



FLOOD RISK ASSESSMENT

Cloonmore Regeneration LRD, Tralee, Co.Kerry

On behalf of Tulfarris CG Ltd.

August 2023

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| Project No. | Doc. No. | Rev. | Date | Prepared By | Checked By | Approved By | Status |
|-------------|----------|------|------------|--------------|------------|-------------|--------|
| 23824 | 6008 | A | 25/08/2023 | G.Fitzgerald | I Brosnan | IB | Final |
| | | | | | | | |
| | | | | | | | |

MWP, Engineering and Environmental Consultants
Address: Park House, Bessboro Road, Blackrock, Cork, T12 X251
www.mwp.ie



1. Introduction

1.1 Location and Proposed Development

The proposed development consists of 129 apartments and 18 Townhouses (147 Residential Units), drainage and associated site development works.

The site is located to the south-east of Austin Stack's Park and within the townland of Boherbee to the east of Tralee Town Center. University Hospital Kerry is located to the southeast of the site. See Figure 1-1 below for an aerial image of the site.



Figure 1-1: Aerial Image of Site

The site is relatively flat, levels on the site vary 8.117mOD on the east to 7.020mOD (AOD Above Ordnance Datum) on the west with the site slightly falling from east to west. The proposed development is currently a greenfield and part brownfield site. The site area is approximately 1.55ha. The EPA records the presence of The Big River to the west of the site and the River Lee to the south of the site as shown in Figure 1-2.

MWP were appointed to prepare a Flood Risk Assessment with respect to this development.

