
Chapter 2

Need for the Proposed Development

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2.1 Introduction

This chapter sets out the need for the proposed Flood Defences West and provides an overview of the planning and development policy context under which the proposed development is being progressed. The existing flood defence measures are described under the heading of background and context along with an assessment of their effectiveness. The objectives of the proposed development are also identified in this chapter, which have formed the basis of the design development.

2.2 Background and Context

The proposed development is located within the townlands of Mountmisery and Newrath in Co. Waterford, the townland of Newrath in Co. Kilkenny along the north bank of the River Suir in Waterford City, Co. Waterford. The R680 Rice Memorial Bridge and the Waterford railway station, Plunkett Station are located at the easternmost extent of the site of proposed development, while the Iamród Éireann (IÉ) rail corridor and the Sallypark industrial site bound the development to the north. The River Suir and the existing quay wall run along the south of the site. The lands within the extent of the proposed development are zoned for 'Opportunity Sites' and 'Mixed Use' by the Waterford City Development Plan 2013 – 2019 (as extended).

The site is characterised by a historically heavy industrial usage however it is currently used for rail freight traffic running from Dublin to Waterford. Commuter rail services also operate within the rail corridor. The existing flood protection measures afforded to this section of the north quays consist of a quay wall along the banks of the River Suir. As outlined in the following paragraphs and the remaining sections of this chapter, the existing flood protection measures are no longer effective in protecting the infrastructure on the northern bank of Waterford City from flood events.

2.2.1 Existing Masonry Quay Wall

The existing quay wall within the development site, is a masonry structure over most of its length, which originated in late 19th century and has been subject to numerous upgrades, including sections of mass concrete. The structure of the existing masonry quay wall is described in the following paragraphs with reference to chainages shown in Figures 4.1 to 4.6 (Volume 3 of the EIAR).

From Ch.0.0 to Ch.340, the old masonry quay wall is no longer visible, with any potential remnants covered with current infrastructure. The available as-builts drawings from the 1980's and 1990's, created during the design and construction of the current R448 Terminus Street Bridge and Rice Bridge roundabout, indicate the lower parts of old masonry wall to be present below the base of the new structures, i.e. below the west car park boundary wall built in the 1990's as shown in Plate 2.1 below. This could not be confirmed by visual observations.



Plate 2.1 Typical condition of the wall/shoreline between Ch.0.0 and Ch.340 (photo taken at approx. Ch.200)

From Ch.340 to Ch.1090, the front face of the quay wall, facing the river, is visible as shown in Plate 2.2. The wall is typically made of masonry or blockwork, with frequent concrete additions, mostly in the upper part where a concrete capping beam forms the top of the wall. Gabions and shotcrete are also encountered locally. The heterogeneity of materials used implies that the current wall was built and upgraded in numerous stages. Between chainages Ch.790 to Ch.840, the riverbank is exposed with no remnants of the existing quay wall visible at this location. The base of the wall from Ch.340 to Ch.1090 is beneath the existing mudline and therefore, the exact shape of the wall cross-section is currently unknown. Numerous drainage outlets also protrude through the wall face.



Plate 2.2 Typical condition of the wall/shoreline between Ch.340 and Ch.1090 (Photo taken at approx. Ch.650)

A visual inspection of the existing masonry quay wall carried out in August 2018 by Roughan & O'Donovan, revealed that large sections of the existing quay wall are of inadequate height and condition and are below the design flood level of 4.0mOD, rendering it ineffective at protecting IÉ lands and associated rail infrastructure, against flooding. The deficiencies of the height and condition of the existing quay wall are described and presented in photographs below.

Wall height

The main cause of flooding within the development lands was observed to be the overtopping of the existing wall at the low points, with the flood waters then running gravitationally eastwards along the ballast towards the low point at Plunkett station. The locations of low points along the existing quay wall where the River Suir has been observed to be overtopping (by Iarnród Éireann staff) on several flood occasions include chainage Ch.370, between chainages Ch.540 and Ch.590 and between chainages Ch.900 and Ch.1050 (see Figures 4.1 to 4.6 in Volume 3 of this EIAR for chainage reference points).

A survey of the levels along the top of the wall was undertaken on 16th of May 2018. Plate 2.3 below shows the wall levels plotted on the graph along with a variety of flood levels including, the design flood level of +4.00 mOD. It is evident that the wall is of inadequate height to protect the site, even against frequent 1-in-2 years combined tidal/fluvial flood events in some places and is entirely inadequate to protect against the design flood level.

