BALLINA FLOOD RELIEF SCHEME

Report to Support Derogation Licence Application

F02
MGW0290
11 March 2025

rpsgroup.com

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
D03	Author Draft	JL	MN	MN	20/01/2025
A01	Internal Review	JL	KM/PJG	PJG	22/01/2025
F02	For Submission	JL	KM/PJG	PJG	11/03/2025

Approval for issue

PJ Griffin 11 March 2025

Prepared by:

RPS

Prepared for:

Mayo County Council

Dublin | Cork | Galway | Sligo | Kilkenny
rpsgroup.com

RPS Group Limited, registered in Ireland No. 91911
RPS Consulting Engineers Limited, registered in Ireland No. 161581
RPS Engineering Services Limited, registered in Ireland No. 99795
The Registered office of each of the above companies is West Pier Business Campus, Dun Laoghaire, Co. Dublin, A96 N6T7

Contents

Tables

Figures

Appendices

ACRONYMS

Acronym	Meaning
AEP	Annual Exceedance Probability
CFRAM	Catchment Flood Risk Assessment and Management
ECoW	Ecological Clerk of Work
GGBS	Ground Granulated Blast-Furnace Slag
MCC	Mayo County Council
OPW	Office of Public Works
SAC	Special Area of Conservation
SoP	Standard Operation Procedure

1 INTRODUCTION

This derogation licence is being sought to permit works associated with the Ballina Flood Relief Scheme (FRS), hereafter referred to as the 'Proposed Scheme'. A total of six features are within the potential zone of disturbance of the Proposed Scheme; one otter holt and three otter couches located on the southern bank of the River Brusna within the townland of Abbeyhalfquarter, Ballina, Co. Mayo; and two otter couches along the eastern bank of the River Moy at Clare Street in the centre of Ballina town, Co. Mayo. A number of mitigation and other measures are included for the Proposed Scheme to reduce the effects of the temporary loss of these features by otter. This includes the construction of two artificial holts on the banks of the River Brusna for use by otter while the use of the holt that is the subject of this derogation licence is not possible.

The document has been prepared by suitably qualified and experienced RPS ecologists.

The document is structured as follows:

- **Section 2: Proposed Works** sets out the proposed works which are expected to have an effect on otter.
- **Section 3: Overview of Otter Surveying** summarises the methodology and findings of the desktop and field studies which have been completed to inform this derogation licence.
- **Section 4: Conditions for Seeking Derogation Licence** applies the tests required to ensure that the pre-conditions for a derogation licence are met.
- **Section 5: Proposed Mitigation Measures** outlines the mitigation measures proposed for the Proposed Scheme with respect to otter.

2 PROPOSED WORKS

The Proposed Scheme includes flood relief measures in Ballina for the River Moy and the following tributaries: Quignamanger Stream, Bunree Stream, Brusna River and the Tullyegan Stream.

The derogation licence application pertains to the River Moy (Clare Street) and River Brusna sections of the Proposed Scheme as this is where one otter holt and five couches were observed. The proposed works along River Moy (Clare Street) and the River Brusna sections of the Proposed Scheme are outlined below.

2.1 River Moy (Clare Street)

The proposed works along the River Moy including Clare Street are outlined in **Figure 2-1**.

2.1.1 Flood wall upgrade

The existing flood wall along Clare Street will need to be removed and new flood walls will be constructed. A typical flood wall detail to be used on the River Moy and other areas is shown in **Figure 2-2.** Flood walls will consist of reinforced concrete with a suitable foundation and stone cladding along the face.

The existing flood walls located along the River Moy, including Clare Street will be removed and disposed offsite. Suitable demolished flood wall material will be reused for the likes of stone cladding of the new flood wall. The walls will be constructed from cast in-situ reinforced concrete typically by the following methodology:

- Removing existing footpaths and some trees.
- Excavation to the required depth will be undertaken typically up to 2m below existing ground level.
- Installation of a cut off lean mix or clay core beneath the wall foundation.
- Blinding concrete will be placed to enable the fixing of steel reinforcement for the base of the wall.
- Shuttering will be placed to enable pouring of the base of the wall.
- The wall reinforcement steel will then be fixed and shuttered before pouring the walls.
- It may be necessary to utilise a crane and excavator to ‘skip’ the concrete into some of the higher sections of wall or use a concrete pump.
- Cladding of the walls in stone.
- In-situ reinforced concrete will be designed to account for the saline environment (increased cover etc.) and consideration of Ground Granulated Blast-Furnace Slag (GGBS) to increase technical performance and minimise environmental impact.

