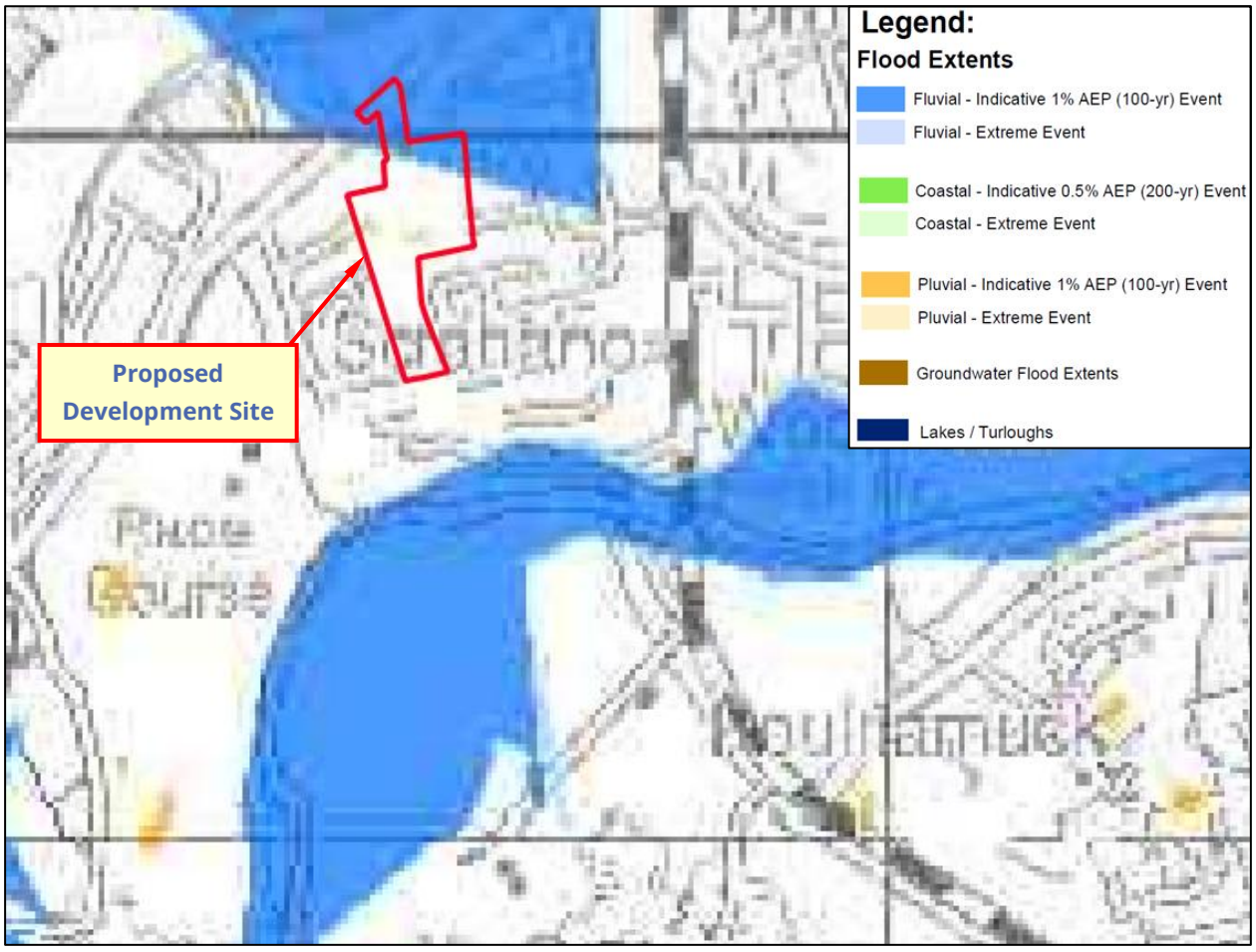

Figure 3 - OPW PFRA Mapping

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The OPW PFRA flood mapping indicates that a limited area within the northern portion of the site falls within an indicative fluvial flood zone. The site does not fall within an indicative pluvial or groundwater flood zone.

It should be noted that the indicated extent of flooding illustrated on these maps was developed using a low-resolution digital terrain model (DTM) and illustrated flood extents are intended to be indicative only. The flood extents mapped on the PFRA maps are not intended to be used on a site-specific basis.

4.3. OPW Flood Maps Website

The OPW Flood Maps Website (www.floods.ie) was consulted in relation to available historical or anecdotal information on any flooding incidences or occurrences at or in the vicinity of the proposed development site. *Figure 4* below illustrates mapping from the Flood Maps website in the vicinity of the site.

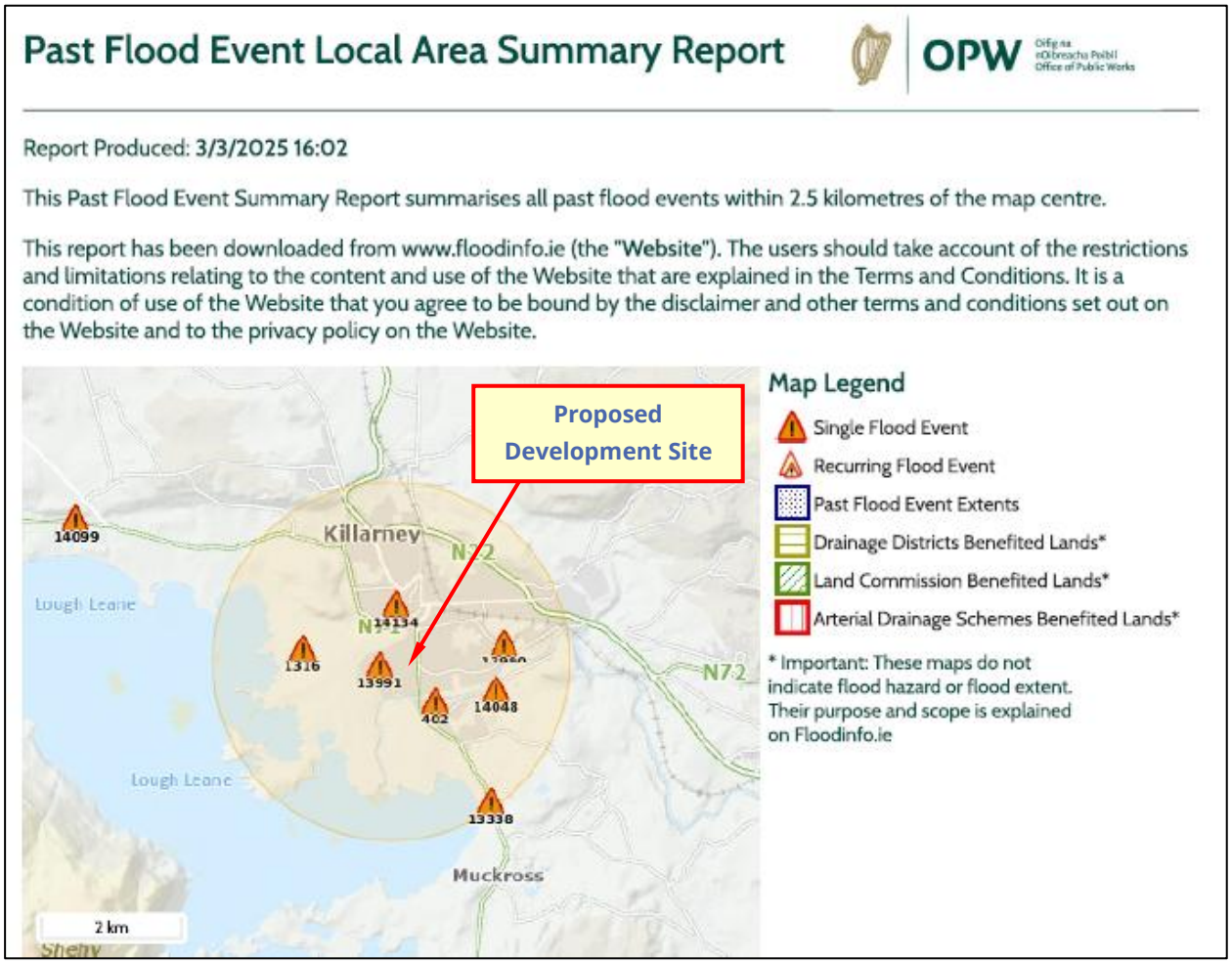

Figure 4 - OPW Flood Maps

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Figure 4 above indicates that there is a total of seven historical or recurring flooding events recorded within a 2.5km radius of the proposed development site. However, 6 of these flood events are located far from the proposed development site (over 700m away) (Flood ID-14048, Flood ID-402, Flood ID-1316, Flood ID-13990, Flood ID-13338, and Flood ID-14134). Due to the distance of these 6 flood events from the subject site these events are deemed unsuitable to assess flood history at the location of proposed development site.

The nearest flood event to the proposed development site is a flood event which occurred on the 05/12/2015 (Flood ID-13991). There are no details or data available to indicate that this flood event impacted the area of the proposed development site.

4.4. Ordnance Survey Historic Mapping

Available historic mapping for the area was consulted, as this can provide evidence of historical flooding incidences or occurrences. The maps that were consulted were the historical 6-inch maps (pre-1900), and the historic 25-inch map series. *Figure 5* and *Figure 6* below illustrates the historic mapping for the area of the proposed development site.

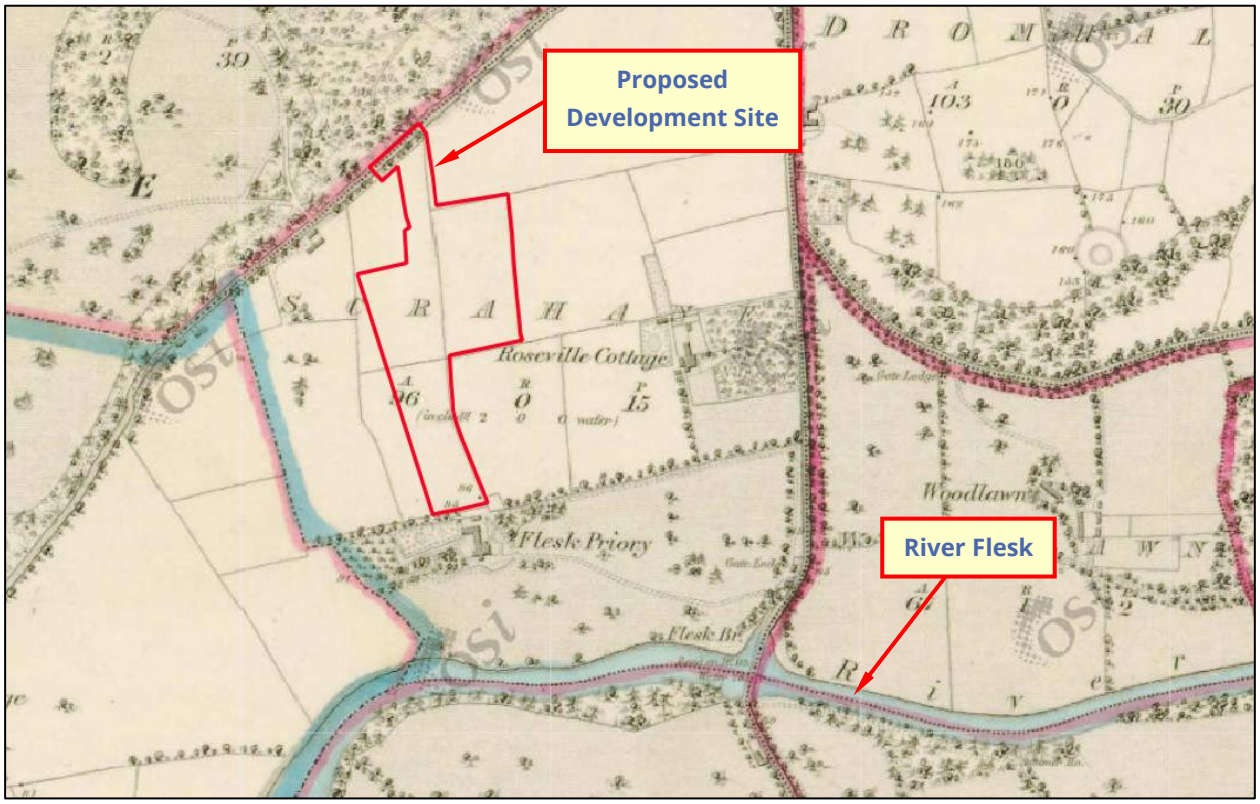

Figure 5 - Historic 6-Inch Mapping

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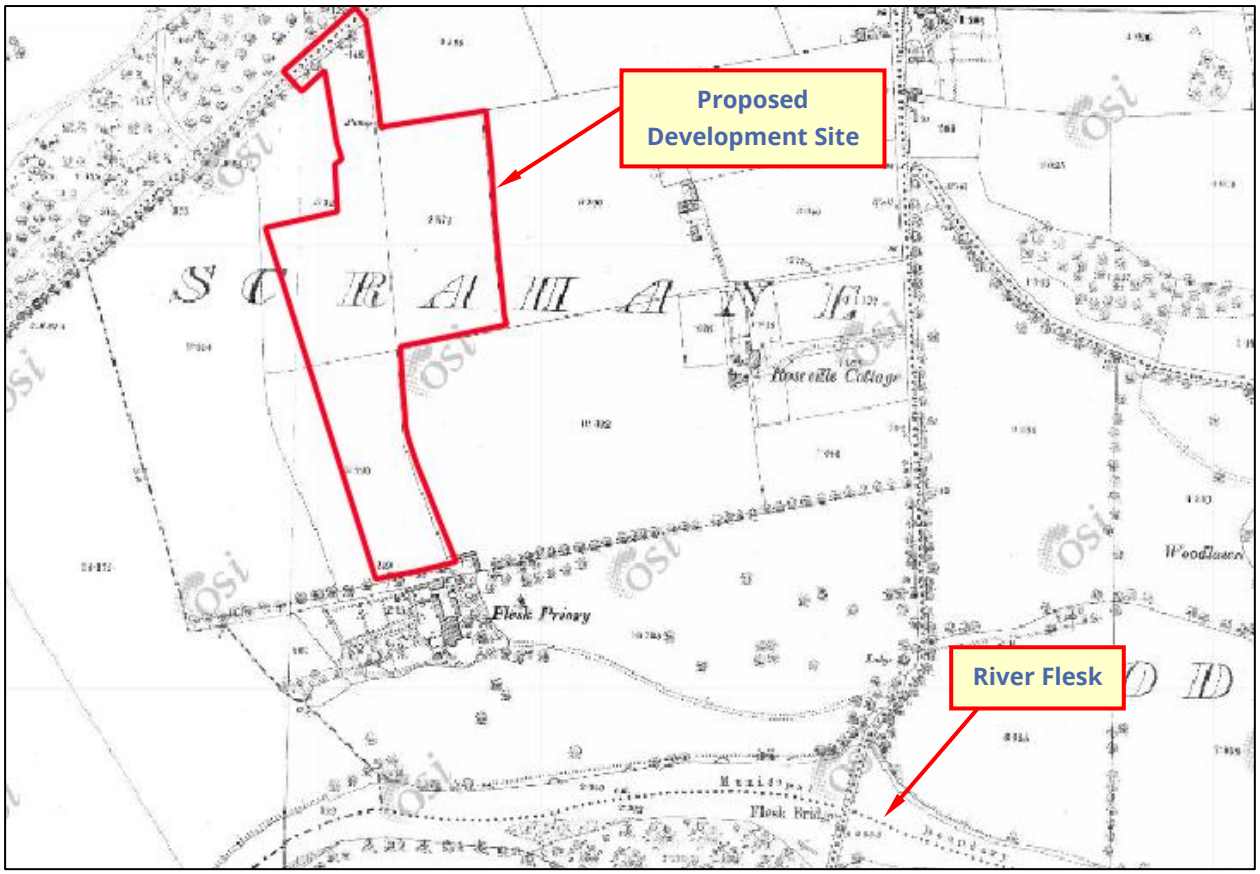

Figure 6 - Historic 25-Inch Mapping

The historic 6-inch and 25-inch mapping does not indicate any historical or anecdotal instances of flooding within or adjacent to the boundary of the proposed development site.

4.5. Geological Survey of Ireland Mapping

The alluvial deposit maps from the Geological Survey of Ireland (GSI) were consulted to assess the extent of any alluvial deposits in the vicinity of the proposed development site. Alluvial deposits can be an indicator of areas that have been subject to flooding in the recent geological past. *Figure 7* below illustrates the sub-soils mapping for the general area of the proposed development site.

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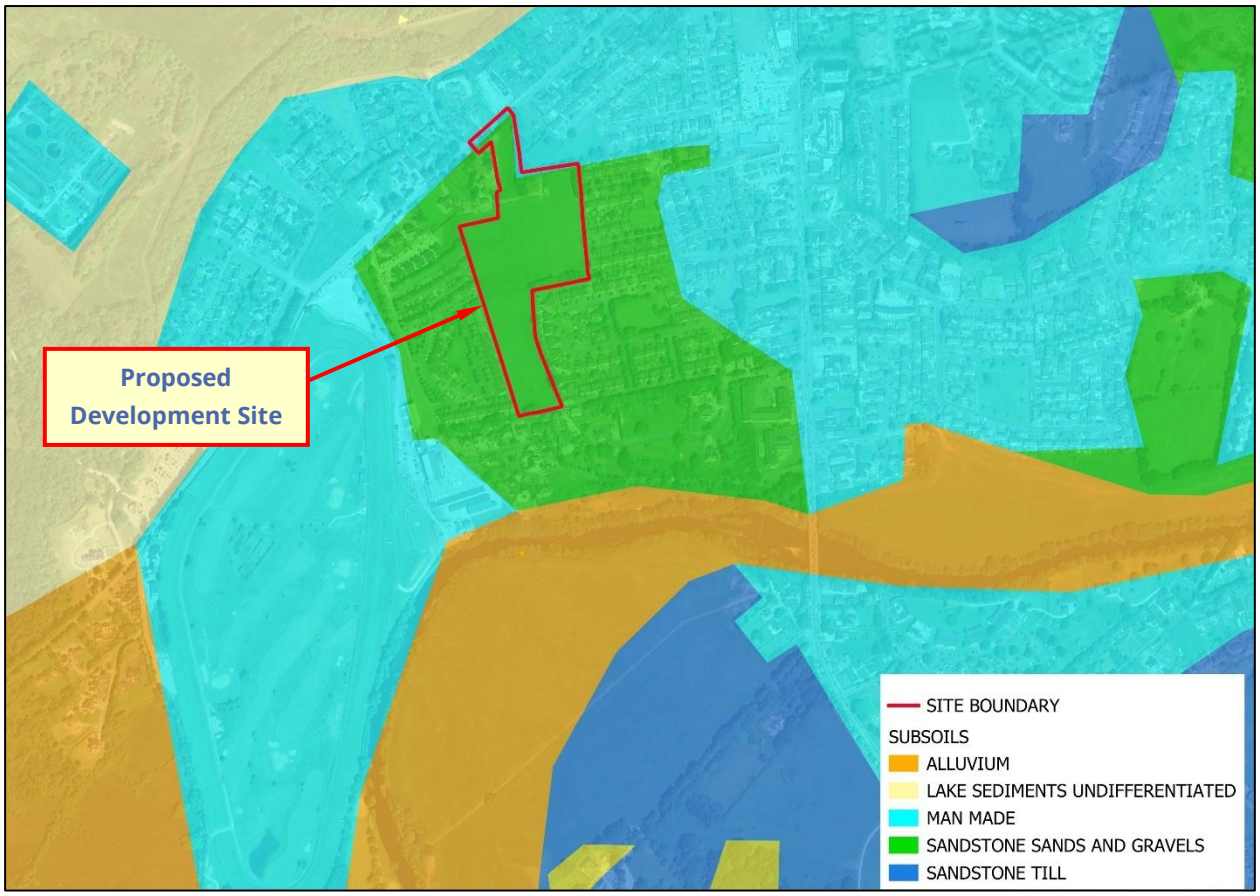

Figure 7 - GSI Subsoil Mapping

Figure 7 above indicates that the proposed development site is predominantly underlain by sandstone sands and gravels., with a very minor area of man-made ground mapped in the northern portion of the site, along the north eastern boundary.

Alluvium deposits are not mapped within or in the immediate vicinity of the site.

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4.6. Geological Survey of Ireland Groundwater Flood Mapping

Historic and Predictive Groundwater Mapping for Ireland was prepared by the GSI Department of Communication, Climate Action, and Environment in collaboration with Trinity College Dublin and the Institute of Technology Carlow.

Figure 8 below illustrates an extract from the above groundwater flood mapping in the vicinity of the proposed development site.

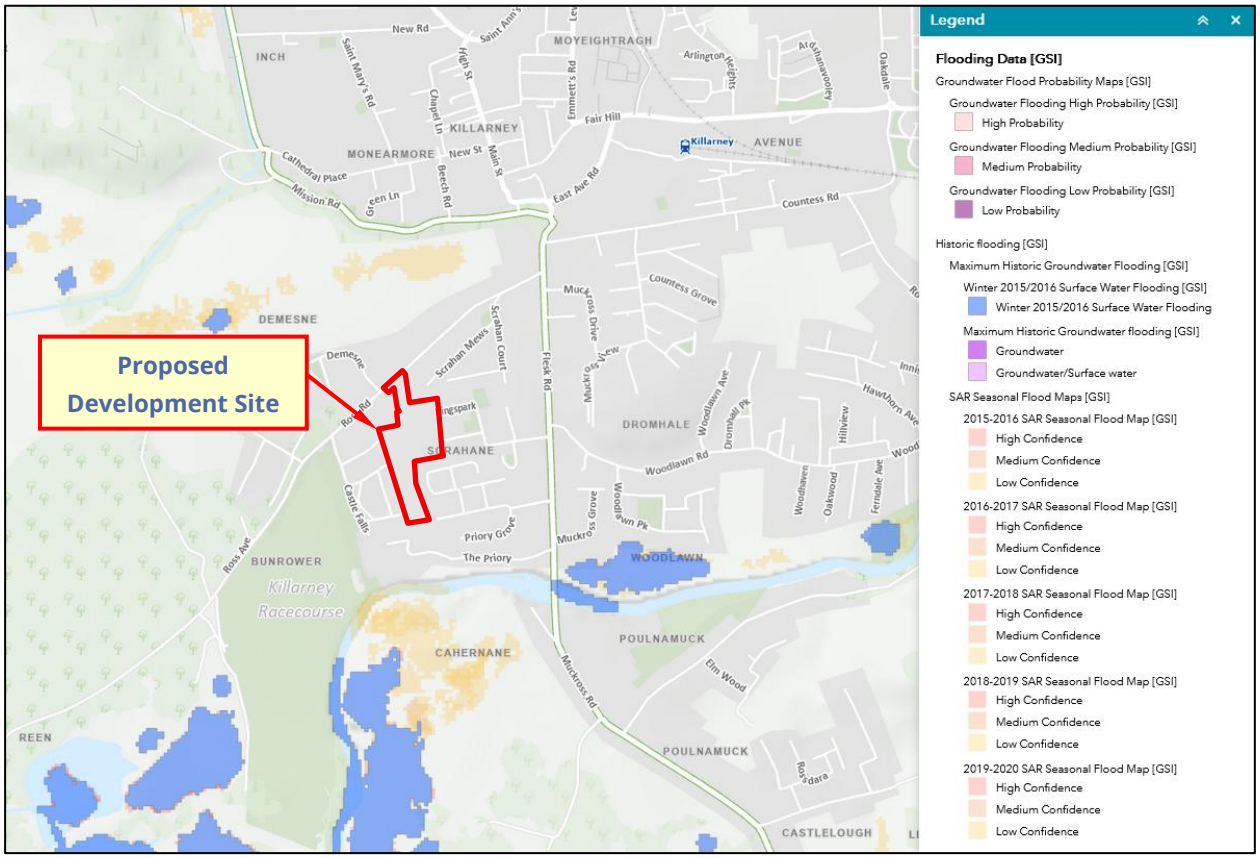

Figure 8 - GSI Groundwater Flood Mapping

The above GSI Groundwater Mapping indicates no areas of seasonal groundwater flooding or historic surface water flooding within or in the immediate vicinity of the proposed development site.

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4.7. OPW South Western CFRAM Study

The South Western Catchment Flood Risk & Management Study (CFRAMS) has been undertaken by the OPW and the final version of the flood maps were issued in November 2017. Flood risk extent and depth maps for further assessment areas within Killarney have also been produced. OPW South Western CFRAM study predictive flood map number *MMD/296235/E/DR/I22HKY37/EXFCDEXF/F2/Sht004 & MMD/296235/E/DR/I22HKY37/EXFCDEXF/F2/Sht005* illustrates predictive extreme fluvial flood extents in the vicinity of the proposed development site. A full copy of the above OPW CFRAMS flood extent maps are presented in *Appendix B*.

Figure 9 below (extracted from the South Western CFRAM study flood map *MMD/296235/E/DR/I22HKY37/EXFCDEXF/F2/Sht004 & MMD/296235/E/DR/I22HKY37/EXFCDEXF/F2/Sht005*), illustrates the predictive extreme current scenario 10% AEP (1 in 10 year), 1% AEP (1 in 100 year), and 0.1% AEP (1 in 1000 year) flood extents in the vicinity of the proposed development site.

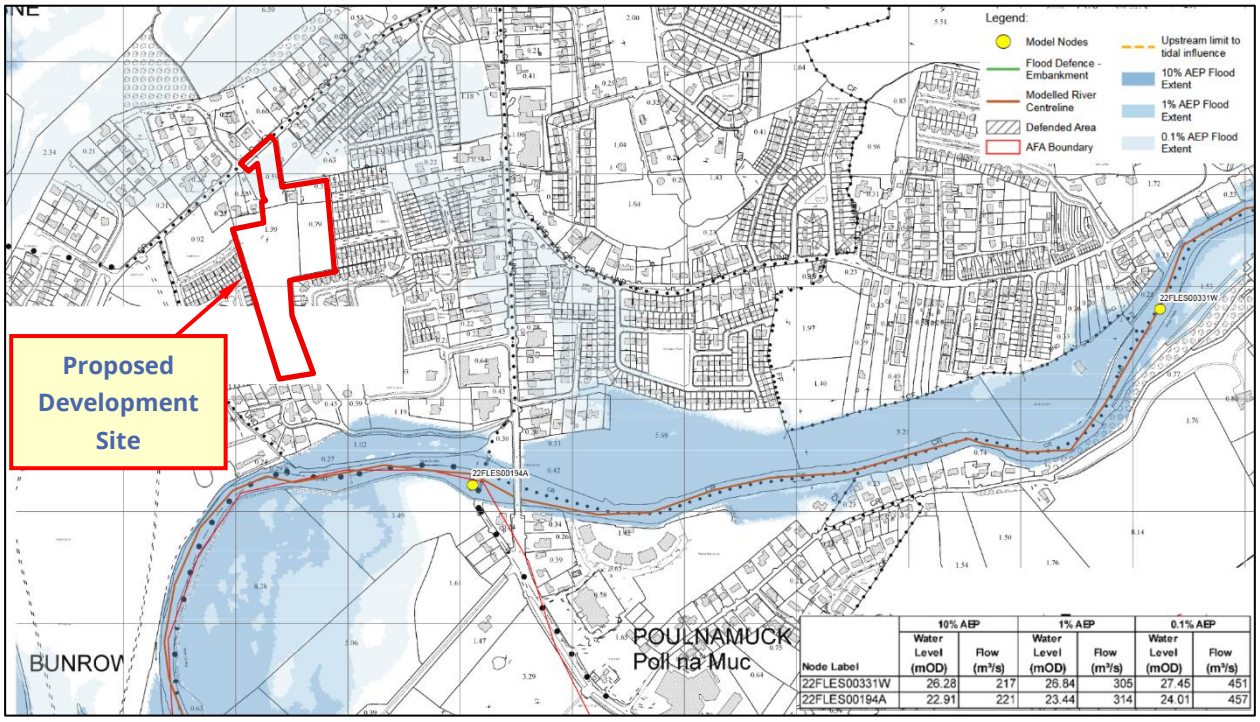

Figure 9 – OPW South Western CFRAMS Fluvial Flood Map

Figure 9 above indicates that the proposed development site does not fall within a predictive current scenario 10% AEP (1 in 10 year) or 1% AEP (1 in 100 year) fluvial flood extent. A limited portion of the northern area of the proposed development site falls within a predictive current scenario 0.1% AEP (1 in 1000 year) fluvial flood zone.

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The OPW South Western CFRAM study flood maps also provide information on predictive water levels and flows for the 10% AEP (1 in 10 year), 1% AEP (1 in 100 year) and 0.1% AEP (1 in 1000 year) fluvial flood events at various hydrological estimate points, or node points. The node points closest to the proposed development site are referenced as node points *22FLES00331W* and *22FLES00194A* as illustrated in *Figure 9* above.

Details of the predictive fluvial flood levels and flows for the OPW CFRAM study node points in the general vicinity of the proposed development site are listed in *Table 2* below, which has been extracted from the South Western CFRAMS flood map reference *MMD/296235/E/DR/I22HKY37/EXFCDEXF/F2/Sht004.*

Node Label	Water Level (m OD) 10% AEP	Flow (m^3/s) 10% AEP	Water Level (m OD) 1% AEP	Flow (m^3/s) 1% AEP	Water Level (m OD) 0.1% AEP	Flow (m^3/s) 0.1% AEP
22FLES00331W	26.28	217	26.84	305	27.45	451
22FLES00194A	22.91	221	23.44	314	24.01	457

Table 2: OPW CFRAMS Predicted Fluvial Flood Levels

Predictive flood depth maps have been produced. *Figure 10* below, extracted from OPW CFRAM flood map numbers *MMD/296235/E/DR/I22HKY37/EXFCDEXF/F2/Sht004 & MMD/296235/E/DR/I22HKY37/EXFCDEXF/F2/Sht005* illustrates the predictive flood depths for the area of the proposed development site in consideration of the 0.1% AEP (1 in 1000 year) fluvial flood event.

As illustrated in *Figure 9* above, the proposed development site does not fall within a current scenario 10% AEP (1 in 10 year) or 1% AEP (1 in 100 year) fluvial flood zone.

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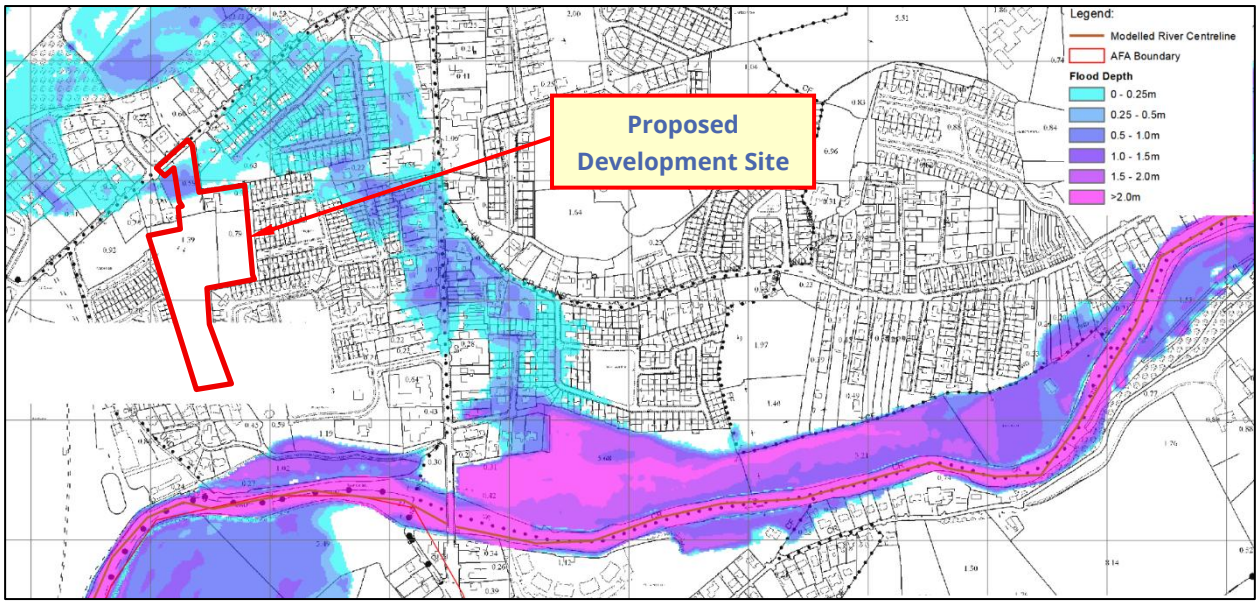

Figure 10 – OPW CFRAMS 0.1% AEP Fluvial Flood Depth Mapping

Figure 10 above indicates potential flood depths within a limited portion of the northern area of the site in the range of 0.25 - 1.0m in consideration of the occurrence of a current scenario 0.1% AEP (1 in 1000 year) fluvial flood event.

The OPW South Western CFRAM study flood maps are predictive flood maps, in that they provide predicted flood extent and depth information for a 'design' flood event that has an estimated probability of occurrence (e.g., the 1% AEP event), rather than information for floods that have occurred in the past.

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4.7.1. OPW South Western CFRAMS – Climate Change

The OPW CFRAM study fluvial flood extents maps are based on the current scenario and do not provide information or data in relation to potential climate change fluvial flood extents or flood levels. The OPW WMS resource was therefore utilised to assess the potential mid-range future climate change scenario fluvial flood extents and flood levels at and in the general location of the proposed development site.

Figure 11 below illustrates the predictive mid-range future climate change scenario 1% AEP + CC (1 in 100 year + climate change) fluvial flood extents in the vicinity of the site as acquired from the OPW WMS resource.

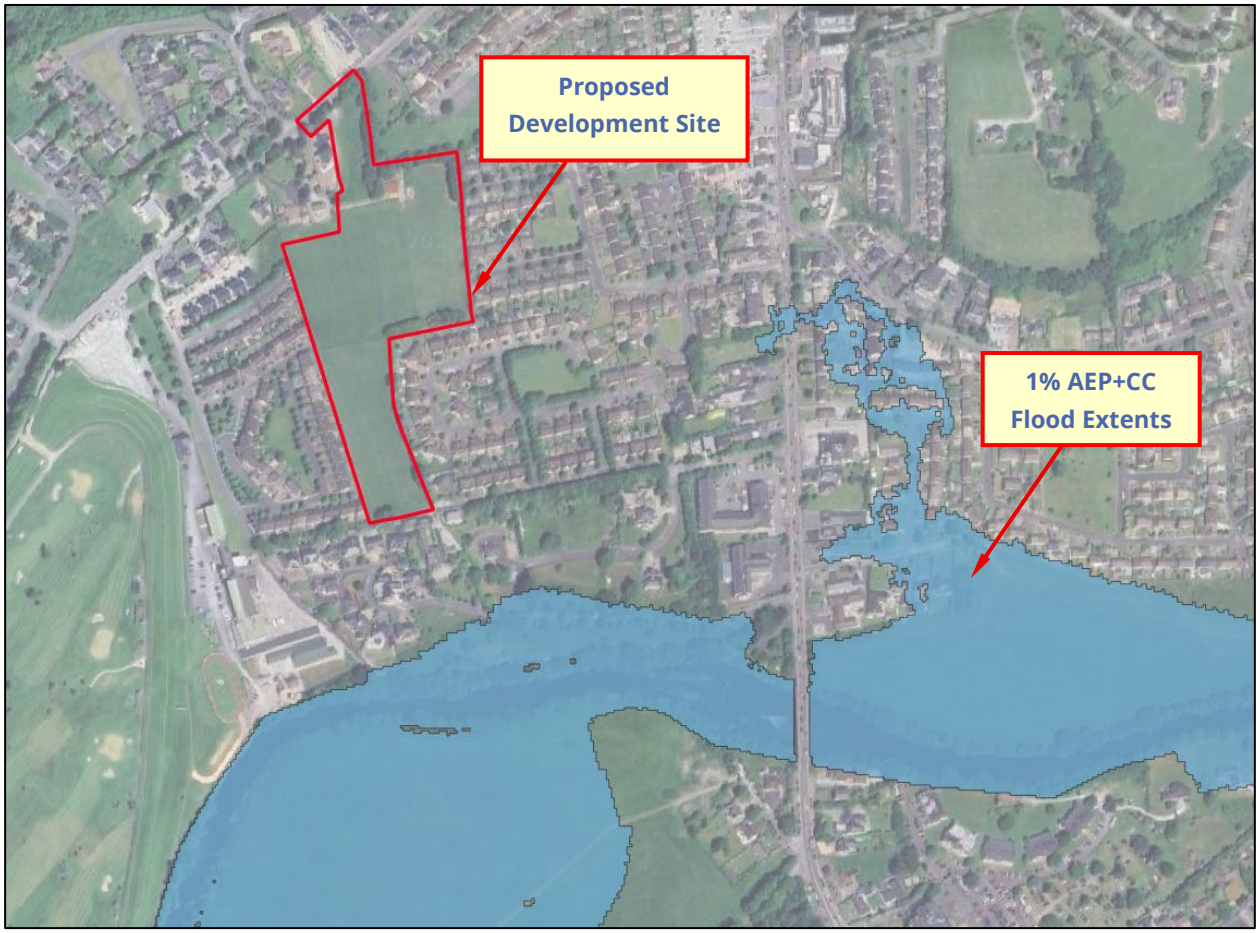

Figure 11 – Mid-Range Future Climate Change Scenario Flood Extent Mapping

Figure 11 above indicates that the proposed development site does not fall within a predictive mid-range future climate change scenario 1% AEP + CC (1 in 100 year plus climate change) fluvial flood zone.

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4.8. Killarney Town Development Plan (2022 – 2028) –Strategic Flood Risk Assessment (SFRA)

Figure 12 below, extracted from the Killarney Town Development Plan (2022 – 2028), illustrates the Strategic Flood Risk Assessment (SFRA) flood extents map in the vicinity of the proposed development site.

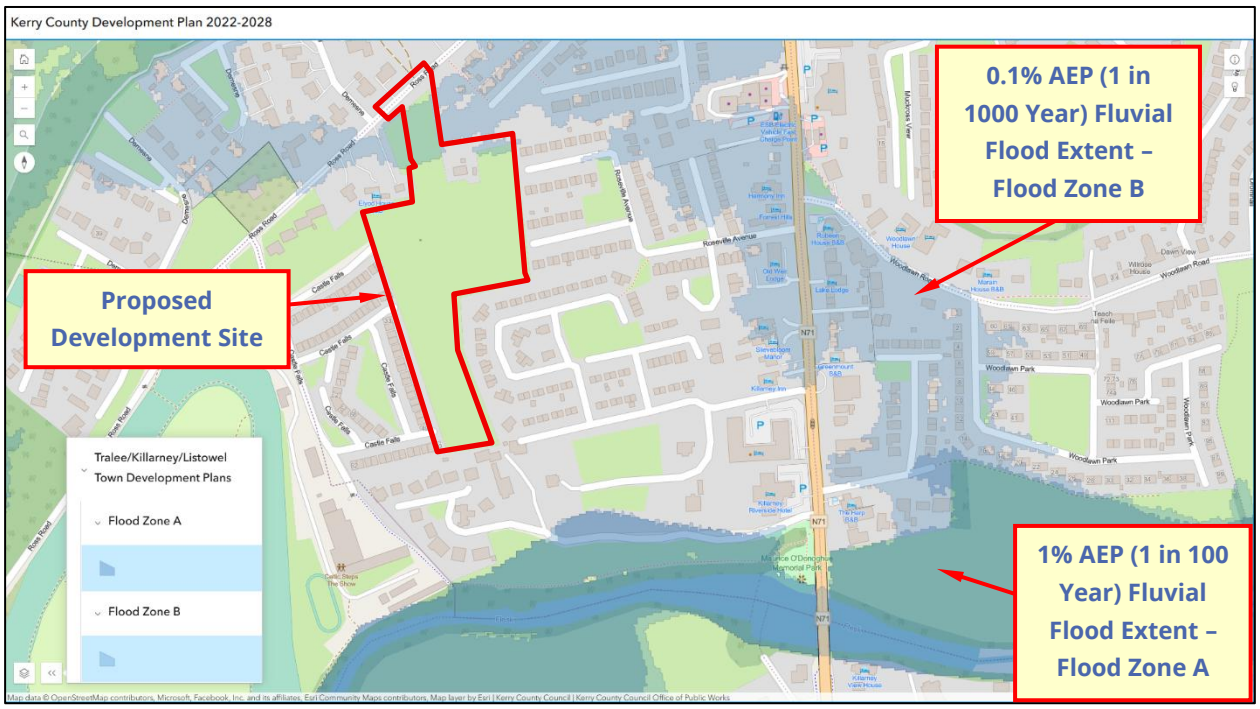

Figure 12 – Killarney Town Development Plan - SFRA

Figure 12 above indicates that a limited area in the northern portion of the proposed development site falls within a Strategic Flood Zone 'B'. The site does not fall within a Strategic Flood Zone 'A'.