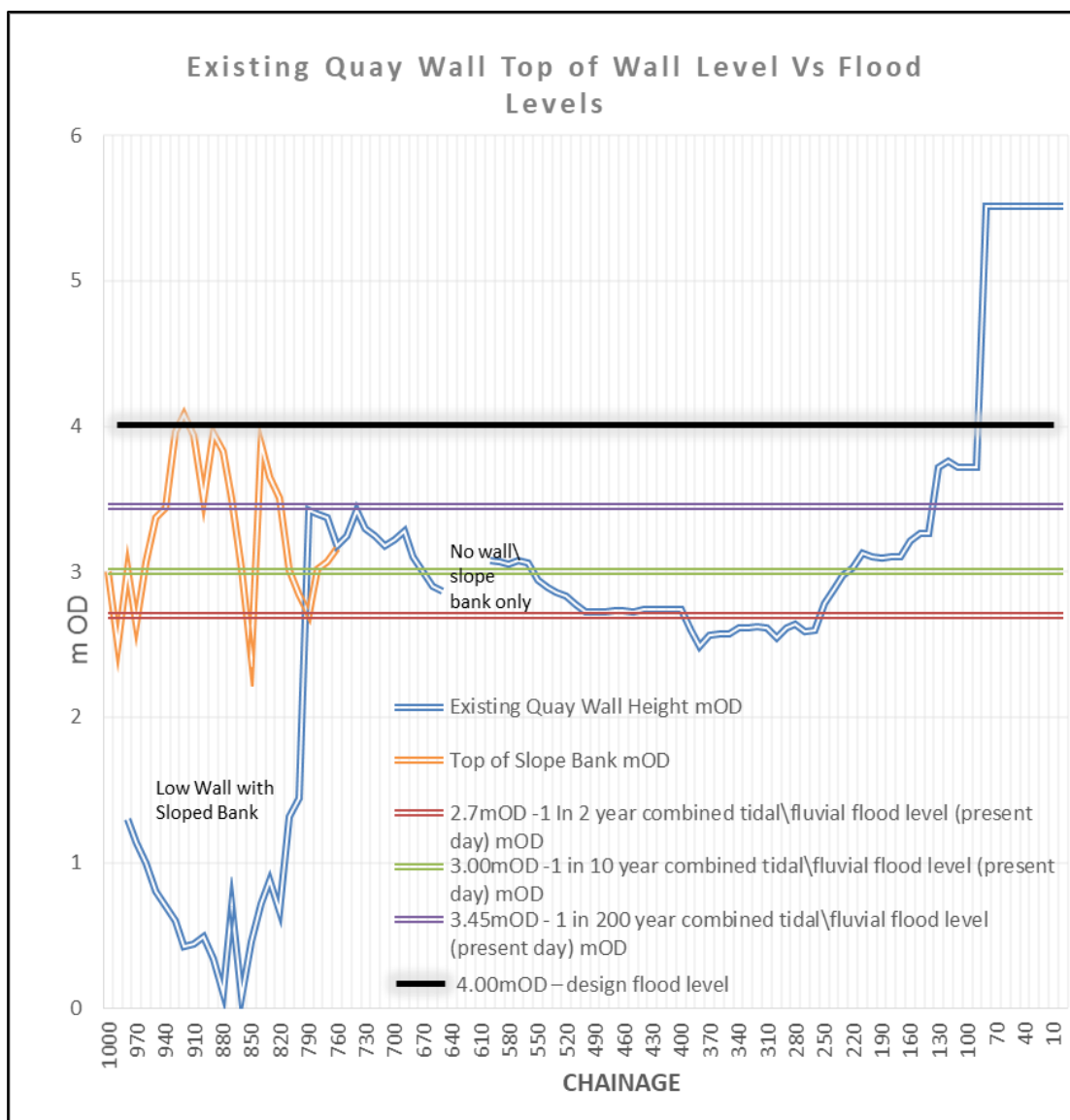


Plate 2.3 Existing quay wall height (note: chainage in the figure is a local chainage done for the purpose of Flood Scoping report in 2019 and 2020. Add 190 to get the chainage shown on the Volume 3 Figures of this EIAR. Example: chainage 100 in above graph equates to Ch.290 in Figure 4.2 in Volume 3 of the EIAR)

The OPW Catchment Flood Risk Assessment and Management (CFRAM) floodmaps (available at www.floodinfo.ie) have modelled the 1% Fluvial AEP with 0.5% Tidal AEP and the 0.1% Fluvial and Tidal AEP flood extents, as illustrated in the extract from the River Suir CFRAM map below. As illustrated in Plate 2.4, the lands behind the north bank of the River Suir are currently prone to flooding and are not protected by the existing quay walls.

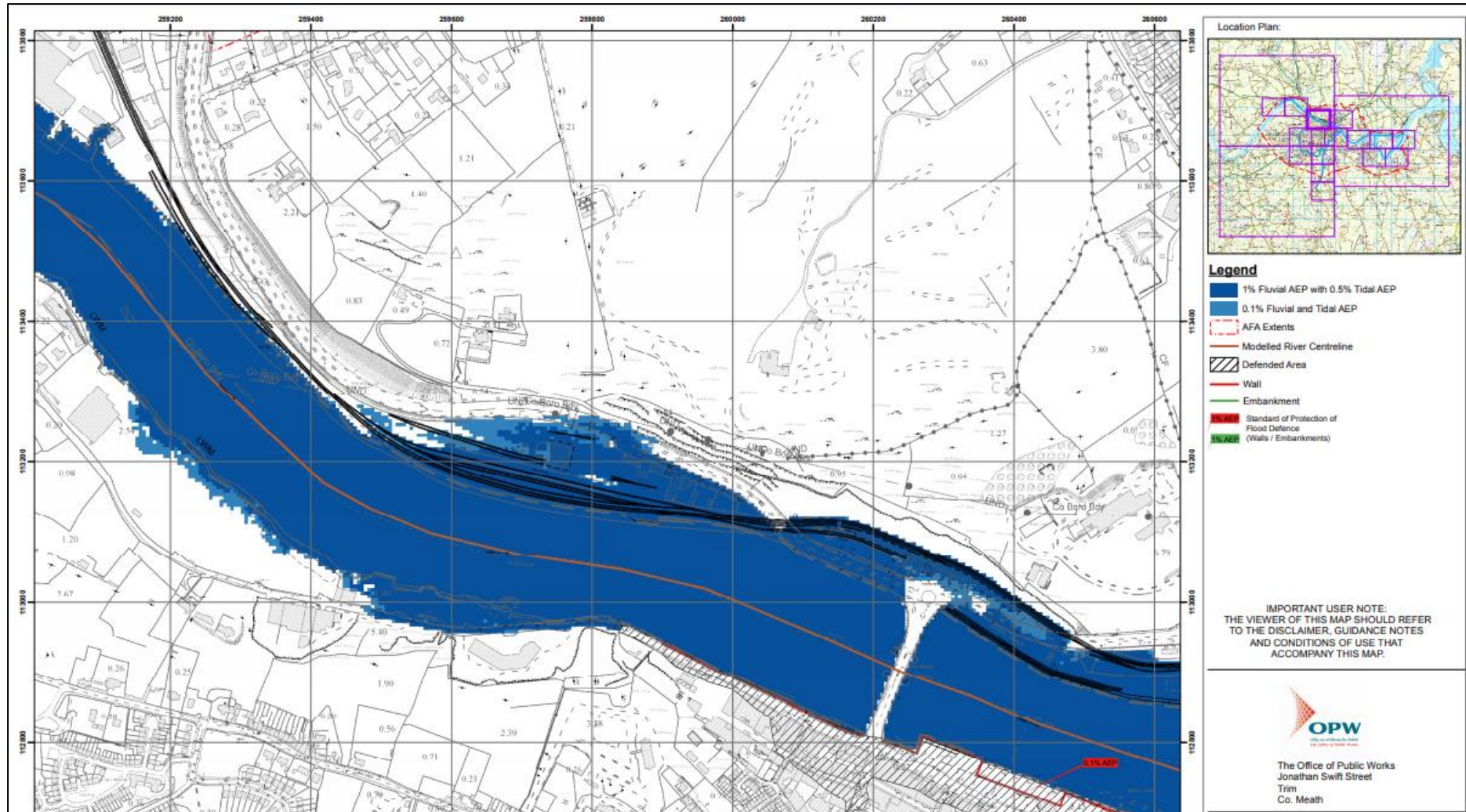


Plate 2.4 OPW River Suir CFRAM Map extract

Wall condition

A structural inspection of the full length of the existing quay wall, was undertaken both from landside and riverside on 17th of August 2018. The riverside inspections were carried out from a boat within a 3-5m distance of the existing quay wall, both at low tide and high tide.

The existing wall between chainages Ch.160 and Ch.300 (see Figure 4.2 in Volume 3 of the EIAR for chainage reference points) was built in the 1990s and doubles as a boundary wall to the Plunkett Station west car parking area. The wall is reinforced concrete, and no defects were found during inspections.

The remaining sections of the wall, composed of masonry / blockwork with mass concrete additions, are in poor condition. The dislodgement of blocks, horizontal and vertical displacement, settlement, cracking, and other defects are ubiquitous throughout the wall length. Evidence of dislodged blocks in the mudflats are plentiful. Particularly large displacement / rotation of the wall has been observed between chainages Ch.540 and Ch.580. At chainage Ch.790, approximately 5.5m length of capping beam was noted to have broken off the wall and fallen onto the bank. From this chainage (Ch.790) to Ch.840, there was no visible wall present.

Plates 2.5, 2.6 and 2.7 below provide an indication of common defects observed along the existing masonry wall.