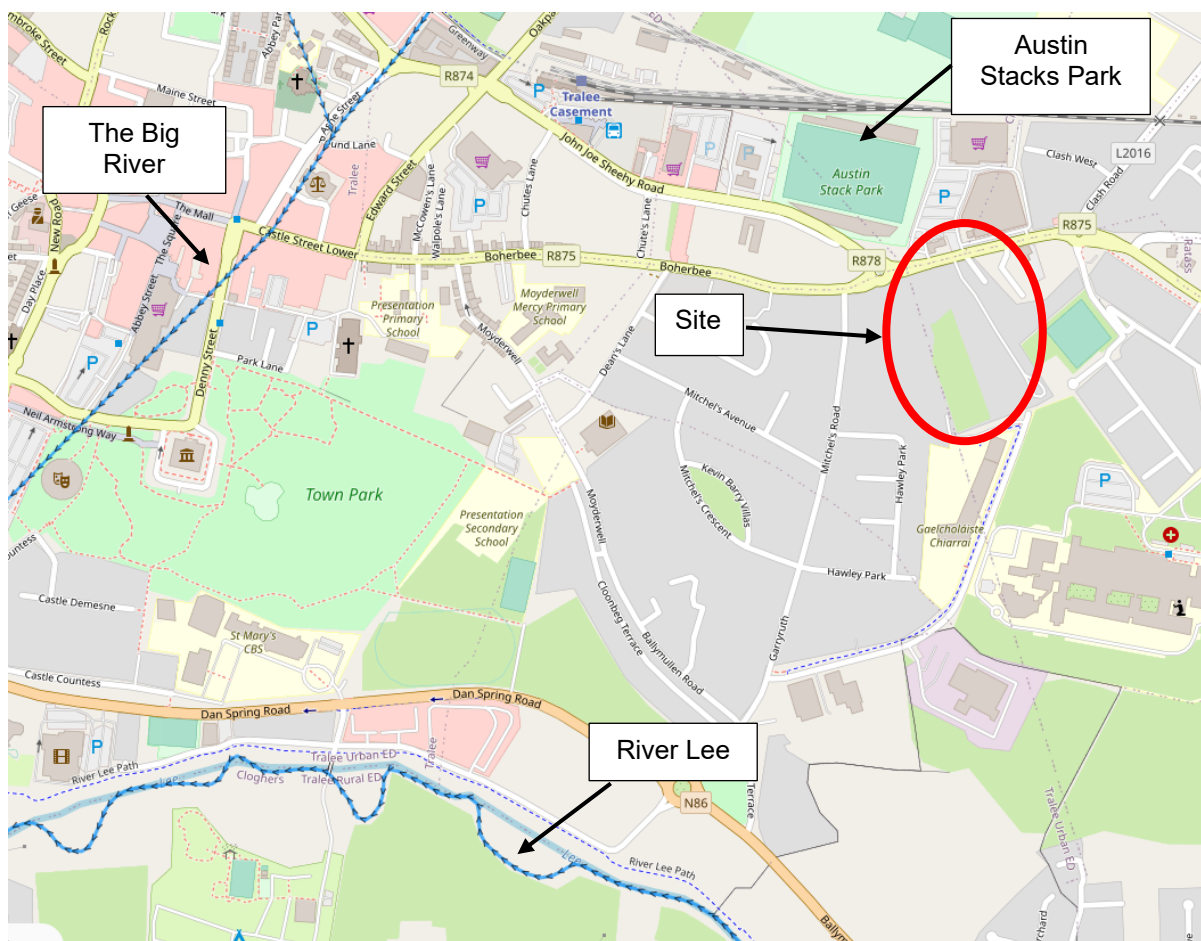


Figure 1-2: Water courses in vicinity of the site (EPA Maps)

1.2 Objectives

The purpose of the report is to establish the flood risk associated with the proposed development and, if appropriate, to recommend mitigation measures to prevent any increase in flood risk within the site or externally in the wider area.

The report has been prepared in the context of The Planning System and Flood Risk Management – Guidelines for Planning Authorities, November 2009, published by the Office of Public Works and the Department of Environment, Heritage and Local Government. Flood Risk Assessments are carried out at different scales by different organisations. The hierarchy of assessment types are Regional (RFRA), Strategic (SFRA) and Site-specific (FRA). This report is site-specific.

1.3 Methodology

The Flood Risk Management Guidelines document outlines three stages in the assessment of flood risk as follows:

Stage 1 Flood risk identification –

To identify whether there may be any flooding or surface water management issues related to a plan area or proposed development site that may warrant further investigation.

Stage 2 Initial flood risk assessment –

To confirm sources of flooding that may affect a plan area or proposed development site, to appraise the adequacy of existing information and to determine what surveys and modelling approach is appropriate to match the spatial resolution required and complexity of the flood risk issues. The extent of the risk of flooding should be assessed which may involve preparing indicative flood zone maps. Where existing river or coastal models exist, these should be used broadly to assess the extent of the risk of flooding and potential impact of a development on flooding elsewhere and of the scope of possible mitigation measures; and

Stage 3 Detailed risk assessments –

To assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk to a proposed or existing development, of its potential impact on flood risk elsewhere and of the effectiveness of any proposed mitigation measures. This will typically involve use of an existing or construction of a hydraulic model or a river or coastal cell across an area wide enough to appreciate the catchment wide impacts and hydrological processes involved.

This report has been prepared generally in accordance with these stages.

1.4 Flood Zones

The Flood Risk Management Guidelines document defines three flood zone types as follows:

Flood Zone A –

where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding).

Flood Zone B –

where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding); and

Flood Zone C –

where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all areas of the plan which are not in zones A or B.

The flood zone type is determined based on current water surface levels without allowance for climate change.

The Guidelines divide developments into three vulnerability classes as follows:

- Highly vulnerable developments
- Less vulnerable developments
- Water compatible developments

The Guidelines include a matrix that determines the appropriateness of different types of development based on their vulnerability classification and the Flood Zones in which they are located.

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

Table 1-1: Vulnerability Matrix

| Vulnerability Class | Land uses and types of development which include; |
|---|---|
| Highly vulnerable development (including essential infrastructure) | <p>Garda, ambulance and fire stations and command centers required to be operational during flooding; Hospitals; Emergency access and egress points Schools Dwelling houses, student halls of residence and hostels Residential institutions such as residential care homes, children's homes and social services homes Caravans and mobile home parks Dwelling houses designed, constructed or adapted for the elderly or, other people with impaired mobility; and Essential infrastructure, such as primary transport and utilities distribution, including electricity generating power stations and sub-stations, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding</p> |
| Less vulnerable development | <p>Buildings used for: retail, leisure, warehousing, commercial, industrial and non-residential institutions; Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans Land and buildings used for agriculture and forestry Waste treatment (except landfill and hazardous waste) Mineral working and process and Local transport infrastructure</p> |
| Water-compatible development | <p>Flood control infrastructure Docks, marinas and wharves Navigation facilities Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location; Water-based recreation and tourism (excluding sleeping accommodation); Lifeguard and coastguard stations Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms and Essential ancillary sleeping or residential accommodation for staff required by uses in this category(subject to a specific warning and evacuation plan)</p> |

Table 1-2: Vulnerability Classification

Where the matrix indicates that a development is not appropriate, it may still be justified based on a procedure described as a Justification Test.

