

Appropriate Assessment Screening Report

Dunmanus – Bantry – Kenmare

Appropriate Assessment Screening Report

For

River Basin (21) Dunmanus - Bantry - Kenmare Flood Risk Management Plan

Areas for Further Assessment included in the Plan:

| | |
|---------------------------------|-----------------------|
| <i>Neidín</i> | <i>Kenmare</i> |
| <i>Baile Chaisleáin Bhéarra</i> | <i>Castletownbere</i> |
| <i>Beanntraí</i> | <i>Bantry</i> |
| <i>Dúras</i> | <i>Durrus</i> |

Flood Risk Management Plans prepared by the Office of Public Works 2018

In accordance with

European Communities (Assessment and Management of Flood Risks) Regulations 2010 and 2015

Purpose of this Report

As part of the National Catchment-based Flood Risk Assessment & Management (CFRAM) programme, the Commissioners of Public Works have commissioned expert consultants to prepare Strategic Environmental Assessments, Appropriate Assessment Screening Reports and, where deemed necessary by the Commissioners of Public Works, Natura Impacts Assessments, associated with the national suite of Flood Risk Management Plans.

This is necessary to meet the requirements of both S.I. No. 435 of 2004 European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (as amended by S.I. No. 200/2011), and S.I. No. 477/2011 European Communities (Birds and Natural Habitats) Regulations 2011.

Expert Consultants have prepared these Reports on behalf of the Commissioners of Public Works to inform the Commissioners' determination as to whether the Plans are likely to have significant effects on the environment and whether an Appropriate Assessment of a plan or project is required and, if required, whether or not the plans shall adversely affect the integrity of any European site.

The Report contained in this document is specific to the Flood Risk Management Plan as indicated on the front cover.

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Executive Summary

Introduction

The Office of Public Works (OPW) is the competent authority in Ireland for the implementation of the EU Floods Directive [2007/60/EC], which is transposed into Irish law by the European Communities (Assessment and Management of Flood Risk) Regulations, 2010. The Floods Directive requires Member States to:

- Identify areas of existing or foreseeable future potentially significant flood risk (referred to as Areas for Further Assessment - AFAs);
- Prepare flood hazard and risk maps for the AFAs;
- Prepare Flood Risk Management Plans, setting objectives for managing the flood risk within the AFAs and setting out a prioritised set of measures for achieving those objectives.

The programme for the delivery of flood risk management in Ireland comprised the following phases:

- i Preliminary Flood Risk Assessment, which was completed in 2011, identified areas of existing or foreseeable future potentially significant flood risk (referred to as 'Areas for Further Assessment'/AFAs);
- i CFRAM Studies, which were completed in the period 2011 to 2016;
- i The Flood Risk Management Plans were produced for each CFRAM study in 2017;

The Flood Risk Management Plans will be implemented from 2017 onwards and will be reviewed on a rolling six-yearly cycle.

Mott MacDonald Ireland Ltd. was appointed by the OPW to undertake the above activities as part of the Catchment Flood Risk Assessment and Management Study (CFRAMs) for the South Western River Basin District.

The South Western River Basin District CFRAM study (and output Flood Risk Management Plans) have been informed by Appropriate Assessment, the requirement for which is derived from Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive). Appropriate Assessment is the process of determining whether the Flood Risk Management Plan is likely to pose a risk to the attainment or maintenance of conservation objectives for areas protected for their ecological value within the State (Natura 2000 sites - Special Areas of Conservation and Special Protection Areas), and the identification of alternatives or mitigation as appropriate.

One Flood Risk Management Plan has not been developed for the entire South Western River Basin District but rather, targeted individual plans were produced on a waterbody catchment basis (Units of Management basis). The South Western River Basin District is broken down into five Units of Management:

- The Munster Blackwater Catchment (UoM18)
- The Lee / Cork Harbour Catchment (UoM19)
- The Bandon / Skibbereen Catchment (UoM20)
- The Dunmanus / Bantry / Kenmare Bay Catchment (UoM21)

- The Laune / Maine / Dingle Bay Catchment (UoM22)

UoMs are further broken down in to Areas for Further Assessment (AFAs). These are communities within an individual UoM with a quantifiable flood risk and include towns, villages and areas where significant development is anticipated. Associated with AFAs are high and medium priority watercourses. High priority watercourses are located within and 2km upstream of AFAs whereas medium priority watercourses are the interconnecting watercourses between AFAs or the coast.

Dunmanus- Bantry- Kenmare Bay Catchment (UoM21)

The Dunmanus / Bantry / Kenmare Bay UoM contains four Areas for Further Assessment (AFAs): Bantry, Castletown Bearhaven (Castletownbere), Durrus and Kenmare. Associated with the AFAs is over 25km of high and medium priority watercourse.

Flood risk management options for the Dunmanus / Bantry / Kenmare Bay UoM were provisionally identified through options appraisal as:

| AFA | Viable Options |
|----------------|--|
| Bantry | <ul style="list-style-type: none"> · Option 1 - Flood defences and road raising - flood embankments in Caherdaniel West and Newtown and tidal walls in Bantry town coupled with road raising on the N71. · Option 2 - Flood defences and tidal barrage – flood embankments in Caherdaniel West and Newtown and tidal barrage in the harbour with an inner area of approximately 78,880m². The barrage will need to be closed at the low tide preceding a tidal event in order to accommodate fluvial flows. The barrage would remain closed until the tide level outside is lower than the maximum water level within the barrage 9 modelled as being approx. 9 hours). |
| Castletownbere | <ul style="list-style-type: none"> · Walls and Flood Barriers |
| Durrus | <ul style="list-style-type: none"> · No measures are proposed. |
| Kenmare | <ul style="list-style-type: none"> · Option 1 - Flood defences including walls, embankments, road raising and flood gates · Option 2 - Storage on the Finnihy River coupled with flood defences · Option 3 - Removal of a foul sewage pipe from across the eye of Finnihy Bridge coupled with flood defences · Option 4 - Flow Diversion along the Kealnagower Stream and through the town by diverting flows to Kenmare Bay. · Option 5 - Combination of Conveyance, Flow Diversion and Flood Defences |

Natura 2000 Sites

Flood risk management options in Kenmare are proposed for both the Finnihy River. Kenmare River SAC (002158) extends from the N71 road bridge crossing seaward as far as Dursey Island and Scariff Island and includes the tidal extent of the Finnihy River which stops approximately 200m short of the Finnihy Bridge. Flood risk management measures are proposed at the Finnihy Bridge and may extend to within the SAC.

The Castletownbere AFA boundary does not overlap with any Natura 2000 site boundary. The nearest Natura 2000 site is the Beara Peninsula SPA (004155), which is approximately 3.5km south of Castletownbere.

The Bantry AFA boundary does not overlap with any Natura 2000 site boundary.

There is potential for impacts on the qualifying features of the Kenmare River SAC (002158) and the Beara Peninsula SPA (004155).

Potential Impacts on Qualifying Features

Bantry AFA

There is no potential impacts for the flood risk management works in the Bantry AFA.

Castletownbere AFA

Disturbance to wetland birds is extremely unlikely given distance from site.

Kenmare AFA

Impacts on Annex I habitats are determined to be extremely unlikely given that these are primarily coastal habitats and the options will be implemented inland.

Impacts on whorl snail, lesser horseshoe bat, otter and common seal are determined to be extremely unlikely given the distance of these species from the indicative locations for the viable flood risk management options.

The Finnihy River hosts a freshwater pearl mussel population. This is not a qualifying feature of the Kenmare River SAC therefore there can be no impacts on the conservation objectives of the SAC.

Significance of Impacts

This Screening for Appropriate Assessment was carried out in conjunction with the preliminary option appraisal process, (Document Ref: Preliminary Options Report for UoM 21). The option appraisal assessed each viable flood risk management option in terms of potential technical, social and environmental impacts.

No likely impacts have been determined on the Kenmare River SAC and the Beara Peninsula SPA from the implementation of viable options in the Kenmare AFA and the Castletownbere AFA.

This screening for Appropriate Assessment has determined that significant effects on Natura 2000 sites are not reasonably foreseeable as a result of the implementation of flood risk management measures in UoM 21.

1 Introduction

1.1 Flood Risk Assessment and Management in Ireland

Flood risk management in Ireland has historically focused on land drainage schemes for the improvement of agricultural land. The 1945 Arterial Drainage Act established a national drainage authority (the Office of Public Works) with the remit of implementing a national arterial drainage programme. The Arterial Drainage Act was amended in 1995 to include for the protection of urban areas suffering from flooding.

In 2004, the Irish Government adopted a new National Flood Policy for Ireland which shifted the emphasis in addressing flood risk away from arterial drainage (targeted towards the protection of agriculture and cities / town liable to serious flooding) and towards a waterbody catchment-based flood risk assessment (a similar catchment-based management approach to that already being implemented under the Water Framework Directive 2000/60/EC).

In 2007 the Floods Directive [2007/60/EC] was published which requires the establishment of a framework of measures to reduce the risks of flood damage. The Floods Directive was transposed into Irish law by the European Communities (Assessment and Management of Flood Risks) Regulations, 2010 (S.I. No. 122 of 2010). The Regulations identify the Office of Public Works (OPW) as the lead agency in implementing flood management policy in Ireland.

Catchment Flood Risk Assessment and Management (CFRAM) Studies

For the purpose of delivering on the components of the National Flood Policy and on the requirements of the European Union Floods Directive, the OPW, in conjunction with local authorities and stakeholders, conducted a number of Catchment Flood Risk Assessment and Management (CFRAM) Studies. These studies are the core activity from which medium to long-term strategies for the reduction and management of flood risk in Ireland will be achieved.

The overarching objectives of the CFRAM Studies were to:

- Identify and map the existing and potential future flood hazard within the study area;
- Assess and map the existing and potential future flood risk within the study area;
- Identify viable structural and non-structural options and measures for the effective and sustainable management of flood risk within the study area;
- Prepare Flood Risk Management Plans (FRMPs) setting out recommendations to manage the existing flood risk and also the potential future flood risk which may increase due to climate change, development, and other pressures that may arise in the future. FRMPs set out policies, strategies, measures and actions that should be pursued by the relevant bodies (including the OPW, Local Authorities and other Stakeholders), to achieve the most cost-effective and sustainable management of existing and potential future flood risk within the study area, taking account of environmental plans, objectives and legislative requirements and other statutory plans and requirements¹.

¹ The Floods Directive requires that Flood Risk Management Plans should take into account the particular characteristics of the areas they cover and provide for tailored solutions according to the needs and priorities of those areas, whilst promoting the

The programme for the delivery of flood risk management in Ireland comprised of the following phases:

- Preliminary Flood Risk Assessment, which was completed in 2011, identified areas of existing or foreseeable future potentially significant flood risk (referred to as 'Areas for Further Assessment'/AFAs);
- CFRAM Studies, which were completed in the period 2011 to 2017;
- Flood Risk Management Plans were produced for each CFRAM study in 2017;
- The Flood Risk Management Plans will be implemented from 2017 onwards and will be reviewed on a rolling six-yearly cycle.

It is emphasised that observations and views submitted as part of the consultation on the Draft Flood Risk Management Plan (and associated Strategic Environment Assessment and Appropriate Assessment) have been reviewed and taken into account in the preparation of the finalised Plans

Furthermore, once the FRMP is adopted, measures involving physical works (e.g., flood protection schemes) will need to be further developed at a local, project level before Exhibition or submission for planning approval. At this stage, local information that cannot be captured at the Plan-level of assessment, such as ground investigation results and project-level environmental assessments, may give rise to some amendment of the proposed measure to ensure that it is fully adapted, developed and appropriate within the local context.

While the degree of detail of the assessment undertaken to date would give confidence that any amendments should generally not be significant, the measures set out in the FRMP may be subject to some amendment prior to implementation, and in some cases, may be subject to significant amendment.

In this context, it is stressed that the SEA and AA undertaken in relation to the FRMP are plan-level assessments. The FRMP will inform the progression of the preferred measures, but project-level assessments will need to be undertaken as appropriate under the relevant legislation for consenting to that project for any physical works that may progress in the future. The approval of the Final FRMP does not confer approval or permission for the installation or construction of any physical works. The requirements for EIA and/or AA Screening, including any particular issues such as knowledge gaps or mitigation measures that are expected to be necessary, are set out in the Environmental Report or Natura Impact Statement as relevant.

It should be noted that the detailed designs for flood risk management measures are not developed as part of the Flood Risk Management Plans / CFRAM Studies but rather measures will be progressed on a scheme by scheme basis, outside of the scope of the CFRAM studies.

The OPW has commissioned a CFRAM study for each of Ireland's seven River Basin Districts (RBDs)². This report is a Screening for Appropriate Assessment produced in accordance with the Habitats Directive and pertains to the South Western River Basin District.

² River Basin Districts (RBDs) are the main units for the management of river basins and have been delineated by Member States under Article 3 of the Water Framework Directive (2000/60/EC). RBDs are areas of land and sea, made up of one or more neighbouring river basins together with their associated groundwaters and coastal waters.

2 Appropriate Assessment

2.1 Statutory Requirement for Appropriate Assessment

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive) is European Community legislation regarding nature conservation. The intention of the Directive is to aim to ensure biodiversity through the conservation of natural habitats and wild fauna and flora in Europe. The Habitats Directive was transposed into Irish law by the European Communities (Natural Habitats) Regulations, 1997 (S.I. No. 94/1997) which was subsequently revoked and replaced by the European Communities (Birds and Natural Habitats) Regulations 2011.

A network of sites of conservation importance hosting habitats and/or species identified in the Directives as needing to be either maintained at or returned to favourable conservation status have been identified by each Member State. These sites are known as the Natura 2000 network and in Ireland, Natura 2000 sites comprise areas designated as Special Areas of Conservation (SACs) and candidate Special Areas of Conservation (cSACs), and/or Special Protection Areas (SPAs) and candidate Special Protection Areas (cSPAs).

The Habitats Directive requires that where a plan or project is likely to have a significant effect on a Natura 2000 Site, while not directly connected with or necessary to the nature conservation management of the site, it shall be subject to 'Appropriate Assessment' to identify any implications for the site in view of the site's conservation objectives³.

Specifically, Article 6(3) of the Habitats Directive states:

*Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to **appropriate assessment** of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.*

The CFRAM studies will identify viable strategies and measures for flood risk management in Ireland, some of which will be within areas designated under the Natura 2000 network. The Flood Risk Management Plans developed under these studies **are not directly connected with or necessary to the management of any Natura 2000 sites**. Therefore, in the context of the Habitats Directive, the Plans must be subjected to Screening for Appropriate Assessment to determine whether the strategies or measures outlined therein are likely to have a significant effect on a Natura 2000 site, either alone or in

³ The NPWS is currently developing Conservation Management Plans for all SACs nationally. Objectives for the conservation of the features of interest for which the site is designated are set out in the Conservation Management Plans and the principal pressures impacting the achievement of Favourable Conservation Status are identified. Strategies to meet the objectives are also identified.

combination with other plans or projects. Where significant effects are determined to be likely the Plans are statutorily required to be subjected to Appropriate Assessment.

2.2 Appropriate Assessment – The Process

The European Commission in 2002 published guidance on the assessment of plans and projects significantly affecting Natura 2000 sites. This guidance provides details of the general approach to Appropriate Assessment. The guidance sets out a tiered/staged approach as summarised below:

Stage 1 - Screening for a likely significant effect: An initial assessment of the project or plan's effect on a European site(s). A description of the plan/project and the elements that have the potential to impact on Natura 2000 sites must be provided. The potential impacts and their significance must be assessed. If it cannot be concluded that there will be no significant effect upon a European site, an Appropriate Assessment is required; (*Note this report is a Screening Assessment*).

Stage 2 - Appropriate Assessment: The consideration of the impact on the integrity of the Natura 2000 site of the project or plan, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts. The output of this stage of Appropriate Assessment is a Natura Impact Statement (NIS) report;

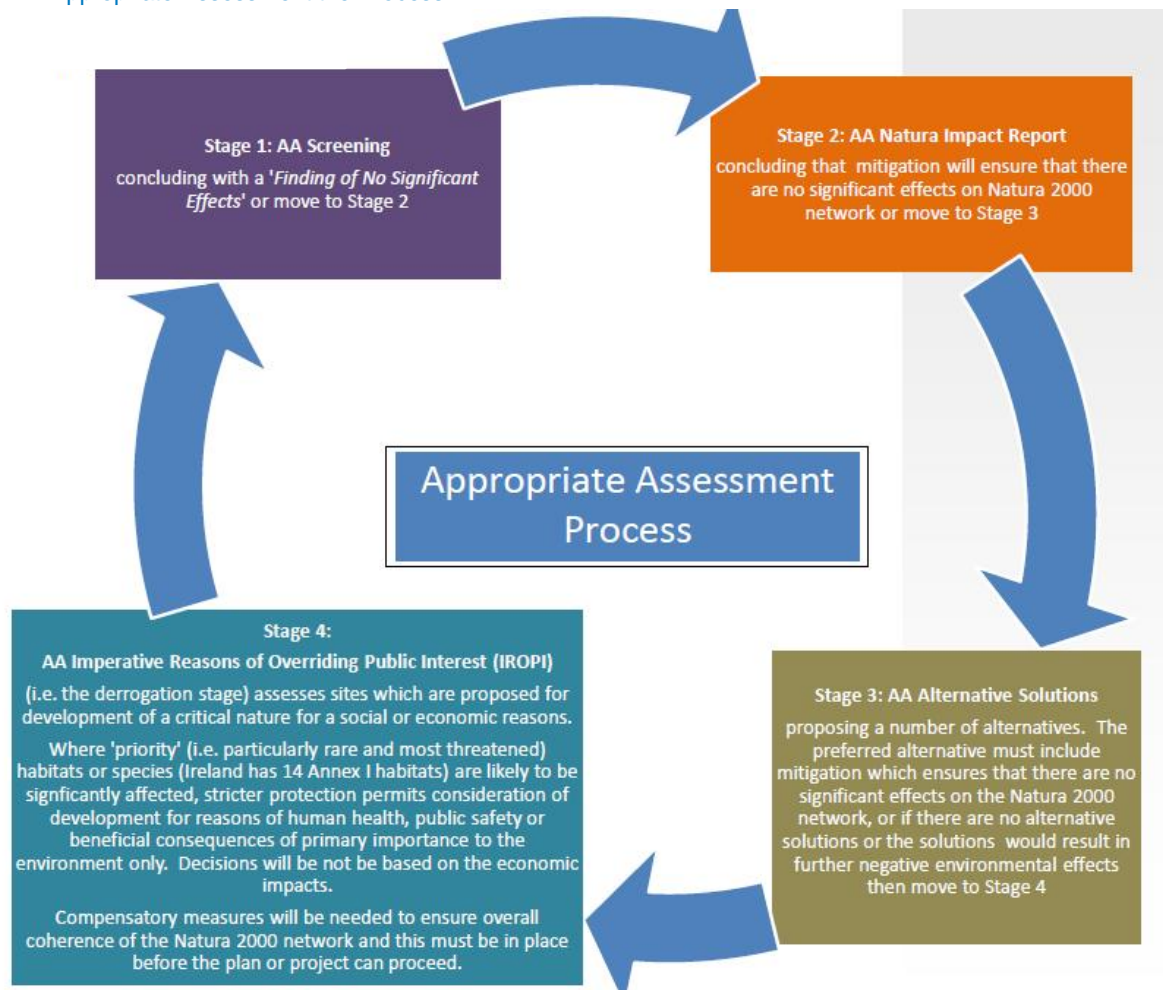
Stage 3 – Assessment of alternative solutions: The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site (where mitigation cannot be achieved); and

Stage 4 – Assessment where no alternative solutions exist and where adverse impacts remain: Development of compensatory measures where, in the light of imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan should proceed.

Each stage in the process determines whether a further stage is required. If, for example, the conclusions at the end of Stage 1 are that there will be no significant impacts on the Natura 2000 site, there is no requirement to carry out an Appropriate Assessment (Stage 2). The approach to Appropriate Assessment screening must however apply the precautionary principle i.e. where it cannot be definitively determined that a plan/project will not adversely impact the integrity of the Natura 2000 site then it must be assumed that there is potential for impact and a full Appropriate Assessment must be carried out.

The objective of the process is to provide adequate information, based on the best available scientific information, to inform the Competent Authority to enable them to conduct an assessment of whether the plan or project is likely to have a significant effect on the conservation objectives of the relevant Natura 2000 sites within the zone of influence. Where adverse impacts are identified mitigation measures necessary to avoid, reduce or offset such impacts must be prescribed.

Figure 2-1 Appropriate Assessment the Process



Source: West Regional Authority (WRA) in association with the Environmental Protection Agency (EPA) (2013) Draft 'SEA Resource Manual for Local and Regional Authorities'

2.3 Objective of Appropriate Assessment Screening

The objective of this Screening for Appropriate Assessment is to determine whether the South Western RBD Flood Risk Management Plans are likely to have adverse effects on conservation objectives of Natura 2000 sites. The direct, indirect and in-combination ecological impacts of the proposed plan policies / measures on Natura 2000 sites are identified and the necessity to carry out an Appropriate Assessment is determined. The outcomes of the assessment are also summarised in a 'Screening Matrix' presented in Section 6.

The DEHLG Guidance (2009) [revised, February 2010], '*Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities*' requires that the findings and recommendations of Appropriate Assessment informs the policies and strategies of the Plan.

Information contained in the Appropriate Assessment that will inform the South Western RBD Flood Risk Management Plans (FRMP) includes the following;

- i the areas likely to be significantly affected by the plan;
- i any existing environmental characteristics which are relevant to the plan including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC;
- i the environmental protection objectives and qualifying interests (established at international, Community or Member State level) which are relevant to the areas of the environment likely to be affected by the plan;
- i the likely significant effects on the Natura 2000 sites, such as impacts on biodiversity, fauna, flora, soil, water, etc.
- i the measures envisaged to mitigate against any significant adverse effects on the designated sites of implementing the plan; and
- i alternatives to the proposals in the plan and their potential effectiveness in maintaining the conservation value of the site.

2.4 Methodology

This screening assessment has been prepared in accordance with all relevant guidance and legislation including:

- i European Communities (Birds and Natural Habitats) Regulations 2011;
- i NPWS (2012) Marine Natura Impact Statements in Irish Special Areas of Conservation. A Working Document.
- i DEHLG (2009) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities [revised, February 2010];
- i EC (2000) Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC;
- i EC (2001) Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC;
- i EC (2007) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC: Clarification of the concepts of alternative solutions and imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the Commission.

An extensive data collection exercise was conducted as part of this Appropriate Assessment Screening. Available information utilised in the preparation of this report includes:

- i Conservation Status Assessment Reports⁴ (CSARs), Backing Documents and Maps prepared in accordance with Article 17 of the Habitats Directive;

⁴ Every six years, Member States of the European Union are required to report on the conservation status of all habitats and species listed on the annexes of the Habitats Directive as required under Article 17 of the Directive. Ireland submitted our conservation

- | Natura 2000 Site Synopsis, Data Forms and Conservation Objective Reports available from NPWS;
- | Published and unpublished NPWS reports on protected habitats and species including Irish Wildlife Manual reports, Species Action Plans and Conservation Management Plans;
- | Existing relevant mapping and databases e.g. waterbody status, species and habitat distribution etc. (sourced from the Environmental Protection Agency - <http://gis.epa.ie/>, the National Biodiversity Data Centre - <http://maps.biodiversityireland.ie> and the National Parks and Wildlife Services - <http://www.npws.ie/mapsanddata/>).

2.4.1 Identification of Natura 2000 Sites Within the Zone of Influence

DEHLG Guidance states that screening for Appropriate Assessment should be carried out for any Natura 2000 site within the likely 'Zone of Influence' of a plan or project. For plans, the guidance recommends that a distance of 15km be considered. However, the Zone of Influence must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects. Plans have the potential to impact on European sites beyond the confines of the individual sites themselves.

The Zone of Influence of a plan is the area in which qualifying interests are present which are sensitive to the effects that may be caused by the activities associated with the plan. The zone of influence will therefore vary relative to the scale of the effect and relative to the sensitivity of the receptor to the effect.

In order to establish the zone of influence and to determine baseline conditions, nationally available data on protected habitats and species was mapped using GIS. This data was interrogated for any physical, hydrological, or ecological connectivity to the activities associated with the project. All Natura 2000 sites within 15km of the UoM boundary were identified and the Zone of Influence was therefore determined. This included all Natura 2000 sites traversed by works and those with potential connectivity to the activities associated with the project. The Zone of Influence is determined using the source-pathway-receptor (SPR) approach as follows:

- The first step in the SPR assessment is to identify the likely direct, indirect and cumulative impacts from the project (i.e. identify the source). The likely effects of the project are detailed in Section 3 of this report.
- Secondly the pathway between the impacts (source) and receptor must be determined i.e. the spatial and temporal limits of the likely effects (biological / chemical / physical changes) are identified.
- Finally, the presence of ecological receptors (in this case European Sites and/or their qualifying features / conservation interests) within the spatial and temporal limits of the likely effects are determined and the sensitivity of these ecological receptors to effects is assessed. Where there is no sensitivity, the ecological receptor will not be impacted and therefore is not within the 'zone of influence'.

2.5 Consultation

A National Workshop on Appropriate Assessment (AA) of Flood Risk Management Plans (FRMP) was held between the Office of Public Works (OPW), their consultants on the CFRAMs projects and the National Parks & Wildlife Service (NPWS) on the 28th January 2015. The NPWS outlined their expectations of the AA for the FRMPs as follows:

- i The zone of influence of flood risk management options should be identified on a case by case basis using the Source-Pathway-Receptor approach;
- i Any mitigation prescribed in the NIS should be specific and should be demonstrated to be achievable and effective;
- i Consideration should be given the construction impacts at Plan level;
- i Appropriate Assessment must be based on scientific evidence;
- i If an option for one AFA needs to go to IRPOI then it may be the case that the entire FRMP will need to go through IROPI;
- i Care needs to be taken in how the Freshwater Pearl Mussel is considered.

The draft Flood Risk Management Plans and the associated SEA and AA assessments were subject to public consultation between July 2016 and September 2016. A series of Public Consultation Days were held to engage locally and directly with the community and provide people with opportunity to discuss and fully understand the Draft FRMPs and associated environmental assessments. The feedback and comments received through public consultation (which includes observations and recommendations received from the SEA statutory consultees) have been taken into account in the Final FRMPs (and in the associated SEAs and AAs). The manner in which consultation feedback has been taken into account is presented in the SEA statements for each FRMP.

3 Description of the Plan

3.1 Flood Risk Management Plan

The Floods Directive [2007/60/EC] requires the establishment of a framework of measures to reduce the risks of flood damage. Catchment Flood Risk Assessment and Management (CFRAM) Studies were commissioned to determine flood hazard and identify risk receptors that are susceptible to flooding in Ireland. Measures to mitigate risk (both existing and future) were also determined. The outputs of the CFRAM studies are Flood Risk Management Plans (FMRPs). The purpose of the FMRPs was to set out policies, strategies, measures and actions that should be pursued by the relevant bodies to achieve the most cost-effective and sustainable management of existing and potential future flood risk.

One Flood Risk Management Plan was not developed for the entire South Western River Basin District but rather, targeted individual plans were produced on a waterbody catchment basis (Units of Management basis). The South Western River Basin District is therefore broken down into Units of Management (UoMs) for the purpose of implementing the Floods Directive.

UoMs are representative of existing Hydrometric Area boundaries constituting major catchments or river basins typically greater than 1,000km² and their associated coastal areas, or conglomerations of smaller river basins and their associated coastal areas.

The FRMPs include a prioritised set of actions and measures aimed at meeting defined flood risk management objectives for each UoM. The flood risk management objectives are set out under four categories (Technical, Economic, Social, and Environmental), and include objectives such as:

- i Minimise health and safety risk of flood risk management options;
- i Manage risk to agricultural land;
- i Minimise risk to social amenity;
- i Minimise the risk of environmental pollution;
- i Avoid damage to, and where possible enhance, fisheries within the catchment.

A description of the flood risk management objectives which are particular to each UoM is included in the Flood Risk Management Plans.

The Flood Risk Management Plans demonstrate the indicative costs and benefits of the preferred actions and measures, the robust reasoning for the identification of a measure as a preferred option and the priority each measure should be afforded. The plans also recommend a programme of work (including a prioritised and costed programme of policies, strategies, actions and measures) to be implemented by the OPW, Local Authorities or other relevant bodies to mitigate flood risk in each UoM.