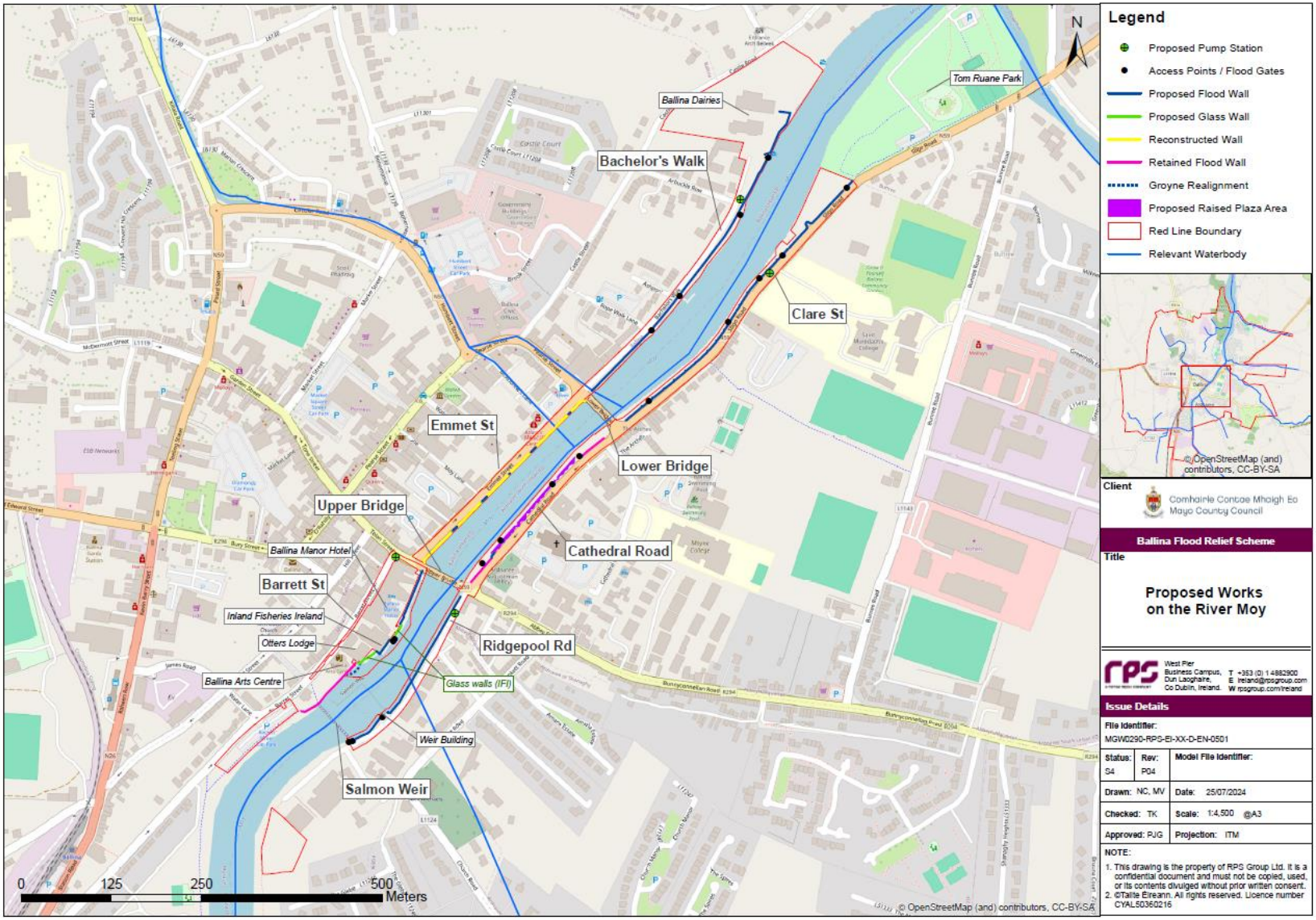


Figure 2-1 Proposed works to be carried out across the River Moy

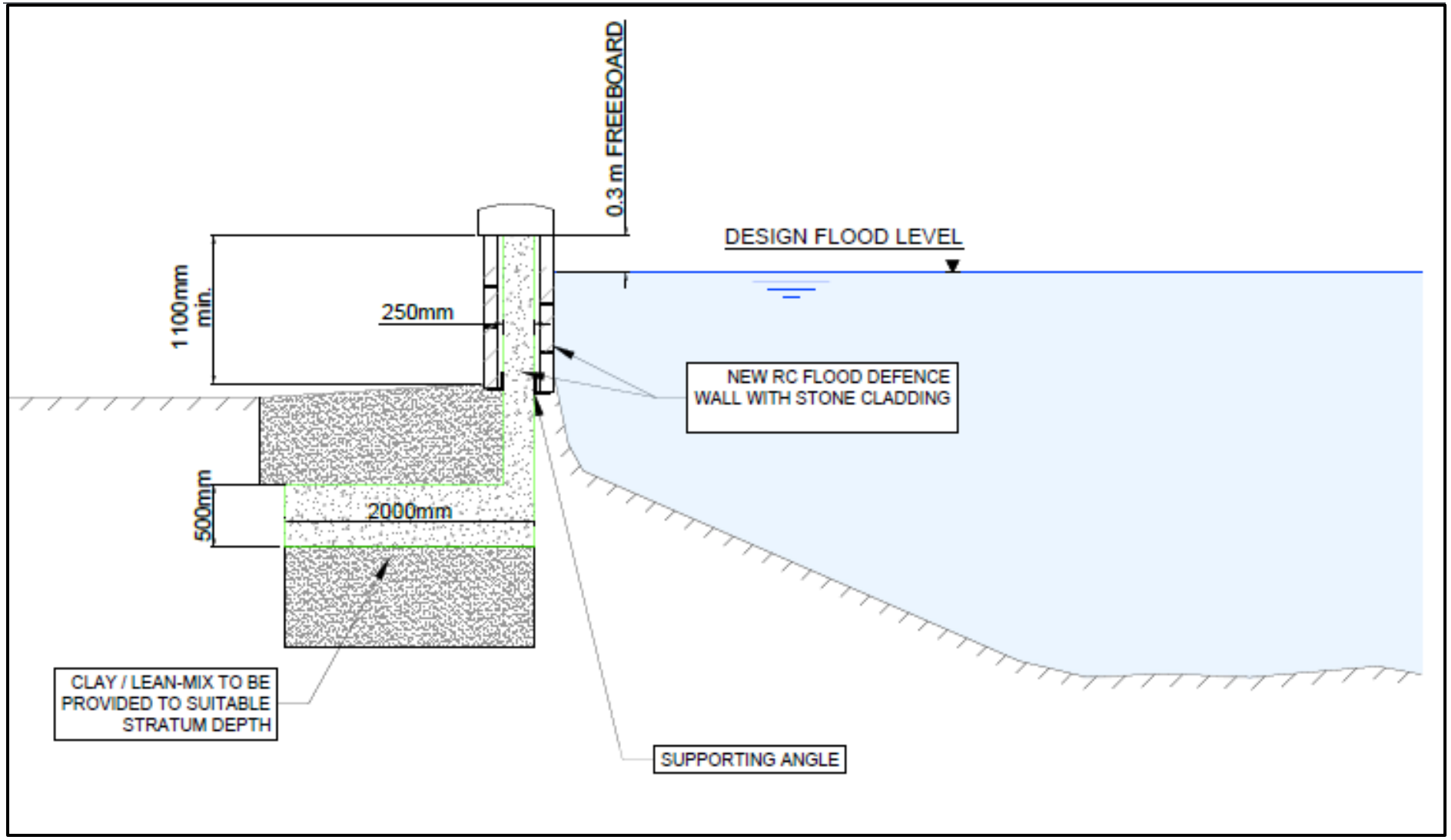


Figure 2-2 Standard Cross Section Detail of Flood Wall - River Moy

2.1.2 Surface water drainage

Additionally, new surface water sewers will be installed along Clare Street. New outfalls to the River Moy will be installed with petrol interceptors. Flap valves would be required on all discharge points into the rivers.

A surface water pumping station will also be installed along Clare Street (**Figure 2-1**) to manage excess water during flood events. The pumping station will be submersible in nature with a valve chamber and kiosk. Surface water flows from the pumping station will be pumped directly to the river. Hydrocarbon interceptors will be installed upstream of the pumping stations. This pump station will have a minimum of two submersible pumps. At a minimum the pump will be designed to accommodate the 1 hr 2 year return storm event. It is not proposed to provide permanent backup power at the pumping station but the facility to connect a mobile generator will be provided.

2.1.3 Amenity access to the River Moy

Access to the River Moy for recreational activities and anglers along the Proposed Scheme is required. Access types include vehicular, pedestrian and accessible entry. Current and proposed access points are shown in **Figure 2-3.** Public access to the religious grotto on Clare Street will also be maintained by placing the wall behind the structure. Additionally, a wheelchair accessible angling access point will be provided on Clare Street.

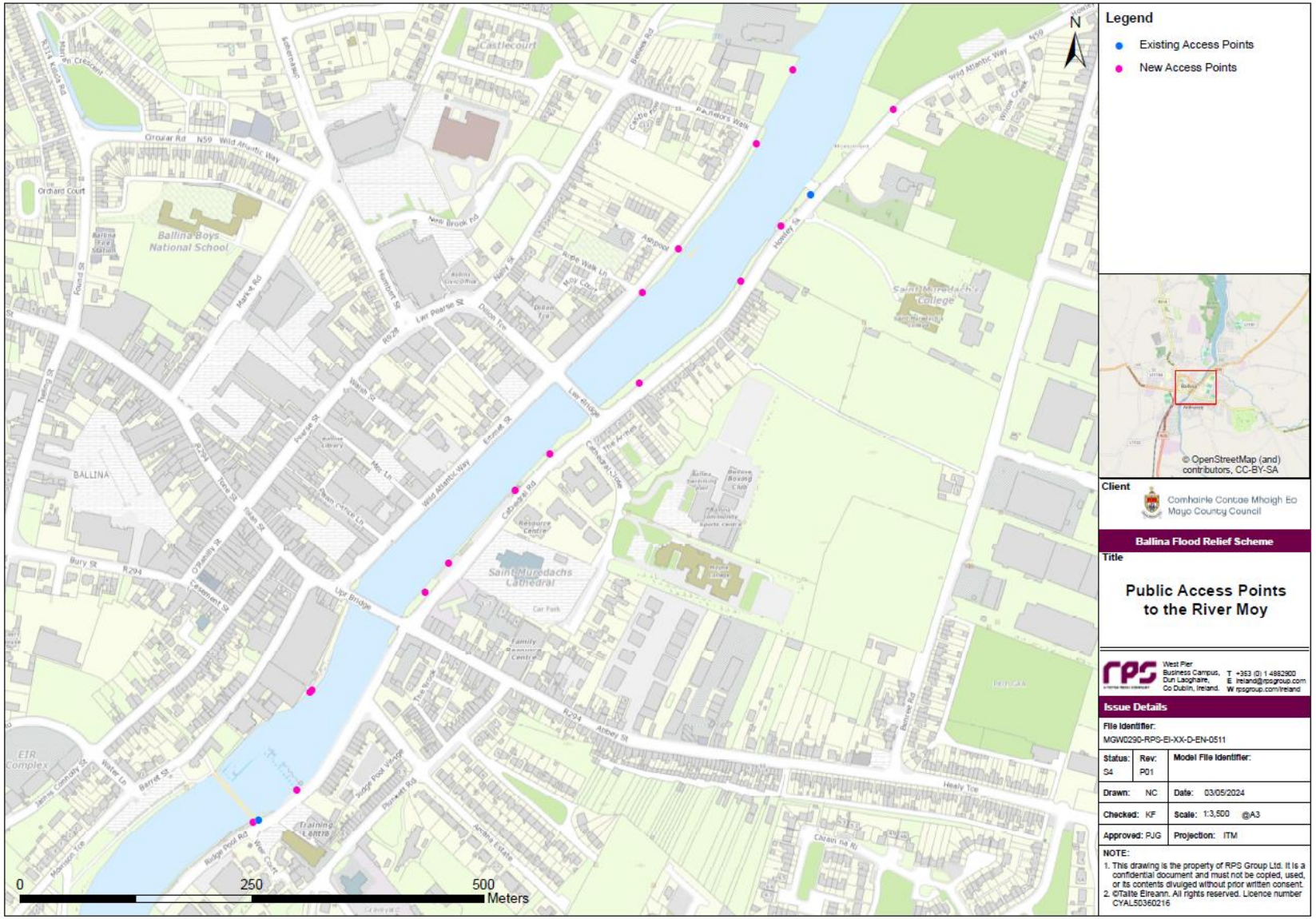


Figure 2-3 Public Access Points to the River Moy

2.1.4 Advance Works

It is proposed that advance works may be undertaken on Clare Street. The works will include demolition and reconstruction of 10 linear metres of existing quay wall to create sample sections of finished wall to determine extent of existing stone that could be reused in the final design. These advance works will be subject to the same constraints and mitigation measures identified for the permanent works in these areas.

2.2 River Brusna

The proposed works on the Brusna (Glenree) River (see **Figure 2-4)** include hard defences consisting of flood walls and embankments. Flood walls and embankments are required on both sides of the river upstream of the access bridge. Flood walls and embankments are required on the right-hand bank of the river downstream of the bridge. The maximum height of flood walls and embankment is approximately 1.7m. There are no existing walls in most of the locations where flood walls are proposed, it is mostly fenced or hedgerows. Flood walls and embankments have been set back from the river to minimise the removal of trees and protect the riparian zone.