It is noted that the strategic flood zones illustrated on the above SFRA flood extent map is a duplication of the OPW South Western CFRAM study flood extents as illustrated in *Figure 12* above.

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5. Scoping Assessment

The purpose of the scoping stage is to identify possible flood risks and to implement the necessary level of detail and assessment to assess these possible risks, and to ensure these can be adequately addressed in the flood risk assessment. The scoping exercise should also identify that sufficient quantitative information is already available to complete a flood risk assessment appropriate to the scale and nature of the development as proposed.

In specific consideration of the OPW South Western CFRAM study predictive flood mapping for the area, the above screening assessment indicates that the proposed development site does not fall within an extreme predictive 10% AEP (1 in 10 year) or 1% AEP (1 in 100 year) fluvial flood zone. A limited portion of the northern area of the site falls within an extreme predictive 0.1% AEP (1 in 1000 Year) fluvial flood zone. The screening assessment indicates that the proposed development site is not a risk of pluvial or groundwater flooding.

In consideration of the information collated as part of the screening exercise, and the availability of other information and data specific to the proposed development site, it is considered that sufficient quantitative information to complete an appropriate flood risk assessment cannot be derived from the information collated as part of the screening exercise alone. In particular, the potential impact of the proposed development on the existing hydrological regime of the area needs to be analysed, quantified and assessed in greater detail. In this regard it is required to undertake a more detailed and robust analysis of the fluvial flood regime at and in the vicinity of the proposed development site in consideration of the existing undeveloped scenario and the proposed development scenario.

The specific flood risk to and from the proposed development site is assessed in the subsequent 'Assessing Flood Risk' stage of this study report.

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6. Assessing Flood Risk

Fluvial flood risk from a particular watercourse is normally assessed for a 1% AEP (1 in 100 year) and a 0.1% AEP (1 in 1000 year) flood event, in accordance with most county development plans and in accordance with the DOEHLG guidelines 'The Planning System and Flood Risk Management Guidelines'.

The following sections present an analysis and assessment of the potential 1% AEP (1 in 100 year) and 0.1% AEP (1 in 1000 year) fluvial flood events in the River Flesk in the general vicinity of the proposed development site.

6.1. Overland Flow Conveyance Assessment

As illustrated above in *Figure 10* above, a small limited portion within the northern area of the proposed development site falls within a current scenario 0.1% AEP (1 in 1000 year) fluvial flood zone. The site does not fall within a current scenario or mid-range future climate change scenario 1% AEP (1 in 100 year) fluvial flood zone.

The specific flood mechanism that results in a current scenario 0.1% AEP (1 in 1000 year) fluvial flood event potentially impacting the small limited portion within the northern area of the site is attributed to overland flow conveyance of floodwaters emanating from the River Flesk located 175m beyond the southern boundary of the proposed development site.

As illustrated in *Figure 13* below, during the occurrence of an 0.1% AEP (1 in 1000 year) fluvial flood event, flood waters have the potential to overtop the right overbank of the River Flesk channel upstream of the N71 road bridge.

In this scenario flood waters are predicted to be conveyed via overland flow in a northly direction along the Woodlawn Park Estate to the location of the Woodlawn Road, after which flood waters are diverted in a north westerly direction and conveyed over the N71 (Muckross Road) and through the Roseville estate and to the location of Sarahan Mews. The overland flow conveyance of flood waters is then predicted to diverge at this location, with a portion of the waters being conveyed in a northerly direction towards Ross Road, and a portion of the waters being conveyed in a westerly directly and through the northern portion of the proposed development site.

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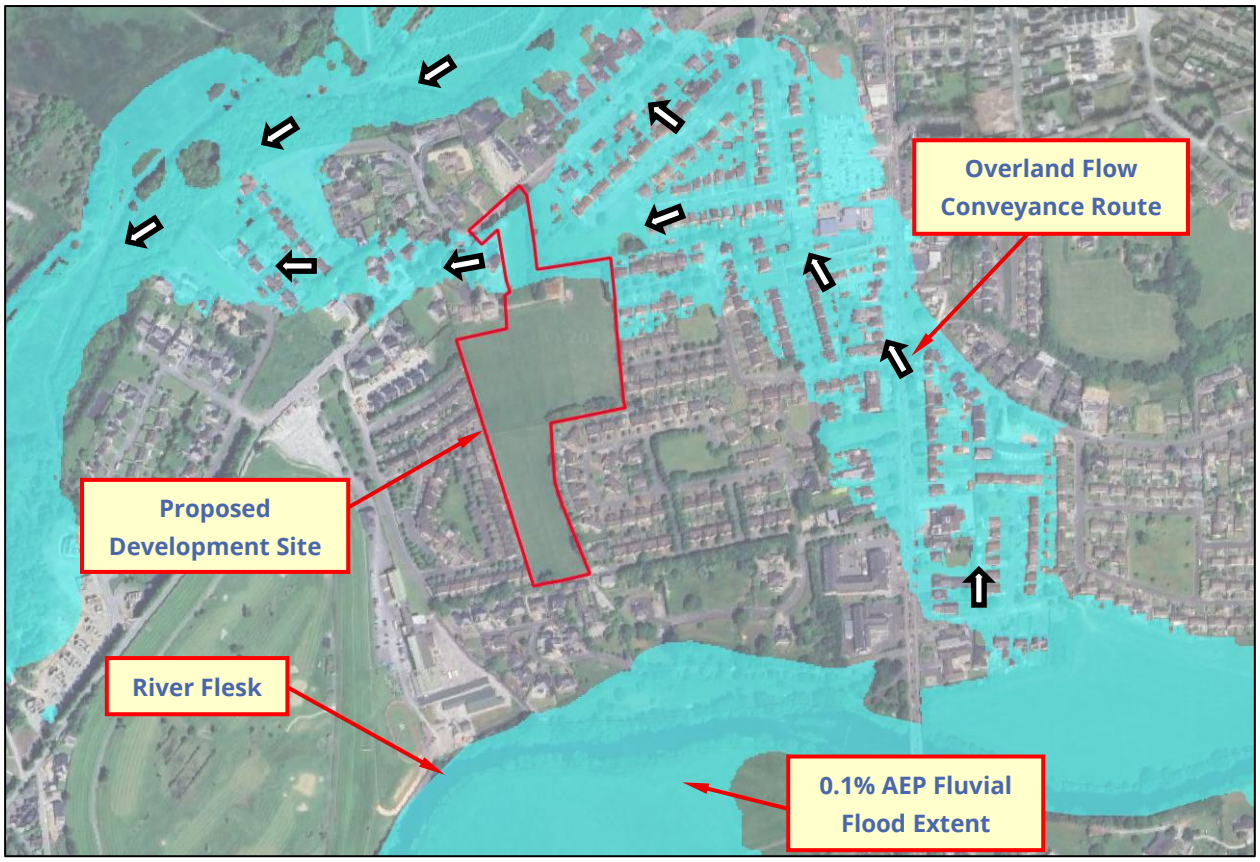

Figure 13 - Flow Path to Proposed Development Site

The proposed development site does not form part of the natural fluvial flood plain of the River Flesk. The 0.1% AEP (1 in 1000 year) fluvial flood extents mapped at the location of the site are attributed only to potential overland flow conveyance.

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6.2. Selection of Hydrological Estimation Point (HEP)

In order to assess the potential 1% AEP (1 in 100 year), and 0.1% AEP (1 in 1000 year) fluvial flood risk to the proposed development site from the River Flesk, a suitable hydrological estimation point (HEP) must be selected. As discussed above in *Section 4.1* there is a hydrometric gauge located on the River Flesk which is within the vicinity of the proposed development site.

To best represent the potential flood risk, a HEP was selected which corresponds to the location of hydrometric gauge (22006) on the River Flesk. Hydrometric gauge flow data is deemed to be the most accurate method to calculate flood flows within a watercourse, and this specific gauge was utilised in the OPW South Western CFRAMS study. The location of the selected HEP / gauge 22006 was obtained from the OPW Flood Studies Update (FSU) portal resource and is illustrated below in *Figure 14.*

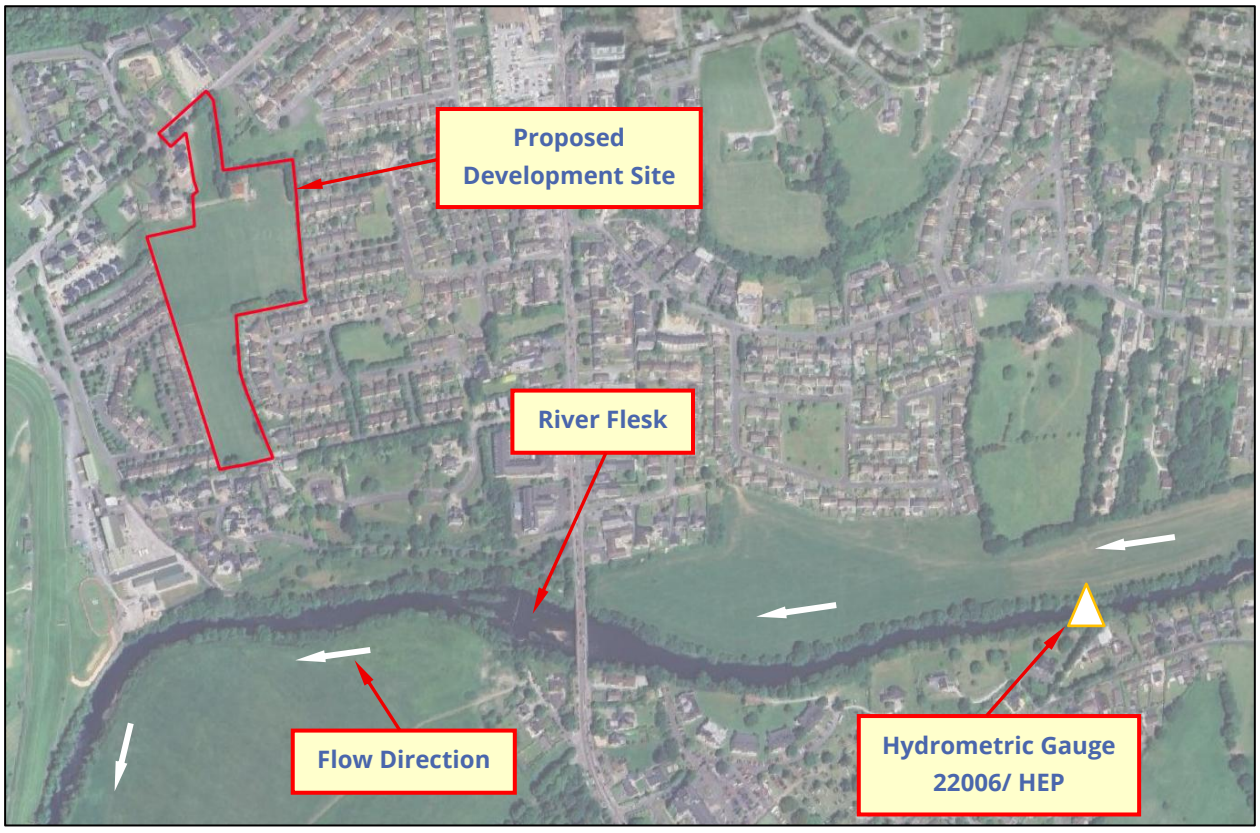

Figure 14 – Hydrological Estimation Point

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6.3. Calculation of South Western CFRAMS Flood Flows

The OPW South Western CFRAM study Hydrology Report was examined to determine the methodology used to derive the 1% AEP (1 in 100 year), and 0.1% AEP (1 in 1000 year) flow rates associated with the River Flesk at this location.

The report states that the index flood flow (QMED) was derived from the median value of the Annual Maximum Flood Series (AMAX) from the gauge (22006). Once the QMED value was calculated the growth factor associated with the 1% AEP (1 in 100 year), and 0.1% AEP (1 in 1000 year) flood flows at the gauge was derived. To determine this, a pooling group was developed for the selected HEP. Pooling groups are used to estimate long return period flood peaks (e.g. 0.1% AEP) to reduce uncertainty at gauges. The pooling groups are made up of other hydrometric gauges which have similar catchment characteristics to the HEP in the study (in this case gauge 22006). The pooling of these gauges allows for the calculation of the larger flood flows, by applying statistical methods to extrapolate the growth factors. The statistical distribution Generalised Logistical was applied to the pooling group to derive the 1% AEP (1 in 100 year) and 0.1% AEP (1 in 1000 year) growth curves. These growth curves were then applied to the QMED value derived to determine the 1% AEP (1 in 100 year) and 0.1% AEP (1 in 1000 year) peak flood flows at the gauge (22006).

From this review the hydrological methods applied in the OPW South Western CFRAM study were deemed suitable for the purpose of this Site-Specific Flood Risk Assessment.

The peak flows calculated as part of the OPW South Western CFRAM study for the 1% AEP (1 in 100 year) and 0.1% AEP (1 in 1000 year) peak flood flows, are listed below in *Table 3.*

	QMED (1 in 2 Year) Peak Flood Flow	1% AEP (1 in 100 year) Peak Flood Flow	0.1% AEP (1 in 1000 year) Peak Flood Flow
Growth Factor	1	1.940	2.866
Flow (m3/s)	172.6	334.8	494.6

Table 3 – OPW South Western CFRAMS Peak Flood Flows at Gauge 22006

The 1% AEP (1 in 100 year) and 0.1% AEP (1 in 1000 year) peak flood flows listed in *Table 3* above have been utilised for the purposes of this Site Specific Flood Risk Assessment.

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6.4. Characteristic Hydrograph Transfer to Subject Site

The 1% AEP (1 in 100 year), and 0.1% AEP (1 in 1000 year) peak flow hydrographs for River Flesk at the HEP/ gauge 22006 were derived utilising the OPW FSU resource hydrograph width method. The peak flows listed in *Table 4* below have subsequently been fitted onto the created hydrographs.

Watercourse	1% AEP Flow (m^3/s)	AEP 0.1% Flow (m^3/s)
River Flesk	334.8	494.6

Table 4 - Estimated Peak Flows in the River Flesk for Different Return Periods

The peak flows listed in *Table 4* above have been fitted onto the created hydrographs as illustrated below in *Figure 15.*

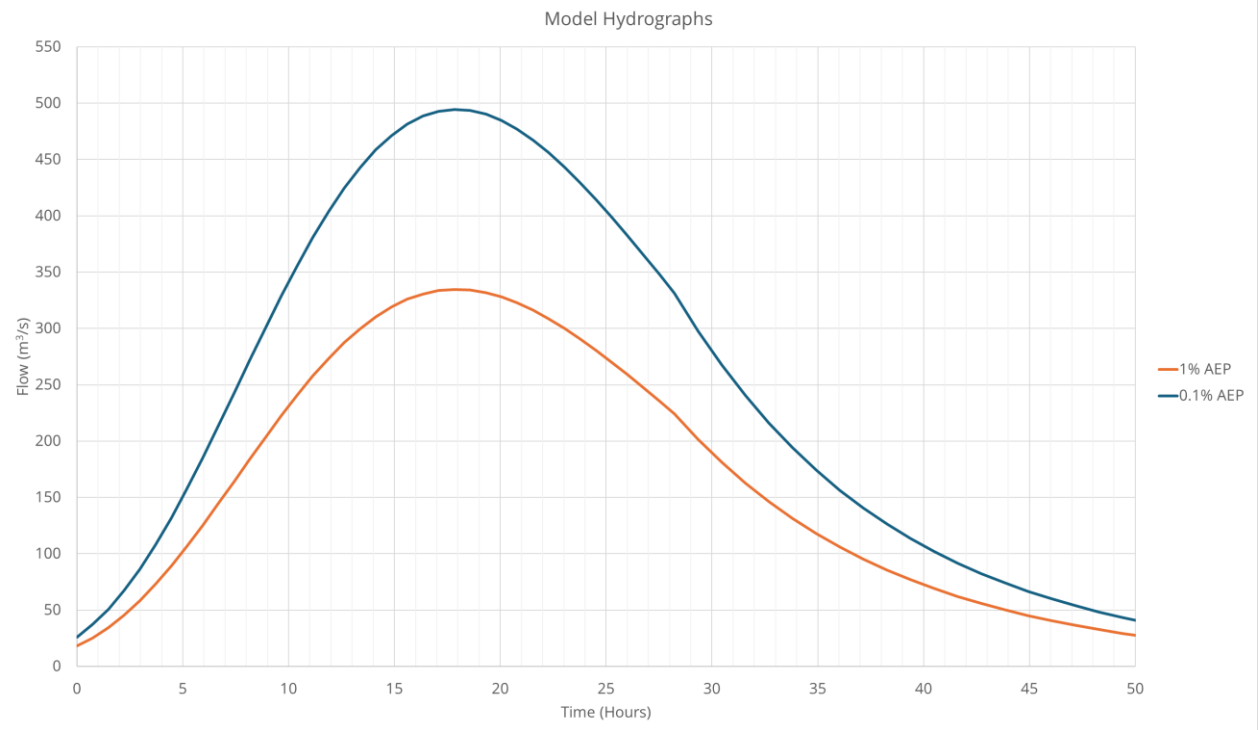

Figure 15 – River Flesk Hydrographs

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6.5. Lough Leane Water Levels

The River Flesk discharges to Lough Leane approximately 1700m south west of the proposed development site. As part of the OPW South Western CFRAM study a water level analysis of Lough Leane was undertaken. The results of this analysis estimated the peak water levels within the lough during the 1% AEP (1 in 100 year), and 0.1% AEP (1 in 1000 year) flood event. The same peak water levels utilised for the OPW South Western CFRAM study were applied to the downstream extent of the hydraulic model developed as part of this Site Specific Flood Risk Assessment.

The peak water levels in Lough Leane which were calculated as part of the OPW South Western CFRAM study for the 1% AEP (1 in 100 year), and 0.1% AEP (1 in 1000 year) flood events are listed below in *Table 5.*

	QMED (1 in 2 Year) Peak Flood Flow	1% AEP (1 in 100 year) Peak Flood Flow	0.1% AEP (1 in 1000 year) Peak Flood Flow
Peak Water Levels in Lough Leane (m OD)	19.23	20.28	20.85

Table 5 - South Western CFRAMS Peak Flood Levels in Lough Leane

The peak Lough Leane water levels listed in *Table 5* above have been applied to the downstream extent of the hydraulic model developed as part of this Site Specific Flood Risk Assessment.

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7. Hydraulic Assessment

A linked 1D-2D hydraulic model was developed for the River Flesk along a channel reach length of approximately 2015m. The purpose of developing a hydraulic model is to estimate flood water levels at specific locations along the modelled reach representing the existing river channel and hydraulic structures on the River Flesk. The hydraulic model developed is based on an appropriate computer software package that utilises topographical information about the river and flood plain geometry, the hydraulic resistance characteristics (Manning's 'n') of the river and flood plain and appropriate boundary conditions at the upstream and downstream extent of the study area. The extent of modelled watercourse reach length is illustrated in *Figure 16* below: -

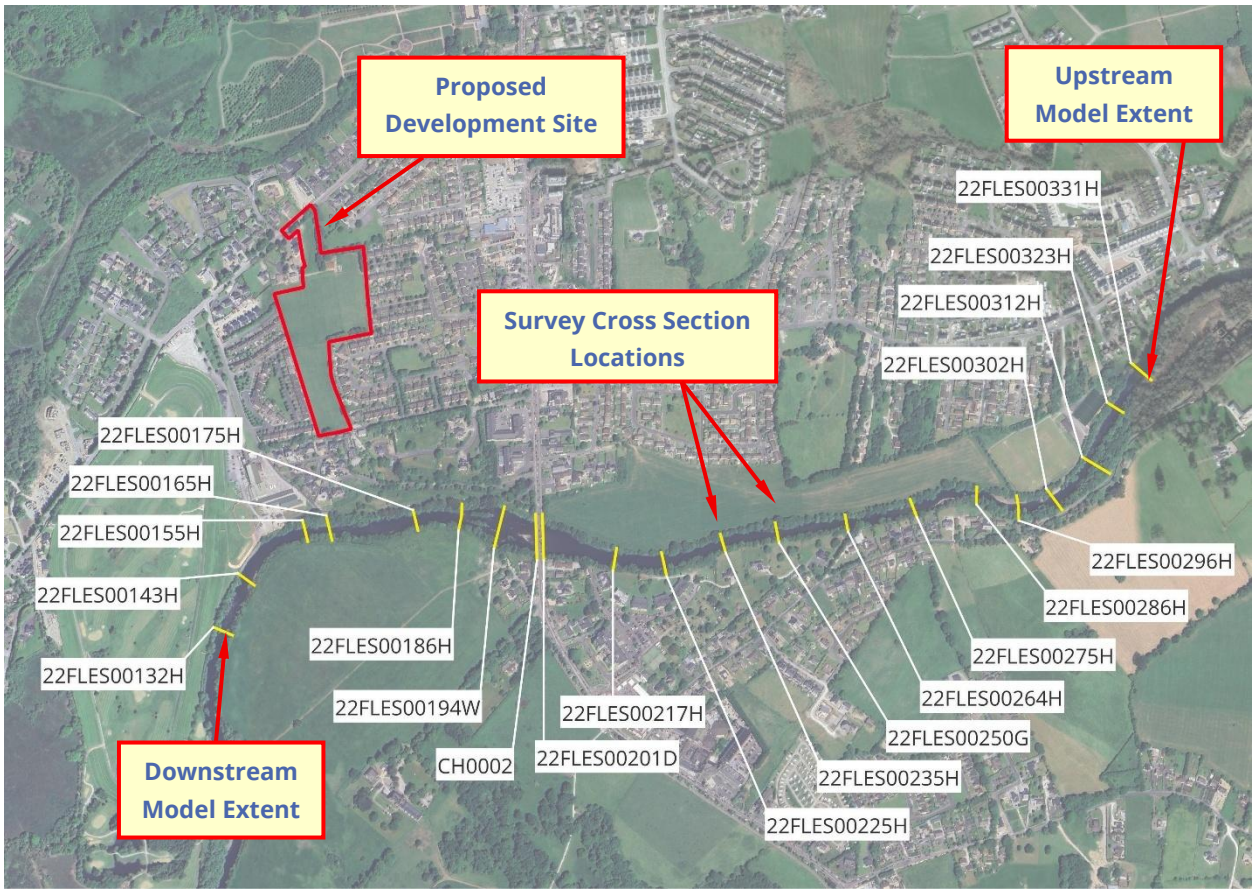

Figure 16 –River Flesk Hydraulic Model Extent

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7.1. Hydraulic Model Selection

A number of hydraulic models are available which will predict flood levels for a given design flow. For this assessment Flood Modeller Pro software package was employed. This software suite was preceded by ISIS, which was developed and progressed by Jacobs over the past 30 years. The Flood Modeller Pro software package allows for one-dimensional (1D) and two-dimensional (2D) modelling of steady and unsteady state flow profiles and thematic mapping of flood plains and overland flow paths when required. It also supports modelling of structures such as bridges, culverts, and weirs along with storage ponds. It is well regarded for use in the application of river and flood plain modelling.

The model type utilised is a linked 1D-2D model where the 1D model defines the main watercourse channel flow and the 2D model defines the flood plain. The two domains are linked together at the point where the flow spills from the channel bank onto the flood plain. This allows the overland flow paths within the flood plain to be accurately mapped, which is particularly useful in urbanised areas.

7.2. Hydraulic Modelling Assumptions

The following are the main assumptions used in the development of the Flood Modeller hydraulic model:

- Cross-section information between successive surveyed cross-sections was obtained by interpolation, where required to provide stability to the model.
- The openings of all hydraulic structures (bridges, culverts, etc.) and the reach modelled were assumed to be free from blockages or debris in all events.

7.3. Topographical Survey Data

High-resolution site-specific survey data was collected by NcW Surveys within the boundary of the proposed development site. A copy of the topographic survey data is included below in *Appendix C*.

Cross sectional river survey data of the River Flesk was collected as a part of the OPW South Western CFRAM study survey, and this data was acquired from the OPW and utilised to create the 1D component of the hydraulic model developed for this assessment. A copy of the OPW CFRAM study river survey is included below in *Appendix D*.

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7.4. LiDAR Derived Digital Terrain Model & Contour Mapping

To assist in the assessment of any potential flooding in the general area of the proposed development site and to enable an accurate representation of flood zone mapping to be developed, a detailed Digital Terrain Model (DTM) was developed utilising LiDAR data for the area. From this data a detailed contour map was developed to encompass the area of the hydraulic model domain, including the area of the proposed development site and surrounding lands.

The DTM and contour mapping was developed using aerial flown Light Detection & Ranging Data (LiDAR) which was commissioned by the OPW and collected by Fugro in 2011. The LiDAR data was supplied in Irish Transverse Mercator (ITM) in TIF file format, at 2m resolution. The DTM and contour mapping developed for the modelled area is illustrated in *Figure 17* below. The high-resolution topographical survey of the proposed development site was also incorporated within the DTM.

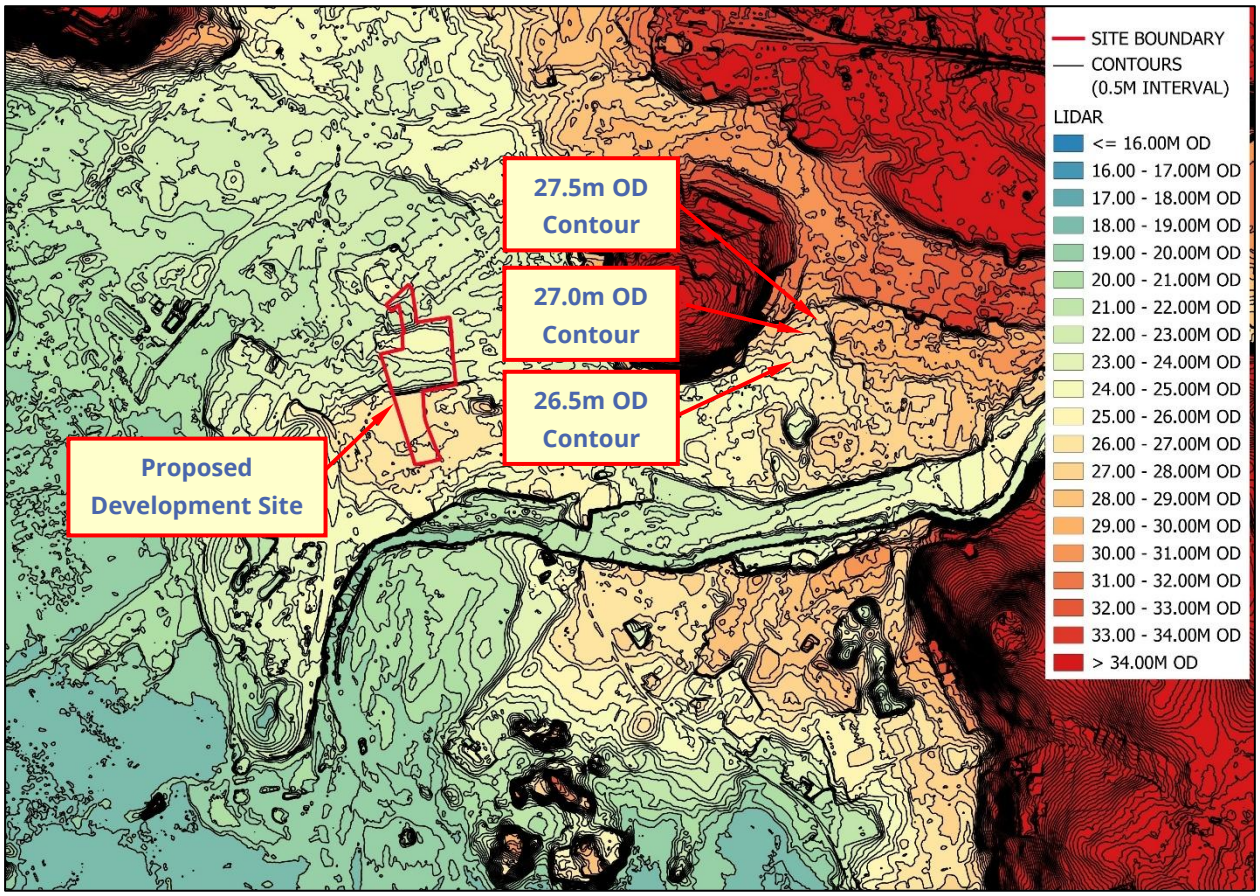

Figure 17 - DTM and Contour Data

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7.5. River Channel & Flood Plain Roughness Co-Efficients

The Manning's 'n' coefficient represents the hydraulic resistance to flow of the river channel or flood plain. The Manning's 'n' coefficients chosen are estimated from a visual inspection of the river channel and associated flood plain lands. Guidance is available on selecting appropriate Manning's 'n' values (from Chow 1959, French 1986); however, the Manning's 'n' coefficients are usually subsequently refined upon the development of the model by calibrating with any historical flooding data in the area, if available.

Table 6 below lists recommended river channel overbank land roughness co-efficients for various vegetation types.

Type of Channel and Description	Minimum	Normal	Maximum
A. *Natural Streams*			
1. **Main Channels**			
a. Clean, straight, full, no rifts or deep pools	0.025	0.030	0.033
b. Same as above, but more stones and weeds	0.030	0.035	0.040
c. Clean, winding, some pools and shoals	0.033	0.040	0.045
d. Same as above, but some weeds and stones	0.035	0.045	0.050
e. Same as above, lower stages, more ineffective slopes and sections	0.040	0.048	0.055
f. Same as "d" but more stones	0.045	0.050	0.060
g. Sluggish reaches, weedy. deep pools	0.050	0.070	0.080
h. Very weedy reaches, deep pools, or floodways with heavy stands of timber and brush	0.070	0.100	0.150
2. **Flood Plains**			
a. Pasture no brush			
1. Short grass	0.025	0.030	0.035
2. High grass	0.030	0.035	0.050
b. Cultivated areas			
1. No crop	0.020	0.030	0.040
2. Mature row crops	0.025	0.035	0.045
3. Mature field crops	0.030	0.040	0.050
c. Brush			
1. Scattered brush, heavy weeds	0.035	0.050	0.070
2. Light brush and trees, in winter	0.035	0.050	0.060
3. Light brush and trees, in summer	0.040	0.060	0.080
4. Medium to dense brush, in winter	0.045	0.070	0.110
5. Medium to dense brush, in summer	0.070	0.100	0.160
d. Trees			
1. Cleared land with tree stumps, no sprouts	0.030	0.040	0.050
2. Same as above, but heavy sprouts	0.050	0.060	0.080
3. Heavy stand of timber, few down trees, little undergrowth, flow below branches	0.080	0.100	0.120
4. Same as above, but with flow into branches	0.100	0.120	0.160
5. Dense willows, summer, straight	0.110	0.150	0.200

Table 6 - Manning's 'n' Values

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With reference to *Table 6* above, varying roughness co-efficients were applied to the hydraulic model to reflect the type and form of vegetation observed during the survey of the River Flesk undertaken by a hydrological engineer from IE Consulting. In respect of the main channel of the River Flesk an applied roughness co-efficient of 0.050 was utilised. An applied flood plain roughness co-efficient of 0.080 was utilised along the River Flesk right and left overbanks. These are the same roughness values that were utilised in the OPW South Western CFRAM study.

Figure 18 below illustrates the typical observed conditions along the modelled reach of the River Flesk.

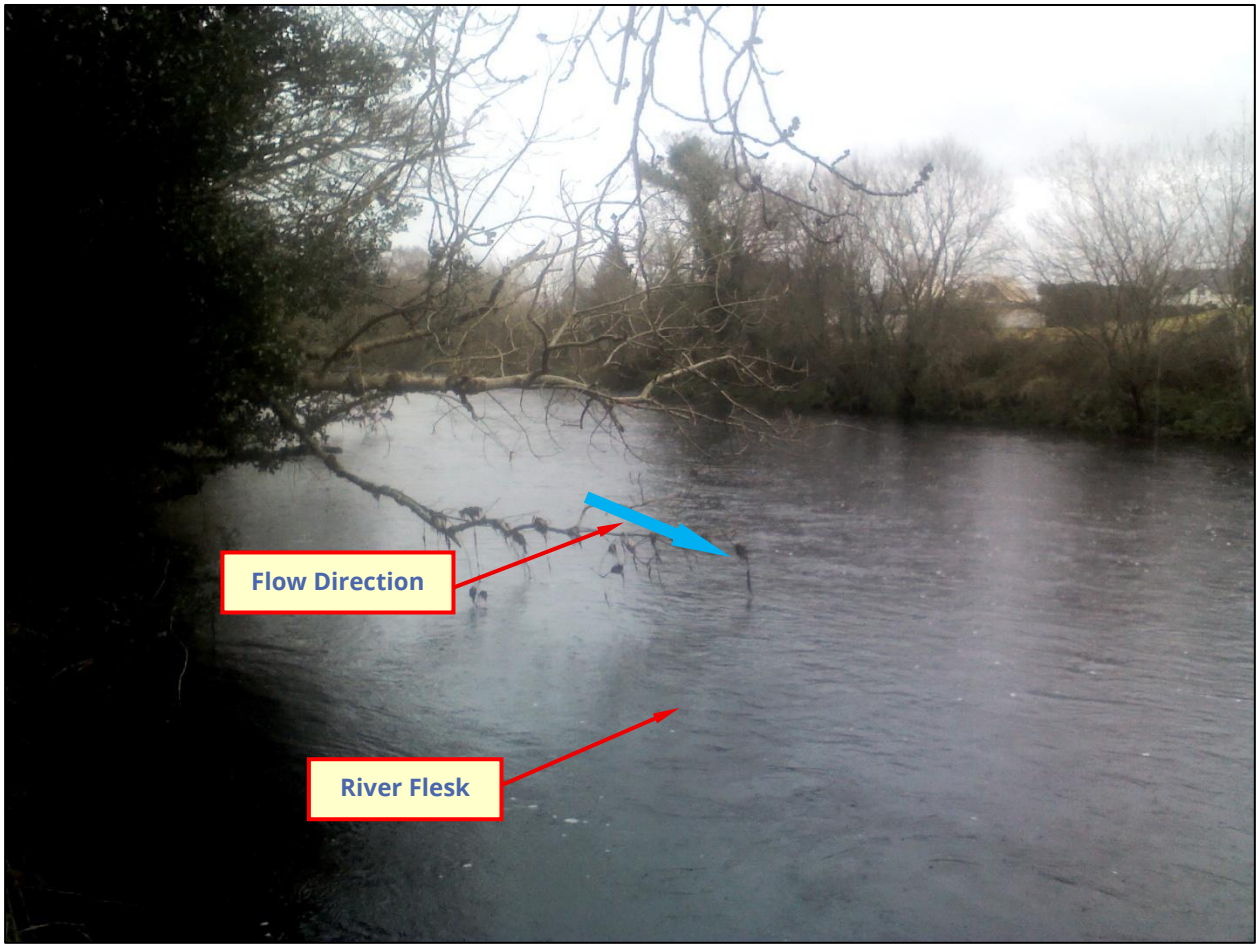

Figure 18 –River Flesk at Cross Section 22FLES00235H - Looking Downstream

The roughness in the 2D model domain was represented using a shapefile, as illustrated below in *Figure 19*. Different areas within the model domain have different roughness values based on the land use characteristic. The OPW South Western CFRAM study report was used to identify the roughness values of the underlying land use.

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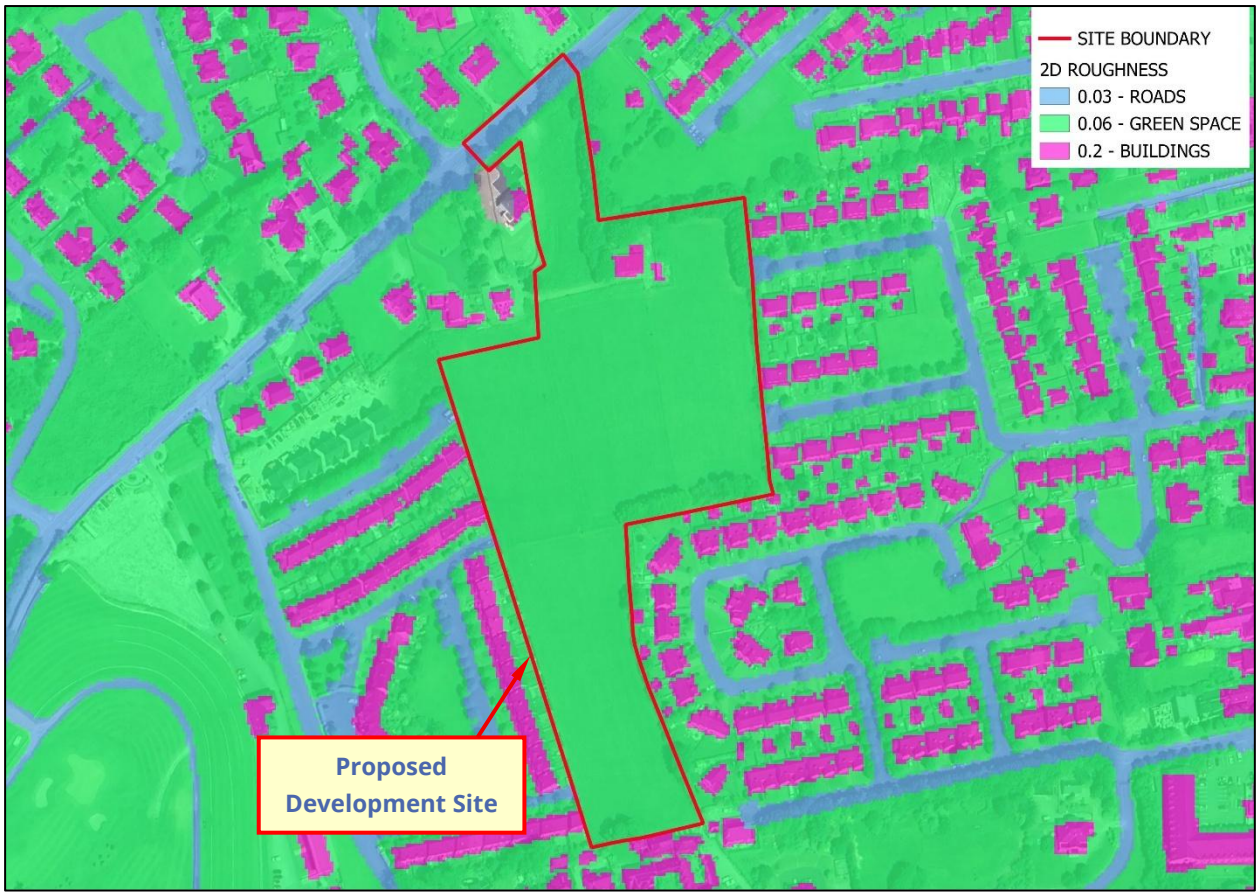

Figure 19 – 2D Roughness Values

Roads and buildings within the model domain were also represented in the model, with roads having a value of 0.03 to represent a smooth asphalt surface, and buildings having a roughness of 0.2 to represent the potential for a building structure to impede the flow of water. These are the same values utilised in the OPW South Western CFRAM study.

