# CLONASLEE FLOOD RELIEF SCHEME

## Environmental Impact Assessment Report
## Chapter 5: Project Description

MDW0867
27 February 2025
S5.P01

## Document status

| Version | Purpose of document | Authored by | Reviewed by | Approved by | Review date |
|---|---|---|---|---|---|
| S5.P01 | Issue for Planning | BC | KM/PC | BC | 27 Feb 2025 |

## Approval for issue

| | |
|---|---|
| BC | 27 February 2025 |



**Prepared by:**

**RPS**

**Prepared for:**

**Laois County Council**

Dublin | Cork | Galway | Sligo | Kilkenny
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# 5 PROJECT DESCRIPTION

## 5.1 Flood Relief Scheme Design Approach

The Proposed Scheme was developed following a detailed hydrological and hydraulic study of the catchment. Potential options were developed and compared using the OPW's Multi-Criteria Analysis (MCA) guidelines. All potential options were required to deliver a Target Standard of Protection (SoP) for the 1% Annual Exceedance Probability (AEP) fluvial event. The MCA identified the preferred scheme based on technical, social, environmental, and economic criteria.

All proposed flood relief works are planned for the Clodiagh River; no flood relief works are considered necessary on the Gorragh River.

Each of the flood relief measures has been analysed and developed in detail to solve a specific source of flood risk in the Scheme Area as described in **Table 5-1**.

**Table 5-1: Scheme Design Approach**

| Source of Flood Risk | Specific Flood Relief Measure |
|---|---|
| A tributary from Brittas Lake joining the Clodiagh River upstream of the village, was identified as a flood source during Public Information Events. The root cause of flooding here is an existing culvert in Brittas Wood that is almost totally blocked. | Remediation to the culvert (600mm pipe road crossing) including a headwall on the upstream side to reduce blockage risk and ease of maintenance. |
| Potential for water coming out of bank from the Clodiagh River at Brittas Wood, leading to adjacent land flooding and flowing into the village. | Construction of an embankment above predicted flood levels. |
| Blockage in the Clodiagh River caused by woody debris accumulation at the Clodiagh Bridge in Clonaslee village. | Installation of a debris trap upstream of the bridge at a location that can be easily accessed for debris removal. |
| The existing stone wall on Chapel St currently acts as a flood defence. It is structurally vulnerable, and information gleaned at Public Information Events indicates water visibly seeps through the wall and from under the road. | Bolstering the existing stone wall with a specifically designed flood relief wall, and below ground flow cut-off. |
| An existing informal embankment to the north of the village acts as a flood defence. It is structurally vulnerable and has gaps possibly caused by livestock. | A new embankment constructed parallel to the existing. |
| Potential for water coming out of bank from the Clodiagh River and increasing flooding of the Integrated Constructed Wetlands (ICW) Treatment Plant owned and operated by Uisce Éireann (UÉ). | A new retaining wall adjacent to the ICW to mitigate flood increases over the wetlands. |

The flood wall heights have been designed to include for 300 mm 'freeboard'. This sets the top level of the wall 300 mm above the maximum predicted flood level in the design event. This is to allow for contingency in the design and allow for the wave effect of floodwater. For embankments, an extra 200 mm freeboard is added, to cater for the additional risk of the embankment material settling over time. This will give a total freeboard of 500mm for embankments.

## 5.2 Description of the Proposed Scheme

The following sections provide an overview of the proposed Clonaslee Flood Relief Scheme. The Proposed Scheme is divided into three areas as shown in **Figure 5-1. Table 5-2** lists the proposed defence elements in each area.

**Table 5-2: Summary of Proposed Scheme**

| Location | Defence Elements |
|---|---|
| Area 1: Brittas Wood | • Embankment<br>• Debris trap with access slipway<br>• Culvert remediation |
| Area 2: Chapel Street | • Flood wall |
| Area 3: Tullamore Rd and Integrated Constructed Wetland (ICW) | • Flood wall<br>• Embankment |

The full set of planning drawings for the scheme are included in Appendix 5-1 for ease of reference.

