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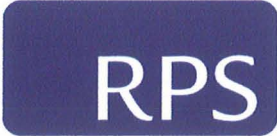
RIVER ILEN (SKIBBEREEN) DRAINAGE SCHEME ENVIRONMENTAL IMPACT STATEMENT

VOLUME I: NON-TECHNICAL SUMMARY

April 2013



RIVER ILEN (SKIBBEREEN) DRAINAGE SCHEME
ENVIRONMENTAL IMPACT STATEMENT
VOLUME I: NON-TECHNICAL SUMMARY



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PREFACE

The structure of the Environmental Impact Statement (EIS) for the River Ilen Drainage Scheme is laid out in the preface of each Volume for clarity. It consists of three Volumes as follows:

- **Volume I - Non-Technical Summary**

A non-technical summary of the information contained within the Main Volume (Vol. 2)

- **Volume II - Environmental Impact Statement (EIS)**

This Volume deals with the environmental impact of the proposed scheme and includes drawings to accompany the text of the EIS.

- **Volume III - Technical Appendices**

This Volume contains responses to written consultation and specialist technical information.

ACKNOWLEDGEMENTS

This Environmental Impact Statement has been prepared by RPS, their Environmental Sub-consultants and with the assistance of Cork County Council and the Office of Public Works.

Environmental Sub-Consultants

Flora and Fauna (Aquatic and Terrestrial) DixonBrosnan and Associates

Cultural Heritage John Cronin & Associates

SKIBBEREEN (RIVER ILEN) DRAINAGE SCHEME

ENVIRONMENTAL IMPACT STATEMENT

1. INTRODUCTION

RPS was commissioned by Cork County Council and Office of Public Works (OPW) to undertake an Environmental Impact Statement (EIS) of the proposed Skibbereen (River Ilen) Drainage Scheme.

1.1 EIS Team

This EIS has been prepared by RPS consultants and additional specialist sub-consultants for the Cultural Heritage and Aquatic and Terrestrial Flora and Fauna elements of the EIS. The study team comprises:-

Human Environment	RPS
Terrestrial Flora & Fauna	DixonBrosnan and Associates
Aquatic Ecology, Water Quality & Fisheries	DixonBrosnan and Associates
Landscape & Visual	RPS
Air Quality	RPS
Noise and Vibration	RPS
Material Assets	RPS
Soils, Geology & Hydrogeology	RPS
Cultural Heritage	John Cronin & Associates

2. PROJECT DESCRIPTION AND DEVELOPMENT CONTEXT

2.1 Background and Need for the Works

RPS were appointed by Cork County Council, in conjunction with the OPW, in February 2011 to complete a study to identify appropriate flood risk alleviation measures for the town of Skibbereen, Co. Cork and to prepare a Flood Risk Assessment and Management Plan (FRAMS). This scheme was progressed following severe flooding in Skibbereen in November 2009 and December 2009. Prior to November 2009, the most severe flood event affecting Skibbereen occurred in August 1986.

Following detailed assessment of the flood risk in Skibbereen and evaluation of potential options for Flood Risk Management (see **Chapter 4 Consideration of Alternatives** of EIS Vol II) a Preferred Option was identified. The preferred River Ilen (Skibbereen) Drainage Scheme, the subject of this environmental impact assessment, is illustrated in **Figure 1.2 Layout Plan of the Proposed Works** and described in **Sections 2.4** and **2.5** below.

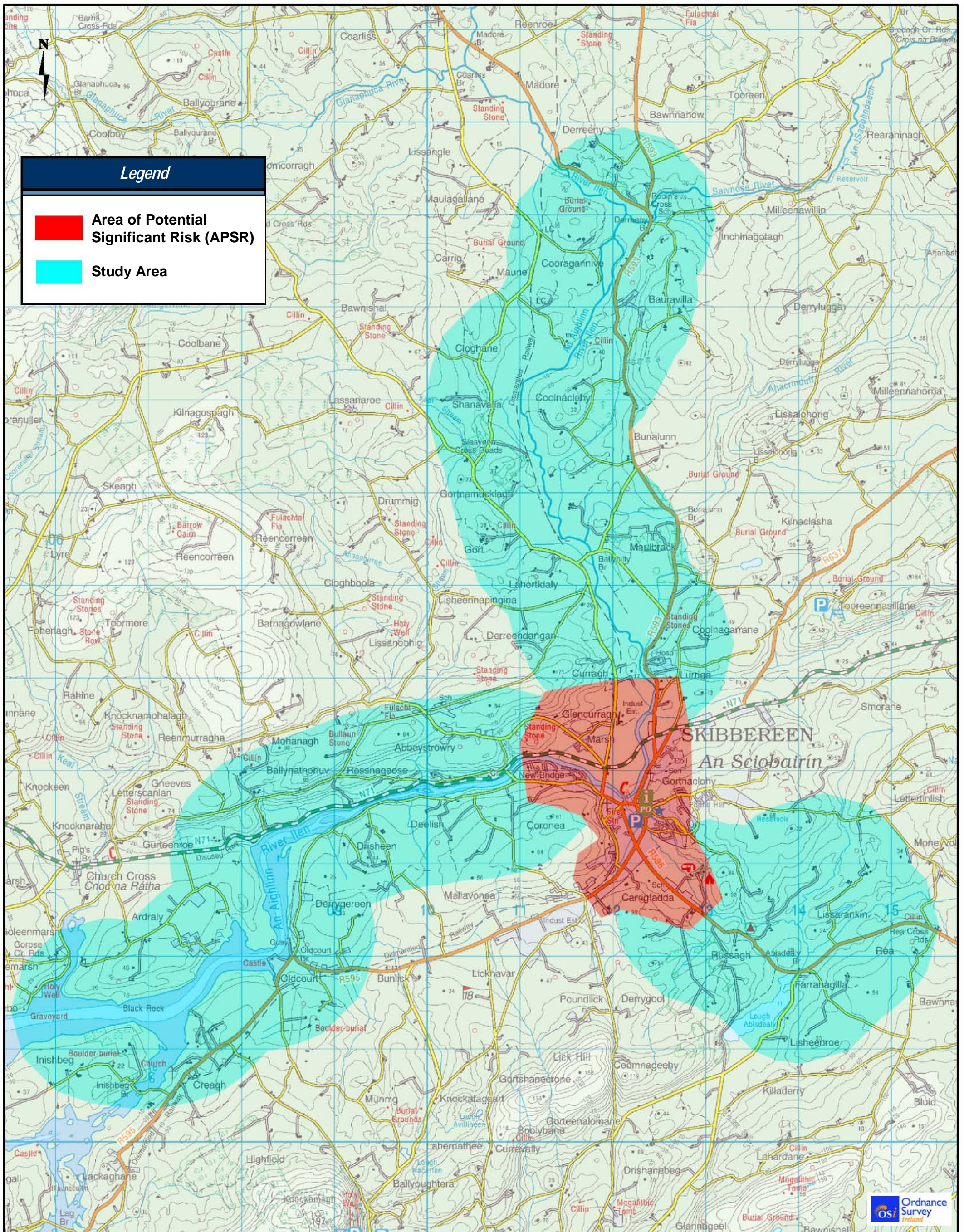
This Environmental Impact Statement has been prepared in accordance with EC (Environmental Impact Assessment) Regulations 1989 to 2001, and the recommendations of the Environmental Protection Agency's (EPA) *Draft Guidelines on the Information to be contained in Environmental Impact Statements (2002)* and *Advice Notes on Current Practice (on the preparation of Environmental Impact Statements)* (EPA, 1998) and in accordance Schedule 6 of the Planning and Development Regulation 2001, relating to the information to be contained in an EIS. **Chapter 3 Methodology and Consultation of the EIS** provides an overview of the methodology used in order to prepare this EIS.

2.2 Study Area

Skibbereen Town centre is located around the junction of the River Ilen and its tributary the Caol Stream with development of the town being largely forced along the valleys of both due to steep hills in the east and south.

The River Ilen itself is approximately 23 km in length and has a catchment of 245k m² to just upstream of its junction with the Caol Stream within the town. The River Ilen rises in the mountains north of the town at Mullagmesha, flows north to south before turning almost due west through approximately a 90 degree bend at Skibbereen to ultimately discharge into Roaringwater Bay at Ringarogy Island, 10 km downstream. Skibbereen Town is located at the head of the estuary which is tidal to 1.5 km upstream of the town as far as the hospital at Lurriga.

Details of the area identified as at risk from flooding, referred to as the Area of Potential Significant Risk (APSR) are presented in **Figure 1.1** below.



Legend

- Area of Potential Significant Risk (APSR)
- Study Area

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Cork County Council



Project
River Ilen (Skibbereen) Drainage Scheme

Title
Skibbereen Study Boundary and Flood Extent

Figure 1.1



Issue Details

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Notes

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2.3 History of Flooding

Overview of Flooding

This scheme was progressed following severe flooding in Skibbereen in November 2009 and December 2009. Prior to November 2009, the most severe flood event affecting Skibbereen occurred in August 1986. Other recorded flood events in 1969, 1974, 1975 and 1982 were less severe. Frequent flooding also occurred in the 1940's and 1950's.

Serious flooding of residential and commercial properties occurs in three main areas in Skibbereen:

- Adjacent to the Caol Stream and near its junction with the Ilen River. Flooding in this area invariably affects all of Townsend Street, the Baltimore Road, part of Market Street and Mardyke Street, 98th Street, part of Main Street, and Bridge Street. This area includes much of the commercial heart of Skibbereen; and
- On the Mill Road affecting Glenilen Terrace and the houses between the junction with the Cork Road and Lurriga House.
- The Marsh Road and Glencurragh areas located to the north of the town have also been subjected to serious flooding in the past.

2.4 Overview of the Key Characteristics of the Proposed Scheme

The Proposed Drainage Scheme is based on Primary and Secondary flood risk management measures.

The proposed height of the defences will typically be 500 mm above the predicted 0.5% Annual Exceedence Probability (AEP) event, often referred to as the 200-year flood event, levels as determined by hydraulic modelling completed as part of the Skibbereen FRAMS. Additional hydrological assessments are being undertaken by RPS in conjunction with the OPW that may result in a re-evaluation of estimated of design flood flows. While significant modifications to the scheme as described below are not anticipated these assessments may result in minor modifications to the proposed defence height and lengths at detailed design stage.

All engineering works will be designed in accordance with best practice.

The Primary Measures as illustrated in **Figure 1.2** include:-

River Ilen

- Embankments & flood walls.
- Sealing of existing opes.
- Localised channel widening upstream of John F. Kennedy Bridge.
- Localised regrading works at John F. Kennedy Bridge.
- Works at Mill Race upstream of Showgrounds Stream.

Caol Stream

- Hard defences including flood walls and the construction of a formed channel (circa 340 m) (downstream of Baltimore Road).
- Embankments / walls upstream of Baltimore Road.
- Non-return valves on existing drainage.
- Grouting/strengthening works to masonry arch structures.
- Non return valve on existing uncontrolled storm drainage discharging into stream.
- Pumping stations as required.

Assolas Stream

- Hard defences comprising embankments / walls.

Glencurragh Stream

- Pumping station (circa 1 m³/s capacity).
- Non return valve at crossing of Schull Road.