The OPW South Western CFRAM study has modelling the potential impact of building structures by increasing the building structure footprint by 0.2m above existing ground levels. This was incorporated to represent the step into these building structures, and was intended to represent within the model the potential impeding effect of the building structure, while still accounting for the storage capacity within these structures. For the purposes of this Site Specific Flood Risk Assessment the entire footprint area of all the building structures has been blocked out, which assumes that all building structures within the hydraulic model domain provide no storage capacity during the occurrence of an extreme fluvial flood event. This is deemed to be a conservative approach.

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7.6. Initial Hydraulic Model Development

A total channel length of approximately 2015m along the River Flesk was modelled as illustrated in *Figure 16* above. The cross-sections surveyed were geo-referenced and incorporated into the hydraulic model together with the following existing hydraulic structure listed below.

As illustrated in *Figure 20* below, the N71 (Muckross Road) cross the River Flesk via an arch bridge structure located between hydraulic model sections 22FLES00201D and CH0002. This bridge structure has been represented in Flood Modeller with an arch bridge unit with three openings. When the structure becomes surcharged, the model switches the structure to orifice flow. Any overtopping of the bridge is represented with a spill unit.

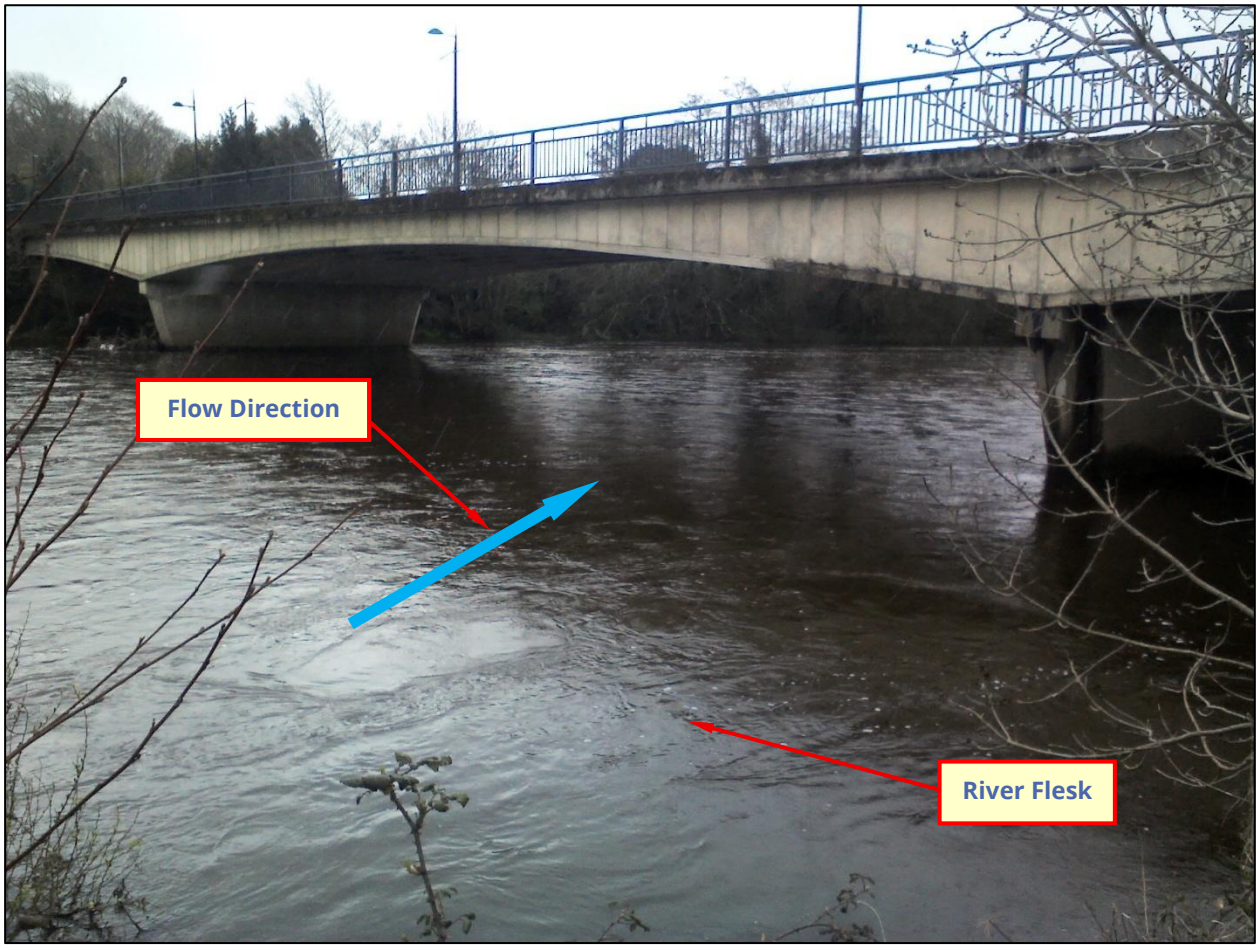

Figure 20 - Upstream face of Arch Bridge at Section 22FLES00201D

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8. Hydraulic Model Simulation Results

The hydraulic model was run in consideration of the predictive current scenario 1% AEP (1 in 100 year) and the 0.1% AEP (1 in 1000 year) fluvial flood flows as presented in *Section 6* above.

Table 7 below summarises the predictive current scenario 1% AEP (1 in 100 year), 0.1% AEP (1 in 1000 year) fluvial flood levels at cross section locations 22FLES0221H to 22FLES0132H as outputted by the hydraulic simulation model. The locations of these cross sections are illustrated below in *Figure 21.*

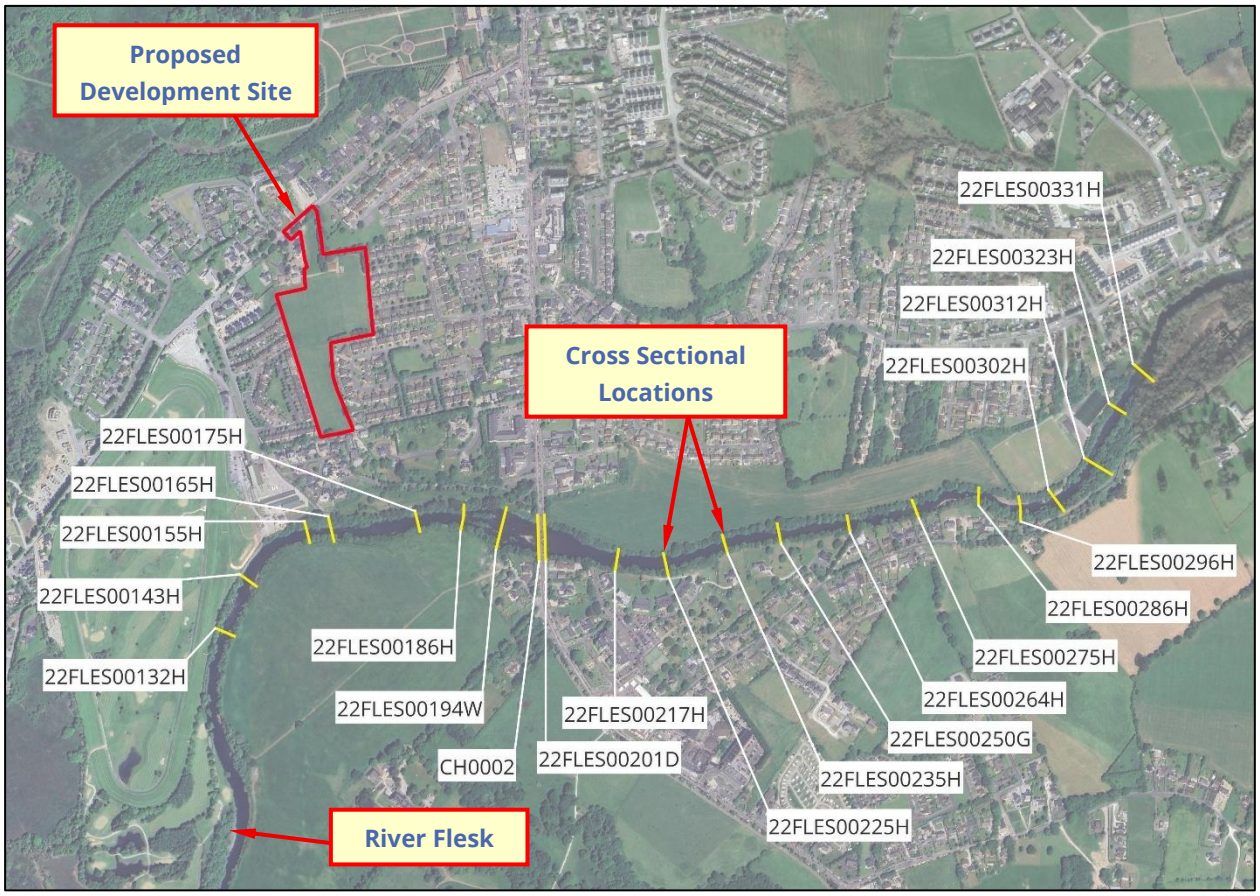

Figure 21 – Hydraulic Model Cross Section Locations

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Node Label	1% AEP Peak Flood Level (m OD)	0.1% AEP Peak Flood Level (m OD)
22FLES00331H	26.47	26.88
22FLES00323H	26.34	26.75
22FLES00312H	25.88	26.41
22FLES00302H	25.71	26.28
22FLES00296H	25.51	26.12
22FLES00286H	25.24	25.85
22FLES00275H	24.91	25.52
22FLES00264H	24.65	25.26
22FLES00250G	24.44	25.08
22FLES00235H	24.24	24.87
22FLES00225H	24.02	24.72
22FLES00217H	23.83	24.51
22FLES00201D	23.42	23.96
CH0002	23.41	23.95
22FLES00194W	23.23	23.75
22FLES00186H	23.03	23.52
22FLES00175H	22.84	23.31
22FLES00165H	22.52	22.98
22FLES00155H	22.42	22.86
22FLES00143H	21.32	21.75
22FLES00132H	20.28	20.85

Table 7 - Predictive 1% AEP, & 0.1% AEP Flood Levels – Existing Baseline Scenario

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Figure 22 below illustrates the longitudinal hydraulic model profile of the predictive current scenario 1% AEP (1 in 100 year), and 0.1% AEP (1 in 1000 year) flood levels along the modelled reach of the River Flesk as outputted by the hydraulic simulation model.

As illustrated below, flood waters are predicted to overtop both the right and left overbanks of the River Flesk during the occurrence of a current scenario 1% AEP (1 in 100 year) and 0.1% AEP (1 in 1000 year) fluvial flood event.

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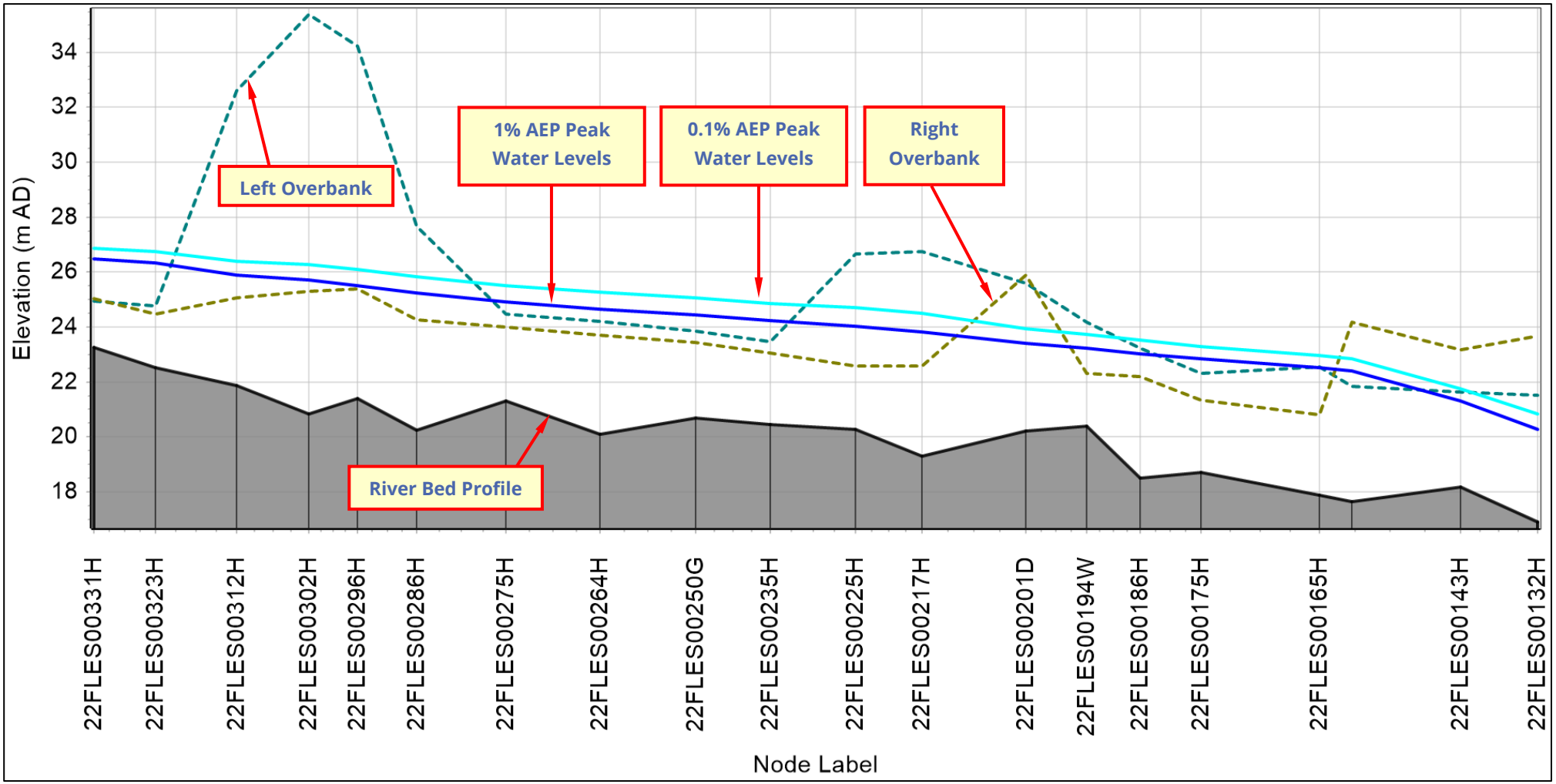

Figure 22 – River Flesk – Longitudinal Hydraulic Profile

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The delineated current scenario 1% AEP (1 in 100 year) and 0.1% AEP (1 in 1000 year) fluvial flood zones as outputted by the hydraulic simulation model in consideration of the existing undeveloped baseline scenario are illustrated in *Figure 23* below.

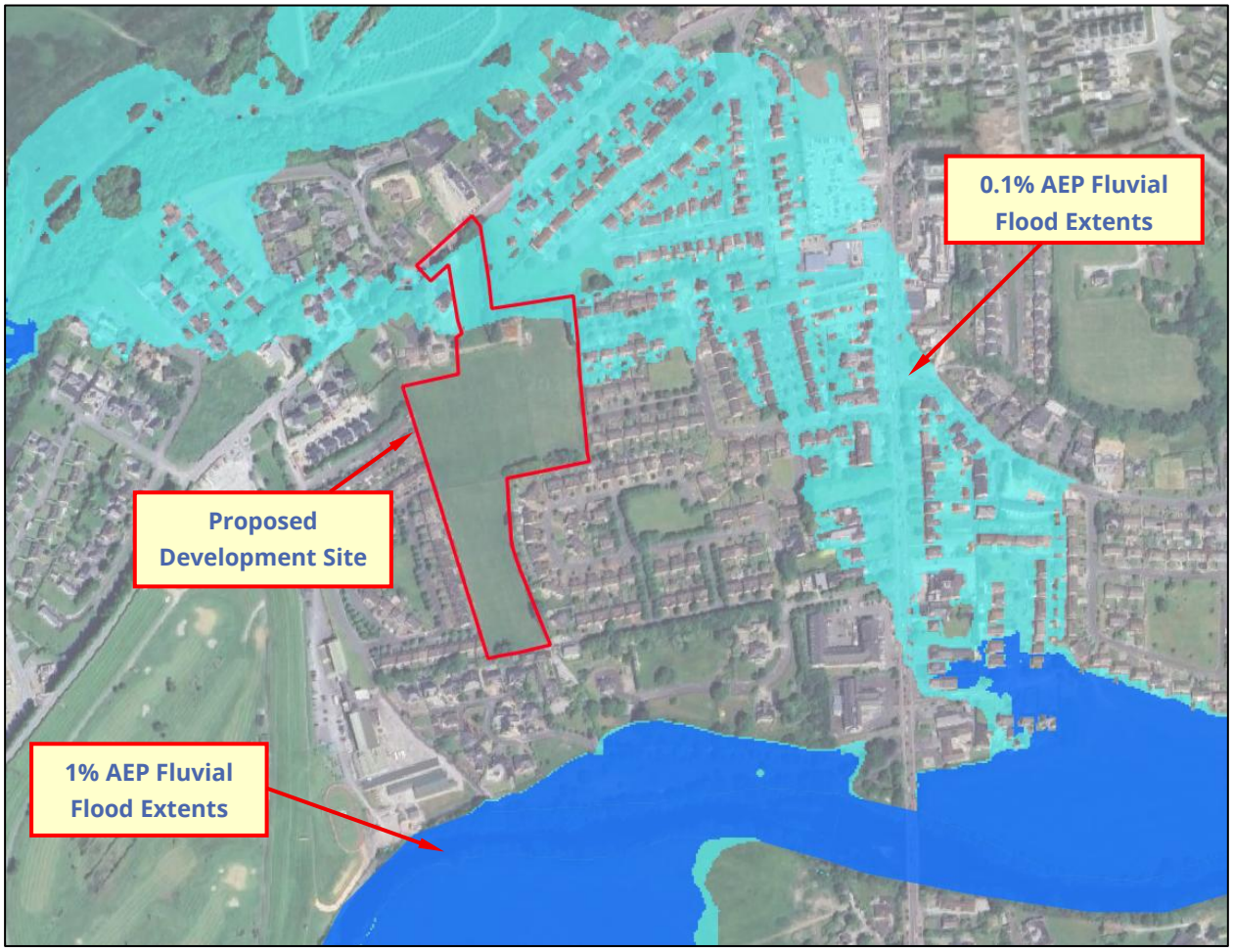

Figure 23 - 1% AEP & 0.1% AEP Fluvial Flood Extents – Existing Undeveloped Baseline Scenario

As illustrated above in *Figure 23*, the proposed development site does not fall within a predictive delineated 1% AEP (1 in 100 Year) fluvial flood zone. A limited portion in the northern area of the proposed development site does fall within a predictive delineated 0.1% AEP (1 in 1000 Year) fluvial flood zone. The vast majority of the site area does not fall within a predictive 1% AEP (1 in 100 year) or 0.1% AEP (1 in 1000 year) fluvial flood zone.

The delineated 1% AEP (1 in 100 year) and 0.1% AEP (1 in 1000 year) fluvial flood zone extents illustrated above are also presented on *Drawing Number IE3115-002-A*, in *Appendix A*.

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Figure 24 below illustrates the predictive 0.1% AEP (1 in 1000 year) fluvial flood depths at and in the vicinity of the proposed development site as outputted by the hydraulic simulation model, and in consideration of the existing undeveloped baseline scenario.

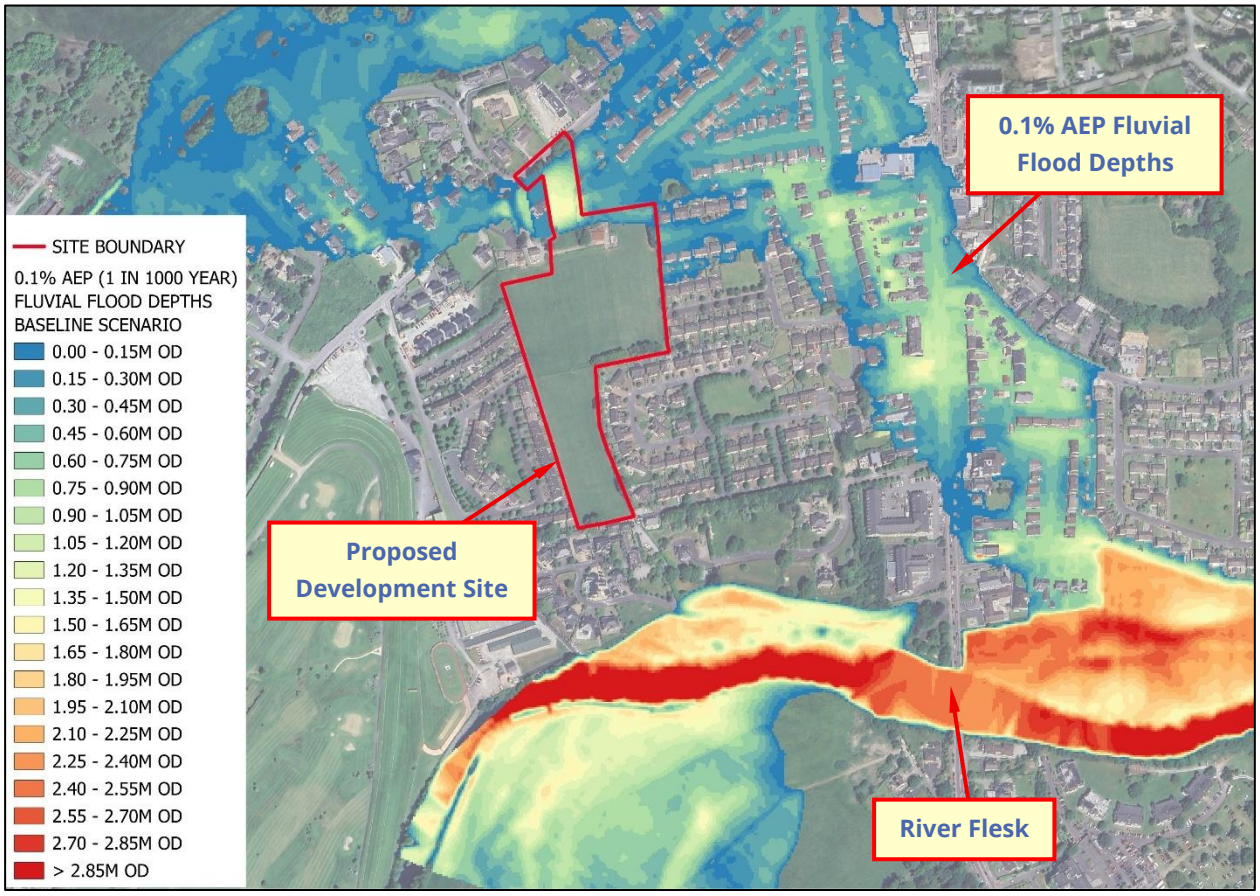

Figure 24 – 0.1% AEP Flood Depths – Existing Undeveloped Baseline Scenario

As illustrated above in *Figure 24* flooding is a small limited portion in the northern area of the proposed development site falls within a predictive 0.1% AEP (1 in 1000 year) fluvial flood zone, with flood depths at this location ranging from 0.01m - 1.52m, and a peak 0.1% AEP (1 in 1000 year) flood level of **24.10m OD** at this location.

The vast majority of the site does not fall within a predictive 0.1% AEP (1 in 1000 year) fluvial flood zone.

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9. Proposed Development in the Context of the Guidelines

In the context of the 'Planning System and Flood Risk Management Guidelines, DOEHLG, 2009' three flood zones are designated in consideration of flood risk to a particular development site.

Flood Zone 'A' – where the probability of flooding from rivers and watercourses is the highest (greater than 1% or 1 in 100 year for river and watercourse flooding and 0.5% or 1 on 200 for coastal or tidal flooding).

Flood Zone 'B' – where the probability of flooding from rivers and watercourses is moderate (between 0.1% or 1 in 1000 year for river and watercourse flooding and 0.5% or 1 on 200 for coastal or tidal flooding).

Flood Zone 'C' – where the probability of flooding from rivers and watercourses is low or negligible (less than 0.1% or 1 in 1000 year for both river and watercourse and coastal flooding). Flood Zone 'C' covers all areas that are not in Zones 'A' or 'B.'

The 'Planning System and Flood Risk Management Guidelines' list the planning implications for each flood zone, as summarised below: -

Zone A – High Probability of Flooding. Most types of development would not be considered in this zone. Development in this zone should be only be considered in exceptional circumstances, such as in city and town centres, or in the case of essential infrastructure that cannot be located elsewhere, and where the 'Planning System and Flood Risk Management Guidelines' justification test has been applied. Only water-compatible development, such as docks and marinas, dockside activities that require a waterside location, amenity open space and outdoor sports and recreation would be considered appropriate in this zone.

Zone B – Moderate Probability of Flooding. Highly vulnerable development such as hospitals, residential care homes, Garda, fire and ambulance stations, dwelling houses, strategic transport and essential utilities infrastructure would generally be considered inappropriate in this zone, unless the requirements of the justification test can be met. Less vulnerable development such as retail, commercial and industrial uses and recreational facilities might be considered appropriate in this zone. In general however, less vulnerable development should only be considered in this zone if adequate lands or sites are not available in Zone 'C' and subject to a flood risk assessment to the appropriate level of detail to demonstrate that flood risk to the development can be adequately managed and that development in this zone will not adversely affect adjacent lands and properties.

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Zone C – Low to Negligible Probability of Flooding. Development in this zone is appropriate from a flood risk perspective. Developments in this zone are generally not considered at risk of fluvial flooding and would not adversely affect adjacent lands and properties from a flood risk perspective.

In the context of the 'Planning System and Flood Risk Management Guidelines, DOEHLG, 2009' the assessment and analysis undertaken as part of this Site Specific Flood Risk Assessment indicates that a small limited portion of the northern area of the proposed development site falls within a delineated predictive fluvial Flood Zone 'B'. The vast majority of the site falls within Flood Zone 'C'.

In accordance with the 'Planning System & Flood Risk Management Guidelines, DOEGLG, 2009' the development as proposed may be subject to the requirements of the Justification Test.

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10. Discussion

The analysis and flood zone delineation undertaken as part of this Site Specific Flood Risk Assessment (SSFRA) indicates that a small limited area in the north eastern portion of the proposed development site falls within a predictive 0.1% AEP (1 in 1000 year – Flood Zone 'B') fluvial flood zone associated with the River Flesk (see Drawing Number *IE3115-002-A*, *Appendix A*). The proposed development site does not fall within a predictive 1% AEP (1 in 100 year – Flood Zone 'A') fluvial flood zone. The vast majority of the site falls within Flood Zone 'C.'

The proposed development will consist of a largescale residential development (LRD), comprising of 134no. residential dwellings as follows: 65no. houses consisting of 10no. 4-bed dwellings and 55no 3-bed dwellings; 51no. townhouses consisting of 32no. 3-bed units and 19no. 2-bed units; and 18no. apartments consisting of 12no. 2-bed units and 6no. 1-bed units. The proposed development also includes crèche (585sqm) with capacity to accommodate 102no. children, and all ancillary site development works including 2no. vehicular and pedestrian accesses onto the Ross Road.

As illustrated in *Figure 25* below, the delineated undeveloped baseline scenario 0.1% AEP (1 in 1000 year – Flood Zone 'B') flood extents have been thematically mapped onto the proposed development site layout plan in order to provide an assessment of the predictive flood extents in consideration of the proposed development scenario. The proposed development scenario layout illustrated in *Figure 25* below includes the proposed permitted single residential unit located within the northern portion of the proposed development site (Planning Reference 23/60005). This permitted development shall be incorporated within the overall development proposal.

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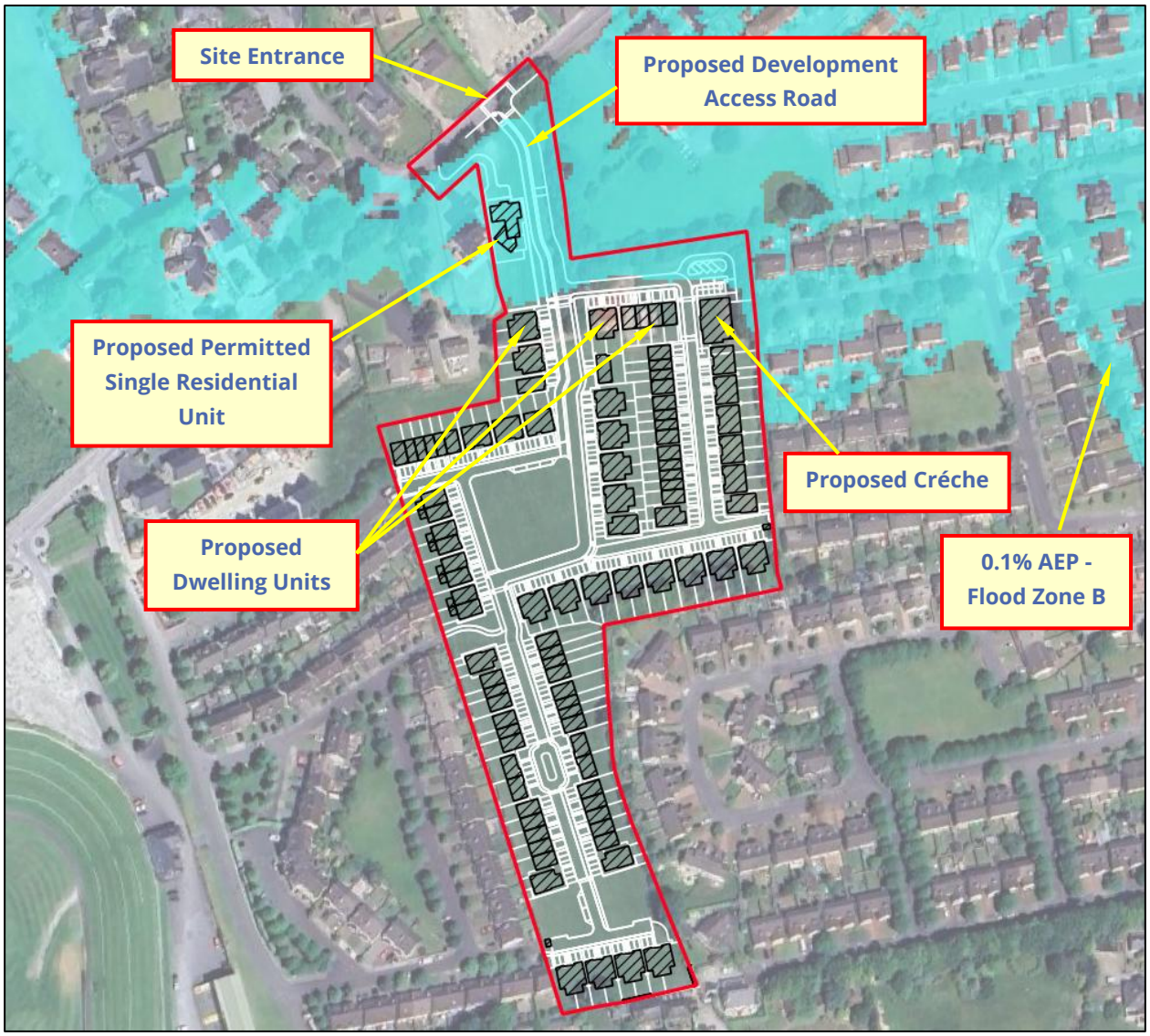

Figure 25 – Baseline Scenario Fluvial Flood Extents

As illustrated in *Figure 25* above, the proposed permitted single residential unit (Planning Reference 23/60005) and a portion of the proposed development access road falls within the delineated predictive 0.1% AEP (1 in 1000 year – Flood Zone 'B') fluvial flood zone. The proposed dwelling units, proposed crèche and majority of the proposed development assessment roads do not fall within a delineated predictive 0.1% AEP (1 in 1000 year – Flood Zone 'B').

In order to ensure a sustainable development, and to ensure that the potential flood risk to the portion of the proposed access road that falls within the delineated predictive 0.1% AEP (1 in 1000 year - Flood Zone 'B') fluvial flood zone is mitigated to an acceptable level, it is proposed to raise the finished ground level of the proposed access road to a level which will ensure that the maximum

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potential flood depth along this portion of the access road will not exceed 0.3m during the occurrence of an extreme 0.1% AEP (1 in 1000 year) fluvial flood event.

Flood depths of less than 0.3m along this portion of the proposed access road will still permit 0.1% AEP (1 in 1000 year) fluvial flood waters to be conveyed overland in an east to west direction as per the existing scenario and maintaining the existing hydrological regime of the area, while also ensuring that vehicular access to and egress from the proposed development site is not impeded during the occurrence of an extreme 0.1% AEP (1 in 1000 year) fluvial flood event.

The peak 0.1% AEP (1 in 1000 Year) fluvial flood level at the location of proposed access road is **23.79m OD**. Therefore, the proposed access road will have a minimum finished road level of **23.50m OD**, which will ensure a maximum potential flood depth of **0.29m** along the portion of the proposed access road that falls within the predictive 0.1% AEP (1 in 1000 year) fluvial flood zone.

The finished floor level of the proposed permitted single residential unit (Planning Reference 23/60005) located within the 0.1% AEP (1 in 1000 year – Flood Zone 'B') will be constructed to a level of 0.31m above the 0.1% AEP (1 in 1000 Year) fluvial flood level at this location – i.e. 23.79m OD + 0.31m = **24.10m OD**. The access driveway off Ross Road associated within this permitted single residential unit shall be constructed to a level of **23.50m OD**, which will ensure that maximum potential flood depths do not exceed 0.3m during the occurrence of a 0.1% AEP (1 in 1000 year) fluvial flood level.

The proposed development flood mitigation measures discussed above are illustrated in *Figure 26* below.

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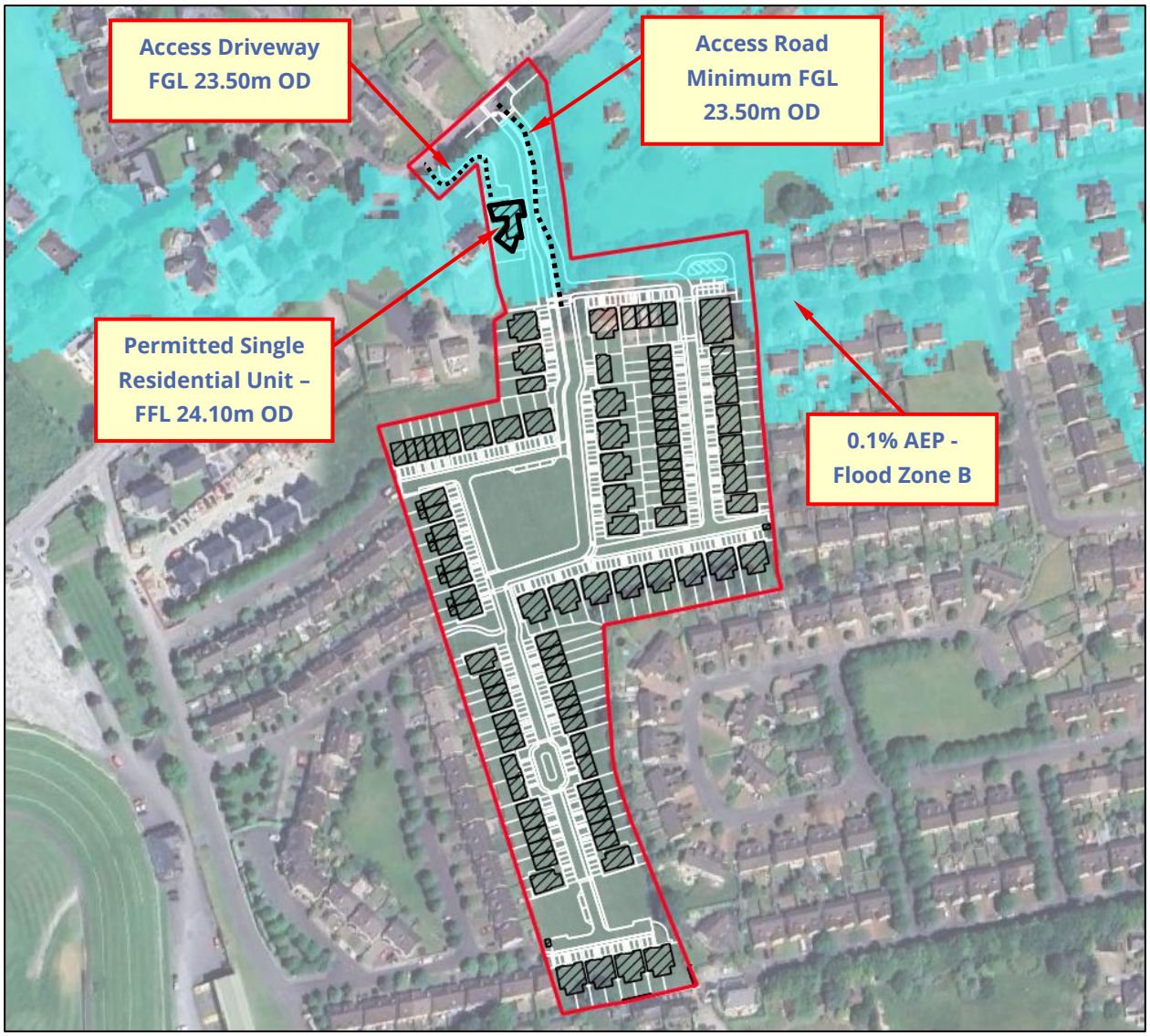

Figure 26 - Proposed Recommendations

A copy of the proposed development layout plan is included in *Appendix E*.

10.1. Potential Hydrological Impact of Proposed Development

In consideration of the proposal to raise the finished level of the portion of the proposed access road that falls within the delineated 0.1% AEP (1 in 1000 year – Flood Zone 'B') fluvial flood zone, and to raise the footprint area and access driveway of the permitted single residential unit that falls within the delineated 0.1% AEP (1 in 1000 year – Flood Zone 'B') fluvial flood zone, the potential impact of this proposal on the existing hydrological regime of the area was assessed by undertaking additional hydraulic modelling incorporating the proposed flood mitigation measures as discussed above (i.e. the proposed development scenario).

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The road levels illustrated in the proposed development layout plans (illustrated in *Appendix E*) have been applied to the updated hydraulic model. The hydraulic model was re-run in consideration of the proposed developed scenario and the results were processed and evaluated.

10.1.1. Predictive Flood Levels – Proposed Development Scenario

Table 8 below summarises the predictive 1% AEP (1 in 100 year), and 0.1% AEP (1 in 1000 year) flood levels at cross sectional locations 22FLES00331H to 22FLES00132H as outputted by the hydraulic simulation model within the vicinity of the site in consideration of the proposed development scenario.