Plate 2.5 Defects on the existing quay wall – cracking of the wall and dislodgement of masonry blocks (Ch. 370)



Plate 2.6 Defects on the existing quay wall – large displacement and rotation of the wall (Ch. 540)



Plate 2.7 Defects on the existing quay wall – Dislodgement of blocks, mortar washout, several phases of wall upgrades (Ch. 550)

It is considered likely that the flood events are related to high tide levels in the River Suir and are often compounded by strong south easterly winds pushing water back up the river. They are not particularly driven by high rainfall, however this may have occurred concurrently. The flood waters frequently enter into Iarnród Éireann lands and affect the railway infrastructure with subsequent impacts on both rail freight and commuter services. Plate 2.8 illustrates the extent of flooding within the Plunkett Station during the October 2020 flood event. This shows the passenger rail line completely flooded almost to platform level (height of 0.915m).

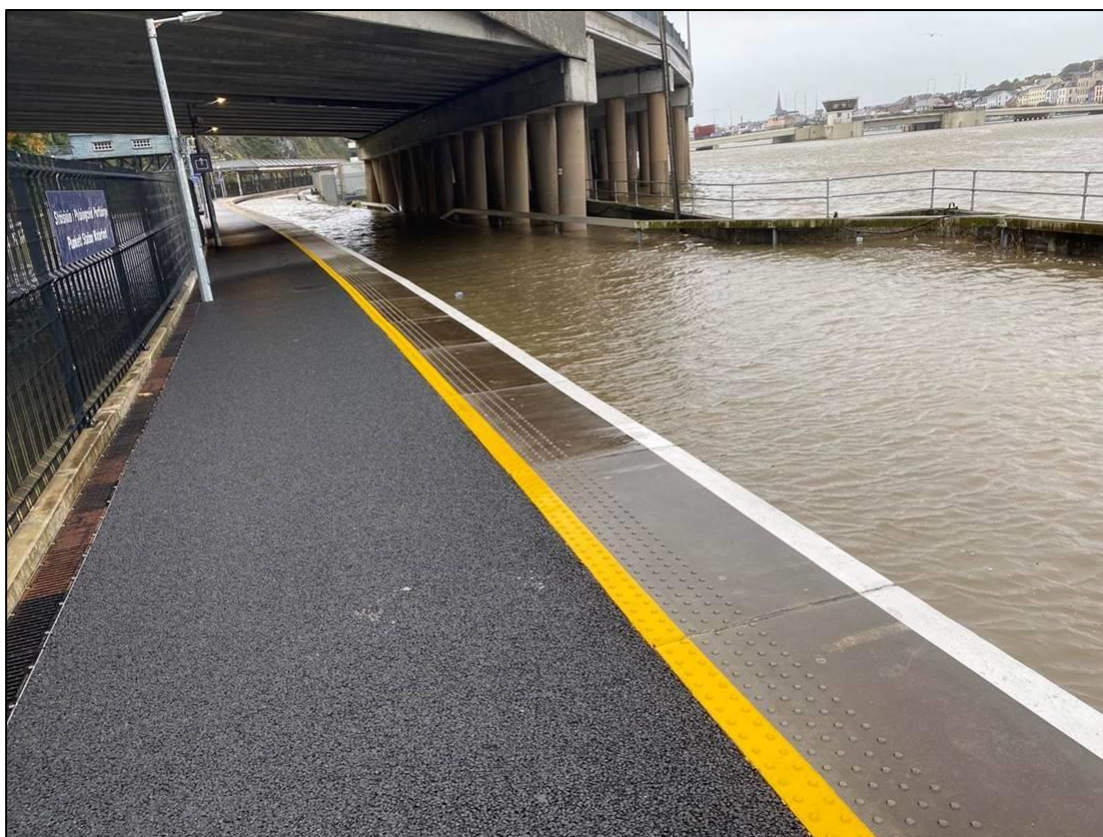


Plate 2.8 Flooding at Waterford (Plunkett) Station in October 2020

The OPWs “The Planning System and Flood Risk Management - Guidelines for Planning Authorities” (2009) states that new “*essential infrastructure, such as primary transport*” (e.g., railways) are classified as ‘highly vulnerable developments’. The Guidelines further state that ‘highly vulnerable developments’ should be protected in the 1 in 1,000-year flood event, including an allowance for climate change. Plunkett Station, the future SDZ Transportation Hub and the railway line between these points can be considered as “essential infrastructure” and can be classified as a “highly vulnerable development”. Therefore, it is essential that this infrastructure is protected into the future against extreme flood events (1 in 1,000-year flood event), while also future proofing against increases in flood levels due to climate change.

2.3 Overview of the Need for the Proposed Development

As outlined in the above section, flooding of the existing railway line at and to the west of Plunkett Station impedes on the operation of the railway service to and from Waterford City and has the potential to damage the rail infrastructure. The need for protection of the existing infrastructure and to build resilience against climate change induced flood events is outlined at national, regional, and local planning policy. The development of flood defence measures will enable future development of the Waterford North Quays in a sustainable manner as well as preserving the existing rail infrastructure in proximity of Plunkett Station. The proposed development will also facilitate the upgrade of rail infrastructure proposed as part of the separately approved SDZ Transport Hub.

2.3.1 Objectives of the Proposed Development

The objectives of the Flood Defences West are as follows:

- To protect the existing and future rail infrastructure in the vicinity of Plunkett Station and the proposed Transport Hub from fluvial and tidal flooding.
- To future proof rail commuter services arriving to and departing from Waterford City and maintaining Intercity sustainable public transport links.
- To prevent disruption to traffic in the vicinity of Rice Bridge from future flood events.
- To support the growth of Waterford City in a sustainable manner by protecting lands on the northern bank of the River Suir from flood related impacts.
- To support Waterford City in building its resilience against flooding induced by climate change.

2.4 Supporting Studies

2.4.1 Flood Defences West – Site Specific Flood Risk Assessment

Waterford City and County Council commissioned ROD to complete a Site – Specific Flood Risk Assessment (SSFRA) for the proposed development as part of the design process. The SSFRA identified the proposed Flood Defences West as falling under a category of developments classified as flood control infrastructure as per ‘*The Planning System and Flood Risk Management Guidelines for Planning Authorities*’ (OPW, 2009) and that it is a water-compatible development, signifying that it’s not vulnerable to flooding. The primary sources of flood risk identified as part of the assessment for the site of proposed development are from combination of tidal/fluvial events emanating from the River Suir. The SSFRA (see Appendix 10.1 of this EIAR) concluded that the proposed development will serve existing and future development within Waterford City and environs. The proposed project shall reinforce the transportation network, which will assist in achieving strategic planning objectives in the immediate vicinity and County Waterford as a whole.

2.4.2 Flood Protection West of Plunkett Station – Scoping Report

ROD undertook a scoping exercise to determine the likely cause of the persistent flooding experienced on the railway line in the vicinity of Plunkett Station, and to define the scope of services which should be undertaken in order to develop flood risk management infrastructure proposals, to provide the appropriate standard of flood protection to the railway line and the relocated train station.

The report titled “Flood Protection West of Plunkett Station – Scoping Report” which was completed in January 2020 identified multiple flood events in the vicinity of Plunkett Station over the 16-year period 2002-2018. Plate 2.9 below shows flooding at Plunkett Station on the 17th of October 2012. The flood level recorded for this event at Adelphi Quay (1.1 km downstream of Plunkett Station) was 2.77m OD.



Plate 2.9 Flooding at Plunkett Station on the 17th of October 2012

It was found that all flood events were related to high tide levels in the River Suir, which are often compounded by strong south easterly winds. The report determined that during frequent, low severity flood events, while water may encroach on the railway line and cause disruption to services, once the tide falls, these waters can recede and flow over the edge or through the existing quay wall.