CO. LAOIS

Clonaslee

**LEGEND**

- PROPOSED EMBANKMENT
- PROPOSED FLOOD WALL
- PROPOSED DEBRIS TRAP LOCATION
- PROPOSED CONSTRUCTION COMPOUND

ICW WASTEWATER TREATMENT FACILITY

BALLNAKILL

BRITTAS WOOD

*(Area 3)*

*Area 2)*

*(Area 1)*

Clodiagh River

Chapel Street

CHAPEL STREET

Clodiagh Way

Main Street

**ORDNANCE SURVEY SHEET NUMBERS:**

- 3649, 3650, 3707, 3708 *(1:5,000)*

50m SCALE 1:2500

Client

**Laois County Council**
Aras an Chontae, Portlaoise, Co, Laois

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| P01.03 | 01/10/24 | DB | BC | Work in Progress (WIP) | BC |
| P01.02 | 28/08/24 | DB | BC | Work in Progress (WIP) | BC |
| P01.01 | 29/07/24 | DB | BC | Work in Progress (WIP) | BC |

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Model File Identifier

| Scale | Project |
|---|---|
| 1:2,500 @ A1<br>1:5,000 @ A3 | **CLONASLEE FLOOD RELIEF SCHEME**<br>**Planning Application** |
| Created on: 29/07/2024 | Title: Figure 5-1: KEY LAYOUT PLAN |
| Sheets: 01 of 01 | |

| File Identifier | | Status | Rev |
|---|---|---|---|
| MDW0867-RPS-00-XX-DR-T-DG0002.dwg | | S0 | P01.03 |

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### 5.2.1 Area 1 – Brittas Wood

Area 1 is located within Brittas Wood which is includes a publicly accessible amenity trail owned and operated by Coillte (refer to **Figure 5-2**). The proposed works in Area 1 – Brittas Wood are designed to fulfil three crucial flood defence functions:

1. Catch fallen trees and other large debris that cause a blockage risk to the Clodiagh Bridge in Clonaslee village;
2. Ensure that increased water levels due to debris trap blockages will not create a flood risk;
3. Facilitate ongoing maintenance and cleaning of the existing Brittas Lake Stream crossing culvert (600 mm diameter); and

A site-specific scour analysis will be carried out at detailed design stage to assess the need to extend the debris trap foundation to form bed scour protection. Such scour protection would comprise an extension of the debris trap foundation, matching the top level of it (i.e. 500mm below the natural bed level), similar to the IFI guidelines (2016) requirement for embedment of a culvert structure.

As obstructions to flow will be introduced to the channel, measures will be taken to ensure this does not lead to excessive scour or erosion on the adjacent banks. Soft engineering methods such as willow spiling are preferred for bank erosion protection. The final design will be discussed and agreed with IFI prior to implementation.

Further detailed drawings are included in Appendix 5-1.