Node Label	1% AEP Peak Flood Level (m OD)	0.1% AEP Peak Flood Level (m OD)
22FLES00331H	26.47	26.88
22FLES00323H	26.34	26.75
22FLES00312H	25.88	26.41
22FLES00302H	25.71	26.28
22FLES00296H	25.51	26.12
22FLES00286H	25.24	25.85
22FLES00275H	24.91	25.52
22FLES00264H	24.65	25.26
22FLES00250G	24.44	25.08
22FLES00235H	24.24	24.87
22FLES00225H	24.02	24.72
22FLES00217H	23.83	24.51
22FLES00201D	23.42	23.96
CH0002	23.41	23.95
22FLES00194W	23.23	23.75
22FLES00186H	23.03	23.52

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Node Label	1% AEP Peak Flood Level (m OD)	0.1% AEP Peak Flood Level (m OD)
22FLES00175H	22.84	23.31
22FLES00165H	22.52	22.98
22FLES00155H	22.42	22.86
22FLES00143H	21.32	21.75
22FLES00132H	20.28	20.85

Table 8 - Predictive 1% AEP, & 0.1% AEP Flood Levels – Proposed Development Scenario

10.1.2. Predictive Flood Extents – Proposed Development Scenario

The delineated 1% AEP (1 in 100 year – Flood Zone 'A') and 0.1% AEP (1 in 1000 year – Flood Zone 'B') fluvial flood zone as outputted by the hydraulic simulation model in consideration of the proposed development scenario are illustrated in *Figure 27* below.

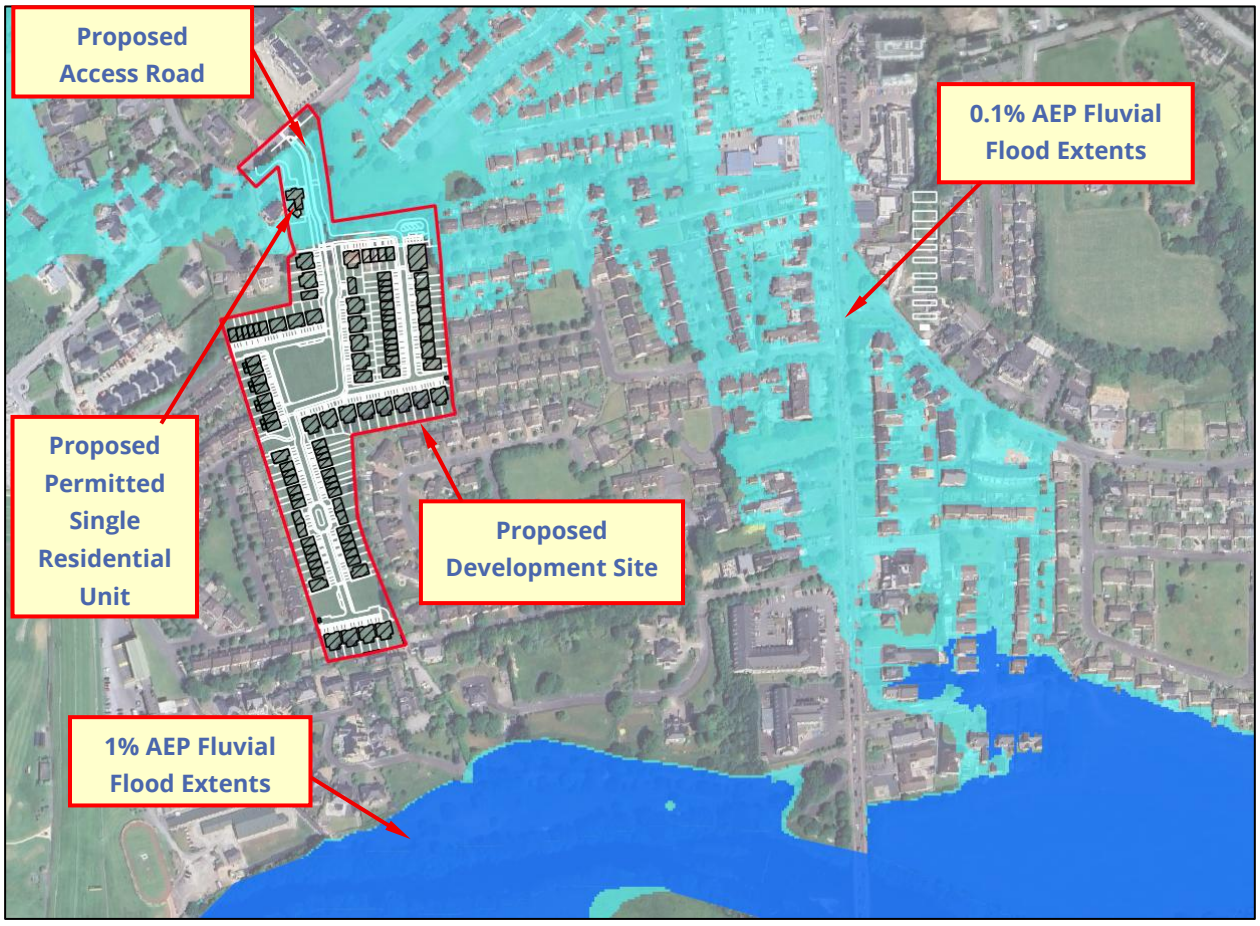

Figure 27 - 1% AEP & 0.1% AEP Fluvial Flood Extents – Proposed Development Scenario

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As illustrated in *Figure 27* above, in consideration of the proposed development scenario, the proposed development residential units, the proposed crèche and the proposed permitted single residential unit (Planning Reference 23/60005) do not fall within a predictive delineated 1% AEP (1 in 100 Year – Flood Zone 'A') or 0.1% AEP (1 in 1000 year – Flood Zone 'B') fluvial flood zone. A limited portion of the proposed development access road within the northern area of the site falls within a predictive delineated 0.1% AEP (1 in 1000 Year – Flood Zone 'B')) fluvial flood zone. The vast majority of the site falls within Flood Zone 'C'.

The delineated 1% AEP (1 in 100 year – Flood Zone 'A') and 0.1% AEP (1 in 1000 year – Flood Zone 'B') fluvial flood zone extents in consideration of the proposed development scenario are also illustrated on *Drawing Number IE3115-003-B*, *Appendix A*.

Figure 28 below illustrates the predictive 0.1% AEP (1 in 1000 year) flood depths in consideration of the proposed development scenario at and in the vicinity of the proposed development site as outputted by the hydraulic simulation model.

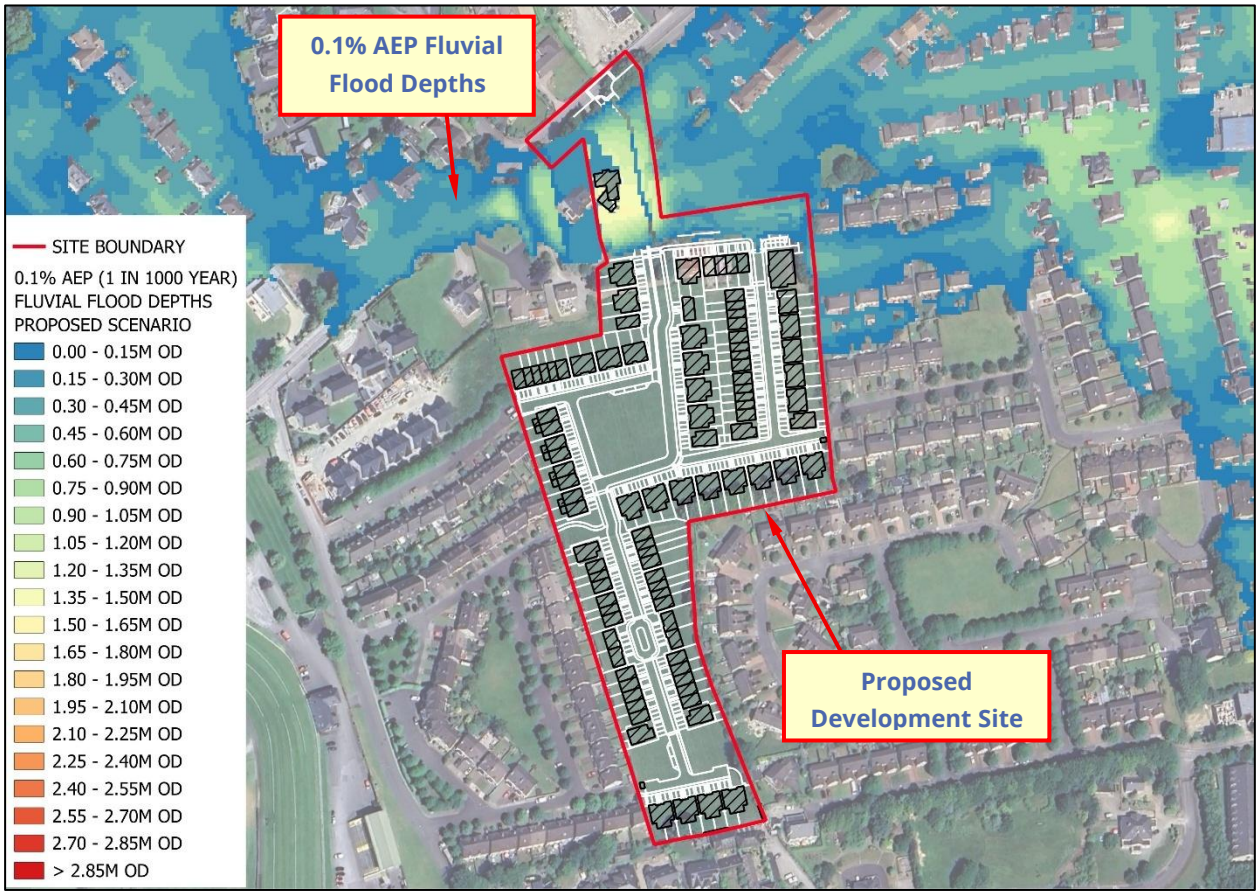

Figure 28 – Predictive 0.1% AEP Flood Depths – Proposed Development Scenario

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As illustrated in *Figure 28* above, in consideration of the proposed development scenario, a limited portion of the proposed development access road within the northern area of the site, and the access driveway associated with the proposed permitted single residential unit, falls within a predictive delineated 0.1% AEP (1 in 1000 Year – Flood Zone 'B')) fluvial flood zone. However except for a minor area less then 28m^2 in the northern eastern portion of the access road where flood depths between 0.3 – 0.37m, the predictive 0.1% AEP (1 in 1000 year) fluvial flood depths along the rest of the proposed access road and single residential unit access driveway are <0.3m.

Therefore, vehicular access to and egress from the proposed development site and the permitted single residential unit would not impeded during the occurrence of an extreme 0.1% AEP (1 in 1000 year) fluvial flood event.

10.1.3. Flood Level & Flood Extents Comparative Analysis

In consideration of the proposed development scenario predictive flood levels and predictive flood extents presented in *Section 10.1.1* and *Section 10.1.2* above, an comparative assessment and analysis has been undertaken in order to compare the existing undeveloped baseline scenario and the proposed development scenario flood regime at the location of the proposed development site.

Table 9 below presents the output of a comparative analysis of the predictive flood water levels in consideration of the existing undeveloped baseline scenario and the proposed development scenario at each of the hydraulic model cross section locations, and in consideration of the predictive 1% AEP (1 in 100 year) and the 0.1% AEP (1 in 1000 year) fluvial flood events.

Figure 21 above illustrates the location of the modelled cross sections.

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Node Label	1% AEP Peak Flood Level (m OD) Baseline Scenario	1% AEP Peak Flood Level (m OD) Proposed Scenario	Difference (m)	0.1% AEP Peak Flood Level (m OD) Baseline Scenario	0.1% AEP Peak Flood Level (m OD) Proposed Scenario	Difference (m)
22FLES00331H	26.47	26.47	0	26.88	26.88	0
22FLES00323H	26.34	26.34	0	26.75	26.75	0
22FLES00312H	25.88	25.88	0	26.41	26.41	0
22FLES00302H	25.71	25.71	0	26.28	26.28	0
22FLES00296H	25.51	25.51	0	26.12	26.12	0
22FLES00286H	25.24	25.24	0	25.85	25.85	0
22FLES00275H	24.91	24.91	0	25.52	25.52	0
22FLES00264H	24.65	24.65	0	25.26	25.26	0
22FLES00250G	24.44	24.44	0	25.08	25.08	0
22FLES00235H	24.24	24.24	0	24.87	24.87	0
22FLES00225H	24.02	24.02	0	24.72	24.72	0
22FLES00217H	23.83	23.83	0	24.51	24.51	0
22FLES00201D	23.42	23.42	0	23.96	23.96	0
CH0002	23.41	23.41	0	23.95	23.95	0
22FLES00194W	23.23	23.23	0	23.75	23.75	0
22FLES00186H	23.03	23.03	0	23.52	23.52	0
22FLES00175H	22.84	22.84	0	23.31	23.31	0
22FLES00165H	22.52	22.52	0	22.98	22.98	0
22FLES00155H	22.42	22.42	0	22.86	22.86	0
22FLES00143H	21.32	21.32	0	21.75	21.75	0
22FLES00132H	20.28	20.28	0	20.85	20.85	0

Table 9 – Existing Undeveloped Baseline Scenario versus Proposed Development Scenario Flood Water Levels

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As listed in *Table 9* above, during the occurrence of an extreme 1% AEP (1 in 100 year) or a 0.1% AEP (1 in 1000 year) fluvial flood event there is no increase in predictive flood water levels within the River Flesk when comparing the undeveloped baseline scenario versus the proposed development scenario.

Therefore, the development as proposed is not predicted to result in an adverse impact to the existing hydrological regime of the area or increase flood risk elsewhere.

Figure 29 below illustrates a comparative analysis of the predictive 0.1% AEP (1 in 1000-year) fluvial flood extents at and upstream and downstream of the site in consideration of the existing undeveloped baseline scenario and the proposed development scenario.

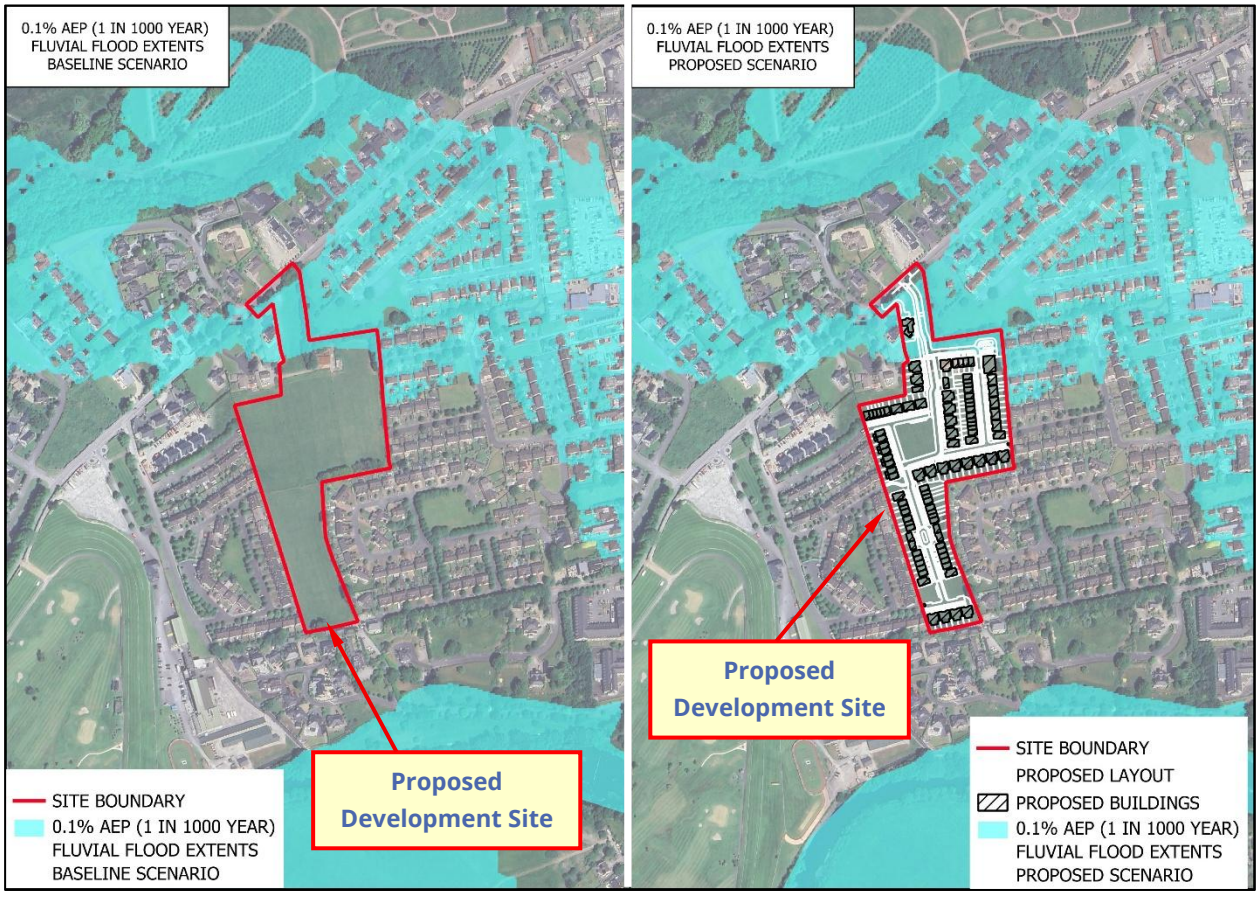

Figure 29 – 0.1% AEP Fluvial Flood Extents – Existing Undeveloped Baseline Scenario versus Proposed Development Scenario

As illustrated in *Figure 29* above, there is no predictive upstream or downstream increase or alteration in 0.1% AEP (1 in 1000 year) fluvial flood extents in consideration of the existing undeveloped baseline scenario and the proposed development scenario.

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The development as proposed will not result in an increased 0.1% AEP (1 in 1000 year) fluvial flood risk to any surrounding lands or properties, or elsewhere.

In summary, the results of the hydraulic modelling exercise demonstrate that;

- The proposed access road does not restrict or alter the existing overland flow path due to the proposed development.
- The proposed access road will not impede vehicular access to or egress from the development as proposed during the occurrence of an extreme 0.1% AEP (1 in 1000 year) fluvial flood event.
- There are no predictive negative or adverse impacts to adjoining landowners or to the existing public road due to the proposed development.

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11. Recommendations for Site Development

In addition to the flood mitigation measures discussed in *Section 10* above, and as illustrated in *Figure 30* below, it is recommended that the finished ground floor levels of the proposed residential units and proposed crèche located in proximity to predictive delineated 0.1% AEP (1 in 1000 year – Flood Zone 'B') fluvial flood zone, be constructed to a minimum finished flood level of 0.3m above the peak 0.1% AEP (1 in 1000 year) flood level.

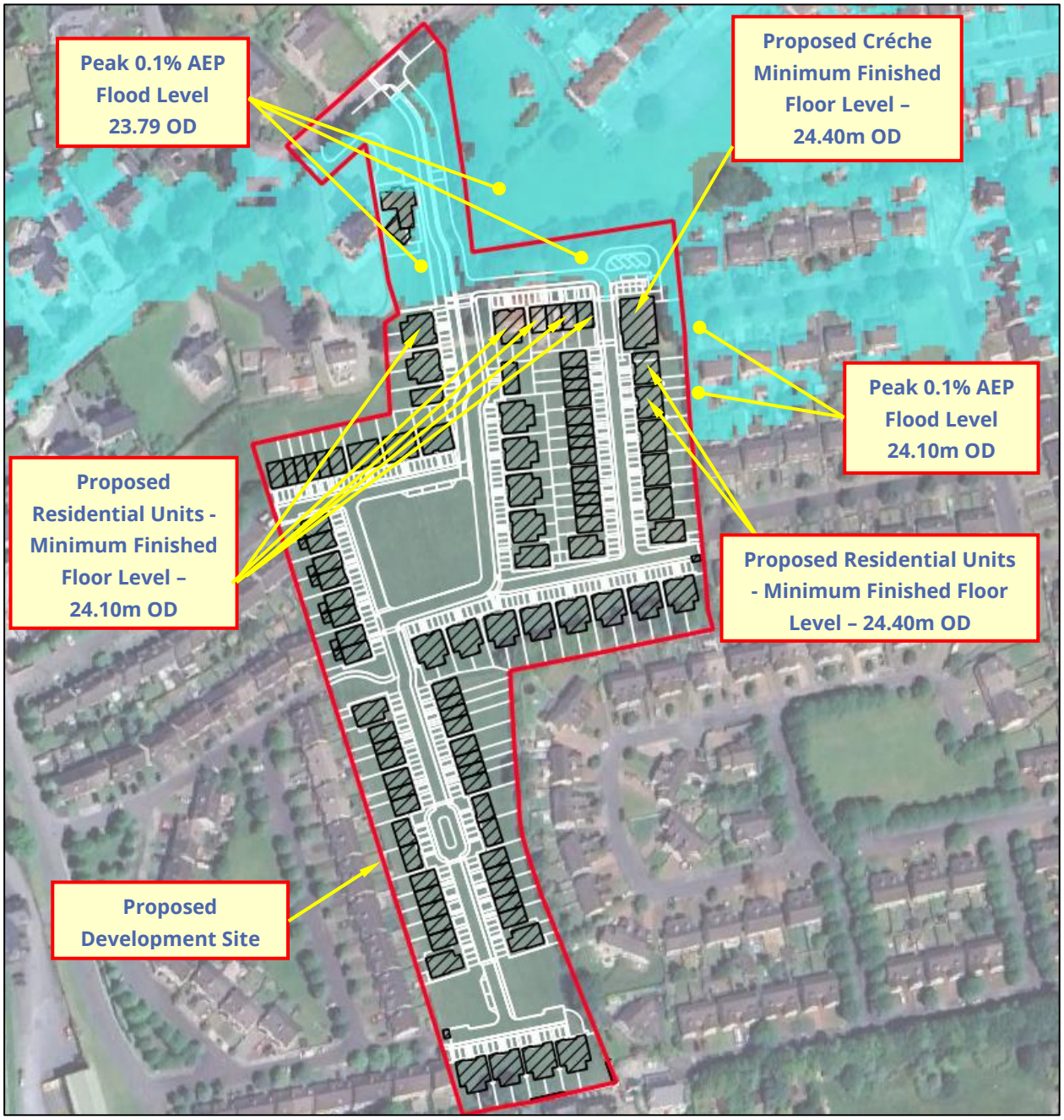

Figure 30 – Recommended Finished Ground Floor Levels

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12. Justification Test for Development Management

In the context of the 'Planning System and Flood Risk Management Guidelines, DOEHLG, 2009' and in consideration of the scenario that the development as proposed is undefended, the assessment, analysis and flood zone delineation undertaken as part of this Site Specific Flood Risk Assessment (SSFRA) indicates that a small limited portion in the northern area of the proposed development site where the access road is proposed and the location of the permitted single residential unit (Planning Reference 23/60005) falls within a predictive Flood Zone 'B' (Note: the permitted single residential unit shall be incorporated as part of this overall development proposal). The vast majority of the proposed development site, including the area of the proposed residential units and proposed crèche falls within Flood Zone 'C'.

Table 3.1 of the guidelines lists the vulnerability class of various types of development. The small, limited area of the proposed access road that falls within Flood Zone 'B' is classified as 'Less Vulnerable Development.' The permitted single residential unit that falls within Flood Zone 'B' is classified as 'Highly Vulnerable Development'.

Table 3.2 of the guidelines (duplicated below) provides a matrix of different vulnerability classes of development in relation to Flood Zones A, B and C, and lists if development is appropriate in each Zone and where the Justification Test should be applied.

	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 3.2: Matrix of vulnerability versus flood zone to illustrate appropriate development and that required to meet the Justification Test

With reference to Table 3.2 above, the small limited area of the proposed access road that falls within Flood Zone 'B' is 'Less Vulnerable Development' and is deemed 'Appropriate' and is therefore not subject to the Justification Test.

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The permitted single residential unit that falls within Flood Zone 'B' is classified as 'Highly Vulnerable Development'. Where 'Highly Vulnerable Development' is proposed within a delineated Flood Zone 'B,' the planning authority must be satisfied that the development as proposed satisfies the criteria of the Justification Test as described in Box 5.1 of the guidelines (duplicated below):

Box 5.1 Justification Test for development management (to be submitted by the applicant)

When considering proposals for development, which may be vulnerable to flooding, and that would generally be inappropriate as set out in Table 3.2, the following criteria must be satisfied:

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.

2. The proposal has been subject to an appropriate flood risk assessment that demonstrates:

   (i) The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk;

   (ii) The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible;

   (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; and

   (iv) The development proposed addresses the above in a manner that is compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.

The acceptability or otherwise of levels of residual risk should be made with consideration of the type and foreseen use of the development and the local development context.

Note: See section 5.27 in relation to major development on zoned lands where sequential approach has not been applied in the operative development plan.

Refer to section 5.28 in relation to minor and infill developments.

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Each of the criteria listed in Box 5.1 above are considered as follows:

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.

   Answer – The subject site is zoned Residential R1 New Residential and R2 Existing Residential. The Kerry County Development Plan identifies that the residential units are appropriate uses for lands identified for this zoning.

   The site is further identified in the Plan as site no. 18 in the Killarney – Settlement Capacity Audit of Zoned Lands, identifying that the site is serviceable, has road access and footpaths with a potential to yield up to 110 residential units.

   Given the Plan's zoning objective for the site and the residential character of the immediate area, a residential development is therefore the most appropriate use for the site. It can be concluded that the proposed development is acceptable in terms of the proper planning and sustainable development of the town and is supported in principle.

2. The proposal has been subject to an appropriate flood risk assessment that demonstrates:

   (i) The development proposed will not increase flood risk elsewhere and, if practical will reduce overall flood risk;

   Answer – A Site-Specific Flood Risk Assessment appropriate to the scale and nature of the development as proposed, including a detailed 1D-2D hydraulic modelling exercise of the River Flesk, has been undertaken.

   The results of the hydraulic modelling exercise demonstrate that, in consideration of the proposed development scenario, the development as proposed will not result in an adverse impact to the existing hydrological regime of the area or increase fluvial flood risk to adjacent lands or properties elsewhere.

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(ii) The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible;

Answer – The finished floor level of the proposed permitted single residential unit located Flood Zone 'B' shall be constructed to a level of 0.31m above the predictive 0.1% AEP (1 in 1000 Year) fluvial flood level at this location – i.e. 23.79m OD + 0.31m = **24.10m OD**. The access driveway off Ross Road associated within this permitted single residential unit shall be constructed to a minimum level of **23.50m OD**, which will ensure that maximum potential flood depths do not exceed 0.3m during the occurrence of a 0.1% AEP (1 in 1000 year) fluvial flood level..

(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;

Answer – The assessment and analysis undertaken as part of this Site Specific Flood Risk Assessment has not identified any specific residual flood risk to the development as proposed. The development as proposed does not depend on the adequacy of any existing flood protection measures, or no the design, implementation and funding of any future flood risk management measures. The assessment and analysis undertaken as part of this Site Specific Flood Risk Assessment demonstrates that emergency vehicle assess to and egress from the development as proposed would not be impeded or restricted during the occurrence of an extreme 0.1% AEP (1 in 1000 year) fluvial flood event.

(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;

Answer – The proposed residential development in helping meet high-level national and local objectives to increase housing supply is also in keeping with the character of the immediate area in terms of the extent and scale of the proposed residential units.

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A high-quality finish to the dwellings is proposed in terms of materials with a contemporary approach taken. The design and orientation of the proposed dwellings reflects that of the existing established housing estates in the area to ensure that the proposed development will integrate successfully with the existing urban character along this section of the public roadway as one enters the village from the south.

The development will see the creation of a new sustainable neighbourhood within the town of Killarney, a Key Town both locally and regionally. The development will provide much needed housing stock along with key community facilities in close proximity to both existing and permitted residential developments on serviceable lands, within the development boundary of the outer edge of Killarney.

The proposed development does not give rise to any undue negative traffic, public health or other planning impacts. The proposal will not adversely affect the residential amenity of adjoining properties, or the character of the area.

Having regard to the Development Plan objectives for Killarney and the pattern of development in the local area, it is considered that the proposed residential development represents a high quality, residential development at an appropriate density that will complement the existing and evolving character of the local area.

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13. Summary Conclusions

In consideration of the findings of this Site Specific Flood Risk Assessment and analysis the following conclusions are made in respect of the development as proposed:

- A Site Specific Flood Risk (SSFRA) assessment, appropriate to the type and scale of development proposed, and in accordance with 'The Planning System and Flood Risk Management Guidelines – DoEHLG-2009' and the Killarney Town Development Plan (2022 – 2028) has been undertaken.
- The proposed development site has been screened, scoped, and assessed for flood risk in accordance with the above guidelines.
- The primary potential flood risk to the proposed development site can be attributed to an extreme fluvial flood event in the River Flesk located 175m beyond the southern boundary of the proposed development site.
- The screening assessment undertaken as part of this SSFRA indicates that the site is not at risk of pluvial or groundwater flooding.
- A detailed Digital Terrain Model (DTM) has been developed for the area of the proposed development site.
- A detailed hydrological assessment and analysis has been undertaken in order to determine the 1% AEP (1 in 100 year) and 0.1% AEP (1 in 1000 year) peak flood flows in the River Flesk at this location.
- A linked 1D-2D hydraulic model has been developed of the River Flesk utilising the Flood Modeller Pro software. The model has been developed utilising surveyed watercourse cross sectional data and LiDAR data for the area.
- The hydraulic model developed for this Site Specific Flood Risk has incorporated the proposed permitted single residential units (Planning Reference 23/60005) located within the northern portion of the proposed development site.
- The hydraulic model developed for this Site Specific Flood Risk Assessment is considered to provide an accurate and site specific delineation of the predictive 1% AEP (1 in 100 year) and 0.1% AEP (1 in 1000 year) flood zone at the location of the proposed development site.
- A small limited portion in the northern area of the proposed development site falls within a predictive Flood Zone 'B'.

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- The vast majority of the proposed development site, including the area of the proposed residential units and proposed crèche falls within Flood Zone 'C'.
- In order to ensure a sustainable development, and to ensure that the potential flood risk to the portion of the proposed access road that falls within the delineated predictive 0.1% AEP (1 in 1000 year - Flood Zone 'B') fluvial flood zone is mitigated to an acceptable level, it is proposed to raise the finished ground level of the proposed access road to a minimum level of **23.50m OD** which will ensure that the maximum potential flood depth along this portion of the access road will not exceed 0.3m during the occurrence of an extreme 0.1% AEP (1 in 1000 year) fluvial flood event.
- Vehicular access to and egress from the proposed development site and the permitted single residential unit would not impeded during the occurrence of an extreme 0.1% AEP (1 in 1000 year) fluvial flood event.
- The development as proposed is considered to comply with the requirement of the 'Justification Test'
- As illustrated in *Figure 30* above, the finished ground floor level of the proposed residential units and the proposed crèche shall be constructed to a minimum level of 0.3m above the predictive 0.1% AEP fluvial flood level.
- In consideration of findings and output of this Site Specific Flood Risk Assessment, the potential flood risk to and from the development as proposed is considered to be LOW. The development as proposed is not predicted to result in an adverse impact to the existing hydrological regime of the area or increase flood risk elsewhere and is therefore considered to be appropriate from a flood risk perspective.

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Appendices

Appendix A. Drawings

Drawing Number IE3115-001-A Site Location Map

Drawing Number IE3115-002-A Fluvial Flood Extents During 1% AEP and 0.1% AEP Events – Baseline Scenario

Drawing Number IE3115-003-B Fluvial Flood Extents During 1% AEP and 0.1% AEP Events – Proposed Scenario

LEGEND

SITE BOUNDARY

rev.	date	amendment	drn	ckd
A	14.03.25	ISSUE	MOF	PMS

PROPOSED LARGE SCALE DEVELOPMENT (LRD) AT ROSS ROAD, KILLARNEY, CO. KERRY

SITE SPECIFIC FLOOD RISK ASSESSMENT

SITE LOCATION

IE CONSULTING
WATER-ENVIRONMENTAL-CIVIL

CARLOW OFFICE:
INNOVATION CENTRE
GREEN ROAD
CARLOW R95 W248

NEWRY OFFICE:
1 RDC HOUSE
WIN BUSINESS PARK
NEWRY BT35 6PH

file location: N:\IE3115\DRAWINGS	scale: 1:35,000	A3
drawing status: PLANNING	datum: MALIN	
	drawn: MOF	
drawing no. IE3115-001	rev: A	checked: PMS
		approved: PMS
		date: 14/03/2025

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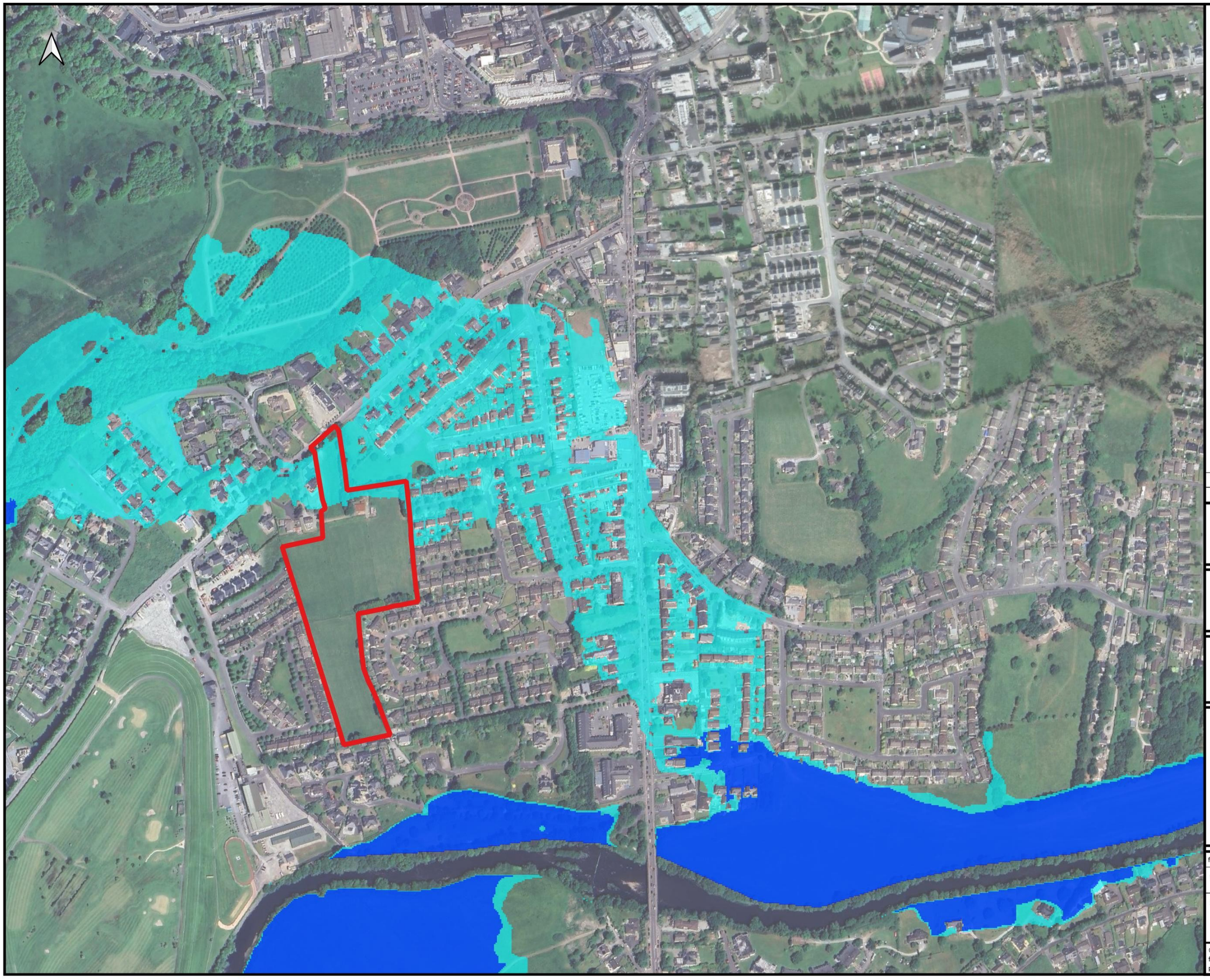

LEGEND

- SITE BOUNDARY
- 1% AEP (1 IN 100 YEAR) FLUVIAL FLOOD EXTENTS BASELINE SCENARIO
- 0.1% AEP (1 IN 1000 YEAR) FLUVIAL FLOOD EXTENTS BASELINE SCENARIO

rev.	date	amendment	drn	ckd
A	14.03.25	ISSUE	MOF	PMS

PROPOSED LARGE SCALE DEVELOPMENT (LRD) AT ROSS ROAD, KILLARNEY, CO. KERRY

SITE SPECIFIC FLOOD RISK ASSESSMENT

1% AEP (1 IN 100 YEAR) & 0.1% AEP (1 IN 1000 YEAR) FLUVIAL FLOOD EXTENTS BASELINE SCENARIO

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WATER-ENVIRONMENTAL-CIVIL

CARLOW OFFICE:
INNOVATION CENTRE
GREEN ROAD
CARLOW R95 W248

NEWRY OFFICE:
1 RDC HOUSE
WIN BUSINESS PARK
NEWRY BT35 6PH

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	approved: PMS	
	date: 14/03/2025	

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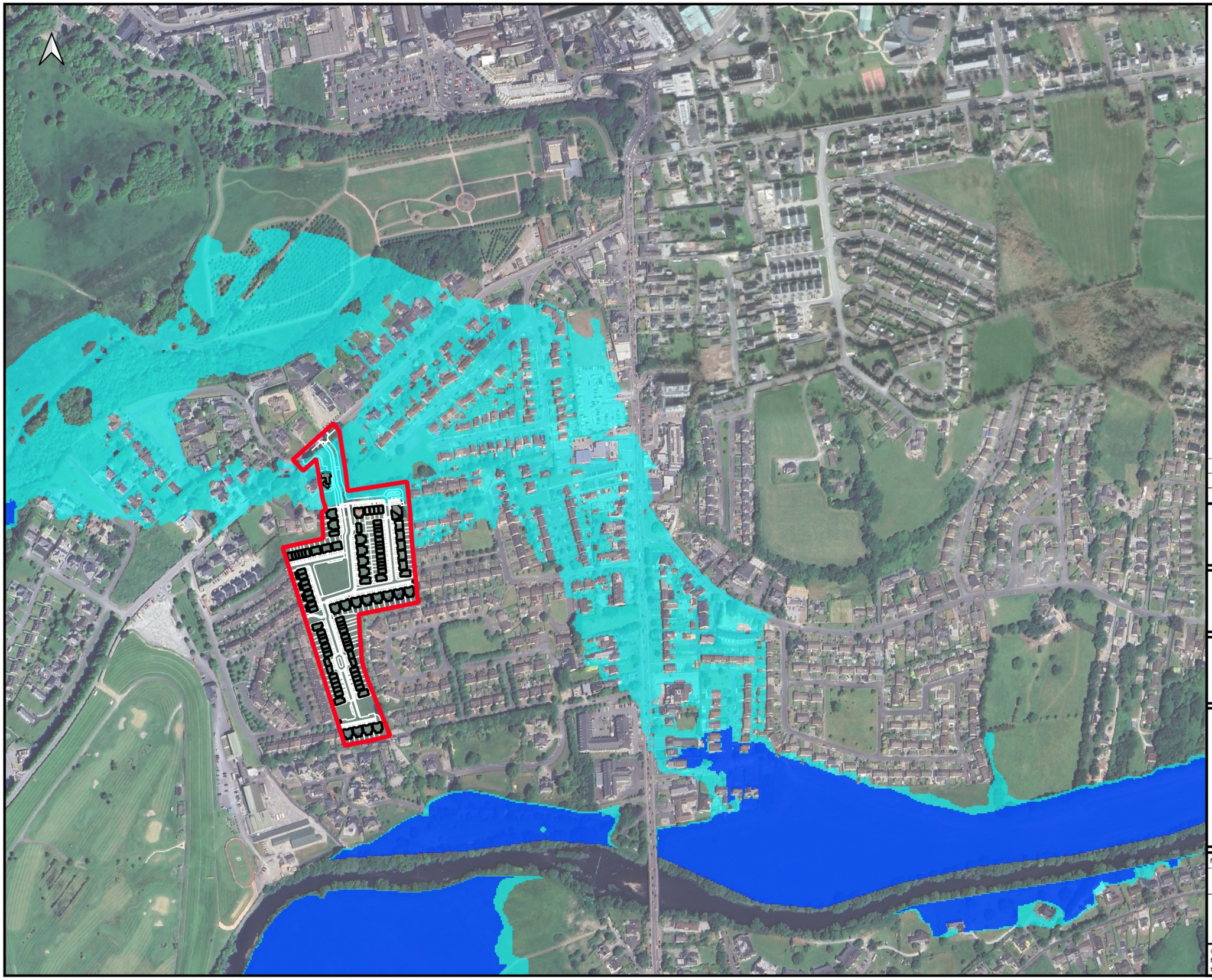