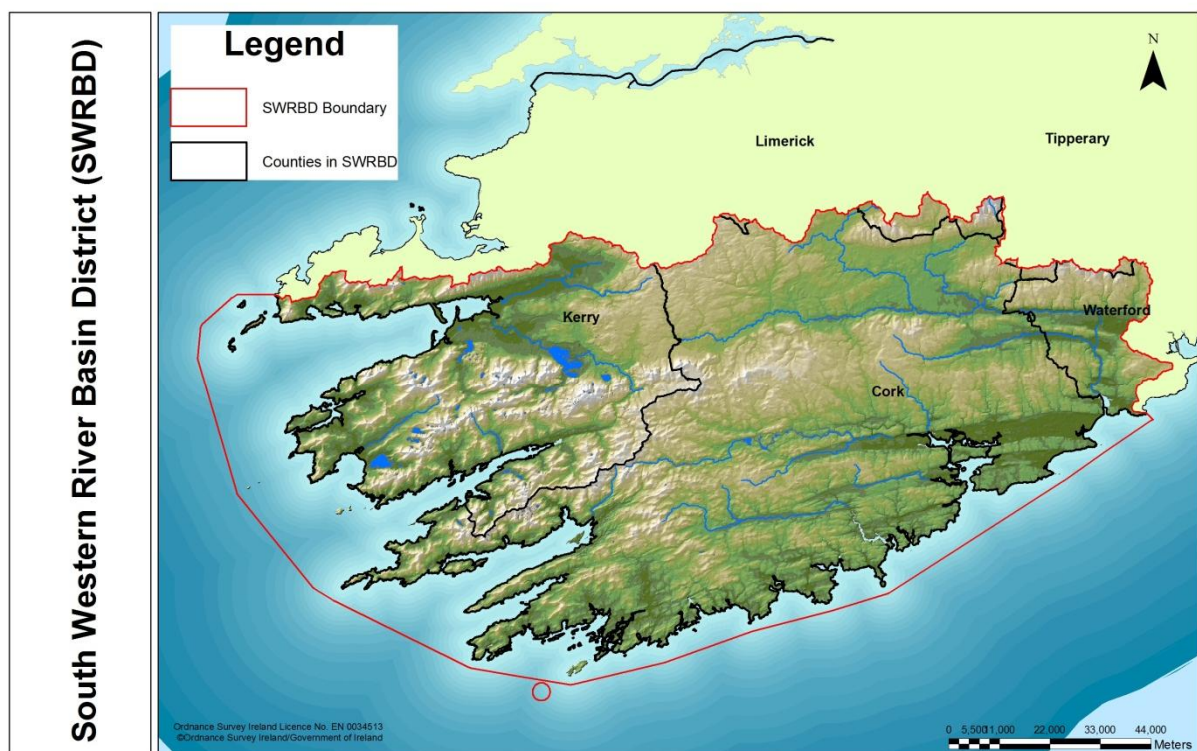
The FRMPs will influence, and will in turn be influenced by external statutory and non-statutory plans, strategies and policies and programmes. National and local policies relating to the protection of the

environment have been considered in the development of the FRMPs. This process was conducted as part of the Strategic Environmental Assessment of the FRMPs.

3.2 Overview of the South Western River Basin District

The South Western River Basin District (SWRBD) covers an area of approximately 11,160 km² and includes most of county Cork, large parts of counties Kerry and Waterford along with small parts of the counties of Tipperary and Limerick. The SWRBD contains over 1,800 km of coastline along the Atlantic Ocean and the Celtic Sea.

Figure 3-1 South Western River Basin District (SWRBD)



3.2.1 Units of Management in the SWRBD

There are five Units of Management within the South Western River Basin District which follow watershed catchment boundaries rather than political boundaries. The Units are as follows;

- | The Munster Blackwater Catchment (UoM18)
- | The Lee / Cork Harbour Catchment (UoM19)
- | The Bandon / Skibbereen Catchment (UoM20)

- | The Dunmanus / Bantry / Kenmare Bay Catchment (UoM21)
- | The Laune / Maine / Dingle Bay Catchment (UoM22)

UoMs are further broken down in to Areas for Further Assessment (AFAs). The SWRBD includes 26 Nr. Areas for Further Assessment (AFAs).

Figure 3-2 Units of Management and Areas for Further Assessment in the SWRBD



3.3 Flood Risk Management Options

The CFRAM study for the SWRBD included *options appraisal*, to identify the preferred measures and options to manage flood risk for each UoM in the SWRBD. Receptors to flood risk within each UoM in the SWRBD were identified through detailed technical studies. The potential options to manage the flood risk of the various receptors were provisionally identified and were assessed for viability.

A flood risk management option consists of one, or more commonly a combination of, flood risk management measures. The suite of flood risk management options considered under the CFRAM study are presented in Table 3.1.

Table 3.1: Suite of Flood Risk Management Options

| Option | Description |
|--|--|
| Do Nothing | Implement no new flood risk management measures and abandon any existing practices. |
| Existing Regime | Continue with any existing flood risk management practices, such as reactive maintenance. |
| Do Minimum | Implement additional minimal measures to reduce the flood risk in specific problem areas without introducing a comprehensive strategy - infill gaps in existing walls, maintain channel. |
| Non-Structural Measures | <p>Planning and development control measures (zoning of land for flood risk appropriate development, prevention of inappropriate incremental development, review of existing Local Authority policies in relation to planning and development and of inter-jurisdictional co-operation within the catchment, etc.);</p> <p>Building regulations (regulations relating to floor levels, flood-proofing, flood resilience, sustainable drainage systems, prevention of reconstruction or redevelopment in flood-risk areas, etc.);</p> <p>Sustainable urban drainage systems (SUDS);</p> <p>Installation of a flood forecasting and warning system and development of emergency flood response procedures;</p> <p>Targeted public awareness and preparedness campaign;</p> <p>Individual property flood resistance (protection / flood-proofing) and resilience;</p> <p>Land use management, including creation of wetlands, riparian buffer zones, etc.</p> |
| Structural measures | <p>Storage (single or multiple site flood water storage, flood retardation, etc.)</p> <p>Flow diversion (full diversion / bypass channel, flood relief channel, etc.)</p> <p>Increase conveyance (in-channel works, floodplain earthworks, removal of constraints / constrictions, channel / floodplain clearance, etc.)</p> <p>Construct flood defences (walls, embankments, demountable defences, etc.)</p> <p>Rehabilitate, improve existing defences</p> <p>Relocation of properties</p> <p>Localised protection works (e.g. minor raising of existing defences / levels).</p> |
| Channel or Flood Defence Maintenance Works / Programme | - |
| Other relevant works | - |

Flood risk management options were developed for each UoM in the SWRBD. All of the available options from the prescribed suite (Table 3.1) are not applicable to every UoM. Options appraisal involved the technical assessment⁵ of all options to determine those which are applicable and viable for each UoM and associated AFAs. Following the technical assessment, a cost analysis of the viable options was conducted such that a preferred option (in terms of effectiveness, potential impacts, and cost) was determined.

The options proposed in the Flood Risk Management Plans are set at an appropriate scale which includes the following levels:

⁵ The effectiveness and potential impacts of each FRM option is considered in terms of the following criteria:

- Applicability to the area
- Economic (potential benefits, impacts, likely costs etc.)
- Environmental (potential impacts and benefits)
- Social (impacts on people, society and the likely acceptability of the method) and
- Cultural (potential benefits and impacts upon heritage sites and resources)

- i Units of Management (UoM) – i.e. at river basin catchment level;
- i Analysis Unit (AU) - these are sub-catchments or coastal areas within the Unit of Management;
- i Areas for Further Assessment (AFAs) - these are communities within an individual UoM with a quantifiable flood risk and include towns, villages and areas where significant development is anticipated. Associated with AFAs are high and medium priority watercourses. High priority watercourses are located within and 2km upstream of AFAs whereas medium priority watercourses are the interconnecting watercourses between AFAs⁶.

3.4 The Dunmanus-Bantry-Kenmare Bay Catchment (UoM21)

The Dunmanus / Bantry / Kenmare Bay UoM covers an area of approximately 1,890 km² and is split between counties Cork and Kerry. The main rivers within UoM 21 are the Cumberagh, Inny and the Roughty. UoM 21 also includes a number of large lakes including Lough Currane and Derrianna Lough.

Bantry and Castletown Bearhaven AFAs

There are three distinct hydrological catchments in the Bantry AFA. The Mealagh catchment to the north of Bantry Town is a reasonably large catchment covering 56km². The River Mealagh rises in the uplands of the Maughanaclea Hills (113240, 053930) and flows approximately 10km to the west before skirting around Drombrow Lough and entering the Bantry AFA. The Mealagh flows through the town of Dunmark before passing through Dunmark Bridge and down a steep section into the tidally affected harbour. There is a small ridge to the west of Drombrow Lough that forms a low barrier between the Lough and the Mealagh. The water in the Lough flows into the Mealagh by a small channel that has its confluence to the northeast, away from the AFA. In the area near to the AFA, where there is a risk of flooding from tributaries to the Mealagh, there are the Raheen Beg, Doneelagh, Milleencolla East and Milleencolla West streams. Flooding from the Ardnageehy tributaries in the upper reaches of the Doneelagh Stream has been shown during the course of this study to flow to the west, into the River Bantry catchment and not, as expected to the northeast into Doneelagh Stream.

Bantry Town itself resides in the River Bantry catchment, the middle hydrologically distinct catchment in the Bantry AFA. The River Bantry is 2.2km long, rises near Ardnageehy More (101050, 048450) and flows along a fairly steep channel (a gradient of up to 1 in 30) before passing into a tidally influenced culvert under Chapel Street in Bantry. The culvert passes under Bantry town centre and terminates in an outfall into Bantry Harbour. The River Bantry is joined by five tributaries: the Knocknaveagh, Sheskin East, Carrignagat, Dromleigh and Reenrour tributaries. The four tributaries to the south of Bantry River, the Knocknaveagh, Sheskin East, Carrignagat and Dromleigh, are all narrow and steep channels with many engineered sections, including culverts, weirs, bridges and aqueducts. The Reenrour Stream is the largest tributary to Bantry River and it has a shallower gradient of approximately 1 in 50. The lowest reach of the Reenrour is culverted and has a confluence with Bantry River in the long culvert beneath Bantry Town.

⁶ The designation of a watercourse as high priority or medium priority is not a reflection of how the watercourse is viewed in terms of its importance in flood risk management planning.

The third hydrological catchment in the Bantry AFA contains the Kilnaruane and Dromacoosane Rivers which flow through a predominantly rural area on the coast to the south of Bantry.

Bantry Bay is a narrow tidal bay which extends from Dursey Island inland to Ballylicky and the Owane River outfall. Bantry Bay has a number of islands which modify the tidal current and provide some protection to the mainland from incoming storm waves. These islands include Bear Island at Castletown Bearhaven and Whiddy Island at Bantry. Castletown Bearhaven Harbour is further protected from extreme waves by Dinish Island which is a low lying extension of the Castletown Bearhaven port with low sea walls protecting the quayside.

Durrus AFA

The Durrus River runs approximately 10km from its source in the Coomnagoragh Mountain range (0102200, 044770). At Ballycommene it is renamed Four Mile Water and continues as an open channel to Dunmanus Bay. The Four Mile Water River is tidally influenced as far upstream as the waterfall at (094730, 042040), 500m upstream of Carrigboy Bridge. The only tributary to Four Mile Water is the Ahanegavanagh Stream which flows southwards from the Coomkeen area (094480, 044850) to Dunmanus Bay, joining the Four Mile Water River in the tidally influenced reach downstream of Durrus town.

Dunmanus Bay is the smallest and narrowest of the three bays considered in UoM21. It extends from Mizen Head to Four Mile Water at Durrus. The Bay is characterised by steep cliffs along the headlands but develops more estuarine tidal bars at Four Mile Water outfall. Durrus AFA is actually located some distance from the tidal outfall of Four Mile Water, and well above the extreme coastal conditions. Therefore, flooding from coastal sources has not been assessed at Durrus for the CFRAM study.

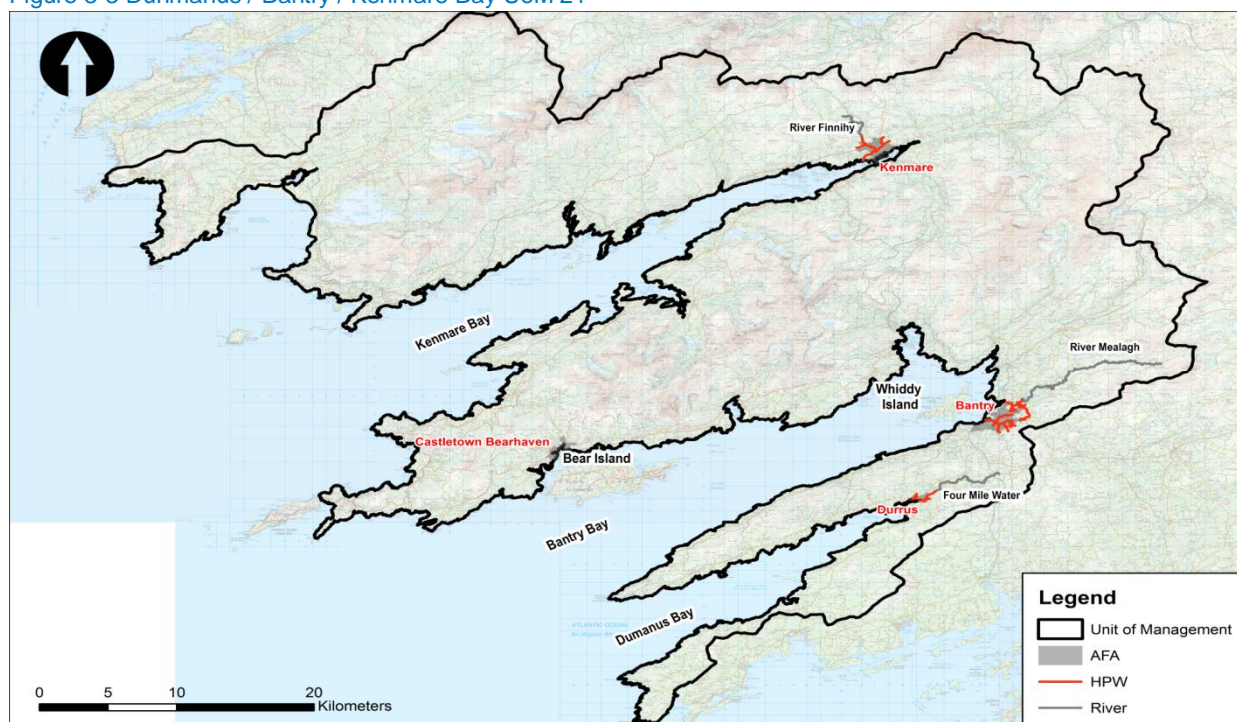
Kenmare AFA

The River Finnihy flows from Barfinnihy Lough at 084950,076590 down a very steep channel before being joined by a number of small tributaries, and flowing south-eastwards towards Kenmare. Within the town, the River Finnihy flows over a waterfall 300m upstream of Finnihy Banks estate, and is joined by the Lissaniska tributary immediately upstream of Finnihy Bridge. The river channel then meanders to the west, under Cromwell's Bridge and continues to outfall into Kenmare Bay/River at 090030,070190. The River Finnihy is tidally influenced as far as Cromwell's Bridge under typical tidal conditions but the tidal influence can extend beyond Finnihy Bridge under extreme high tides. The only other tributary considered in Kenmare is Gortamullen Stream which drains the bog land to the north of the N70. The Gortamullen Stream rises at 089802,071366 and then splits flow between the Claddanure catchment to the west and the Finnihy catchment to the east. The eastern branch flows down a stream reach (a gradient of 1 in 55) before entering a long culvert at the N70 (090208,071500) to join the River Finnihy immediately downstream of the waterfall.

Kenmare Bay known as Kenmare "River" is protected under the Habitats Directive as a Special Area of Conservation for its shallow inlets and varying shoreline cliffs and dune areas. It narrows towards Kenmare into "The Sound" inland of the N71 crossing. The Sound is characterised by more estuarine features including a series of in-channel bars and tidal channel loops. The low tide channel width and

shape is highly variable in this dynamic fluvial-tidal environment and varies from channel widths of 50m to 195m. There are also low lying areas at Reennagross which are covered by high spring tides.

Figure 3-3 Dunmanus / Bantry / Kenmare Bay UoM 21



3.4.1 Areas for Further Assessment in UoM 21

The Dunmanus / Bantry / Kenmare Bay UoM contains four contains four Areas for Further Assessment (AFAs). Associated with the AFAs is over 25km of high and medium priority watercourse.

Table 3.2: List of AFAs in the Dunmanus / Bantry / Kenmare Bay UoM

| AFA Name | Unique ID | Fluvial Flooding | Coastal Flooding | County | Easting | Northing |
|----------------------|-----------|------------------|------------------|--------|---------|----------|
| Bantry | 210307 | Yes | Yes | Cork | 99750 | 48500 |
| Castletown Bearhaven | 210308 | No | Yes | Cork | 68000 | 46000 |
| Durrus | 210309 | Yes | No | Cork | 95000 | 42000 |
| Kenmare | 210312 | Yes | Yes | Kerry | 90750 | 70500 |

3.5 Flood Risk Management Options for the Dunmanus / Bantry / Kenmare Bay UoM

Flood risk management options for the Dunmanus / Bantry / Kenmare Bay UoM have been identified through option appraisal. Non-structural and structural options (as described in Table 3.1 of this report) will be combined to reduce the risk of damage to properties from flooding. Structural options are not viable for all AFAs however non-structural measures can be applied on a UoM basis.

This Appropriate Assessment Screening was carried out in conjunction with the option appraisal process such that potential environmental impacts of the various options are considered at option selection stage.

3.5.1 Non-Structural Measures

Planning Control

In November 2009, the Guidelines on the Planning System and Flood Risk Management, jointly developed by DECLG and the OPW, were published under Section 28 of the Planning Acts. These Guidelines provide a systematic and transparent framework for the consideration of flood risk in the planning and development management processes, whereby:

A sequential approach should be adopted to planning and development based on avoidance, reduction and mitigation of flood risk.

A flood risk assessment should be undertaken that should inform the process of decision-making within the planning and development management processes at an early stage.

Development should be avoided in floodplains unless there are demonstrable, wider sustainability and proper planning objectives that justify appropriate development and where the flood risk to such development can be reduced and managed to an acceptable level without increasing flood risk elsewhere (as set out through the Justification test).

The proper application of the Guidelines by the planning authorities is essential to avoid inappropriate development in flood prone areas, and hence avoid unnecessary increases in flood risk into the future. The flood mapping provided as part of the FRMP will facilitate the application of the Guidelines.

In flood-prone areas where development can be justified (i.e., re-development, infill development or new development that has passed the Justification Test), the planning authorities can manage the risk by setting suitable objectives or conditions, such as minimum floor levels or flood resistant or resilient building methods.

Building Regulations / Planning Conditions

The risk of damage to properties from flooding can be mitigated by the use of appropriate construction techniques and materials. For example the damage caused to an internal wall of a property by flooding can depend on the materials and methods of its construction. A timber stud partition covered with plasterboard with low level electrical wiring would have to be completely replaced following immersion in flood water. However, a solid concrete block wall covered with tiles and high level electrical wiring on the other hand would only have to be washed down following a flood.

If for a particular town or high flood probability areas, certain building regulations or planning conditions were adopted that ensured structures were flood resilient through specified construction methods, building fabrics and uses, a decrease in the risk of damage could be achieved. The question of whether such regulations or planning conditions could be imposed upon developers, business owners or householders in flood prone areas would need to be addressed at implementation stage.

Flood Forecasting

Flood forecasting is a means of providing advanced warning of an impending flood event. A reliable advance warning system allows protective measures to be put in place and protective actions to be carried out in advance of a flood event. These actions and measures can reduce the damage caused in a flood event.

Flood forecasting is not a viable Flood Risk Management Measure for all of the UoM 21 AFAs. This is because the time between transmitting a flood forecast and the arrival of flood waters may not be long enough for people to take effective action to reduce flood damage. Flood warning is a viable option in the Castletownbere, Bantry and Kenmare AFAs. The infrastructure required for flood forecasting in these AFAs are listed in Table 3.3.

Table 3.3: Flood Forecasting Infrastructure required

| AFA | Infrastructure |
|---------------------------------|--|
| Castletownbere Tidal | Subscribe to OPW Surge forecast system |
| Kenmare Tidal | Subscribe to OPW Surge forecast system |
| Bantry Fluvial (on the Meelagh) | Rain Gauges |
| | River Level Gauges |
| | Flood Forecasting model and warning infrastructure |
| Bantry Tidal | Subscribe to OPW Surge forecast system |

Public Awareness

Many of the measures to mitigate and manage flood risk and the potential consequences for flooding will involve the public at large. It is therefore important that the public is made aware of where to find information, what the information means and what actions the public and business owners can take to reduce the damage that would occur to their properties, possessions and interests in the event of a flood.

Measures to increase and promote public awareness include:

- | Identifying the areas prone to flooding
- | Information on measures to be implemented to reduce and / or manage the risk of flooding
- | Measures in place to provide advance warning of flooding
- | Establishment of methods to interface with the public and in particular the owners of vulnerable properties, i.e. workshops and meetings, Facebook, Twitter, text messaging, newsprint, websites, etc.

Land Use Management

Land Use Management includes strategies to control overland flow, such as improving agricultural and forestry practices in key catchment areas. Local natural flood management measures such as the creation of wetlands or forestry to retain overland flow could also be adopted.

Emergency Response Planning

Well prepared and executed emergency response plans can significantly reduce the impact of flood events, particularly for human health and welfare.

The Framework for Major Emergency Management was developed in 2005 and was adopted by Government decision in 2006. Its purpose is to set out common arrangements and structures for front line public sector emergency management in Ireland. The Framework is based on the internationally recognized systems approach that, in essence, proposes an iterative cycle of continuous activity through five stages of emergency management:

- Hazard Identification
- Mitigation
- Preparedness
- Response
- Recovery

Under the Framework, Local Authorities are designated as the lead agency for co-ordinating the response to severe weather events, and each Local Authority should have, as a specific sub-plan of its Major Emergency Plan, a plan for responding to severe weather emergencies, whether a major emergency is declared or not. The other principal response agencies should include sub-plans for responding to notifications from the Local Authorities of severe weather warnings.

A Guide to Flood Emergencies (MEM Guidance Document 11, July 2013) has been published to assist the Principal Response Agencies in meeting their responsibilities, under the Framework for Major Emergency Management, and to deliver on the responsibilities of the OPW and the Local Authorities with respect to emergency planning as set out in the Report of the Flood Policy Review Group. The Guide provides advice on the development and implementation of consistently effective flood emergency response and short-term recovery planning by the Principal Response Agencies and others, and includes a template plan.

3.5.2 Structural Measures

Structural flood risk management options for the Dunmanus / Bantry / Kenmare Bay are shown in Table 3.4. Options are presented in terms of the viable options considered for each AFA. Drawings showing the viable flood risk management options are included in the Preliminary Options Report. It should be noted that these drawings are indicative only. The locations in which viable options may be constructed within the AFAs may change at detailed design stage if an option is progressed through a scheme.

The preferred option for the AFAs emerges following technical assessment and cost analysis of the viable options and following input from public consultation.

Table 3.4: Structural Flood Risk Management Options for UoM 21

| AFA | Viable Options |
|----------------|---|
| Bantry | <ul style="list-style-type: none"> Option 1 - Flood defences and road raising - flood embankments in Caherdaniel West and Newtown and tidal walls in Bantry town couples with road raising on the N71. Option 2 - Flood defences and tidal barrage – flood embankments in Caherdaniel West and Newtown and tidal barrage in the harbour with an inner area of approximately 78,880m². The barrage will need to be closed at the low tide preceding a tidal event in order to accommodate fluvial flows. The barrage would remain closed until the tide level outside is lower than the maximum water level within the barrage 9modelled as being approx. 9 hours). |
| Castletownbere | <ul style="list-style-type: none"> Walls and Flood Barriers |
| Durrus | <ul style="list-style-type: none"> No measures are proposed. |
| Kenmare | <ul style="list-style-type: none"> Option 1 - Flood defences including walls, embankments, road raising and flood gates Option 2 - Storage on the Finnihy River coupled with flood defences Option 3 - Removal of a foul sewage pipe from across the eye of Finnihy Bridge coupled with flood defences Option 4 - Flow Diversion along the Kealnagower Stream and through the town by diverting flows to Kenmare Bay. Option 5 - Combination of Conveyance, Flow Diversion and Flood Defences |

3.6 Flood Risk Management Options with Potential for Significant Effects on Natura 2000 Sites

Flood risk management measures, while having a positive social impact can have a negative environmental impact. The requirement for ecological protection can limit potential options for flood risk

management. The South Western River Basin District contains a variety of habitats and species of conservation concern which are protected under national and European legislation. A flood risk management option is unlikely to emerge as the preferred option for an AFA where there is an associated significant impact on species or habitats for which Ireland has designated areas for their protection (i.e. Natura 2000 Sites).

The potential impacts of the structural and non-structural flood risk management options for UoM 21 are characterised hereunder.

3.6.1 Potential Impacts of Non-Structural Options in UoM 21

Periodic high (flood) and low (drought) flows are a natural element of river hydrology. The flora and fauna inhabiting a watercourse and its riparian zone will be adapted to the natural variation in flow and level which is typical of the system. An extreme flood event, outside of the river systems normal range, can have negative impacts on the ecology of the watercourse as follows:

- i Prolonged submergence of riparian flora can result in damage to and loss of species, this can provide opportunity for colonisation by invasive species;
- i Increase pollution of the watercourse due to high levels of runoff from land and increased erosion of river banks due to high flow velocities can lead to high sedimentation in the river which can have subsequent negative impacts on fishery habitat;
- i Reduced biomass in the watercourse due to the washing out of macroinvertebrates and detritus which has subsequent impacts on populations of consumers in the watercourse;

With the exception of Land Use Management, non-structural measures will not restrain the flow of water during an extreme flood event. The implementation of these measures cannot therefore influence the current frequency, extent or depth of flooding. Impacts on an ecosystem from an extreme flood event will not be prevented by the implementation of non-structural measures. Non-structural measures can however prevent future exacerbation of flooding by ensuring that development within the catchment will not increase runoff to the watercourse through Planning Control.

Land Use Management aims at retaining / delaying runoff within a catchment such that a sudden increase in flows in a watercourse is not experienced / is limited. This option can have the effect of reducing the depth and extent of a flood event. There will be an associated reduction in the potential negative impacts on ecology. Land Use Management provides an opportunity to increase biodiversity through creation of woodland or wetland habitat in place of agricultural lands. This can have a long term positive impact.

Flood Forecasting requires the installation of gauges along a watercourse to measure level and flow. Typically, river gauges are installed within a housing (usually a PVC pipe) strapped to a bridge. The bridge acts as a supporting structure to the gauge housing, thereby eliminated the requirement for bankside works. It is not always practical to site a river gauge at the location of a bridge, in which case a bank-side structure is required to support the gauge. The installation of a gauge and supporting structure can have the following impacts on the watercourse:

- i permanent removal of riparian vegetation to accommodate the support structure;
- i temporary disturbance of river bank and river bed during installation resulting in the release of sediment into the watercourse which can cause temporary deterioration in the quality of fishery habitat and can smother immobile flora and fauna in the watercourse;
- i release of concrete into the watercourse (where the structure is not prefabricated) which can result in reduced water quality with subsequent negative consequences for the ecology of the watercourse;
- i temporary noise and physical disturbance to species in proximity to the gauge site during installation;
- i alteration of water turbulence / flow pattern in the immediate vicinity of the gauge structure which can result a change in erosion / deposition pattern locally and therefore a change in habitat.

3.6.2 Potential Impacts of Structural Options in UoM 21

The viable structural options identified for the management of for the extreme flood event within the UoM can be summarised as Storage, Conveyance Measures (removing pipe from Finnihy Bridge in Kenmare), Flood Walls and Embankments, and Tidal barrage. The potential impacts associated with each viable structural option are presented hereunder.

Storage

Storage is provided upstream of a flood risk area in order to limit the flow in the downstream watercourse such that it does not overtop its banks. The storage area will come in to operation in times of flood flows. Implementation of flood storage requires the availability of land upstream of the flood risk area with suitable topography which can be allowed to flood during flood conditions in the river. A storage area / reservoir is typically formed by constructing earth embankments perpendicular to the course of the river coupled with a control structure on the watercourse which will limit flows to that which can be accommodated downstream. The storage area is designed such that during flood flows the watercourse will overtop its banks into the surrounding lands within the storage area (which is contained by the earth embankments) and the control structure will ensure that flows downstream are maintained at levels which will not overtop the banks.

Flood Storage has been determined to be a viable option for the Finnihy River in Kenmare comprising a 32,150m² area in an agricultural setting. A 6m high earth embankment is proposed as the retaining structure coupled with a control structure.

Construction of the flood storage area will require that earth is brought to site for embankment construction. Potential significant environmental effects associated with the construction of embankments include:

- i Sedimentation of the Finnihy River. Sediment deposition in a watercourse can cause a temporary to short term reduction the quality of fishery habitat by infilling interstitial spaces in gravel beds. Sedimentation can reduce light penetration in the water column and can affect oxygen levels both in

the river bed and in the free moving water thereby impacting river vegetation and river fauna. Sedimentation can block the gills of in-stream fauna.

- i Introduction of invasive species, e.g. Japanese Knotweed, in the earth imported to site.

The storage areas will require a control structure (sluice gate / penstock) to be installed on the watercourse to ensure downstream flows are maintained below extreme flood levels. The installation of the control structure will require in-stream works. Installation of a sluice gate / penstock requires that bed and bank material is excavated and the section is replaced by a concrete channel and walls such that the control structure can be anchored to the concrete. Potential significant environmental effects associated with the installation of the control structure include:

- i Permanent loss of river bed and river bank within the footprint of the control structure;
- i Damage to the river bed and bank due to machinery movement in-stream;
- i Release of sediment in to the watercourse during installation caused by disturbance to river bed and banks (sedimentation effects are discussed in relation to the embankments above);
- i Obstruction to fish / lamprey passage within the river channel when the control structure is restricting flows;
- i Isolation of fish / lamprey within the flooded storage area in the event that flood waters subside rapidly;
- i Creation of temporary wetland habitat within the storage area during flooding;

Conveyance Measures

Conveyance Measures involve the physical alteration of a river channel or floodplain to improve flood flow throughput. The removal of the foul sewer pipe from across the eye of the Finnnihy Bridge is a conveyance measure. Potential environmental effects of removing the pipe from across the eye of the bridge include:

- i Disturbance of river bank and bed where in-stream works are required in order to access the pipe;
- i Pollution of the watercourse by accidental release of foul sewage which may be within the section of pipe to be diverted.