Showgrounds Stream

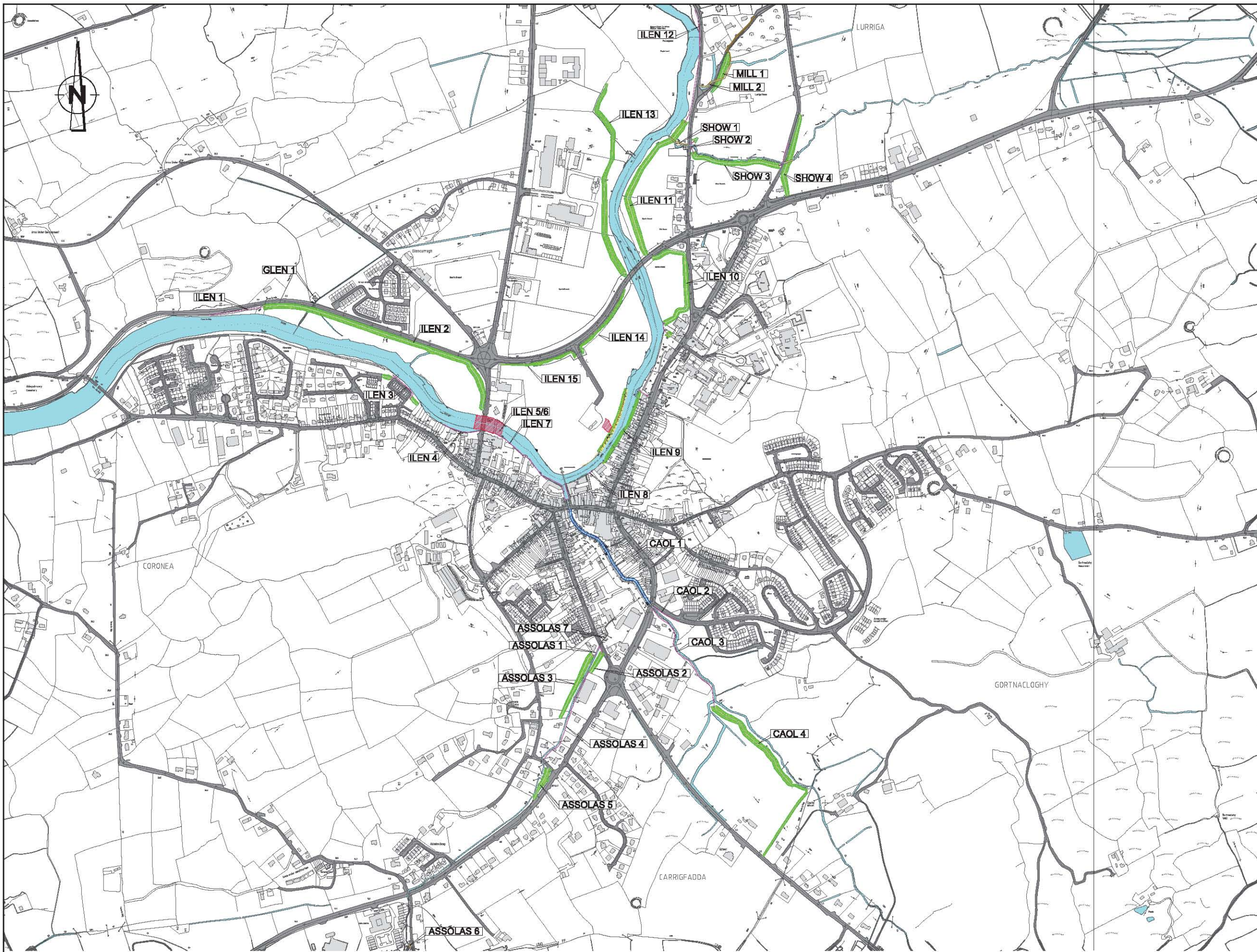
- Hard defences comprising embankments and flood walls
- Two culverts under embankments.

Local Drainage









- Stormwater / road drainage upgrade at Baltimore Road / Castletownshend Road.
- Upgrade of road drainage on Ilen Street.
- Sealing of opes from historic redundant culverts.
- Localised pumping or sealing of storm system, if necessary, to manage road drainage at Cork Road and Marsh Road.

The secondary measures recommended as part of the Flood Risk Management Strategy include:-

- Increased public awareness;
- Proactive and planned maintenance programme;
- Planning & development controls; and
- Management of lands with flood plain.



PLAN LAYOUT
(Scale 1 : 5000)

- LEGEND:-**
-  EXISTING ROADS
 -  EXISTING WATER BODIES
 -  PROPOSED FLOOD DEFENCE EMBANKMENT
 -  PROPOSED FLOOD DEFENCE WALL
 -  PROPOSED 'U-BOX'
 -  PROPOSED CULVERT
 -  PROPOSED REGRADING
 -  PROPOSED PUMPING STATION

Client



CORK COUNTY COUNCIL

General Notes

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D01	Mar '13	DRAFT ISSUE FOR DISCUSSION	BB



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Drawn DC	Project	River Ilen (Skibbereen) Drainage Scheme
Checked RMcC	Title	PROPOSED FLOOD DEFENCE WORKS - EIS
Approved BB	Scale Half @ A3	
Date March 2013	As Shown @ A1	
Job No. MCW0626	File Ref. MCW0626DG0202 Fig 1.2.dwg	Drg. No. Fig. 1.2
		Rev D01

2.5 Detailed Description of Proposed Works

River Ilen Flood Relief Proposals

Beginning at the downstream end of the works, approximately 300 m upstream of the western extremity of the town (near Abbeystrowry Cemetery), the following flood defences are proposed along the River Ilen.

(Ilen) 1

Approximately 147 m of flood wall along the northern bank of the river, located adjacent to the Schull Road, along the boundary of a public seating area. The masonry faced reinforced concrete wall will be approximately 1.4 m high in relation to the level of the adjacent Schull Road.

(Ilen) 2

Approximately 709 m of embankment along the northern bank of the river, located adjacent to the Schull Road, from the upstream end of the wall in 1 above to John F. Kennedy Bridge. The embankment will vary from approximately 1.2 to 1.8 m high in relation to the level of the adjacent Schull Road.

(Ilen) 3

A combination of approximately 135 m of floodwall and embankment along the southern bank of the river, located adjacent The Flax Mills. The wall/embankment will be approximately 1.2 m high in relation to the level of the adjacent access road around The Flax Mills houses.

(Ilen) 4

Approximately 105 m of flood wall along the southern bank of the river, located just downstream of John F. Kennedy Bridge. The masonry faced reinforced concrete wall will be approximately 1.2- 1.8 m high in relation to the level of the adjacent carpark.

(Ilen) 5

Regrading of approximately 1670 m² of the bed of the River Ilen at John. F. Kennedy Bridge.

(Ilen) 6

Structural protection works to the bridge supports at John. F. Kennedy Bridge in the form of reinforced concrete beams constructed around the supports. This work will be required as a result of the regrading work proposed around the support structures.

(Ilen) 7

Approximately 270 m of flood wall along the southern bank of the river, located upstream of John F. Kennedy Bridge. This section of works also incorporates flood walls to be constructed along the quay edge on the Caol stream, down stream of Main Street Bridge. The masonry faced wall will be approximately 1.4 -1.7 m high in relation to the level of the adjacent carparks and yards to the rear of Bridge Street properties, or approximately 0.9 m above the access deck at Thornhills. Where feasible, the flood defence wall will be constructed along the existing quay edge. However, subject to detailed engineering design, it is possible that the wall will be constructed by sheet piling offset from the existing river wall by approximately 2 to 3 m in the river direction. In this instance and where works encroach significantly into the river so as to restrict channel capacity, then works will be completed on the opposite river bank to compensate for volume of river lost.

(Ilen) 8

Approximately 12 m of flood wall along the southern bank of the river, located 62 m upstream of the new footbridge at Levis Quay. The height of the masonry faced reinforced concrete wall is to be approximately 1.7 m in relation to the level of the adjacent property and yard. Some works will also be completed at the new mixed use development at Levis Quay. It is proposed to construct a wall between six existing arches along a boardwalk over the River

Ilen. The wall height will be approximately 500 mm, and a handrail is proposed to be placed on top.

(Ilen) 9

To the rear of the properties on North Street, it is proposed to construct approximately 210 m of embankment, floodwall and stone revetment along the eastern bank of the river. The top of the flood defence wall will be approximately 1.2 – 1.8 m higher than the level of the existing yards in this area. The overall width of the flood defences along this stretch of river is approximately 9.5 m, which encroaches into the river. The loss in channel flow capacity resulting from this defence on the eastern bank will be compensated on the western bank by widening of the river channel over this length of works. Where widened the formed river bank will be reinforced with gabions of similar existing sewer in line of proposed embankments which will be incorporated into the works.

(Ilen) 10

Between the eastern bank of the River Ilen and Cork Road, it is proposed to construct approximately 313 m of embankment in the sports grounds of the school. The embankment will be approximately 1.25 -1.8 m high in relation to the level of the adjacent sports pitches.

(Ilen) 11

Approximately 424 m of flood embankment along the eastern bank of the river, from 70 m north of the Showgrounds stream to the Rugby Club property. The height of the flood defence embankment will be approximately 1.8 – 2.4 m above the levels in the adjacent fields.

(Ilen) 12

Approximately 308 m of flood wall along the eastern bank of the river, located between the confluence of the River Ilen with the Showgrounds Stream and Skibbereen County Hospital. The masonry faced reinforced concrete wall will be approximately 1 to 1.5 m high in relation to the level of the adjacent Mill Road.

(Ilen) 13

Between the western bank of the River Ilen and the rear of the industrial premises along Marsh Road, it is proposed to construct approximately 547 m of embankment at the river bank. The height of the embankment will vary from approximately 1.4 to 2.0 m high in relation to the level of the adjacent industrial premises.

(Ilen) 14

It is proposed to construct approximately 217 m of flood embankment along the south side of the N71 Skibbereen Relief Road. The embankment will be approximately 300 – 600 mm high in relation to the level of the adjacent Relief Road.

(Ilen) 15

It is proposed to construct approximately 211 m of flood embankment along the south side of the N71 Skibbereen Relief Road. The embankment will be approximately 300 – 600 mm high in relation to the level of the adjacent Relief Road.

Caol Stream Flood Relief Proposals

Works along the Caol Stream downstream of Main Street Bridge are included in Ilen 7 above, beginning immediately downstream of Main Stream Bridge, in the town centre and travelling in an upstream direction, the following flood defences are proposed along the Caol Stream.

(Caol) 1

Approximately 340 m of reinforced concrete formed channel section between Main Street Bridge and the Market Street road bridge in Field's Supervalu Carpark. The channel width will

be a minimum of 5 m and the sides of the channel will be approximately 1.2 m to 1.6 m high in relation to the adjacent road/carpark level. There are two existing crossings along the Caol, the parapets of which are to be amended to be solid walls. A thalweg will be provided within the channel to emulate the existing streambed features in so far as possible (refer to **Chapter 7 Aquatic Flora and Fauna** of Vol II of the EIS). The existing masonry arch bridges on either end of the proposed channel section are to be regouted where required. Walls will be masonry faced on both sides of the channel as far as Warners Lane (chainage 2,630 m) and on the public side only between Warners Lane and Market Street Bridge.

(Caol) 2

Upstream of Market Street, it is proposed to construct approximately 320 m of reinforced concrete flood wall along southern/western bank of the Caol Stream. The wall is to be constructed to the rear of the industrial premises along Castletownshend Road. The proposed wall will be approximately 1.5 m high in relation to the level of the adjacent industrial areas.

(Caol) 3

Upstream of Market Street, it is proposed to construct approximately 83 m of masonry clad flood wall along northern/eastern bank of the Caol Stream. The wall is to be constructed in the grassed area adjacent Chapel Lane. The height of the wall will be approximately 1.2 m in relation to the level of the adjacent Chapel Lane roadway.

(Caol) 4

From the industrial premises on Castletownshend Road to the Caravan Park site, it is proposed to construct approximately 558 m of embankment wall along the southern/western bank of the Caol Stream. The embankment will be approximately 1.5 to 2.5 m high in relation to the level of the adjacent fields.

Assolas Stream (Carrigfadda) Flood Relief Proposals

The Assolas Stream passes under Townshend Street approximately 80 m northwest of the Baltimore Road / Townshend Street roundabout. Beginning at this point and travelling upstream, the following flood defences are proposed along the Assolas Stream: -

(Assolas)1.

Approximately 35 m of flood wall along the northern bank of the stream, located along a residential property boundary. The masonry faced reinforced concrete wall will be approximately 1.3 m high in relation to the level of the adjacent garden.

(Assolas)2.

Approximately 65 m of embankment along the southern bank of the stream, located along the edge of a field adjacent the roundabout. The embankment will be approximately 1.3 m high in relation to the level of the field.

(Assolas)3.

Approximately 202 m of embankment along the northern bank of the stream, located along various property boundaries. The height of the embankment will vary from 0.6 to 1.8 m approximately in relation to the level of the adjacent land.

(Assolas)4.