LEGEND

PROPOSED BUILDINGS

PROPOSED LAYOUT

1% AEP (1 IN 100 YEAR) FLUVIAL FLOOD EXTENTS PROPOSED SCENARIO

0.1% AEP (1 IN 1000 YEAR) FLUVIAL FLOOD EXTENTS PROPOSED SCENARIO

rev.	date	amendment	drn	ckd
B	25.07.25	ISSUE	MOF	PMS
A	14.03.25	ISSUE	MOF	PMS

PROPOSED LARGE SCALE DEVELOPMENT (LRD) AT ROSS ROAD, KILLARNEY, CO. KERRY

SITE SPECIFIC FLOOD RISK ASSESSMENT

1% AEP (1 IN 100 YEAR) & 0.1% AEP (1 IN 1000 YEAR) FLUVIAL FLOOD EXTENTS PROPOSED SCENARIO

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1 RDC HOUSE
WIN BUSINESS PARK
NEWRY BT35 6PH

file location: N:\IE3115\DRAWINGS	scale: 1:7,000	A3
drawing status: PLANNING	datum: MALIN	
	drawn: MOF	
drawing no. IE3115-003 / rev: B	checked: PMS	
	approved: PMS	
	date: 25/07/2025	

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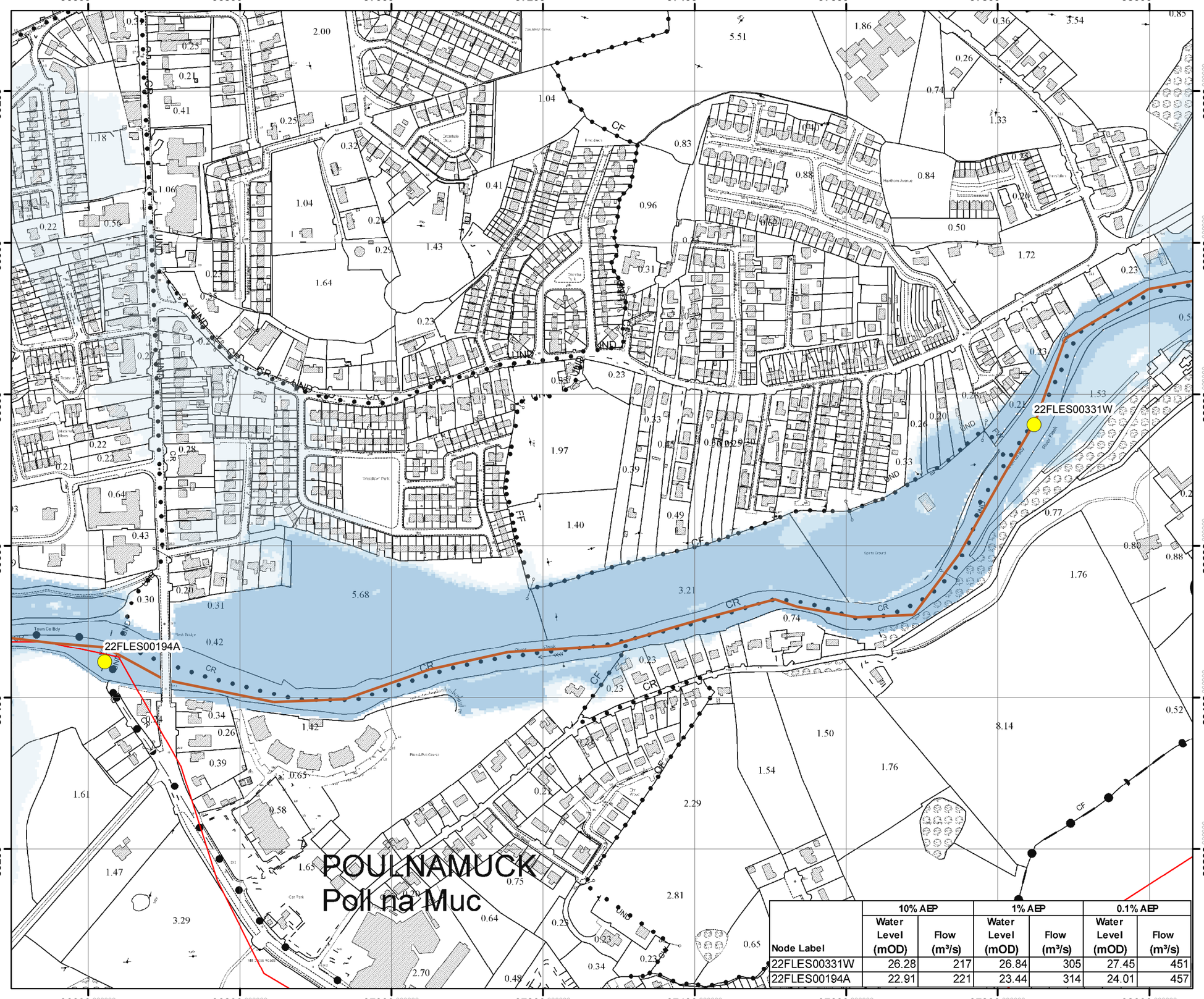
Appendix B. CFRAMS Map

Fluvial Extents Maps

- *MMD/296235/E/DR/I22HKY37/EXFCDEXF/F2/Sht004*
- *MMD/296235/E/DR/I22HKY37/EXFCDEXF/F2/Sht005*



Node Label	10% AEP Water Level (mOD)	10% AEP Flow (m³/s)	1% AEP Water Level (mOD)	1% AEP Flow (m³/s)	0.1% AEP Water Level (mOD)	0.1% AEP Flow (m³/s)
22FLES00331W	26.28	217	26.84	305	27.45	451
22FLES00194A	22.91	221	23.44	314	24.01	457

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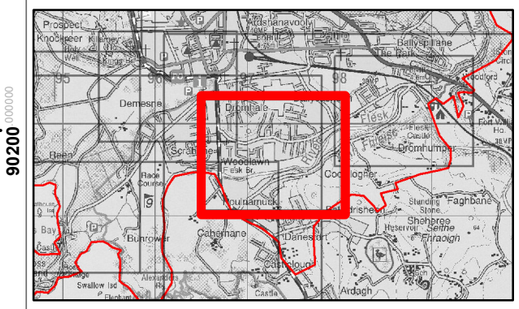
Location Plan:



Legend:

- Model Nodes
- Flood Defence - Embankment
- Modelled River Centreline
- Defended Area
- AFA Boundary
- Upstream limit to tidal influence
- 10% AEP Flood Extent
- 1% AEP Flood Extent
- 0.1% AEP Flood Extent

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

SOUTH WESTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT

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

MOTT MACDONALD
Mott MacDonald Ireland
5 Eastgate Avenue
Little Island
Co. Cork

Project:	South Western CFRAM Study
Map:	Killarney/flesk 2 - Flood Extent
Map type:	Flood Extent
Source:	Fluvial Flooding
Map area:	Urban Area
Scenario:	Current
Drawn by:	Emily Shipton — Date: Nov-17
Checked by:	Barry O'Connor — Date: Nov-17
Approved by:	Fintan McGivern — Date: Nov-17
Map No.:	MMD/296235/E/DR/I22HKY37/EXFCDEXF/F2/Sht004
Sheet:	4 of 9 — Revision: F2
Drawing Scale:	1:5,000 — Plot Scale: 1:1@A3

Node Label	10% AEP		1% AEP		0.1% AEP	
	Water Level (mOD)	Flow (m³/s)	Water Level (mOD)	Flow (m³/s)	Water Level (mOD)	Flow (m³/s)
22DEN00195A	26.86	15.4	27.20	24.3	27.77	35.7
22DEN00169A	25.43	15.4	25.77	24.2	26.35	37.0

22DEN00195A

22DEN00169A

INCH

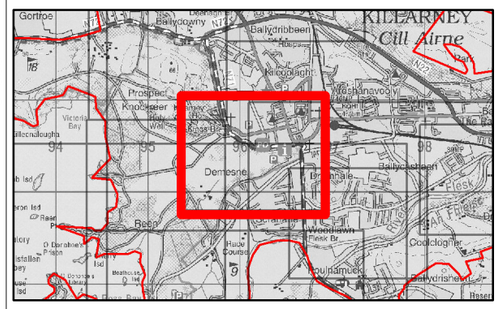
KILLARNEY

KILLARNEY

MONEARMORE

DEMESNE

Location Plan:



Legend:

- Model Nodes
- Flood Defence - Embankment
- Modelled River Centreline
- Defended Area
- AFA Boundary
- Upstream limit to tidal influence
- 10% AEP Flood Extent
- 1% AEP Flood Extent
- 0.1% AEP Flood Extent

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SOUTH WESTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT

OPW
Oifig na nOibreacha Poiblí
The Office of Public Works

Office of Public Works
Jonathan Swift Street
Trim Co. Meath

MOTT MACDONALD

Mott MacDonald Ireland
5 Eastgate Avenue
Little Island
Co. Cork

Project:
South Western CFRAM Study

Map:
Killarney/flesk 2 - Flood Extent

Map type:	Flood Extent
Source:	Fluvial Flooding
Map area:	Urban Area
Scenario:	Current

Drawn by:	Emily Shipton	Date:	Nov-17
Checked by:	Barry O'Connor	Date:	Nov-17
Approved by:	Fintan McGivern	Date:	Nov-17

Map No.: MMD/296235/E/DR/I22HKY37/EXFCDEXF/F2/Sht005

Sheet: 5 of 9 Revision: F2

Drawing Scale: 1:5,000 Plot Scale: 1:1@A3

0 100 200 300 400 500 Meters

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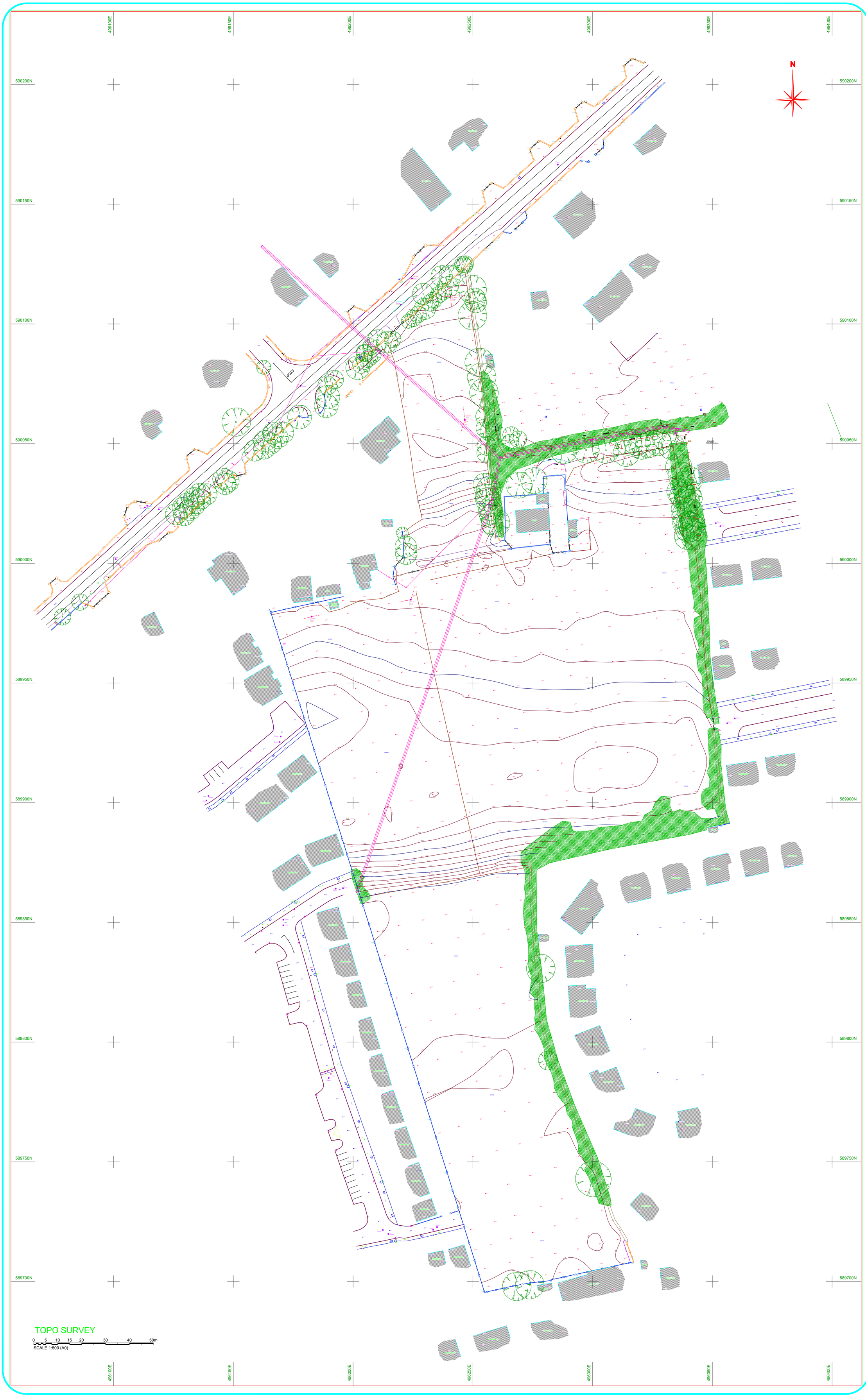
Appendix C. Topographic Survey of Proposed Development Site



LEGEND

TOPO SURVEY:

- AV — AIR VALVE
- AJ — ARMSTRONG JUNCTION
- ESB — ESB MINI PILLAR
- EP — ESB POLE
- OHD PWR LINES — ELECTRICITY LINE OVER
- OHD TEL LINES — TELECOM LINE OVER
- FH — FIRE HYDRANT
- WM — WATER METER
- GATE — GATE
- RG — ROAD GULLY
- IC — INSPECTION CHAMBER
- LP — LAMP POST
- MH CL=10.01m — MANHOLE
- SP — SIGN POST
- SV — SLUICE VALVE
- SC — STOPCOCK
- Ncw1 / 100.00 — SURVEY STATION
- ICTE — TELECOM CHAMBER
- TP — TELECOM POLE
- LB — LIGHT BOLLARD
- TREES
- 225mmØ Approx. — COMBINED SEWER
- 225mmØ Approx. — FOUL SEWER
- 225mmØ Approx. — STORM SEWER

MEASURED BUILDING SURVEY:

- 2.00m — FLOOR TO CEILING HEIGHT DIMENSION
- FL=200.00m — FLOOR LEVEL - MALIN DATUM (Metres)
- FL=200.00m — FLOOR LEVEL - MALIN DATUM (Metres)
- FALL — ROOF FALL INDICATOR

TOPO SURVEY

0 5 10 15 20 30 40 50m

SCALE 1:500 (A0)

NOTE:

01. Levels are in metres to OSGM15 (MALIN DATUM) unless otherwise noted. This datum was established using a Trimble Network Rover GPS system.
02. Co-ordinate system used - ITM95.
03. North refers to Grid North.
04. Only visible services have been surveyed.
05. Sewer TYPE, PIPE DIAMETER & FLOW direction have been estimated unless otherwise noted.
06. Building floor levels have been surveyed remotely and are approximate only, unless otherwise noted.
07. IF ANY DISCREPANCIES ARE FOUND IN THIS SURVEY, THEY SHOULD BE REPORTED TO NCWSURVEYS LTD IMMEDIATELY. FAILURE TO DO SO WILL INVALIDATE ANY SUBSEQUENT ISSUES ARISING FROM USING THIS SURVEY DATA.

REVISIONS

No.	Date	Staff	Description
C	27/02/25	Bm	EXTRA SURVEY DETAIL ADDED - 17/02/25

Ncw SURVEYS

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Upper Grange,
Newcastlewest,
Co. Limerick.
Tel: +353(0)69-77820
Mob: +353(0)87-8702148
Email: Eamon@Ncwsurveys.ie

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Client :	Homeland Group Ltd		
Scale:	1:500 (A0)		
Project :	Lands at Ross Road, Killarney, Co. Kerry		
Site crew :	Mm, Doc, Cob, Pb	Date :	Sept 2024
Drawn by :	Bm & Emc	Date :	Sept 2024
Checked by :	Emc	Date :	Sept 2024
Description :	TOPO SURVEY		
Drawing number :	24-351-001	Rev:	C

Appendix D. CFRAMS River Survey

North

22FLES00331H
22FLES00323H
22FLES00286H
22FLES00312H
22FLES00279H
22FLES00284H
22FLES00305H
22FLES00236H
22FLES00229H
22FLES00217H
22FLES00106H
22FLES00101H
22FLES00178H
22FLES00198H
22FLES00169H
22FLES00155H
22FLES00143H
22FLES00132H
22FLES00122H
22FLES00113H
22FLES00104H
22FLES00082H
22FLES00063H
22FLES00044H
22FLES00019H
22FLES00000H
22FLES00296H
22FLES00302H

COOLCLOGHER
POULAMUCK
BALLYDRISHEEN
CAHERNANE
CASTLELOUGH
LISTYMURRAGH
ARDAGH
(ED MUCKROSS)

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london@murphysurveys.co.uk

www.murphysurveys.ie

LEGEND

Section Line Details

- Surveyed Section Lines with References & Section Orientation (at Open channel)
- Surveyed Section Lines with References & Section Orientation (at Structures)
- Surveyed Section Lines with References & Section Orientation (at Additional items)

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Supply-Line supported by Ambic

Map Sheet Layout

Map Sheet 6084-03,04,12, 6084-A,B,C&D, 6085-C&D, 6131-B

North
Irish Grid
Malin Hd.
OSNI 1970/08
ING

Site Location

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Surveyed by	MSL	Date: APRIL 2013
Drawn by	DMUG	Date: MAY 2013
Checked by	MZ	Date: MAY 2013

Revisions

No	Date	Description
1	17.05.13	First Drawing
2	24.05.13	Final Drawing

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Mott MacDonald

OPW
The Office of Public Works
Oifig na nOibreacha Poiblí

Client : OFFICE OF PUBLIC WORKS

Project : 00000004674_SURVEY_CONTRACT_05

Date : 17.05.13 | Scale : 1:2500 @ A0

Description : SECTIONS PLAN

Drawing Number : 4674_22FLES_FLESK-A_XS_PLAN_1

North

BALLYCASHEEN

BALLYCASHEEN

LISSYVIGEEN

DROMHUMPER

COOLCLOGHER

FAGHBANE

SHEHEREE

BALLYDRISHEEN

Old Pike Wood

Woodford River

Woodford Bridge

Coolclogher House

Fleak Castle (in Ruins)

River Fleak

22FLES00449H

22FLES00463D

22FLES00464S

22FLES00469H

22FLES00480H

22FLES00431H

22FLES00492H

22FLES00421H

22FLES00412H

22FLES00404H

22FLES00512H

22FLES00342H

22FLES00331H

22FLES00323H

22FLES00312H

22FLES00302H

22FLES00296H

22FLES00286H

22FLES00354H

22FLES00366H

22FLES00376H

22FLES00385H

22FLES00395H

22FLES00531H

22FLES00547H

22FLES00567H

22FLES00589H

22FLES00610H

22FLES00631H

22FLES00655H

22FLES00672H

22FLES00692H

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Surveyed Section Lines with References & Section Orientation (at Structures)

Surveyed Section Lines with References & Section Orientation (at Additional Items)

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Map Sheet Layout

Map Sheet 6084-03.04.12, 6084-A.S.CAD, 6085-CAD, 6131-S

North

Grid: Malin Hd.
Projection: ING

Site Location

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Surveyed by :	MSL	Date: APRIL 2013
Drawn by :	SMcG	Date: MAY 2013
Checked by :	MZ	Date: MAY 2013

Revisions

No	Date	Description
1	17.05.13	First Drawing
2	24.05.13	Final Drawing

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Mott MacDonald

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Oifig na nOibreacha Poiblí

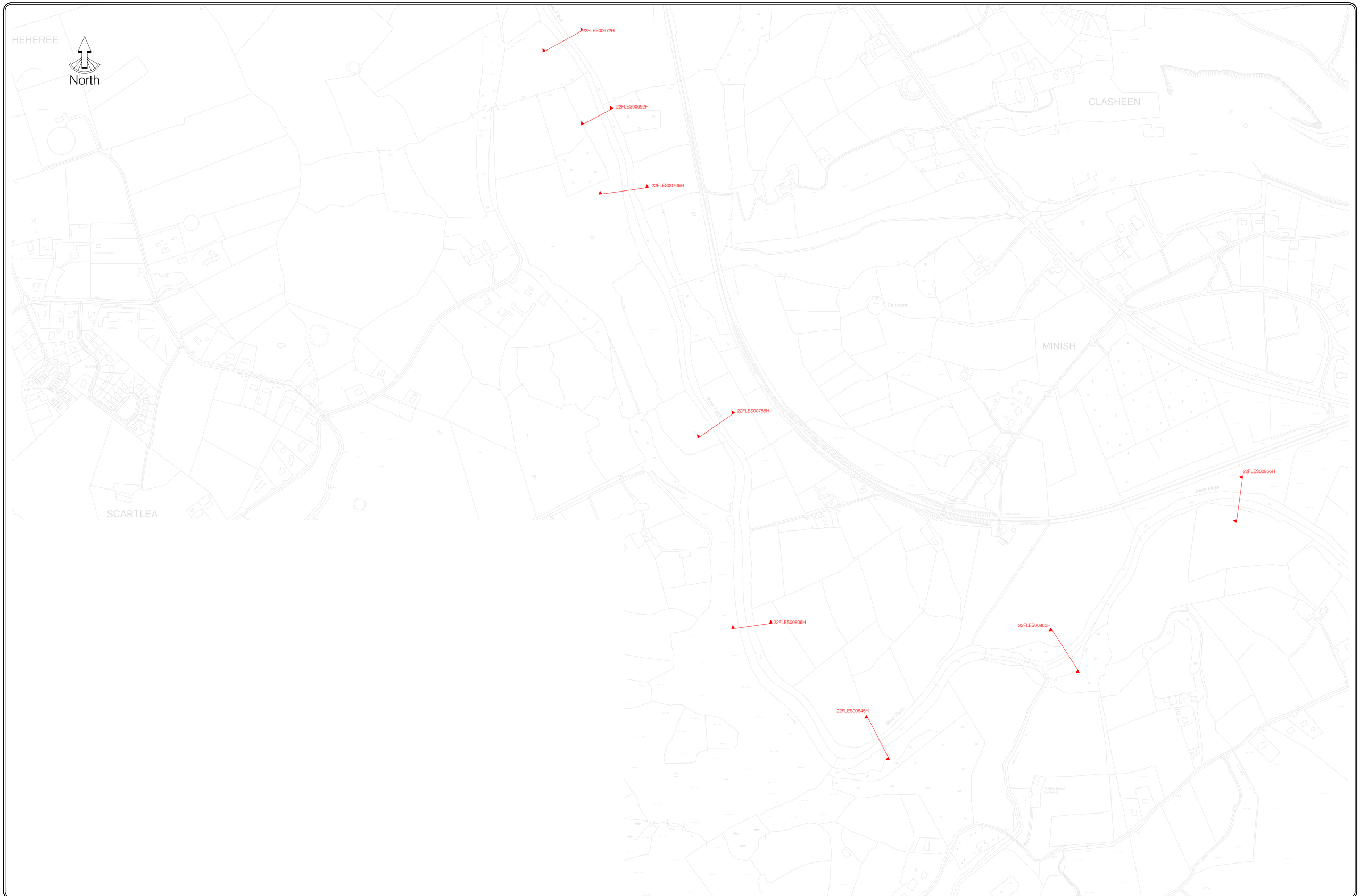
Client : OFFICE OF PUBLIC WORKS

Project : 00000004674_SURVEY_CONTRACT_05

Date : 17.05.13 | Scale : 1:2500 @ A0

Description : SECTIONS PLAN

Drawing Number : 4674_22FLES_FLESK-A_XS_PLAN_2



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Map Sheet Layout

Map Sheet 6084-03,04,12, 6084-A,B,C&D, 6085-C&D, 6131-B

North

Grid: Malin Hd.
Datum: ING

Site Location

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Surveyed by	MDL
Drawn by	SMcG
Checked by	MC
Date	APRIL 2013
Date	MAY 2013
Date	MAY 2013

Revisions

No.	Date	Description
1	17.04.13	First Drawing
2	24.05.13	Final Drawing

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Mott MacDonald

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Oifig na nOibreacha Poiblí

Client : OFFICE OF PUBLIC WORKS

Project : 00000004674_SURVEY_CONTRACT_05

Date : 17.05.13 | Scale : 1:2500 @ A0

Description : SECTIONS PLAN

Drawing Number : 4674_22FLES_FLESK-A_XS_PLAN_3

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22FLES01005H

22FLES01054H

22FLES01103H

22FLES01154H

22FLES01203H

22FLES01204E

22FLES01205D

22FLES01206H

22FLES01218H

OLDFORGE

GORTAHOOSH

TULLAHA

TULLAHA

CROSSTOWN

River Flesk

River Flesk

River Arn

Fliesc

Area Under Construction

Area Under Construction

Area Under Construction

Area under development

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Surveyed Section Lines with References & Section Orientation (at Structures)

Surveyed Section Lines with References & Section Orientation (at Additional items)

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Map Sheet Layout

Map Sheet 6084-03,04,12, 6084-A,B,C&D, 6085-C&D, 6131-B

North

Datum: Malin Hd.
Grid Origin: ING

Site Location

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Surveyed by	MSL	Date: APRIL 2013
Drawn by	SMcG	Date: MAY 2013
Checked by	MZ	Date: MAY 2013

Revisions

No	Date	Description
1	17.05.13	First Drawing
2	24.05.13	Final Drawing

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Client : OFFICE OF PUBLIC WORKS

Project : 00000004674_SURVEY_CONTRACT_05

Date : 17.05.13 **Scale :** 1:2500 @ A0

Description : SECTIONS PLAN

Drawing Number : 4674_22FLES_FLESK-A_XS_PLAN_4

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MIKE Chainage: 9919.248
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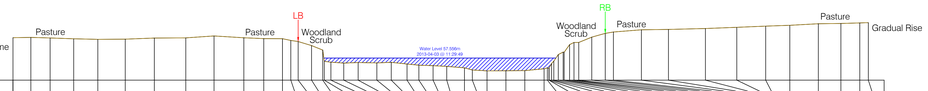
Vt.Scale 1: 250
Datum:55.00



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MIKE Offset	54.69	52.42	50.42	47.66	44.80	37.74	36.38	34.75	31.48	29.05	25.73	20.09	22.63	20.74	18.65	16.87	15.21	14.53	13.46	12.71	11.05	9.22	7.86	6.52	4.64	3.90	2.50	1.98	1.78	1.36	15.36	15.87	17.78	17.77	17.71	19.29	19.76	19.90	21.93	21.94	21.78	21.54	21.08	21.54	21.58	21.62	21.62	21.62	21.62	21.62	21.62
Elevation Ground	56.90	56.94	59.67	59.77	59.73	59.80	59.78	59.86	59.90	59.79	59.79	59.78	59.59	59.99	59.68	57.72	57.34	57.34	56.97	57.34	56.99	59.67	59.72	59.72	59.72	59.72	59.72	59.72	59.72	56.70	56.71	56.42	56.23	56.42	56.42	56.42	56.42	56.24	55.92	55.92	55.92	55.92	55.92	55.92	55.92	55.92	55.92	55.92	55.92	55.92	55.92
Feature Name	Continues Same	Pasture	Spot Height - Soft	Spot Height - Soft	Spot Height - Soft	Spot Height - Soft	Spot Height - Soft	Spot Height - Soft	Spot Height - Soft	Spot Height - Soft	Pasture	Section Turn Down	Left Bank	Spot Height - Soft	Section Edge	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone

ID:22FLES01206H
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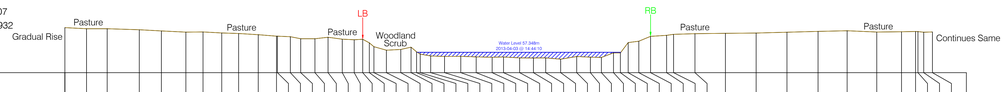
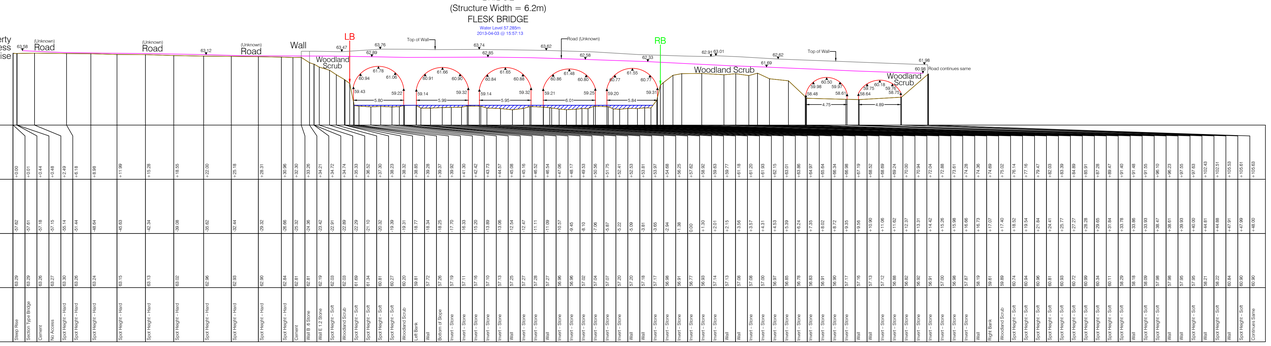
MIKE Chainage: 10015.932
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:55.00



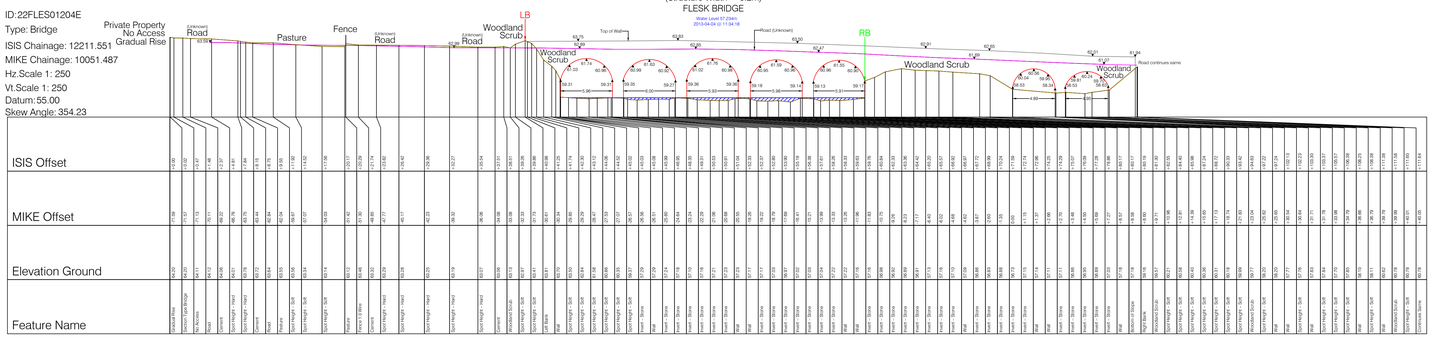
ISIS Offset	0.000	2.249	4.497	6.536	11.113	13.196	15.169	18.939	23.044	24.941	26.031	27.271	28.850	30.196	32.300	34.367	35.172	35.953	37.090	38.211	39.446	41.237	41.709	42.203	43.063	43.267	44.114	46.259	48.900	52.247	54.496	55.457	57.222	58.441	59.222	60.141	74.222	75.999	76.235	76.744	78.026	80.300	82.689	85.424	87.996	90.453	92.035	94.036	95.713	96.461	97.026	98.713	99.502	100.231	101.002	101.581	102.243	102.511	103.091	103.548
MIKE Offset	51.20	54.71	52.30	48.62	48.67	43.24	41.27	38.11	37.15	35.34	34.88	32.79	32.89	31.78	29.89	28.85	28.34	25.20	23.83	22.08	21.20	20.11	19.77	19.63	18.63	18.20	17.89	15.42	13.92	9.79	7.91	6.80	4.73	3.71	3.72	1.85	1.85	3.43	4.73	4.59	4.68	4.68	7.73	7.62	11.53	13.30	14.90	15.26	15.70	16.70	17.29	17.78	18.48	18.94	19.27	19.31	19.31	19.31	19.31	19.31	19.31
Elevation Ground	60.23	60.07	60.07	59.98	59.98	59.68	59.71	59.58	59.62	59.58	59.71	59.71	59.73	59.82	59.82	59.82	59.82	59.87	59.96	59.96	59.96	59.96	59.96	59.96	57.74	57.74	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93	95.93
Feature Name	Gradual Rise	Pasture	Spot Height - Soft	Spot Height - Soft	Spot Height - Soft	Spot Height - Soft	Spot Height - Soft	Spot Height - Soft	Spot Height - Soft	Spot Height - Soft	Pasture	Spot Height - Soft	Spot Height - Soft	Spot Height - Soft	Spot Height - Soft	Spot Height - Soft	Spot Height - Soft	Pasture	Left Bank	Spot Height - Soft	Spot Height - Soft	Spot Height - Soft	Spot Height - Soft	Spot Height - Soft	Spot Height - Soft	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone	Inset - Stone

ID:22FLES01205D
Type: Bridge
ISIS Chainage: 12218.303
MIKE Chainage: 10044.736
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:55.00
Skew Angle: 354.24

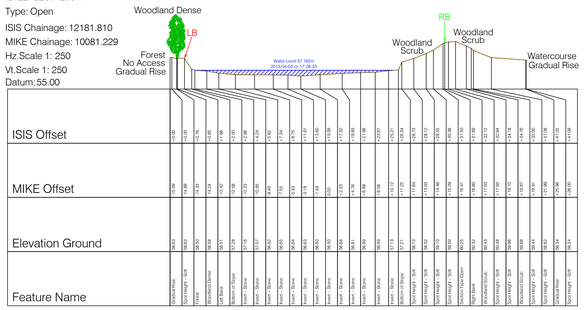


| ISIS Offset | -11.00 | -10.01 | -9.44 | -7.48 | -4.78 | -1.68 | 11.68 | 11.78 | 15.28 | 19.05 | 22.06 | 25.78 | 29.31 | 33.86 | 35.34 | 36.32 | 37.30 | 39.32 | 39.33 | 39.50 | 39.85 | 39.97 | 40.32 | 41.42 | 43.75 | 44.57 | 46.08 | 46.16 | 46.32 | 46.70 | 46.94 | 47.06 | 48.71 | 49.53 | 50.03 | 51.75 | 52.47 | 53.53 | 53.97 | 54.98 | 55.62 | 56.02 | 56.93 | 57.69 | 58.44 | 59.07 | 59.77 | 61.18 | 62.03 | 63.13 | 64.34 | 65.28 | 66.27 | 67.11 | 68.04 | 68.77 | 69.53 | 70.32 | 71.04 | 71.39 | 71.89 | 72.21 | 74.26 | 75.89 | 76.79 | 77.78 | 79.47 | 81.03 | 85.59 | 88.89 | 90.72 | 92.43 | 93.22 | 102.01 | 102.91 | 105.55 | 112.69 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---

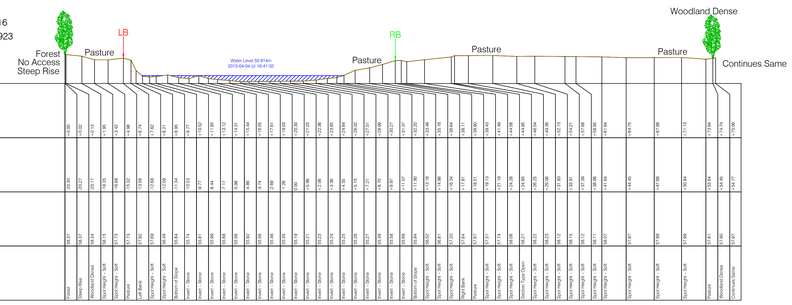
ID:22FLES01204E
Type: Bridge
ISIS Chainage: 12211.551
MIKE Chainage: 10051.487
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:55.00
Skew Angle: 354.23



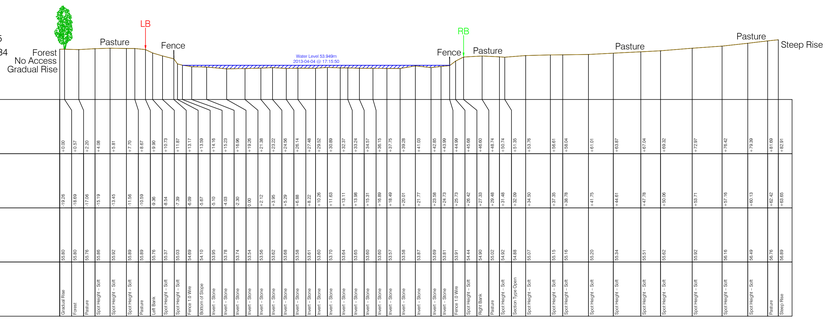
ID:22FLES01203H
Type: Open
ISIS Chainage: 12181.810
MIKE Chainage: 10081.229
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:55.00



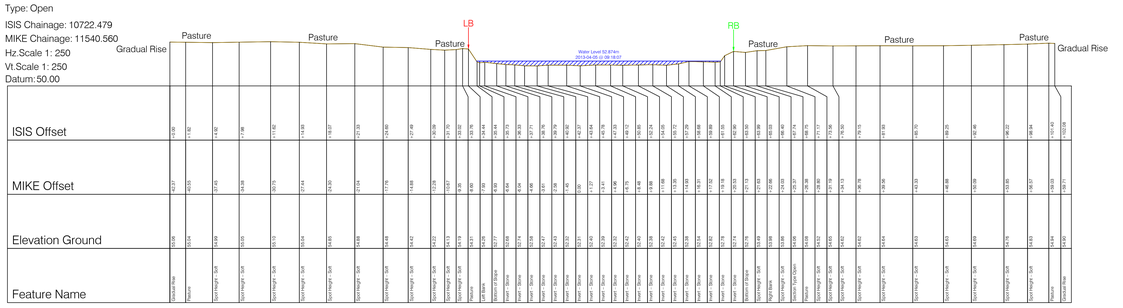
ID:22FLES01154H
Type: Open
ISIS Chainage: 11728.116
MIKE Chainage: 10534.923
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:55.00