Flood levels would be higher than deck level of the bridge to Rathkip/Shanaghy area, therefore a reinforced concrete beam spanning the river on the upstream side of the bridge is required to prevent overtopping and remove any additional loading to the bridge. The beam will be connected to the upstream side of the bridge. The beam will be installed using a crane located on the southern (left-hand) bank of the river. The beam will be supported on 2 proposed reinforced concrete piers. The piers will tie into the proposed flood walls on either side of the bridge. The existing railing will be reinstalled along the proposed beam to ensure fall protection height is provided. Construction of the beam will not block access across the bridge and access to the houses on the other side of the river will be maintained. The beam, scour protection, and proposed replacement bank retaining walls is shown in **Figure 2-5.**

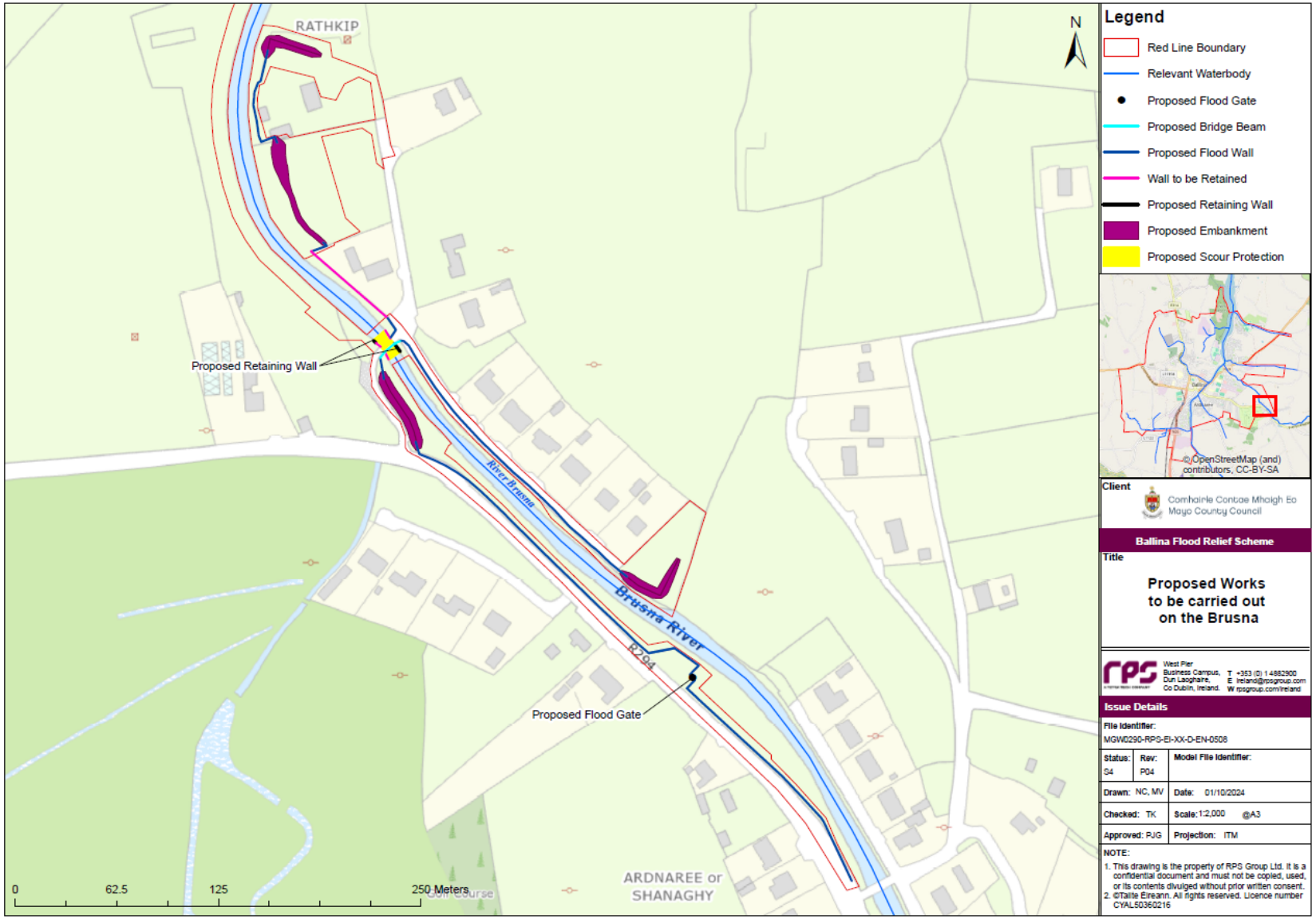


Figure 2-4 Proposed Works to be carried out on the River Brusna

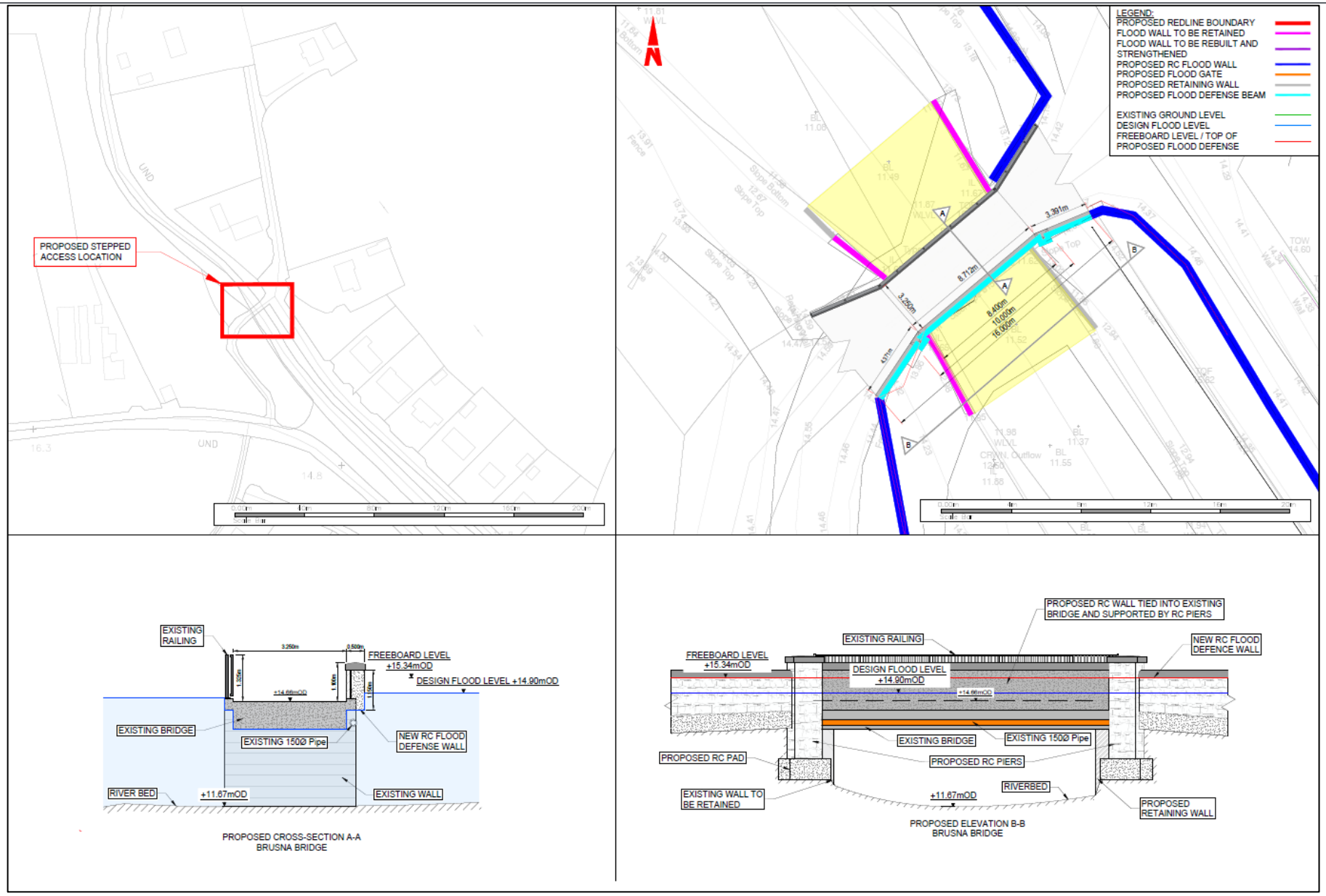


Figure 2-5 Proposed Instream Works for the Brusna River

2.2.1 Flood wall construction

Flood walls along the Brusna will be constructed as per the details in **Section 2.1.1** above.

2.2.2 Embankments

Embankments on the River Brusna will be constructed of impermeable clay with a capping of topsoil of approximately 150mm depth to allow for landscaping.

The construction of the flood embankments will involve the following construction methodology:

- Stripping and storage of topsoil for reuse.
- Import and storage of suitable clay material to form the core of the embankment by lorry and road. This will be stored within the working area and brought to required locations using an excavator and dumper.
- Excavate cut off trench approximately 1m below the embankment and fill with impermeable clay to prevent seepage.
- Place and compact impermeable clay until the defences have reached the necessary height. Embankment front and back slopes will be profiled to meet the required gradient of up to 1 in 3. The embankment will then be topsoiled with a suitable, biodegradable geotextile and sown in grass. The geotextile will protect the embankment from erosion until such times as the vegetation has been established.
- A back drain will be required at the rear toe of the embankment. A trench will be excavated to facilitate the laying of typically a 100mm diameter perforated drainage pipe in clean stone. Manholes will be required at 90m intervals or at changes of direction of the back drains. Outfalls from this rear drain, passing beneath the earth embankment and discharging to the river will be required. These will need to be flapped to prevent backflow during times of flood.
- A typical embankment structure is shown in **Figure 2-6**.