The proposed development would be classified as a Highly Vulnerable Development.

2. Flood Risk Identification (Stage 1)

Possible sources of flood risk were identified by

- A walkover survey of the subject site and surrounding terrain;
- Topographical survey information for the site;
- Examination of available information on the website (www.floodinfo.ie);

The Past Flood Event Local Area Summary Report was obtained from the Office of Public Works (OPW) floodinfo.ie website. This report summarises all recorded past flood events within 2.5km radius of the map centre. The report shows 31 records of flooding within 2.5km radius of the proposed site, refer to Figure 2-1 below. The majority of these occurred to the south/west of the site towards the town centre. There is no record of flooding in the immediate vicinity of the site refer to Figure 2-2.

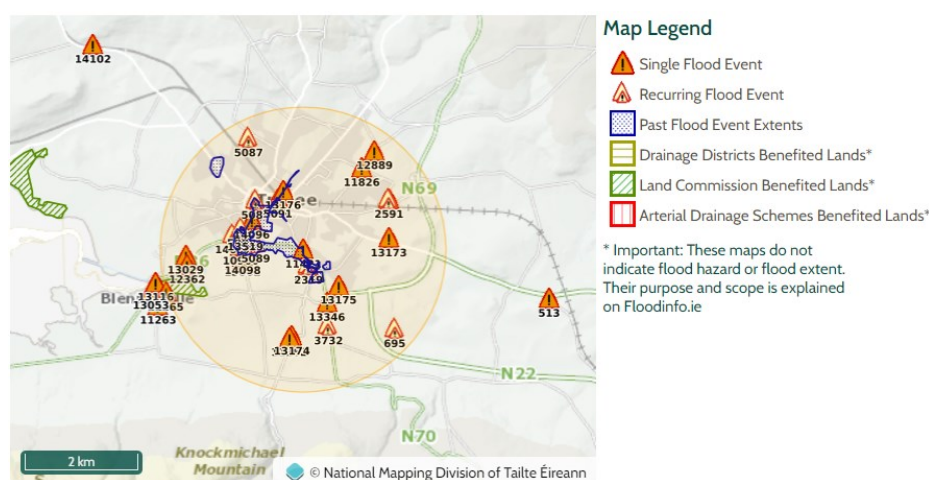


Figure 2-1: Recorded Flood Events in the vicinity of the site (Floodinfo.ie)



Figure 2-2: Recorded Flood Events in the vicinity of the site (Floodinfo.ie)

The flooding event in Ballymullen that occurred 450m to the south-west of the site is outlined below.

2.1.1 November 2011

Flooding on Thursday 29th November 2011 and ended on the same day affected lands to the south of the site. The location of the flood was at Main Street, Ballymullen, Tralee, Co. Kerry. The source of the flood waters was a storm sewer became overwhelmed once the outfall flaps were closed (and the cause was heavy rainfall). The flooding occurred in the Lee catchment, on the River Lee. Flooding has occurred frequently at this location before. These occurred in November.



Figure 2-3: Ballymullen, Tralee, Co. Kerry 29th November 2011

2.2 Draft Kerry County Development Plan SFRA 2022-2028

The draft county development plan shows the site as being outside Flood Zones A and B.