Flow Diversion

Flow diversion involves the interception of flood flows within a watercourse and diverting these flows through an artificial channel into another watercourse or into another section of the same watercourse such that a reduction in water volumes is achieved within areas at risk of flooding. Flow diversion has been identified as a viable option for the Kealnagower stream to Kenmare Bay. Potential environmental effects include:

- i Increased flow volume and velocity in the Kenmare Bay during storm events. This can cause bankside erosion and associated loss of habitat;
- i Scouring of the bed of the Kealnagower stream at the culvert discharge point resulting in possible loss of fishery habitat and sedimentation of the watercourse;
- i Attraction of fish into the culvert and ultimately into the Kenmare Bay when the culvert is in operation.

Flood Walls and Embankments

Flood Walls and Embankments are physical structures designed to contain floodwaters for a defined flood event. Floodwalls can be constructed from a variety of materials including concrete, brick / stone masonry and steel. Embankments are typically constructed from earth which is vegetated to protect against erosion.

The construction of flood walls and embankments has been determined to be a viable option in Bantry, Castletownbere and Kenmare. The physical implementation of these structural measures can have the following environmental effects:

- i Temporary release of sediment to the watercourse from embankments with subsequent effects on habitat quality;
- i Compaction of riparian area due to weight of embankment and machinery movement during construction (note embankment design would need to consider ground stability).
- i Introduction of invasive species, e.g. Japanese Knotweed, in the earth imported to site for embankments;
- i Accidental spill of construction materials e.g. concrete for wall construction, which can have toxic effects on flora and fauna;
- i Noise disturbance to species during construction.

Tidal Barrage

A tidal barrage is a viable option for Bantry. The barrage will be a solid structure with a gate / penstock system to allow tidal conditions to operate as normal except in times of tidal flooding where the penstocks would close and the barrage would become impermeable. The barrage should be closed at low tide. This will facilitate adequate storage for fluvial flows from the Bantry Stream, the Knocknavaghnea stream, the Ardnageehy and Mileencoola East Streams. The barrage would require an inner area of approximately 78,880m² and a minimum barrage height of 2.98m. The barrage would be required to remain closed for approximately 9 hours during flooding. Potential impacts of constructing a barrage in Bantry Harbour include:

- i Damage to habitat within the footprint of the barrage;
- i Alteration of tidal inundation within the barrage during flooding (because barrage is closed) and change in salinity due to stronger fluvial influence when barrage is closed;
- i Restriction of fish movement during barrage closure;
- i Disturbance of estuary bed causing sediment plumes during construction;
- i Noise impacts during construction;

4 Characteristics of Natura 2000 Sites

4.1 Natura 2000 Sites within the Zone of Impact

Natura sites which are located within 15km of UoM 21, and have been considered as part of this screening are presented in table 4.1, along with the distance to the Natura sites and identification of Source-Pathway-Receptors. Viable flood risk management options have been determined for the AFAs of Kenmare, Castletownbere and Bantry. The AFAs and their location in relation to Natura 2000 sites within 15km are presented in Appendix B.

Table 4.1: Natura Sites Within 15km of UoM 21 AFAs

| Natura 2000 site | Distance from AFAs (km) | Source-Pathway-Receptor Identification between viable options and Natura 2000 Sites |
|---|-------------------------|--|
| Special Areas of Conservation (SAC) | | |
| Kenmare River SAC | 0.0km | Flood risk management options in Kenmare are proposed for both the Finnihy River. Kenmare River SAC (002158) extends from the N71 road bridge crossing seaward as far as Dursey Island and Scariff Island and includes the tidal extent of the Finnihy River which stops approximately 200m short of the Finnihy Bridge. Flood risk management measures are proposed at the Finnihy Bridge and may extend to within the SAC. |
| Mucksna Wood SAC | 0.1km | No viable source pathway receptor identified |
| Dunbeacon Shingle SAC | 2.1km | No viable source pathway receptor identified |
| Killarney National Park, Macgillicuddy's Reeks and Caragh River Catchment SAC | 3.2km | No viable source pathway receptor identified |
| Sheep's Head SAC | 4.3km | No viable source pathway receptor identified |
| Kilgarvan Ice House SAC | 4.3km | No viable source pathway receptor identified |
| Blackwater River (Kerry) SAC | 4.5km | No viable source pathway receptor identified |
| Reen Point Shingle SAC | 4.8km | No viable source pathway receptor identified |
| Glanmore Bog SAC | 5.3km | No viable source pathway receptor identified |
| Maulagowna Bog SAC | 5.7km | No viable source pathway receptor identified |
| Old Domestic Building, Dromore Wood SAC | 6.3km | No viable source pathway receptor identified |
| Glengarriff Harbour and Woodland SAC | 6.9km | No viable source pathway receptor identified |
| Roaringwater Bay and Islands SAC | 7.9km | No viable source pathway receptor identified |
| Glanlough Woods SAC | 8.1km | No viable source pathway receptor identified |
| Caha Mountains SAC | 8.1km | No viable source pathway receptor identified |
| Cleanderry Wood SAC | 8.2km | No viable source pathway receptor identified |
| Derryclogher (Knockboy) | 8.3km | No viable source pathway receptor identified |

| Natura 2000 site | Distance from AFAs (km) | Source-Pathway-Receptor Identification between viable options and Natura 2000 Sites |
|--|-------------------------|--|
| Bog SAC | | |
| Cloonee and Inchiquin Loughs, Uragh Wood SAC | 9.0km | No viable source pathway receptor identified |
| Farranamanagh Lough SAC | 10.8km | No viable source pathway receptor identified |
| Old Domestic Building, Curraglass Wood SAC | 13.9km | No viable source pathway receptor identified |
| Barley Cove to Ballyrisode Point SAC | 14.9km | No viable source pathway receptor identified |
| Special Protection Areas (SPA) | | |
| Beara Peninsula SPA (004155) | 0.8km | The Castletownbere AFA boundary does not overlap with any Natura 2000 site boundary. The nearest Natura 2000 site is the Beara Peninsula SPA (004155), which is approximately 3.5km south of Castletownbere. |
| Killarney National Park SPA (004038) | 5.3km | No viable source pathway receptor identified |
| Eirk Bog SPA (004108) | 7.6km | No viable source pathway receptor identified |
| Sheep's Head to Toe Head SPA (004156) | 10.8km | No viable source pathway receptor identified |

There is potential that impacts as described in Section 3.6 of this Screening Assessment could affect the qualifying features of the Kenmare River SAC (002158) and the Beara Peninsula SPA (004155).

Figure 4.1: Kenmare AFA Boundary in Relation to EU (Natura 2000) Sites

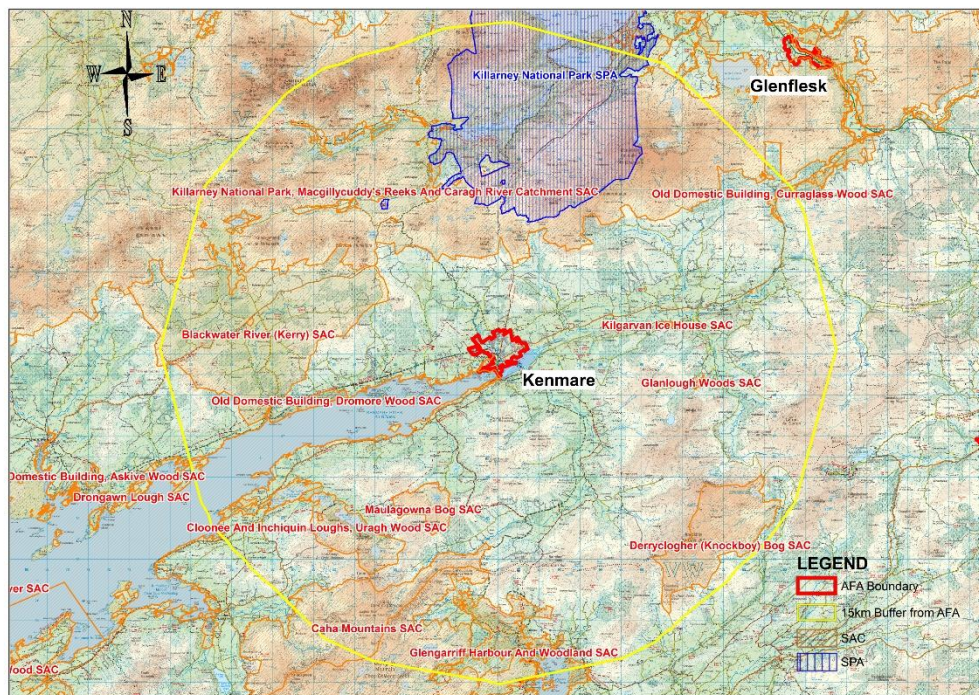


Figure 4.2: Castletownbere AFA Boundary in Relation to EU (Natura 2000) Sites

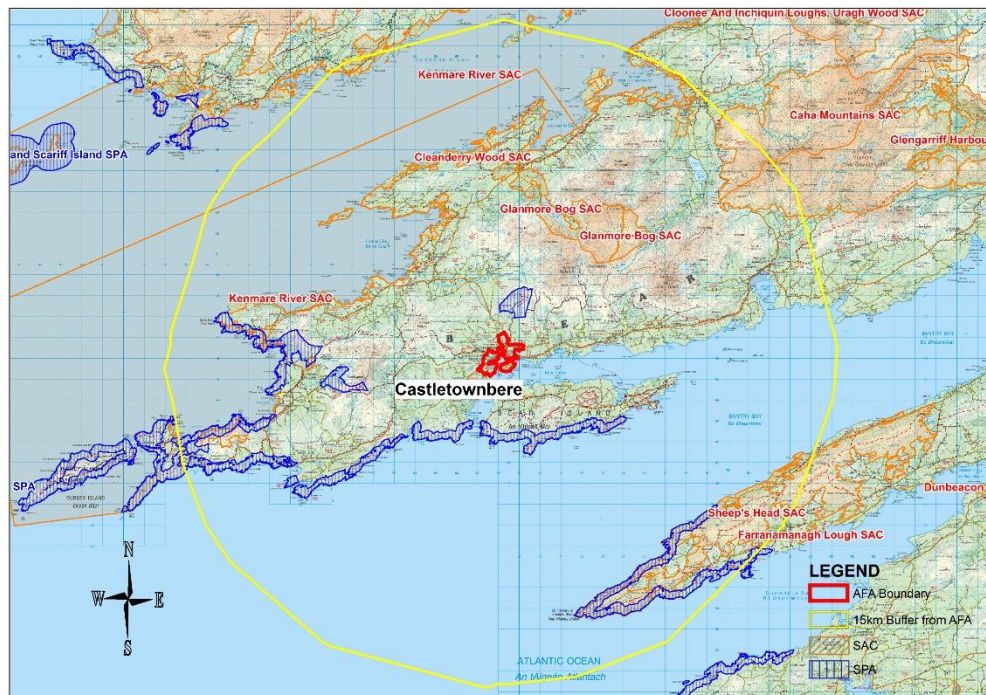
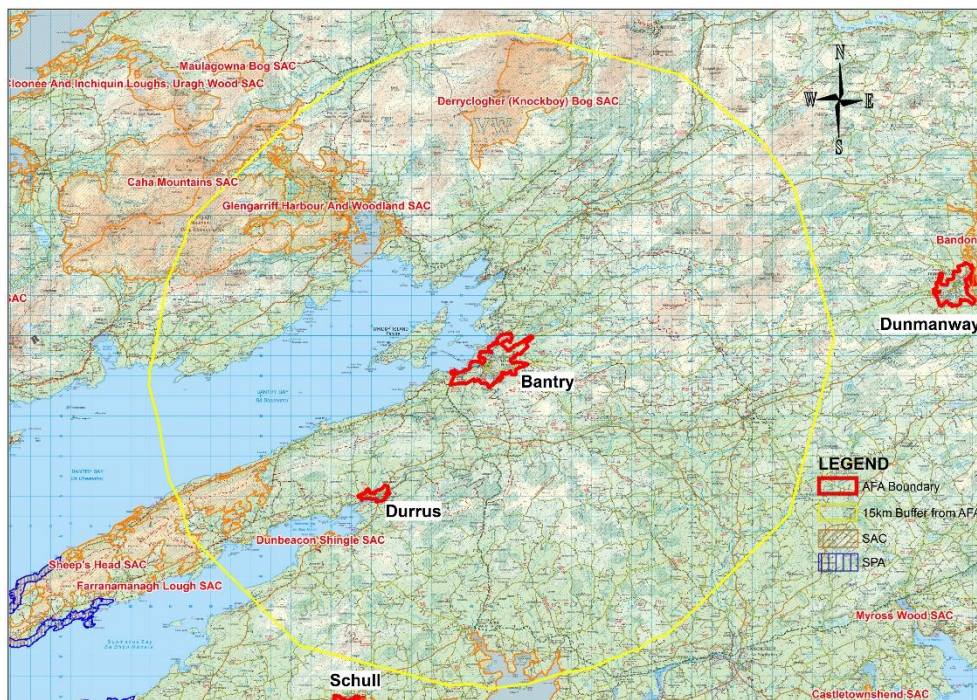


Figure 4.3: Bantry AFA Boundary in Relation to EU (Natura 2000) Sites



Kenmare River SAC (002158)

Kenmare River is a long and narrow south-west facing bay situated in the southwest of Ireland. The site includes very good quality examples of large shallow bays, reefs, and marine caves. Kenmare River is the only known site in Ireland for the northern sea-fan (*Swiftia pallida*) (which occurs near Sneem / Ardgroom). Qualifying features of the SAC are: [1160] large shallow inlets and bays, [1170] reefs, [1220] perennial vegetation of stony banks, [1230] vegetated sea cliffs, [1330] Atlantic salt meadows, [1410] Mediterranean salt meadows, [2120] marram dunes (white dunes), [2130] fixed dunes (grey dunes)*, [4030] dry heath, [6130] Calaminarian grassland, [8330] sea caves, [1014] narrow-mouthed whorl snail (*Vertigo angustior*) (found in Derrynane), [1303] lesser horseshoe bat (*Rhinolophus hipposideros*), [1355] otter (*Lutra lutra*) and [1365] common (harbour) seal (*Phoca vitulina*).

Beara Peninsula SPA (004155)

The Beara Peninsula SPA is a coastal site situated on the west coast of Co. Cork, south-west of the town of Kenmare. It encompasses the high coast and sea cliff sections of the western end of the peninsula from Reenmore Point/Cod's Head in the north, around to the end of Dursey Island in the west, and to Bear

Island in the south. The site is designated for fulmar (*Fulmarus glacialis*) and chough (*Pyrrhocorax pyrrhocorax*).

4.2 Likelihood of Impacts on Natura 2000 Sites

The likelihood of the potential impacts as described in Section 3.6 of this Screening Assessment affecting the qualifying features of the Kenmare River SAC (002158) and the Beara Peninsula SPA (004155) is determined through Source-Pathway-Receptor assessment.

A review of available data was carried out to determine the presence of qualifying features of the designated areas within the environs of Kenmare, Bantry and Castletownbere AFAs. Data reviewed included:

- | Protected species spatial datasets for the SWRBD provided by NPWS
- | Article 17 spatial data on protected habitats and species available through NPWS website
- | Article 12 reporting data on breeding distributions and ranges of protected bird species available through NPWS website
- | iWebs data
- | National Survey of Native Woodlands 2003-2008 spatial data available through NPWS website
- | Irish Semi-Natural Grassland Survey spatial data available through NPWS website
- | Coastal Monitoring Project 2004-2006 available through NPWS website
- | Saltmarsh Monitoring Project 2006-2008 available through NPWS website
- | Protected species data sourced through the National Biodiversity Data Centre

The likelihood of an impact occurring is characterised in accordance with the NRA (2009) classification:

- | Near-certain: >95% chance of occurring as predicted
- | Probable: 50-95% chance of occurring as predicted
- | Unlikely: 5-50% chance of occurring as predicted
- | Extremely unlikely: <5% chance of occurring as predicted

4.2.1 Bantry AFA

There is no potential for the flood risk management works in the Bantry AFA to impact upon Natura 2000 sites due to absence of connectivity to any Natura 2000 site. Bantry AFA is screened out from further assessment.

4.2.2 Castletownbere AFA

The Beara Peninsula SPA is approximately 3.5km south of Castletownbere. Flood walls and property defences are viable options to provide tidal flood protection within the town. The works will be confined to within the existing urban landscape. There is no potential for the destruction of habitats which support flumar or chough.

Disturbance to species is extremely unlikely given distance from site. The flight response distance (i.e. the point at which the bird moves away from a source of disturbance) varies between species, is greater during adverse weather, and depends on the acclimatisation of the birds to such disturbance. Wetland birds have been documented to tolerate noise levels at or below 70dB(A) (Institute of Estuarine & Coastal Studies, University of Hull, 2009). BS 5228-1:2009+A1:2014 prescribes typical noise level data for various construction plant and activities within 10m from source. The inverse square law⁷ can be applied to determine likely noise levels at varying distances from construction activities (Table 4.2).

Table 4.2: Noise Levels, dB(A), at Various Distances from Construction Activities

| Distance from Source (m) | Tracked excavator | Mixing cement - large lorry concrete mixer | Dumper Truck (empty) | Dumper Truck (tipping fill) | Breaking concrete | Dozer | Wheeled Loading Lorry |
|--------------------------|-------------------|--|----------------------|-----------------------------|-------------------|-----------|-----------------------|
| 10 | 78 | 77 | 87 | 79 | 96 | 81 | 80 |
| 20 | 74 | 73 | 83 | 75 | 92 | 77 | 76 |
| 40 | 68 | 67 | 77 | 69 | 86 | 71 | 70 |
| 80 | 62 | 61 | 71 | 63 | 80 | 65 | 64 |
| 160 | 56 | 55 | 65 | 57 | 74 | 59 | 58 |
| 320 | 50 | 49 | 59 | 51 | 68 | 53 | 52 |
| 640 | 44 | 43 | 53 | 45 | 62 | 47 | 46 |
| 1280 | 38 | 37 | 47 | 39 | 56 | 41 | 40 |
| 2560 | 32 | 31 | 41 | 33 | 50 | 35 | 34 |

Based on BS 5228-1:2009+A1:2014

From Table 4.2, noise generated during construction will have diminished to tolerable levels for wetland birds [70dB(A)] within 320m of the works.

Sediment release to the harbour is extremely unlikely given that the walls would be constructing within existing hardstanding areas along the coast.

4.2.3 Kenmare AFA

The viable flood risk management options for Kenmare are located within the town. It is extremely unlikely that the options will result in direct damage to Annex I habitat for which the SAC is designated given that these are primarily coastal habitats and the options will be implemented inland.

The SAC is designated for narrow-mouthed whorl snail. The location of this population is Derrynane. It is highly unlikely that the construction of flood walls within Kenmare will impact whorl snail.

⁷ Inverse Square Law – For every doubling of the distance from the noise source, the sound pressure levels will broadly be reduced by 6 decibels (dB)

Kenmare River SAC is designated for lesser horseshoe bat. There are fourteen confirmed roosts for this species within a 6km radius⁸ of Kenmare (NPWS Data). The nearest roost is located approximately 1.5km from Finnihy Bridge. Disturbance to roosts by noise is extremely unlikely given the distance between the roosts and flood risk management options. Conveyance measures to the Finnihy Bridge (i.e. removal of the existing foul pipe from the bridge) will not alter the existing linear structure of the bridge (which might be used by lesser horseshoe bat as navigation for commuting). The re-location of the effluent pipe may require the removal of riparian trees to accommodate a new pipe crossing of the Finnihy River. The number of trees requiring removal will be related to the trench width required to lay the pipe, which, assuming a 450mmø pipe, equates to 900mm diameter trench (ref. IW-STD-WW-7). The removal of a limited number of trees to accommodate the pipe crossing would not significantly alter the linear structure of the treeline such that it would affect lesser horseshoe bat commuting.

The storage area is proposed within agricultural lands in the Gortamullen area, opposite a small ribbon development of eight residential properties. The nearest recorded lesser horseshoe bat roost is located 2.5km south, near the coast, and is a hibernation/satellite roost (NPWS data). Lesser horseshoe bats normally forage in woodlands/scrub within 2.5km of their roosts (Schofield, 2008), and are therefore unlikely to commute to this area of the Finnihy River. Notwithstanding this, the Finnihy River flows immediately adjacent to the N71 at the proposed location of the storage area. The riparian treeline is sparse (gappy) and narrow as it has been isolated to a narrow strip located between the road and the river and is restricted on the opposite bank by agricultural activities. It will be necessary to remove approximately 500m of this treeline north of the proposed control structure on the river to accommodate the storage area. However, given the habitat is sub-optimal for lesser horseshoe bat (due to its location immediately adjacent to the busy N71 road and opposite residential properties, causing light pollution, and the low-density planting of the treeline), it is unlikely to be used as commuting or foraging habitat and will therefore not cause a reduction in the quality of foraging habitat or commuting behaviour.

Flow diversion of the Kealnagower Stream is proposed in proximity to the mixed residential and retail units recently constructed in Killowen. High flows in the stream will be diverted to the coast during flood conditions. The diversion will be via a 650mmø culvert. Installation of same will likely require a 1200mm diameter trench (ref. IW-TEC-1000-01). There will be an associated requirement to remove a corridor of broadleaf woodland (to accommodate the 1.2m trench) from within the golf course located at the coast. This habitat is likely to be used as foraging by lesser horseshoe bats. Knight (2006) identified the importance of edge habitat to lesser horseshoe bat foraging. The partitioning of the woodland within the golf course will therefore have the effect of increasing the edge habitat (woodland margin) available to lesser horseshoe bat for foraging i.e. this will have a positive effect on lesser horseshoe bat habitat.

Flood walls and embankments are proposed within Kenmare town. The defences on the Finnihy River are generally proposed within agricultural lands or on existing hardstanding areas and will not require significant removal of trees or hedgerows. It may be necessary to remove a linear strip of woodland, approximately 200m in length, along the N71 road, north of the Finnihy Bridge and south of the school/convent. However, the woodland itself will not be removed and will not affect the availability of foraging habitat. The construction of flood walls on the Kealnagower Stream would likely require the

⁸ Bat Conservation Ireland recommends a 6km zone of assessment such that impacts on foraging and commuting are accounted for.

removal of a proportion of riparian habitat. However, this stream is within a highly urbanised area with high lighting levels which would act as a deterrent to usage by lesser horseshoe bat.

Otter habitat as mapped in the Kenmare River Conservation Objectives Report represents a 10m terrestrial buffer along shoreline. There have been numerous sightings of otter along the coast near Kenmare (ref <http://maps.biodiversityireland.ie/#/Map>). Otter are likely to be present on the Finnihy River. Disturbance to otter by noise during the development of the flood risk management measures is highly unlikely given that otter are crepuscular animals (most active at dawn and dusk). Additionally, the works are proposed within the urban fabric of the town, where an otter holt / couch is unlikely. The storage area is proposed to be located immediately adjacent to the N71 road. The riparian habitat on the Finnihy River at this location is suboptimal for otter. Additionally, the location next to the busy N71 road would be a deterrent to use by otter.

The Finnihy River hosts a freshwater pearl mussel population. This is not a qualifying feature of the Kenmare River SAC therefore there can be no impacts on the conservation objectives of the SAC by impacting this species.

DAHG Guidance (2014) sets out measures to minimise the risk of noise related impacts on aquatic mammals caused by maritime sound-producing operations or activities. The guidance specifies that operations should not commence if marine mammals are detected within a 500m radial distance of dredging / drilling activities. The Kenmare River Conservation Objectives Report identifies breeding and moulting sites for common seal. Viable options for flood management in Kenmare are concentrated on the Finnihy River and are located in excess of 500m from the harbour. Noise impacts on seal are therefore extremely unlikely.

4.2.3.1 Summary of Likely Impacts on the Kenmare River SAC and the Beara Peninsula SPA

No likely impacts have been determined on the Kenmare River SAC and the Beara Peninsula SPA from the implementation of viable options in the Kenmare AFA and the Castletownbere AFA.

4.3 In Combination Impacts

4.3.1 General

Article 6(3) of the Habitats Directive requires that:

*Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, **either individually or in combination with other plans or projects**, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives.*

The Source-Pathway-Receptor assessment has determined the absence of physical or ecological connectivity between European sites within the Natura 2000 network and the flood risk management

measures for UoM 21. There will therefore be no effects on European Sites. Given the absence of impacts, there is no potential for in-combination effects.

5 Significance of Impacts on Natura 2000 Sites

5.1 General

The significance of an impact is relative to the existing condition/conservation status of a Natura 2000 site and to the scale of the impact in space and time.

Favourable conservation condition of an Annex I habitat is achieved when:

- i its natural range, and area it covers within that range, are stable or increasing,
- i the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- i the conservation status of its typical species is favourable.

The favourable conservation condition of an Annex II species is achieved when:

- i population dynamics data on the species concerned indicate that it is maintaining itself on a long term basis as a viable component of its natural habitats, and
- i the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- i there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Impacts are assessed as significant where the conservation objectives of a Natura 2000 site are undermined.

Where it is determined that a likely impact of the flood risk management options will have a significant impact on a Natura 2000 site, the flood risk management options must be assessed through full Appropriate Assessment. The precautionary principle must be applied in determining significance of an impact. Where the significance of an impact cannot definitively be ascertained on the basis of the information available it is required to progress to full Appropriate Assessment i.e. an option cannot be screened out unless there is certainty that no significant impact is likely.

5.2 Assessment of Significance

This Screening for Appropriate Assessment was carried out in conjunction with the preliminary option appraisal process, (Document Ref: Preliminary Options Report for UoM 21). The option appraisal assessed each viable flood risk management option in terms of potential technical, social and environmental impacts.

No likely impacts have been determined on the Kenmare River SAC and the Beara Peninsula SPA from the implementation of viable options in the Kenmare AFA and the Castletownbere AFA.

This screening for Appropriate Assessment has determined that significant effects on Natura 2000 sites are not reasonably foreseeable as a result of the implementation of flood risk management measures in UoM 21.

6 Conclusions and Screening Statement

No likely significant effects on Natura 2000 sites are reasonably foreseeable as a result of the implementation of flood risk management measures in UoM 21.

Table 6.1: Screening Matrix for UoM 21

| Screening Matrix | |
|--|--|
| | Project |
| Brief description of the project or plan | <p>Kenmare AFA:</p> <ul style="list-style-type: none"> • Flood defences including walls, embankments, road raising and flood gates • Storage on the Finnihy River coupled with flood defences • Removal of a foul sewage pipe from across the eye of Finnihy Bridge coupled with flood defences • Flow Diversion along the Kealnagower Stream and through the town by diverting flows to Kenmare Bay. • Combination of Conveyance, Flow Diversion and Flood Defences <p>Castletownbere AFA:</p> <ul style="list-style-type: none"> • Flood defences including walls and embankments <p>Bantry AFA:</p> <ul style="list-style-type: none"> • Flood defences and road raising - flood embankments in Caherdaniel West and Newtown and tidal walls in Bantry town couples with road raising on the N71. • Flood defences and tidal barrage – flood embankments in Caherdaniel West and Newtown and tidal barrage in the harbour with an inner area of approximately 78,880m². The barrage will need to be closed at the low tide preceding a tidal event in order to accommodate fluvial flows. The barrage would remain closed until the tide level outside is lower than the maximum water level within the barrage 9modelled as being approx. 9 hours). |
| | Natura 2000 Site |
| Brief description of the Natura 2000 site(s) | <p>Kenmare River SAC (002158)</p> <p>Kenmare River is a long and narrow south-west facing bay situated in the southwest of Ireland. The site includes very good quality examples of large shallow bays, reefs, and marine caves. Kenmare River is the only known site in Ireland for the Northern Sea-fan (<i>Swiftia pallida</i>) (which occurs near Sneem / Ardgroom). Qualifying features of the SAC are: [1160] Large Shallow Inlets and Bays, [1170] Reefs, [1220] Perennial Vegetation of Stony Banks, [1230] Vegetated Sea Cliffs, [1330] Atlantic Salt Meadows, [1410] Mediterranean Salt Meadows, [2120] Marram Dunes (White Dunes), [2130] Fixed Dunes (Grey Dunes)*, [4030] Dry Heath, [6130] Calaminarian Grassland, [8330] Sea Caves, [1014] Narrow-mouthed Whorl Snail (<i>Vertigo angustior</i>) (found in Derrynane), [1303] Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>), [1355] Otter (<i>Lutra lutra</i>) and [1365] Common</p> |

Screening Matrix

(Harbour) Seal (*Phoca vitulina*).

Beara Peninsula SPA (004155)

The Beara Peninsula SPA is a coastal site situated on the west coast of Co. Cork, south-west of the town of Kenmare. It encompasses the high coast and sea cliff sections of the western end of the peninsula from Reenmore Point/Cod's Head in the north, around to the end of Dursey Island in the west, and to Bear Island in the south. The site is designated for Fulmar (*Fulmarus glacialis*) and Chough (*Pyrrhocorax pyrrhocorax*).

Assessment Criteria

Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the Natura 2000 site.

In-stream works and removal of river bed and riparian habitat to accommodate flood management measures.

Sediment release to the watercourse due to works within and in proximity to rivers and streams.

Noise from construction machinery

Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the Natura 2000 site by virtue of:

No likely impacts are determined for the Bantry, Kenmare or Castletownbere AFAs.

Size and scale;

Land-take;

Distance from the Natura 2000 site or key features of the site;

Resource requirements (water abstraction etc);

Emissions (disposal to land, water or air);

Excavation requirements;

Transportation requirements;

Duration of construction, operation, decommissioning etc;

Other.

Describe any likely changes to the site arising as a result of:

No likely changes to the SAC / SPA are determined

Reduction in habitat area;

Disturbance to key species;

Habitat or species fragmentation;

Reduction in species density;

Changes in key indicators of conservation value (water quality etc);

Climate change.