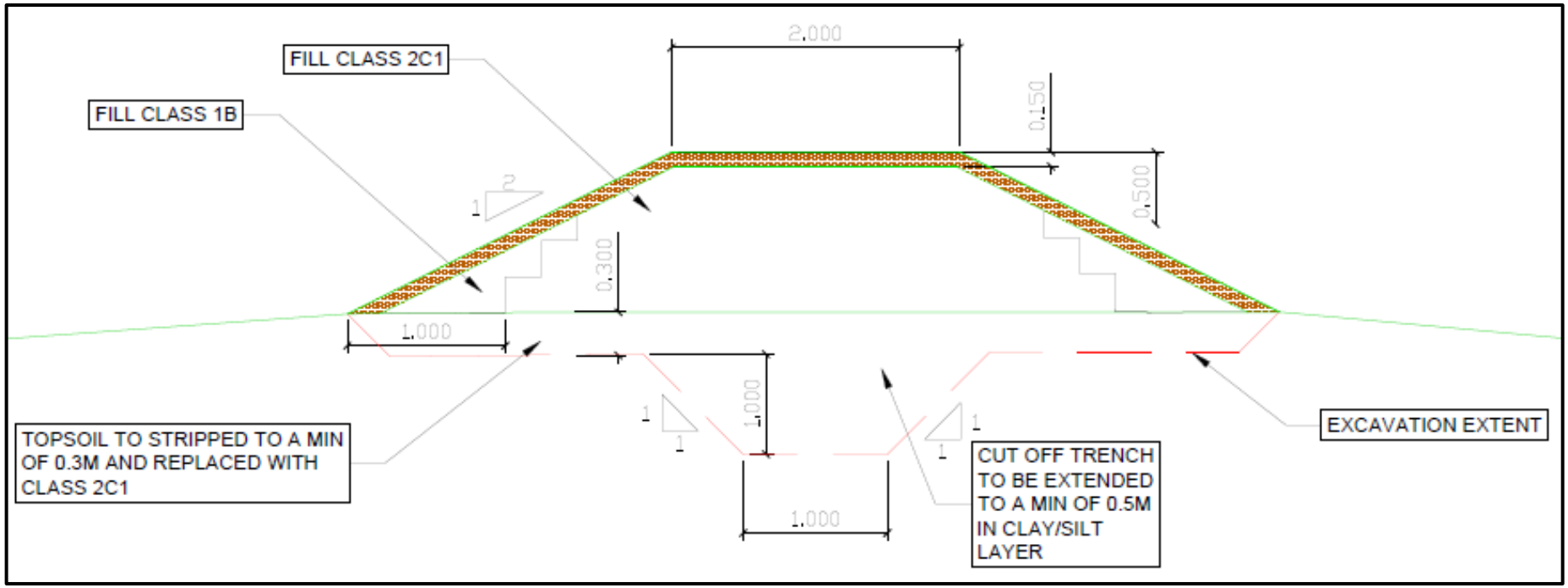


Figure 2-6 Typical Embankment Details

2.2.3 Instream works

The existing bridge has bank and bed scour protection extending 6m upstream and downstream of the respective bridge parapet faces. The existing bed scour protection is comprised of a conglomerate of concrete and cobble/gravel, which has eroded in the mid-channel. This existing scour protection will be replaced in a like for like manner to ensure no change in habitat. In stream works will be restricted to July through September. Water management measures will be put in place to avoid sediment and construction waste entering the water. The instream works footprint is approximately 300m^2. The proposed instream works for the Brusna River are shown in **Figure 2-5**.

2.2.4 Ground investigation works

A number of ground investigation (GI) works will be undertaken along the Brusna. This includes four boreholes and six slit trenches. These site investigation works will be required to inform the detailed design phase of the project and prior to the commencement of the construction works.

The location of each of these GI points in outlined in **Figure 2-7**.

2.2.5 Site Preparation

Tree removal, cutting, pruning and bankside maintenance along the Brusna River will be required in each section to facilitate construction works.

Figure 2-7 Proposed GI locations along the River Brusna

3 OVERVIEW OF OTTER SURVEYING

3.1 Methodology

3.1.1 Desktop Study

A desktop study was completed in January 2025 to identify relevant information regarding otter across the Proposed Scheme area. This desktop study established, from available publications and other publicly available resources, the known distributions and potential presences of otter across the Proposed Scheme area. Otter records older than 10 years or more were excluded from the data search. This exercise collated information from the following sources:

- Distribution records for otter held online by the National Biodiversity Data Centre (NBDC) (https://maps.biodiversityireland.ie/Map). Study area: 10km hectads G21, G22
- Information on the location, nature and design of the Proposed Scheme.
- Photographs and aerial imagery e.g. Google Maps (https://www.google.ie/maps/); Bing Maps (https://www.bing.com/maps) etc. Study area: 150m buffer around the redline of the Proposed Scheme.
- Tailte Éireann - mapping and aerial photography (https://www.geohive.ie/). Study area: 150m buffer around the redline of the Proposed Scheme.

3.1.2 Field Survey

Ecological surveys were conducted on the 7th and 27th June 4th and 5th July 22nd August and 20th September 2022 and on the 4th and 5th May 2023 for observations of otter and otter signs (e.g. footprints, spraints, couches, holts, live sightings, etc.). These surveys were undertaken to confirm the presence or absence of otter activity, including breeding or resting locations (e.g. holts, couches etc.), for all land within 150m of the Proposed Scheme work areas, and to detail otter activity and the locations of such activity.

The surveys were conducted with reference to TII's Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (2008) and with reference to the National Otter Survey of Ireland 2010-2012 (Reid, *et al*., 2013).

On the 21st September 2022 a trail camera was set up on the banks of the River Brusna adjacent to a potential otter holt identified during earlier surveys. This camera was set up by an RPS ecologist with a licence to photograph/film wild animals from the NPWS (Licence No. 197/2022) and was removed 8 days later on the 29th September 2022.

3.2 Otter Survey Results

3.2.1 Desktop Study

The NBDC data search returned nine records of otter from the 10km grid square G22 with the most recent record from 2017. There were no records of otter from grid square G21.

3.2.2 Field Survey

Numerous signs of otter (spraints, slides, couches, holts, live sightings) and potential signs of otter (mammal trails) were observed during surveys indicating a high level of otter activity throughout the Proposed Scheme area. Most of the otter evidence records occurred on the banks of the Brusna and Tullyegan watercourses. A single occupied holt was confirmed by camera trapping on the banks of the Brusna River in close proximity (approximately 10m) to the Proposed Scheme works area (**Table 3-1, Figure 3-1**). This holt has the potential to be a natal holt as two otter (mother and cub) were observed exiting the holt on the video images. Of the eight days the camera was in position, otters were observed exiting or entering the holt on six of these days/nights. Surveys also identified three otter couches along the southern bank of the Brusna between 3 and 50m of the Proposed Scheme works (**Table 3-1, Figure 3-1**). An additional two otter couches were identified within the Proposed Scheme boundary along the River Moy (Clare Street) in the centre of Ballina

town (**Table 3-1, Figure 3-2**). This derogation license pertains to one active otter holt and the three couches identified along the River Brusna and the two otter couches along the River Moy (Clare Street).

The holt and Couch 1 along the River Brusna are within 10m of the proposed main works and within 10m of the proposed GI works (**Table 3-1)** therefore it is considered that the use of these two features by otter will be interrupted by both the main works and the GI works. Couch 2 is located in the area identified for the construction of an artificial holt; however, this artificial holt will be located a minimum of 20m from this couch (the exact locations of the artificial holts have not been identified yet), therefore works are not considered to impact upon the use of this couch by otter. The nearest GI point is approximately 45m from Couch 2, however, the River Brusna is located between Couch 2 and this GI point. The GI works, therefore, are not considered to impact upon the use of this couch by otter as the river will provide a buffer to the noise and vibrations caused by these works. Couch 3 is located approximately 80m from the proposed main works and approximately 106m from the nearest proposed GI point. Proposed works are not expected to affect the use of this couch by otter.

Couch 4 and couch 5 are located within the redline along River Moy (Clare Street) and will be removed by the proposed works.

Table 3-1 The holt and five couches identified adjacent to the works boundary

Feature	Location	GPS Co-ordinates	Distance from main works (m)	Distance from nearest GI point (m)
Holt	River Brusna	54.109089, -9.123576	10	10 (GI Point ST37)
Couch 1	River Brusna	54.108709, -9.122937	3	16 (GI Point ST39)
Couch 2	River Brusna	54.111321, -9.125152	15	45 (River Brusna between Couch 2 and nearest GI point (BH44)
Couch 3	River Brusna	54.111898, -9.124984	80	106 (River Brusna between Couch 3 and nearest GI point (BH44)
Couch 4	River Moy – Clare Street	54.114629, -9.148990	Within redline boundary	N/A
Couch 5	River Moy – Clare Street	54.115217, -9.147803.	Within redline boundary	N/A

Figure 3-1 Confirmed holt and three couch locations along the River Brusna and the adjacent proposed works