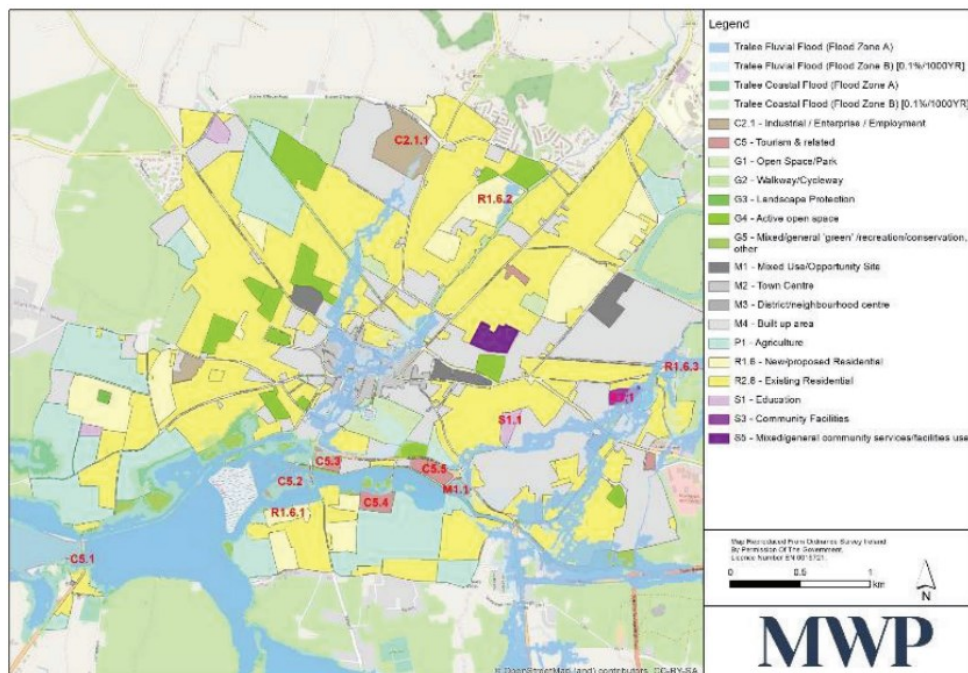


Figure 2-4: Extract from Draft Development Plan – Tralee Town – Flood Zone Map

2.3 Walkover Survey

A site walkover was conducted by MWP on the 15th of June 2023 to identify any potential flood sources and gain an understanding of possible flow paths to the site. The site is located in an urban area. There are no watercourses in the immediate vicinity of the site. The River Lee is located approximately 730m southwest of the site.

2.4 Topographic Survey

The site and surrounding area is relatively flat. The highest elevation on the site area is circa 8.116 AOD near the eastern boundary. The site slopes slightly to the west where the lowest elevation is approximately 7.020m AOD, along the western boundary. The full site topography is attached in Appendix B.

3. Initial Flood Risk Assessment (Stage 2)

The purpose of Initial Flood Risk Assessment is to ensure that all the relevant flood risk sources are identified so that they can be addressed appropriately in the Detailed Risk Assessment.

3.1 Flooding Sources

The potential sources of flooding and their relevance to the flood risk to the site are outlined in the following sub section's.

3.1.1 Fluvial flooding

Fluvial flooding occurs when the capacity of a river channel is exceeded and water flows onto the adjacent land or flood plain.

The Shannon CFRAM Study was carried out by the Office of Public Works (OPW) and Jacobs Consultants. The predicted flood extent maps for both tidal and fluvial flood sources are available on www.floodinfo.ie.

OPW Map (S23TRE_EXFCD_F1_02) shows the site being outside the extent for the 0.1% AEP fluvial flood event as shown in Figure 3-1. The modelled flood water elevations are summarized below in Table 3-1.

| Annual Exceedance Probability | 10% | 1% | 0.1% |
|-------------------------------|------|------|------|
| Water Level (mOD) | 3.52 | 3.68 | 3.82 |

Table 3-1: Fluvial Flood Levels for Model Node "03LEE01527"