This Scoping Report proposed a design concept for the flood protection measures west of Plunkett Station based on the completion of the topographical survey & utility survey work, and an assessment of the flood risk and further hydrological assessments of the catchment. The impact of flooding and the key design considerations identified by the Scoping Report are outlined in Table 2.1 below.

Table 2.1 Main Findings of the Flood Projection West of Plunkett Station Scoping Report

Section of Quay Wall ^{Note 1}	Impact of Flooding
Ch.150 to Ch.320	Existing quay wall comprises varying wall heights and structure types along the section. To adapt for climate change existing quay wall height will need to increase, otherwise this Section will become a weak point in the flood defences Risk of flooding at Plunkett Station and railway line east of Plunkett Station for an event > 1:20 year (excl. climate change) Likely damage to signalling, automated points in flood event.

Section of Quay Wall ^{Note 1}	Impact of Flooding
Ch.320 to Ch.1090	<p>Existing quay wall top of wall level is too low.</p> <p>Sections of the existing Quay Wall are in poor condition, with wall sections missing and evidence of rotational displacement and failure.</p> <p>Risk of major flooding at Plunkett Station and railway line east of Plunkett Station.</p> <p>Risk of inundation during a high tide event, leading to significant flooding at low point on railway line at Plunkett Station.</p> <p>Risk of frequent localised flooding of railway line during minor events.</p> <p>Likely damage to signalling, automated points in flood event.</p>

Note 1: The chainages have been updated since the publication of the Flood Projection West of Plunkett Station Scoping Report. The chainages identified in this table are updated as per the chainages illustrated in Figures 4.1 to 4.6 in Volume 3 of the EIAR.

2.5 Policy Context

The need for protection of the existing railway infrastructure and future development against existing flooding and the effects of future climate change impacts has been identified in a number of European, national, regional, and local planning policy documents. The relevant policy documents have been reviewed and it has been established that the proposed development has been identified in, and is consistent with, an array of policy documents listed in Table 2.2.

Table 2.2 Overview of Policy Documents which Support the Proposed Development

Policy Level	Policy Document
European	The EU Floods Directive
National	Project Ireland 2040, National Planning Framework and National Development Plan, 2018 – 2027;
	Investing in the Transition to a Low-Carbon and Climate-Resilient Society 2018-2027
	National Adaptation Framework: Planning for a Climate Resilient Ireland
Regional	Southern Regional Spatial and Economic Strategy (S-RSES)
Local	Waterford City Development Plan 2013-2019 (as extended)
	Kilkenny City and County Development Plan 2021 - 2027
	Ferrybank Belview Local Area Plan (LAP) 2017 – 2023
	Waterford North Quays SDZ Planning Scheme 2018
	Climate Change Adaptation Strategy 2019 – 2024

2.5.1 European Policy Context

2.5.1.1 EU Floods Directive

On November 2007, the Directive 2007/60/EC on the assessment and management of flood risks entered into force. The Directive aims to reduce and manage the risks

that floods pose to human health, the environment, cultural heritage, and economic activity. The Directive requires the Member States:

- By 2011 to carry out a Preliminary Flood Risk Assessment (PFRA) to identify the river basins and associated coastal areas at risk of flooding;
- By 2013 to draw up flood risk maps for areas identified under the PFRA to be at risk from flooding; and
- By 2015, to prepare Flood Risk Management Plans (FRMPs) for the areas identified under the PFRA to focus on prevention, protection, and preparedness.

The preparation of the FRMPs and the river basin management plans under the Directive are to be carried out in coordination with the Water Framework Directive (WFD). In preparation of the aforementioned plans, the Member States are to take into consideration long term developments, including climate change, as well as sustainable land use practices in the flood risk management cycle.

2.5.2 National Policy Context

2.5.2.1 *Project Ireland 2040: National Planning Framework and the National Development Plan 2018 - 2027*

The National Planning Framework (NPF) is the Government's long-term strategic planning framework guiding national, regional and local planning and investment decisions over the next 25 years. The NPF companion document is the National Development Plan (NDP), a ten-year strategy for public capital investment of almost €166 Billion known as the 'Project Ireland 2040'. Their joint publication is intended to create a unified and coherent plan for the country aligning the investment strategy with strategic planning documents.



The overarching ambition of the NPF is to *“to create a single vision, a shared set of goals for every community across the country”* by achieving a number of goals including, but not limited to the following:

- Guide the future development of Ireland, taking into account a projected 1 million increase in our population by 2040.
- Of the 1 million extra people,
 - 50% of growth to occur in key regional centres, towns, villages and rural areas, to be determined in the forthcoming regional plans – Regional Spatial and Economic Strategies (RSEs).
- Regenerate rural Ireland by promoting environmentally sustainable growth patterns;
- Plan for and implement a better distribution of regional growth, in terms of jobs and prosperity;
- Co-ordinate delivery of infrastructure and services in tandem with growth, through joined-up NPF/National Investment Plan and consistent sectoral plans, which will help to manage this growth and tackle congestion and quality of life issues in Dublin and elsewhere.

These goals are expressed in the Framework across ten National Strategic Outcomes (NSOs), as illustrated in Plate 2.10 and have taken into account the overarching themes of wellbeing, equality, and opportunity.