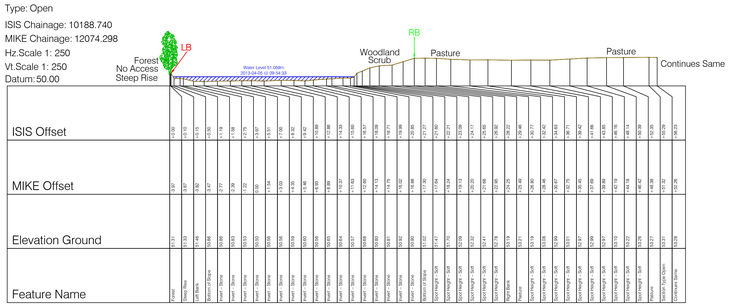
ID:22FLES01103H
Type: Open
ISIS Chainage: 11156.405
MIKE Chainage: 11106.634
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:50.00



ID:22FLES01054H
Type: Open
ISIS Chainage: 10722.479
MIKE Chainage: 11540.560
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:50.00



ID:22FLES01005H
Type: Open
ISIS Chainage: 10188.740
MIKE Chainage: 12074.298
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:50.00



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LEGEND

River Profile		LB	Left Bank
Water Level		RB	Right Bank
Ground Level			Building Line
Road Line			Wall Line
Wall Line			Fence Line
Bridge Line			Pipe Profile

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No. 318

Map Sheet Layout

Map Sheet 6084-03,04,12, 6084-A,B,C&D, 6085-C&D, 6131-B

North
Datum
Malin Hd.
Projection
ING

Site Location

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Surveyed by	MSL	Date:	APRIL 2013
Drawn by	SMcG	Date:	MAY 2013
Checked by	MZ	Date:	MAY 2013

Revisions

No	Date	Description
1	17.05.13.	First Drawing
2	24.05.13.	Final Drawing

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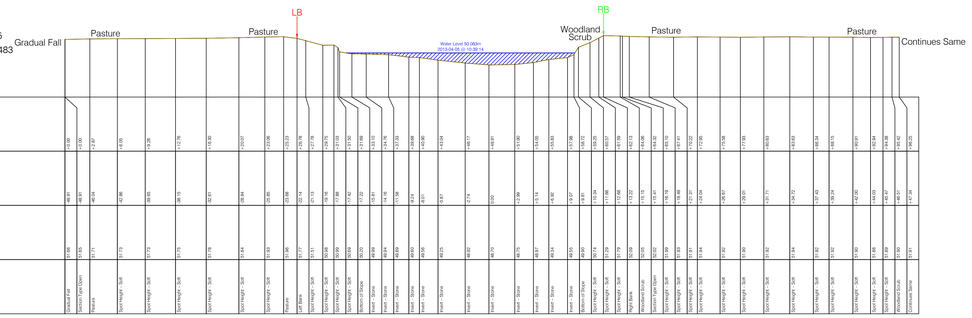
Topographic surveys, Measured Building Surveys, Setting-Out, As-Built Surveys, Hydrographic Surveys, Legal Mapping, Pipeline Surveys, Services Location, Ground Penetrating Radar, Condition Surveying, Building Information Modelling
Kildare Cork Belfast London

Mott MacDonald

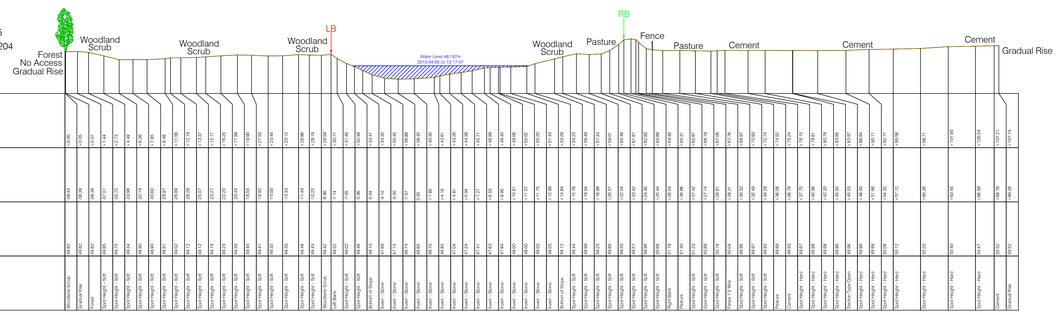
OPW
The Office of Public Works
Oifig na nOibreacha Poiblí

Client : OFFICE OF PUBLIC WORKS
Project : 00000004674_SURVEY_CONTRACT_05
Date : 17.05.13 Scale : AS SHOWN
Description : CROSS SECTIONS
Drawing Number : 4674_22FLES_FLESK-A_XS_2

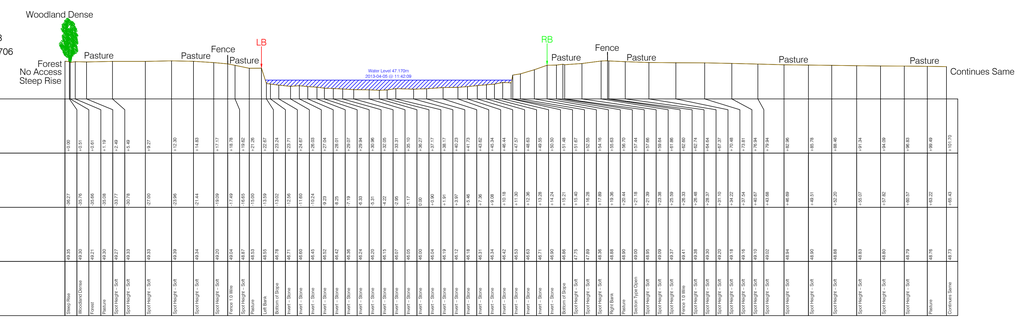
ID:22FLES00956H
Type: Open
ISIS Chainage: 9683.555
MIKE Chainage: 12579.483
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:45.00



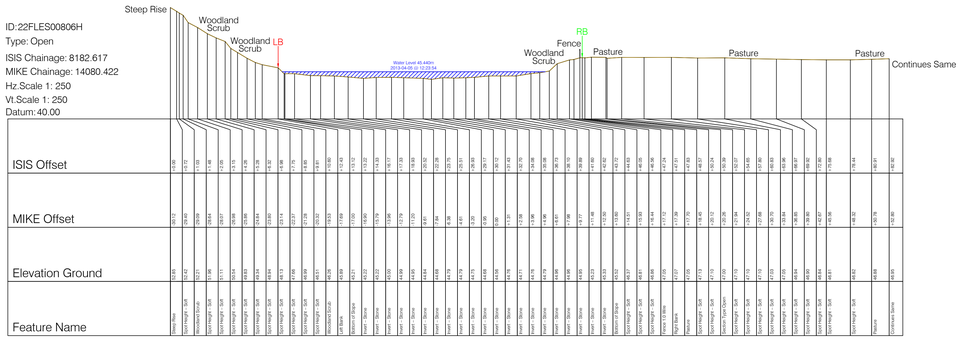
ID:22FLES00905H
Type: Open
ISIS Chainage: 9138.835
MIKE Chainage: 13124.204
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:45.00



ID:22FLES00845H
Type: Open
ISIS Chainage: 8643.333
MIKE Chainage: 13619.706
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:45.00



ID:22FLES00806H
Type: Open
ISIS Chainage: 8182.617
MIKE Chainage: 14080.422
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:40.00



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LEGEND

River Profile		LB	Left Bank
Water Level		RB	Right Bank
Ground Level			Building Line
Road Line			Wall Line
Wall Line			Fence Line
Bridge Line			Pipe Profile

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No. 318

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Map Sheet Layout

Map Sheet 6084-03,04,12, 6084-A,B,C&D, 6085-C&D, 6131-B

North

Malin Hd.
to
ING

Site Location:

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Surveyed by	MSL	Date:	APRIL 2013
Drawn by	SMcG	Date:	MAY 2013
Checked by	MZ	Date:	MAY 2013

Revisions

No	Date	Description
1	17.05.13.	First Drawing
2	24.05.13.	Final Drawing

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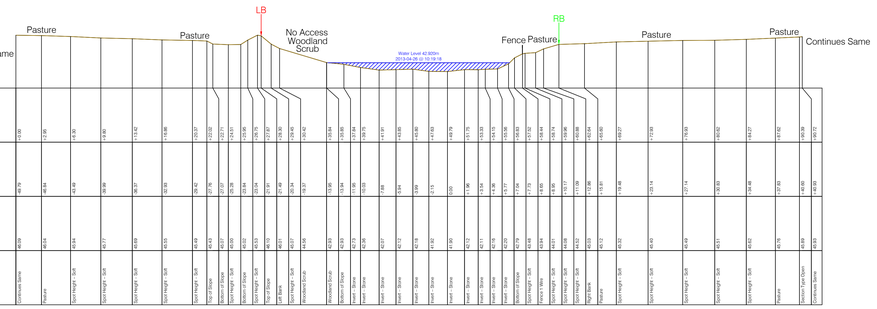
Kildare Cork Belfast London

Mott MacDonald

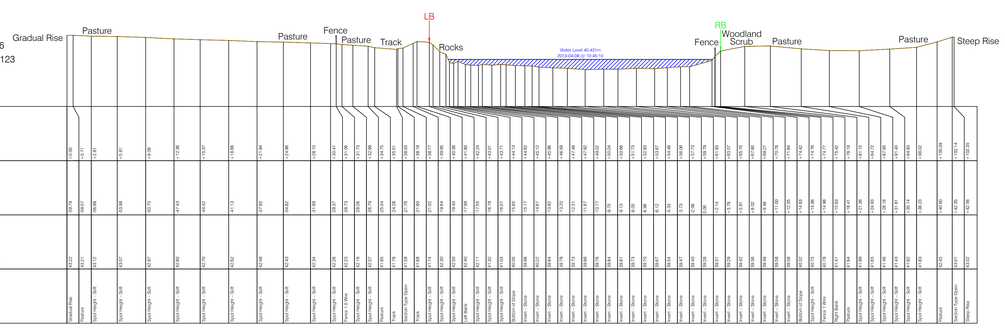
OPW
The Office of Public Works
Oifig na nOibreacha Poiblí

Client :	OFFICE OF PUBLIC WORKS
Project :	00000004674_SURVEY_CONTRACT_05
Date : 17.05.13	Scale : AS SHOWN
Description :	CROSS SECTIONS
Drawing Number :	4674_22FLES_FLESK-A_XS_3

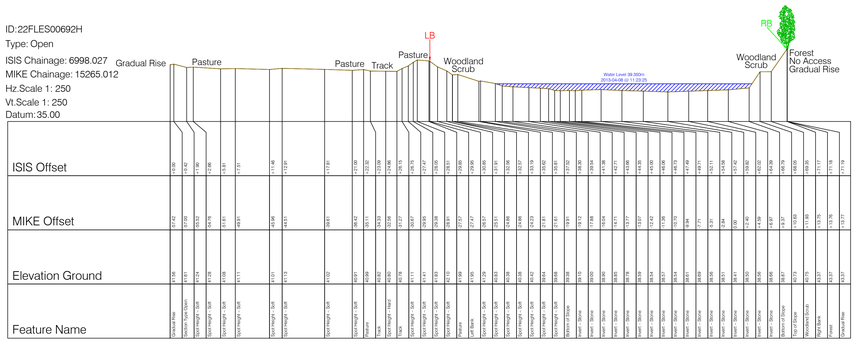
ID:22FLES00756H
Type: Open
ISIS Chainage: 7727.114
MIKE Chainage: 14535.925
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:40.00



ID:22FLES00706H
Type: Open
ISIS Chainage: 7175.916
MIKE Chainage: 15087.123
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:35.00



ID:22FLES00692H
Type: Open
ISIS Chainage: 6998.027
MIKE Chainage: 15265.012
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:35.00



ID:22FLES00672H
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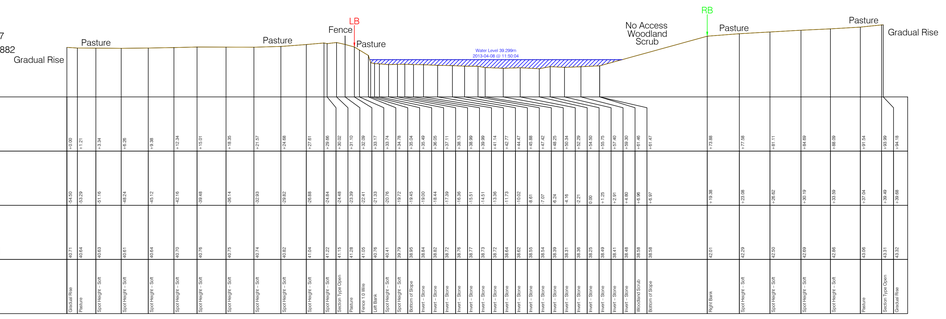
MIKE Chainage: 15445.882
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:35.00



ID:22FLES00655H
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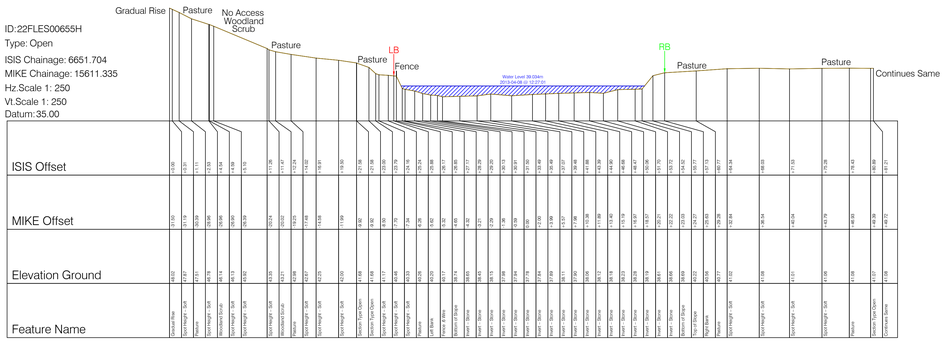
MIKE Chainage: 15611.335
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:35.00



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LEGEND

River Profile		LB	Left Bank
Water Level		RB	Right Bank
Ground Level			Building Line
Road Line			Wall Line
Wall Line			Fence Line
Bridge Line			Pipe Profile

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Map Sheet Layout

Map Sheet 6084-03,04,12, 6084-A,B,C&D, 6085-C&D, 6131-B

North
Grid
Malin Hd.
Datum
ING

Site Location

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No	Date	Description
Surveyed by	MSL	Date: APRIL 2013
Drawn by	SMcG	Date: MAY 2013
Checked by	MZ	Date: MAY 2013
		Revisions
1	17.05.13	First Drawing
2	24.05.13	Final Drawing

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Kildare Cork Belfast London

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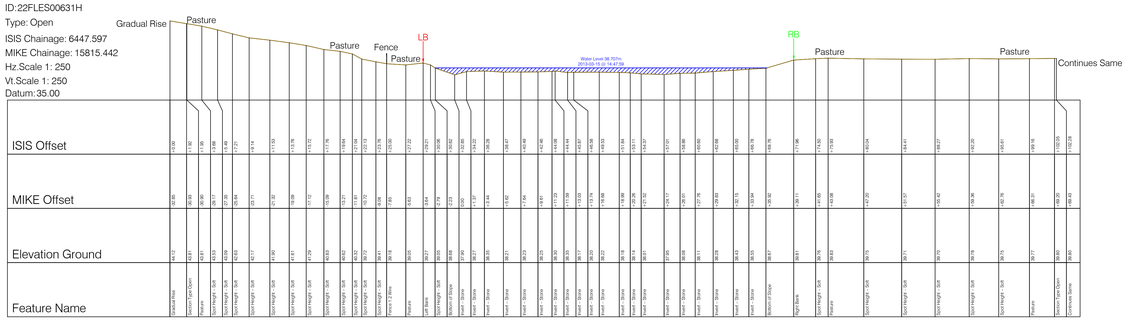
OPW
The Office of Public Works
Oifig na nOibreacha Poiblí

Client : OFFICE OF PUBLIC WORKS
Project : 00000004674_SURVEY_CONTRACT_05
Date : 17.05.13
Scale : AS SHOWN
Description : CROSS SECTIONS
Drawing Number : 4674_22FLES_FLESK-A_XS_4

ID:22FLES00631H
Type: Open
ISIS Chainage: 6447.597
MIKE Chainage: 15815.442
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:35.00



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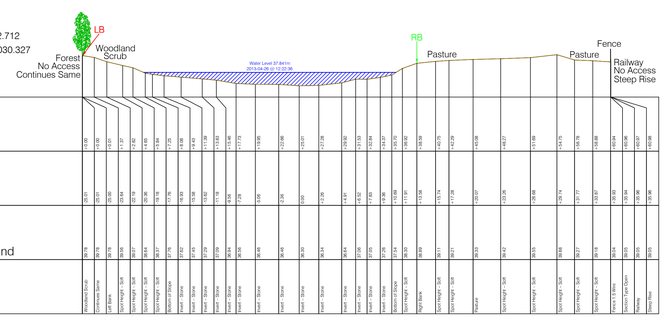
Vt.Scale 1: 250
Datum:35.00



ID:22FLES00589H
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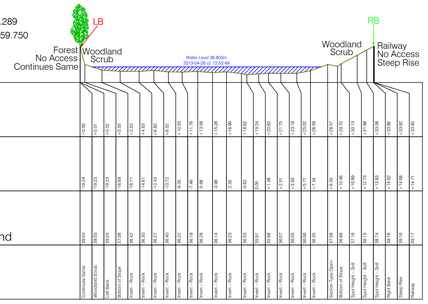
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:35.00



ID:22FLES00567H
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MIKE Chainage: 16458.731
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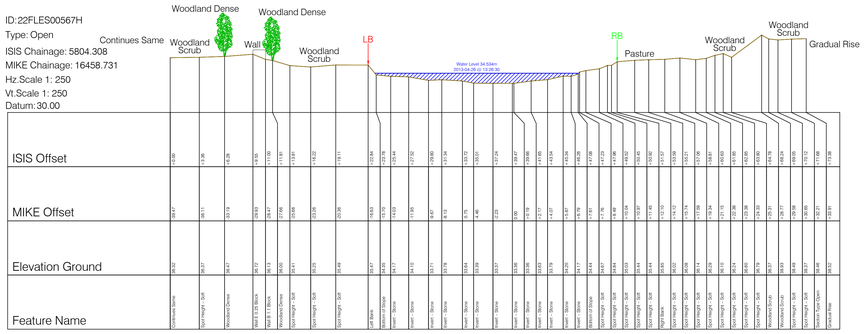
Vt.Scale 1: 250
Datum:30.00



ID:22FLES00547H
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ISIS Chainage: 5592.617
MIKE Chainage: 16670.422
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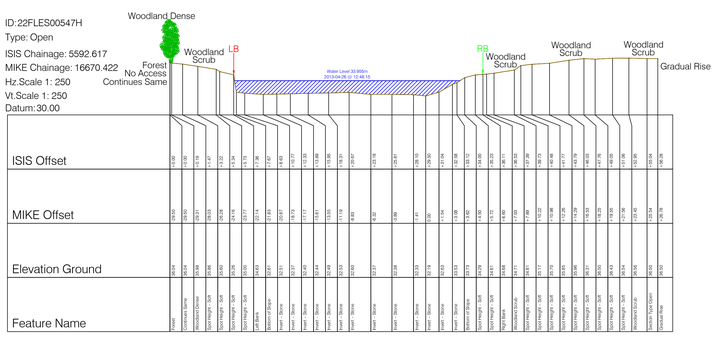
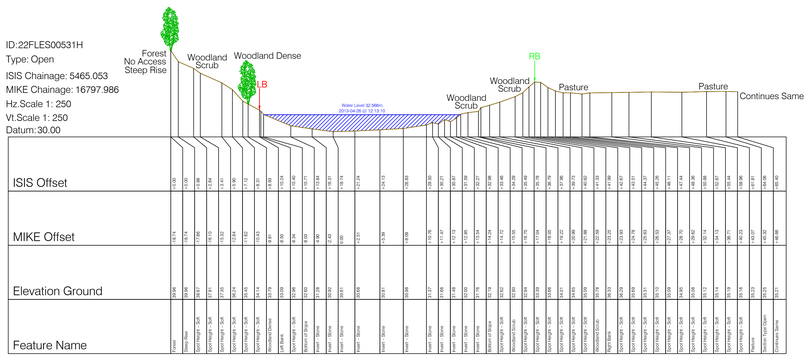
Vt.Scale 1: 250
Datum:30.00



ID:22FLES00531H
Type: Open
ISIS Chainage: 5465.053
MIKE Chainage: 16797.986
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:30.00



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LEGEND

River Profile	LB	Left Bank
Water Level	RB	Right Bank
Ground Level		Building Line
Road Line		Wall Line
Wall Line		Fence Line
Bridge Line		Pipe Profile

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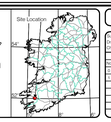
Map Sheet Layout

Map Sheet 6084-03,04,12, 6084-A,B,C&D, 6085-C&D, 6131-B

North
Grid
Malin Hd.
Datum
ING

Site Location



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Surveyed by	MSL	Date:	APRIL 2013
Drawn by	SMcG	Date:	MAY 2013
Checked by	MZ	Date:	MAY 2013

Revisions

No	Date	Description
1	17.05.13.	Final Drawing
2	24.05.13.	Final Drawing

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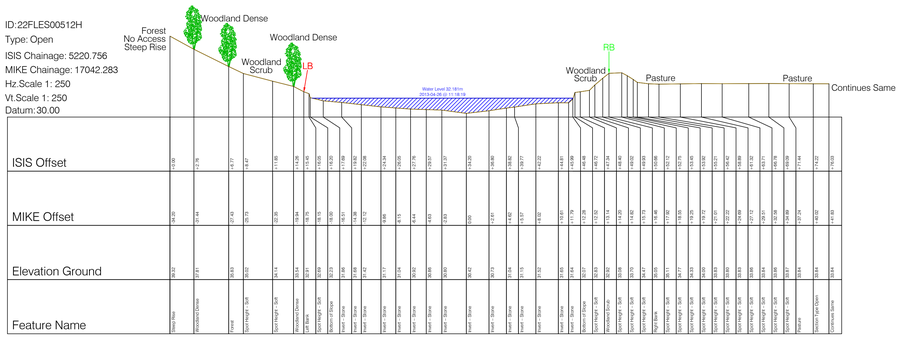
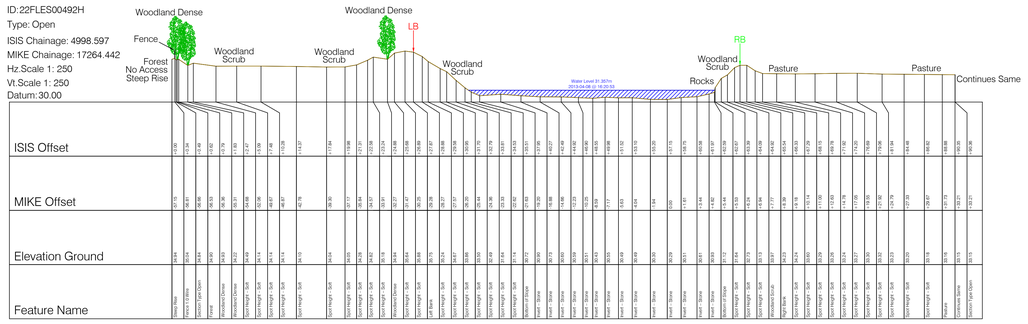
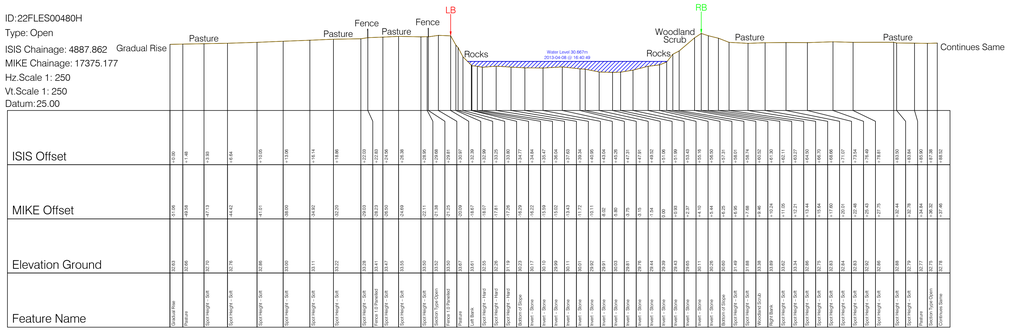
Mott MacDonald

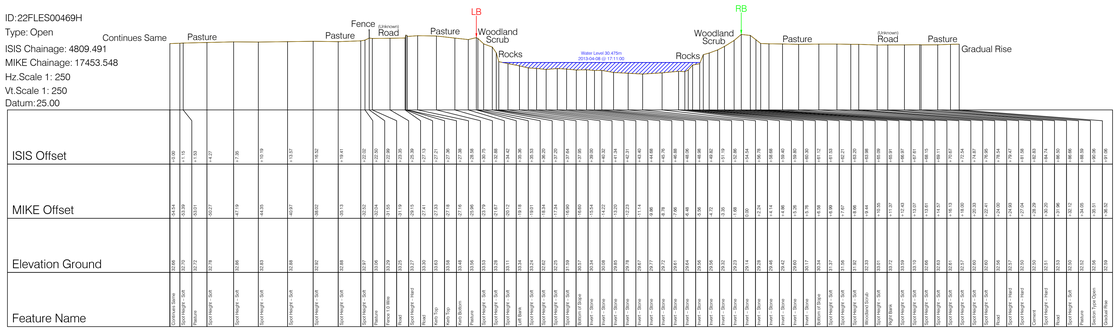
OPW
The Office of Public Works
Oifig na nOibreacha Poiblí

Client :	OFFICE OF PUBLIC WORKS
Project :	00000004674_SURVEY_CONTRACT_05
Date : 17.05.13	Scale : AS SHOWN
Description :	CROSS SECTIONS
Drawing Number :	4674_22FLES_FLESK-A_XS_5









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LEGEND

River Profile		LB	Left Bank
Water Level		RB	Right Bank
Ground Level			Building Line
Road Line			Wall Line
Wall Line			Fence Line
Bridge Line			Pipe Profile

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SURVEY ASSOCIATION

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Map Sheet Layout

Map Sheet 6084-03,04,12, 6084-A,B,C&D, 6085-C&D, 6131-B

North

Datum: Malin Hd.
Projection: ING

Site Location

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Surveyed by	MSL	Date:	APRIL 2013
Drawn by	SMcG	Date:	MAY 2013
Checked by	MZ	Date:	MAY 2013

Revisions

No	Date	Description
1	17.05.13.	First Drawing
2	24.05.13.	Final Drawing

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Mott MacDonald

OPW
The Office of Public Works
Oifig na nOibreacha Poiblí

Client : OFFICE OF PUBLIC WORKS

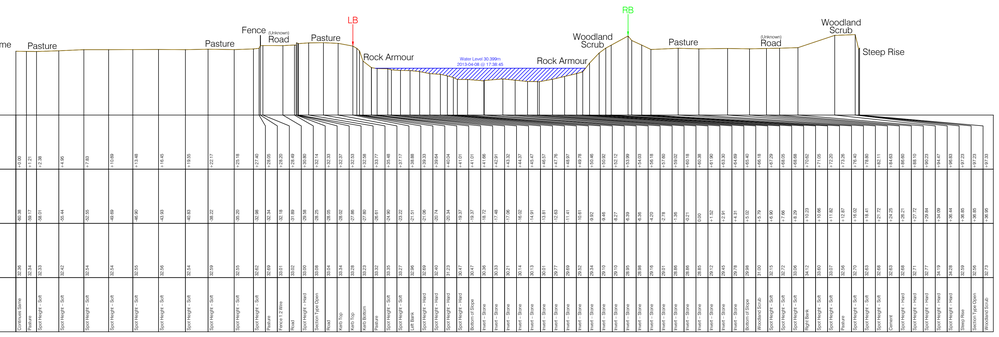
Project : 00000004674_SURVEY_CONTRACT_05

Date : 17.05.13 | Scale : AS SHOWN

Description : CROSS SECTIONS

Drawing Number : 4674_22FLES_FLESK-A_XS_6

ID:22FLES00464S
Type: Open
ISIS Chainage: 4755.139
MIKE Chainage: 17507.899
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:25.00



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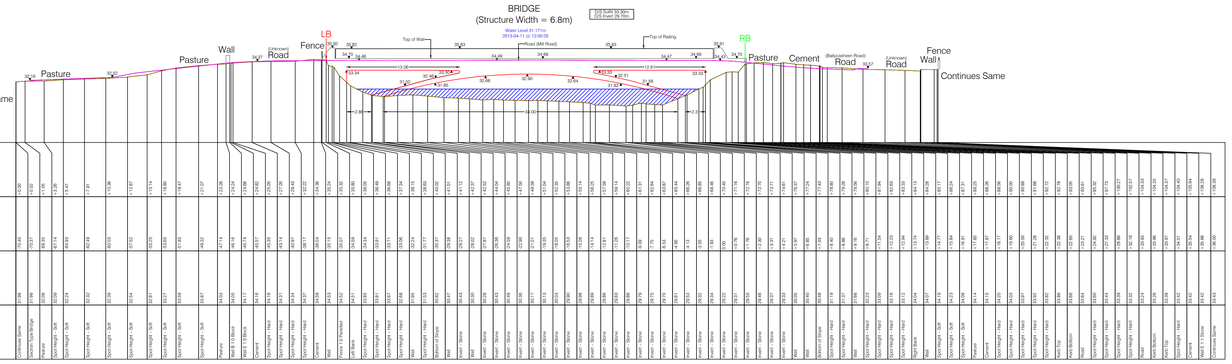
Vt.Scale 1: 100
Datum:25.00
Skew Angle: 31.73



ID:22FLES00449H
Type: Open
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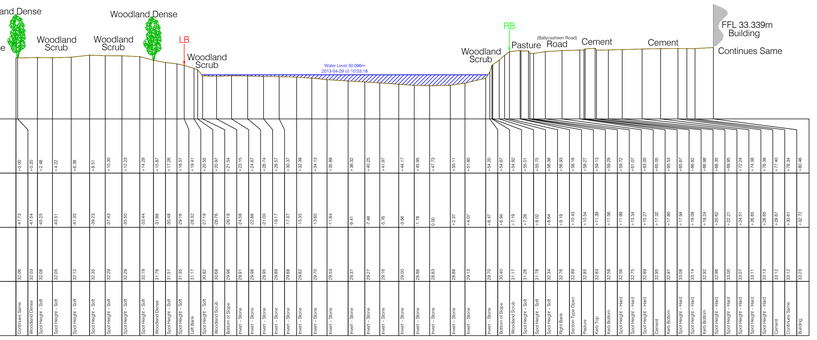
MIKE Chainage: 17639.028
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:25.00



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ISIS Chainage: 4407.141
MIKE Chainage: 17855.898
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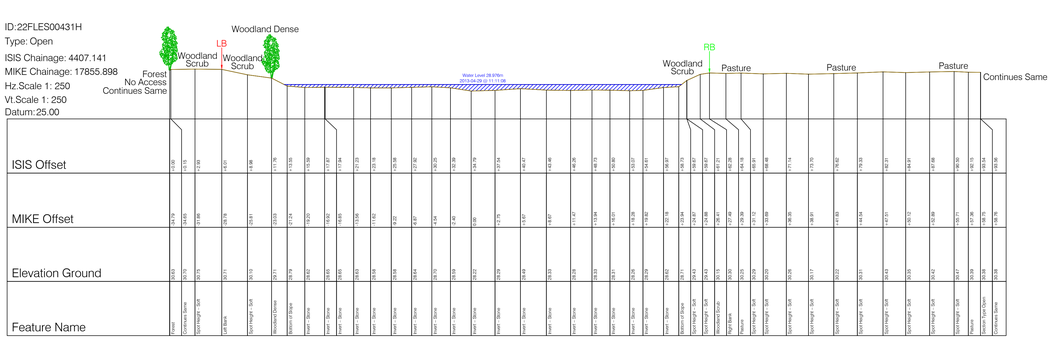
Vt.Scale 1: 250
Datum:25.00



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LEGEND

River Profile		LB	Left Bank
Water Level		RB	Right Bank
Ground Level			Building Line
Road Line			Wall Line
Wall Line			Fence Line
Bridge Line			Pipe Profile

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Map Sheet Layout

Map Sheet 6084-03,04,12, 6084-A,B,C&D, 6085-C&D, 6131-B

North
Grid
Malin Hd.
Datum
ING

Site Location

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Drawn by	SMcG	Date:	MAY 2013
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1	17.05.13.	First Drawing
2	24.05.13.	Final Drawing

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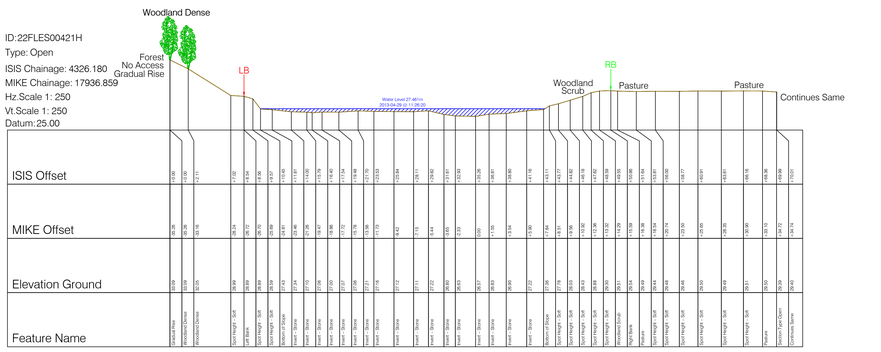
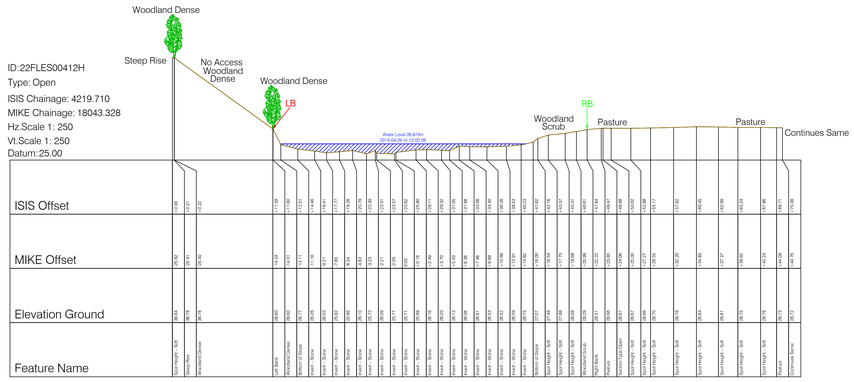
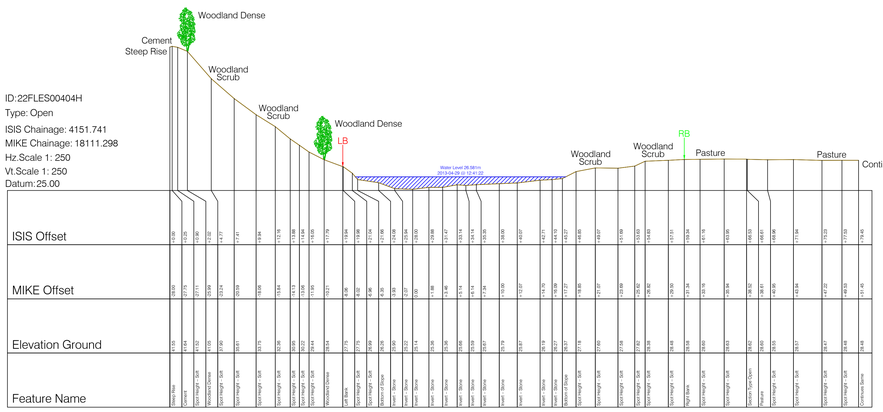
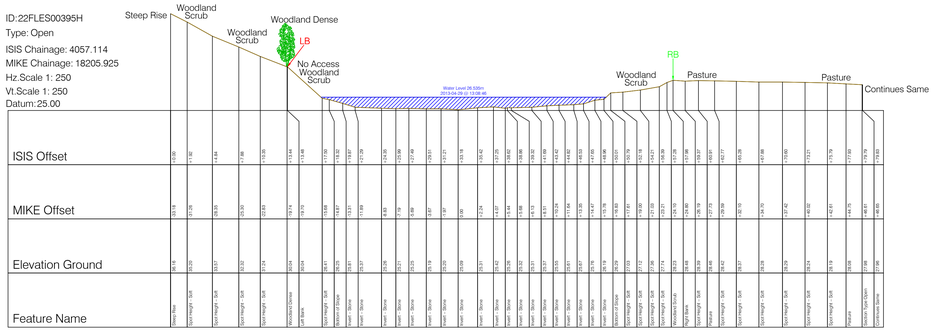
OPW
The Office of Public Works
Oifig na nOibreacha Poiblí

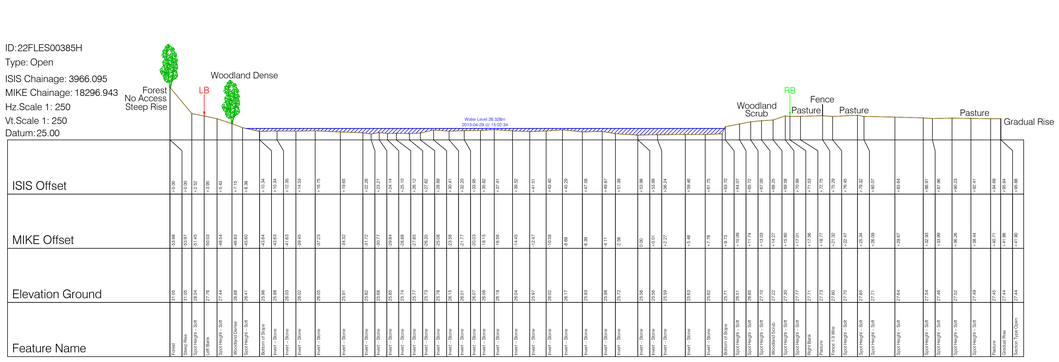
Client : OFFICE OF PUBLIC WORKS
Project : 00000004674_SURVEY_CONTRACT_05
Date : 17.05.13 Scale : AS SHOWN
Description : CROSS SECTIONS
Drawing Number : 4674_22FLES_FLESK-A_XS_7

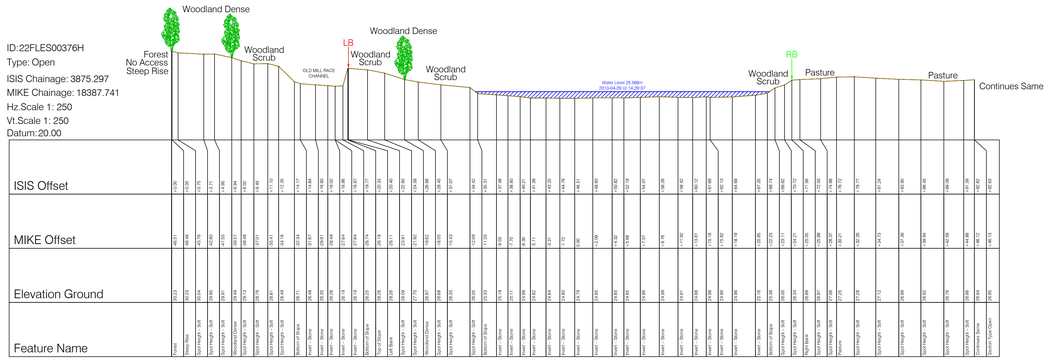












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LEGEND

River Profile		LB	Left Bank
Water Level		RB	Right Bank
Ground Level			Building Line
Road Line			Wall Line
Wall Line			Fence Line
Bridge Line			Pipe Profile