Approximately 277 m of flood wall along the southern bank of the stream, located along property boundaries. There is an existing wall at Lidl but this does not have sufficient height to provide 500 mm freeboard and it is therefore proposed to construct a concrete stub wall, approximately 450 mm high, on top of the existing bank through the grounds of Lidl. The remainder of the wall will be approximately 1.1 m high in relation to the level of the adjacent gardens.

(Assolas)5.

Approximately 92 m of embankment along the southern bank of the stream, located in front gardens between the stream and the Baltimore Road. The embankment will be approximately 0.5 m high in relation to the level of the gardens. Works will also be required along the access roads to the three houses to bring the ground levels to flood defence level.

(Assolas)6.

An existing double culvert (2 x 600 mm diam pipes) to the east of the Care Centre on Baltimore road will be replaced with a single box culvert of similar or greater hydraulic capacity under the public roadway.

(Assolas)7.

Approximately 180 m of the Assolas is culverted (1500 mm diameter) upstream of its confluence with the Caol Stream. There are two manholes on the culvert which will be sealed as part of these works. A further open section of channel, on the downstream side of the where the Assolas crosses Townsend Street, will be sealed.

Glencurragh Stream Flood Relief Proposals

The confluence of the Glencurragh Stream with the River Ilen is located to the southwest of The Moorings housing estate on the Schull Road, N71. The following flood defence works are proposed along the Glencurragh Stream: -

(Glencurragh)1.

Immediately west of the Moorings Housing Estate, it is proposed to construct a pumping station adjacent the Glencurragh Stream. Flows from the stream will be pumped from the pumping station under the Schull Road to discharge to the River Ilen when water levels do not allow the stream to freely discharge to the main Ilen channel. A headwall and anti-scour measures will be provided at the discharge point. A non return valve will be fitted to the downstream side of the existing Glencurragh Stream under the Schull Road. An onsite electricity generating facility may also be provided to operate pumps as an alternative to the electricity station.

The pumping station will require an underground pump sump with access points, an above ground control kiosk, and may require an electricity supply sub-station. A hard-standing area will be required in the location of the pump station to allow access and maintenance to the sump.

Mill Race Flood Relief Proposals

The confluence of the Mill Race with the River Ilen is located in the townland of Lurriga, along the northernmost section of floodwall proposed as part of the River Ilen flood defence works (Refer to (Ilen)12). Beginning at the confluence and travelling upstream, the following flood defences are proposed along the Mill Race.

(Mill Race) 1.

The downstream section of the existing Mill Race will be culverted over approximately 68 m upstream from the Mill Road crossing. The culvert will run parallel to a local road (east of Mill Road), and under this roadway. The Lurriga land drain will be diverted from its existing road crossing to this new crossing.

(Mill Race) 2.

Approximately 117 m of embankment will be constructed to run parallel to the new land drain route. The height of the embankment, which will be constructed in fields, will vary from approximately 1.8 to 2.0 m in relation to the level of the adjacent local road. Approximately 150 m of 400 mm diameter storm sewer will also be laid along this local road, catering for surface water runoff in the area. All manholes up to a level of 500 mm above flood level will be sealed.

Showgrounds Stream (Clurriha) Flood Relief Proposals

The confluence of the Showgrounds Stream with the River Ilen is located to the northwest of the Showgrounds on the Mill Road. Beginning at this point and travelling upstream, the following flood defences are proposed along the Showgrounds Stream: -

(Showgrounds) 1.

Approximately 48 m of concrete culvert (approx 2.7 x 1.5) between the River Ilen flood defence embankment/wall and the Mill Road crossing. The culvert will pass under the roadway.

(Showgrounds) 2.

Approximately 14.5 m of flood embankment and approximately 36 m of reinforced concrete flood wall along the eastern side of Mill Road. The embankment will be located within an open field and will tie into existing high ground levels locally and to the section of reinforced concrete flood wall. The flood will tie in on its southern end with Showgrounds 3. The top of this section of works will be a maximum of 1.9 m high in relation to the level of the adjacent road.

(Showgrounds) 3.

Approximately 250 m of flood embankment along the southern bank of the stream, located along boundary of the Showgrounds. The embankment will be approximately 1.5 m high in relation to the level of the adjacent grounds. The bank will tie into a proposed section of masonry faced reinforced concrete floodwall at the eastern end of the Showground site. The wall will run parallel to the adjacent road. It will be approximately 77 m long and 1.2 m high in relation to the level of the adjacent road.

(Showgrounds) 4.

Approximately 223 m of embankment running perpendicular to the stream along the roadside boundary of the Lurriga Road, and to the rear of a private property at the Cork Road/Lurriga Road junction. A short section of culvert will be laid under the line of the proposed embankment. The height of the embankment will vary from approximately 1.1 to 1.5 m in relation to the level of the adjacent road.

2.6 Drainage Proposals

Where required, new surface water sewers will be laid behind the proposed flood defences to collect existing surface water runoff and discharge it in a controlled manner via non-return valves through the flood defences to the river. As part of this work, new gullies and stormwater sewers may be required to connect to the new system. Existing stormwater outlets will also to be redirected to new sewers as required. Non-return valves will be installed on all outlets to the river. At a number of locations, small stormwater pumping stations will be constructed behind the flood defences at discharge points. Control kiosks will be required for any proposed pumping stations. When the river water level is high in times of flood, these pumps will become operational to ensure a continuous discharge of stormwater to the river.

Onsite electricity generating facilities may also be provided within the pumping stations to operate pumps as an alternative to the electricity station.

2.7 Site Investigation

Chapter 13 Soils, Geology, Hydrology and Hydrogeology of Vol II of the EIS provides summary details of Site Investigations undertaken to date. Further detailed geotechnical ground investigation will be carried out prior to the detailed design of the proposed works. A number of boreholes will be drilled behind the existing quay walls, along the proposed line of defences to determine the insitu ground conditions. Structural condition surveys of adjacent structures will be completed as part of detailed engineering design to determine their current structural condition.

2.8 Outline Construction Stage Methodology

General

All relevant safety, structural and engineering codes and standards will be adhered to throughout the construction stage.

Duration

The contract duration will be determined by the Contractors work proposals accounting for any timing and seasonal restrictions imposed by the EIS or other statutory bodies. However, it is expected that it will take approximately **24 months** to complete the proposed works. Typical normal working hours will be 08:00 to 18:00 Monday to Friday and 08:00 to 16:00 on Saturday but these may be varied in exceptional circumstances with the agreement of Cork County Council (on behalf of the OPW).

Access

Access to construct the proposed works will vary depending on the watercourse, the location of the works along the watercourse and the nature of works to be carried out. The Construction Contractor is likely to use a variety of access locations, temporary works and construction techniques.

Where possible, it is expected that the Contractor will gain access from the river banks. However, in areas where working space is restricted on the landside, the Contractor may gain access and construct a temporary working area within the river channel. Similarly, for works such as masonry facing to proposed floodwalls, this may, depending on the Contractors preferred works proposals, be carried out from a temporary working platform on the riverside of the works.

It is expected that access to construct the proposed flood defences which are located away from the river's edge where possible will be from the landward side in order to avoid any impact to the river, e.g. embankments.

Where in-stream works are proposed, e.g. regrading of the riverbed and structural works to piers at John F. Kennedy Bridge, the Contractor will be required to enter the watercourse at agreed designated safe access points on the river bank.

Further details of the access requirements at each location will be determined during the detailed design stage of the project. Should access from the river channel be required, the details will be discussed with staff from the various statutory bodies including the Inland Fisheries Ireland (IFI) and National Parks and Wildlife Service (NPWS) and appropriate mitigation measures will be agreed to avoid negative impacts on the rivers/streams.

Equipment

It is expected that most of the equipment used will be standard construction plant for a project of this nature, e.g. mechanical excavators, dump trucks, dewatering pumps, ready mix concrete lorries, pile drivers, rock breakers etc. The results of the site investigation and the successful contractor's construction methods will determine the specific equipment required.

Temporary Protection Work

It is not envisaged that temporary flood protection works to Skibbereen Town will be necessary prior to or during construction. It is likely, however, that the Contractor will require localised temporary works to keep his working area dry and/or protect the working area from inundation.

These temporary works are likely to include but are not limited to earthen dams, steel sheet piles, sandbags and dewatering equipment, depending on the location of the works and the adjacent water level. Safety considerations will require the Contractor to provide temporary fencing to working areas. In some locations, this may involve temporary public road closures.

Clearance of Vegetation

In order to reduce potential damage to vegetation that will be retained following the works, efforts will be made to limit the amount of work to be carried out within the spread of trees, shrubs or hedges to be retained. No soil, spoil, construction materials or rubbish will be stored or tipped and no construction plant or vehicles will be parked within the spread of existing trees, shrubs or hedges.

Clearance of some vegetation will be required at and adjacent to the proposed works. Where work must take place inside or close to the spread of trees to be retained, then a qualified Arboriculturist should be consulted and works should take place outside the nesting period.

The Contractor will take all reasonable precautions to protect, in the course of his work, any existing plant materials from malicious or accidental damage and will endeavour to ensure that no branches will be lopped and no roots over 50 mm diameter severed from growing trees without prior consultation with an Arboriculturist. Where possible, vegetation will be reinstated following completion of the project.

Biotic Contaminants

Invasive alien species such as Himalyan balsam and Japanese knotweed are present (See **Chapter 8 Terrestrial Flora and Fauna** of Vol II of the EIS) within the proposed works areas and these species could potentially be dispersed downstream via the River Ilen into *Roaringwater Bay and Islands* cSAC as a consequence of the proposed works.

The Contractor will take every precaution to prevent the spread of invasive species (Japanese Knotweed in particular) encountered during the works by ensuring that all plant and equipment that comes in contact with these species (and soil deemed contaminated with species) are regularly cleaned in the appropriate manner.

The Contractor will be obliged to comply with The European Communities (Birds and Natural Habitats) Regulations 2011 which contain important new provisions to address the problem of invasive species.

See **Section 8.5 of Chapter 8 Terrestrial Flora and Fauna** of Vol II of the EIS for further details on mitigation measures with regards to the control of invasive species.

Reinstatement

Lands entered or disturbed during construction will be reinstated to their original condition upon completion of the main works. Landscaping is to take place following construction, in a manner appropriate to each particular area as detailed in **Section 9.5 of Chapter 9 Landscape and Visual Impact Assessment** of Vol II of the EIS.

In Stream Works

The most significant in-stream works are proposed at John F. Kennedy Bridge (regrading works) and in the Caol Stream, where a concrete channel section is to be installed / constructed.

The remainder of the proposed works primarily consist of the construction of flood defences on the river banks. Where possible, the flood defences are located away from the river's edge to avoid encroachment into the river channel. However, certain flood walls may also be constructed in the river channel outside of the existing walls.

It is therefore envisaged that temporary access to the river banks to construct the proposed flood defences may be required.

The following areas have been identified where access for construction may be within or via the river channel:-

- Approximately 43 m of in stream riverbed regrading works in the River Ilen at John F. Kennedy Bridge.
- Structural works to bridge piers at John F. Kennedy Bridge.
- Approximately 310 m of flood wall along the southern bank of the River Ilen, located upstream of John F. Kennedy Bridge.

- To the rear of the properties on North Street, it is proposed to construct approximately 260 m of embankment, floodwall and stone revetment along the eastern bank of the River Ilen. Working space and access to the rear of these properties is restricted.
- To compensate for the loss of river channel along the eastern bank caused by the construction of the embankment, floodwall and revetment to the rear of North Street as outlined above, widening of the river channel over the same length of works is required along the western bank of the River Ilen.
- Approximately 340 m of concrete channel section along the Caol Stream between Main Street Bridge and Market Street.
- Approximately 290 m of flood walls along the banks of the Assolas Stream.
- Approximately 330 m of flood walls along the banks of the Caol Stream.
- Installation of a non return valve on the Glencurragh Stream.
- Two culverts, approximately 48 m and 15 m on Showgrounds Stream.
- Approximately 60 m of culvert of Mill Race east of Mill Road.

The extent of the temporary in-stream works is not limited to those outlined above. The full extent can only be determined at the detailed design stage, following a comprehensive geotechnical ground investigation. However, for the purpose of this assessment it has been assumed that all of the above works will be required and the resulting potential impacts have been addressed in each of the chapters.