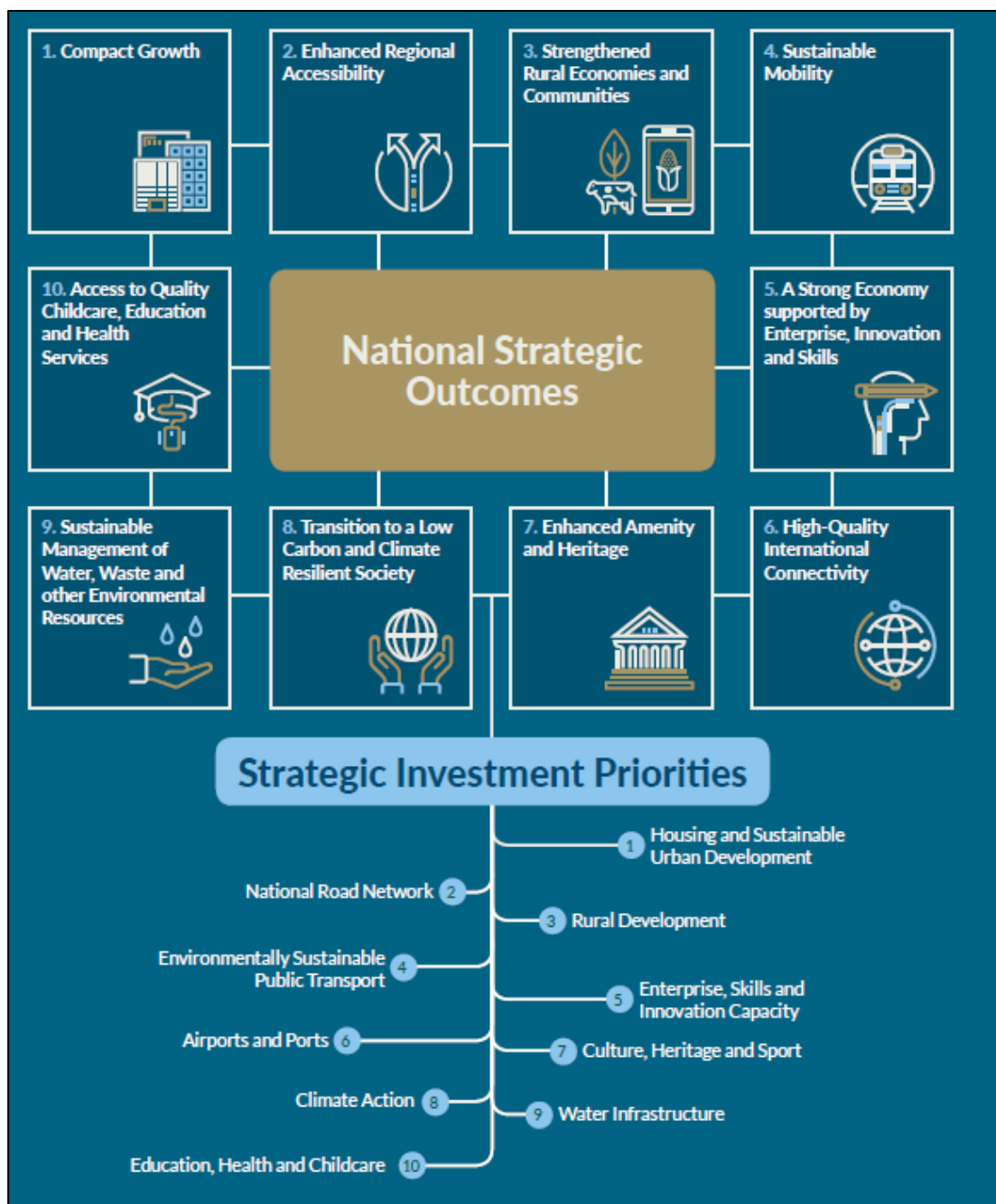


Plate 2.10 National Strategic Objectives and Strategic Investment Priorities (NPF)

The NPF recognises the need for a planned and co-ordinated development of our existing cities and towns. It states that 40% of Ireland’s population lives within 5km of the coast including all of our major cities which are the most densely populated parts of the country.

Climate change is a key issue for planning and flood risk management, particularly in existing coastal settlements such as Waterford City, where future development and population growth is being targeted and supported by the National Development Plan

(NDP). Flooding induced by extreme weather events and sea level rise are some of the key issues of climate change and poses a major threat to existing settlements.

The proposed flood defence measures will protect the existing rail infrastructure and any future built infrastructure envisaged for the north bank of Waterford City and will support the delivery of objectives under the following five NSOs:

1. **NSO 1 Compact Growth:** by protecting the area from potential flooding, the proposed development supports the sustainable development of Waterford City on the northern side of the River Suir.
2. **NSO 2 Enhanced Regional Accessibility and NSO 4 Sustainable Mobility:** the proposed development will protect the existing rail corridor from flood events into the future and will eliminate existing flood related disruption to rail services arriving to and departing from Waterford City. The proposed development will also facilitate the development of the separately proposed Transportation Hub, which was granted planning permission in 2019 and which will enhance the City's regional connectivity through rail, as a sustainable transport method.
3. **NSO 8 Transition to Low Carbon and Climate Resilient Society:** The proposed development will protect the public transport rail network in Waterford City from flooding, and in turn, will support the transition to a low carbon and climate resilient society.
4. **NSO 9 Sustainable Management of Water, Waste and other Environmental Resources.** Under NSO 9, the NPF states that it will:

“Coordinate EU Flood Directive and Water Framework Directive implementation and statutory plans across the planning hierarchy, including national guidance on the relationship between the planning system and river basin management. Local authorities, DHPLG, OPW and other relevant Departments and agencies working together to implement the recommendations of the CFRAM programme will ensure that flood risk management policies and infrastructure are progressively implemented”

“Improve storm water infrastructure to improve sustainable drainage and reduce the risk of flooding in the urban environment;”

The proposed development supports the sustainable management of water resources by upgrading the existing drainage system and flood defence measures along the north bank of Waterford City, reducing the risk of flooding of these lands.

To deliver the desired NSOs, the Framework developed a series of National Policy Objectives (NPOs) that will set a new way forward for regional and local planning and sustainable development policy in Ireland. The key NPOs for coastal environment, such as Waterford City, and planning for climate change, are:

NPO 41a *“Ensure that Ireland’s coastal resource is managed to sustain its physical character and environmental quality”*

NPO 41b *“In line with the collective aims of national policy regarding climate adaptation, to address the effects of sea level changes and coastal flooding and erosion and to support the implementation of adaptation responses in vulnerable areas”*

The proposed flood defences will protect the railway corridor, including Plunkett Station and the associated rail infrastructure against coastal, tidal, and combined flood events. The proposed development will also support the implementation of the NSOs and NPOs identified in the NPF and NDP respectively.

2.5.2.2 Investing in the Transition to a Low-Carbon and Climate-Resilient Society 2018-2027

The effects of climate change are beginning to have an impact on Ireland's environments, economy, natural resources, and society. The key issues attributed to climate change are predicted to include more intense storm and rainfall events, sea level rise as well as more frequent and more intense river and coastal flooding events. In 2011, 300 areas, including Waterford City, were identified by the Government as being potentially at significant risk from flooding and "together account for 80% of Ireland's potential flood risk from rivers and seas, the primary source of flooding in Ireland". In response to climate change, the Irish Government aims to transition to a low carbon economy and to create a climate resilient society. To achieve this, investment into several areas have been targeted to make the transition, as well as to build resilience to climate change, as outlined in this policy document. A total of €940m has been allocated for the development of flood defences which will enable Ireland to become more resilient to the effects of climate change.

The Strategic Flood Risk Assessment (SFRA) conducted for Project Ireland 2040 identified that Waterford City is subject to coastal flooding and to fluvial flooding from the Suir river catchment. The SFRA identified that some areas within the North Quays SDZ, are at risk from fluvial and tidal flooding. The SFRA states that "*regeneration needs to be sustainable and should consider the Planning System and Flood Risk Assessment Guidelines for Planning Authorities (2009) and Circular PL02/2014 (August 2014). The circular specifically addresses regeneration areas and flood risk management of their development*". The proposed flood defences will protect the lands along the northern bank of the River Suir and the railway infrastructure against coastal and fluvial flood risk.

2.5.2.3 National Adaptation Framework: Planning for a Climate Resilient Ireland

The National Adaptation Framework (NAF) has been developed to address current and future risks associated with climate change, including impacts attributed to increase in heavy rainfall events, intensity of storms, sea level rise etc.

The NAF acknowledges that changes in Ireland's climate correlate with the global trends; temperature increased by approximately 0.8°C between the 1900-2020 period and due to a slow response time of the climate system, changes in temperature are predicted to increase over the coming decades.

Specifically to Ireland, average annual rainfall has increased by approx. 60mm, or 5% in the 1981 to 2020 period, compared to the 30-year period between 1961 and 1990. The number of annual frost days has decreased while the number of warm days has increased. The sea level rise has been observed to increase by 1.7cm per decade since 1916 in Newlin (southwest England), which is considered to be representative of the situation in the south of Ireland, such as Waterford.