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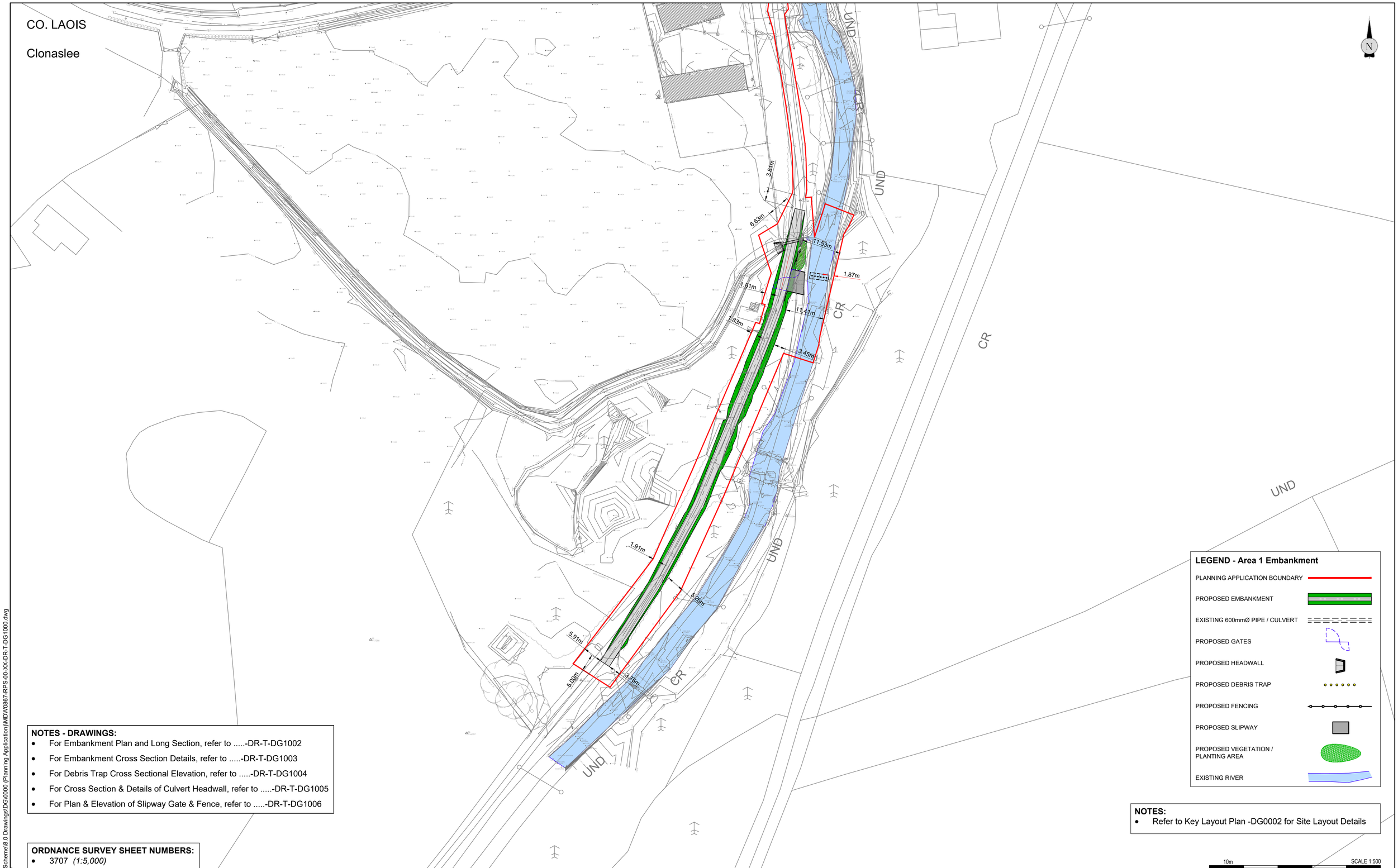


**NOTES - DRAWINGS:**

- For Embankment Plan and Long Section, refer to .....-DR-T-DG1002
- For Embankment Cross Section Details, refer to .....-DR-T-DG1003
- For Debris Trap Cross Sectional Elevation, refer to .....-DR-T-DG1004
- For Cross Section & Details of Culvert Headwall, refer to .....-DR-T-DG1005
- For Plan & Elevation of Slipway Gate & Fence, refer to .....-DR-T-DG1006

**ORDNANCE SURVEY SHEET NUMBERS:**

- 3707 *(1:5,000)*

**LEGEND - Area 1 Embankment**

- PLANNING APPLICATION BOUNDARY
- PROPOSED EMBANKMENT
- EXISTING 600mmØ PIPE / CULVERT
- PROPOSED GATES
- PROPOSED HEADWALL
- PROPOSED DEBRIS TRAP
- PROPOSED FENCING
- PROPOSED SLIPWAY
- PROPOSED VEGETATION / PLANTING AREA
- EXISTING RIVER

**NOTES:**

- Refer to Key Layout Plan -DG0002 for Site Layout Details

10m SCALE 1:500

Client

**Laois County Council**
Aras an Chontae, Portlaoise, Co, Laois

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| Scale | 1:500 @ A1<br>1:1,000 @ A3 |
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| Sheets | 01 of 06 |