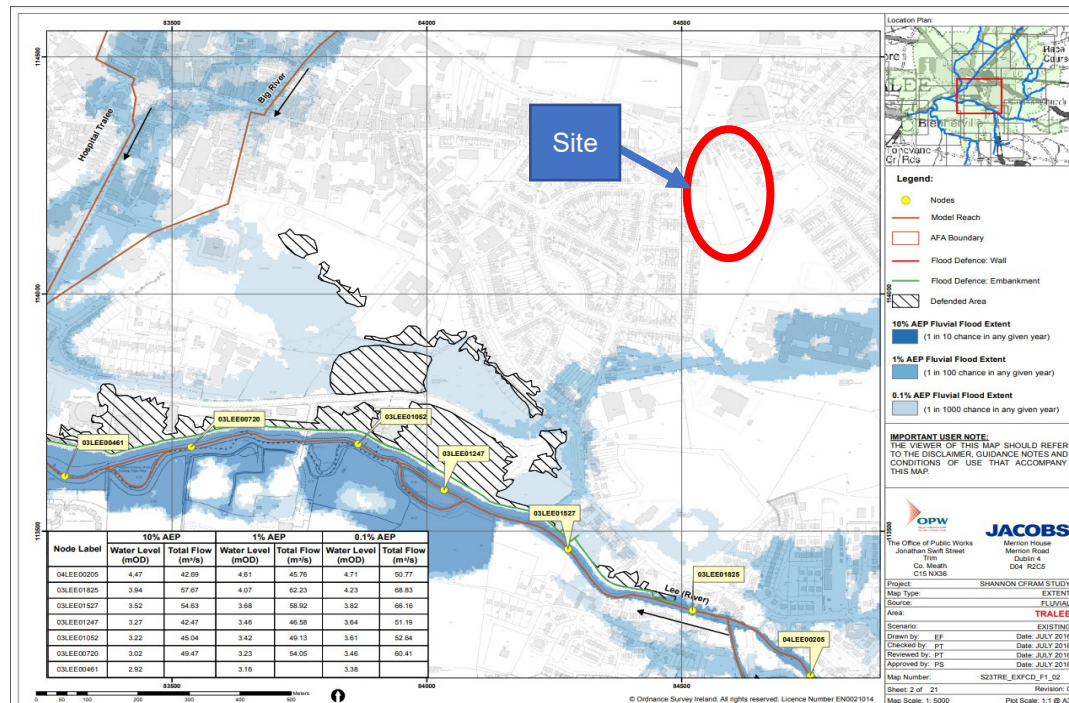


Figure 3-1: Extract from Fluvial Flood Extents Map (Floodinfo.ie)

Fluvial flooding is shown at a distance of 200m from the southern boundary of the site, as you enter Kevin Barry’s Villas. The highest level of the fluvial flood in a 1 in 1000 Year Event is 3.82m. This is considerably lower than the lowest proposed finished floor level of 7.75m.

The River Lee watercourse was not modelled as part of this process. Given the minimal depth of water observed at the site visit, contours of the area and being over 730m from the site, it is highly unlikely for a flood event from this watercourse to affect the site.

3.1.2 Coastal Flooding

Given that the site is approximately 3.3km from the coast and its elevations are more than 7mOD, Coastal flooding from coastal sources is highly unlikely on this site. OPW Map (S23TRE_EXCCD_F1_02) confirms the site is outside the extent for the 0.1% AEP coastal flood event as shown in Figure 3-2. .