The NAF recognises that climate change will have a negative impact on a number of key socio, economic and environmental sectors including the following:

- **Critical infrastructure:** encompassing transport, emergency, water, energy, and communications services that are at risk from a range of climate induced impacts such as sea level rise, changing rainfall patterns, increasing temperature and extreme weather events.
- **Water Management:** climate change induced impacts are likely to pose a significant risk to water management by intensifying the pressures associated with flooding, provision of adequate water supply, and quality.

- **Human Health and wellbeing:** increase in extreme weather events is likely to have a significant impact on human health and wellbeing by increasing the risk of physical injuries / death and sustaining mental health effects related to potential loss and displacement from flooding.

In response to climate change, the NAF aims to set up effective adaptation strategies to reduce the vulnerability of Ireland's environment, society, and economy and to increase its resilience to the effects of climate change. The NAF identified an array of adaptation measures that *"enhance adaptive capacity of social, industrial and environmental infrastructures and mitigate the effects of climate change"*. Adaptation measures have been categorised in the NAF as follows:

- *"Soft adaptation involves alteration in behaviour, regulation or system of management,*
- *Green adaptation measures seek to utilise ecological properties to enhance the resilience of human and natural systems to climate change impacts.*
- *Grey adaptation measures involve technical or engineering solutions to climate impacts"*

Building new or raising the level of existing flood defences is an example of 'grey' adaptation measures.

The rail corridor servicing Waterford City is particularly susceptible to both river and coastal flooding due to its proximity to the tidal estuary of the River Suir. The proposed development will provide protection to the rail corridor, a critical piece of infrastructure, against existing and future flood risk and will support Waterford City in building its resilience to climate change.

2.5.3 Regional Planning Context

2.5.3.1 Southern Region Regional Spatial and Economic Strategy (RSES)

Arising under the Local Government Reform Act 2014, the Southern Regional Assembly has assumed a number of new functions. Chief among these responsibilities is the preparation of a Regional Spatial and Economic Strategy (RSES) for the Southern Region. The Southern Regional Assembly prepared the Regional Spatial and Economic Strategy (RSES) in 2020. The RSES provides a framework for the implementation of policies and objectives under the National Planning Framework (NPF) at regional level.

Objectives RPO 89 and RPO 119 of the RSES support measures outlined in the 'Investment in the Transition to a Low Carbon Society 2018-2027' to address climate change induced effects and to ensure transition to low carbon economy:

RPO 89: Building Resilience to Climate Change

"Local Authorities and other public agencies shall continue to work with the Office of Public Works to implement the Flood Risk Management Plans and address existing and potential future flood risks arising from coastal, fluvial, pluvial, groundwater and potential sources of flood risk".

RPO 119: Flood Relief Schemes

- a. *"Support investment in the sustainable development of Strategic Investment Priorities under the National Development Plan 2018-27 and to ensure that flood risk assessment for all strategic infrastructure developments is future-proofed to consider potential impacts of climate change;*

- b. *“Support investment in subsequent projects by capital spending agencies to deliver flood relief schemes under National Strategic Outcome: Transition to a Low Carbon and Climate Resilient Society. Such projects should be future proofed for adaptation to consider potential impacts of climate change.*
- c. *“All Infrastructure and energy providers/ operators should make provision for adaptation measures to protect strategic infrastructure (including roads, railways, ports and energy infrastructure) from increased flood risk associated with climate change”.*

The importance of flood defences in maintaining a good water quality status has also been highlighted in RPO 112:

RPO 112: Water Quality

“It is an objective to support commitments to achieve and maintain “At Least Good” status, except where more stringent obligations are required, and no deterioration of status for all water bodies under the Marine Strategy Framework Directive and its programme of measures, the Water Framework Directive and the River Basin Management Plan. Key challenges include, inter alia, the need to address significant deficits in urban waste-water treatment and water supply, addressing flooding and increased flood risks from extreme weather events and increased intense rainfall because of climate change”.

Waterford Metropolitan Area Strategic Plan (MASP)

The Southern RSES seeks to align with the NPOs and the goals set out in the NPF, including NPO 7 which seeks to accelerate the development of Waterford, Cork, and Limerick to grow by at least half of the 2016 Census population, i.e., by 60% by 2040.

The Waterford Metropolitan Area Strategic Plan (MASP) was developed as part of the RSES to meet the required population growth targets of NPO 7 by providing a high-level strategic framework for the sustainable growth of Waterford City “*both north and south of the River Suir*” (see Plate 2.11). The objective of Waterford MASP is for the City to become an essential driver of national growth and a ‘Regional City of Scale’.

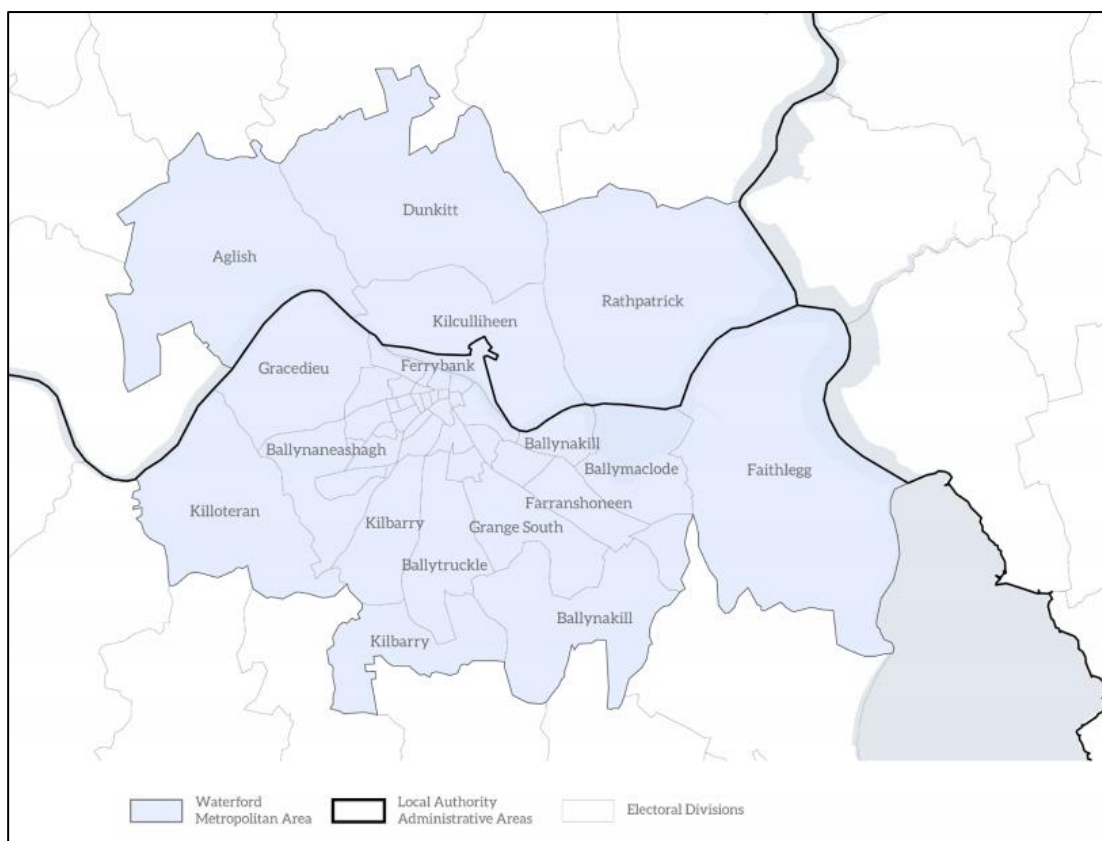


Plate 2.11 Waterford Metropolitan Area. Source: Southern Regional RSES 2020 – 2040

To meet the growth targets identified in NPO 7, the MASPs are prepared in accordance with four Regional Planning Objective (RPOs), including RPO 9 which aims to deliver and future proof infrastructure in each City, including Waterford:

RPO 9: Holistic Approach to Delivering Infrastructure

“It is an objective to ensure investment and delivery of comprehensive infrastructure packages to meet growth targets that prioritise the delivery of compact growth and sustainable mobility as per the NPF objectives including:

Water services, digital, green infrastructure, transport and sustainable travel, community and social, renewable energy, recreation, open space amenity, climate change adaptation and future proofing infrastructure including flood risk management measures, environmental improvement, arts, culture and public realm”.