Project: **CLONASLEE FLOOD RELIEF SCHEME**
**Planning Application**

Title: Figure 5-2 SITE LAYOUT PLAN - AREA 1

| File Identifier | Drawing No. | Status | Rev |
|---|---|---|---|
| MDW0867-RPS-00-XX-DR-T-DG1000.dwg | *MDW0867-RPS-00-XX-DR-T-DG1001.dwg* | S0 | P01.03 |

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#### 5.2.1.1 Debris Trap

The risk to blockage of the Clodiagh Bridge comes from large fallen trees in Brittas Wood. To capture this type of debris, a coarse debris trap is required in the form of 'tree poles'. This is the only proposed in-stream work on the Scheme and requires careful water flow management to allow construction of the substantial foundation and the poles themselves.

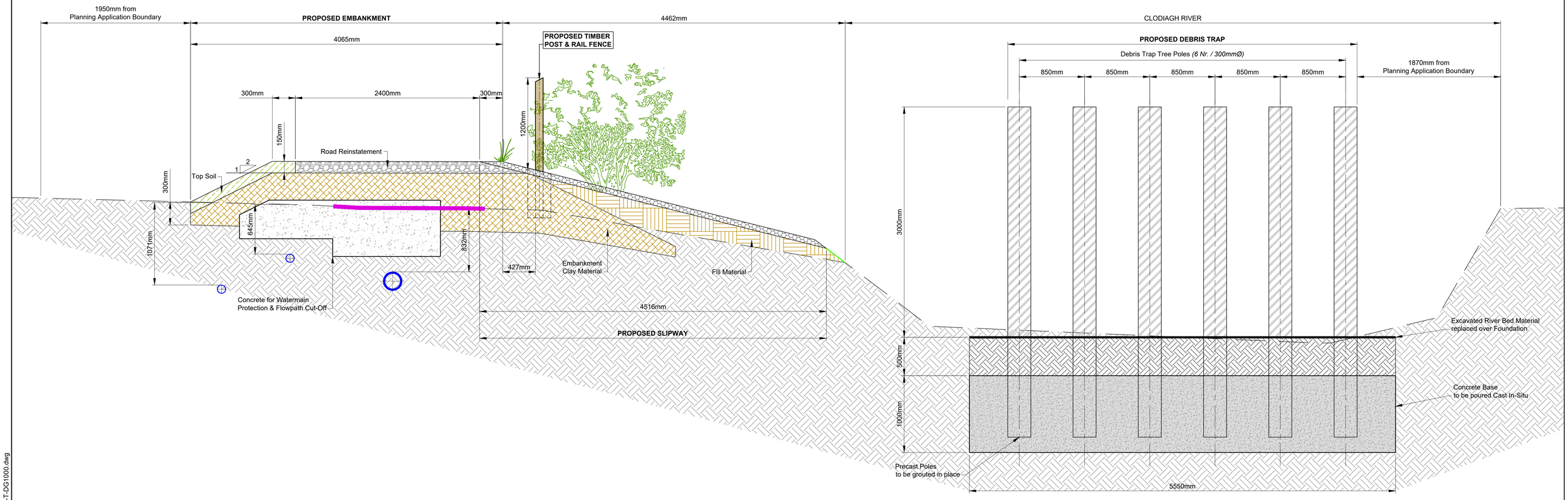
The key features of the debris trap are the following:

- A concrete base extending the full width of the Clodiagh River - the concrete base will be set 500mm below the riverbed level to allow re-naturalisation of riverbed material above;
- The base shall be designed to include roughness elements, as opposed to having a smooth surface. The inclusion of roughness elements shall support the stabilisation of instream river material reinstated on top of the foundation;
- Concrete poles cast in place - the concrete poles measure approx. 3 m height from the riverbed and will be 300 mm in diameter; and
- Willow spiling erosion protection on the adjacent riverbanks.

A slipway is required to allow for maintenance access to the debris trap. The proposed slipway extends from the Brittas Wood trail pathway to the edge of the River Clodiagh. **Figure 5-3** shows the debris trap as it will be located in the river channel. This figure also shows details of the proposed embankment which is discussed further in the next section. A locked gate and fence will be installed across the slipway which will be opened only to facilitate machine access to the debris trap during maintenance works.