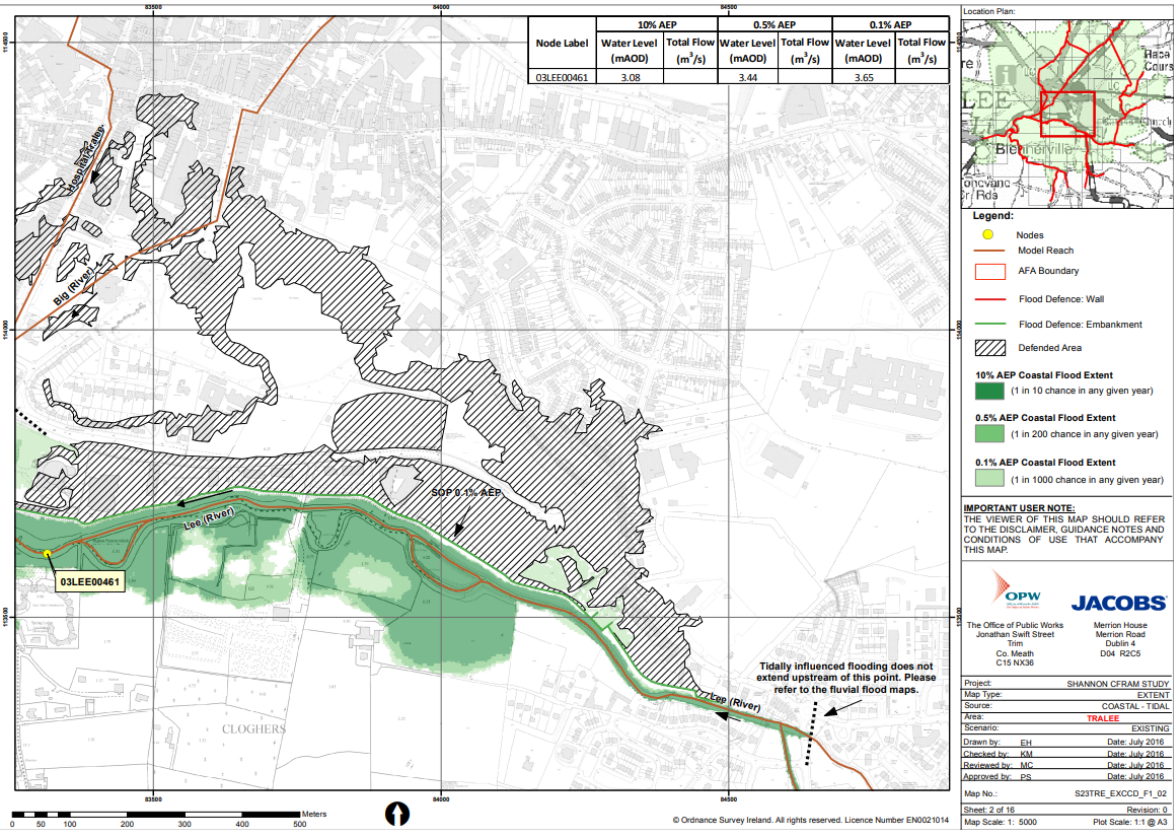


Figure 3-2: Extract from Coastal Flood Extents Map (Floodinfo.ie)

3.1.3 Pluvial flooding

Pluvial flooding or overland flow occurs when rainfall intensity exceeds the infiltration capacity of the ground. The excess water flows overland to the nearest watercourse or results in ponding in low areas or upstream of physical obstructions. Overland flow is most likely to occur following periods of sustained rainfall that cause the ground surface to become saturated or by high intensity short duration rainfall events. The proposed site is a part greenfield and brownfield urban site, and is located on relatively even topography and therefore it is not envisaged that any overland flow will occur.

The risk from this flood mechanism can be addressed by designing the storm system in accordance with best practice guidelines using a Sustainable Urban Drainage System (SUDs) which will replicate the greenfield scenario insofar as practicable. Appropriately sized pipes and drainage should be provided to prevent flooding within the site and an attenuation system should be incorporated to prevent an increased risk of flooding downstream of the site.

3.1.4 Groundwater flooding

Groundwater flooding occurs when the water table rises to the level of the ground surface due to rainfall and flows out over the surface. The Groundwater Flooding Data Viewer by the GSI shows the closest area affected by groundwater flooding is located over 800m south of from the site. The ground in the vicinity of the site generally has good permeability.

3.1.5 Flood Zoning

The OPW flood zoning maps indicate the site will be outside Flood Zones A and B. The proposed type of development is appropriate for this Flood Zone and therefore a justification test is not required.

4. Conclusions and Recommendations

The flood risk assessment has identified that the site is outside of Flood Zones A and B as defined in the Flood Risk Management Guidelines. The proposed uses are justified based on existing zoning, existing use and the SFRA conducted for the Kerry County Development Plan. The primary flood source threat to the site will be from pluvial sources.

The topography ensures that the lowest proposed finished floor level in the development of 7.75 mOD will be positioned well above any potential flood levels.

Potential flood levels in Tralee rise to approximately 3.82m in the area. This site is well above this predicted level.

The lowest recommended finished floor level is:

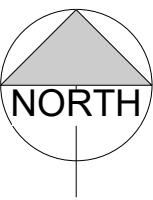
- Floor level of building 7.75mOD

The following recommendations are advised to be incorporated into the design:

- Finished Floor Levels to be 150mm above adjacent ground level to minimise risk of surface water ingress.
- Stormwater drainage to cater for the rainfall run off within the site in accordance with the Development Plan.

Appendix A

Site Layout Plan



- NOTES:
1. ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT SPECIFICATIONS, BILLS OF QUANTITIES, ARCHITECTURAL SERVICES AND ENGINEERING DRAWINGS.
 2. ANY DISCREPANCIES BETWEEN THESE DOCUMENTS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
 3. ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS NOTED OTHERWISE.
 4. ALL LEVELS ARE IN METRES RELATED TO ORDNANCE DATUM.
 5. DRAWINGS ARE NOT TO BE SCALED.