The Waterford MASP was also developed with reference to the objectives listed under seven strategic ‘Goals’ for the development of the metropolitan areas. The proposed development will facilitate the achievement of objectives prescribed under the following Goals:

Goal 1 Sustainable Place Framework:

- *“Enhancing the quality of our existing places through retrofitting a high standard of infrastructure, services and amenities that improve the liveability and quality of place in existing settlements and communities, especially locations that experienced significant new population growth in the past (such as metropolitan towns) and existing areas experiencing positive growth (such as city centre neighbourhoods).*

- *Resilience to climate change and flooding*".

Goal 2 Excellent Connectivity and Sustainable Mobility:

- *"Inter-regionally through efficient rail, road, bus networks and services.*
- *To achieve efficient mobility, with close alignment between home and work locations, ease of travel on sustainable transport modes, efficient and sustainable movement of freight and logistics, guaranteed journey times for inter-city and inter-regional travel*".

The proposed development supports the RPOs of the RSES document listed above by addressing existing and potential future flood risks and future proofing rail infrastructure. In addition, the proposed development will enhance the quality of the existing areas on the north bank and facilitate the sustainable development of Waterford City, while building its resilience against climate change induced impacts, such as flooding. The proposed development will future proof the Waterford railway station, Plunkett Station, and associated rail infrastructure from future flood events, ensuring that inter-regional sustainable travel is safeguarded. By protecting the rail infrastructure from extreme weather events, the proposed development will minimise impacts on journey times for freights and rail Inter-City commuter services as a result of flooding.

2.5.4 Local Planning Context

2.5.4.1 Waterford City Development Plan 2013-2019 (as extended)

The Waterford City Development Plan sets out a strategy which guides the proper and sustainable development of Waterford City for the 2013 – 2019 period. The Development Plan identifies Waterford City as being particularly susceptible to climate change induced flooding. The City is situated on a tidal estuary of River Suir which currently floods the low-lying areas. The existing Waterford railway station, Plunkett Station, is located within Flood Zone A and is susceptible to both fluvial and tidal flooding. Flooding within the City is predicted to become more frequent and severe due to climate change. One of the core strategy objectives of the Development Plan (OBJ 2.1.10) is *"to require new development to account for known and anticipated climate change impacts including flood risk"*.

Consequently, all future developments are required to consider potential flood risk issues as outlined in the following planning policies:

POL 11.7.1

"Applications for development on lands identified on the SFRA maps, shall be subject to a site specific Flood Risk Assessment appropriate to the type and scale of the development being proposed, and pass the Development Management Justification Test as detailed in the Flood Risk Management Guidelines in accordance with the Planning Guidelines requirements and those of the Waterford City SFRA"

POL 11.7.3

"All applicants shall primarily be responsible in the first instance when making a planning application for assessing whether there is a flood risk issue and how it will be addressed in the development they propose"

The proposed development is located within lands zoned as Flood Zone A as identified by the Waterford City SFRA. The proposed flood defence measures will protect the existing Plunkett Station and the railway tracks west of the train station from future

flooding by incorporating the projected effects of climate change into its design and will support further development of the City in the north quays area.

Draft Waterford City and County Development Plan 2022 - 2028

Draft Waterford City and County Development Plan (CCDP) for the 2022 – 2028 period has been prepared and is currently being reviewed following public consultation. While the draft has not yet been adopted, it has been reviewed to ensure that the proposed development is consistent with the draft policies and objectives.

The draft Waterford CCDP supports the Key Future Growth Enablers for Waterford City set out in the NPF, Southern Region RSES and Waterford MASP.

In relation to rail transport, the General Public Transport Policy Objective **Trans 22** in the Draft Plan aims to “*support the optimal use of the rail network, in catering for the movement of people and goods and thereby enhance the economic corridor between Dublin and Waterford City and the Key towns of Kilkenny and Carlow, Clonmel and Wexford Town*”.

The proposed Flood Defences West development will protect the Waterford – Dublin railway line against existing and future flood risk and will support Objective **Trans 22** to optimise the use of the railway line for commuter services and freight transport.

2.5.4.2 Kilkenny City and County Development Plan –2021 - 2027

The Kilkenny City and County Development Plan (CCDP) for the 2021 to 2027 period has been made by Kilkenny County Council (KCC) on 3rd of September 2021 and came into effect on the 15th of October 2021.

The Plan identifies that 57.60sq.km of the area subject to the Waterford MASP is within the administrative area of KCC. The National Planning Objective (NPO 8) of the National Planning Framework (NPF) sets out a 60% minimum population growth for Waterford City and Suburbs by 2040. The Kilkenny CCDP acknowledges that this will require targeted growth on both south and north sides of the River Suir focussed on development of significant housing and employment locations.

The northern suburb of Ferrybank is within the administrative area of KCC and is also included in the Waterford MASP area. The Kilkenny CCDP is supportive of the Waterford MASP as outlined in the RSES, which identifies policy objectives supporting sustainable mobility and improved regional connectivity to / and from Waterford, including rail connectivity.

Furthermore, the Plan states that KCC will “*ensure that new developments do not reduce the effectiveness or integrity of any existing or new flood defence infrastructure, and will facilitate the provision of new, or the reinforcement of existing, flood defences and protection measures where necessary*” [pp. 183].

The proposed Flood Defences West will form a continuation of the flood defences east which received planning approval as part of the SDZ Transportation Hub and will cumulatively protect the Waterford City North Quays area against existing and future flood risk. As such, the proposed development will assist the Kilkenny CDP to provide new flood protection measures and to realise its sustainable development objectives by enabling sustainable growth of areas on the northern side of the River Suir, such as Ferrybank.

2.5.4.3 Ferrybank Belview Local Area Plan 2017 - 2023

The Ferrybank Belview Local Area Plan (LAP) 2017 – 2023 outlines a strategy for the proper planning and sustainable development of an area of land stretching from Grannagh to Belview and from the River Suir to the line of the Waterford bypass. The Ferrybank Belview LAP area is located adjacent to the lands to be protected as part of the proposed Flood Defences West.