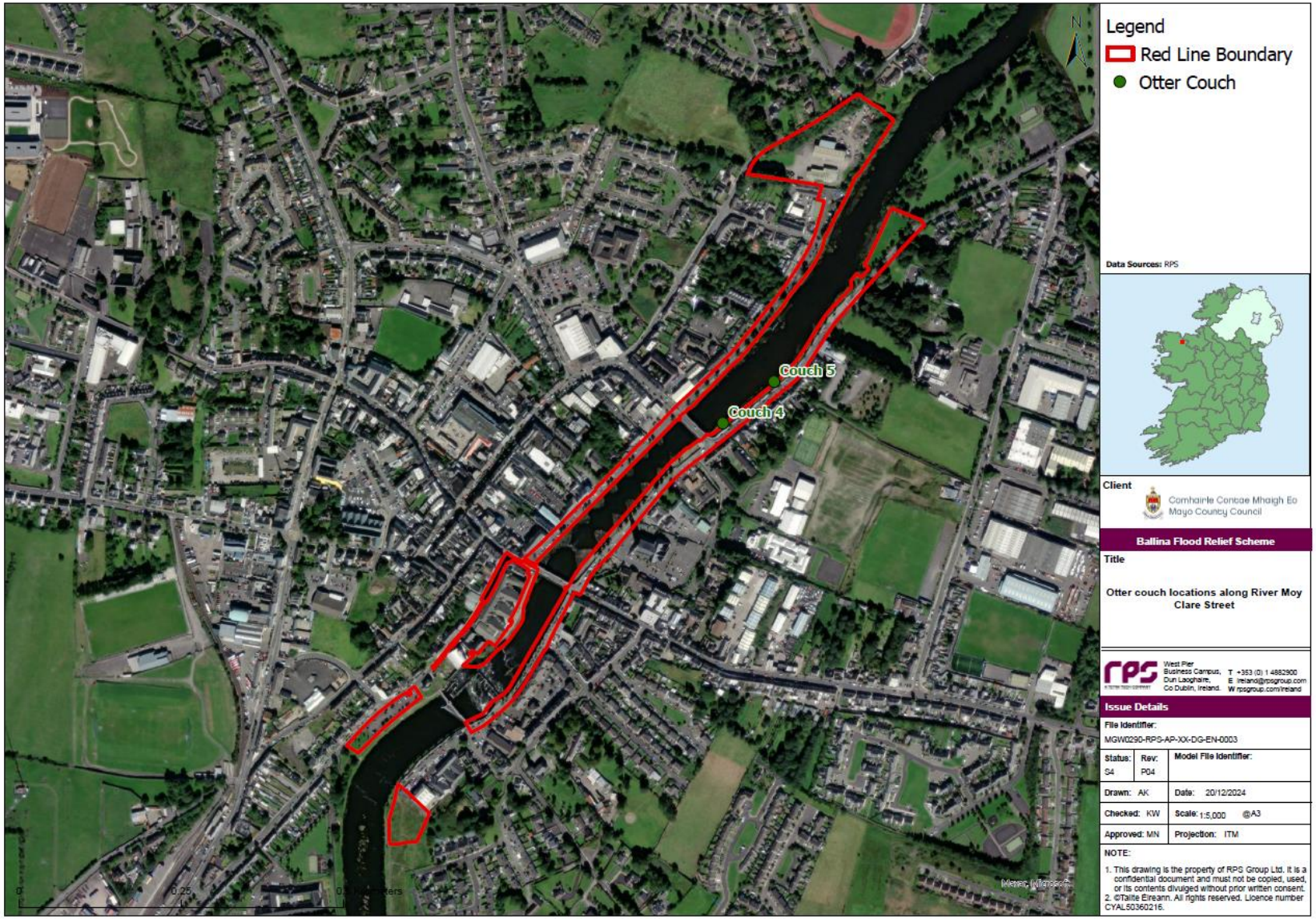


Figure 3-2 Location of the two couches along the River Moy (Clare Street)

4 CONDITIONS FOR SEEKING DEROGATION LICENCE

4.1 Test 1 - Reason(s) for Seeking Derogation

As per Article 16 of the Habitats Directive which is transposed into Irish law by Regulation 54(2) (b) of the EC (Birds and Natural Habitats) Regulations 2011, this derogation licence is being sought *"In the interests of public health and public safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment".*

4.2 Test 2 – There is No Satisfactory Alternative

4.2.1 Aim of the Proposed Scheme

The aim of the Proposed Scheme is to alleviate the risk of flooding in Ballina Town to a defined Standard of Protection (SoP). Ballina Town is a key town in terms of natural, cultural and built heritage. The River Moy and Brusna river are both protected as a Special Area of Conservation (SAC). The River Moy is also vital for angling for its salmon production.

4.2.2 Need for the Proposed Scheme

The Office of Public Works (OPW), working in partnership with Mayo County Council (MCC) and other local authorities completed the Western Catchment Flood Risk Assessment and Management (CFRAM) Study. The study included Ballina as an Area for Further Assessment and concluded that an FRS would be viable and effective for the community.

As per OPW targets, the SoP for areas at risk of flooding within the community is 1% of the Annual Exceedance Probability (AEP) for fluvial areas and 0.5% AEP for coastal flood events.

Based on Ballina's current susceptibility to flooding in conjunction with the expected increase in future flooding, there is a strong need to develop an FRS to protect Ballina residents from serious flooding events and to preserve Ballina as an attractive town for development. Ballina has a long history associated with flooding because of the River Moy's high-water level, in conjunction with inadequate conveyance capacities of the smaller stream/channels and associated culverts. The highest observed water level recorded a height of 3.21 metres above Ordnance Datum (mOD)-Malin in 2014. Within this flood plain, a high number of receptors are currently at risk of damage. Approximately 228 residential and 69 commercial receptors are potentially affected by flooding within the River Moy catchment.

4.2.3 Alternatives Considered

A number of reasonable alternatives for the Proposed Scheme were studied during the development of the Proposed Scheme. The consideration of these alternatives was undertaken by a multi-disciplinary technical, environmental and planning project team and is considered to have concluded with the identification and selection of solutions that provide the best balance between technical, environmental and community / social indicators. The preferred option has been further assessed in terms of alternative layouts and location aimed at reducing potential impacts and also maximizing opportunities.

These alternatives are outlined in **Section 4.2.3.1** through **Section 4.2.3.3.**

4.2.3.1 Do Nothing

The 'Do Nothing' scenario is defined as the option involving no future expenditure on water management infrastructure, flood defences and differs from the 'Do Minimum' alternative in that it also assumes no future maintenance of such infrastructure. This involves maintaining the status quo without taking any proactive steps to address the existing and future flood risks associated with the River Moy and its tributaries. This includes a description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the Proposed Scheme as far as natural changes from the baseline scenario can be assessed with reasonable effort based on the availability of environmental information and scientific knowledge.

Hydraulic modelling has clearly demonstrated that the current infrastructure does not meet the required Target Standard of Protection (SoP) of 1% of the Annual Exceedance Probability (AEP) for fluvial areas and 0.5% of the AEP for coastal areas, also referred to the 1 in 100 year and 1 in 200-year flood events, respectively. This means that there is an unacceptable risk of flooding and damage to property and infrastructure. In addition, the current flood defences need repair, in particular some of the quay walls along the River Moy including along Clare Street and, if not addressed, may fail in the future, further increasing the flood risk and associated damage to property and infrastructure.

4.2.3.2 Do Minimum

The 'Do Minimum' measure consists predominantly of repair and ongoing maintenance works to maintain the existing water management infrastructure. Although the current level of protection would be maintained in this scenario, the current infrastructure does not meet the required Target SoP and the risk of flooding is considered unacceptable.

4.2.3.3 Nature-Based Solutions

A Nature-based Catchment Management (NbCM) assessment was completed for the Ballina catchment to better understand what nature-based solutions (NBS) could be considered within the Proposed Scheme catchment area. The measures proposed would intercept rainfall, slow overland flow, and/or store water.

The assessment concluded that there were no NBS solutions that would entirely address the SoP required for the Proposed Scheme due to the predominately tidal nature of flooding along the River Moy. Fluvial flooding risk could be reduced with the implementation of NBS within the wider catchment; however, current legislation and an onus to prove 1 in a 100-year flood resilience would make these options unsuited to meet the project requirements.

Government funding for Flood Relief Schemes is typically based on a positive Cost-Benefit Analysis (CBA) where a Benefit Cost Ratio (BCR) of greater than 1 can be demonstrated. This requires a monetary demonstration of the benefit that the scheme will provide in the form of damages avoided from flooding. The effectiveness of the NbCM measures identified is very uncertain making it difficult to demonstrate the monetary benefit. At present, there is no guidance on how to account for this uncertainty and bring NbCM measures into the Flood Relief Scheme.

Various NbCM measures will require specialist input, separate plans, large scale landowner negotiations, and large-scale environmental assessments. This will likely increase the programme for the development and implementation of the scheme. It has therefore been recommended that the NbCM measures identified be progressed through a separate and parallel strategy using a coordination group led by Mayo County Council (MCC) and will therefore not form part of the Ballina FRS. This group would have the required specialist and local knowledge to implement the NbCM measures and be tasked with procuring the funds, agreements and permissions to do so.

A potential NbCM plan for the River Moy would include the following:

- Woodland creation
- Land management practices
- Land management features
- River restoration

Assuming that NbCM measures are implemented in the Ballina catchment it will be essential that their performance is measured through flood flow monitoring. Suitable river monitoring of the ungauged tributaries to the River Moy should be commenced as soon as possible to record current catchment conditions.

4.2.4 Options Development

The 'Do Nothing' scenario could mean the failure of the existing levels of protection and thus does not meet current or future acceptable levels of flood protection. Furthermore, although doing the minimum will not result in any impacts related to the construction and development of a FRS, it is not a sustainable alternative. Therefore, given the need for a FRS for Ballina town, flood relief options were developed. These options were selected based on achieving the Target SoP for protecting the areas at flood risk within the community of Ballina i.e. 1% of the AEP for fluvial areas and 0.5% of the AEP for coastal areas option development.

A Multi-Criteria Analysis (MCA) and Cost-Benefit Analysis, which considers technical, social, economic and environmental criteria was used to compare the options. From these analyses, the options with the best value for money and providing the most positive benefits to the community of Ballina were identified.

For the River Moy, flood walls were the only option identified. It is the most economic and sustainable solution identified for the River Moy and can accommodate additional flow through the provision of freeboard. Environmentally, it didn't score as well as the other tributaries due to potential impact to the River Moy SAC and to the flora and fauna in and around the River Moy.