Describe any likely impacts on the Natura 2000 site as a whole in terms of:

No likely impacts are determined.

Interference with the key relationships that define the structure of the site;

Interference with key relationships that define the function of the site.

| Screening Matrix | |
|---|--|
| Provide indicators of significance as a result of the identification of effects set out above in terms of: Loss; Fragmentation; Disruption; Disturbance; Change to key elements of the site. | No significant impacts are determined |
| Describe from the above those elements of the project or plan, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known. | No significant effects have been determined. |

It is concluded that there is no potential for significant effects on the abovementioned designated sites from the plan, either alone or in-combination with other plans and/or projects. The findings of this screening for Appropriate Assessment are summarised in the Findings of no Significant Effects Matrix in Table 6.2.

Table 6.2: Finding of No Significant Effects Matrix for UoM 21

| Name of project or plan | Lee Harbour Catchment (UoM21) |
|--|--|
| Name and location of Natura 2000 sites | <ul style="list-style-type: none"> Kenmare River SAC (002158), located 0km from UoM19 Beara Peninsula SPA (004155), located 0.8km from UoM19 |
| Description of the project or plan | . |
| Is the project or plan directly connected with or necessary to the management of the site? | No |
| Are there other projects or plans that together with the project or plan being assessed could affect the site? | No |
| The assessment of significance of effects | |
| Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 site. | No likely effects were determined from the proposed plan. |
| Explain why these effects are not considered significant | No likely effects were determined therefore there can be no alteration of the conservation condition or objectives of the Natura 2000 sites due to the proposed works. |
| List of agencies consulted: provide contact name and telephone or e-mail address | National Parks and Wildlife Service, |
| Response to consultation. | As detailed in section 2.5 |
| Data collected to carry out the assessment | |
| Who carried out the assessment? | Rita Mansfield, Ecologist with Mott MacDonald |
| Sources of data? | Refer to References Section. |
| Level of assessment? | Desktop study |

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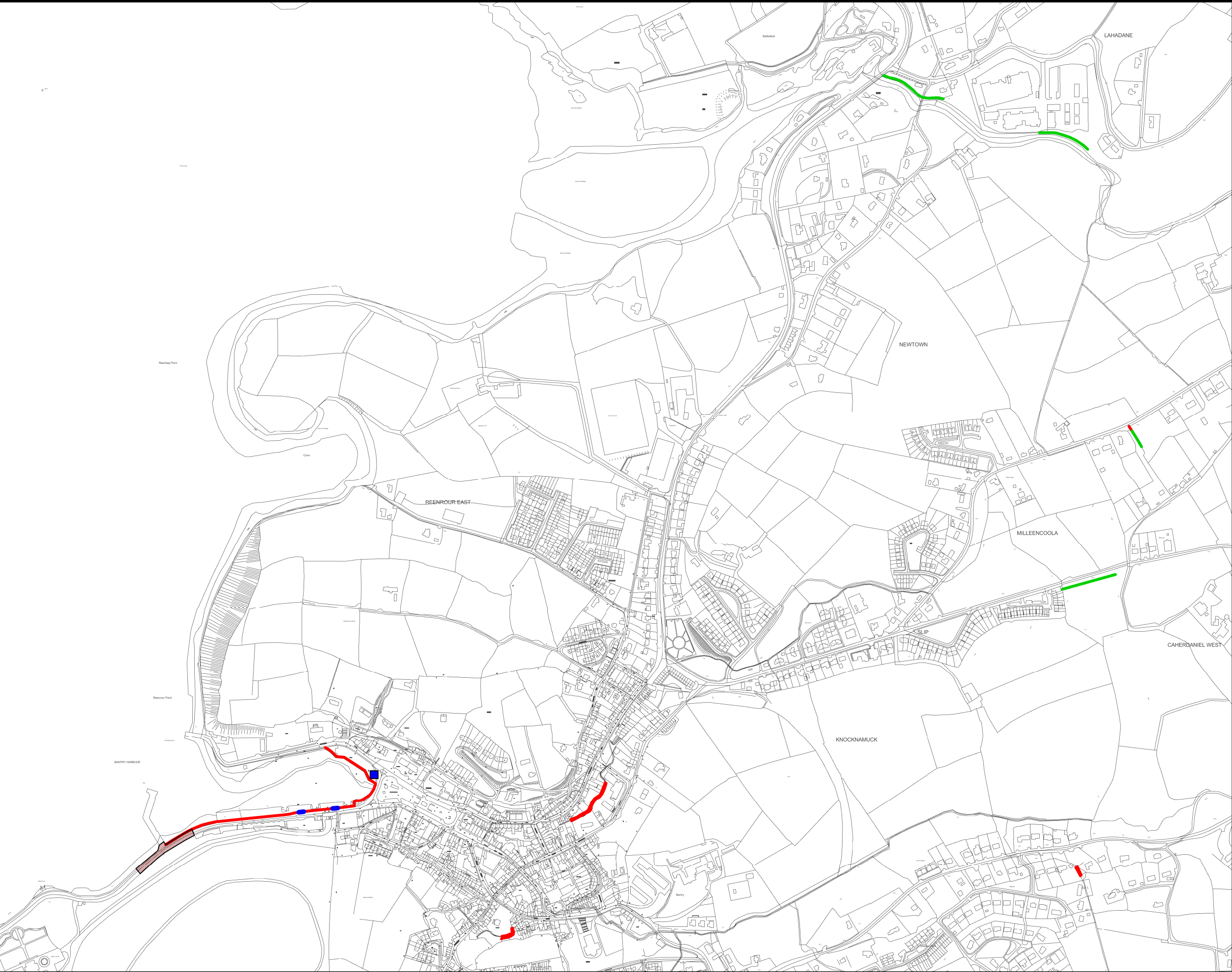
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8 Appendix A



- Flood Defence Walls
- Flood Defence Embankment
- Road Raising
- Pump Station
- Flood Barriers



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

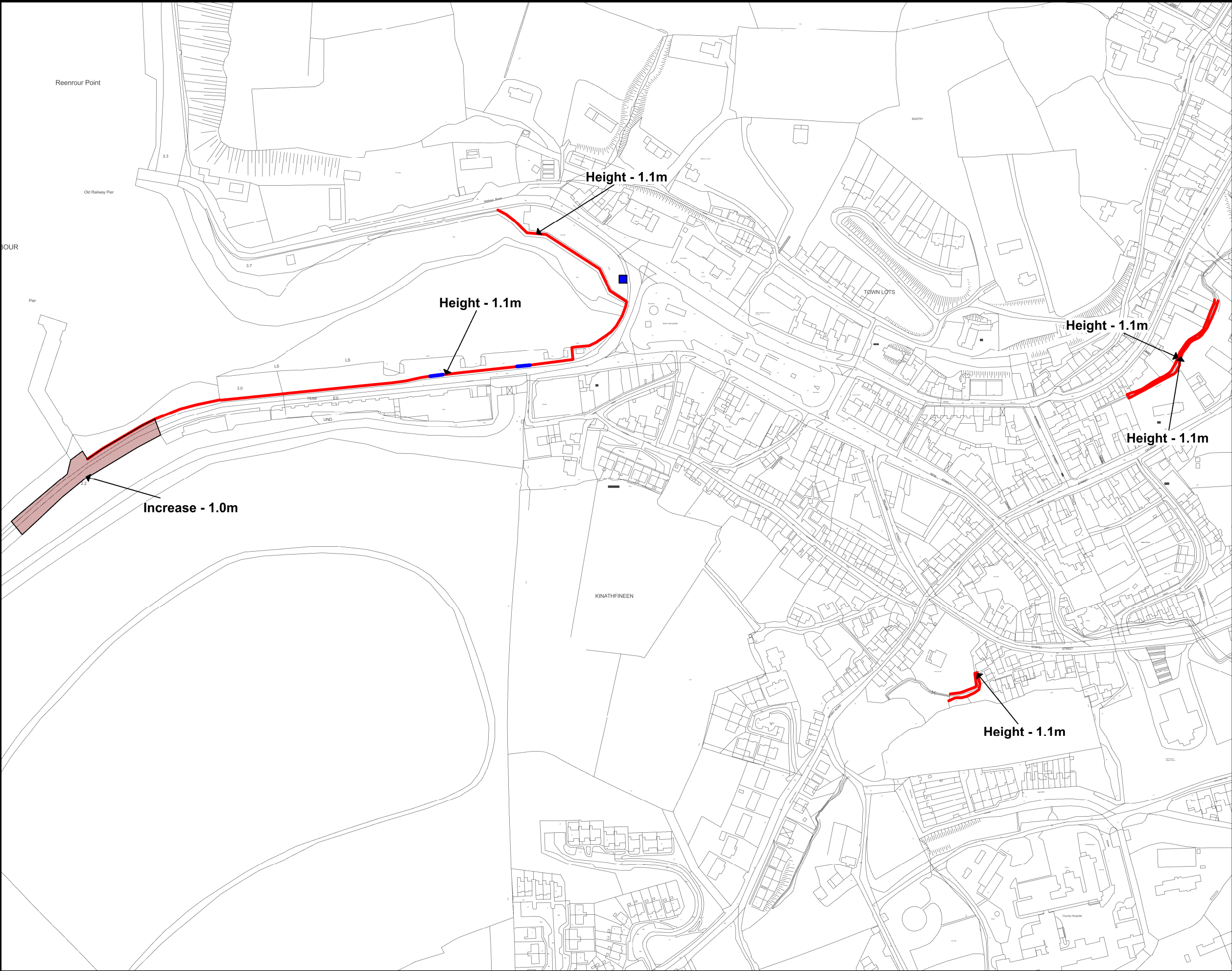
Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

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| Map : Bantry Flood Defences - Overview | |
| Map Type: | Preliminary Options |
| Source: | Fluvial & Tidal Flooding |
| Map Area: | Urban Area |
| Scenario: | Current |
| Drawn by: | Tony Donovan |
| Checked by: | Barry O'Connor |
| Approved by: | Fintan McGivern |
| Map No.: | MMD-296235-E-DR-21-BY-201-P1 |
| Sheet: | 1 of 1 |
| Drawing Scale: | NTS |
| Revision: | P1 |
| Plot Scale: | 1:1 @ A3 |



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Flood Defence Walls

Flood Defence Embankment

Road Raising

Pump Station

Flood Barriers



Office of Public Works
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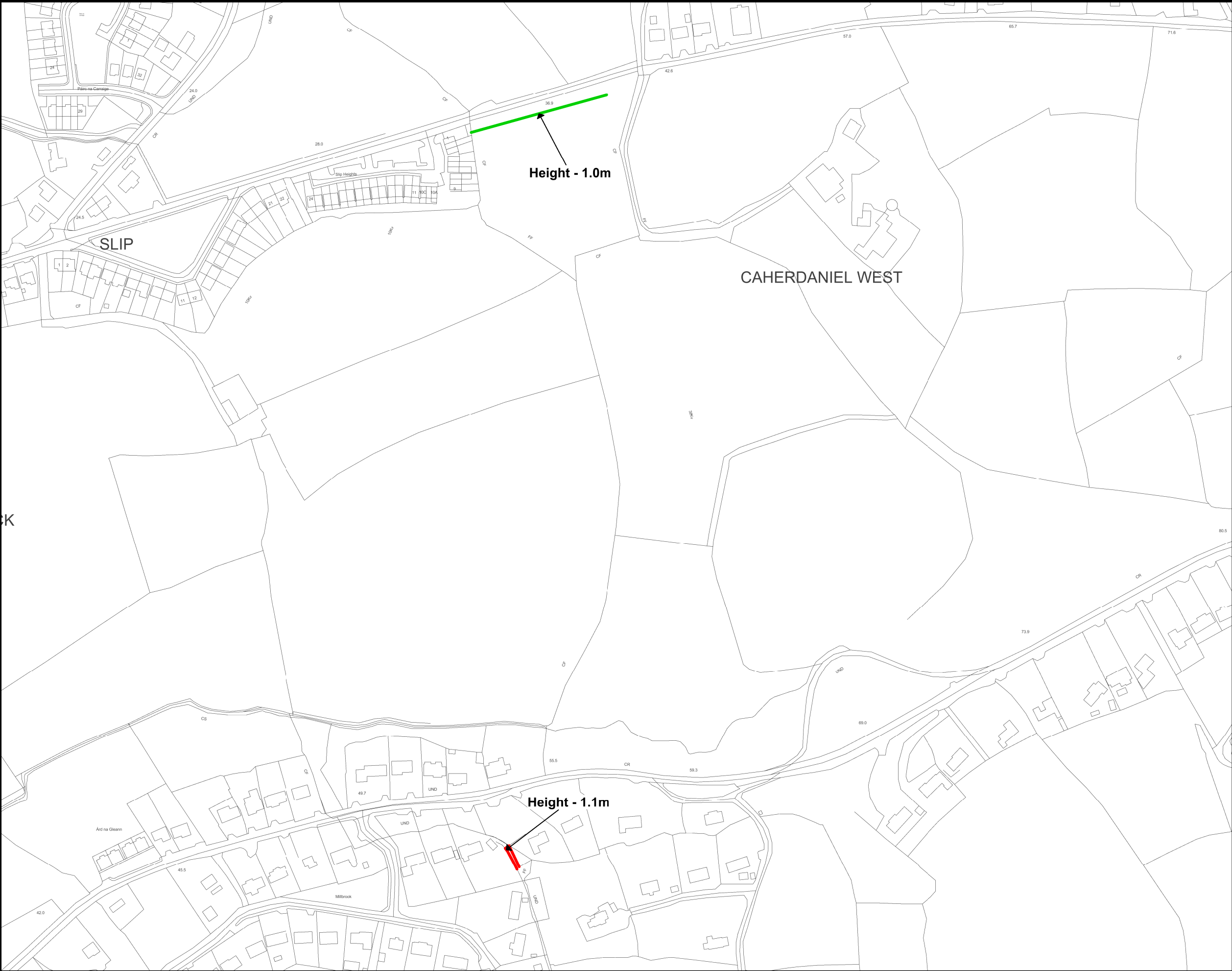
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Little Island, Cork

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| Checked by: | Barry O'Connor |
| Approved by: | Fintan McGivern |
| Map No.: | MMD-296235-E-DR-21-BY-202-P1 |
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| Drawing Scale: | NTS |
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Flood Defence Walls

Flood Defence Embankment

Road Raising

Pump Station

Flood Barriers



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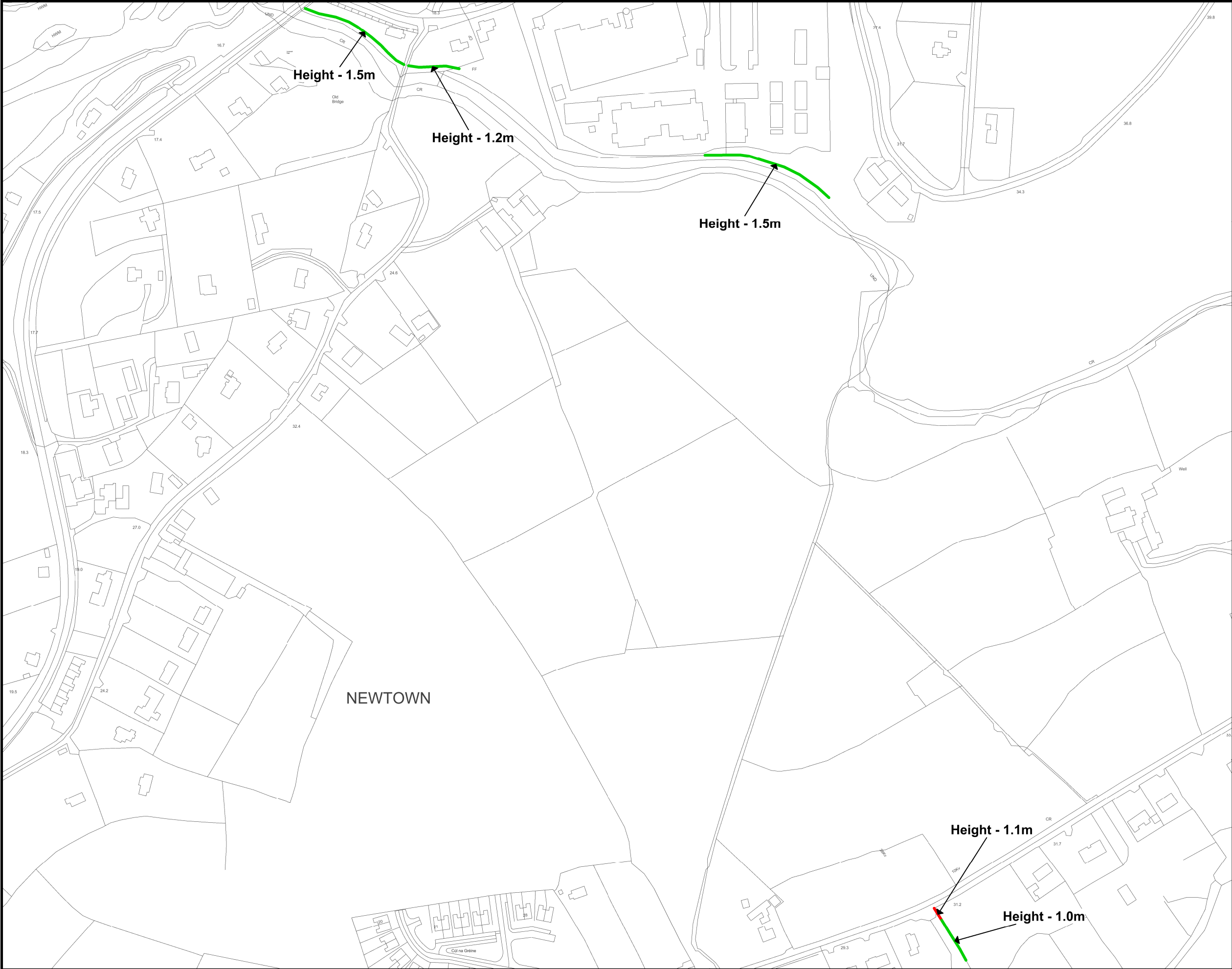
Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

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| Map : Bantry Flood Defences | |
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| Drawn by: | Tony Donovan |
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| Approved by: | Fintan McGivern |
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- Flood Defence Walls
- Flood Defence Embankment
- Road Raising
- Pump Station
- Flood Barriers

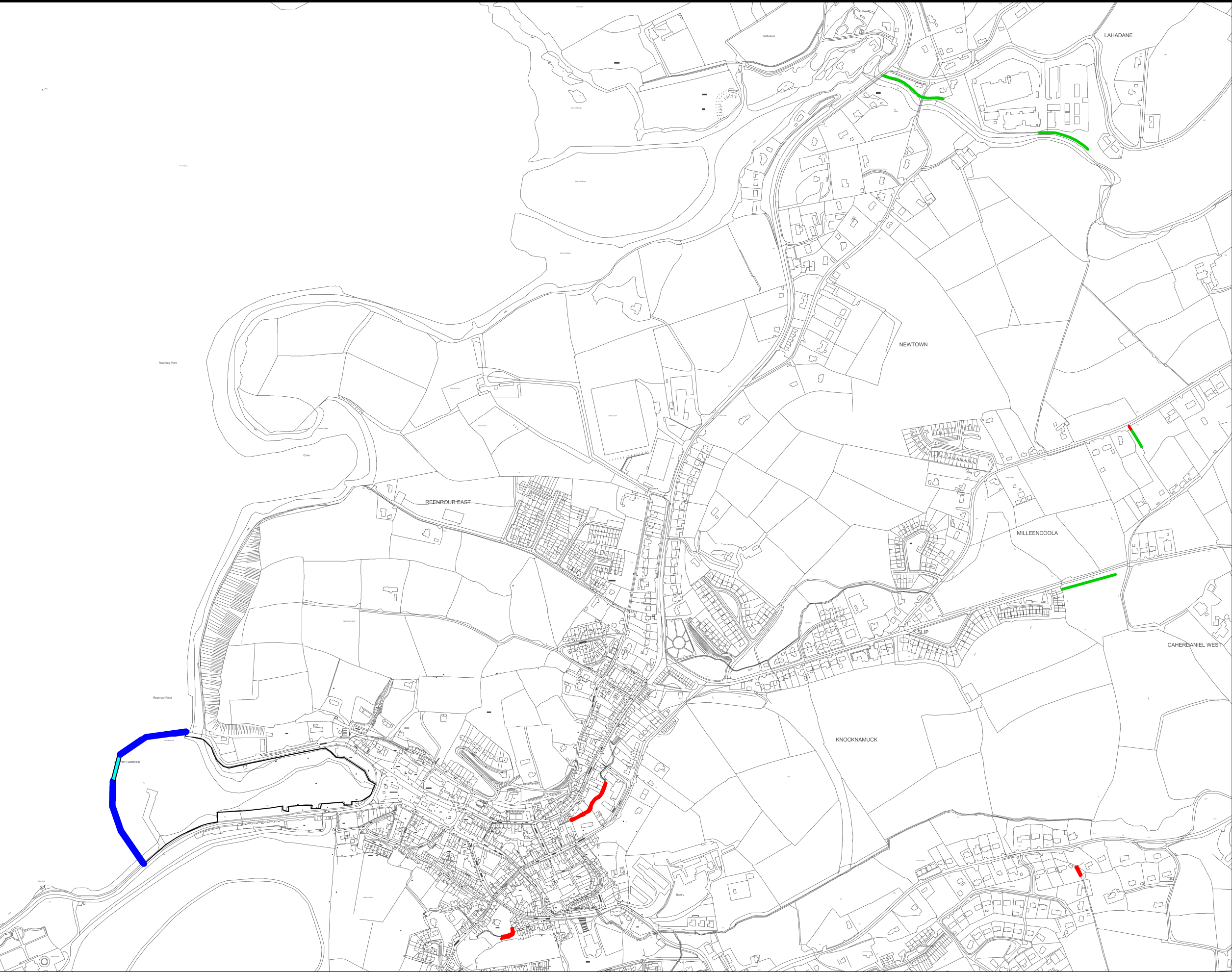


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| Map : Bantry Flood Defences | |
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| Checked by: | Barry O'Connor |
| Approved by: | Fintan McGivern |
| Map No.: | MMD-296235-E-DR-21-BY-204-P1 |
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Flood Defence Walls



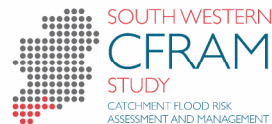
Flood Defence Embankments



Tidal Barrage



Gate



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Jonathan Swift Street
Trim, Co. Meath



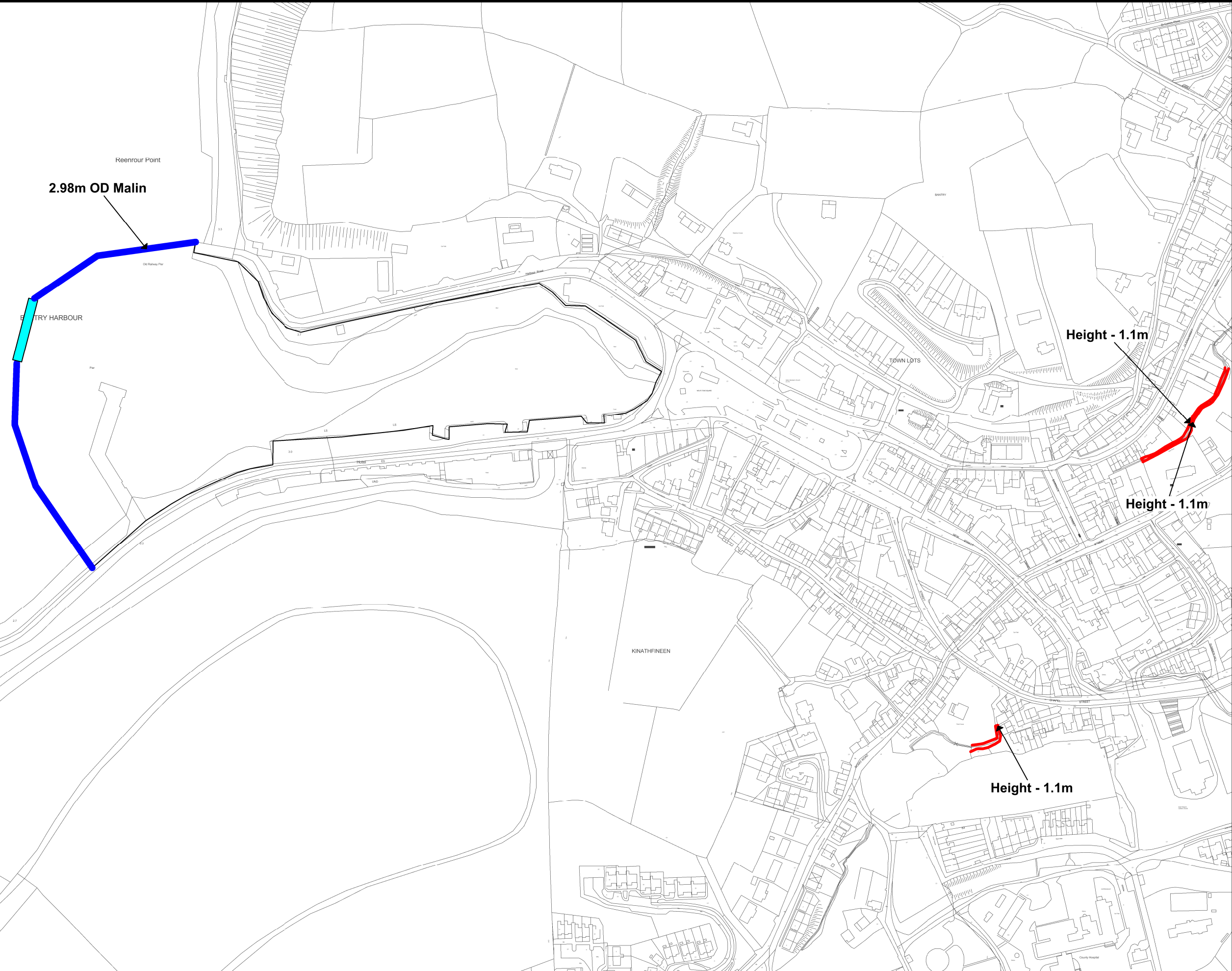
Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

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| Map : Bantry Fluvial Flood Defences & Tidal Barrage - Overview | |
| Map Type: | Preliminary Options |
| Source: | Fluvial & Tidal Flooding |
| Map Area: | Urban Area |
| Scenario: | Current |
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| Checked by: | Barry O'Connor |
| Approved by: | Fintan McGivern |
| Map No.: | MMD-296235-E-DR-21-BY-205-P1 |
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Flood Defence Walls

Flood Defence Embankments

Tidal Barrage

Barrage

Gate



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Jonathan Swift Street
Trim, Co. Meath



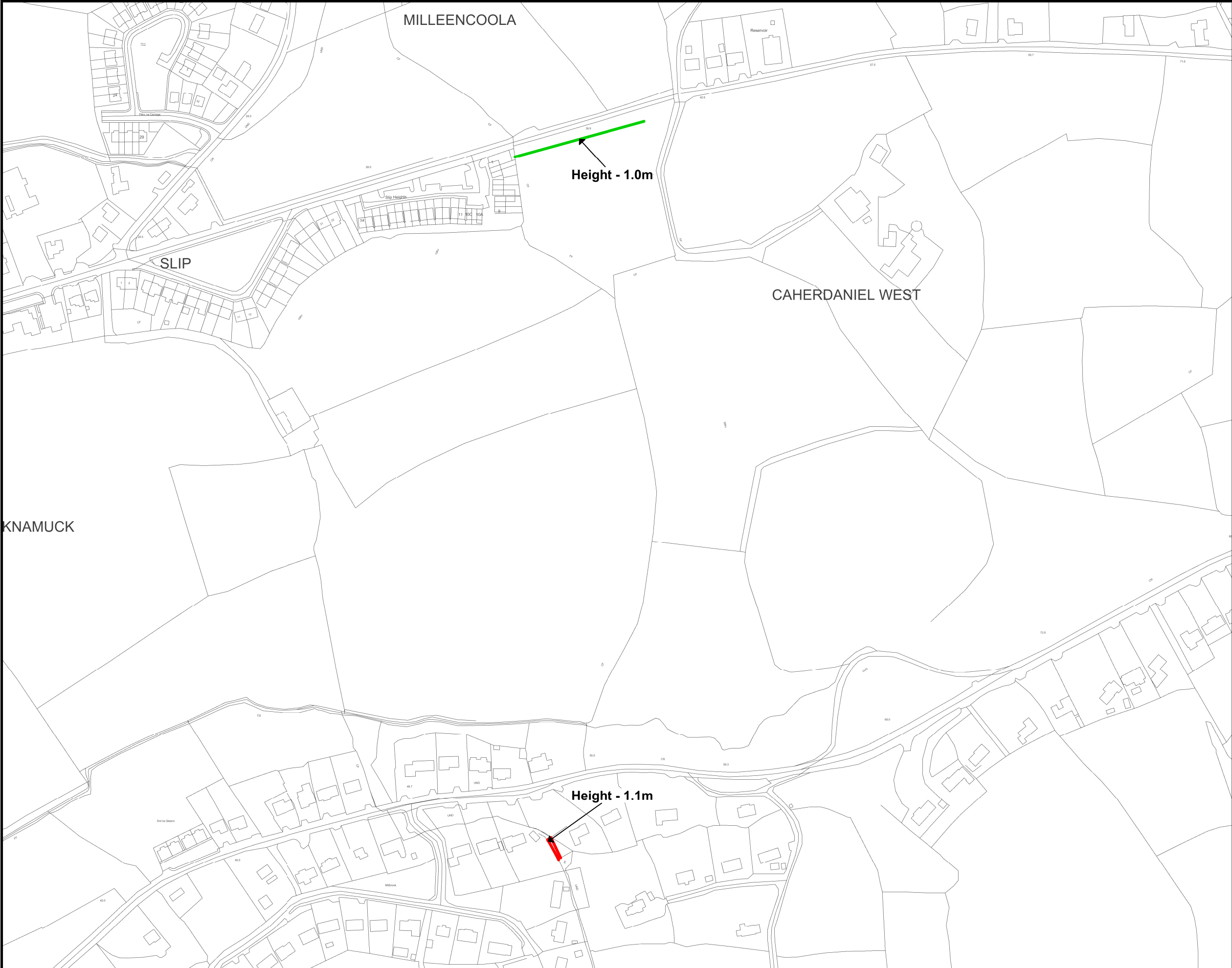
Mott MacDonald Ireland
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| Map : Bantry Fluvial Flood Defences & Tidal Barrage | |
| Map Type: | Preliminary Options |
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| Revision: | P1 |
| Plot Scale: | 1:1 @ A3 |