CO. LAOIS

Clonaslee - BRITTAS WOOD




**CROSS SECTIONAL ELEVATION 1E**
Scale: 1:25 @ A1

**CROSS SECTION DETAILS KEY**

EXISTING GROUND LEVEL

EXISTING ROADWAY

EXISTING WATERMAIN *(GPR Survey)*

**NOTES:**

- Refer to Key Layout Plan -DG1001 for Site Layout Plan - Area 1

# SECTION - AREA 1 DEBRIS TRAP

R:\MDW0867 - Clonaslee Flood Relief Scheme\8.0 Drawings\DG\0000 (Planning Application)\MDW0867-RPS-00-XX-DR-T-DG1000.dwg

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Scale: As Shown @ A1 ----- @ A3

Created on: 29/07/2024

Sheets: 04 of 06

Project: **CLONASLEE FLOOD RELIEF SCHEME**
**Planning Application**

Title: Figure 5-3
AREA 1 DEBRIS TRAP - CROSS SECTIONAL ELEVATION

File Identifier: MDW0867-RPS-00-XX-DR-T-DG1000.dwg

Drawing No.: *MDW0867-RPS-00-XX-DR-T-DG1004.dwg*

Status: S0

Rev: P01.03

### 5.2.1.2 Embankment

As discussed in **Section 5.3.1**, Brittas Wood includes a publicly accessible amenity trail which is used by walkers and cyclists from the local area. It is proposed to construct a flood relief embankment on a portion of this amenity trail. The proposed embankment will prevent increased water levels due to debris trap blockages from creating a flood risk. Its required extent is shown in **Figure 5-4**. A tree survey has been completed to inform the design of the embankment and to minimise tree removal. All trees that will be removed to accommodate the construction phase of the Proposed Scheme will be replaced once construction works are completed. Please see **Appendix 9-6 Biodiversity Management and Enhancement** plan for details on tree removal and replacement.

The key features of the embankment are the following:

- It is a trapezoidal structure composed of non-porous clay material;
- To minimise disturbance to the woodland vegetation, its footprint is within the curtilage of the existing amenity pathway;
- It will be 135 m in length with a maximum height above existing ground level of 0.8 m, and a maximum width of 6 m.
- An impermeable barrier must be built into the embankment to prevent seepage of water through and underneath the embankment. This will be achieved by constructing a concrete core, which will need to be excavated below the existing ground level;
- Pipelines associated with Uisce Éireann water supply boreholes are located within the footprint of the embankment. These pipelines will be excavated and backfilled with concrete. This will provide the cut-off described above and provide protection to the pipelines during construction of the embankment;
- The crest of the embankment will be paved to allow traffic (from Coillte, Uisce Éireann and private Landowner) to drive on top of the embankment and amenity users to walk/cycle along the embankment. The re-paved embankment will have a crest width of 3.00 m, and the side slopes of 1:3. It will merge into the existing ground level at each end i.e., there will be no perceivable step or ramp-up onto the embankment;
- The shoulder and side slopes of the embankment will be reinstated with the topsoil removed in preparation for the works and allowed to regrow naturally.

A ground penetrating radar (GPR) survey has been completed to provide the location of watermains in the trail pathway. These will be further verified by slit trenching prior to detailed design. Plan, Long Section and Cross sections of this embankment taken at three locations are shown in **Figure 5-4 and Figure 5-5** below. These include watermain locations, associated concrete protection and surface finishes.