For the Brusna, hard defences including walls and embankments was the only option identified. It is the most economic and sustainable solution identified for the River Brusna and can accommodate additional flow through the provision of freeboard. This option has a low environmental score due to the potential impact it may have to the River Moy SAC and to the River Brusna fisheries habitats.

4.2.4.1 Alternative Layouts

Alternative layouts for each of the scheme's sections evolved over a design process that included input from environmental experts, as well as contributions from stakeholders and feedback from public consultations.

4.2.4.1.1 Access to Rathkip/Shanaghy - Brusna River

It was originally proposed to raise the road to the river bridge that leads to Rathkip/Shanaghy. The alternative of providing a flood embankment on the river side of the road was considered. The option is preferred as it will negate the need for a road diversion during construction thus lowering the ecological impact footprint in a sensitive habitat (part of the River Moy SAC). It is expected to be a lower impact solution while still achieving the flood management objectives.

4.3 Test 3 – Favourable Conservation Status

The potential effects of the Proposed Scheme on otter have been assessed within Chapter 10: Terrestrial Biodiversity of the Environmental Impact Assessment Report, and within the Natura Impact Statement (NIS) for the Proposed Scheme and have been summarised here.

The Proposed Scheme intersects with the River Moy SAC (Site Code: 002298). Otter are a Qualifying Interest (QI) of this SAC. The Conservation Objectives (CO) for otter for the River Moy SAC is '*To maintain the favourable conservation condition of otter in the River Moy SAC*' which is defined by the attributes and targets outlined in **Table 4-1**.

Table 4-1 Conservation Objectives for otter for the River Moy SAC (NPWS, 2016).

Attribute	Measure	Target
Distribution	Percentage positive survey sites	No significant decline
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 1068.8ha
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated at 479.4km
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 1248.2ha
Couching sites and holts	Number	No significant decline
Fish biomass available	Kilograms	No significant decline
Barriers to connectivity	Number	No significant increase

The granting of this derogation licence will not have an effect on the following attributes associated with the CO for otter for the River Moy SAC: 1) extent of terrestrial habitat; 2) extent of freshwater (river) habitat; 3) extent of freshwater (lake) habitat; 4) fish biomass available; and 5) barriers to connectivity. The granting of this derogation licence will have an effect on the number of couching sites and holts available for use by otter within and adjacent to the River Moy SAC, which in turn may have an effect on the distribution of otter across the SAC. As outlined in **Section 3.2.2**, the Proposed Scheme works are expected to remove two couching locations along River Moy (Clare Street) and to temporarily interrupt the use of one holt and one couch along the River Brusna. Couches are generally used on a short-term, transient basis and otter can be very flexible in where they rest and sleep, generally relying on a network of holts and couches across their territory (Lundy, 2023). They are, however, more likely to show faithful year-to-year use of below-ground natal holts

(Liles, 2003). Therefore, a number of mitigation measure have been proposed to limit negative effects (see **Section 5**).

The works along the Brusna are not expected to permanently remove any otter couching sites or holts, however, the works are in close proximity to one holt, therefore there is potential for disturbance or collapse of the holt. Both the holt and the couching spot along the River Brusna will be temporarily unavailable for use for otter during the proposed construction phase. However, once works cease, these features will be available for use by otter once again. The couch on the River Brusna is outside the footprint of the Proposed Scheme works but in very close proximity (c. 3m) to the works, therefore the presence of works personnel and machinery will likely deter otter from using this feature. As otter are primarily crepuscular (i.e. mostly active at dusk and dawn), mitigation has been proposed to prevent any night-time works (including dusk and dawn) along the River Brusna (see **Section 5**), thus reducing the likelihood of disturbance of use of this couch. However, should disturbance occur, the adjacent suitable riparian habitat, both upstream and downstream of the Proposed Scheme works, is considered to be sufficient for use by otter. With respect to the holt identified along the River Brusna, two artificial holts will be constructed downstream of the current holt to provide alternative resting or breeding areas for otter when the use of the identified holt will be temporarily interrupted by the Proposed Scheme construction phase.

The works along Clare Street will remove two otter couches as the soil and vegetation along this section of riverbank will be removed to build the flood wall. The mitigation for this area stipulates that the majority of works are to take place from the road-side to ensure minimal disturbance of the habitat and that at any one time a maximum length of working area that can be undertaken in one working week can be implemented (See **Section 5**). It further states that the habitat in a previous works area will be reinstated prior to work commencing in the next section. The entirety of the works area along Clare Street, where the riparian habitat will be disturbed, is c. 350m (tall herb swamp is c. 285m of this) long. The mitigation provided for this area will maintain undisturbed areas of this habitat at the edge of the watercourse, that can be used by otter. Furthermore, working in this manner will allow sufficient additional area of this habitat for use by otter away from the works area.

With the implementation of the mitigation measures stipulated in **Section 5,** and the considerable riparian habitat upstream and downstream of both Proposed Scheme works areas, it is considered that there will be no significant decline of couching sites and holts and correspondingly, no significant decline in the distribution of otter within the River Moy SAC and adjacent habitats as a result of granting this derogation licence.

Within Ireland, both the short-term (for the period 2007-2018) and long-term (for the period 1994-2018) trends for otter are stable (NPWS, 2019). The current range of otter across Ireland is 83,600km which is commensurate with the favourable reference range for the species, as there is no evidence of decline of otter since the Habitats Directive came in to force in 1994. Therefore, the future prospects for the range of otter have been assessed as 'Good' (NPWS, 2019). There is estimated to be between 7,218 and 10,186 breeding otter females across the country (NPWS, 2019) with the female breeding otter population size thought to have increased in the short-term (i.e. for the period 2007-2018). The favourable reference range for breeding females is 7,046, therefore, the current estimate of the breeding female population is at least 172 individuals above the favourable reference range. Additionally, the future prospects for the population of otter have been assessed as 'Good' (NPWS, 2019). Furthermore, there is considered to be sufficient area and quality of occupied habitat across the country to support the long-term survival of the species with both the short-term (i.e. for the period 2007-2018) and long-term (i.e. for the period 1994-2018) sufficiency of area and quality of occupied habitat trends stable. The future prospects for the habitat of otter have, therefore, been assessed as 'Good' (NPWS, 2019).

The NPWS also assessed the range, population, habitat for otter, future prospects and overall conservation status of otter within Ireland to be 'Favourable' noting "*the most recent distribution data shows that the otter continues to be widespread throughout Ireland and present nationwide in a wide variety of habitat types"* (NPWS, 2019). They further state "*the otter population is considered to be stable and none of the threats or pressures identified is considered likely to impact significantly on the species. Overall, the species is assessed as Favourable and the overall trend is demonstrating an on-going increase".*

Given the Good future prospects for each parameter assessed for otter, the overall Favourable conservation status of the species and increasing population trend, it is considered that the granting of this derogation licence will not affect the favourable conservation status of otter at the local, regional or national level.

5 PROPOSED MITIGATION MEASURES

Mitigation measures have been proposed within Chapter 10: Terrestrial Biodiversity of the Environmental Impact Assessment Report and within the Natural Impact Statement. These mitigation measures are outlined in the following sections.

5.1 Ecological Clerk of Works

- The Developer shall appoint a suitably experienced and competent Ecological Clerk of Works (ECoW) before the commencement of both the main works and the GI works. The ECoW will supervise all pre-construction ecological surveying, implementation and overseeing of ecological mitigation measures ensuring that activities on site are conducted in accordance with the planning permission as they pertain to ecological matters and specifically any works that could impact protected habitats, species and aquatic ecology.
- The ECoW will be the liaison for the purposes of consulting with environmental bodies including the NPWS. In advance of works commencing on site, all personnel will receive on-site induction by the ECoW and Contractor relating to the ecological constraints and mitigation measures associated with the site. It will be the responsibility of the Contractor to ensure that any new personnel who are employed during the construction work also receive the on-site induction.

5.2 Pre-construction Surveys

- Pre-construction surveys by an experienced ecologist will be carried out for otter prior to both the GI works and main works commencing. This includes a survey of any otter breeding/resting sites identified in the current baseline within the ZoI of the Proposed Scheme (150m for breeding sites, where access allows; noting that TII guidance recommends 20m for non-breeding sites). These will be undertaken in a representative season to ensure accuracy. Otter surveys will be carried out in accordance with NRA guidance (NRA, 2008).
- Based on the findings of the pre-construction surveys, the adequacy of all mitigation measures for otter will be reviewed and, if necessary, adjusted accordingly by the ECoW.
- Any adjustment to the mitigation measures will be agreed with the local authority in advance of them being implemented. The pre-construction surveys will be supplemented by further inspection by the ECoW (as deemed necessary by them) immediately prior to site clearance.

5.3 Derogation Licensing Mitigation

- Mindful of the mobile nature of otters, the need for derogation licencing for any particular phase of works will need to be kept under review and informed by the findings of the pre-construction surveys.
- The level of surveying will need to be sufficient to inform any derogation licensing which may be required. The need for derogation licensing will be determined by the ECoW prior to any works commencing, including site preparation works and the GI works. The need for derogation licences will be kept under review by the ECoW as the works progress based on the findings of the pre-construction surveys completed for Otter.
- It is assumed that all active holts at the time of construction and within close proximity to the Proposed Scheme boundary will need to be handled in accordance with a derogation licence.
- If holts are to be closed (wholly or partially), this will be completed in accordance with the necessary derogation licence and with reference to the Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes (NRA, 2008).
- Where required, evacuation and destruction of holts will be carried out under the supervision of an appropriately qualified ecologist under licence from the NPWS. The locations of such holts will be determined by the ECoW in liaison with the Contractor and the requirement of any derogation licence.
- Neither blasting nor pile-driving will be undertaken within 150m of active holt during the breeding season, unless subject to provisions of a derogation licence.