- LEGEND:
- SITE OWNERSHIP BOUNDARY
 - SITE BOUNDARY
 - PROPOSED FLUSH KERB
 - PROPOSED 125mm UPSTAND BULLNOSE KERB
 - PROPOSED 80mm UPSTAND BULLNOSE KERB
 - PROPOSED 65mm UPSTAND BULLNOSE KERB
 - PROPOSED ROAD
 - PROPOSED CONCRETE FOOTPATH
 - PARKING AREA
 - TACTILE PAVING
 - GRASS
 - PATIO
 - TRAFFIC CALMING PEDESTRIAN AND CYCLIST PRIORITY ZONE
 - PROPOSED CONCRETE APRON
 - ACCESSIBLE PARKING
 - WHEEL STOPS

- A= APARTMENT TYPE "A"
B= APARTMENT TYPE "B"
C= TRIPLEX UNITS
D= TOWNHOUSE

| | | | | |
|-----|----------|------------------------|------|------|
| P01 | 25.08.23 | ISSUED FOR INFORMATION | J.H. | I.B. |
| REV | DATE | DESCRIPTION | BY | APP |

PROJECT: CLOONMORE REGENERATION LRD,TRALEE

TITLE: SITE LAYOUT MASTER SHEET

CLIENT: TULFARRIS CG LTD



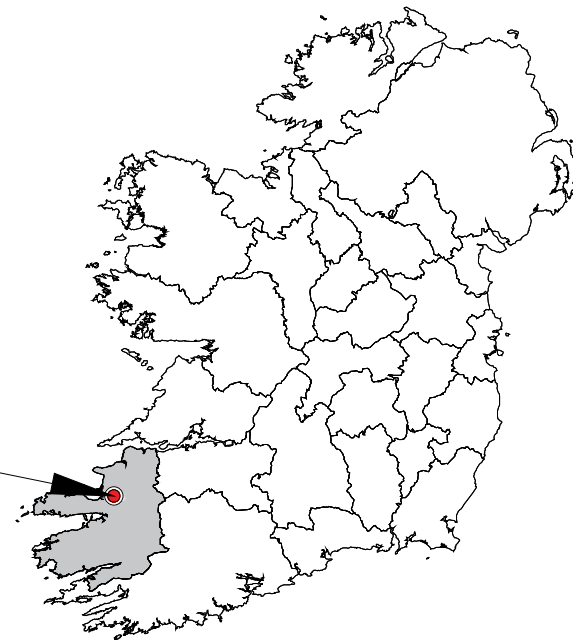
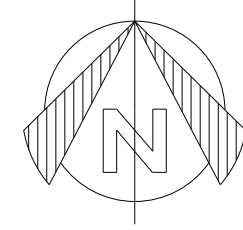
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| DRAWING NUMBER: 23824 - MWP -00 -00 -DR-C-0100 | REV: P01 |
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Appendix B

Site Topographical Survey



Site Location:
Cloonmore,
Tralee,
Co. Kerry

Datum : Malin Head **Grid System :** Irish National Grid ☐ ITM ☒

- Legend**
- | | | | |
|--|----------------------|--|---------------------------|
| | Manhole Cover | | Manhole ESB/Eircom |
| | Road Gully | | Light Pole |
| | Road Sign | | Utility Pole |
| | Mini Pillar | | Deciduous Tree |
| | Water Main | | Coniferous Tree |

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Cahills Park, Tralee, Co. Kerry, Ireland **Phone: 0860532258**
Email: fiachradunne@gmail.com



- | | |
|---------------------------|----------------------|
| • Topographic surveys | • UAV/Drone Services |
| • Building surveys | • Orthomosaics |
| • Engineering surveys | • DEMs & DTMs |
| • Legal mapping | • Site progress |
| • 3D Laser scanning | • Inspections |
| • BIM | • 3D Modelling |
| • Heritage & Conservation | • Photogrammetry |

Client : Malachy Walsh and Partners,
Consulting Engineers

Project : Cloonmore Housing Tralee

Description : Topographic Survey

Drawing Number : 230624-KY-001

Revision: 0 **Surveyed by :** FD

Scale : A1 @ 1:500 **Drawn by :** FD

Date : 24/06/2023 **Checked by :** FD