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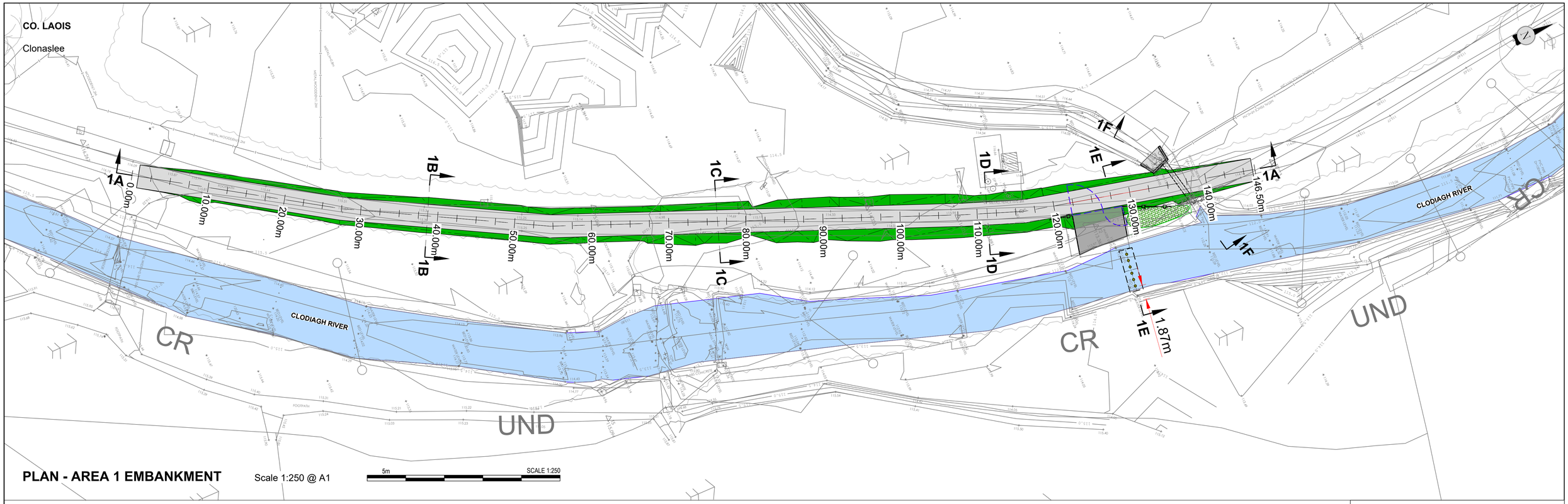


**PLAN - AREA 1 EMBANKMENT** Scale 1:250 @ A1

5m SCALE 1:250

**LEGEND - Area 1 Embankment**

- PROPOSED EMBANKMENT
- EXISTING 600mmØ PIPE / CULVERT
- PROPOSED GATES
- PROPOSED HEADWALL
- PROPOSED DEBRIS TRAP
- PROPOSED FENCING
- PROPOSED SLIPWAY
- PROPOSED VEGETATION / PLANTING AREA
- EXISTING RIVER