5.4 Exclusion of otter from holt

Currently, one otter holt has been identified within 150m of the works boundary. Given the proximity of this holt to the proposed works, otter will need to be excluded from this holt prior to any works commencing including site preparations and GI works. The removal of this holt will not occur due to the proposed works, however, given the proximity of works, they will affect the use of the holt by otter and there is the potential for collapse of the holt. The requirement for exclusion of any additional holts, not currently known, will be updated as the pre-construction surveys are undertaken. The procedure for exclusion of the holt will follow NRA guidance (NRA, 2008) noting:

- Two artificial holts will be created to provide alternative resting areas for otter while works are ongoing. These two holts are to be located along the left-hand bank of the River Brusna downstream of the Rathkip/Shanaghy bridge. The design of these holts is outlined in **Appendix A**. These two artificial holts will be installed prior to exclusion of the holt identified along the river Brusna. A pre-construction survey of the section of bank where these two holts are to be located will be undertaken prior to installation to ensure these artificial holts do not interfere with any otter couching or resting spots.
- A sufficient period of monitoring of the holt should be undertaken directly prior to exclusion commencement. This monitoring should be undertaken for a minimum period of 4 consecutive weeks. If this monitoring identifies the use of the holt by a pregnant female or a female with cubs, then exclusion will only commence once the female and her cubs have vacated the holt.
- Once the holt is confirmed as a non-breeding site, a one-way gate and fine wire mesh will be installed. Where necessary, mesh will be buried and as a minimum securely pegged.
- Gates will be tied open for three days prior to being ‘set’ to exclude (i.e. untied so that gate closes and animals can exit but cannot enter the holt). At this time, sticks will also be placed within gated tunnels (to the depth of an arm’s length) to determine if the holt is still being used.
- Works within 150m may only proceed if monitoring by suitably licenced ecologists confirms that the holt has been inactive for 21 days.
- In the event where an animal digs back into a closed holt, appropriate measures will be taken, potentially including the installation of additional gates. In this case the suitably experienced and qualified ecologist will advise that the exclusion process (and 21 day clock) must be restarted.
- Gates and mesh will be retained in-situ for the duration of the works, after which the gates and mesh will be removed. The exclusion timeframe is envisaged to be approximately 36 months.

5.5 Watching Brief during Site Clearance

- Where dense vegetation or inaccessibility prevents adequate determination of the presence or absence of otter holts as part of the pre-construction surveys, these areas will require monitoring by the ECoW during vegetation clearance to ensure that any potential holts present will be found and treated appropriately.
- Where new holts are identified, all works will cease until the appropriate mitigation has been put in place. This may require amendment to the derogation licence.

5.6 Tall Herb Swamp Mitigation Measures

The couches along the River Moy (Clare Street) are located within and adjacent to tall herb swamp habitat. Therefore, the following mitigation measures for the protection and reinstatement of tall herb swamp will also help minimise disturbance of these otter resting places:

- In so much as possible, works along the bank of the River Moy along Clare Street are to take place from the roadside to avoid damage to tall herb swamp habitat.
- Fencing is to be erected at the boundary of the necessary works footprint within this habitat along all proposed works areas where this habitat occurs to prevent unnecessary incursion of personnel and machinery. Silt fencing (see **Section 5.6.1**) is also to be erected along this boundary to prevent any potential siltation of nearby watercourses.

- At any one time a maximum length of working area along Clare Street which can be undertaken in 1 working week, is to be implemented. Works on additional areas will not commence until works on previous areas have been completed and tall herb swamp habitat reinstated (see next point).
- Where tall herb swamp habitat is to be disturbed by flood wall construction, turves are to be collected from the areas to be disturbed and stored on bog mats within adjacent working areas in a single layer i.e. no stacking of turves is to occur. The turves to be removed will be approximately 2m x 1m x 0.5m deep and will be collected with the use of a specially designed excavator bucket to lift and place the turves carefully on to bog mats so that they do not break up. The storing of turves on bog mats will facilitate their later removal and reinstatement without damaging the underlying habitat. Turves will be monitored during storage, and they will be watered when required to keep them moist. The depth of turves proposed is in line with practice elsewhere (Anderson, 2003), where in a wetland situation, the turf depth extracted for translocation was between 50 and 80 cm, depending on rooting depth. The deeper the turves, the greater likelihood of vegetation recovery. Turves will be stored for no more than 1 working week and measures will be implemented to ensure no erosion of tall herb swamp habitat or turves occurs while works are ongoing e.g. monitoring of weather forecasts to ensure works are avoided during periods of heavy rainfall, monitoring of tides to ensure habitat area does not flood while works are ongoing etc. The area where turves are to be taken and reinstated will not be traversed by machinery prior to or after works to ensure compaction does not occur to help facilitate recovery post reinstatement. Anderson (2003) recommends that all turf translocation should take place in the dormant season for terrestrial habitats, therefore, the best time for undertaking works where sections of tall herb swamp are to be disturbed is during the autumn or early winter. This timing ensures that soils will be at their field capacity with maximum cohesiveness without containing excess water which will facilitate habitat recovery after reinstatement.
- Ground protection mats shall be used at all areas of tall herb swamp where turve extraction is not necessary e.g. access routes for personnel (if required) to prevent compaction and erosion of this habitat.
- The ECoW will undertake regular monitoring of habitat restoration undertaken to inform any adaptive mitigation measures as required and report such monitoring to relevant parties. All re-instated or indirectly impacted vegetation will be inspected at the completion of construction at which time the ECoW will report to the local authority and other relevant parties on habitat condition. If the condition of the habitat is unsatisfactory the ECoW will determine whether collection of local seed is additionally required to achieve effective vegetation restoration and take appropriate steps to source and sow such seed Only seeds of native Irish shall be used should such a measure be necessary.

5.6.1 Silt Fencing Specifications

- The bottom edge of the geotextile silt fence material must be installed to a 200mm embed below ground level.
- Stakes should be placed at the ends, on any bends, and at 2m intervals along the silt fence. Stakes need to be driven a minimum of 400mm to provide adequate support.
- The silt fence must have a tensioned wire backing - a minimum of 2 lines of wire run along the stakes. The top wire is used to clip the geotextile onto to hold it up and provide strength against trapped sediment.
- Silt fences need to be checked and maintained weekly at minimum, and always before any forecasted heavy rain event.

5.7 Other Otter Specific Mitigation Measures

- No construction personnel or machinery will be used within 150m of otter holts unless subject to the provisions of a derogation licence. The location of otter holts are to be confirmed during the pre-construction survey.
- During the pre-construction survey, otter holts located within the Proposed Scheme boundary or within 150 m of this boundary will be clearly identified to all personnel working in the vicinity of the holt.
- Temporary boundary tape fencing (or similar) can used at the discretion of the ECoW to identify such holts subject to such measures themselves not impacting on the use of the holt.

- To prevent injury or mortality from otter accidentally falling into excavations any excavations greater in depth than 30cm which are left open overnight will either be temporarily covered over or a temporary ramp (e.g. scaffold board at suitable angle) will be inserted.
- Two artificial holts will be created. These two holts are to be located along the left-hand bank of the River Brusna downstream of the Rathkip/Shanaghy bridge.
- Night-time (including dawn and dusk) works along the Brusna will be avoided.
- Should night-time works be required along the River Moy the entire stretch/width of the river shall not be lit up while works are being undertaken, i.e. a dark stretch of the river shall remain to facilitate the movement of otter past the works.
    - This can be achieved by using directional lighting (i.e. lighting which only shines on the proposed works and not nearby lands) to prevent overspill. This shall be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvres and shields to direct the light to the intended area only.

5.8 Reporting

Local NPWS Conservation Rangers or other nominated persons shall be notified as to the commencement of works and will be kept abreast of the monitoring protocol and installation of the temporary exclusion structures.

Upon completion of the monitoring effort, an after-report will be provided to the NPWS on the proposed activities as per likely requirements, and at a minimum within 14 days of completing the principal monitoring activities with a follow-on report 14 days after removal of the temporary exclusion structures.

6 REFERENCES

Anderson, P. (2003) Habitat translocation: a best practice guide. CIRIA, London

Liles G. (2003). *Otter Breeding Sites. Conservation and Management.* Conserving Natura 2000 Rivers Conservation Techniques Series No. 5. English Nature, Peterborough.

Lundy, M. (2023) 'Species Profile: Otter', Vincent Wildlife Trust Ireland.

NPWS (2016) Conservation Objectives Series River Moy SAC 002298. National Parks and Wildlife Service. Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

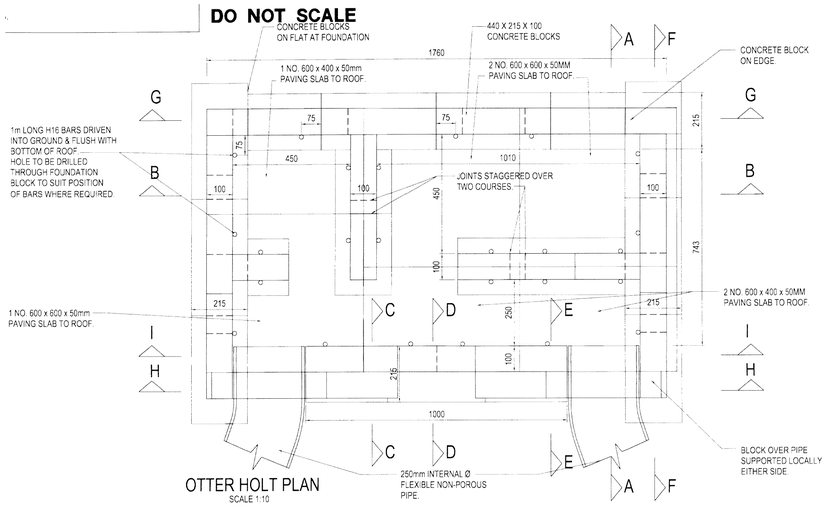
NPWS (2019) The Status of EU Protected Habitats and Species in Ireland: Species Assessments. Volume 3 2019. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Dublin.