Construction of the Flood Defences

Construction of the flood defences outlined above is likely to involve but is not limited to the following construction activities:

- Site investigation
- Temporary Works
- Pile driving
- Sheetpiling
- Excavation for foundations, including over excavation of unsuitable materials
- Blinding of formations
- Steel fixing
- Placing and stripping of formwork
- Placing of cast in situ concrete
- Placing of precast concrete components
- Placing of fill material
- Placing of pipes
- Grouting of existing structures
- Masonry facing
- Landscaping
- Reinstatement

Construction of the Drainage Scheme

The construction of the reinforced concrete flood defence walls is likely to be carried out by traditional methods whereby a hole is excavated large enough to accommodate the foundations. Then the foundation and wall steel reinforcement will be fixed. Temporary formwork is erected to form the faces of the wall. Concrete is poured to form the wall and the formwork is removed several days later. Then masonry cladding will be fixed to those parts of the wall that will be designated to receive masonry facing. Finally, the ground on both sides of the wall will be backfilled and reinstated. It should be pointed out that during the construction of foundations, it may be necessary to use dewatering pumps to keep the working area dry.

Some of the proposed wall sections will be on sheet piled foundations. The sheet piles will be driven from the land side where possible; however it may be necessary to work from the river to complete these works, and the exact methodology will be determined by the successful Contractor. The appropriate pile driving methods will be determined when the geotechnical site investigation results are available. On completion of the pile driving, the ground to the rear of the piles will be excavated and a drainage pipe in a granular trench will be laid. Formwork for the concrete surround will be erected and concrete will be poured to form a wall around the top of the sheet pile to the required height. The formwork will then be removed, and a masonry facing will be fixed as required. A capping stone will also be fixed to the top of the wall where required. The ground will be backfilled and reinstated to its original condition on completion of the works.

The design criteria for the proposed embankment is to ensure that they be stable and control seepage to acceptable levels. The type of material to be used will have low permeability characteristics overlain by grassed topsoil. The construction of the earthen flood defence embankments is likely to comprise excavation of existing ground to a create formation level for the bank, before placing and compaction of the bank material. The top layer of the embankment will consist of topsoil and will be grass seeded. A toe drain will be provided where required to provide drainage at the foot of the embankment. Alternative designs for seepage control such as sheet piling, grout curtains etc. will also be considered as part of the detailed engineering design.

The construction of drainage and pumping stations will involve excavation to formation level, and placing and compaction of granular bedding material, before placing of pipes/chamber. The trench will be backfilled and compacted with suitable granular material, before the area is reinstated as appropriate.

Concrete Culvert sections are also required as part of the works. These are expected to be pre-cast concrete sections which will be cast off-site and then delivered to site. The existing watercourse will be over-pumped or diverted while the works are being completed. The watercourse bed will be excavated to formation level before the culvert sections are lifted into place. The ground on either side of the culvert will then be backfilled and in general will be grass seeded. Where a watercourse is to be diverted from its original path, the ground will be excavated along the new route to formation level before the sections are dropped into place. The ground will be backfilled to the new culvert, and the surrounding ground will be reinstated as appropriate. The original watercourse channel will be backfilled using excavated material. The surface will be grass seeded or otherwise, as appropriate. A watertight seal between the new culvert sections and older sections/bridge crossings will be ensured.

The extent of disturbance to the lands, to banks and the river bed will be dependent on the successful Contractor. In certain locations, where there is a possibility of seepage underneath the flood defence, either sheet piles or grouting techniques may be required to provide a cut-off. The sheet piles may be metal or plastic and will be driven to the required depth using a piling hammer or similar.

A formed concrete channel with walls to flood defence level is to be laid along the Caol Stream. The existing river bed will be excavated to formation level, before the channel sections are placed. Existing walls/revetments along the bank will be removed where necessary. The ground behind the wall sections of the channel will be excavated and drainage placed to the rear of the wall sections. The ground will be backfilled to the wall and reinstated as appropriate to its location. The parapets of existing bridges will be replaced with solid concrete sections also which will be tied into the wall sections of the channel. A watertight seal between all sections of the channel will be ensured. Masonry cladding will be fixed to those parts of the wall that are designated to receive masonry facing. It is expected that the concrete sections will be pre-cast off site and lifted into place. However exact method of construction of this section of works will be determined by the successful Contactor.

The works required at John F. Kennedy Bridge will require the removal of river bed material from underneath the bridge. It is unlikely that the material excavated can be reused elsewhere on the project. It will be necessary to dispose of this unsuitable material off site in accordance with any requirements governing construction waste. Works will also be required to support the exposed bridge piers. This will involve the construction of a reinforced concrete apron at the piers. It will be necessary to complete this work in the dry. This involves erecting temporary dams around the working area, and dewatering works may be required. The bed level will be excavated to form formation level for the apron, before then the steel reinforcement is fixed. Temporary formwork is erected to form the faces of the apron. Concrete is poured to form the apron and the formwork is removed several days later. The temporary dams will be removed on completion of this work.

Welfare Facilities

Prefabricated temporary buildings will be provided for the site workers during the construction works. These facilities will include welfare facilities and office space as required. Any effluent generated from the welfare facilities will be discharged to the public sewer.

Plant and machinery may also be stored at this location. A wheelwash will be provided at exit points from the works site to ensure that vehicles leaving the works area do not carry excess soil and material onto the adjacent public road infrastructure.

Maintenance

The Office of Public Works are obliged, under the terms of the Arterial Drainage Acts, 1945 and 1995, to maintain completed flood relief schemes in proper repair and effective condition. This may mean, inter alia:-

- Clearing obstructions to flows from time to time, e.g., fallen trees, significant weed growth, build up of materials likely to impact on the performance of the scheme;
- Repairing and rebuilding structures (walls and embankments);
- Prevention of erosion/undermining of the completed works of the scheme; and
- Regular inspection, maintenance and upgrade of all mechanical equipment associated with the proposed works

While the maintenance requirements of the scheme will be monitored and reviewed on an annual basis, it is envisaged that maintenance works would only be undertaken as and when required, e.g., on a six to ten year cycle.

3. METHODOLOGY AND CONSULTATION

This Environmental Impact Statement has been prepared in accordance with EC (Environmental Impact Assessment) Regulations 1989 to 2001, and the recommendations of the Environmental Protection Agency's (EPA) *Draft Guidelines on the Information to be contained in Environmental Impact Statements (2002)* and *Advice Notes on Current Practice (on the preparation of Environmental Impact Statements) (EPA, 1998)*. The details of the methodology to be used in each individual discipline are given in the relevant chapter of the text.

Each of the main section of the EIS follows the same general format, as follows:-

- An **Introduction** describing the purpose of the section.
- A description of the **Methodology** used in the section.
- A description of the aspects of the **Existing Environment** relevant to the environmental topic under consideration.
- An assessment of the **Impact** of the proposed development on the environmental topic under consideration.
- Recommendation for **Mitigation** measures to reduce or eliminate any significant negative impacts identified.
- An assessment of the **Residual Impact**, which will remain assuming that the recommended mitigation measures are fully and successfully implemented.

3.1 Work Completed to Date

The following tasks have been undertaken by the EIS and design team:

- Environmental Constraints Report (RPS, July 2011) and Public Consultation on Constraints (public consultation 23rd March 2011);
- EIA Scoping Report (RPS, July 2012);
- Identification of flood relief options;
- Environmental inputs to overall Multi-Criteria Analysis (MCA) of flood relief options;
- Selection of Preferred Flood Relief Option based on MCA results;
- Public Consultation on the emerging Preferred Flood Relief Option (public consultation 25th of January 2011); and

- Appropriate Assessment Screening Report (See **Appendix 7.2 AA Screening** of Vol III of the EIS) (October, 2012 and updated in February 2012).

Where possible this EIS utilises existing information from previous studies in the area. Additional surveys have been carried out where necessary to update the baseline data for the current impact assessment.

Additional reports completed by the design team that are referred to in the EIS comprise the following:-

- Hydrology Report;
- Hydraulic Model and Hydraulics Report;
- Economic Damages Assessment;
- Flood Risk Assessment and Flood Maps;
- Preliminary Geotechnical Site Investigations; and
- Multi-criteria analysis of Flood Relief Options.

3.2 Consultation

3.1.1 Stage 1 – Constraints Consultation

Public Consultation

As part of the Constraints Study a Public Consultation Day was held in the Town Hall in Skibbereen on the 23rd of March 2011 between 3pm and 9pm.

The main objectives of the public consultation day were to:-

- Gather information on flood events;
- Gather information on possible flood relief options;
- Outline the design and statutory process;
- Provide an opportunity for comment at an early stage; and
- Gather information about environmental constraints.

The Public Consultation Day was initiated with a presentation from RPS, Office of Public Works (OPW) and Cork County Council (CCC) to the Members of Skibbereen Town Council, the purpose of which was to present the study area and the project to the elected members, prior to the Public Information Event, and to outline the process involved in the preparation of the Skibbereen Drainage Scheme.

Following the presentation the public exhibition opened at 3.00pm and remained open to the public until 9.00pm. During which time members of the public met and discussed key issues with members of the Design Team (RPS), the Environmental Team (RPS), Cork County Council, Skibbereen Town Council and the OPW.

Questionnaires were also circulated at the Public Consultation Day and were returned by freepost to RPS. A total of 166 no. questionnaires were given out during the course of the day and 50 no. were returned to RPS.

Stakeholder Consultation

A consultation report was prepared (May, 2011) which summarised the information gathered during the course of the consultation day and from the key questionnaires posed and discussions with members of the public and the study team.

With regards environmental constraints in general people felt that while the environment should be protected the protection of people and their homes was considered a priority. The protection of water quality emerged as the most important environmental issue that should be addressed as part of the EIS (refer to **Chapter 7 Aquatic Flora and Fauna** and **Chapter 13 Soils, Geology, Hydrology and Hydrogeology** of Vol II of the EIS).

Information gathered as part of the consultation process was used to inform the EIS and design of the proposed Drainage Scheme.

3.1.2 Stage 2 - Summary of Consultation during the development of Preferred Flood Relief Option

As part of the Stage 2 Consultation at Option Selection Stage, members of the public and stakeholders were again contacted, asked for their input and invited to a Public Consultation Day held on 25th of January 2011.

The objective of public consultation at the Option Selection Constraints Stage was to:-

- Present an update Progress to Date;
- Present Preliminary Results from the Study;
- Present the emerging Preferred Option for Flood Risk Management; and
- Solicit comments and response from stakeholders to the Proposed Flood Relief Works.

All attendees of the Public Information Day were encouraged to sign a register of attendance. A total of 110 signatures were received, although it was felt that the actual attendance was significantly higher, well in excess of 150 persons.

A consultation report was prepared in January 2012 which summarised the information gathered during the course of the consultation day and from the questionnaires. During this stage of the consultation the comments received largely comprised of the following:-

- Additional Information requests.
- Concerns/clarification with regards to the potential for impact from the proposed measures on individual properties, including:-
 - Prevention of water coming through floors;
 - Access arrangements across embankments;
 - Specific details of measures on individual properties;
 - Compensation arrangements and the associated process;
 - Concerns regarding the capacity of the JF Kennedy Bridge to cater for the flood flow;
 - Suggested alternative flood relief measures;
 - Clarification regarding the increase in water level and an increased frequency of flooding upstream of the proposed defences;

- Clarification regarding planning implications of proposed works;
- Availability of funding for the scheme;
- Provision for future planned riverside walkway; and
- Implications for potential development in the benefiting lands.

3.1.3 Stage 3- EIS Scoping Stage

A Scoping Report was prepared in July 2012 and as part of the Environmental Impact Assessment (EIA) process, a copy of the Scoping Report (refer to **Appendix 3.1 EIA Scoping Report** in Vol III of EIS for full details). was issued to key stakeholders (**Table 3.1**). The purpose of this scoping report was to provide an overview of the options considered, a description of the key environmental issues/constraints, a brief description of the preferred option and the scope of the EIA and EIS.

Consultees were invited to contribute to the EIA by suggesting baseline data, field survey techniques and potential impacts that should be addressed throughout the EIA process and in preparation of the EIS.

Table 3.1 below provides a summary of the responses received during this Scoping Stage of the consultation process (refer to **Appendix 3.3** in Vol III of EIS for full details).