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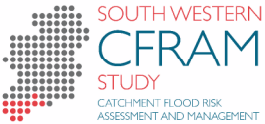


Flood Defence Walls

Flood Defence Embankments

Tidal Barrage

Barrage
Gate



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Jonathan Swift Street
Trim, Co. Meath



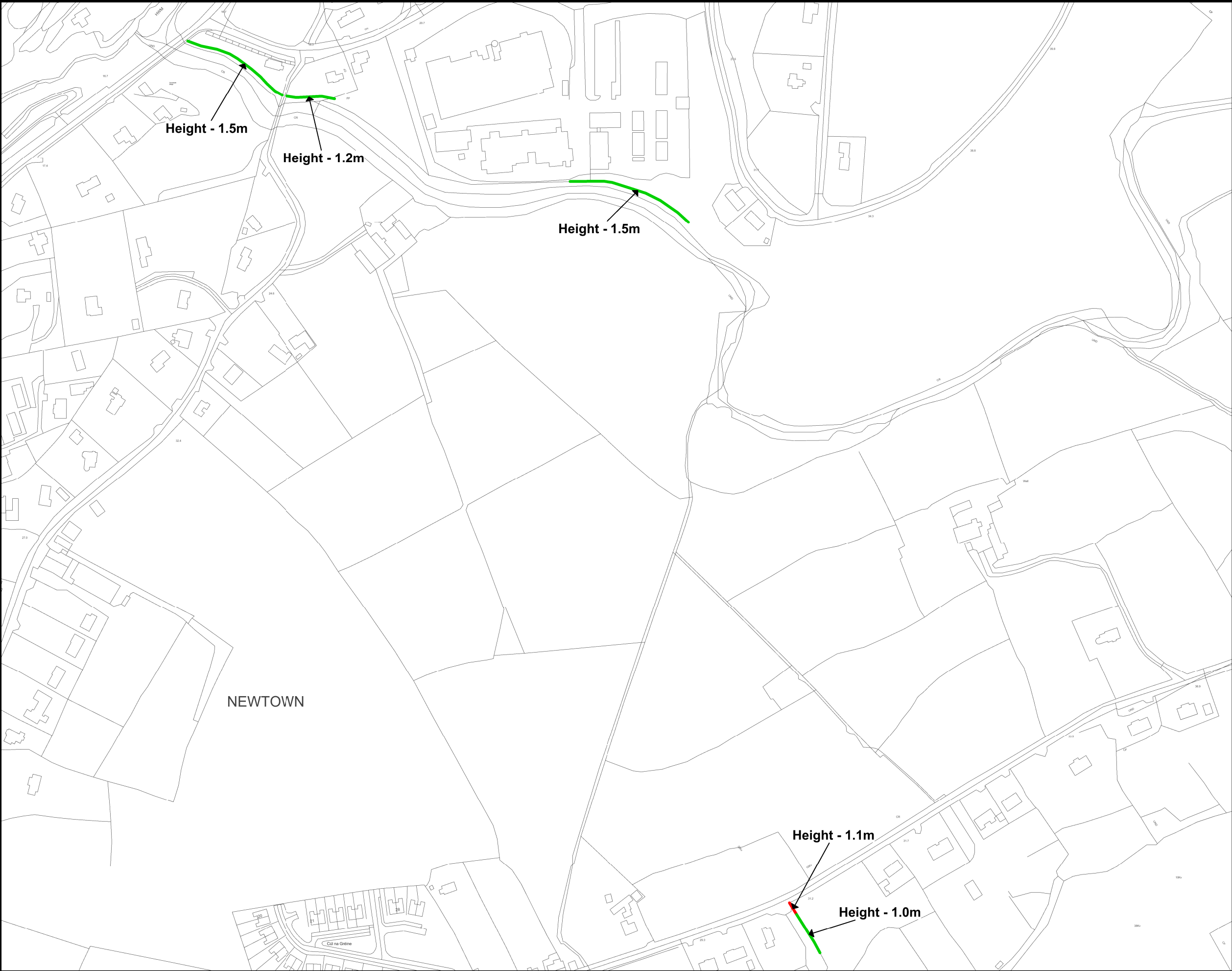
Mott MacDonald Ireland
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Little Island, Cork

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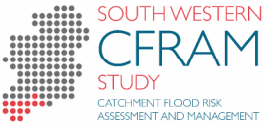
Flood Defence Walls

Flood Defence Embankments

Tidal Barrage

Barrage

Gate



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Jonathan Swift Street
Trim, Co. Meath



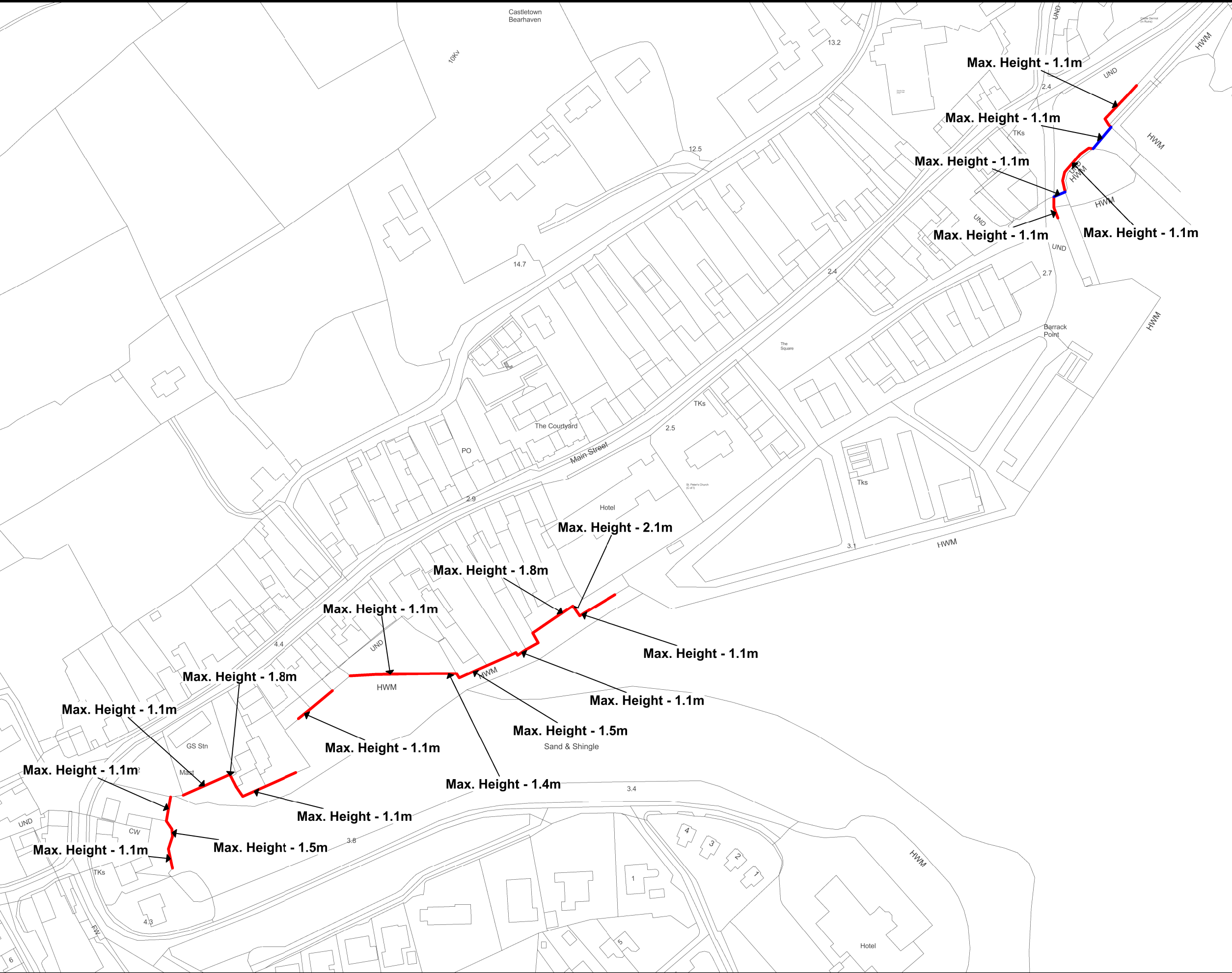
Mott MacDonald Ireland
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Little Island, Cork

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| Map : Bantry Fluvial Flood Defences & Tidal Barrage | |
| Map Type: | Preliminary Options |
| Source: | Fluvial & Tidal Flooding |
| Map Area: | Urban Area |
| Scenario: | Current |
| Drawn by: | Tony Donovan |
| Checked by: | Barry O'Connor |
| Approved by: | Fintan McGivern |
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| Sheet: | 3 of 3 |
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Flood Defence Walls

Flood Defence Barriers



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



Mott MacDonald Ireland
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Little Island, Cork

Project :

South Western CFRAM Study

Map : **Castletownbere
Flood Defences**

Map Type: Preliminary Options

Source: Tidal Flooding

Map Area: Urban

Scenario: Current

Drawn by: Tony Donovan

Checked by: Barry O'Connor

Approved by: Fintan McGivern

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Sheet:

1 of 1

Revision: P1

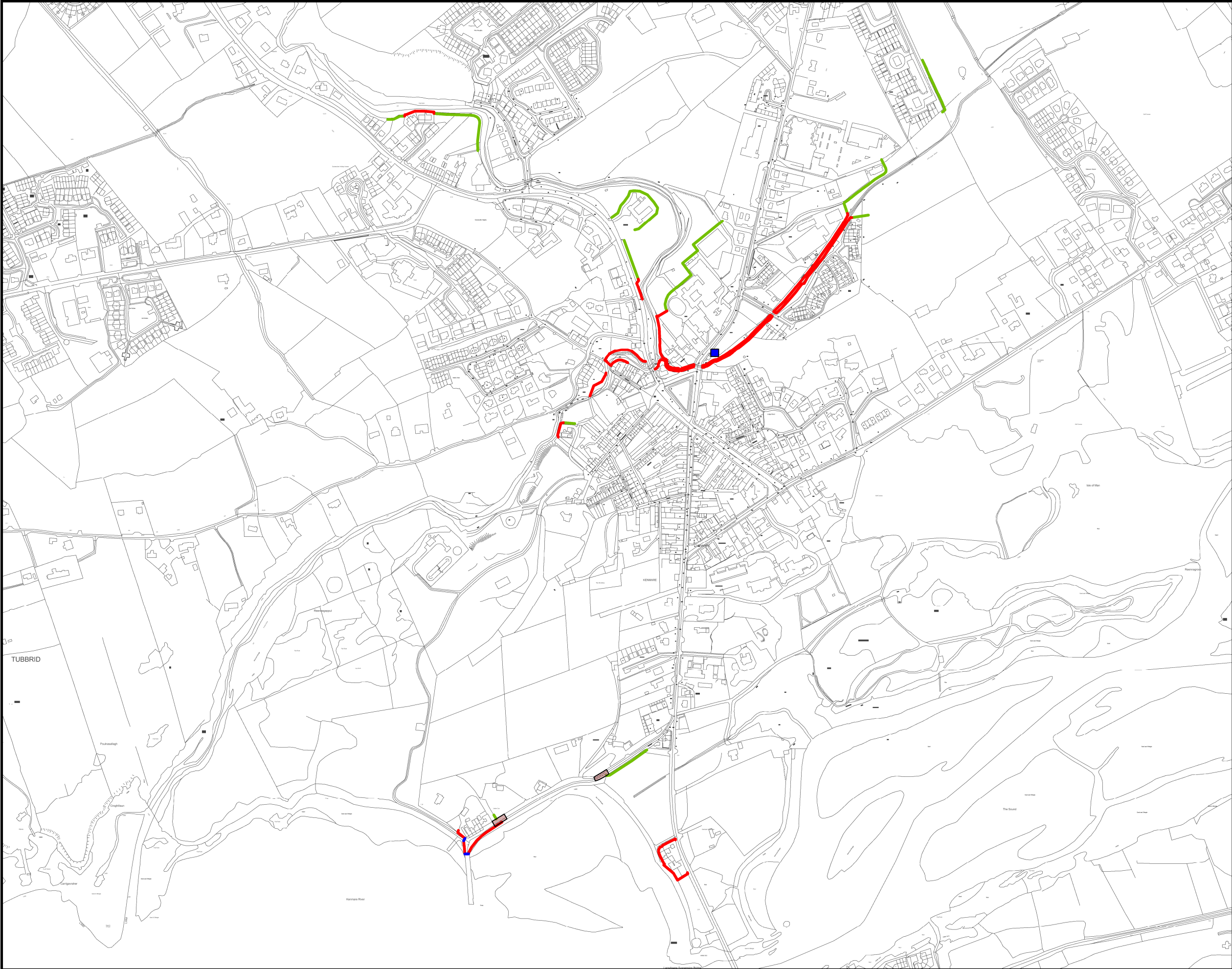
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Flood Defence Walls



Flood Defence Embankments



Flood Barriers / Gates



Road Raising



Pump Station



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5 Eastgate Avenue
Little Island, Cork

Project :

South Western CFRAM Study

Map : Kenmare - Overview
Flood Defences

Map Type: Preliminary Options

Source: Fluvial and Tidal Flooding

Map Area: Urban Area

Scenario: Current

Drawn by: Tony Donovan

Checked by: Barry O'Connor

Approved by: Fintan McGivern

Map No.: MMD-296235-E-DR-21-KE-200-P1

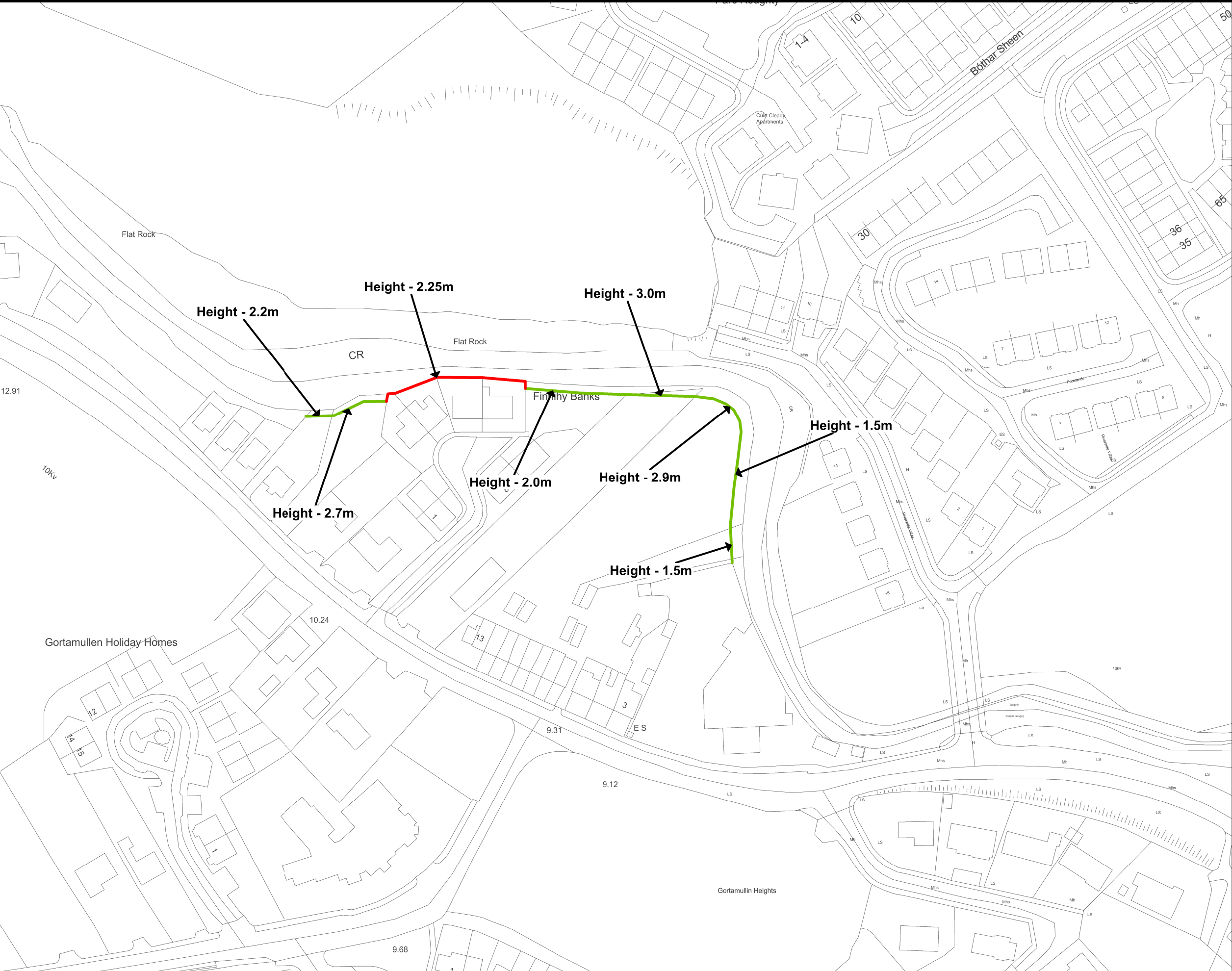
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Flood Defence Walls

Flood Defence Embankments

Flood Barriers / Gates

Road Raising

Pump Station



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5 Eastgate Avenue
Little Island, Cork

| | |
|---|------------------------------|
| Project : South Western CFRAM Study | |
| Map : Kenmare Flood Defences | |
| Map Type: | Preliminary Options |
| Source: | Fluvial and Tidal Flooding |
| Map Area: | Urban Area |
| Scenario: | Current |
| Drawn by: | Tony Donovan |
| Checked by: | Barry O'Connor |
| Approved by: | Fintan McGivern |
| Map No.: | MMD-296235-E-DR-21-KE-201-P1 |
| Sheet: | 2 of 7 |
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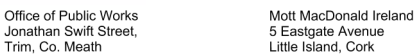
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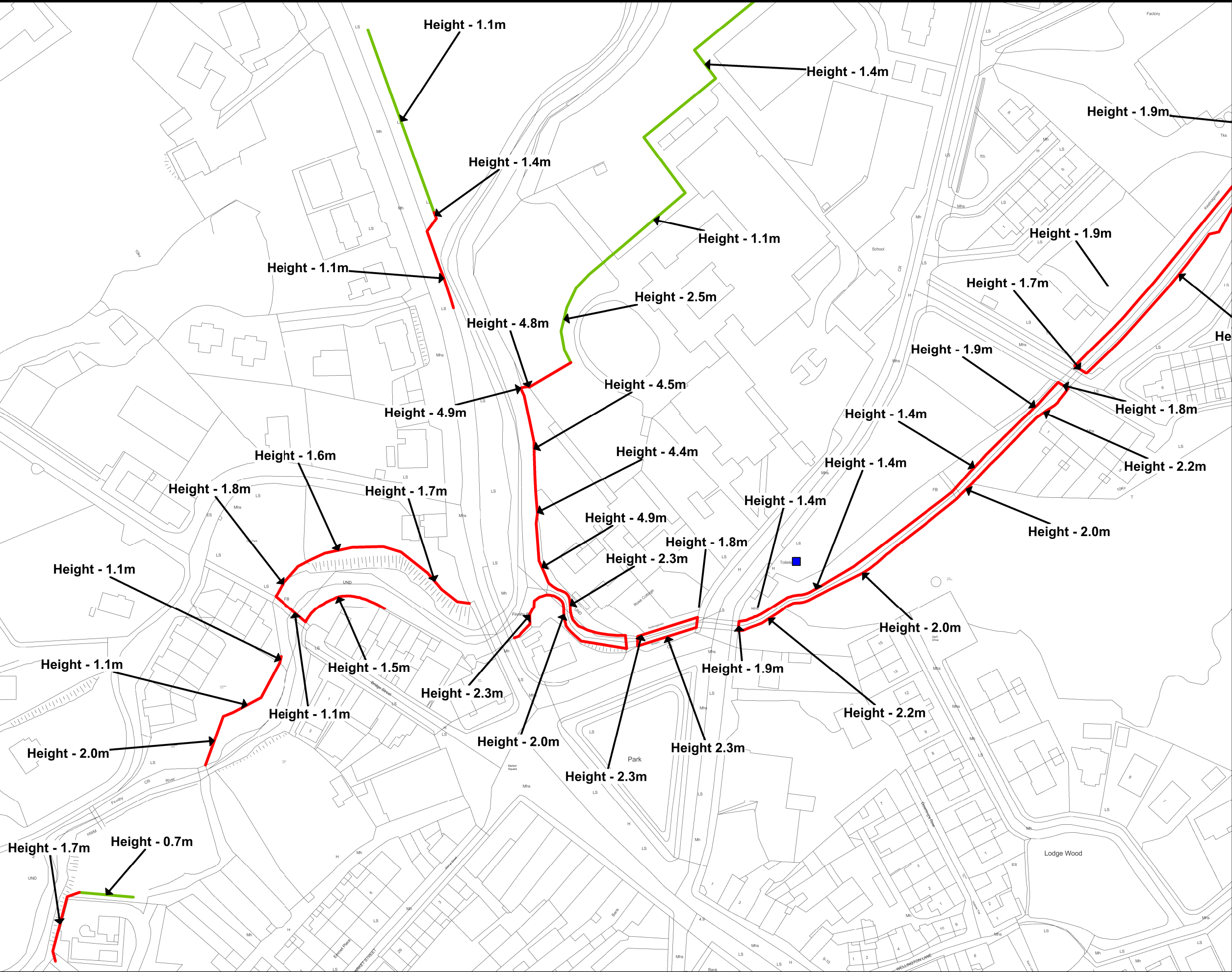



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- 
- SOUTH WESTERN
CFRAM
STUDY**
CATCHMENT FLOOD RISK
ASSESSMENT AND MANAGEMENT





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Flood Defence Walls


Flood Defence Embankments



Flood Barriers / Gates


Road Raising



Pump Station




**SOUTH WESTERN
CFram
STUDY**
CATCHMENT FLOOD RISK
ASSESSMENT AND MANAGEMENT



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



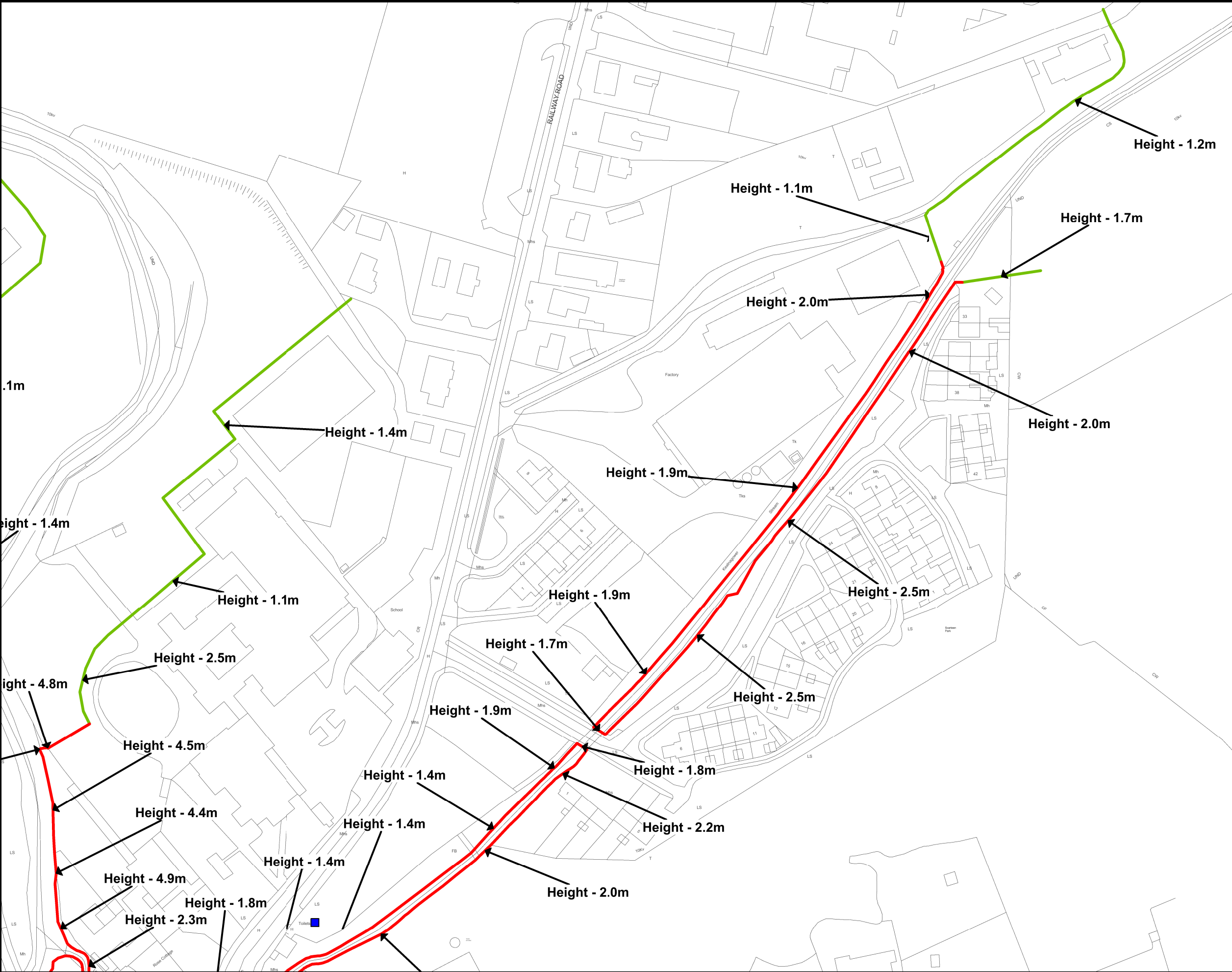
Mott MacDonald
Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

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| Map : Kenmare Flood Defences | |
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| Map Area: | Urban Area |
| Scenario: | Current |
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| Approved by: | Fintan McGivern |
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Flood Defence Walls

Flood Defence Embankments

Flood Barriers / Gates

Road Raising

Pump Station



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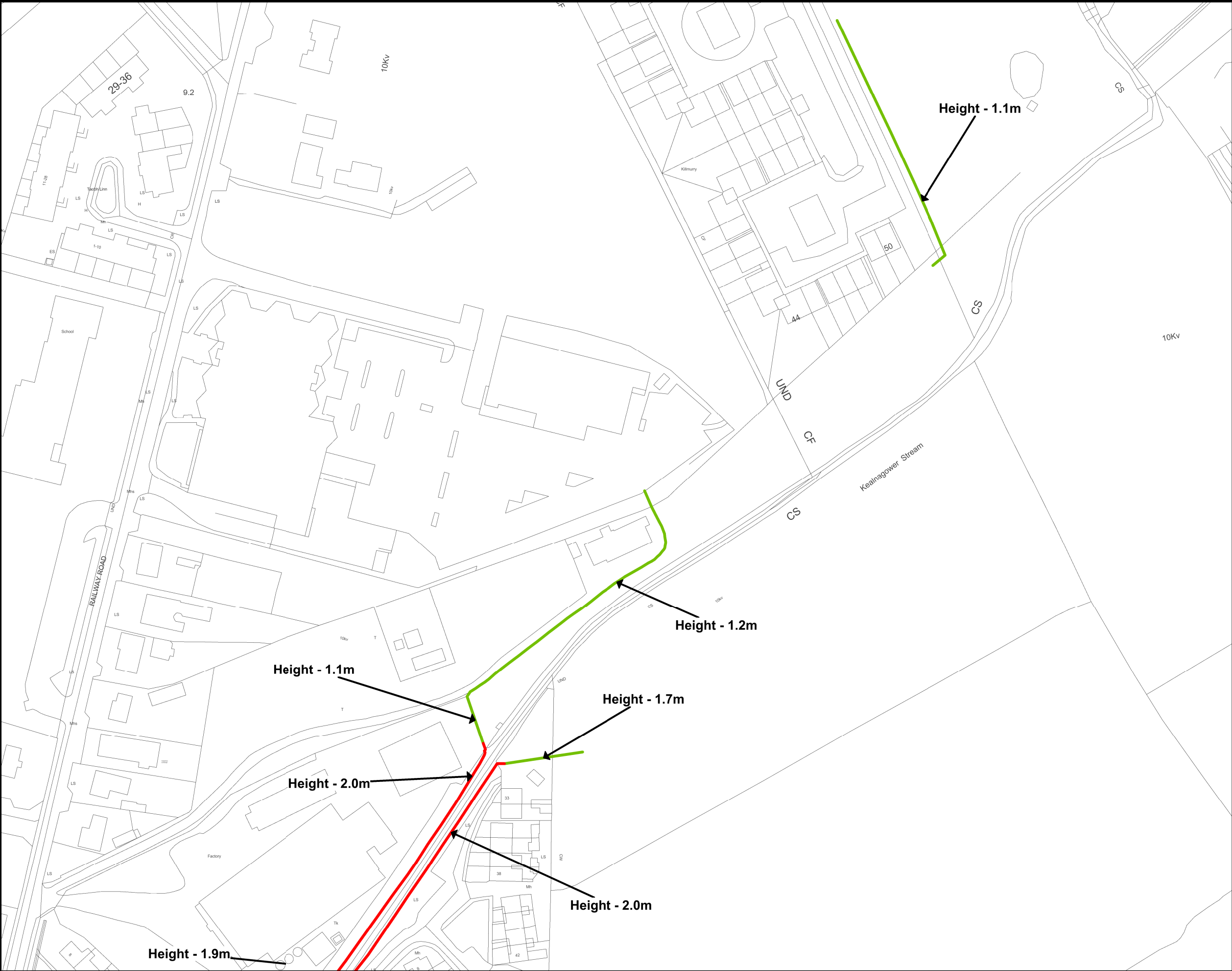


Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

| | |
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| Project : South Western CFRAM Study | |
| Map : Kenmare Flood Defences | |
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| Source: | Fluvial and Tidal Flooding |
| Map Area: | Urban Area |
| Scenario: | Current |
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| Approved by: | Fintan McGivern |
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Flood Defence Walls



Flood Defence Embankments



Flood Barriers / Gates



Road Raising



Pump Station



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Trim, Co. Meath



Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

Project :

South Western CFRAM Study

Map : Kenmare

Flood Defences

Map Type: Preliminary Options

Source: Fluvial and Tidal Flooding

Map Area: Urban Area

Scenario: Current

Drawn by: Tony Donovan

Checked by: Barry O'Connor

Approved by: Fintan McGivern

Map No.: MMD-296235-E-DR-21-KE-205-P1

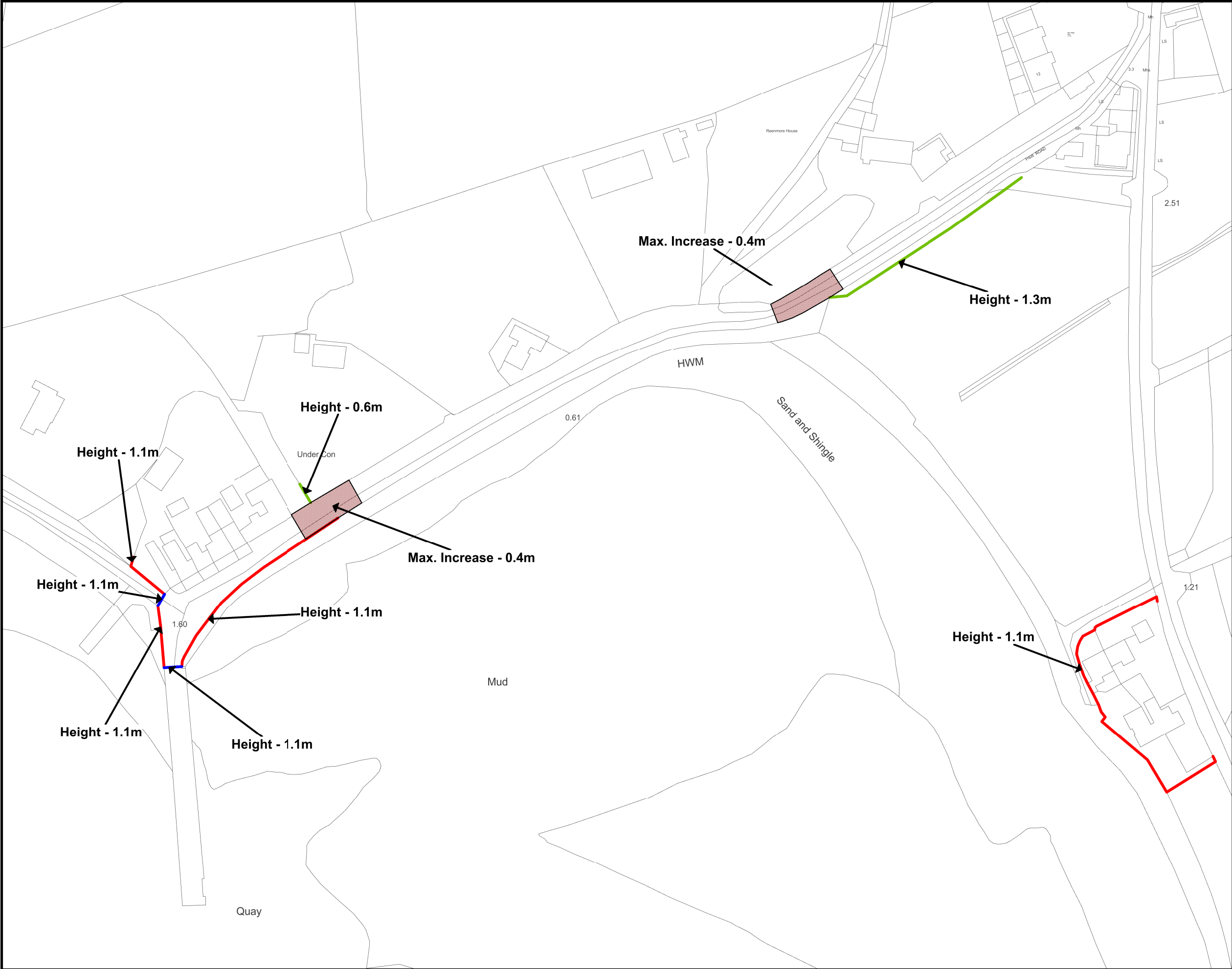
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Flood Defence Walls

Flood Defence Embankments

Flood Barriers / Gates

Road Raising

Pump Station



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Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

Project :

South Western CFRAM Study

Map : Kenmare
Flood Defences

Map Type: Preliminary Options

Source: Fluvial and Tidal Flooding

Map Area: Urban Area

Scenario: Current

Drawn by: Tony Donovan

Checked by: Barry O'Connor

Approved by: Fintan McGivern

Map No.: MMD-296235-E-DR-21-KE-206-P1

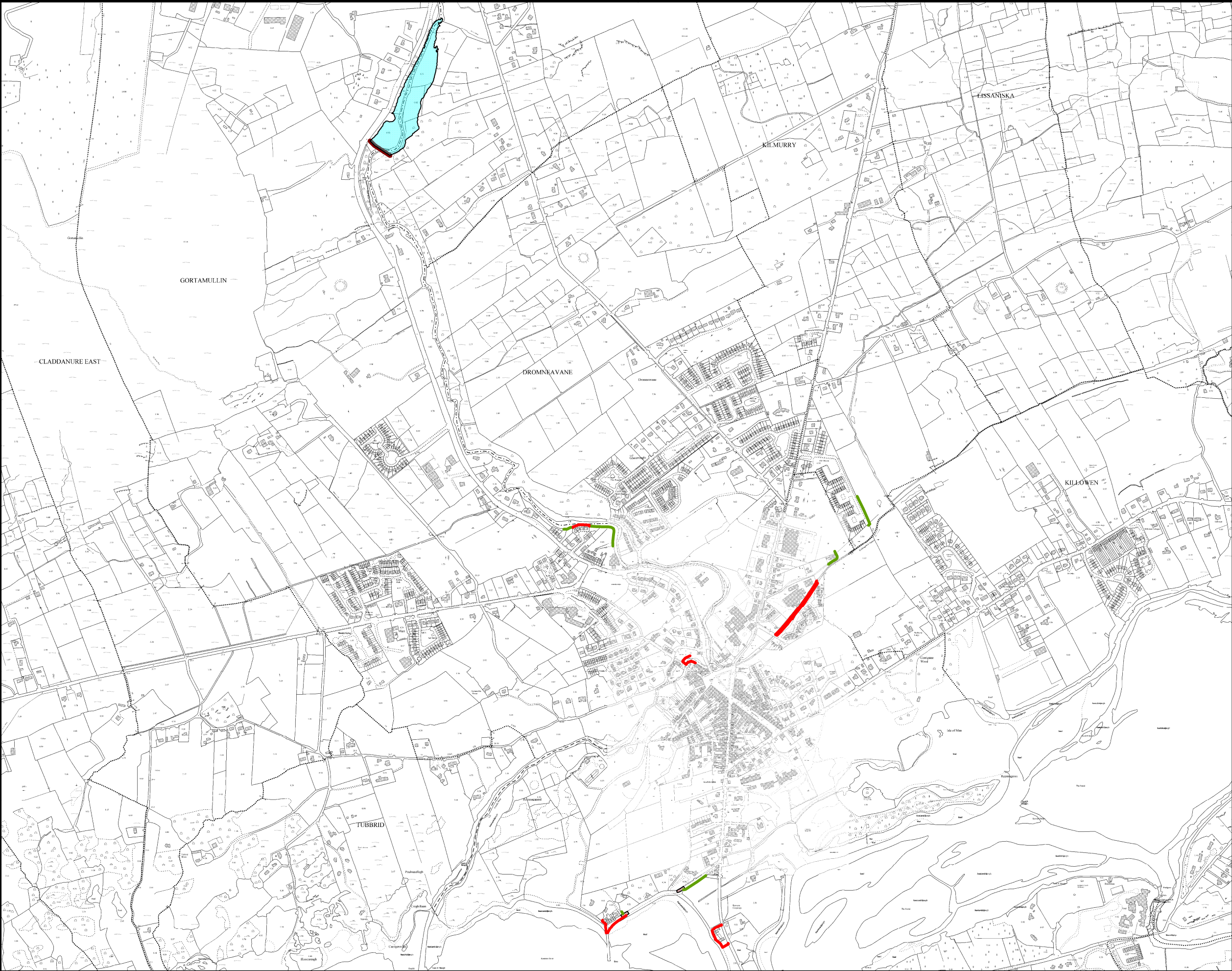
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Flood Defence Walls



Flood Defence Embankments



Storage Area



Storage Embankment



Flood Barriers / Gates



Road Raising



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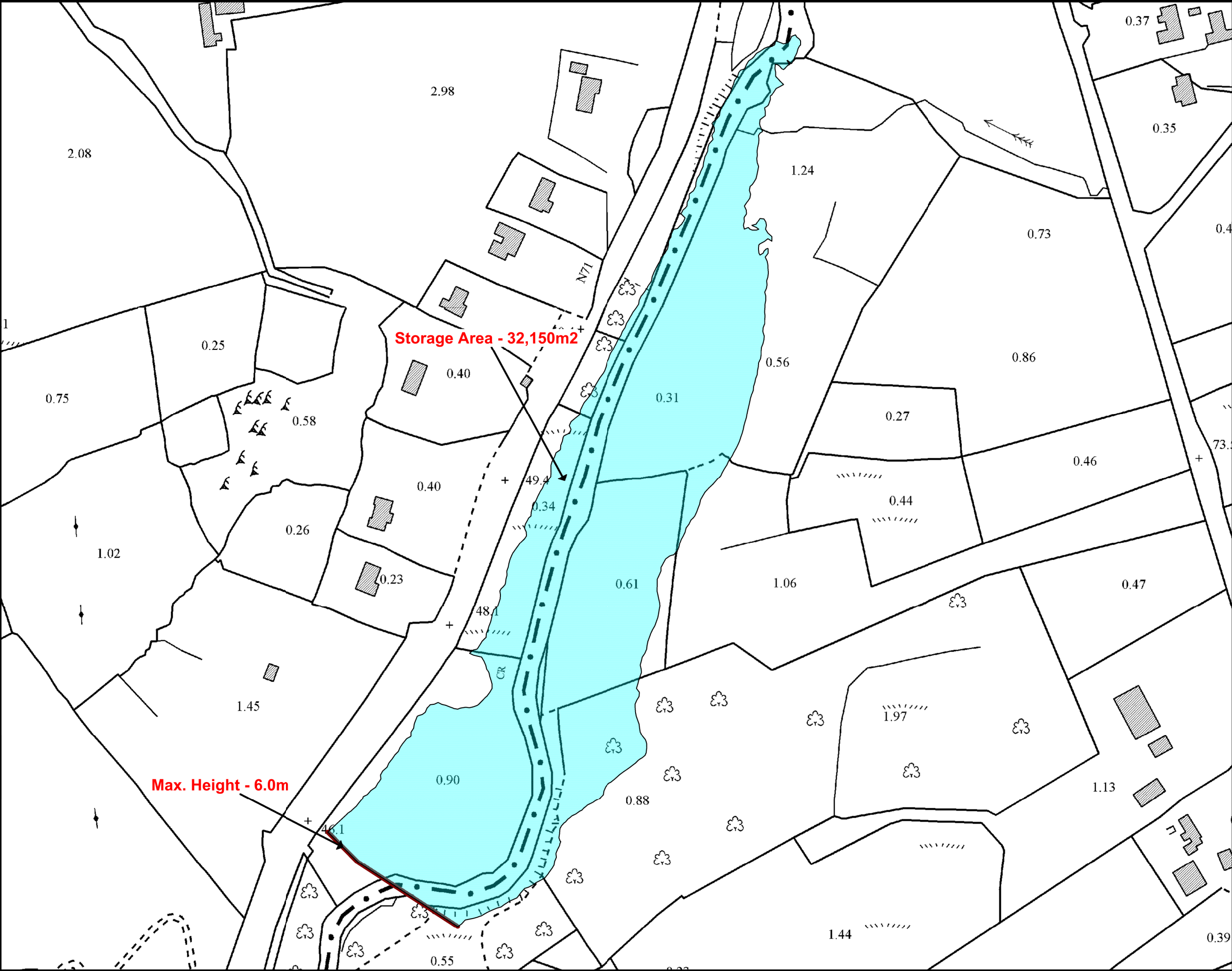
Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

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| Map : Kenmare - Overview Storage and Flood Defences | |
| Map Type: | Preliminary Options |
| Source: | Fluvial and Tidal Flooding |
| Map Area: | Urban Area |
| Scenario: | Current |
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| Checked by: | Barry O'Connor |
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| Map No.: | MMD-296235-E-DR-21-KE-207-P1 |
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| Plot Scale: | 1:1 @ A3 |



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- Flood Defence Walls
- Flood Defence Embankments
- Storage Area
- Storage Embankment
- Flood Barriers / Gates
- Road Raising

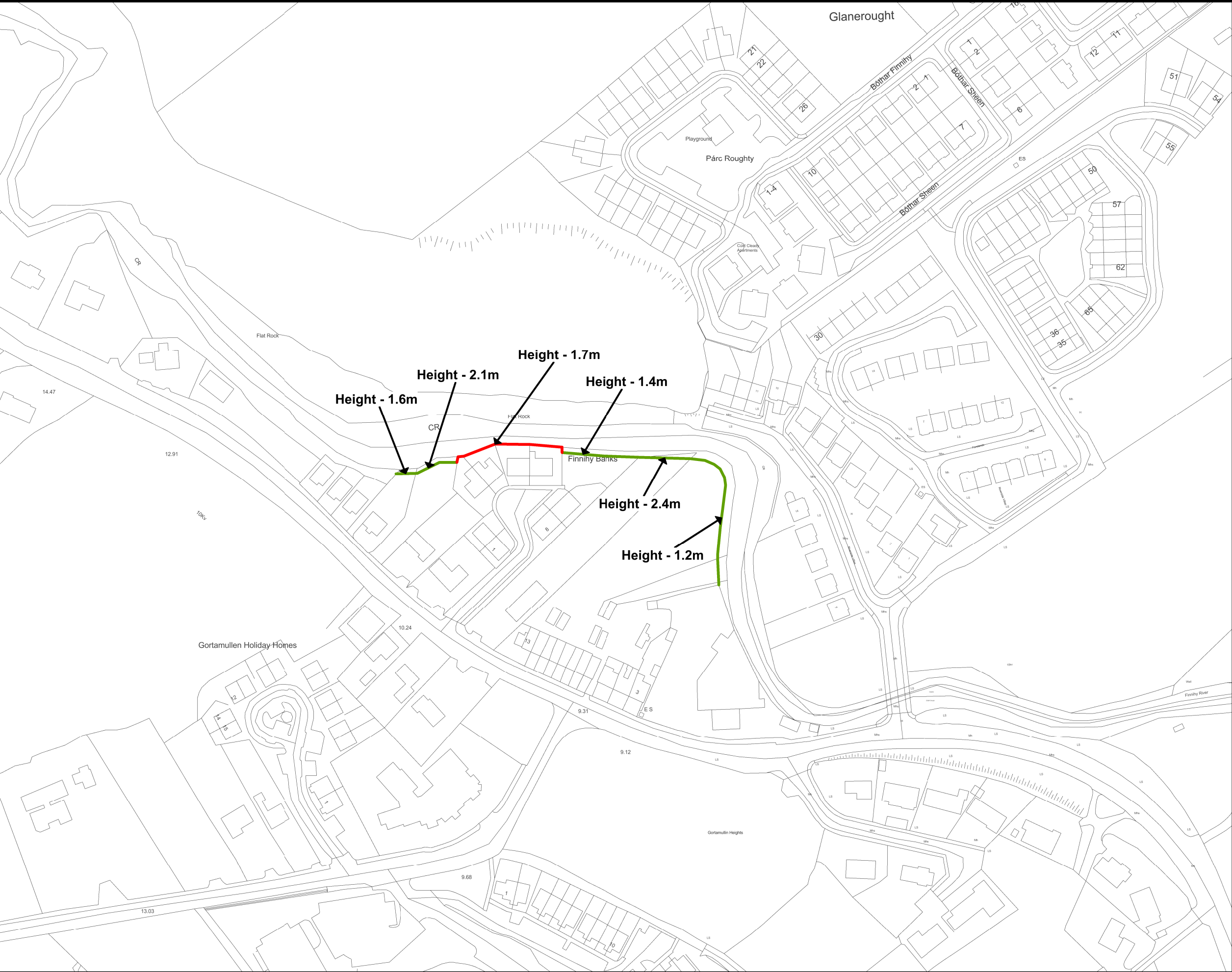


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| Map : Kenmare - Overview Storage and Flood Defences | |
| Map Type: | Preliminary Options |
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| Map No.: | MMD-296235-E-DR-21-KE-208-P1 |
| Sheet: | 2 of 6 |
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- Flood Defence Walls
- Flood Defence Embankments
- Storage Area
- Storage Embankment
- Flood Barriers / Gates
- Road Raising



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



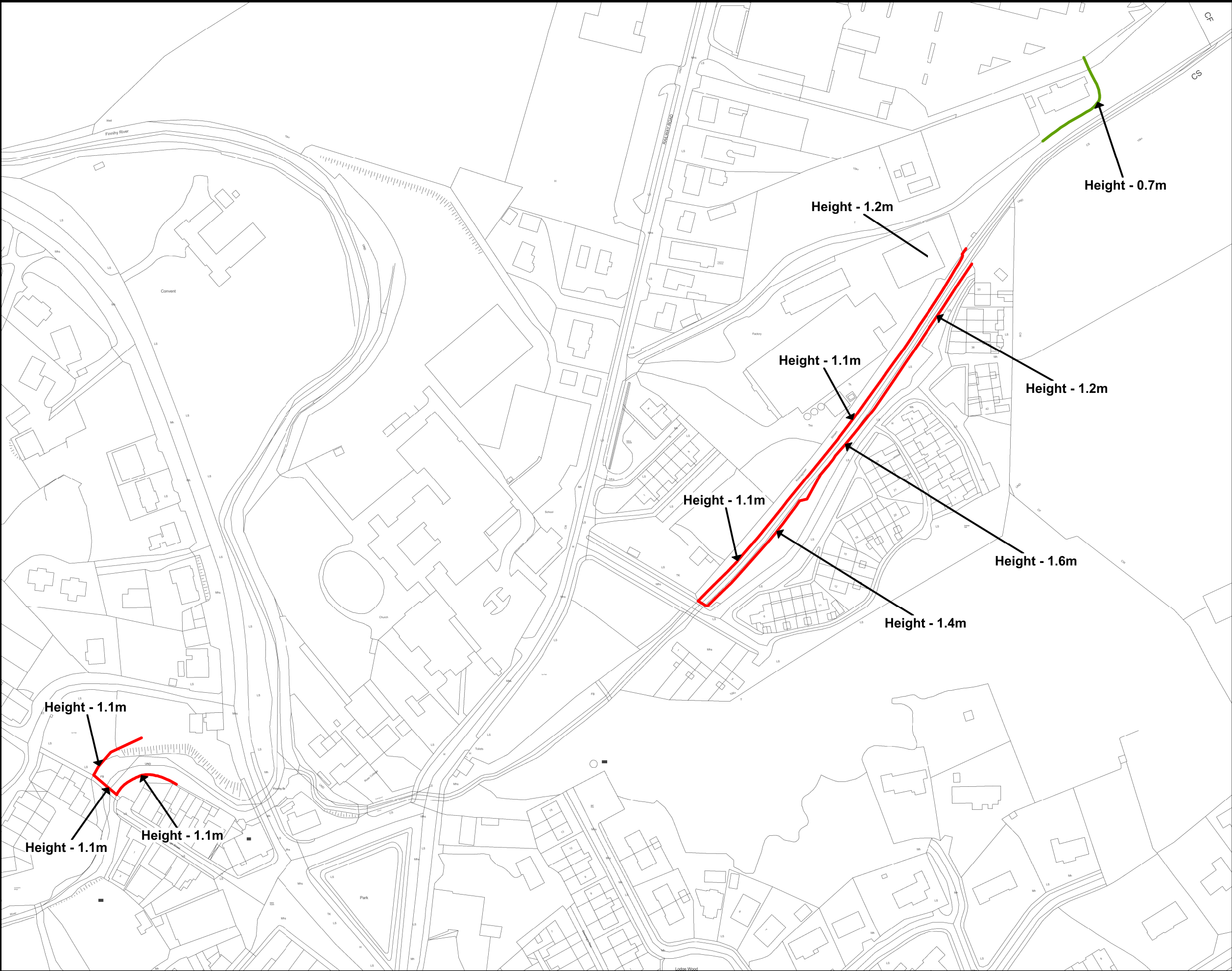
Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

| | |
|--|------------------------------|
| Project : South Western CFRAM Study | |
| Map : Kenmare - Overview Storage and Flood Defences | |
| Map Type: | Preliminary Options |
| Source: | Fluvial and Tidal Flooding |
| Map Area: | Urban Area |
| Scenario: | Current |
| Drawn by: | Tony Donovan |
| Checked by: | Barry O'Connor |
| Approved by: | Fintan McGivern |
| Map No.: | MMD-296235-E-DR-21-KE-209-P1 |
| Sheet: | 3 of 6 |
| Drawing Scale: | NTS |
| Revision: | P1 |
| Plot Scale: | 1:1 @ A3 |



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Flood Defence Walls



Flood Defence Embankments



Storage Area



Storage Embankment



Flood Barriers / Gates



Road Raising



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Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

Project :

South Western CFRAM Study

Map : Kenmare - Overview
Storage and Flood Defences

Map Type: Preliminary Options

Source: Fluvial and Tidal Flooding

Map Area: Urban Area

Scenario: Current

Drawn by: Tony Donovan

Checked by: Barry O'Connor

Approved by: Fintan McGivern

Map No.: MMD-296235-E-DR-21-KE-210-P1

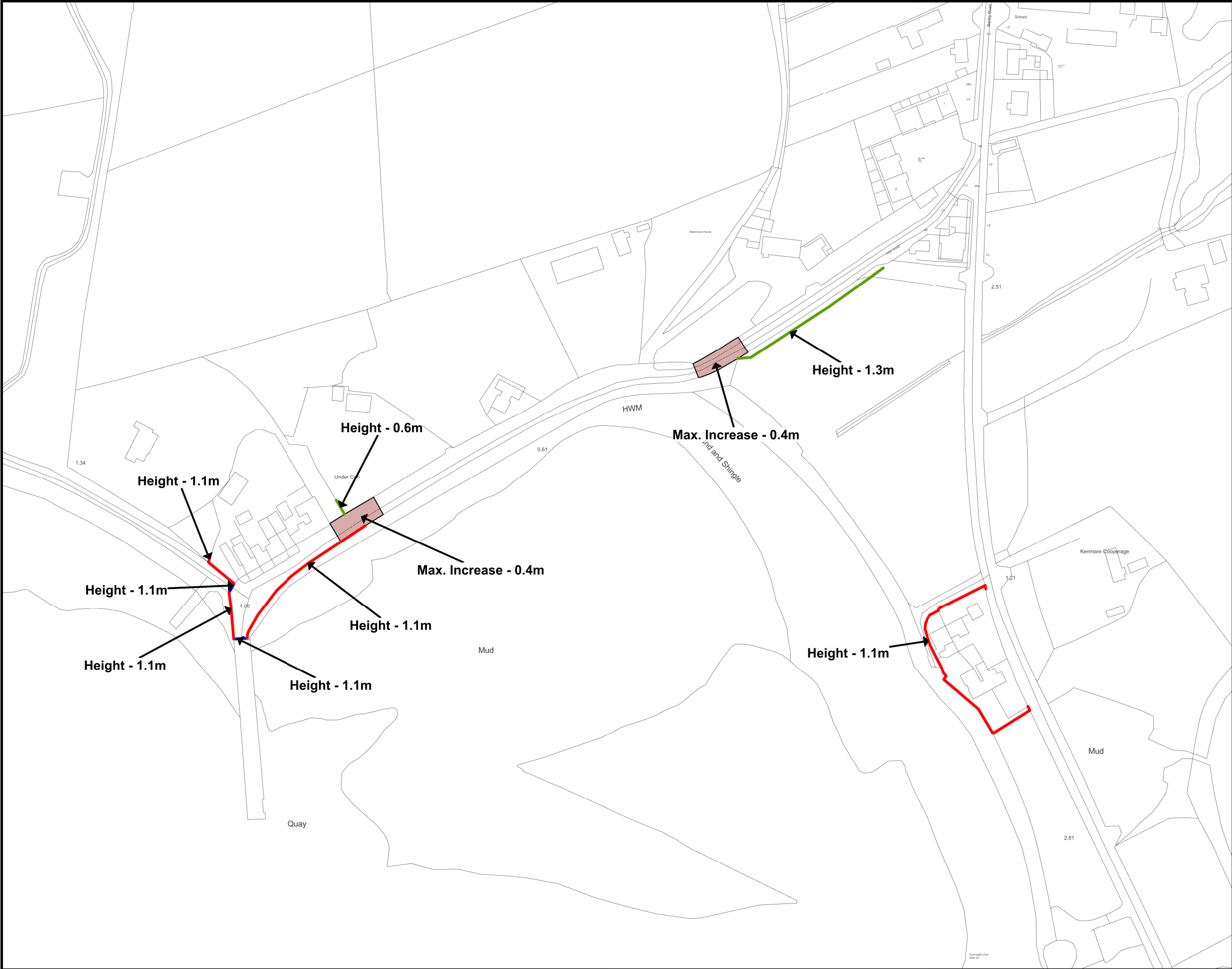
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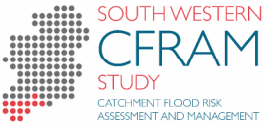


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- Flood Defence Walls
- Flood Defence Embankments
- Storage Area
- Storage Embankment
- Flood Barriers / Gates
- Road Raising



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Trim, Co. Meath



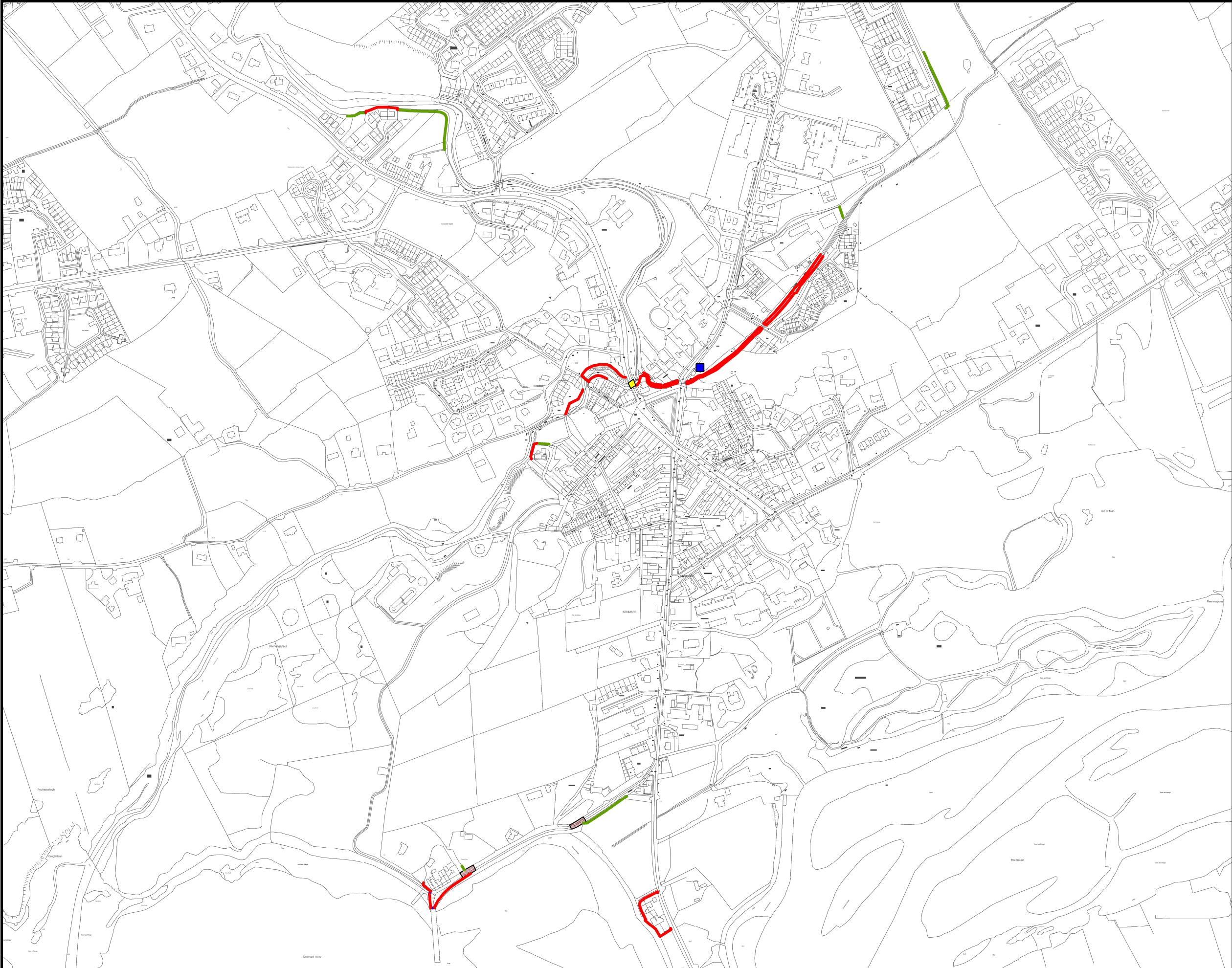
Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

| | |
|--|------------------------------|
| Project : South Western CFRAM Study | |
| Map : Kenmare - Overview Storage and Flood Defences | |
| Map Type: | Preliminary Options |
| Source: | Fluvial and Tidal Flooding |
| Map Area: | Urban Area |
| Scenario: | Current |
| Drawn by: | Tony Donovan |
| Checked by: | Barry O'Connor |
| Approved by: | Fintan McGivern |
| Map No.: | MMD-296235-E-DR-21-KE-212-P1 |
| Sheet: | 6 of 6 |
| Drawing Scale: | NTS |
| Revision: | P1 |
| Plot Scale: | 1:1 @ A3 |