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Map Sheet Layout

Map Sheet 6084-03,04,12, 6084-A,B,C&D, 6085-C&D, 6131-B

North

Grid: Malin Hd.
or
ING

Site Location

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Drawn by	SMcG	Date:	MAY 2013
Checked by	MZ	Date:	MAY 2013

Revisions

No	Date	Description
1	17.05.13.	First Drawing
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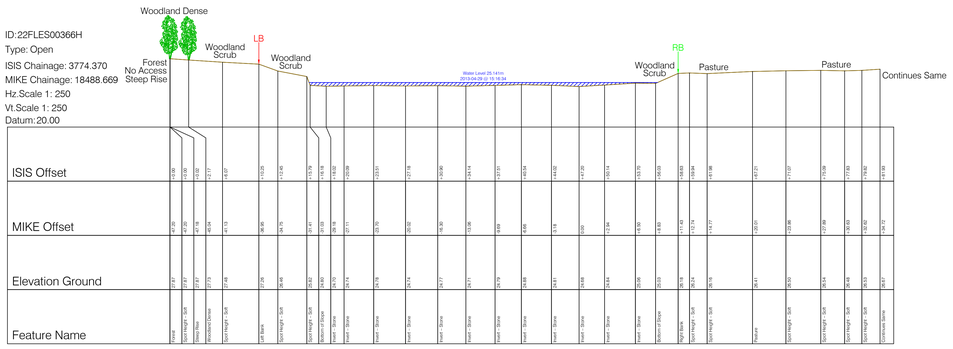
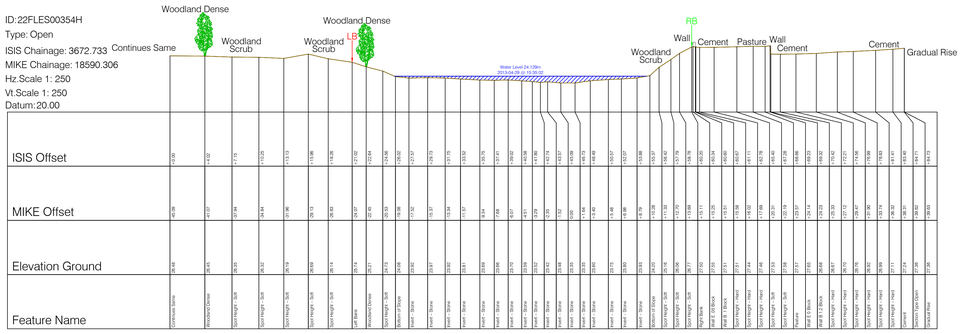
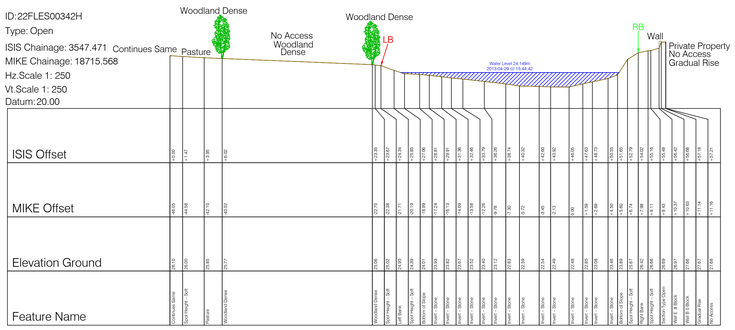
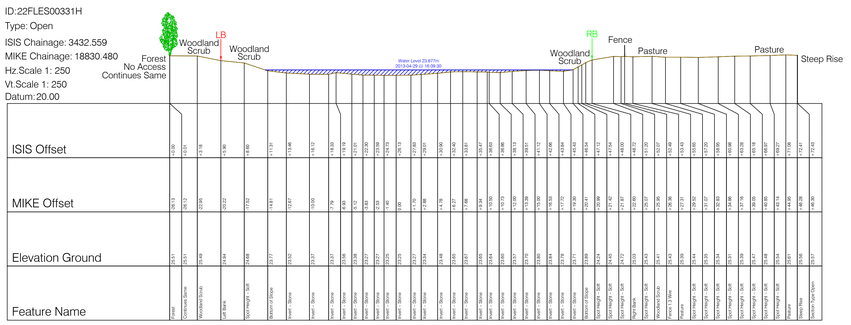
OPW
The Office of Public Works
Oifig na nOibreacha Poiblí

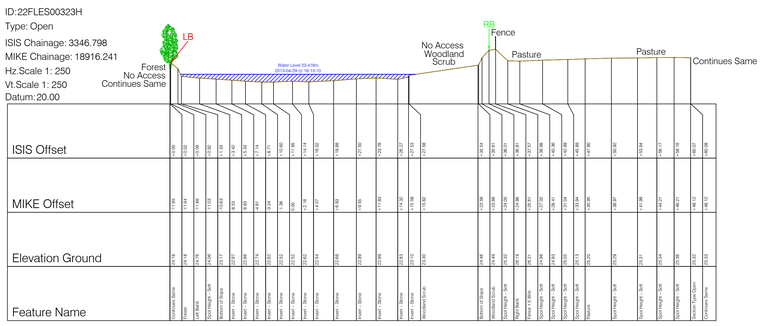
Client :	OFFICE OF PUBLIC WORKS
Project :	00000004674_SURVEY_CONTRACT_05
Date : 17.05.13	Scale : AS SHOWN
Description :	CROSS SECTIONS
Drawing Number :	4674_22FLES_FLESK-A_XS_0

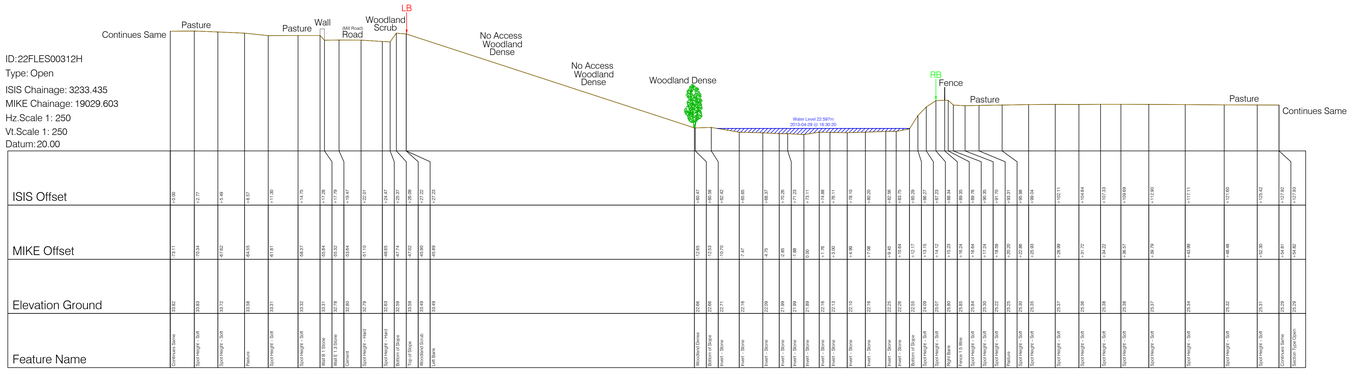












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LEGEND

River Profile		LB	Left Bank
Water Level		RB	Right Bank
Ground Level			Building Line
Road Line			Wall Line
Wall Line			Fence Line
Bridge Line			Pipe Profile

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Map Sheet Layout

Map Sheet 6084-03,04,12, 6084-A,B,C&D, 6085-C&D, 6131-B

North

Grid: Malin Hd.
Datum: IRENET95

Site Location:

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Surveyed by	MSL	Date:	APRIL 2013
Drawn by	SMcG	Date:	MAY 2013
Checked by	MZ	Date:	MAY 2013

Revisions

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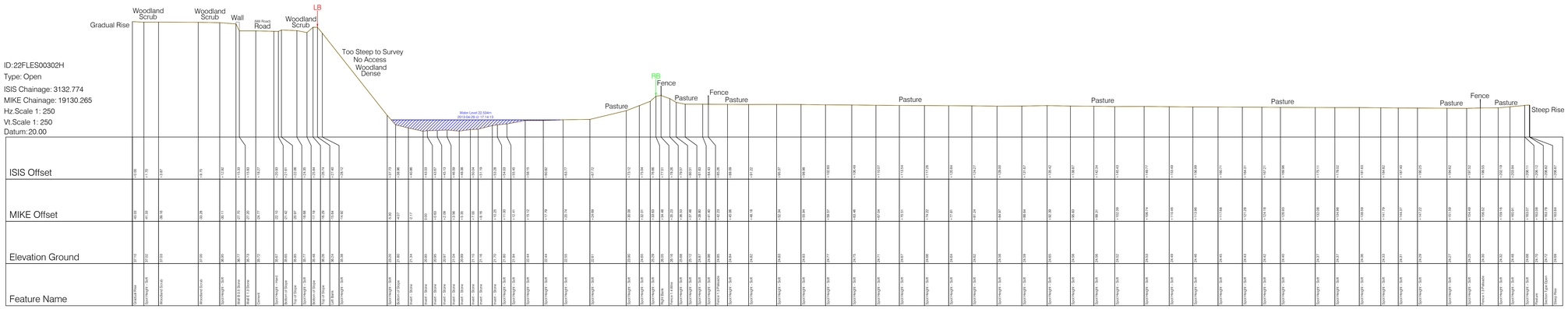
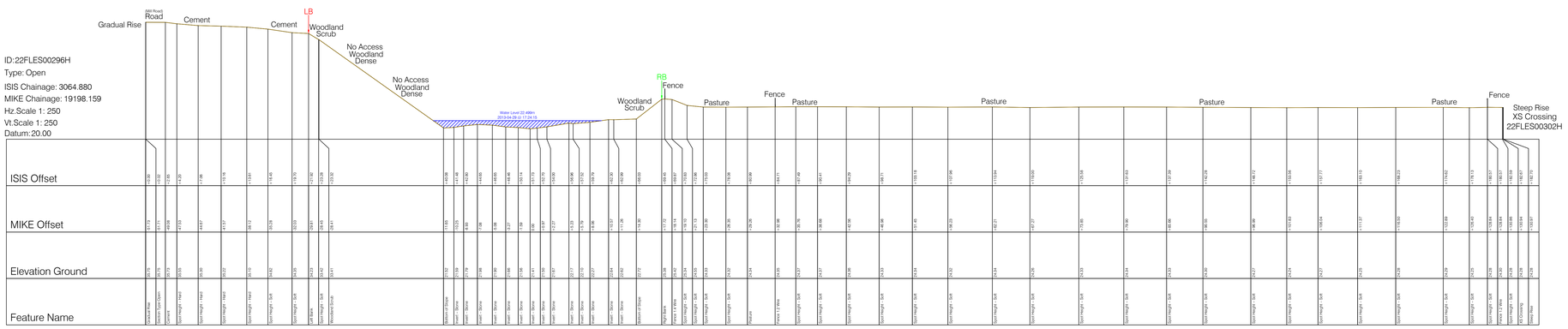
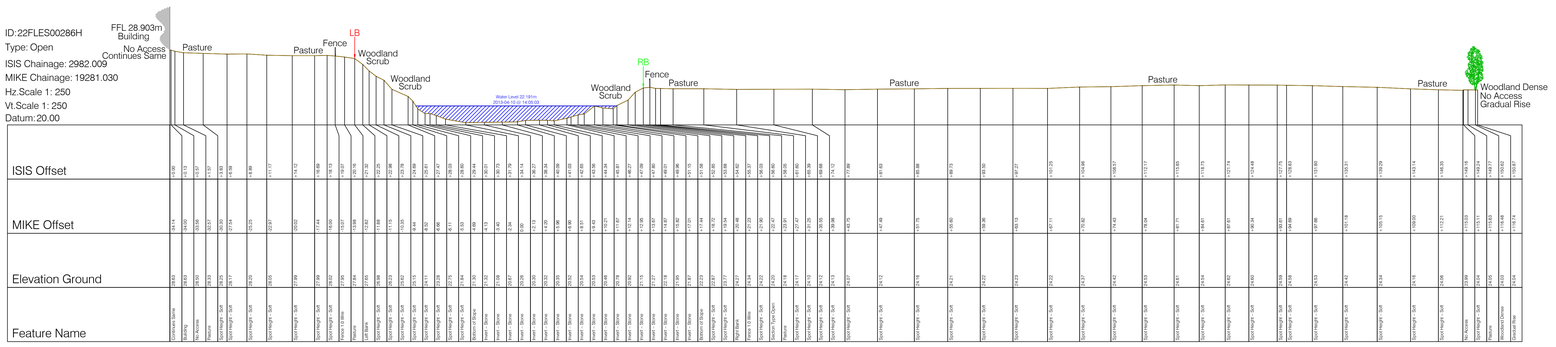
Client :	OFFICE OF PUBLIC WORKS
Project :	00000004674_SURVEY_CONTRACT_05
Date : 17.05.13	Scale : AS SHOWN
Description :	CROSS SECTIONS
Drawing Number :	4674_22FLES_FLESK-A_XS_9







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SURVEY ASSOCIATION
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Map Sheet Layout

Map Sheet 6084-03,04,12, 6084-A,B,C&D, 6085-C&D, 6131-B

North
Grid: Malin Hd.
Datum: IRENET95

Site Location:

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Surveyed by	MSL	Date:	APRIL 2013
Drawn by	SMcG	Date:	MAY 2013
Checked by	MZ	Date:	MAY 2013

Revisions

No	Date	Description
1	17.05.13.	First Drawing
2	24.05.13.	Final Drawing

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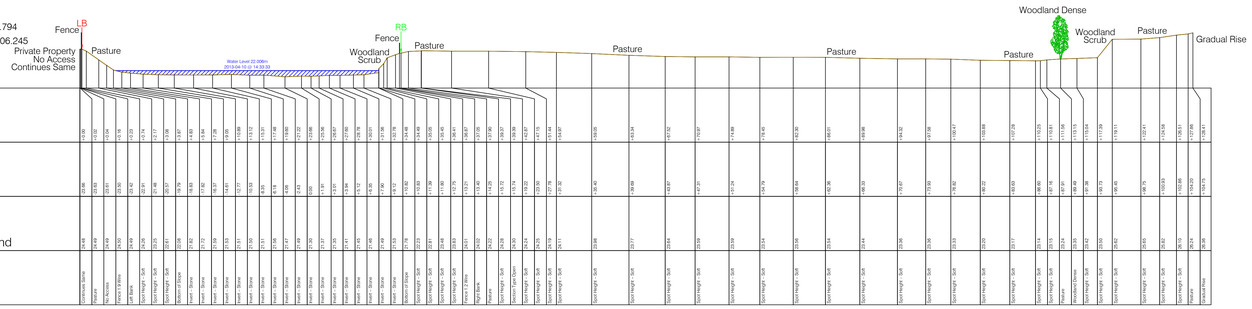
Kildare Cork Belfast London

Mott MacDonald

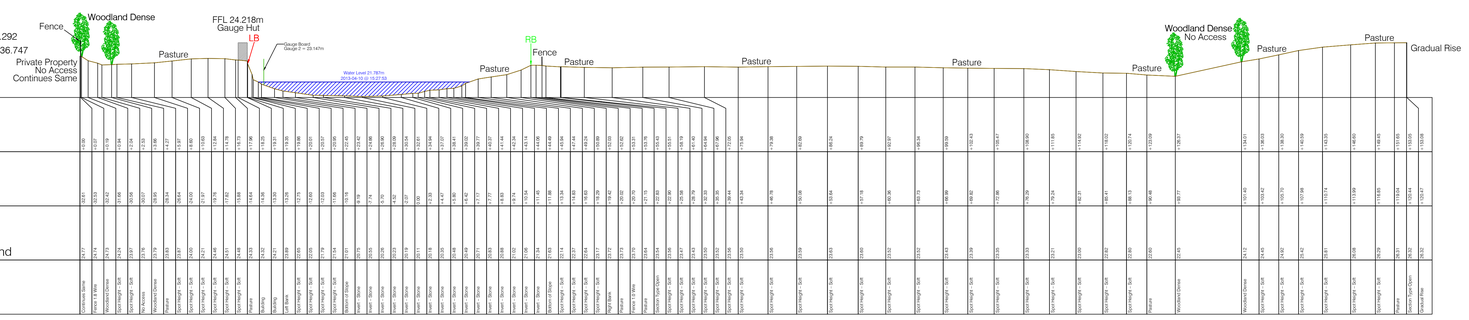
OPW
The Office of Public Works
Oifig na nOibreacha Poiblí

Client :	OFFICE OF PUBLIC WORKS
Project :	00000004674_SURVEY_CONTRACT_05
Date : 17.05.13	Scale : AS SHOWN
Description :	CROSS SECTIONS
Drawing Number :	4674_22FLES_FLESK-A_XS_10

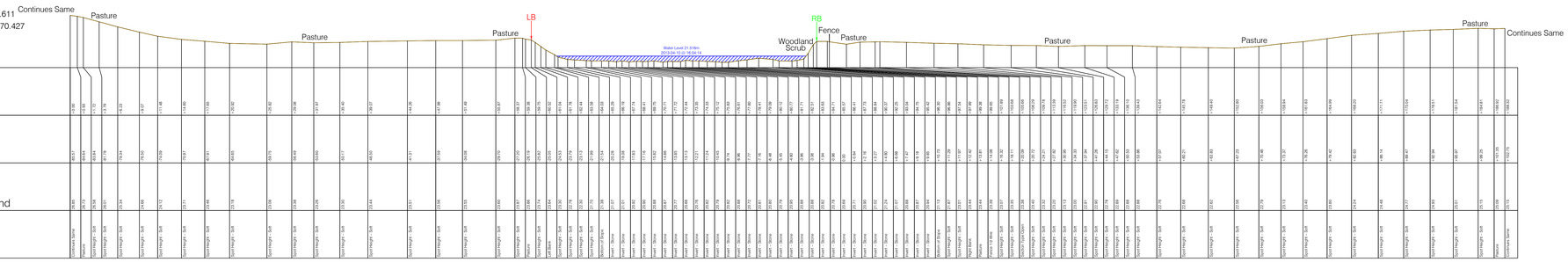
ID:22FLES00275H
Type: Open
ISIS Chainage: 2856.794
MIKE Chainage: 19406.245
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:20.00



ID:22FLES00264H
Type: Open
ISIS Chainage: 2726.292
MIKE Chainage: 19536.747
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:20.00



ID:22FLES00250G
Type: Open
ISIS Chainage: 2592.611
MIKE Chainage: 19670.427
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:20.00



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LEGEND

- River Profile
- Water Level
- Ground Level
- Road Line
- Wall Line
- Bridge Line
- LB Left Bank
- RB Right Bank
- Building Line
- Wall Line
- Fence Line
- Pipe Profile

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No. 318
SURVEY ASSOCIATION
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Map Sheet Layout
Map Sheet 6084-03,04,12, 6084-A,B,C&D, 6085-C&D, 6131-B
North
Datum
Malin Hd.
Projection
ING
Site Location

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Surveyed by	MSL	Date:	APRIL 2013
Drawn by	SMcG	Date:	MAY 2013
Checked by	MZ	Date:	MAY 2013

Revisions

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1	17.05.13.	Final Drawing
2	24.05.13.	Final Drawing

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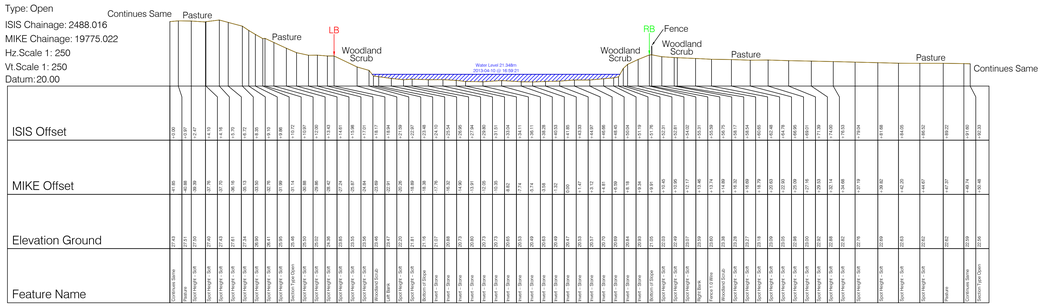
Mott MacDonald

OPW
The Office of Public Works
Oifig na nOibreacha Poiblí

Client : OFFICE OF PUBLIC WORKS
Project : 00000004674_SURVEY_CONTRACT_05
Date : 17.05.13
Scale : AS SHOWN
Description : CROSS SECTIONS
Drawing Number : 4674_22FLES_FLESK-A_XS_11

ID:22FLES00235H
Type: Open
ISIS Chainage: 2488.016
MIKE Chainage: 19775.022
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:20.00



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ISIS Chainage: 2369.407
MIKE Chainage: 19893.632
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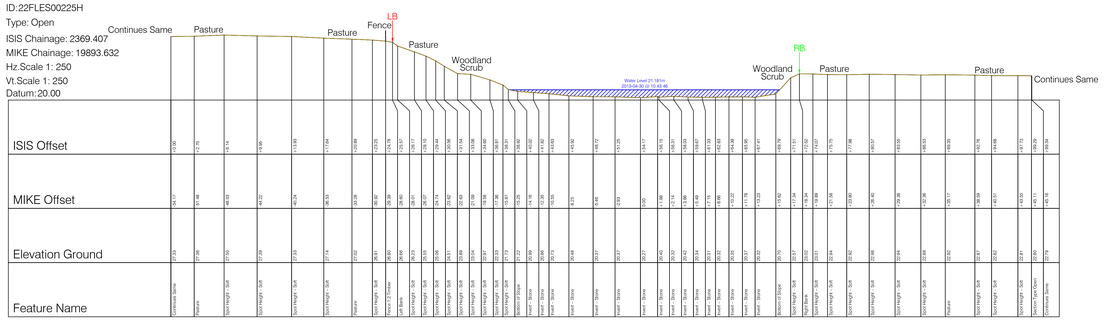
Vt.Scale 1: 250
Datum:20.00



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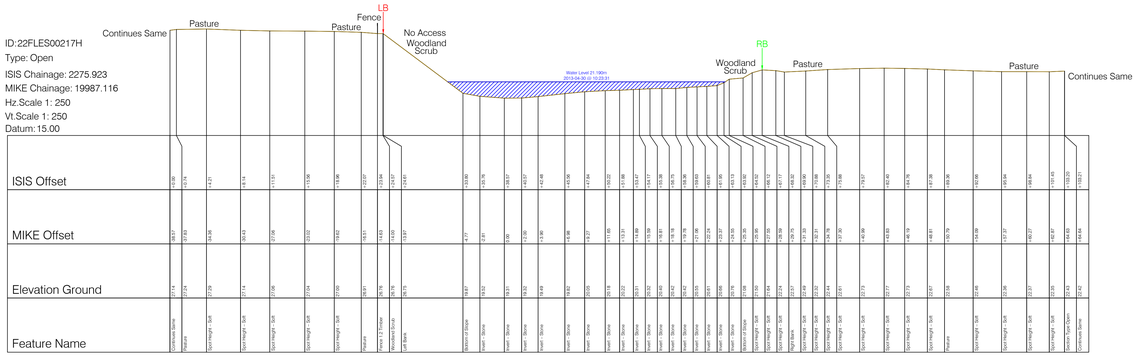
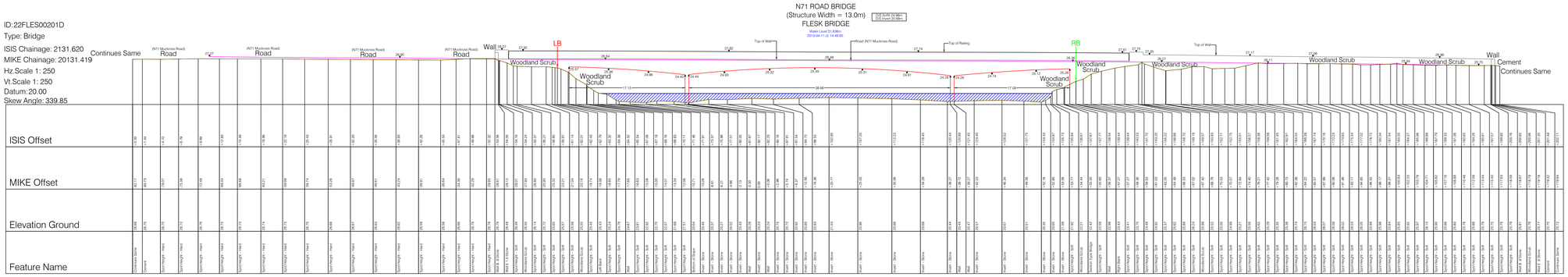
ISIS Chainage: 2275.923
MIKE Chainage: 19987.116
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:15.00



ID:22FLES00201D
Type: Bridge
ISIS Chainage: 2131.620
MIKE Chainage: 20131.419
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:20.00
Skew Angle: 339.85

N71 ROAD BRIDGE
(Structure Width = 13.0m)
FLESK BRIDGE
Water Level 21.636m
2013-04-11 02:14:40.00
SOFFIT SOFFIT 24.98m
SOFFIT SOFFIT 24.98m
Road (N71 Muckross Road)
Top of Wall
Top of Railing
Top of Wall



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LEGEND

River Profile		LB	Left Bank
Water Level		RB	Right Bank
Ground Level			Building Line
Road Line			Wall Line
Wall Line			Fence Line
Bridge Line			Pipe Profile

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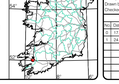
Map Sheet Layout

Map Sheet 6084-03,04,12, 6084-A,B,C&D, 6085-C&D, 6131-B

North
Grid
Malin Hd.
Datum
ING

Site Location:



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Surveyed by	MSL	Date:	APRIL 2013
Drawn by	SMcG	Date:	MAY 2013
Checked by	MZ	Date:	MAY 2013

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No	Date	Description
1	17.05.13.	First Drawing
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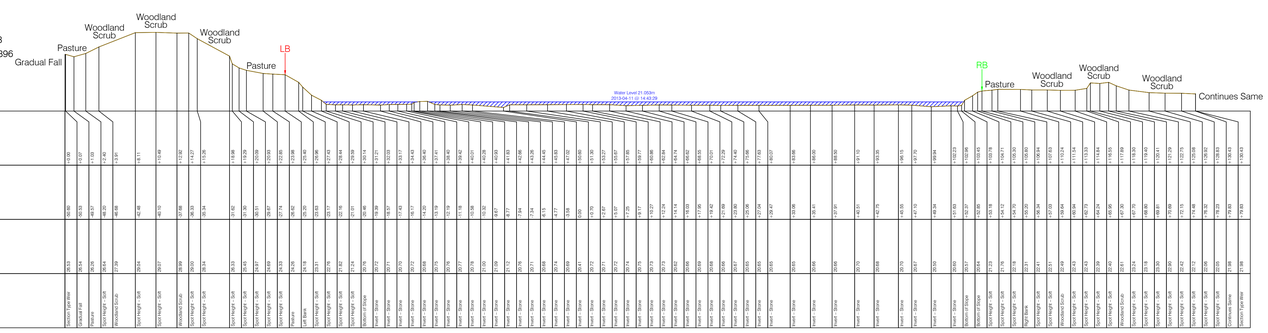
Kildare Cork Belfast London

Mott MacDonald

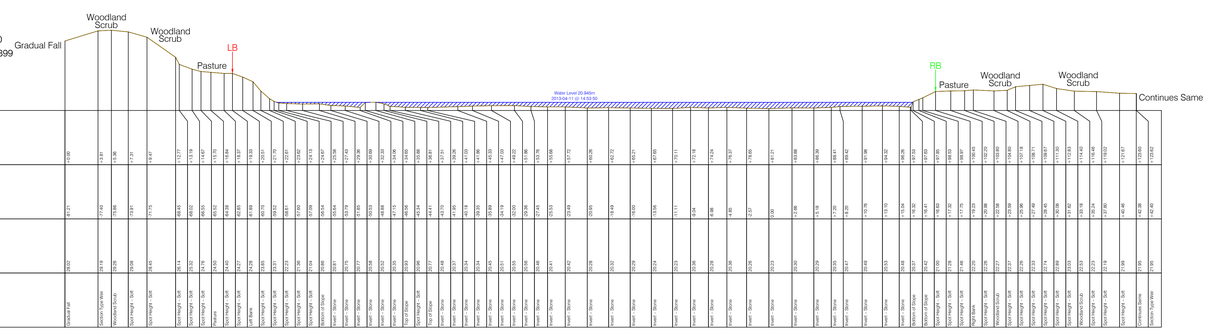
OPW
The Office of Public Works
Oifig na nOibreacha Poiblí

Client :	OFFICE OF PUBLIC WORKS
Project :	00000004674_SURVEY_CONTRACT_05
Date : 17.05.13	Scale : AS SHOWN
Description :	CROSS SECTIONS
Drawing Number :	4674_22FLES_FLESK-A_XS_12

ID:22FLES00194W
Type: Weir
ISIS Chainage: 2046.143
MIKE Chainage: 20216.896
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:20.00
Skew Angle: 2.95

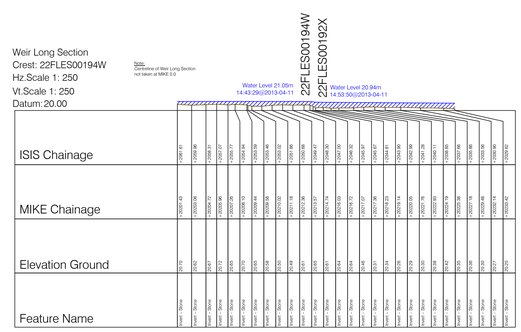


ID:22FLES00192X
Type: Weir
ISIS Chainage: 2044.140
MIKE Chainage: 20218.899
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:20.00
Skew Angle: 2.95

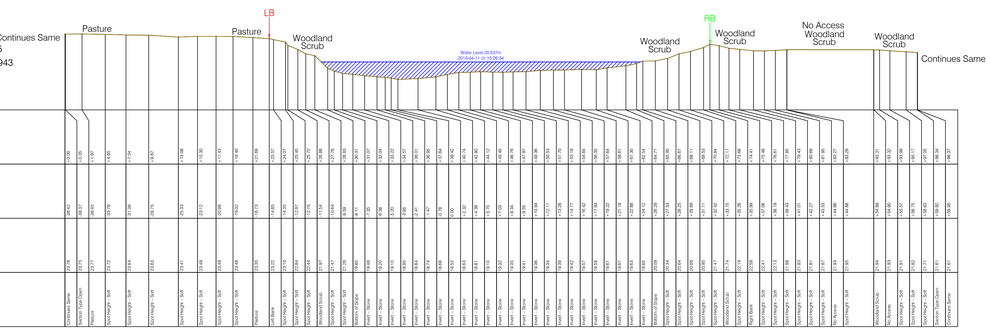


Weir Long Section
Crest: 22FLES00194W
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:20.00

Note:
Centreline of Weir Long Section not taken at MINE 0.0



ID:22FLES00186H
Type: Open
ISIS Chainage: 1971.095
MIKE Chainage: 20291.943
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum:15.00



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LEGEND

River Profile		LB	Left Bank
Water Level		RB	Right Bank
Ground Level			Building Line
Road Line			Wall Line
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SURVEY ASSOCIATION
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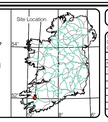
Map Sheet Layout

Map Sheet 6084-03,04,12, 6084-A,B,C&D, 6085-C&D, 6131-B

North
Grid: Malin Hd.
Datum: IRENET95

Site Location



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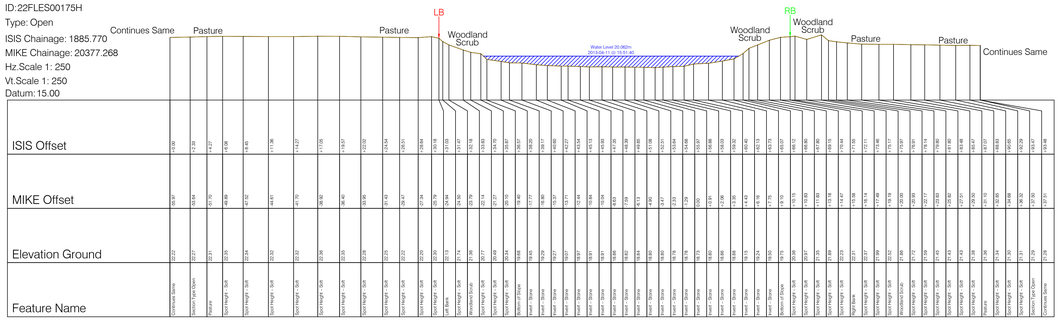
Client :	OFFICE OF PUBLIC WORKS
Project :	00000004674_SURVEY_CONTRACT_05
Date : 17.05.13	Scale : AS SHOWN
Description :	CROSS SECTIONS
Drawing Number :	4674_22FLES_FLESK-A_XS_13

ID:22FLES00175H
Type: Open
ISIS Chainage: 1885.770
MIKE Chainage: 20377.268
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum: 15.00



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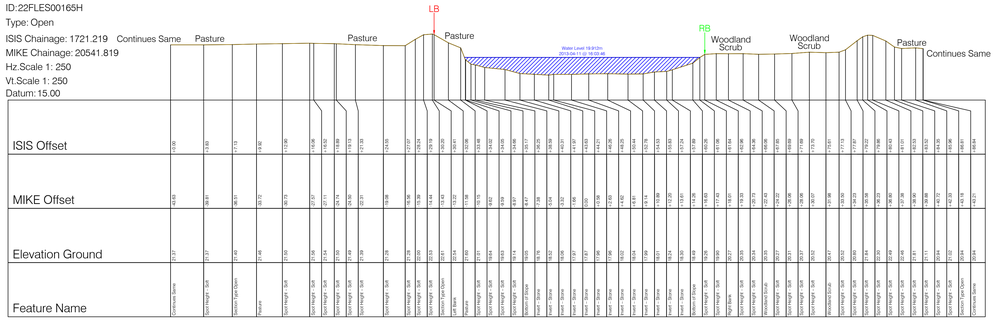
Vt.Scale 1: 250
Datum: 15.00



ID:22FLES00155H
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ISIS Chainage: 1675.168
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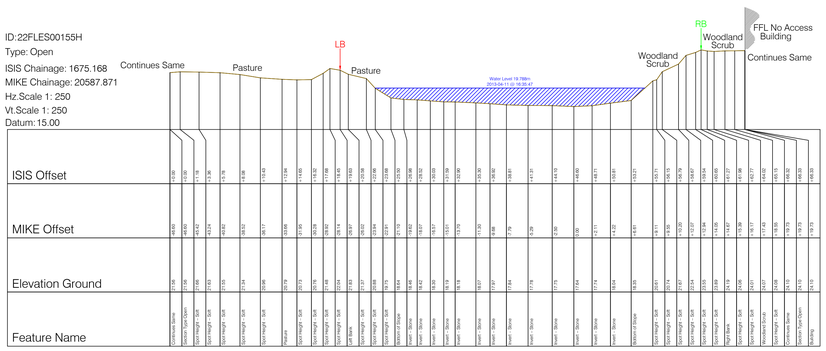
Datum: 15.00



ID:22FLES00143H
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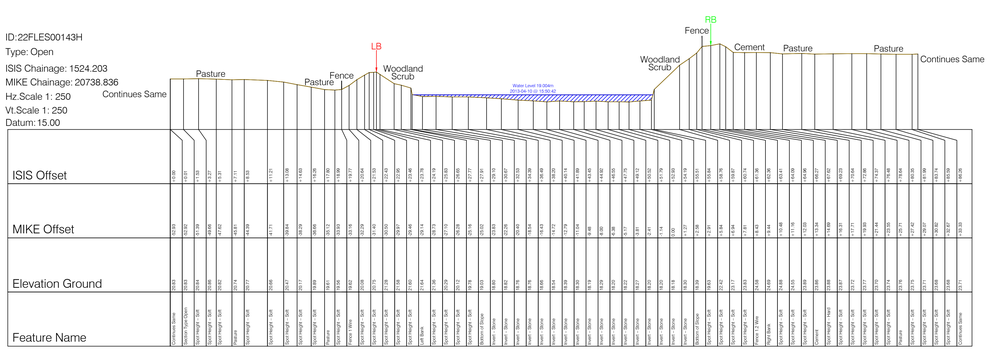
MIKE Chainage: 20738.836
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum: 15.00



ID:22FLES00132H
Type: Open
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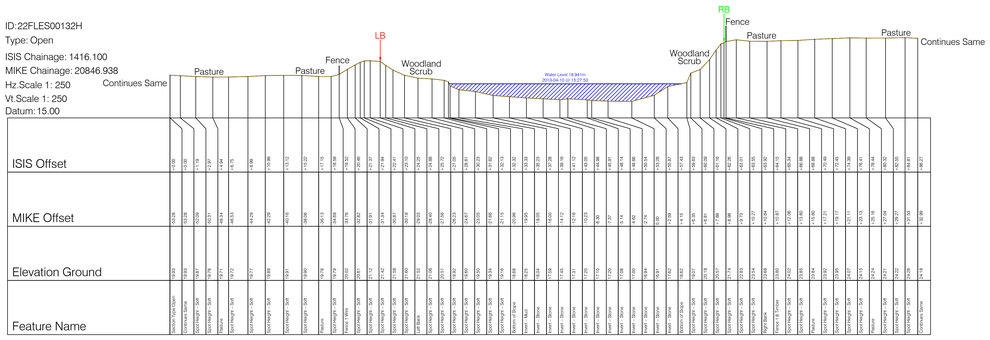
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum: 15.00



ID:22FLES00122H
Type: Open
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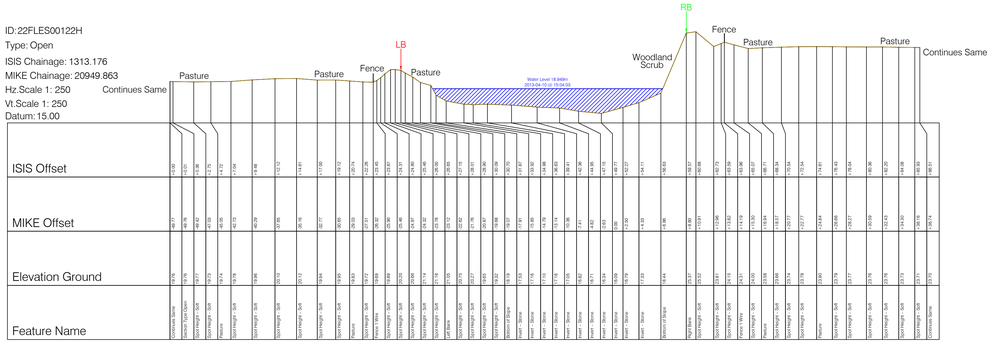
MIKE Chainage: 20949.863
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum: 15.00



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LEGEND

River Profile
Water Level
Ground Level
Road Line
Wall Line
Bridge Line
LB Left Bank
RB Right Bank
Building Line
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Pipe Profile