Table 3.1: Consultees During EIS Scoping Stage

Consultee	Summary Response
Cork County Council (Planning Section)	Acknowledgement
Irish Planning Institute	Declined to comment given the IPA represent individuals in the private and public sector.
An Bord Pleanála	Acknowledgement- No Comments at this stage.
Institute of Geologists	Acknowledgement- No comment
South Western River Basin District	Scheme should comply with the objectives of the Water Framework Directive. Reference in particular should be made to Section 4.2.3 of the SWRBD Plan which refers to new modifications or sustainable development and Section 6.1.1 Land Use Planning.
Inland Fisheries Ireland	Raised concerns over culverting streams widening of the main channel and the potential impact to fisheries. Recommended addressing in terms of fisheries loss of habitat and impact on fish passage. Advised that they would submit detailed comments upon review of the EIS.
Waterways Ireland	Acknowledgement- No comment
Faite Ireland	Faite Ireland Guidelines for the treatment of tourism in EISs should be adhered to.
Irish Creamery Milk Suppliers Association	Avoid impacts to agricultural activity and/or farmland upstream or downstream of the proposed works. A full analysis of any proposal must be undertaken and guarantees given regarding the flooding of agricultural lands.
National Roads Authority	Refer to the NRA Guidelines and circulars. Consultation with relevant Local Authority regarding existing and future road schemes, i.e. potential impacts associated with the N71.

Consultee	Summary Response
	<p>Address potential landscape and visual, dust and noise, traffic and safety impacts.</p> <p>Potential cumulative impacts associated within other road schemes in the areas.</p>
Department of Agriculture Food and the Marine	<p>Potential impacts to soil quality including destabilisation of banks, soil erosion, run-off and soil contamination.</p> <p>Avoidance of impacts to Agricultural activity.</p>
Health Service Executive (2 responses)	<p>Human beings and potential impacts upstream and downstream of the works Landuse intensification in flood protected areas.</p> <p>Water and impacts to WWTP (wastewater treatment plant).</p> <p>Groundwater vulnerability.</p> <p>Air and noise impacts.</p> <p>Pest control.</p> <p>Provision of construction compounds.</p>

Consultation Meetings

In addition to the consultation outlined above, DixonBrosnan (ecologists working on behalf of RPS) and the RPS Project Manager for the design of the proposed Drainage Scheme consulted with Inland Fisheries Ireland (IFI) representatives through a series of phone calls and site meetings on a number of occasions.

Consultation was also undertaken with the NPWS District Conservation Officer (Mr. Declan O'Donnell).

Summary details of all consultation with regards to aquatic and terrestrial ecology is summarised in **Table 7.1 of Chapter 7 Aquatic Flora and Fauna** and **Table 8.1 of Chapter 8 Terrestrial Flora and Fauna** of Vol II of the EIS respectively.

4. CONSIDERATION OF ALTERNATIVES

The primary objective of this study was to identify appropriate flood risk alleviation measures for the town. As part of the study a series of Flood Maps were prepared for Skibbereen Area of Potentially Significant Flood Risk (APSR).

Prior to the Multi Criteria Analysis stage of the option development process RPS completed a Preliminary Option Screening Process whereby a wide range of flood risk management measures were screened for their potential applicability in achieving the Flood Risk

Management Objectives for the Skibbereen APSR. This Preliminary Measure Screening determined whether a measure was either practical and/or applicable and had the potential to achieve a positive benefit when evaluated under the core criteria which comprised:

- Applicability to the area;
- Social;
- Environmental;
- Cultural; and
- Economic.

Following initial Screening, a number of primary and secondary flood risk mitigation measures which were carried forward to the Multi-Criteria Analysis were identified. This included:

- Flood storage;
- Flood defences;
- Channel improvement; and
- Diversion of watercourse.

RPS developed 16 no. potential flood risk management options for the Skibbereen APSR assessment unit. These options were variant combinations of the Primary Measures identified as having flood management potential following initial hydraulic modelling of the options. In general, the options included combinations of varying elements including use of hard defences, diversion, overflow diversion, over pumping, and channel conveyancing.

In developing these options consideration was given to hydrological estimation, hydraulic modelling and available engineering records and surveys for the Skibbereen APSR.

The options were assessed using Multi-Criteria Analysis (MCA). MCA evaluates the proposed option based on Technical, Economic, Environmental and Social Core Criteria. This uses a standardised evaluation system adopted by the Office of Public Works for CFRAM projects.

A number of Objectives and Sub-Objectives were then assigned to each of the Core Criteria. Each objective is also assigned an Indicator and Minimum Requirements / Aspirational Targets against which each Option is scored.

The preferred option is detailed in **Chapter 2 Project Description** of Vol II of the EIS.

5. STRATEGIC AND STATUTORY PLANNING AND DEVELOPMENT CONTEXT

Chapter 5 of Vol II of the EIS provides a planning context for the proposed Drainage Scheme. Strategic policy documents provide detail on the planning policy context for the town of Skibbereen nationally, regionally and county wide and for the proposed Drainage Scheme. This statutory planning review focuses on the relevant development plans, which provide local planning policies and objectives for the area where the scheme is proposed to be implemented.

The following documents set the proposed Drainage Scheme in its strategic planning policy context and have been reviewed in the context of the subject Drainage Scheme:-

- EU Floods Directive 2007/60/EC;
- National Floods Policy 2004 and the Catchment Flood Risk and Assessment Programme (CFRAM);
- Water Framework Directive (See **Chapter 7 Aquatic Flora and Fauna** of Vol II of the EIS for details);
- The Planning System and Flood Risk Management – Guidelines for Planning Authorities 2009;
- National Spatial Strategy 2002-2020;
- Our Sustainable Future: A Framework for Sustainable Development for Ireland 2012;
- National Climate Change Strategy 2007-2012;
- National Development Plan 2007-2013;
- South West Regional Planning Guidelines 2010-2022;
- South Western River Basin District Plan;
- North and West Cork Strategic Plan 2002-2020;
- Cork County Development Plan 2009-2015; and
- Skibbereen Town Development Plan 2009 – 2015.

The proposed development complies with strategic planning policy and therefore no specific mitigation is recommended.

In terms of the statutory planning policy context for the town of Skibbereen, the following is noted:

Future development proposals on zoned land that is susceptible to flooding are currently required to be assessed in accordance with the relevant Flood Risk Guidelines. Any undeveloped zoned land that remains susceptible to flooding following scheme implementation will remain subject to that requirement. Some undeveloped zoned land will benefit from the proposed scheme and on balance the impact will be significant, positive and long-term.

At operational stage, the proposed scheme will influence design and route options for the future implementation of policy objectives to provide amenity walks and a cycleway for the town in some areas. In these areas, the works required will aim not to preclude the future development of walking routes by other parties in future. Consultation will be carried out with the local authority and property owners as necessary at detailed design stage.

6. COMMUNITY AND SOCIO-ECONOMIC IMPACT ASSESSMENT

Human beings comprise one of the most important elements of the “environment”. Any potential impact on human beings that may arise from the proposed River Ilen (Skibbereen) Drainage Scheme must therefore be appropriately assessed. The main concern is to ensure that human beings within the study area experience no significant unacceptable effects on “quality of life” due to the construction and operation of the proposed development. Relevant components of “Human Beings” in this section of the EIS include: population, employment, and community aspects.

This section considers in detail the existing socio-economic context of the site, identifies the various sensitive ‘communities’ within the vicinity of the site, and assesses the potential for

impact on same. Other sections of this EIS, which are relevant for the purposes of assessing impact on the socio-economic characteristics of the town and its environs, as appropriate, are referenced as necessary.

In terms of socio economic impacts during the construction phase the proposed scheme is expected to increase employment in the area. During the construction phase works are likely to cause temporary disruption to resident, working and visiting populations due to construction noise, construction traffic movements and construction works.

Impacts will arise with respect to residential amenity for some residents where proposed flood defences are to be constructed on or adjacent to residential properties.

Construction works may affect land uses through temporary land take, severance or access for construction purposes. The construction process has potential to impact on the health and safety of the public and construction workers due to potential risks associated with proposed works. A Project Supervisor Construction Stage (PSCS) will be appointed as required by health and safety regulations and this should mitigate any potential health and safety issues for the public and / or workers to ensure health and safety of community, visitors and workers is maintained throughout the construction stage.

Construction works will affect land uses within the study area through temporary land take for construction purposes, temporary severance of particular land areas to facilitate construction works, temporary access restrictions and nuisance due to noise and traffic restrictions. Some limited areas of agricultural land will be affected during the construction phase overall; impacts during the construction phase will be temporary, slight and negative.

During the operational phase, the Drainage Scheme has the potential to generate a significant positive impact as it could help to maintain existing population and employment in the area and furthermore might attract additional population and employment within the study area if concerns relating to flooding were allayed. It is considered that the significance and extent of potential positive impacts during operational stage are likely to outweigh any negative impacts arising during construction and the overriding impact on the residential population will be significant, long-term and positive.

The proposed scheme will have a significant positive impact on residents, businesses and tourist facilities through the reduction of risk of serious flood events and damage to properties, businesses and facilities. This will reduce financial costs incurred following flood damage and the associated disruption of such an impact.

The proposed development will reduce flood risk on a range of urban land uses within the study area. Overall, impacts will be significant, long-term and positive. Provided appropriate mitigation is agreed with land, significant adverse long-term impacts can be avoided or the significance of these impacts reduced to slight or even imperceptible levels. However, where agreements and/or appropriate design solutions cannot be developed to address impacts identified, there may be long-term adverse impacts for some specified land uses. This is also applicable to the proposed loss of access to the river at one point. It should be noted that compensation will be payable where appropriate.

Overall the proposed scheme is considered to have a positive impact on the human environment due to the reduction to risk of flooding.

7. AQUATIC FLORA AND FAUNA INCLUDING WATER QUALITY AND FISHERIES

RPS commissioned DixonBrosnan and Associates to prepare this Chapter of EIS which addresses the impacts of the proposed works on aquatic ecology, water quality and fisheries. DixonBrosnan had previously provided ecological input into the design process during the constraints and identification of preferred option stages (July, 2011) in order to assist the design team in identifying a flood relief solution with the least environmental impacts to water quality and fisheries.

Following completion of constraints and the preferred option stages of the project, the potential impact of the planned works was assessed to determine its potential impacts on aquatic habitats. Potential impacts from the works are considered likely to impact on the main channel of the River Ilen and on four smaller tributaries.

The River Ilen is considered a nationally important river which is an important salmonid fishery. It gets a substantial run of salmon and the overall catchment supports lamprey and freshwater pearl mussel. All of these species are listed on Annex II of the Habitats Directive. Consultation with IFI identified the minimisation of impacts on migrating salmonid species as an important objective in any Drainage Scheme.

Habitat surveys were carried out to determine the ecological value of the different watercourses affected by the proposed works. In addition fish stock surveys were carried out on minor watercourses to assess their value for fish. The Coal Stream was identified as the tributary of most value as it supports significant brown trout populations, European eel and small numbers of juvenile salmon. The Showground's Stream was found to support small numbers of brown trout. The remaining small streams (Mill Race, Glencurragh Stream and Grenada) were found to be of minimal value for fish species.

There will be no direct physical structures to act as barriers to migration on the Ilen River; however mitigation including detailed method statements will be put in place to prevent high silt levels during construction from impacting on downstream fish populations. Overall, and although there will be some changes in bankside vegetation, the structure of the river will remain largely unchanged and there will be no barriers to migrating fish. Overall the impact is expected to be localised and short-term.

The Caol Stream supports brown trout, eels and salmon and is tidal within the works area. The provision of a walled channel (U-shaped structure with concrete slab below the river bed) will impact on areas of the stream which have been significantly modified and thus is not of high ecological value in relation to the overall Caol Stream. The walled channel will be designed to preserve and recreate natural flow and substrate conditions as much as possible. Overall there will be a net loss of moderate quality habitat and generation of silt/disturbance during site works; however no significant long term impact on fish populations within the Caol is predicted. Overall the impact is expected to be localised and long-term.