DATUM:
112.00m AOD

| CHAINAGE (m) | EMBANKMENT HEIGHT | EXISTING GROUND LEVELS | PROPOSED EMBANKMENT LEVELS (includes 150mm Surface Finish) |
|---|---|---|---|
| 0.00 | 0.126 | 116.037 | 116.163 |
| 2.50 | 0.225 | 115.931 | 116.156 |
| 5.00 | 0.290 | 115.848 | 116.138 |
| 7.50 | 0.313 | 115.807 | 116.120 |
| 10.00 | 0.327 | 115.775 | 116.102 |
| 12.50 | 0.337 | 115.747 | 116.084 |
| 15.00 | 0.348 | 115.719 | 116.066 |
| 17.50 | 0.361 | 115.687 | 116.048 |
| 20.00 | 0.374 | 115.656 | 116.030 |
| 22.50 | 0.388 | 115.625 | 116.013 |
| 25.00 | 0.401 | 115.594 | 115.995 |
| 27.50 | 0.426 | 115.551 | 115.977 |
| 30.00 | 0.454 | 115.505 | 115.959 |
| 32.50 | 0.482 | 115.459 | 115.941 |
| 35.00 | 0.511 | 115.412 | 115.923 |
| 37.50 | 0.516 | 115.389 | 115.905 |
| 40.00 | 0.515 | 115.372 | 115.887 |
| 42.50 | 0.520 | 115.349 | 115.869 |
| 45.00 | 0.529 | 115.322 | 115.851 |
| 47.50 | 0.538 | 115.295 | 115.833 |
| 50.00 | 0.554 | 115.261 | 115.815 |
| 52.50 | 0.572 | 115.221 | 115.793 |
| 55.00 | 0.567 | 115.181 | 115.748 |
| 57.50 | 0.547 | 115.156 | 115.703 |
| 60.00 | 0.544 | 115.114 | 115.658 |
| 62.50 | 0.537 | 115.076 | 115.612 |
| 65.00 | 0.530 | 115.038 | 115.567 |
| 67.50 | 0.546 | 114.977 | 115.522 |
| 70.00 | 0.567 | 114.910 | 115.477 |
| 72.50 | 0.591 | 114.841 | 115.432 |
| 75.00 | 0.614 | 114.773 | 115.387 |
| 77.50 | 0.635 | 114.707 | 115.342 |
| 80.00 | 0.655 | 114.641 | 115.297 |
| 82.50 | 0.676 | 114.576 | 115.251 |
| 85.00 | 0.707 | 114.499 | 115.206 |
| 87.50 | 0.762 | 114.399 | 115.161 |
| 90.00 | 0.805 | 114.311 | 115.116 |
| 92.50 | 0.839 | 114.231 | 115.071 |
| 95.00 | 0.887 | 114.139 | 115.026 |
| 97.50 | 0.909 | 114.072 | 114.981 |
| 100.00 | 0.904 | 114.032 | 114.935 |
| 102.50 | 0.893 | 113.998 | 114.890 |
| 105.00 | 0.879 | 113.966 | 114.845 |
| 107.50 | 0.860 | 113.940 | 114.800 |
| 110.00 | 0.842 | 113.914 | 114.756 |
| 112.50 | 0.823 | 113.889 | 114.712 |
| 115.00 | 0.796 | 113.871 | 114.667 |
| 117.50 | 0.765 | 113.857 | 114.622 |
| 120.00 | 0.712 | 113.865 | 114.577 |
| 122.50 | 0.657 | 113.875 | 114.532 |
| 125.00 | 0.605 | 113.881 | 114.486 |
| 127.50 | 0.553 | 113.888 | 114.441 |
| 130.00 | 0.502 | 113.894 | 114.396 |
| 132.50 | 0.449 | 113.902 | 114.351 |
| 135.00 | 0.326 | 113.980 | 114.306 |
| 137.50 | 0.202 | 114.059 | 114.261 |
| 140.00 | 0.098 | 114.118 | 114.217 |
| 142.50 | 0.014 | 114.158 | 114.172 |
| 145.00 | | 114.148 | |
| 146.50 | | | |

**LONG SECTION 1A - AREA 1 EMBANKMENT**
Scale: Horiz. 1:250, Vert. 1:50 @ A1

## SECTION - AREA 1 EMBANKMENT

Client

**Laois County Council**
Aras an Chontae, Portlaoise, Co, Laois

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| P01.01 | 29/07/24 | DB | BC | Work in Progress (WIP) | BC |

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Model File Identifier

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| Scale | As Shown @ A1<br>----- @ A3 |
| Created on | 29/07/2024 |
| Sheets | 02 of 06 |
| Project | **CLONASLEE FLOOD RELIEF SCHEME**<br>**Planning Application** |
| Title | Figure 5-4<br>AREA 1 EMBANKMENT -<br>PLAN AND LONG SECTION |
| File Identifier | MDW0867-RPS-00-XX-DR-T-DG1000.dwg |
| Drawing No. | *MDW0867-RPS-00-XX-DR-T-DG1002.dwg* |
| Status | S0 |
| Rev | P01.03 |