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Flood Defence Walls



Flood Defence Embankments



Flood Barriers / Gates



Road Raising



Remove Pipe Under Bridge



Pump Station



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Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

Project :

South Western CFRAM Study

Map : Kenmare - Overview
Conveyance & Flood Defences

Map Type: Preliminary Options

Source: Fluvial and Tidal Flooding

Map Area: Urban Area

Scenario: Current

Drawn by: Tony Donovan

Checked by: Barry O'Connor

Approved by: Fintan McGivern

Map No.: MMD-296235-E-DR-21-KE-213-P1

Sheet: 1 of 5

Revision: P1

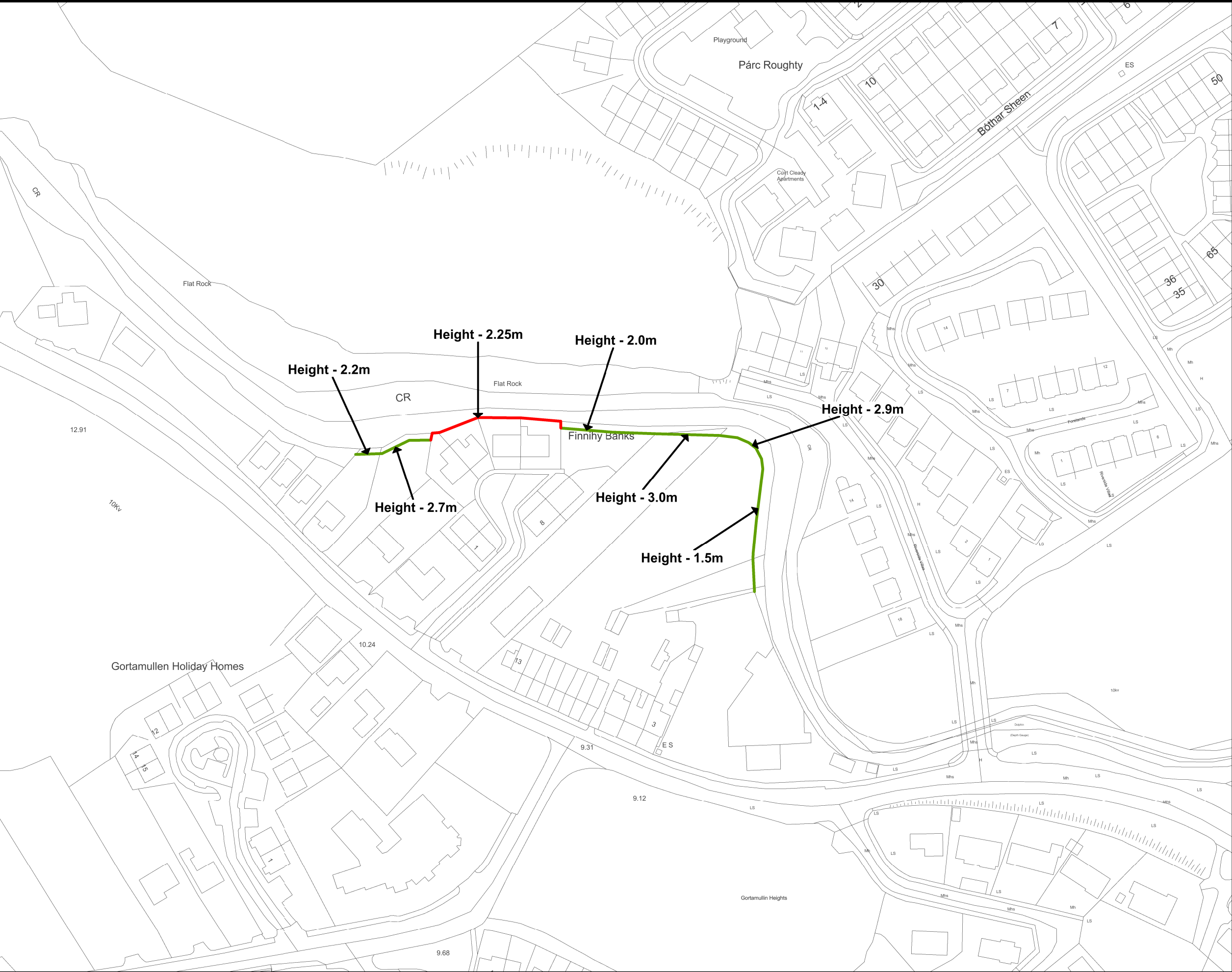
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- Flood Defence Walls
- Flood Defence Embankments
- Flood Barriers / Gates
- Road Raising
- Remove Pipe Under Bridge
- Pump Station



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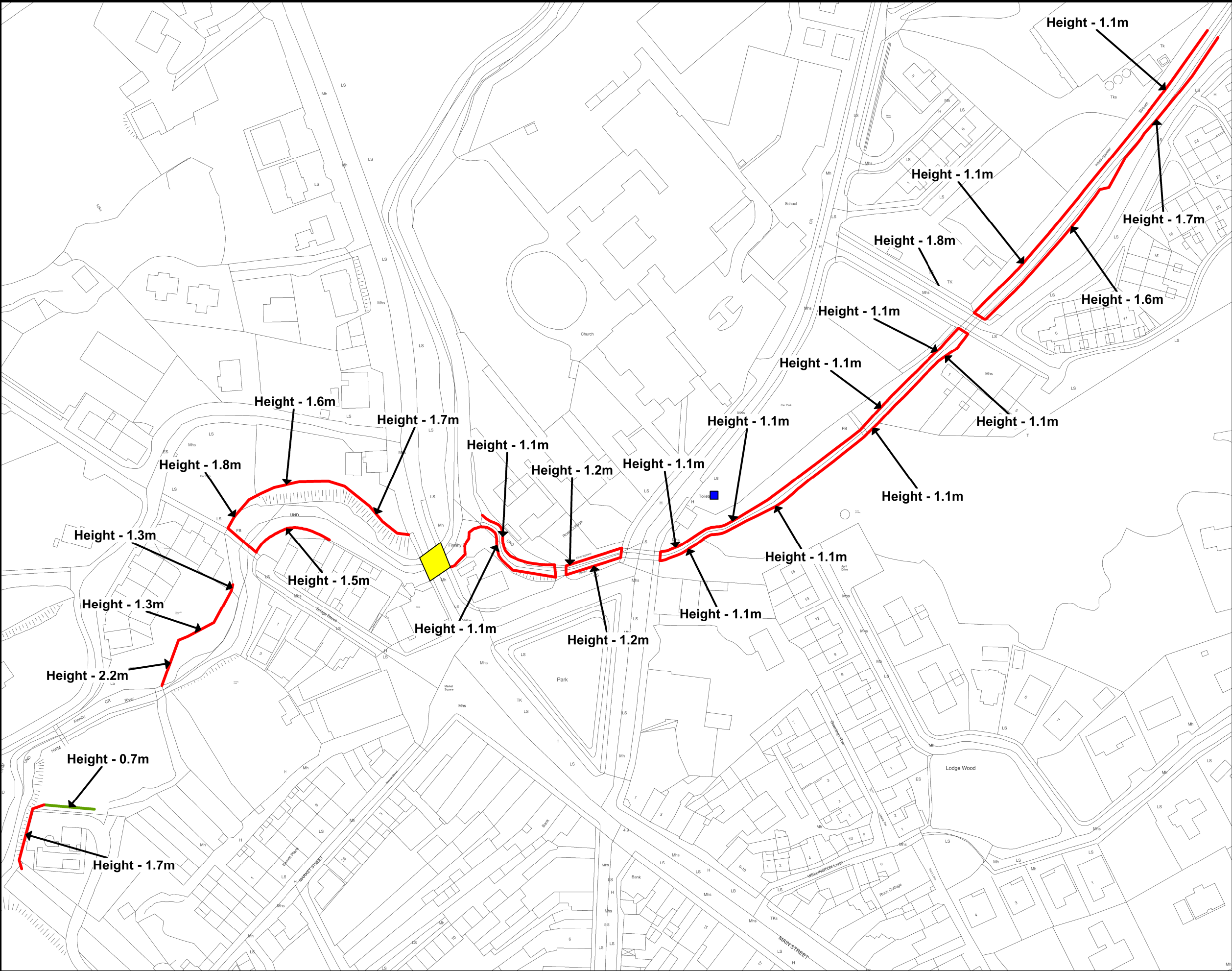
Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

| | |
|--|------------------------------|
| Project : South Western CFRAM Study | |
| Map : Kenmare Conveyance & Flood Defences | |
| Map Type: | Preliminary Options |
| Source: | Fluvial and Tidal Flooding |
| Map Area: | Urban Area |
| Scenario: | Current |
| Drawn by: | Tony Donovan |
| Checked by: | Barry O'Connor |
| Approved by: | Fintan McGivern |
| Map No.: | MMD-296235-E-DR-21-KE-214-P1 |
| Sheet: | 2 of 5 |
| Drawing Scale: | NTS |
| Revision: | P1 |
| Plot Scale: | 1:1 @ A3 |



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- Flood Defence Walls
- Flood Defence Embankments
- Flood Barriers / Gates
- Road Raising
- Remove Pipe Under Bridge
- Pump Station



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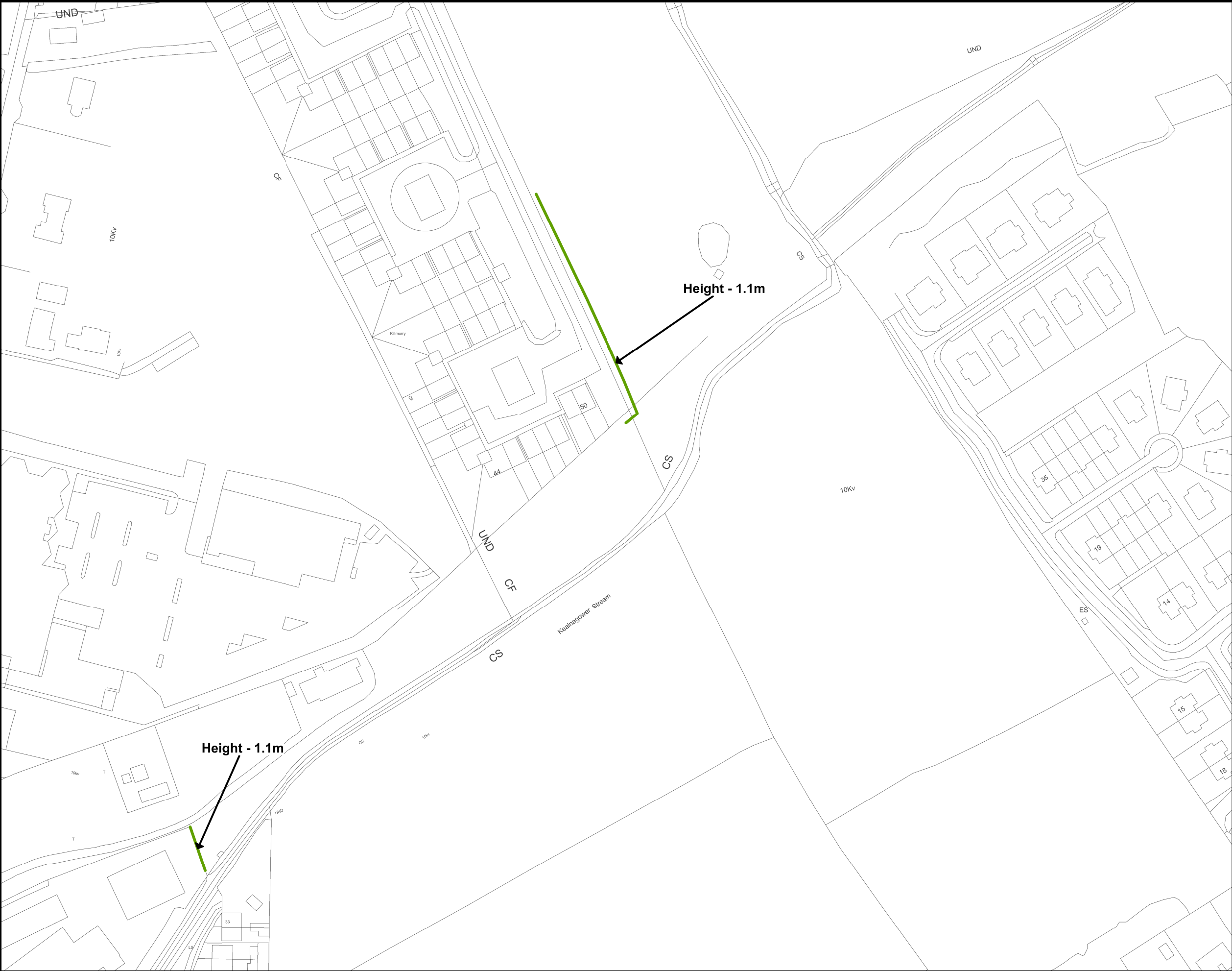
Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

| | |
|--|------------------------------|
| Project : South Western CFRAM Study | |
| Map : Kenmare Conveyance & Flood Defences | |
| Map Type: | Preliminary Options |
| Source: | Fluvial and Tidal Flooding |
| Map Area: | Urban Area |
| Scenario: | Current |
| Drawn by: | Tony Donovan |
| Checked by: | Barry O'Connor |
| Approved by: | Fintan McGivern |
| Map No.: | MMD-296235-E-DR-21-KE-215-P1 |
| Sheet: | 3 of 5 |
| Drawing Scale: | NTS |
| Revision: | P1 |
| Plot Scale: | 1:1 @ A3 |



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- Flood Defence Walls
- Flood Defence Embankments
- Flood Barriers / Gates
- Road Raising
- Remove Pipe Under Bridge
- Pump Station



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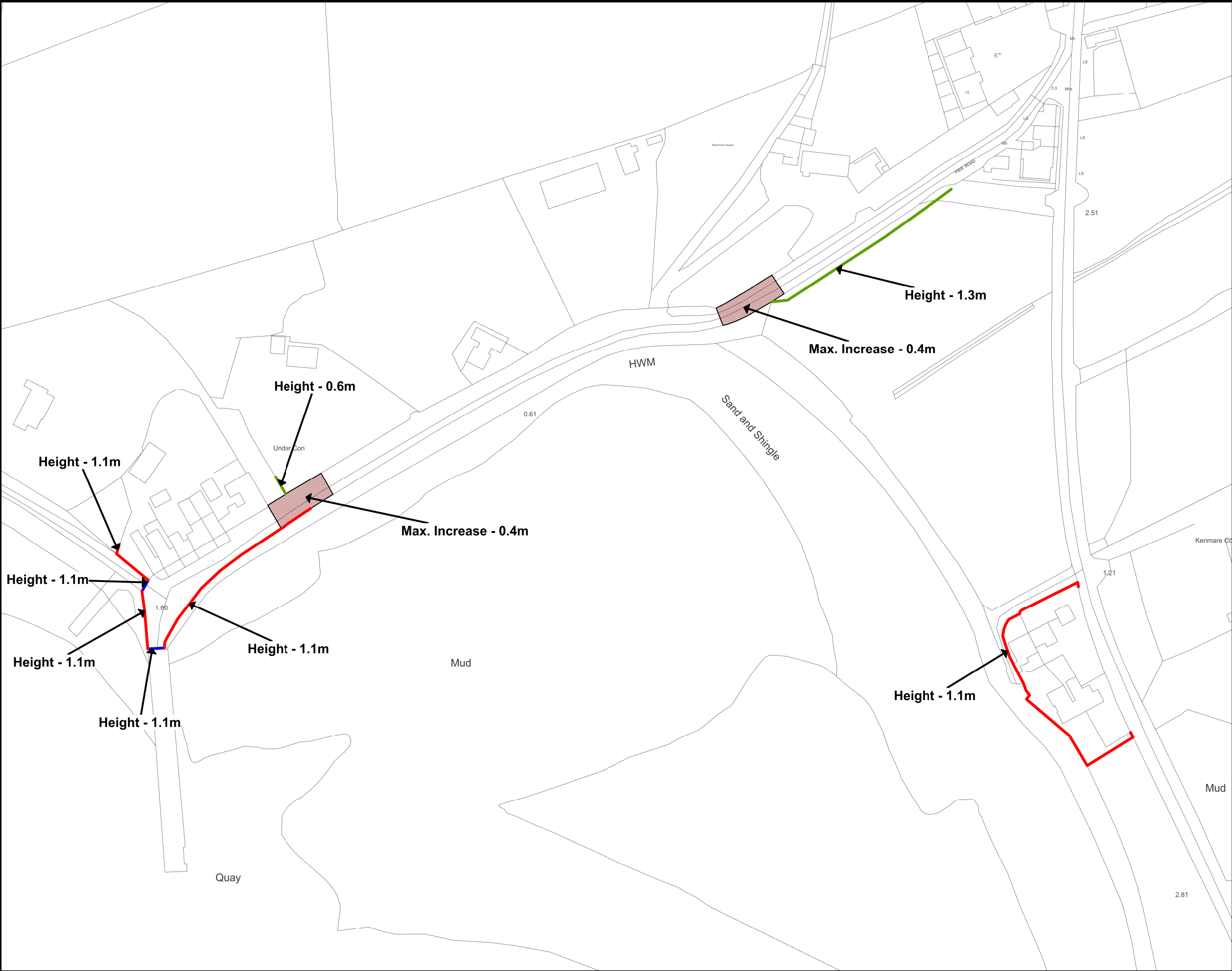
Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

| | |
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| Project : South Western CFRAM Study | |
| Map : Kenmare Conveyance & Flood Defences | |
| Map Type: | Preliminary Options |
| Source: | Fluvial and Tidal Flooding |
| Map Area: | Urban Area |
| Scenario: | Current |
| Drawn by: | Tony Donovan |
| Checked by: | Barry O'Connor |
| Approved by: | Fintan McGivern |
| Map No.: | MMD-296235-E-DR-21-KE-216-P1 |
| Sheet: | 4 of 5 |
| Revision: | P1 |
| Drawing Scale: | NTS |
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- Flood Defence Walls
- Flood Defence Embankments
- Flood Barriers / Gates
- Road Raising
- Remove Pipe Under Bridge
- Pump Station



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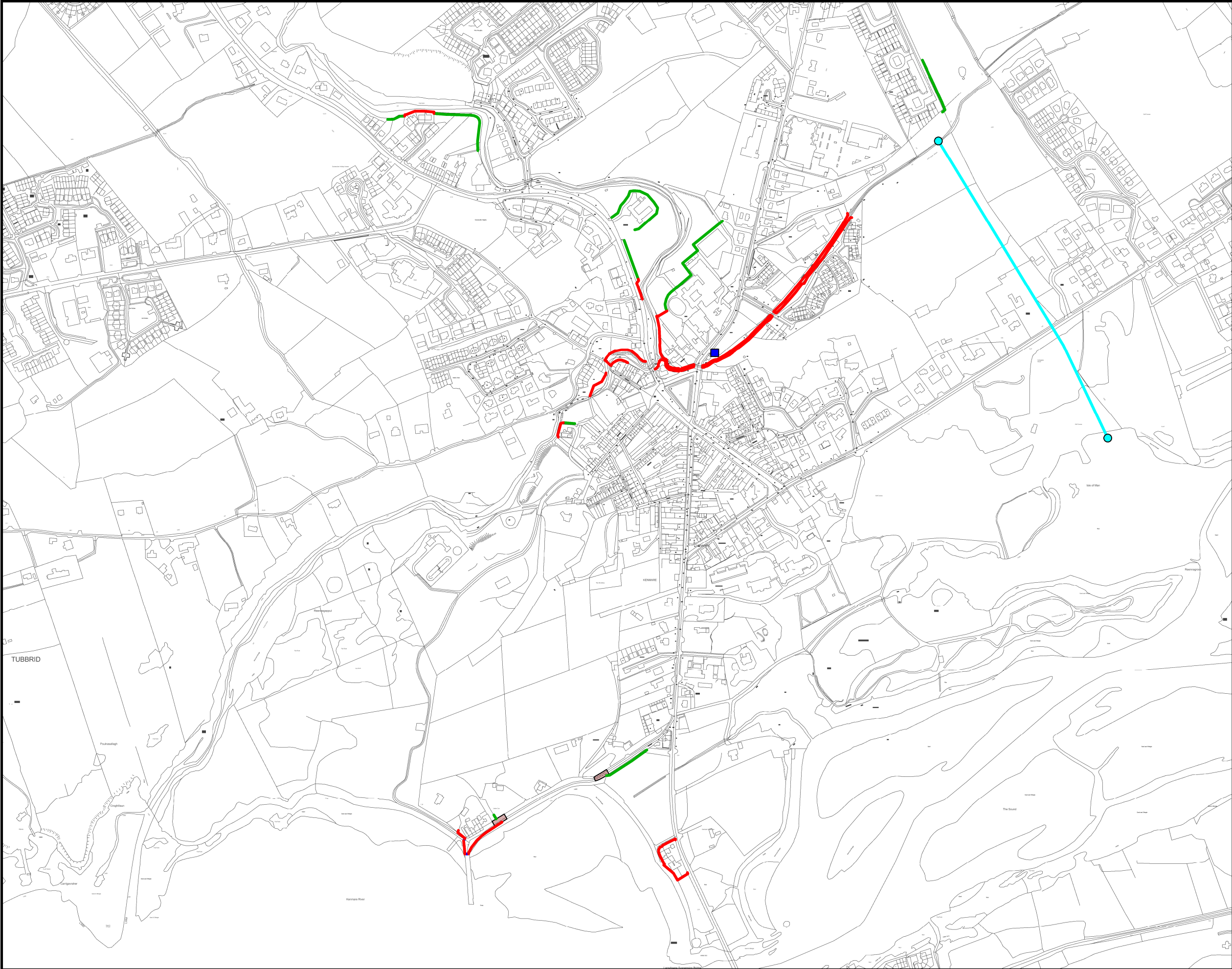
Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

| | |
|--|------------------------------|
| Project : South Western CFRAM Study | |
| Map : Kenmare Conveyance & Flood Defences | |
| Map Type: | Preliminary Options |
| Source: | Fluvial and Tidal Flooding |
| Map Area: | Urban Area |
| Scenario: | Current |
| Drawn by: | Tony Donovan |
| Checked by: | Barry O'Connor |
| Approved by: | Fintan McGivern |
| Map No.: | MMD-296235-E-DR-21-KE-217-P1 |
| Sheet: | 5 of 5 |
| Drawing Scale: | NTS |
| Revision: | P1 |
| Plot Scale: | 1:1 @ A3 |



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- Flood Defence Walls
- Flood Defence Embankments
- Flood Barriers / Gates
- Road Raising
- Pump Station
- Flow Diversion



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Trim, Co. Meath

Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

Project :
South Western CFRAM Study

Map : Kenmare - Overview
Flow Diversion & Flood Defences

Map Type: Preliminary Options

Source: Fluvial and Tidal Flooding

Map Area: Urban Area

Scenario: Current

Drawn by: Tony Donovan

Checked by: Barry O'Connor

Approved by: Fintan McGivern

Map No.: MMD-296235-E-DR-21-KE-218-P1

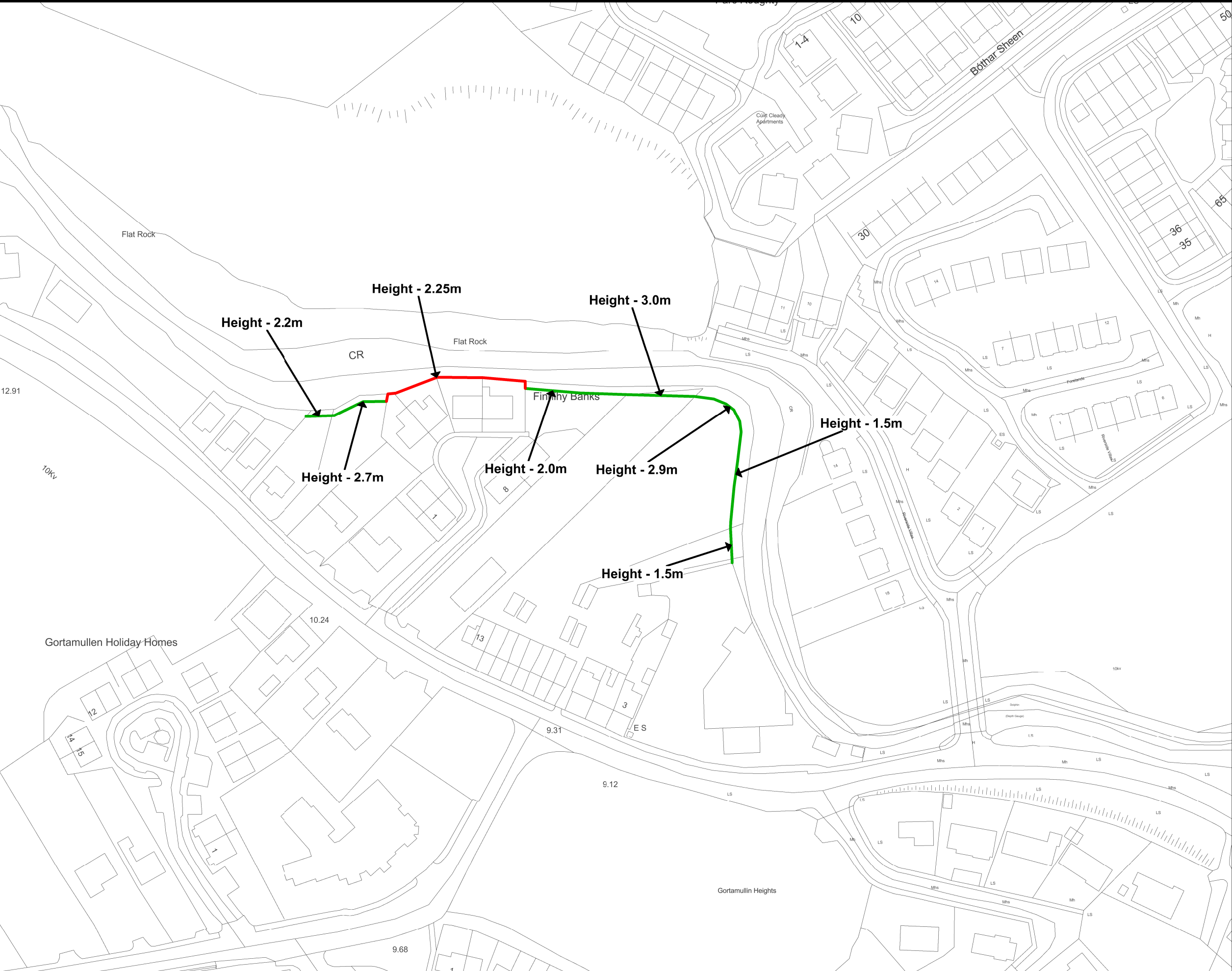
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- Flood Defence Walls
- Flood Defence Embankments
- Flood Barriers / Gates
- Road Raising
- Pump Station
- Flow Diversion