The Showgrounds Stream supports a small population of brown trout and as such is of local value. No fish were detected in the section of watercourse in which the culvert will be placed and water quality in this section of the stream appears to be impaired by upstream agricultural impacts. The culvert will be designed to allow fish to migrate through it and to recreate as much as possible the natural substrate. As movement of fish will not be prevented, fish within this stream are not expected to become isolated from the main channel. Overall impact is expected to be localised and long-term.

No fish were detected in the Assolas Stream (Carrigfadda Stream) however it is of sufficient size to support fish in certain sections. Overall impact is expected to be localised and long-term.

The remaining watercourses to be affected (Millrace and Glencurragh Stream) are small and of no significant value for fish. Overall impact is expected to be localised and long-term.

Overall and provided the specified mitigation measures are effectively implemented the impact on aquatic ecology and fisheries is expected to be of short duration and generally confined to the construction period. Long term impacts will be largely confined to relatively small losses of aquatic habitat and range from minor to moderate negative in the longer term. No significant long term impact on water quality or on designated sites downstream of the works area is envisaged.

8. TERRESTRIAL FLORA AND FAUNA

Chapter 8 of the EIS (Vol II) describes and evaluates the habitats with their representative flora and fauna in order to describe and assess the impacts that would result from the proposed Drainage Scheme and was prepared by DixonBrosnan and Associates. . DixonBrosnan had previously provided ecological input into the design process during the constraints and identification of preferred option stages.

Following completion of a constraints study and the preferred option stage, the potential impact of the planned works was assessed to determine its potential impacts on flora and fauna. It was considered that the proposed works have potential to impact on the main channel of the River Ilen and on four smaller tributaries as well as associated terrestrial habitats.

A number of site visits were carried out throughout 2011 and 2012. All habitats were classified to level 3 of the classification scheme outlined in *A Guide to Habitats in Ireland* (Fossitt 2000). The classification scheme used to define the value of habitats and to define impacts is based on a classification scheme used by the National Roads Authority (NRA) *Guidelines for the assessment of ecological impacts of National Road Schemes* (NRA, 2006a).

The terrestrial habitats which ranged from common grassland habitats to treelines which will be affected or could potentially be affected by site works were classed as being from low value to moderate ecological value. The long term residual impacts on these habitats and on smaller streams were classed as minor to moderate negative.

The River Ilen is classed as a nationally important habitat and the Caol as of high local value. Smaller stream were considered of low to moderate values. Residual impacts on the Ilen and the Caol were classed as moderate negative.

Although some short-term displacement and disturbance of mammals such as otter, bats and grey seal and bird species is envisaged no significant long-term impact on these species is predicted. Work programmes, which incorporate the required mitigation measures to minimise these impacts will be drawn up with input from a qualified ecologist and will be agreed with the NPWS prior to the commencement of works.

No significant impact on Natura 2000 sites including Roaringwater Bay and Islands cSAC which is downstream of site works is predicted.

9. LANDSCAPE AND VISUAL IMPACT ASSESSMENT

Chapter 9 of the EIS sets out the landscape and visual assessment undertaken in respect of the proposed Drainage Scheme. This Chapter was prepared by RPS. Methods used in the landscape and visual assessment have been developed by RPS and are derived from the DoEHLG document, "Landscape and Landscape Assessment" June 2000, and the 'Guidelines for Landscape and Visual Impact Assessment' (GLVIA) by The Landscape Institute and Institute of Environmental Management and Assessment 2002.

Assessment was undertaken through analysis of up to date digital Ordnance Survey maps onto which details of the proposed flood alleviation measures were transposed. Site visits and photographic surveys were undertaken in Winter 2012 to assess the existing environment alongside the potential landscape and visual impacts associated with the proposed scheme. Further baseline information was ascertained via a desk top analysis of the County Cork Development Plan 2009- 2015 and Skibbereen Town Development Plan 2009 - 2015.

The proposed development is located within a landscape character area identified as Skibbereen Urban Landscape Character Area. This landscape character area has been identified as having a low sensitivity to change. During construction the predicted magnitude of landscape resource change will be low and the significance of landscape impact will be slight negative due to limited change in landscape resource as the existing site is robust in character. There is potential for significant visual impacts for residential properties during the construction period and for views from the S90 Scenic Route on Schull Road due to the proximity of works to residential properties and this protected Scenic Route. However all such significant visual impacts will be temporary in nature.

During operational stage the predicted magnitude of landscape resource change will be low and the significance of landscape impact will be slight negative due to limited change in landscape resource at the existing site.

The Zone of Visual Influence (ZVI) has been established for the proposed project to allow any potential areas of significant visual impact to be identified. Actual visual impacts from within the ZVI have been predicted by site survey and assessment.

A total of 10 viewpoints have been assessed during the operation stage of the proposal and only one viewpoint on N71 Schull Road (Viewpoint 2) has been predicted to have significant visual impacts. There will be no significant visual impacts for residential properties on Baltimore Road, Schull Road, North Street, Upper Bridge Street, Mill Road or the local road east of Mill Road.

There is potential for significant visual impacts during the operation stage and for views from S90 Scenic Route on Schull Road due to the proximity of the proposed grass embankment to the protected Scenic Route. The effected section of S90 is however a very short length of this very long route.

In conclusion the broader landscape character area and visual context around Skibbereen Town centre has the capacity to absorb a project of this scale and the proposal is acceptable in landscape and visual terms.

10. AIR QUALITY AND CLIMATE

Chapter 10 of the EIS highlights the likely significant impacts of the proposed Drainage Scheme on Skibbereen and surrounding areas with regard to air quality and climate. The methodology for the description of the general air quality in the existing environment was based on onsite monitoring of pollutants associated with building construction and traffic sources. Particular reference was made to the published data from the Environmental Protection Agency (EPA) on air quality data.

The Skibbereen region is defined under ambient air quality legislation as a “Zone D” region. EPA investigations into air quality at Cork Airport and representative Zone D monitoring stations in Ireland indicates that the air quality during the monitoring period was good with most pollutants showing levels below the ambient air quality limits.

As part of the construction phase of the scheme there is the potential for a number of emissions to atmosphere. Construction activities are likely to generate some dust emissions. The potential for dust to be emitted depends on the type of construction activity being carried out in conjunction with environmental factors i.e. rainfall, wind speed and wind direction.

The potential impact from dust also depends on the distance to potentially sensitive locations and whether the wind can carry the dust to these locations. The majority of any dust produced will be deposited close to the potential source and as such any impacts from dust deposition will typically be close to the source. The construction vehicles, generators etc., could produce petrol and diesel exhaust emissions, although this is of minor significance compared to dust.

The effect of construction activities on air quality, in particular construction dust, will not be significant at the proposed development site following the implementation of the proposed mitigation measures outlined in **Chapter 10 Air Quality and Climate** in Vol II of the EIS. It is proposed to adhere to good working practices and dust mitigation measures (Construction Dust Minimisation Plan) to ensure that the levels of dust generated will be minimal and are unlikely to cause an environmental nuisance.

As part of the operational phase of the Drainage Scheme, there are no scheduled emissions (i.e. through stacks, vents, etc.) planned for the development. It is therefore likely not to cause any deterioration in local air quality. Similarly there is no planned re-routing of existing traffic, thus levels of traffic-borne pollution should remain unchanged with no increase once the scheme is operational.

Impacts to climate during the construction phase include emissions from transportation of materials to the site, embodied emissions in construction materials, emissions from plant machinery and other ancillary areas such as contractor compounds and waste management. These emissions cannot be quantified pre-planning, as details of material use are not available. However in terms of national emissions - construction phase effects on climate are unlikely to be significant.

Impacts to climate during the operation of the Drainage Scheme is also likely to be insignificant. Unless maintenance is required (due to damage to the flood walls), no further works will be necessary once the project is completed.

11. NOISE

Chapter 11 of Vol II of the EIS provides an assessment of the potential noise and vibration impacts associated with the proposed River Ilan (Skibbereen) Drainage Scheme.

Baseline noise surveys were carried out at noise sensitive receptors along the length of the proposed Drainage Scheme. These surveys established that the existing ambient noise environment was notably influenced by proximity to the main noise sources in the area. Presently the predominant noise source in the area is road traffic noise on the roads and streets in the study area.

Following a review of the preliminary design of the proposed Drainage Scheme a noise and vibration impact assessment was undertaken. In order to present a worst-case scenario a number of sensitive receptors in close proximity to the construction working area were identified and noise levels associated with the construction of the flood defences were predicted at these locations, representative of the noise levels associated with the construction phase.

Although the construction phase of the proposed development has the greatest potential for impact it should be noted that these works will be temporary in duration. It is anticipated that construction works will take approximately 24 months to complete. Construction works will progress along the scheme which will in effect be a linear development and therefore construction works will not be on-going in any one area for the duration of the construction phase. Therefore construction works associated with the proposed Drainage Scheme will be temporary and transient in nature.

The results of the noise assessment indicate the predicted construction noise levels associated with the Drainage Scheme will give rise to cumulative noise levels at the sensitive receptors during the construction phase, that will range from slight to moderate and significant short-term negative noise impacts. It should be noted however that the predicted noise impacts are indicative of the potential worst-case scenario and effectively represent an overestimate of the likely construction noise levels that will be generated on a short-term basis. The predicted construction noise impacts assume that all noise sources will be operating simultaneously throughout the day, which is unlikely to occur. Regardless, it should be noted that the predicted cumulative noise levels at all of the noise sensitive receptors are within the NRA Guideline construction noise criterion of 70dB LAeq (1hr).

Although it is predicted that noise levels will not exceed NRA assessment guideline criteria it is recommended that mitigation measures, as outlined in BS5228 will be employed on-site during construction. The contract documents will clearly specify that the Contractor will be obliged to implement best practice noise abatement measures and comply with the recommendations of British Standard BS 5228, Code of Practice for Noise and Vibration Control on Construction and Open Sites – 2009.

It is also recommended that periodic noise monitoring be undertaken during the initial construction phase to determine levels at noise sensitive receptors, in particular during 'noisy' activities. If noise exposure levels are exceeded further mitigation measures will be employed including temporary enclosures or screens around particularly 'noisy' plant.

There will be no continuous noise or vibration generated by the proposed Drainage Scheme upon completion of the construction works. The proposed project comprises creation of flood defences associated with the Drainage Scheme and there will be no operational noise or vibration sources as such on-site once the flood defences are constructed. In this regard there will be negligible noise or vibration during the operational phase of the proposed Drainage Scheme. There may be occasional inspections of the flood defences once constructed but there would be negligible noise or vibration associated with site inspections of the Drainage Scheme.

There will be no significant residual noise and vibration impacts. As outlined above there will be no discernible noise or vibration impacts associated with the proposed Drainage Scheme during the operational phase of the scheme. Therefore, no mitigation measures are prescribed for the operational phase of the Drainage Scheme.

12. CULTURAL HERITAGE

The Cultural Heritage Chapter 12 in Vol II of the EIS provides a context for the archaeological, architectural, historical and folklore resource within the study area around the proposed River Ilen (Skibbereen) Drainage Scheme. The assessment methodology involved the compilation of a comprehensive desk-top survey based on consultation of the various relevant sources, including the Record of Monuments and Places, the Record of Protected Structures, the Skibbereen Architectural Conservation Area and the National Inventory of Architectural Heritage. The chapter outlines an overview of the receiving environment that details the cultural heritage resource from a legislative, temporal and physical context.

The proposed flood relief measures have been designed to avoid negative impacts on the protected cultural heritage sites within the study area.

The chapter also presents the results of a site survey of the footprint and environs of the proposed scheme and these are combined with summary descriptions of the proposed scheme impacts in each locale. The majority of the proposed scheme will involve the construction of flood defences along the lines of the River Ilen and the Caol and Assolas Streams and within their floodplains. Where possible the proposed defences will be set back from the watercourses in order to avoid any impacts to the banks and beds.

An Archaeological Under Water Assessment was previously undertaken within the study area in advance of an earlier sewerage scheme and presented a field/dive survey and assessment of the sections of the River Ilen and Caol Stream within the town (Kieran 2004). The study area for the underwater survey overlapped with the proposed Drainage Scheme and the results have been incorporated into the chapter. The proposed Drainage Scheme will involve limited re-grading works in a 40 m long section of the river bed in the vicinity of John F. Kennedy Bridge and nothing of archaeological significance was noted in this area during the underwater survey.