NRA (2008) *Guidelines for the Treatment of Otters Prior to the Construction of National Road Scheme.* National Roads Authority, Dublin.

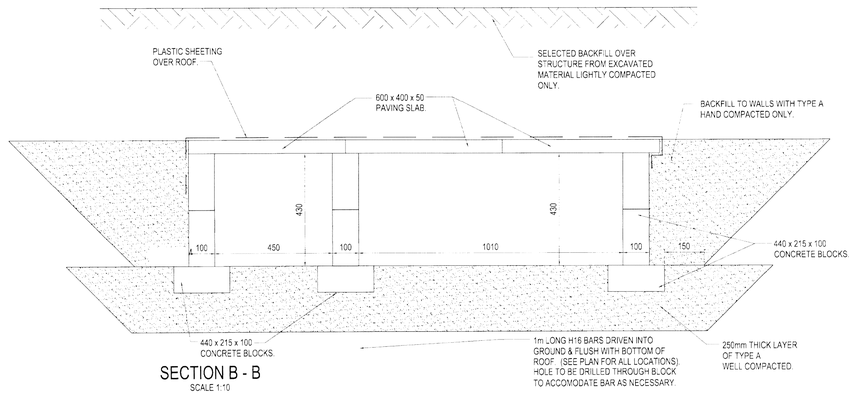
Reid, N., Hayden, B., Lundy, M., Pietravelle, S., McDonald, R., Montgomery, I. (2013). National otter survey of Ireland 2010/12. Irish Wildlife Manuals No. 76. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin.

Appendix A
Otter holt design

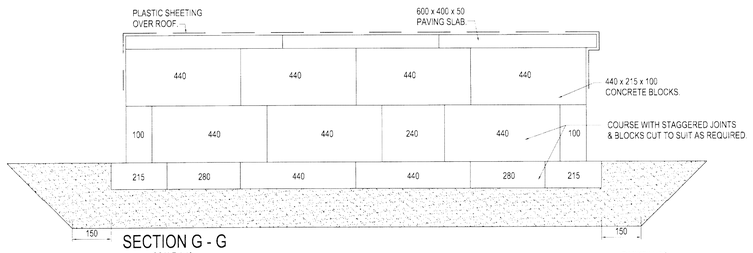
DO NOT SCALE



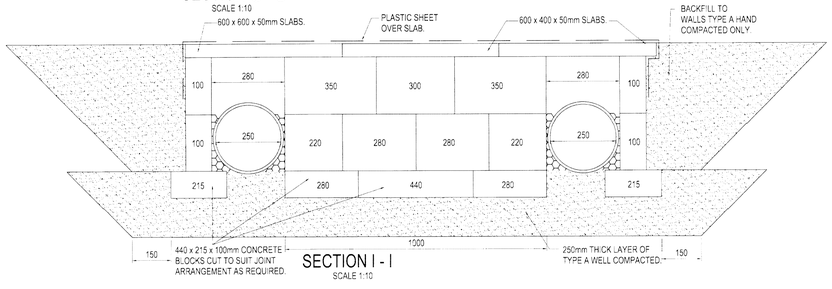
OTTER HOLT PLAN
SCALE 1:10



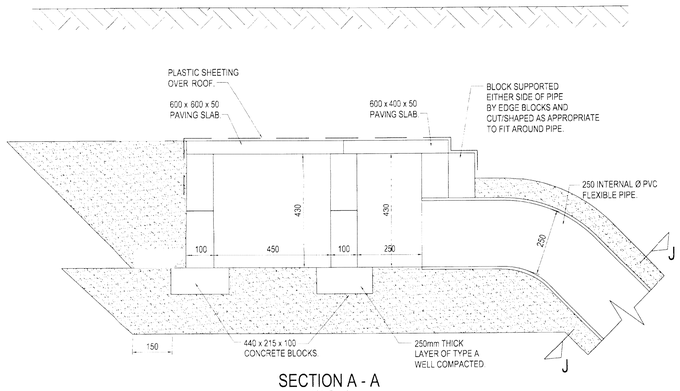
SECTION B - B
SCALE 1:10



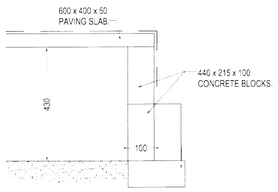
SECTION G - G
SCALE 1:10



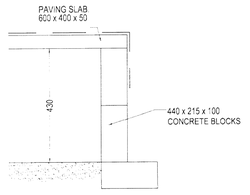
SECTION I - I
SCALE 1:10



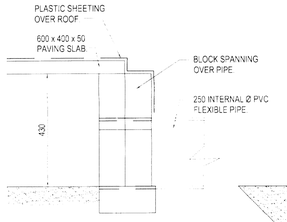
SECTION A - A
SCALE 1:10



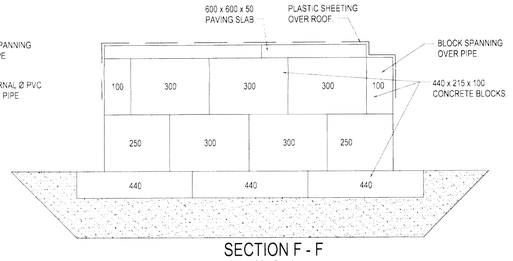
SECTION C - C
SCALE 1:10



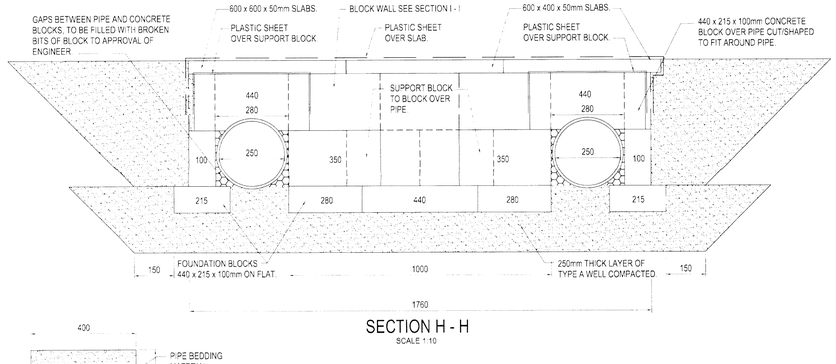
SECTION D - D
SCALE 1:10



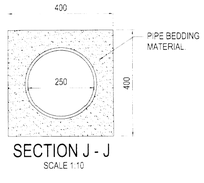
SECTION E - E
SCALE 1:10



SECTION F - F
SCALE 1:10



SECTION H - H
SCALE 1:10



SECTION J - J
SCALE 1:10

NOTES

1. ALL LEVELS TO ORDNANCE DATUM MALIN HEAD.
2. ALL DIMENSIONS IN mm UNLESS STATED OTHERWISE.
6. AS MUCH NATURAL VEGETATION AS POSSIBLE TO BE RETAINED AROUND TUNNEL ENTRANCES.
7. HOLT TO BE CONSTRUCTED OF CONCRETE BLOCKS WITH DRY JOINTS, I.E. NO MORTAR. BLOCKS TO BE CUT WHERE REQUIRED TO PROVIDE STAGGERED VERTICAL

Client **Mayo County Council**

General Notes

(i) Hard copies, dwf and pdf will form a controlled issue of the drawing. All other formats (dwg etc.) are deemed to be an uncontrolled issue and any work carried out based on these files is at the recipients own risk. RPS will not accept any responsibility for any errors from the use of these files, either by human error by the recipient, listing of the un-dimensioned measurements, compatibility with the recipients software, and any errors arising when these files are used to aid the recipients drawing production, or setting out on site.

(ii) DO NOT SCALE, use figured dimensions only.

(iii) This drawing is the property of RPS, it is a project confidential classified document. It must not be copied used or its contents divulged without prior written consent. The needs and expectations of client and RPS must be considered when working with this drawing.

(iv) Information including topographical survey, geotechnical investigation and utility detail used in the design have been provided by others.

(v) All Levels refer to Ordnance Survey Datum, Malin Head.

Rev	Date	Drn	Chk	Amendment / Issue	App
S4 P01	06/04/23	McK	ROD	Issue for Approval	AC

MAKING COMPLEX EASY
West Pier
Business Campus
Dun Laoghaire
Co. Dublin A96 N6T7
T +353 (0)1 4882900
W www.rpsgroup.com/ireland
E ireland@rpsgroup.com

Model File Identifier

Scale	Project
NTS @ A1 NTS @ A3	**Ballina Flood Relief Scheme**
Created on 23/03/2023	Title: Otter Holt Design
Sheets --	

File Identifier	Drawing No.	Status	Rev
MGW0290-RPS-EI-XX-D-EN-0134	DR7400	S4	P01

R:\MDW0825 - Whitechurch Flood Alleviation\8.0 Drawings\DG\MDW0825-RPS-XX-XX-DR-Z-DR7400 - Otter Holt Design.dwg