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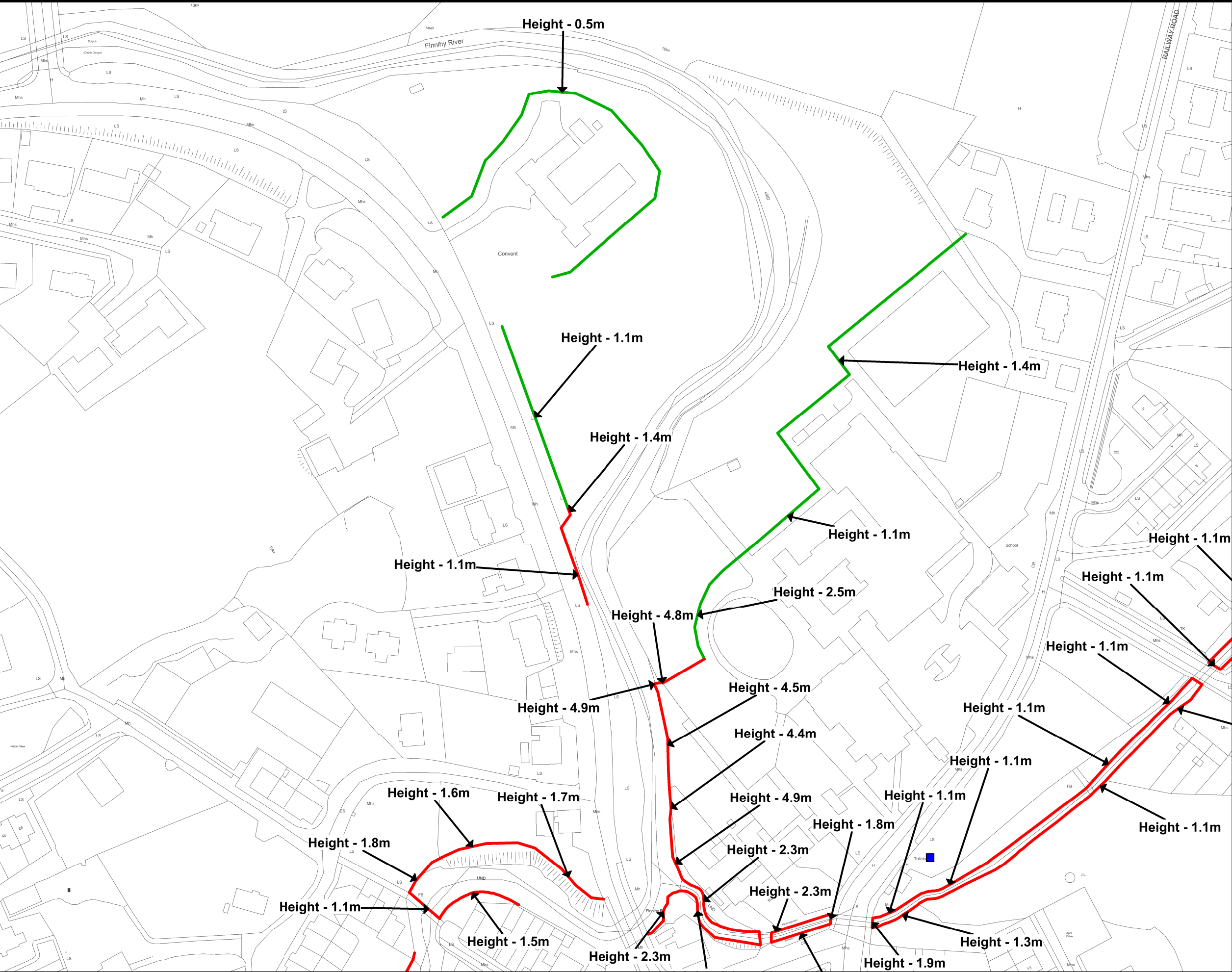
Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

| | |
|--|------------------------------|
| Project : South Western CFRAM Study | |
| Map : Kenmare Flow Diversion & Flood Defences | |
| Map Type: | Preliminary Options |
| Source: | Fluvial and Tidal Flooding |
| Map Area: | Urban Area |
| Scenario: | Current |
| Drawn by: | Tony Donovan |
| Checked by: | Barry O'Connor |
| Approved by: | Fintan McGivern |
| Map No.: | MMD-296235-E-DR-21-KE-219-P1 |
| Sheet: | 2 of 6 |
| Drawing Scale: | NTS |
| Revision: | P1 |
| Plot Scale: | 1:1 @ A3 |



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- Flood Defence Walls
- Flood Defence Embankments
- Flood Barriers / Gates
- Road Raising
- Pump Station
- Flow Diversion



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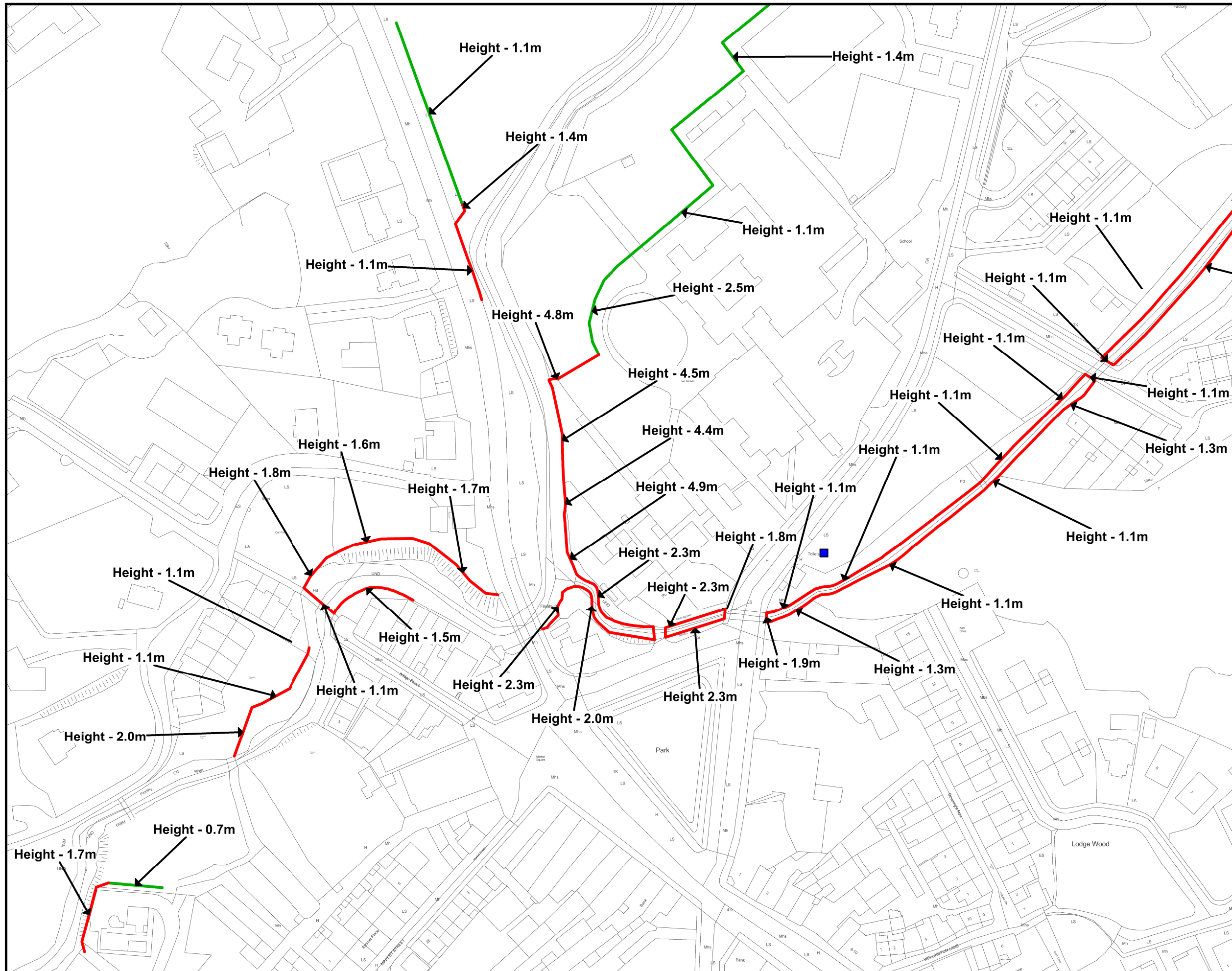
Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

| | |
|--|------------------------------|
| Project : South Western CFRAM Study | |
| Map : Kenmare Flow Diversion & Flood Defences | |
| Map Type: | Preliminary Options |
| Source: | Fluvial and Tidal Flooding |
| Map Area: | Urban Area |
| Scenario: | Current |
| Drawn by: | Tony Donovan |
| Checked by: | Barry O'Connor |
| Approved by: | Fintan McGivern |
| Map No.: | MMD-296235-E-DR-21-KE-220-P1 |
| Sheet: | 3 of 6 |
| Drawing Scale: | NTS |
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| Plot Scale: | 1:1 @ A3 |



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Flood Defence Walls
—


Flood Defence Embankments
—

Flood Barriers / Gates
—

Road Raising
▨

Pump Station
■

Flow Diversion
—

 **SOUTH WESTERN**
CFRAM
STUDY
CATCHMENT FLOOD RISK
ASSESSMENT AND MANAGEMENT

 **OPW**
The Office of Public Works
Offic na n-athbhorascha Poblaithe
Office of Public Works
Jonathan Swift Street,
Trim, Co. Meath

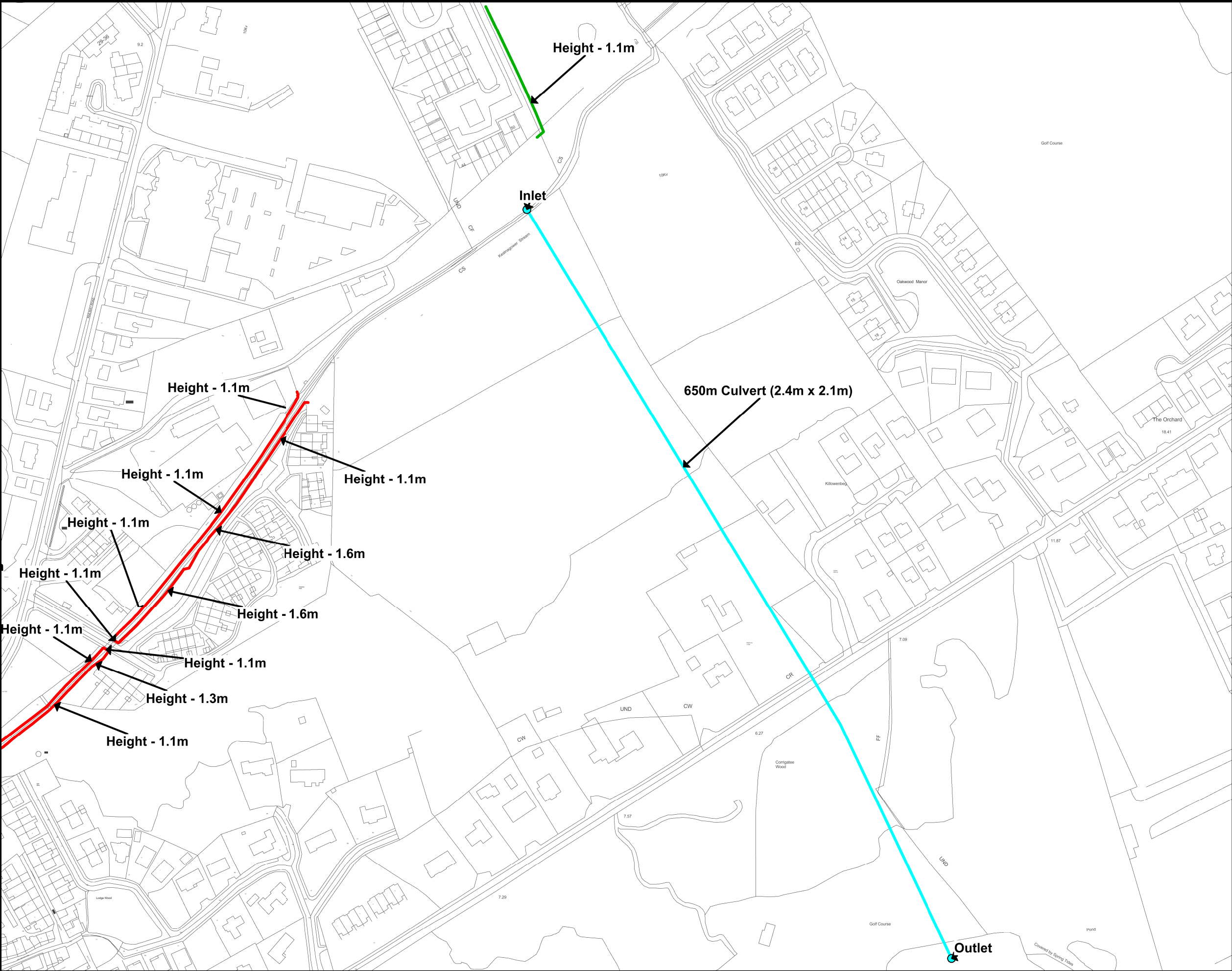
 **Mott MacDonald**
Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

| | |
|--|------------------------------|
| Project : South Western CFRAM Study | |
| Map : Kenmare Flow Diversion & Flood Defences | |
| Map Type: | Preliminary Options |
| Source: | Fluvial and Tidal Flooding |
| Map Area: | Urban Area |
| Scenario: | Current |
| Drawn by: | Tony Donovan |
| Checked by: | Barry O'Connor |
| Approved by: | Fintan McGivern |
| Map No.: | MMD-296235-E-DR-21-KE-221-P1 |
| Sheet: | 4 of 6 |
| Drawing Scale: | NTS |
| Revision: | P1 |
| Plot Scale: | 1:1 @ A3 |



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- Flood Defence Walls
- Flood Defence Embankments
- Flood Barriers / Gates
- Road Raising
- Pump Station
- Flow Diversion



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Jonathan Swift Street,
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Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

| | |
|--|------------------------------|
| Project : South Western CFRAM Study | |
| Map : Kenmare Flow Diversion & Flood Defences | |
| Map Type: | Preliminary Options |
| Source: | Fluvial and Tidal Flooding |
| Map Area: | Urban Area |
| Scenario: | Current |
| Drawn by: | Tony Donovan |
| Checked by: | Barry O'Connor |
| Approved by: | Fintan McGivern |
| Map No.: | MMD-296235-E-DR-21-KE-222-P1 |
| Sheet: | 5 of 6 |
| Drawing Scale: | NTS |
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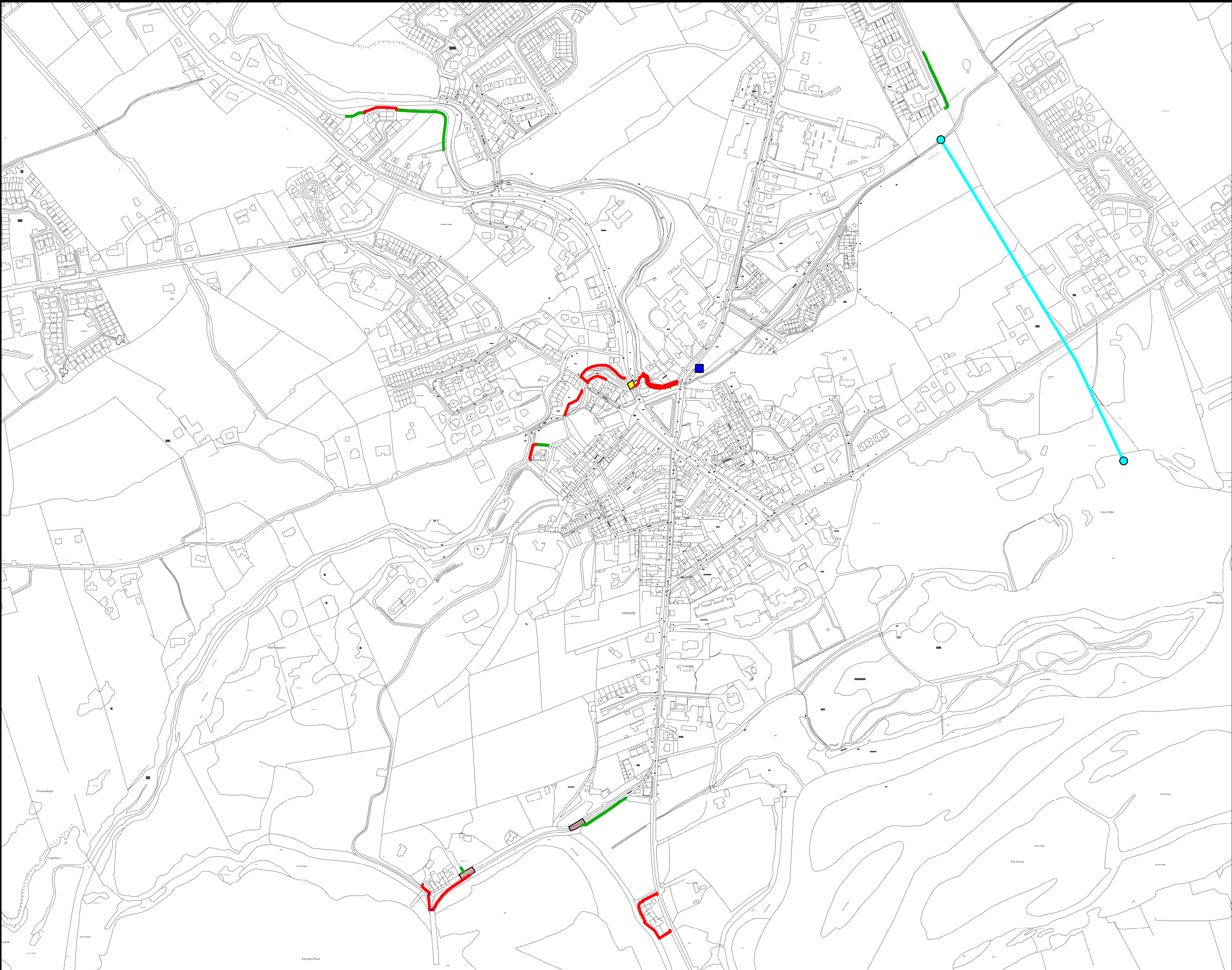


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- 
- SOUTH WESTERN
CFRAM**
STUDY
CATCHMENT FLOOD RISK
ASSESSMENT AND MANAGEMENT



Drawing Scale: NTS Plot Scale: 1:1 @ A3



Flood Defence Walls



Flood Defence Embankments



Flood Barriers / Gates



Road Raising



Remove Pipe Under Bridge



Pump Station



Flow Diversion



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Jonathan Swift Street,
Trim, Co. Meath



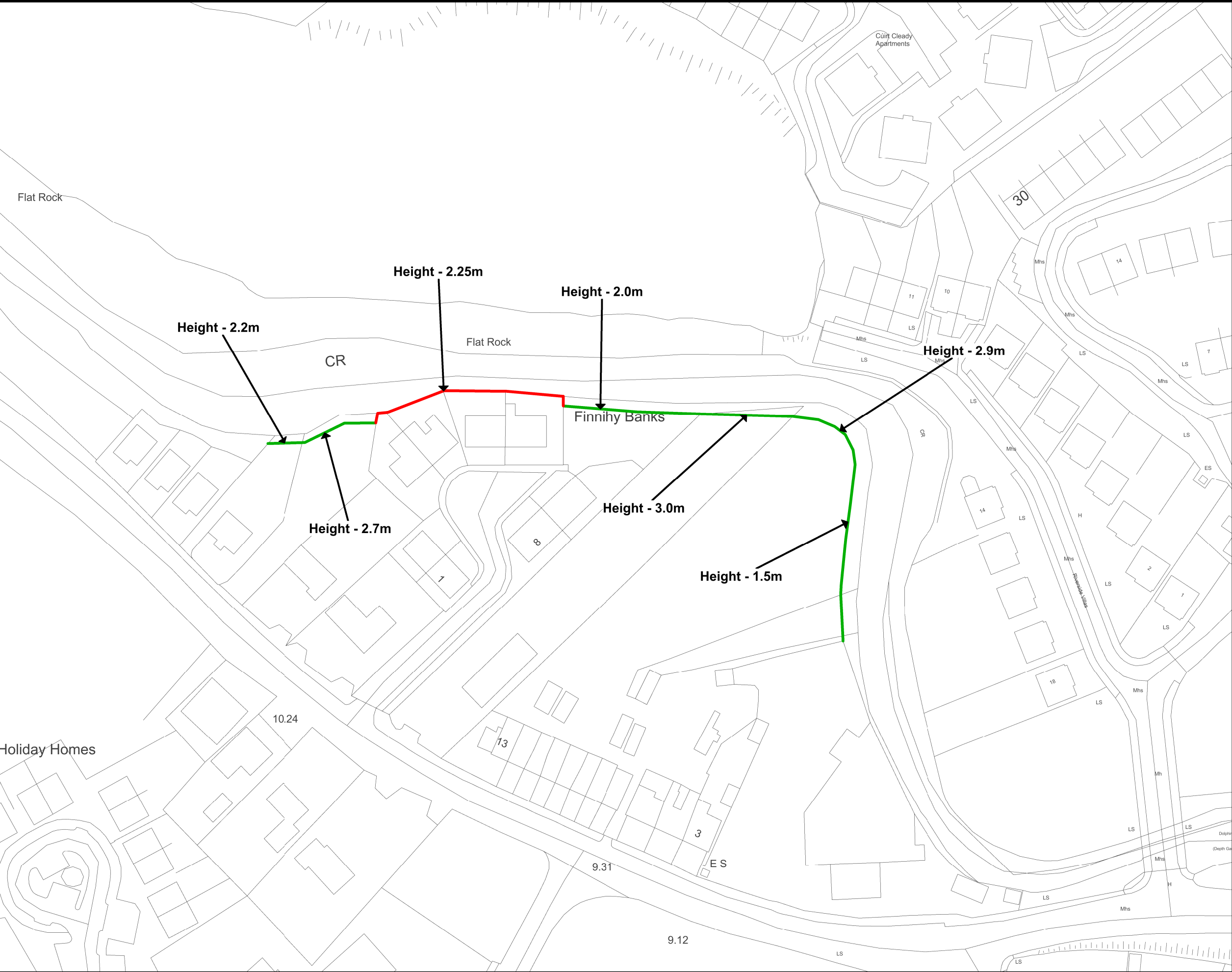
Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

| | |
|---|------------------------------|
| Project : South Western CFRAM Study | |
| Map : Kenmare - Overview Conveyance, Flow Diversion & Flood Defences | |
| Map Type: | Preliminary Options |
| Source: | Fluvial and Tidal Flooding |
| Map Area: | Urban Area |
| Scenario: | Current |
| Drawn by: | Tony Donovan |
| Checked by: | Barry O'Connor |
| Approved by: | Fintan McGivern |
| Map No.: | MMD-296235-E-DR-21-KE-224-P1 |
| Sheet: | 1 of 5 |
| Drawing Scale: | NTS |
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| Plot Scale: | 1:1 @ A3 |



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Flood Defence Walls

Flood Defence Embankments

Flood Barriers / Gates

Road Raising

Remove Pipe Under Bridge

Pump Station

Flow Diversion



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Jonathan Swift Street,
Trim, Co. Meath



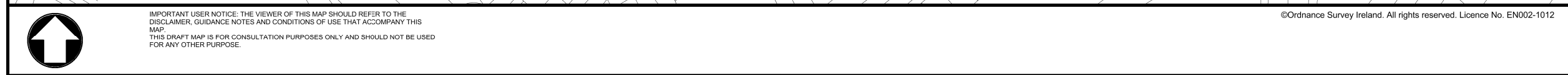
Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork


| | |
|--|------------------------------|
| Project : South Western CFRAM Study | |
| Map : Kenmare Conveyance, Flow Diversion & Flood Defences | |
| Map Type: | Preliminary Options |
| Source: | Fluvial and Tidal Flooding |
| Map Area: | Urban Area |
| Scenario: | Current |
| Drawn by: | Tony Donovan |
| Checked by: | Barry O'Connor |
| Approved by: | Fintan McGivern |
| Map No.: | MMD-296235-E-DR-21-KE-225-P1 |
| Sheet: | 2 of 5 |
| Drawing Scale: | NTS |
| Revision: | P1 |
| Plot Scale: | 1:1 @ A3 |



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- 
- SOUTH WESTERN**
CFRAM
STUDY
CATCHMENT FLOOD RISK
ASSESSMENT AND MANAGEMENT



| | | | |
|----------------|--|-----------|-----------------|
| Project : | South Western CFRAM Study | | |
| Map : | Kenmare Conveyance, Flow Diversion & Flood Defences | | |
| Map Type: | Preliminary Options | | |
| Source: | Fluvial and Tidal Flooding | | |
| Map Area: | Urban Area | | |
| Scenario: | Current | | |
| Drawn by: | Tony Donovan | | |
| Checked by: | Barry O'Connor | | |
| Approved by: | Fintan McGivern | | |
| Map No.: | MMD-296235-E-DR-21-KE-226-P1 | | |
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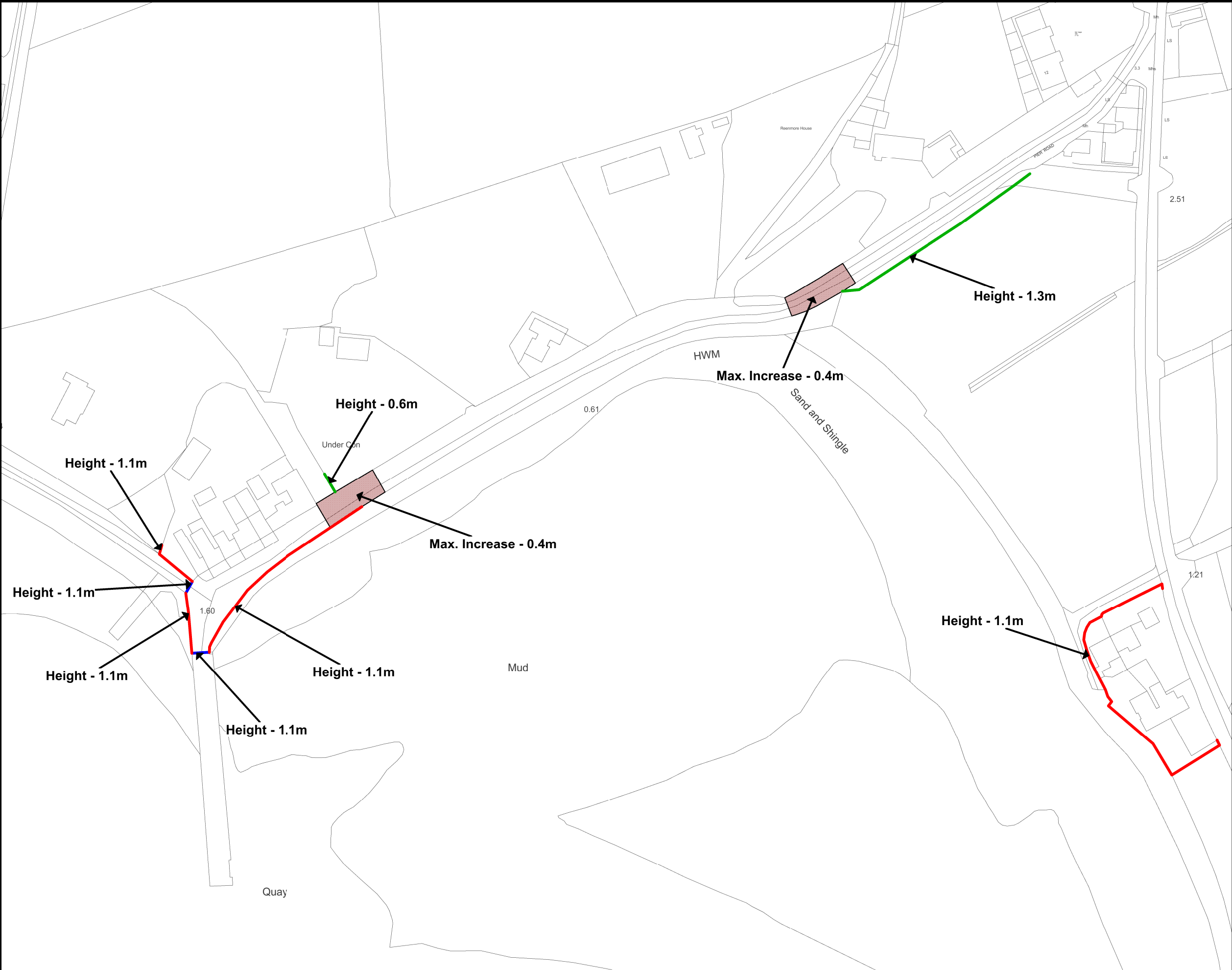


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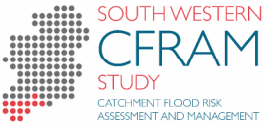
- 
- SOUTH WESTERN
CFRAM
STUDY
CATCHMENT FLOOD RISK
ASSESSMENT AND MANAGEMENT



| | |
|--|------------------------------|
| Project : | |
| South Western CFRAM Study | |
| Map : Kenmare Conveyance, Flow Diversion & Flood Defences | |
| Map Type: | Preliminary Options |
| Source: | Fluvial and Tidal Flooding |
| Map Area: | Urban Area |
| Scenario: | Current |
| Drawn by: | Tony Donovan |
| Checked by: | Barry O'Connor |
| Approved by: | Fintan McGivern |
| Map No.: | MMD-296235-E-DR-21-KE-227-P1 |
| Sheet: | 4 of 5 |
| Revision: | P1 |
| Drawing Scale: | NTS |
| Plot Scale: | 1:1 |



- Flood Defence Walls
- Flood Defence Embankments
- Flood Barriers / Gates
- Road Raising
- Remove Pipe Under Bridge
- Pump Station
- Flow Diversion



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



Mott MacDonald Ireland
5 Eastgate Avenue
Little Island, Cork

| | |
|--|------------------------------|
| Project : South Western CFRAM Study | |
| Map : Kenmare Conveyance, Flow Diversion & Flood Defences | |
| Map Type: | Preliminary Options |
| Source: | Fluvial and Tidal Flooding |
| Map Area: | Urban Area |
| Scenario: | Current |
| Drawn by: | Tony Donovan |
| Checked by: | Barry O'Connor |
| Approved by: | Fintan McGivern |
| Map No.: | MMD-296235-E-DR-21-KE-228-P1 |
| Sheet: | 5 of 5 |
| Drawing Scale: | NTS |
| Revision: | P1 |
| Plot Scale: | 1:1 @ A3 |



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Head Office
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Co. Meath
C15 NX36

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E-mail: floodinfo@opw.ie
Website: www.floodinfo.ie