The Ferrybank Belview LAP supports the development strategy set out in the Waterford Planning, Land Use and Transportation Study (PLUTS) to achieve a balanced and sustainable growth of Waterford. The PLUTS proposed to bring the “*North Quays and the Suburbs fully into the social and economic domain of the City*”. To achieve this overarching objective, the study advocated for future growth to be distributed between the north and south quays of the city, including Ferrybank. The principal goals included in PLUTS include, but are not limited to, the following:

- Provision for a population increase of almost 30,000 people, or 57% population growth, in Waterford City and Environs between 2004 and 2020;
- Requirement for approximately 11,500 new dwellings located both north and south of the River Suir;
- Provision of a rail-passenger platform on the North Quays as part of a new Public Transport Interchange;

The proposed development will assist Ferrybank Belview LAP to realise its sustainable growth objectives by protecting the areas on the northern bank of River Suir from potential flood events. Proposed Flood Defences West will form a continuation of the flood defences east which received a planning approval as part of the SDZ Transportation Hub and will cumulatively protect the rail infrastructure in the City against existing and future flood risk.

2.5.4.4 Waterford North Quays SDZ Planning Scheme 2018

The Government designated lands on the North Quays in Waterford City as a SDZ on 20th January 2016. SDZ designations are created to facilitate development which in the opinion of the Government is of economic or social importance to the State. Waterford City and County Council as the ‘Development Agency’ prepared the North Quays SDZ Planning Scheme which was adopted by the elected members of Waterford City and County Council in February 2018. The Planning Scheme sets out a Vision to:

- To create a sustainable, compact extension to the City Centre that will serve a future population of 83,000 people.
- A regeneration catalyst for the City and Region and the establishment of a sustainable modern city quarter.
- Creation of an integrated multi-modal transport hub designed to sustainably meet the access requirements of The City.
- Building on the context and the riverside location of the site to create a high-quality urban quarter as a natural extension of the City Centre.

The Planning Scheme vision is supported by a range of principal goals, including, but not limited to, the following:

- To promote the expansion of the City Centre to the north of the River Suir in a manner that enhances and supports balanced and sustainable growth in Waterford City and encourages its vitality and viability

- To create a sustainable urban environment, which respects its natural, historic and cultural heritage.
- To provide sustainable solutions that address and manages the risk of flooding and climate change.



Plate 2.12 Photomontage of the Waterford SDZ development site. Source: Waterford SDZ Planning Scheme 2018

The proposed Flood Defences West will form a continuation of the flood defences east which received a planning approval as part of the SDZ Transportation Hub and will cumulatively protect the Waterford City North Quays area against existing and future flood risk. As such, the proposed development will assist the sustainable development of the Waterford SDZ site.

2.5.4.5 Climate Change Adaptation Strategy 2019 – 2024

The Climate Change Adaptation Strategy for the 2019 to 2024 period prepared by Waterford City and County Council (WCCC), forms part of the Ireland's national strategy for climate adaptation as set out in the National Adaptation Framework (NAF) to deliver the national transition objective to a low carbon society and a climate resilience future.

This adaptation strategy provides the Local Authorities' primary tool at a local level to:

- *“Ensure a proper comprehension of the key risks and vulnerabilities of climate change*
- *Bring forward the implementation of climate resilient actions in a planned and proactive manner.*
- *Ensure that climate adaptation considerations are mainstreamed into all plans and policies and integrated into all operations and functions of the LA”.*

The adaptation strategy has undertaken a baseline assessment to identify the potential future climate hazards that may have an impact on WCCC infrastructure and the population of the county by reviewing historic extreme weather events using Met Éireann and WCCC data, in addition to data from the local sources, such as libraries.

Based on the information, the climate hazards that are relevant to County Waterford include extreme wind events, extreme heat/drought events and extreme rainfall/flood events. Over the past 211 years, 20 extreme events have been attributed to extreme rainfall/flood events, 5 of which have been recorded in the past 20 years.

WCCC identified the potential impacts associated within each climate hazard, including extreme rainfall/flood events on infrastructure and the population. To alleviate and eliminate these potential impacts, high level adaptation goals have been established under eight 'Operational Areas' of WCCC. The proposed Flood Defences West are likely to alleviate the potential impacts associated with extreme rainfall/flood events under two of the WCCC operational areas; 'Infrastructure & Built Environment' and 'Water Services', as discussed below.

Infrastructure & Built Environment

According to the strategy, the potential impacts from extreme rainfall/flood events on Infrastructure & Built Environment include, but are not limited to the following:

- *“Affect critical infrastructure through flooding and inundation. Damage to critical infrastructure will impact the function of transport routes, resulting in increased costs of clean up, maintenance, repair and have a wider economic impact.*
- *Failure of WCCC's flood defence system and barriers would be likely due to increased rainfall requiring modification and upgrade of the current system along with construction of new barriers in predicted flood prone locations.*
- *Rising sea levels will quite likely see more extensive damage of low-lying coastal roads and an increase in flood plain areas both coastally and in land. Many low-lying buildings will likely be exposed to more intense storms resulting in coastal erosion which will require coastal protection measures to be implemented.*
- *Coastal infrastructure such as piers / harbours will require additional protection”.*

The high-level goals identified within the strategy to alleviate the potential impacts include, but are not limited to the following:

- *“To increase the resilience of roads and transport infrastructure to the impacts of extreme weather events.*
- *To ensure and increase the resilience of critical infrastructure and infrastructural assets.”*

The proposed development will protect the railway corridor in Waterford City, a critical piece of infrastructure from future flood events by including provision for climate change into its design.

Water Services

The potential impacts from extreme rainfall/flood events on Water Services as outlined in the strategy which include, but are not limited to the following:

- *“With a higher risk of flooding and inundation and more impactful storm surges, this will result in significant impacts on property, land and critical infrastructure affecting the economic viability of certain areas and increasing further the vulnerability of communities.*
- *Extreme rainfall events will increase the risk of impacting water quality and the ability of the LA to meet the requirements of the WFD.*
- *Rising sea levels will affect coastal region water supplies due to the infiltration of sea water into ground water aquifers as the barrier between sea and freshwater is diminished, resulting in salinization of the groundwater supply.*

- *Flood water drains would likely become completely submerged with rising sea levels requiring existing drain systems to be elevated.”*

High-level goals are identified within the strategy to alleviate the potential impacts on Water Services which include, but are not limited to the following:

- *“To implement adaptation measures to limit the risk and impact of urban flooding.*
- *To provide and plan for effective drainage systems.”*

The proposed development will reduce the risk of urban flooding through the provision of flood defences measures along the northern bank of Waterford City, protecting the existing and future built infrastructure from future flood risk. The proposed development will also upgrade the existing drainage network and will include the provision of new surface water outfalls to remove excess runoff in high rainfall events, reducing the risk of water quality impacts. The proposed development will therefore support the goals of the Strategy as outlined above and will mitigate a number of the potential impacts outlined which are likely to occur as a result of future climate hazards.

2.5.4.6 Summary

The proposed development supports national, regional, and local policies and seeks to protect the existing built infrastructure, namely the existing Plunkett Station and the associated rail infrastructure in Waterford City from flood damage. The proposed development will also support the sustainable growth of Waterford City on the north side of River Suir and will support the City in building its resilience against flooding induced by climate change.

Waterford City and County Council is developing the proposed Flood Defences West in consultation with all relevant stakeholders and will be cognisant of the relevant policies and guidance documents.