The chapter provides an assessment of the nature of the identified potential impacts on recorded and potential archaeological sites and architectural heritage structures and, where required, mitigation measures are recommended.

13. SOILS, GEOLOGY, HYDROLOGY AND HYDROGEOLOGY

Chapter 13 of Vol of the EIS contains the information on the soil, geology and hydrogeology of the River Ilen Drainage Scheme area. It provides a description of the bedrock geology, soils and hydrogeology of the area.

In accordance with the EPA guidance the impacts have been assessed as positive, neutral or negative while the magnitudes have been assessed in accordance with the EPA criteria as outlined in **Table 13.1** in Vol II of the EIS.

Construction works have potential to have temporary to permanent slight negative impact due to disturbance, removal and transportation of soil. A Waste Management Plan and Construction Management Plan will be prepared in order to mitigate and offset potential impacts where possible.

During the construction stage there is potential for contamination of soil from spillages. Detailed mitigation measures are proposed in order to prevent spillages and an emergency plan will be prepared in this regard.

No impacts are expected in relation to soils and subsoils and hydrogeology of the area. A significant positive impact in relation to hydrology is expected due to the increase in conveyance capacity of the river and stream channels and the consequent reduction in flooding and positive impact on benefitting lands. A permanent imperceptible negative impact is expected in relation to water levels in the area as a result of the proposed scheme.

There will be no significant impact of the local geology as a result of the proposed development.

The main impact arising from the proposed Drainage Scheme will be an increase in the capacity of the River Ilen and Caol Stream to allow larger volumes of water to be carried downstream during periods of high rainfall thereby reducing the risk and frequency of water levels overtopping the river bank and flooding the surrounding area. This is considered to be a permanent significant positive impact.

The proposed development will have a permanent positive slight impact as the proposed works will have the effect of mitigating future flooding events and soils in areas currently being exposed to flooding will be protected from flooding by the proposed scheme to flooding levels previously experienced.

There is no significant residual impact predicted in relation to geology as a result of the proposed development. The impact is considered to be a permanent imperceptible negative impact.

Due to the nature of the proposed works it is not possible to carry out the proposed Drainage Scheme without having a residual impact on water levels during flood events. The proposed scheme will result in a permanent significant change on water levels during flood events during periods of high surface water levels in the vicinity of the flood defence works. The residual impact of the proposed works on the upstream and downstream water levels will be slightly negative.

There will be localised impacts on groundwater levels in the vicinity of the proposed structures during the operational stage. This is considered to be a permanent insignificant negative impact.

14. MATERIAL ASSETS

Chapter 14 in Vol II of the EIS provides an assessment of the potential impacts of the proposed scheme on Material Assets and was carried out in accordance with the Current Practice (in the preparation of Environmental Impact Statements) (EPA, September 2003). The objective is to ensure the sustainable use of material assets and to ensure that they will be available for future generations. The assessment primarily focuses on the examination of relevant site maps and reference material.

Material assets are generally considered to be the physical resources in the environment, which may be either of human or natural origin. The potential impacts on transport, utilities, residential and landuse, and natural resources are considered in **Chapter 14 Material Assets** of Vol II of the EIS. Impacts to material assets are likely to be on the following:

- Land ownership, use and access;
- The roads network, including effects to traffic;
- Impact on major utilities;
- The use of natural resources; and
- Navigation on the River Ilen.

Some of the issues above, however, are more appropriately described in other sections of the EIS.

The impact on the local population, recreational amenities, property, land use and access is examined under in **Chapter 6 Community and Socio-Economic Impact** in Vol II of the EIS. Impacts on water resources are examined in **Chapter 7 Aquatic Flora and Fauna** and **Chapter 13 Soils, Geology, Hydrology and Hydrogeology** within Volume II of the EIS.

Some areas within the vicinity of the proposed works will be temporarily affected due to the construction of the proposed flood alleviation measures (See **Chapter 6 Community and Socio-Economic Impact** within Vol II of the EIS); there will however be no loss of road space to the defences.

The construction works associated with the proposed flood alleviation works will cause a temporary negative impact on the traffic in Skibbereen Town. It is anticipated that construction activities in conjunction with construction traffic will significantly affect the flow of traffic through Skibbereen Town. A detailed Traffic Management Plan will be prepared in accordance with the 'Guidance for the Control and Management of traffic at Roadworks' in consultation with Cork County Council to ensure any disruption and delay is kept to a minimum.

Necessary precautions will be taken to ensure that flood alleviation works will not damage telecommunications infrastructure and water and sanitary services infrastructure within the town.

All defences will be designed and constructed so as not to affect access to river users. The structural protection works to John F. Kennedy Bridge and the upsizing of the Assolas Stream Culvert will be carefully designed to ensure no negative impact.

Overall, it is expected that the River Ilen Drainage Scheme will have a positive impact on property and land use within the town. Any potential disruption to property, land use, services and existing transport networks in the vicinity of the flood works will be of a temporary nature and limited to the construction stage of the scheme. Good design incorporating appropriate precautionary measures agreed at detailed design stages and the implementation of appropriate site management measures during the construction phase will minimise inconvenience to adjoining residential properties, and reduce disturbances to utilities, and infrastructure.

15. MITIGATION AND MONITORING

Detailed Mitigation and monitoring measures proposed as a result of implementation of the scheme are set out in **Table 15.1** below. Mitigation measures are set out in terms of construction and operational mitigation measures.

Table 15.1: River Ilen Drainage Scheme Mitigation and Monitoring Measures

	Construction Phase Mitigation	Operational Phase Mitigation	Monitoring
Planning Context	No construction phase mitigation required.	Scheme will influence design and route options for amenity walks and a cycleway for the town. On the southern bank flood defences should be designed to support potential future boardwalks.	No monitoring identified.
Human Environment	<p>Overall Mitigation Measures:</p> <ul style="list-style-type: none"> • Preparation of a Construction Management Plan required. • Preparation of a Construction Traffic Management Plan required. Hours of operation during the construction phase should be limited to normal working hours (extended hours may be necessary in limited circumstances). • Publication of any proposed temporary circulation, access and parking arrangements in local media prior to the commencement of construction, with updates as necessary throughout the construction process. • The construction of the proposed new flood relief infrastructure will be carried out under the supervision of a Project Supervisor Construction Stage (PSCS) in accordance with the provisions and requirements of the Safety, Health and Welfare at Work (Construction) Regulations, 2006 • Life buoys should be maintained and replaced as appropriate to avoid any significant adverse impacts. <p>Residents & Working Population – Construction Phase:</p> <ul style="list-style-type: none"> • Detail extent of area required for construction/storage purposes, nature of proposed works within private property and overall timeframe estimated for the scheme works as a whole to all landowners in advance of construction works. • Reinstate all gardens/yards/driveways to condition prior to commencement of construction other than where changes are necessary due to the construction of or presence of the flood defence feature or unless otherwise subject to agreement with the landowner(s) in a timely manner. • Provide suitable protective screening where works are being carried out on residential properties. 	<p>Residential and working community, Operational phase</p> <ul style="list-style-type: none"> • Reinstate and landscape areas damaged or disturbed during the construction phase are implemented in a timely manner following the carrying out of the works. <p>Visiting Community Operational Phase:</p> <ul style="list-style-type: none"> • Ensure final design solution of flood wall and adjacent lands at the Heritage Centre replicate the existing standard of amenity at this visitor attraction. • Liaise with owners and operators of North Street properties where works are to be carried out in terms of impacts on amenities such as the terrace at the Riverside Cafe/Restaurant, and modify design solutions to ensure no significant loss of amenity at operational stage where appropriate. <p>Land Use Operational Phase:</p> <ul style="list-style-type: none"> • Given the requirement to slightly relocate and realign the Skibbereen RFC rugby pitch, additional lands will be required. It is proposed that property will be acquired by agreement between the relevant parties and/or appropriate compensation provided as necessary. Ongoing consultation with the club is 	No monitoring identified.

	Construction Phase Mitigation	Operational Phase Mitigation	Monitoring
	<ul style="list-style-type: none"> Implement all relevant mitigation measures regarding the control of emissions such as noise and dust during the construction process. Organised information campaign on temporary access arrangements as detailed above. <p>Visiting Population- Construction Phase:</p> <ul style="list-style-type: none"> Measures to ensure that the visiting community are notified of the construction programme through the local tourist office/Fáilte Ireland website, with particular emphasis on providing information on any disruption to visiting anglers, cyclists or walkers. Liaison with local accommodation and other visitor service providers and the carrying out of works within or adjacent such facilities during low season where practicable. Implement measures outlined in a Construction Management Plan and Construction Traffic Management Plan, particularly where construction traffic conflicts with pedestrian or cycle routes. <p>Land-use Construction Phase:</p> <ul style="list-style-type: none"> Construction in the vicinity of schools should be limited to or concentrated during the holiday period. Alternatively, provide measures within construction / traffic management plan) to mitigate against such adverse impacts Phasing of works around peak user times of other seasonal uses such as specific sports facilities and tourist facilities should be considered. Town centre land uses would benefit from specific attention to vehicular and pedestrian circulation and access arrangements to commercial and social and community facilities within the CMP. Regular updates and consultation with all sports clubs affected by construction works will be required. Ongoing consultation with other land users specifically affected by proposed construction works In terms of river users, notification of local anglers and the rowing club of proposed works and likely dates should be undertaken. 	<p>recommended as a priority action.</p> <ul style="list-style-type: none"> Consultation with the owners of the Hideaway Camping & Caravan Park and a detailed review of the impact of the proposed embankment on existing operations and layout is recommended. Design modifications and/or appropriate compensation should be development or provided as necessary. Stock proof fencing will be required to replace existing field boundaries and on areas where animals grazing can cause damage to embankments and any compensation deemed appropriate provided for loss of use of agricultural land. Ongoing consultation with the Skibbereen Show Society is recommended. Design enhancements, modifications and/or appropriate compensation for impacts to current layout should be provided as necessary. Ownership and status of the slip access at the Flax Mills should be confirmed and alternative access arranged to be provided or compensation provided for loss of access if appropriate. 	
Terrestrial Flora & Fauna	<ul style="list-style-type: none"> Trees or hedgerows scheduled for retention should be protected by the erection of appropriate fencing. Contractor to ensure no soil, spoil, constructional materials or 	<ul style="list-style-type: none"> Lands entered or disturbed during construction will be reinstated to their original condition upon completion of the 	No monitoring identified.