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North
Datum: Malin Hd.
Projection: ING
Site Location:

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Client : OFFICE OF PUBLIC WORKS
Project : 00000004674_SURVEY_CONTRACT_05
Date : 17.05.13
Scale : AS SHOWN
Description : CROSS SECTIONS
Drawing Number : 4674_22FLES_FLESK-A_XS_14

ID:22FLES00113H
Type: Open
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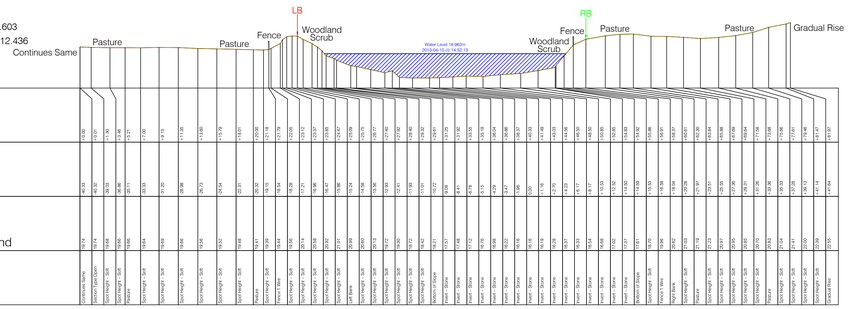
MIKE Chainage: 21012.436
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum: 15.00



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Type: Open
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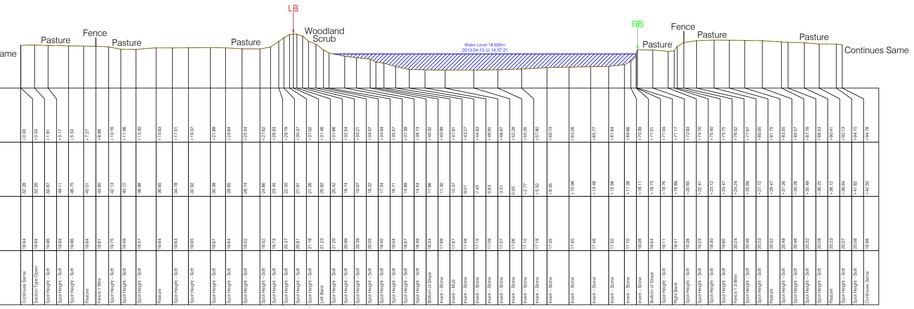
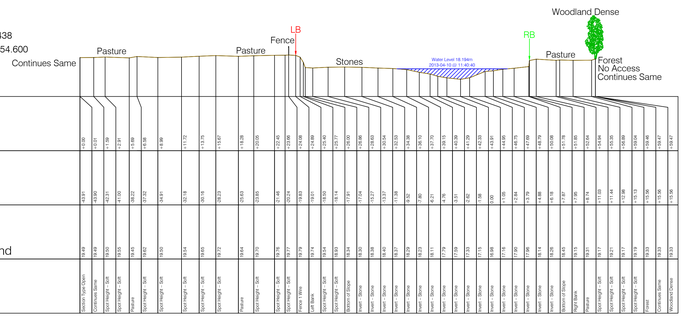
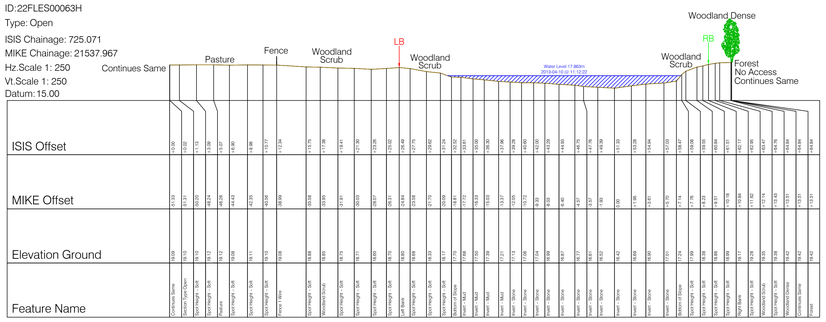
MIKE Chainage: 21134.658
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum: 15.00



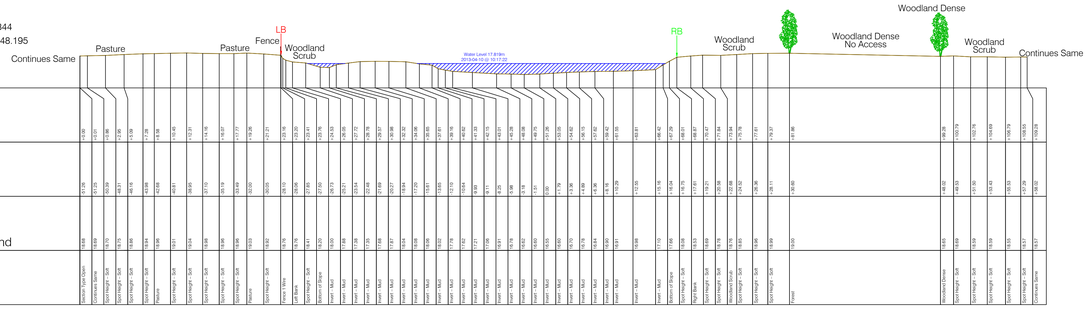
ID:22FLES00082H
Type: Open
ISIS Chainage: 908.438
MIKE Chainage: 21354.600
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum: 15.00



ID:22FLES00063H
Type: Open
ISIS Chainage: 725.071
MIKE Chainage: 21537.967
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum: 15.00



ID:22FLES00044H
Type: Open
ISIS Chainage: 514.844
MIKE Chainage: 21748.195
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum: 15.00



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LEGEND

River Profile		LB	Left Bank
Water Level		RB	Right Bank
Ground Level			Building Line
Road Line			Wall Line
Wall Line			Fence Line
Bridge Line			Pipe Profile

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SURVEY ASSOCIATION
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Map Sheet Layout
Map Sheet 6084-03,04,12, 6084-A,B,C&D, 6085-C&D, 6131-B
North
datum: Malin Hd.
projection: ING
Site Location

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Surveyed by	MSL	Date:	APRIL 2013
Drawn by	SMcG	Date:	MAY 2013
Checked by	MZ	Date:	MAY 2013

Revisions

No	Date	Description
1	17.05.13	First Drawing
2	24.05.13	Final Drawing

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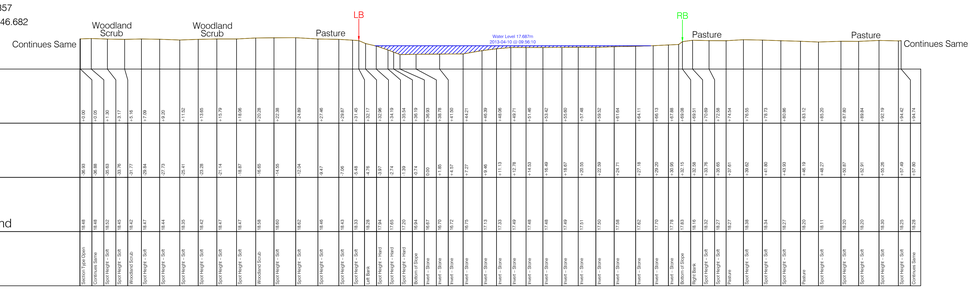
Kildare Cork Belfast London

Mott MacDonald

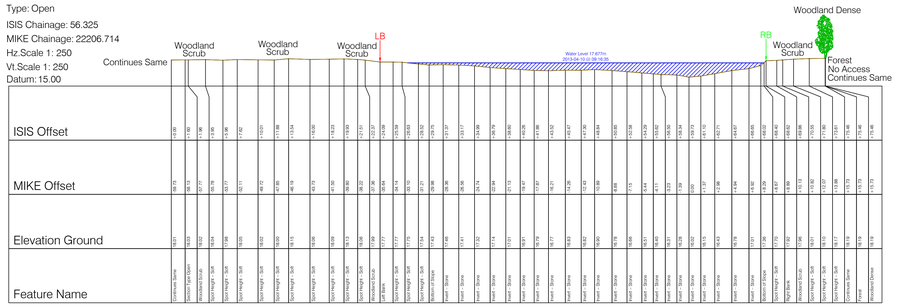
OPW
The Office of Public Works
Oifig na nOibreacha Poiblí

Client : OFFICE OF PUBLIC WORKS
Project : 00000004674_SURVEY_CONTRACT_05
Date : 17.05.13
Scale : AS SHOWN
Description : CROSS SECTIONS
Drawing Number : 4674_22FLES_FLESK-A_XS_15

ID:22FLES00019H
Type: Open
ISIS Chainage: 316.357
MIKE Chainage: 21946.682
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum: 15.00



ID:22FLES00000H
Type: Open
ISIS Chainage: 56.325
MIKE Chainage: 22206.714
Hz.Scale 1: 250
Vt.Scale 1: 250
Datum: 15.00



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LEGEND

River Profile		LB	Left Bank
Water Level		RB	Right Bank
Ground Level			Building Line
Road Line			Wall Line
Wall Line			Fence Line
Bridge Line			Pipe Profile

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Map Sheet Layout
Map Sheet 6084-03,04,12, 6084-A,B,C&D, 6085-C&D, 6131-B
North
Datum: Malin Hd.
Projection: ING
Site Location

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Surveyed by	MSL	Date:	APRIL 2013
Drawn by	SMcG	Date:	MAY 2013
Checked by	MZ	Date:	MAY 2013

Revisions

No	Date	Description
1	17.05.13.	First Drawing
2	24.05.13.	Final Drawing

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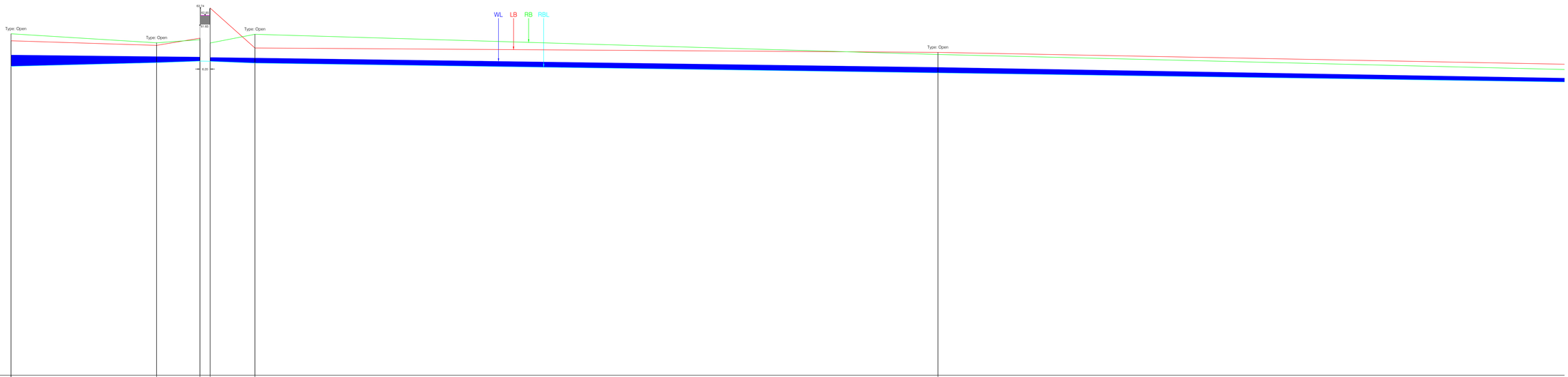
Kildare Cork Belfast London

Mott MacDonald

OPW
The Office of Public Works
Oifig na nOibreacha Poiblí

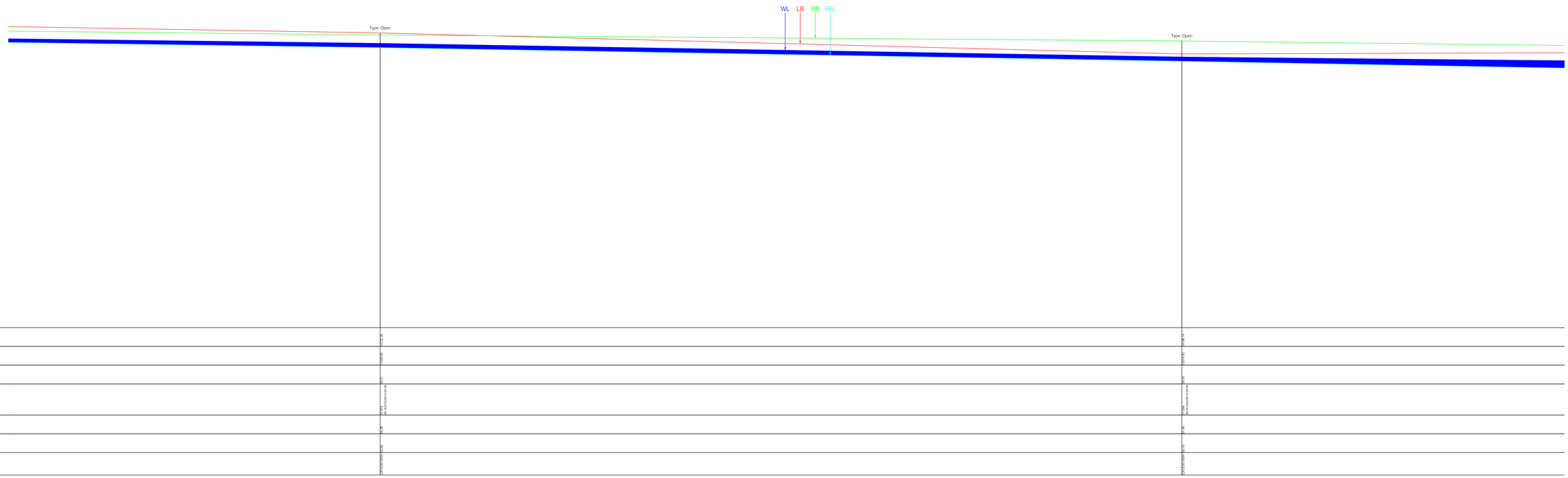
Client : OFFICE OF PUBLIC WORKS
Project : 00000004674_SURVEY_CONTRACT_05
Date : 17.05.13
Scale : AS SHOWN
Description : CROSS SECTIONS
Drawing Number : 4674_22FLES_FLESK-A_XS_16

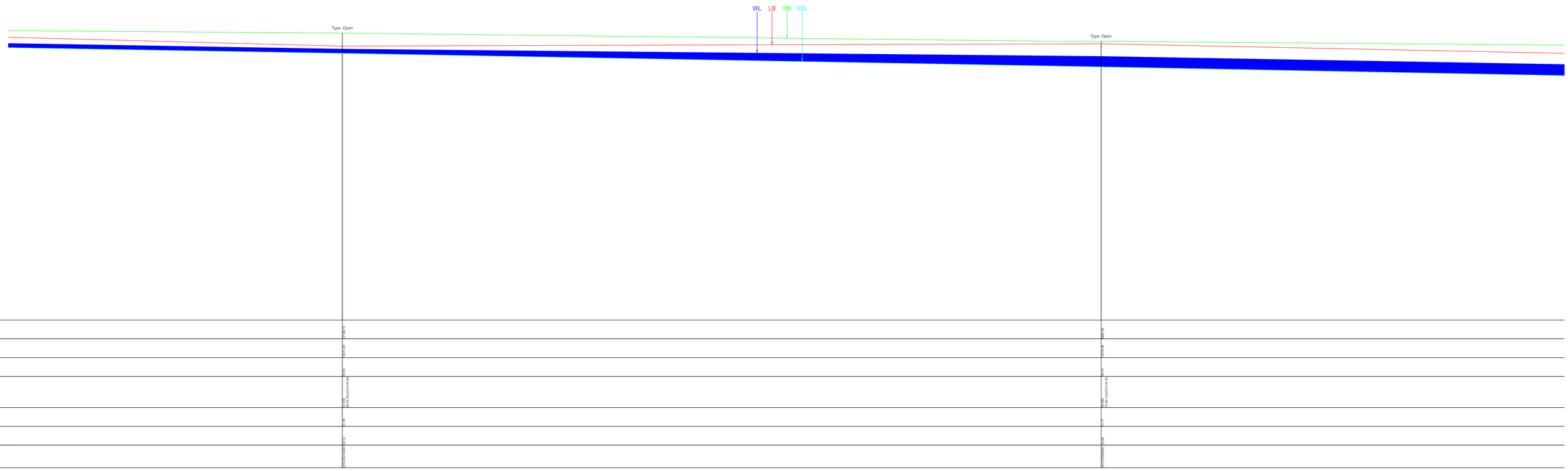
ID:22FLES01205D
Type: Bridge
ISIS Chainage: 12218.303
(Structure Width= 6.2m)
Skew Angle: 354.24
FLESK BRIDGE



River Profile
Chainage 0.000
Hz. Scale 1:1000
Vt. Scale 1:200
Datum 15.00

| | | |





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LEGEND

Water Profile
Water Level
Left Bank Level
Right Bank Level
River Bed Level
Road Level
Structure Level

LB Left Bank Level
RB Right Bank Level
WL Water Level
RBL River Bed Level

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Map Sheet Layout

Map Sheet 6084-03,04,12, 6084-A,B,C&D, 6085-C&D, 6131-B

North
Malin Hd
ORNI
ING

Site Location

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Designed by	MBL	Date: APRIL 2013
Drawn by	MMcS	Date: MAY 2013
Checked by	MZ	Date: MAY 2013

Revisions

No	Date	Description
1	17.05.13	First Drawing
2	24.05.13	Final Drawing

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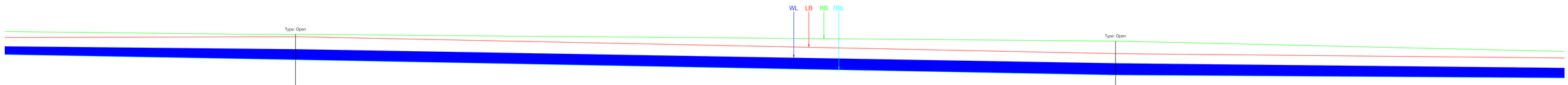
Kildare Cork Belfast London

Mott MacDonald

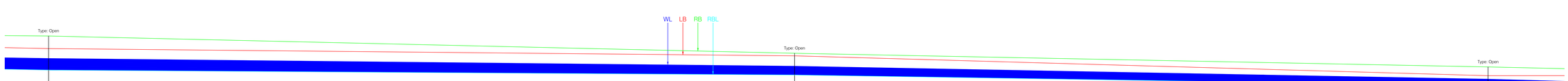
OPW
The Office of Public Works
Oifig na nOibreacha Poiblí

Client :	OFFICE OF PUBLIC WORKS
Project :	00000004674_SURVEY_CONTRACT_05
Date : 17.05.13	Scale : AS SHOWN
Description :	LONG SECTION
Drawing Number :	4674_22FLES_FLESK-A_LS_2



River Profile
Chainage 0.000
Hz. Scale 1:1000
Vt. Scale 1:200
Datum 15.00

ISIS Chainage	0	1913.5
MIKE Chainage	0	1913.5
River Bed Level (MIKE 0)	48.75	47.81
Elevation Water Level	52.284 (1) 04-10-2013 0:00:00	48.197 (1) 17-11-2012 0:00:00
Elevation Left Bank	57.17	54.23
Elevation Right Bank	52.38	51.79
Section ID	SX1720000057.0	SX1720000047.0



River Profile
Chainage 0.000
Hz. Scale 1:1000
Vt. Scale 1:200
Datum 15.00

ISIS Chainage	1913.5	3826.8	5740.1
MIKE Chainage	1913.5	3826.8	5740.1
River Bed Level (MIKE 0)	47.81	46.65	45.06
Elevation Water Level	48.197 (1) 17-11-2012 0:00:00	47.176 (1) 14-12-2012 0:00:00	47.041 (1) 13-12-2012 0:00:00
Elevation Left Bank	54.23	54.15	53.82
Elevation Right Bank	51.79	48.15	48.58
Section ID	SX1720000047.0	SX1720000037.0	SX1720000027.0

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LEGEND

Water Profile
Water Level
Left Bank Level
Right Bank Level
River Bed Level
Road Level
Structure Level

LB Left Bank Level
RB Right Bank Level
WL Water Level
RBL River Bed Level

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Map Sheet Layout
Map Sheet 6084-03.04.12, 6084-A,B,CAD, 6085-CAD, 6131-B
North
Datum
Malin Hd.
ING
Site Location

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Surveyed by	MSL	Date	APRIL 2013
Drawn by	DMUG	Date	MAY 2013
Checked by	MZ	Date	MAY 2013

Revisions

No	Date	Description
1	17.05.13	First Drawing
2	24.05.13	Final Drawing

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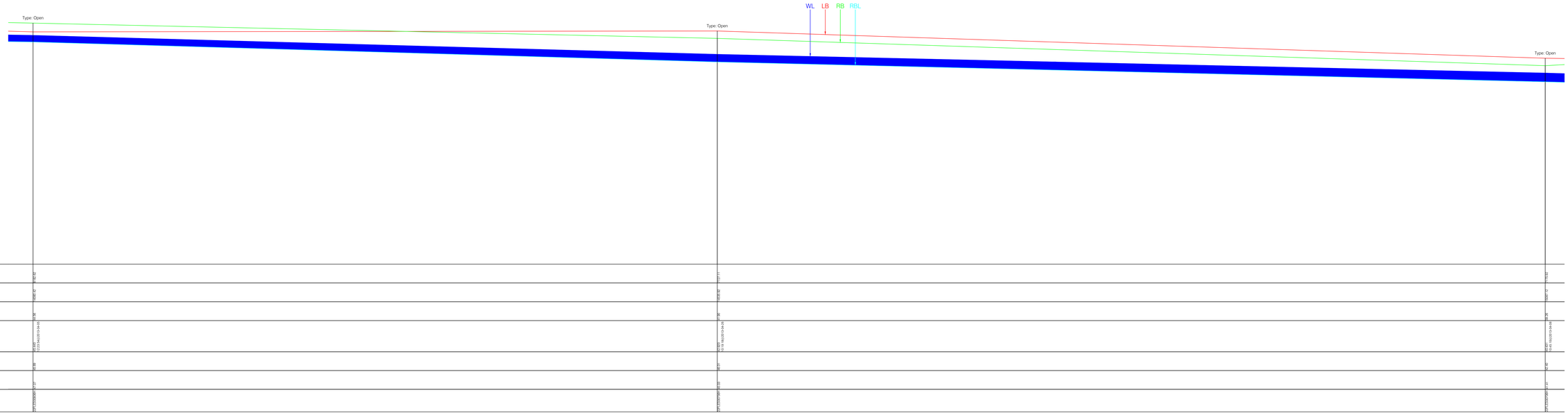
Mott MacDonald

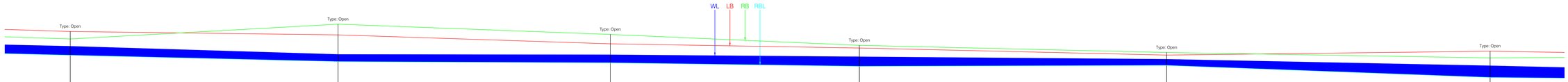
OPW
The Office of Public Works
Oifig na nOibreacha Poiblí

Client : OFFICE OF PUBLIC WORKS
Project : 00000004674_SURVEY_CONTRACT_05
Date : 17.05.13
Scale : AS SHOWN
Description : LONG SECTION
Drawing Number : 4674_22FLES_FLESK-A_LS_3



River Profile
Chainage 0.000
Hz. Scale 1:1000
Vt. Scale 1:200
Datum 15.00

ISIS Chainage	1162.42	1521.11	2733.62
MIKE Chainage	1162.42	1521.82	2733.62
River Bed Level (MIKE 0)	4.36	4.36	4.25
Elevation Water Level	6.25 13:25hr03-Oct-06	6.250 11:21 hr 04/Oct/2006	6.227 13:43 10/Oct/2006
Elevation Left Bank	6.38	6.51	6.42
Elevation Right Bank	7.01	6.53	7.01
Section ID	SECTION0007.01	SECTION0007.03	SECTION0007.01



River Profile
Chainage 0.000
Hz. Scale 1:1000
Vt. Scale 1:200
Datum 15.00

ISIS Chainage	71.62	858.23	1617.16	2431.75	3161.80	3522.71
MIKE Chainage	1524.12	1585.57	1643.88	1691.83	1849.44	1929.92
River Bed Level (MIKE 0)	4.36	4.41	4.36	4.74	4.80	4.30
Elevation Water Level	6.25 13:25hr03-Oct-06	6.250 11:25hr03-Oct-06	6.226 11:50 hr03-Oct-06	6.224 12:21 hr03-Oct-06	6.217 14:21 hr03-Oct-06	6.227 13:43 10/Oct/2006
Elevation Left Bank	6.42	6.56	6.76	6.20	6.27	6.76
Elevation Right Bank	7.41	6.37	6.51	6.36	6.81	6.88
Section ID	SECTION0007.00	SECTION0007.02	SECTION0007.04	SECTION0007.05	SECTION0007.06	SECTION0007.07

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LEGEND

Water Profile
Water Level
Left Bank Level
Right Bank Level
River Bed Level
Road Level
Structure Level

LB Left Bank Level
RB Right Bank Level
WL Water Level
RBL River Bed Level

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Map Sheet Layout
Map Sheet 6084-05.04.12, 6084-A.B.C&D, 6085-C&D, 6131-B

North
Datum: Malin Hd.
Projection: ING

Site Location

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Surveyed by :	MSL	Date: APRIL 2013
Drawn by :	SMcG	Date: MAY 2013
Checked by :	MZ	Date: MAY 2013

Revisions

No	Date	Description
A	17.05.13	First Drawing
1	24.09.13	Final Drawing

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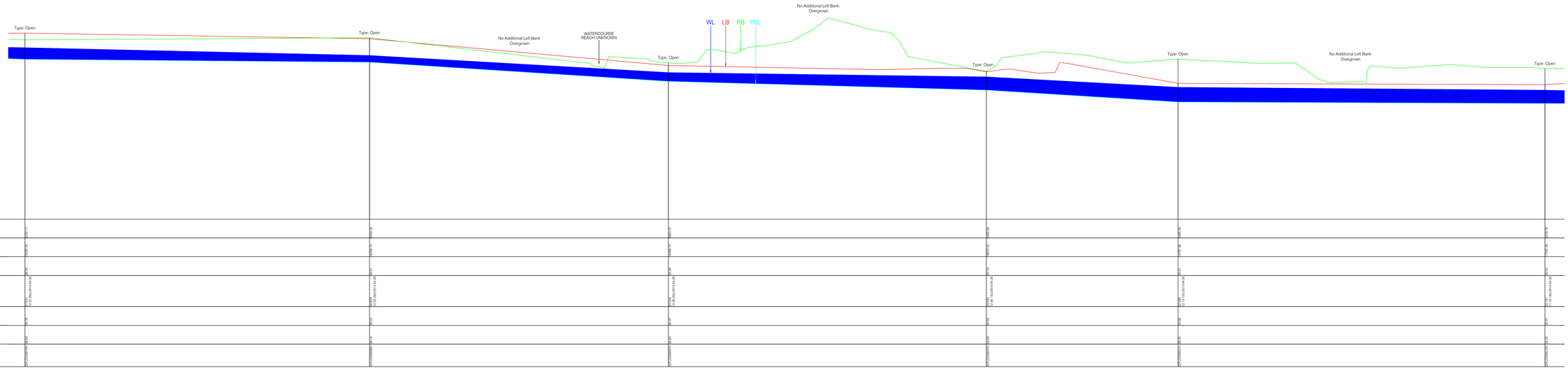
Kildare Cork Belfast London

Mott MacDonald

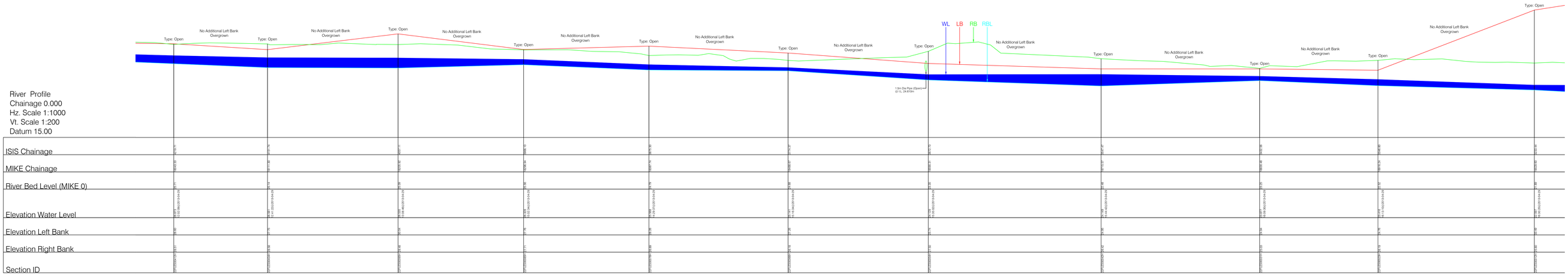
OPW
The Office of Public Works
Oifig na nOibreacha Poiblí

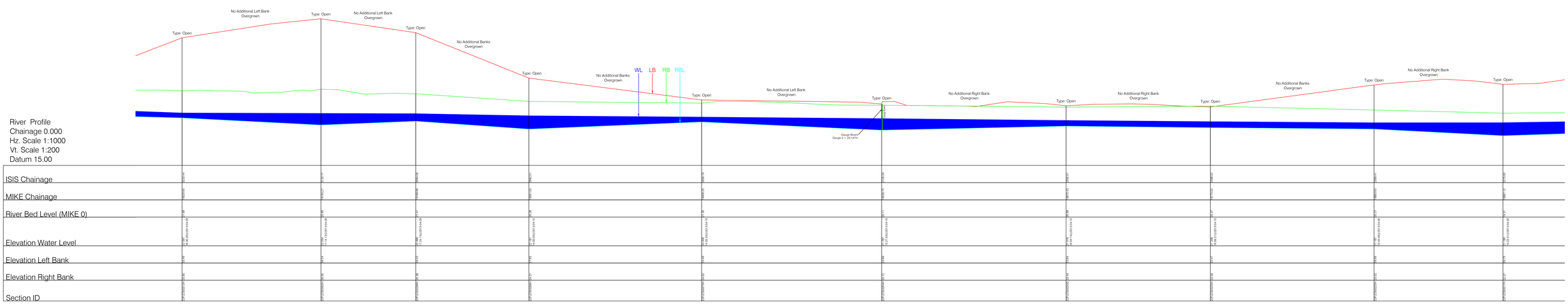
Client :	OFFICE OF PUBLIC WORKS
Project :	00000004674_SURVEY_CONTRACT_05
Date : 17.05.13	**Scale :** AS SHOWN
Description :	LONG SECTION
Drawing Number :	4674_22FLES_FLESK-A_LS_4

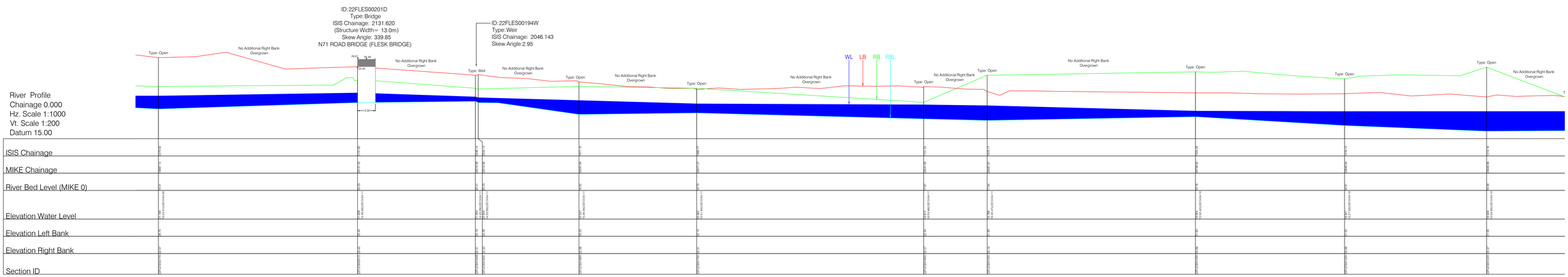


River Profile
Chainage 0.000
Hz. Scale 1:1000
Vt. Scale 1:200
Datum 15.00

| | | |







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LEGEND

Water Profile
Water Level
Left Bank Level
Right Bank Level
River Bed Level
Road Level
Structure Level

LB Left Bank Level
RB Right Bank Level
WL Water Level
RBL River Bed Level

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Map Sheet Layout
Map Sheet 6084-03.04.12, 6084-A.B.C&D, 6085-C&D, 6131-B

North
Malin Hd.
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Site Location

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Surveyed by :	MSL	Date: APRIL 2013
Drawn by :	SMcD	Date: MAY 2013
Checked by :	MZ	Date: MAY 2013

Revisions

No	Date	Description
A	17.05.13	First Drawing
B	24.05.13	Final Drawing

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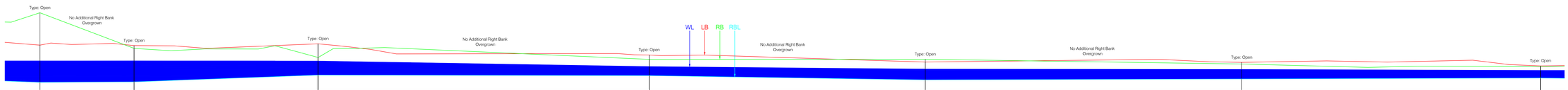
Kildare Cork Belfast London

Mott MacDonald

OPW
The Office of Public Works
Oifig na nOibreacha Poiblí

Client :	OFFICE OF PUBLIC WORKS
Project :	00000004674_SURVEY_CONTRACT_05
Date : 17.05.13	**Scale :** AS SHOWN
Description :	LONG SECTION
Drawing Number :	4674_22FLES_FLESK-A_LS_6

River Profile
Chainage 0.000
Hz. Scale 1:1000
Vt. Scale 1:200
Datum 15.00



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Appendix E. Proposed Development Layout

PROPOSED SHARED PEDESTRIAN / CYCLE WAY - ACTIVE TRAVEL FACILITY

PROPOSED RAISED JUNCTION

PROPOSED SHARED SURFACE ROAD

PROPOSED NEW RAISED JUNCTION ON ROSS ROAD

ACTIVE TRAVEL FACILITY ALONG ROSS ROAD TO BE PROVIDED BY KERRY CO CO AS AGREED

PROPOSED SHARED PEDESTRIAN / CYCLE WAY - ACTIVE TRAVEL FACILITY AS AGREED WITH KERRY COUNTY COUNCIL

PROPOSED 75mm HIGH ROUND-TOP RAMP

ACTIVE TRAVEL FACILITY ALONG ROSS ROAD TO BE PROVIDED BY KERRY CO CO AS AGREED

PROPOSED SHARED PEDESTRIAN / CYCLE WAY - ACTIVE TRAVEL FACILITY

PROPOSED RAISED JUNCTION

INSERT 1 - CONTINUATION

FOLIO KY72304F - PLAN DB6D8
AREA = 0.185 Hectares
AREA = 0.457 Acres

AREA = 7.367 Hectares
AREA = 3.377 Acres

ROAD NOTES:

1. ALL ROADWORKS TO BE UNDERTAKEN IN ACCORDANCE WITH THE TRANSPORTATION INFRASTRUCTURE IRELAND (TII) PUBLICATIONS AND SPECIFICATIONS FOR ROADWORKS.
2. ALL ROADWORKS TO BE UNDERTAKEN IN ACCORDANCE WITH THE "RECOMMENDATIONS FOR SITE DEVELOPMENT WORKS FOR HOUSING AREAS" AND THE BITUMINOUS LAYERS SHALL BE IN ACCORDANCE "TII PUBLICATIONS NRA SPECIFICATION FOR ROAD WORKS SERIES 900 ROAD PAVEMENT-BITUMINOUS MATERIALS".
3. ALL FOOTPATHS TO BE UNDERTAKEN IN ACCORDANCE WITH "TII SPECIFICATION FOR ROAD WORKS SERIES 1100 - KERBS, FOOTWAYS AND PAVED AREAS.
4. THE DISHING OF FOOTPATHS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE "GUIDANCE ON THE USE OF TACTILE PAVING SURFACES DOCUMENT".
5. ALL ROAD MARKINGS SHALL BE IN ACCORDANCE WITH "IS EN 1436 EUROPEAN STANDARD FOR ROAD MARKINGS" & IN ACCORDANCE WITH THE "TRAFFIC SIGNS MANUAL".
6. ALL ROAD SIGNS SHALL BE IN ACCORDANCE WITH "IS EN 1436 EUROPEAN STANDARD FOR ROAD MARKINGS" & IN ACCORDANCE WITH THE "TRAFFIC SIGNS MANUAL".

LEGEND:

- PROPOSED SITE RED-LINE BOUNDARY
- PROPOSED DWELLING / BUILDING FOOTPRINT
- PROPOSED ASPHALT ROADS (BLACK)
- PROPOSED RAISED TABLES, ROUND-TOP RAMP AND JUNCTIONS (BLACK)
- PROPOSED CONCRETE FOOTPATHS
- PROPOSED ASPHALT SHARED PEDESTRIAN / CYCLE WAY - ACTIVE TRAVEL NETWORK (BLACK)
- PROPOSED SHARED SURFACE ROADS ('BUFF')
- PROPOSED PERMEABLE PAVER PARKING (WITHIN CURTLIDGE OF DWELLINGS)
- PROPOSED PERMEABLE PAVER PARKING (VISITORS AND NOT WITHIN CURTLIDGE OF DWELLINGS)
- PROPOSED LANDSCAPE FOOTPATHS
- PROPOSED 'BLISTER TYPE' TACTILE PAVERS. UNCONTROLLED CROSSINGS, BUFF COLOURED.
- PROPOSED 'LADDER TYPE' TACTILE PAVERS. BUFF COLOURED.
- 24.169 — PROPOSED ROAD LEVELS
- FFL 24.300 — PROPOSED FINISHED FLOOR LEVELS

0 20.00m 40.0m

ORDNANCE SURVEY IRELAND LICENSE No. CYAL50364947.
© TAILTE ÉIREANN - SURVEYING

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE TO MALIN HEAD DATUM.
3. ONLY WRITTEN DIMENSIONS SHALL BE USED. NO DIMENSIONS SHALL BE SCALED FROM THE DRAWINGS.
4. CONTRACTOR TO CHECK ALL DIMENSIONS ON SITE.
5. ALL COORDINATES ARE TO IRISH TRANSVERSE MERCATOR
6. ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS.
7. COPYRIGHT OSL.

REV	DATE	DESCRIPTION	BY	CHK'D	AUTH
P05	01.08.25	ISSUED FOR PLANNING	BJM	DB	DB
P04	21.07.25	ISSUED FOR INFORMATION	BJM	DB	DB
P03	12.06.25	ISSUED FOR INFORMATION	BJM	DB	DB
P02	09.04.25	ISSUED FOR SECTION 32B SUBMISSION	DV	BJM	DB
P01	28.03.25	ISSUED FOR INFORMATION	DV	BJM	DB

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CLIENT

HOMELAND PROJECTS LTD.

PROJECT
LARGE-SCALE RESIDENTIAL DEVELOPMENT AT ROSS ROAD, KILLARNEY, CO. KERRY

PURPOSE
FOR PLANNING

TITLE
PROPOSED ROAD LAYOUT PLAN

ORIGINAL SCALE	ORIGINAL ISSUE DATE
A1 - 1:500	27.02.25

STATUS	DRAWING NO	REV
S2	24041-OSL-11-DR-C-1110	P05