	Construction Phase Mitigation	Operational Phase Mitigation	Monitoring
	<p>rubbish will be stored or tipped and no construction plant or vehicles will be parked within the spread of existing trees, shrubs or hedges.</p> <ul style="list-style-type: none"> • Contractor to protect existing plant materials from malicious or accidental damage and will ensure that no branches will be lopped and no roots over 50mm diameter severed from growing trees without express prior permission from an Arboriculturist. • No soil, spoil, constructional materials or rubbish will be stored or tipped and no construction plant or vehicles will be parked within the spread of existing trees, shrubs or hedges. • Where work must take place inside or close to the spread of trees to be retained, then a qualified Arboriculturist should be consulted. • Where possible, vegetation will be reinstated following completion of the project. A new planting scheme will focus primarily on native species which were removed by site works. Works may require access to areas outside the immediate works area (i.e. stockpiling material, storage of machinery etc). Works need to be checked by the supervising ecologist to ensure that invasive species will not be spread prior to the commencement of site works. • It is recommended therefore that a pre-construction survey of invasive species is conducted prior to the commencement of site works. • Contractor shall be obliged to comply with The European Communities (Birds and Natural Habitats) Regulations 2011 which contain important new provisions to address the problem of invasive species. • Contractor shall take every precaution to prevent the spread of invasive species ensuring that all plant and equipment that comes in contact with these species (and soil deemed contaminated with species) are regularly cleaned or disposed off in the appropriate manner. Whilst Himalayan balsam can be treated relatively straight forwardly with herbicides treatment of Japanese Knotweed may involve burial, bunding, herbicides or a combination of methods. • Undertake a repeat survey of the Caol Stream and River Ilen with respect to Otters and Grey Seal prior to the commencement of works on these watercourses (no more than 10-12 months in 	<p>main works. Landscaping is to take place following construction, in a manner appropriate to each particular area. In particular hedges and trees along rivers will be replanted, where feasible, using the same mix of native species as originally present. Where such planting is unfeasible replacement planting will be carried out elsewhere within the study area.</p>	

	Construction Phase Mitigation	Operational Phase Mitigation	Monitoring
	<p>advance of construction). If active holts are detected in the area to be affected, specific measures will be required.</p> <ul style="list-style-type: none"> • Replacement of the trees removed will aid in minimising impacts on feeding bats, particularly trees along watercourses (with native species). • Mature trees and the bridge on the Caol Stream should be checked for bats prior to the commencement of works. Where bats are detected mitigation measures including exclusion measures/replacement habitat will be agreed with the NPWS and carried out under licence. • Any maintenance work carried out in the future should be carried out with a view to minimising impacts on bats. It is recommended that any mature trees felled should be left for 24 hours prior to mulching to allow any bats, if present, to escape. • Recommend that vegetation be removed outside of the breeding season where possible (March-June should be avoided). 		
Aquatic Flora & Fauna	<ul style="list-style-type: none"> • Works will be carried out under the supervision of a suitably qualified and experienced ecologist with respect to instream works only (i.e. monitoring of suspended solids). • Where possible, the Contractor will primarily gain access to river from the river banks. Machine movements in the river will be minimised. Where feasible works should be carried out from the river bank or platforms constructed for this purpose and detailed method statements will be drawn up in consultation with the supervising ecologist and agreed with the NPWS and IFI prior to the commencement of works. • Detailed silt control methods will be required for all in-stream works and will be designed and agreed with the IFI. • Works within the main channel of the Ilen should be carried out during this period from January to March. • Instream works on the Caol and Ilen and resultant silt plume should not, if possible, extent beyond 60% of the width of the watercourse to prevent significant impacts on migrating fish. • Baseline data shall be obtained on suspended solid levels and nutrient levels within the works area of the Caol and River Ilen in the period prior to the commencement of site works. Based on this data specific limits can be reached for levels of suspended solids 	<ul style="list-style-type: none"> • All culverts and walls must be designed to minimise impacts on fish and macro-invertebrate populations. All culverts will be designed with solid floors suppressed by an appropriate amount to allow for suitable streambed material to be deposited and for a suitable habitat to be generated within a given culvert. Ideally gravel substrates and as a natural a flow pattern as possible under low water/ low tide conditions will be provided in channels affected by site works. The structure and flow pattern with culverts on minor streams will be designed to allow fish to move through them. The slope of culverts will follow the existing gradient and trash screens are not envisaged. • Input from a qualified fisheries/aquatic engineering specialist with experience in the design of instream structures is 	Ongoing monitoring will also be agreed to ensure that site works do not elevate levels of suspended solids and nutrients above the set limits

	Construction Phase Mitigation	Operational Phase Mitigation	Monitoring
	<p>and nutrients in the mixing zone downstream of site works which take account of baseline tidal fluctuations. These limits will be agreed with IFI and NPWS and incorporated into the detailed method statement for site works.</p> <ul style="list-style-type: none"> • Where possible, concrete works will be carried out in dry conditions with no in-stream pouring of concrete. It may be necessary therefore to effectively sheet-pile or cofferdam sections of the river and pump out the river water during the construction of the proposed works. If required fish populations which become isolated, will be salvaged via electrofishing under licence from the Department of Communications, Energy & Natural Resources and in consultation with Inland Fisheries Ireland. • All machinery should be maintained in good condition to prevent leakage of hydrocarbons. • Fuelling and lubrication of equipment must not be carried out within 30 m of any watercourse. • All contractors, sub-contractors and in particular machinery operators must be made aware of the provisions for protecting water quality as outlined in the method statements. • Where possible excavated material should not be stockpiled long-term within 10 m of a watercourse. Where this measure is not implementable then specific silt control measures should be planned as part of the detailed method statement for site works in each specific area. • Similarly measures should be taken to prevent bare soil along river banks must be prevented from collapsing or running off into watercourses. 	<p>required into the design of culverts and the post-works flow patterns and channel structure. Such supervision is particularly important for works on the Ilen and Caol Rivers. The specialist in conjunction with the supervising ecologist will be required to visit the watercourses prior to the commencement of site works to assess the existing channel structure, fish holding features, substrate composition, flow patterns etc. Where feasible such structures will be incorporated into the channels following completion of works.</p> <ul style="list-style-type: none"> • Culverts will be maintained to ensure that they do not become blocked and impassable. • Lands entered or disturbed during construction will be reinstated to their original condition upon completion of the main works. • Landscaping is to take place following construction, in a manner appropriate to each particular area. In particular hedges and trees along rivers will be replanted, where feasible, using the same mix of native species as originally present. Where such planting is unfeasible replacement planting will be carried out elsewhere within the study area. 	
Landscape & Visual	<ul style="list-style-type: none"> • Materials chosen for river wall construction to be of similar colour, size and scale to existing river channel walls. Walls where widely visible will be stone faced and where appropriate stone capped. • Construction of Embankments. The embankments will be planted with grass. • Protection of existing trees. The services of a qualified arboriculturist will be sought to perform a tree survey of the route. The trees should be assessed to quantify their age, condition and 	No operational phase mitigation required.	No monitoring identified.

	Construction Phase Mitigation	Operational Phase Mitigation	Monitoring
	<p>amenity value and tagged with metal tags. Prior to commencement of construction, existing trees which are to be retained will be protected by erection of timber post and wire fence to ensure no works are carried out under reach of their canopies.</p> <ul style="list-style-type: none"> • Cleaning up of debris on river banks and providing landscape management programme to protect and reinforce bank side vegetation with aim of ensuring landscape framework remains dominant. • Specific Landscape Screening will be required at the locations set out in chapter 9 of Vol II of the EIS where significant visual impacts have been predicted. • Where new planting is required to improve structure or replace removed bank-side vegetation, the plant selection will be predominantly indigenous species similar to those already growing in the Skibbereen area to ensure successful plant establishment. • Standard trees will also be planted alongside river banks in certain urban areas to create tree lined river bank character and will be positioned where they will not adversely impact on channel or floodplain conveyance, and where they will not have a negative effect on the proposed embankments. 		
Air Quality & Climate	<ul style="list-style-type: none"> • Preparation of a Dust minimisation plan. 	No operational phase mitigation required.	No monitoring identified.
Noise & Vibration	<ul style="list-style-type: none"> • Contractor will be obliged to implement best practice noise abatement measures and comply with the recommendations of British Standard BS 5228, Code of Practice for Noise and Vibration Control on Construction and Open Sites – 2009. • Normal working hours will be 0800-1900 hours Monday to Friday and 0800-1600 hours on Saturdays. Sunday working will be avoided but may be necessary on some occasions. When working outside of normal hours is required the contractor will discuss such requirements with Cork County Council before such operations begin with adequate notice to the local community. • Selection of plant machinery with low inherent potential for generation of noise and/or vibration. All construction plant and equipment to be used at the site will be modern equipment and will comply with the European Communities (Construction Plant 	No operational phase mitigation required.	A programme of noise and vibration monitoring at sensitive receptors will be detailed prior to works beginning.

	Construction Phase Mitigation	Operational Phase Mitigation	Monitoring
	<p>and Equipment) (Permissible Noise Levels) Regulations.</p> <ul style="list-style-type: none"> • Regular maintenance of plant will be carried out in order to minimise noise produced by on-site operations. • All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the Contract. • Any compressors used on-site will be of the “sound reduced” models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers. • Machines, which are used intermittently, will be shut down or throttled back to a minimum during those periods when they are not in use. • Any plant, such as generators or pumps, which are required to work outside of normal working hours, will be surrounded by an acoustic enclosure. • Training of drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation. • A maximum speed limit of 40km/hr will be imposed for HGV’s and drivers will be instructed to maintain as far as possible the distances between vehicles. • Periodic noise monitoring shall be undertaken during the initial construction phase to determine levels at noise sensitive receptors, in particular during ‘noisy’ activities. If the recommended noise exposure levels are exceeded further mitigation measures will be employed including temporary enclosures or screens around particularly ‘noisy’ plant. • If deemed necessary, vibration measurements can be carried out at any requisite monitoring points. If vibration-monitoring results were to indicate that levels were approaching the standard limits, appropriate mitigation measures would be put in place to ensure that vibration levels were reduced to acceptable levels. • Should complaints arise, it is recommended that noise monitoring be carried out at sensitive receptors during the construction phase of the proposed Drainage Scheme to ensure guideline limits are not exceeded and to determine whether further mitigation measures are required. 		

	Construction Phase Mitigation	Operational Phase Mitigation	Monitoring
Cultural Heritage	<ul style="list-style-type: none"> In the event of any impacts an archaeological survey shall be carried out on the 19th-century quays along the south bank of the River Ilen to ensure their preservation by record. Where feasible, pre-construction archaeological test trenching should be carried out on the footprint of flood defence walls and embankments in respect of unrecorded sub-surface archaeological remains. In the event that areas are unavailable for investigation during the pre-construction phase it is recommended that archaeological monitoring of works should be undertaken during the construction phase. All extraction works that may impact on the river bed and its banks and any in-channel extraction works shall be carried out under constant archaeological supervision. Pre-construction site investigation ground works, such as the excavation of trial-pits, should be carried out under archaeological supervision. Additional archaeological mitigation may arise following the mitigations outlined above. This may involve the full excavation or avoidance of any archaeologically significant material uncovered during site investigations. All onsite archaeological measures are subject to archaeological licensing by the Department of Arts, Heritage and the Gaeltacht and sufficient lead-time must be allowed to ensure that archaeological permits and licences are in place before works commence. 	No operational phase mitigation required.	No monitoring identified with the exception of test trenching prior to construction.
Soils, Geology, Hydrology & Hydrogeology	<ul style="list-style-type: none"> Compaction construction activities shall be scheduled such as to minimise the area affected by trafficking and a designated construction access road will be delineated. Construction phase topsoil, subsoil and made ground material will be segregated and subsoils will be reused as fill where possible. A Waste Management Plan for the disposal of unsuitable materials is to be included in the Construction Management Plan Construction Management Plan including construction method statement and Surface Water Management Plan shall be prepared. The following mitigation measures will be included in the Surface Water Management Plan:- <ul style="list-style-type: none"> Vegetation will be left in place as long as possible prior to 	No operational stage mitigation required.	Maintenance requirements to walls and embankments will be monitored and reviewed on an annual basis and it is expected that works would be required on a six to ten year cycle.

	Construction Phase Mitigation	Operational Phase Mitigation	Monitoring
	<p>excavation and stockpiling of soil.</p> <ul style="list-style-type: none"> • Stockpiles will be profiled to facilitate surface water runoff to prevent ponding and saturation of soil. • Soil stockpiling should be limited to specific areas of the site. • Surface water from un vegetated / exposed soil surfaces will be intercepted and diverted to sumps and silt traps to prevent surface water contamination. <p>Stockpiling will not be permitted within 50m of any surface water course.</p> <ul style="list-style-type: none"> • Visual checks of inert material for signs of possible contamination such as staining or strong odours will be required. Site Investigation in advance of works will include testing to identify any contaminated land. • Preliminary site investigations indicate the presence of refuse within some areas of made ground. It is proposed that testing of this material be undertaken to determine the nature of the waste. • An emergency plan to deal with accidental spillages shall be prepared and shall be kept on site during the construction period. • Storage areas will be bunded and spill kits will be retained to prevent spillages. All dispensing of fuels and hazardous materials will occur over areas of concrete hardstanding or other impermeable surface with drainage directed to an oil / water interceptor or a suitably constructed bund. No refuelling will be permitted in or near soil or rock cuttings. • Contractor’s Method Statement shall be prepared to ensure that watercourses are not impacted. 		
Material Assets	<ul style="list-style-type: none"> • A detailed construction traffic management plan will be prepared. • Necessary precautions will be taken to ensure that flood alleviation works will not damage telecommunications infrastructure and water and sanitary services infrastructure within the town. • Waste Management Plan will be prepared and approved prior to construction for the scheme • Any proposed ducting of utilities and telecommunications crossing the defences from wet side to dry side will be sealed in order to prevent passage of flood waters. 	No operational stage mitigation required.	No monitoring identified.