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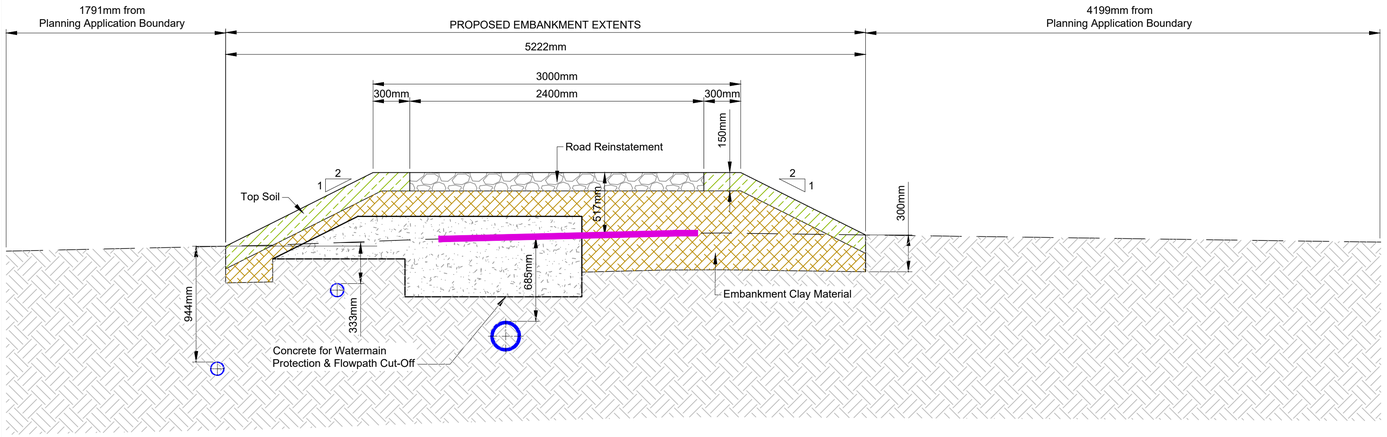
CO. LAOIS

Clonaslee - BRITTAS WOOD




**CROSS SECTION DETAIL 1B** Scale: 1:25 @ A1

**CROSS SECTION DETAILS KEY**

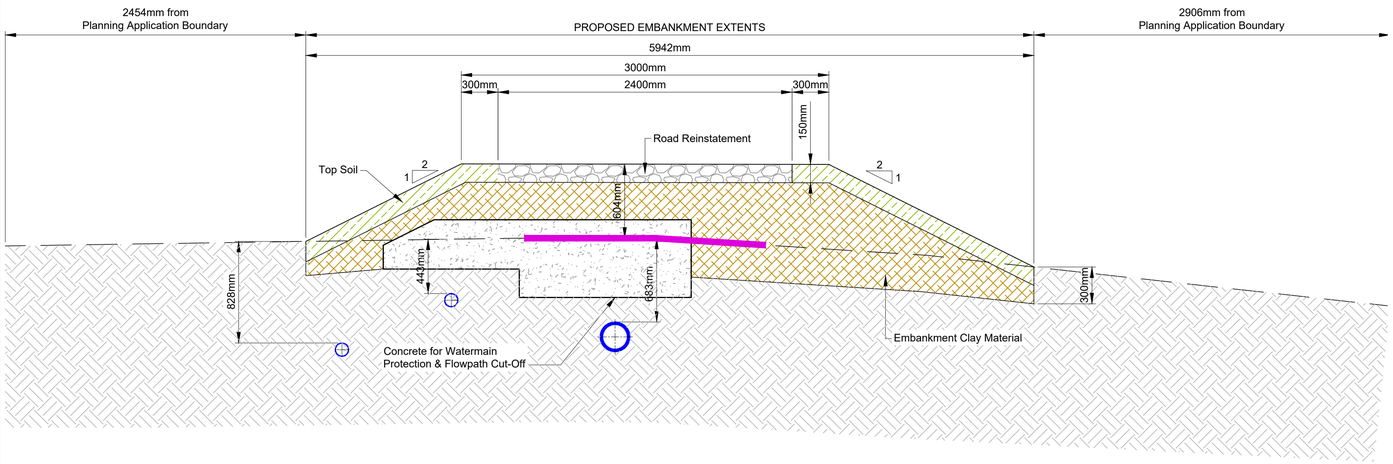
EXISTING GROUND LEVEL

EXISTING ROADWAY

EXISTING WATERMAIN *(GPR Survey)*

**NOTES:**

- Refer to Key Layout Plan -DG1001 for Site Layout Plan - Area 1

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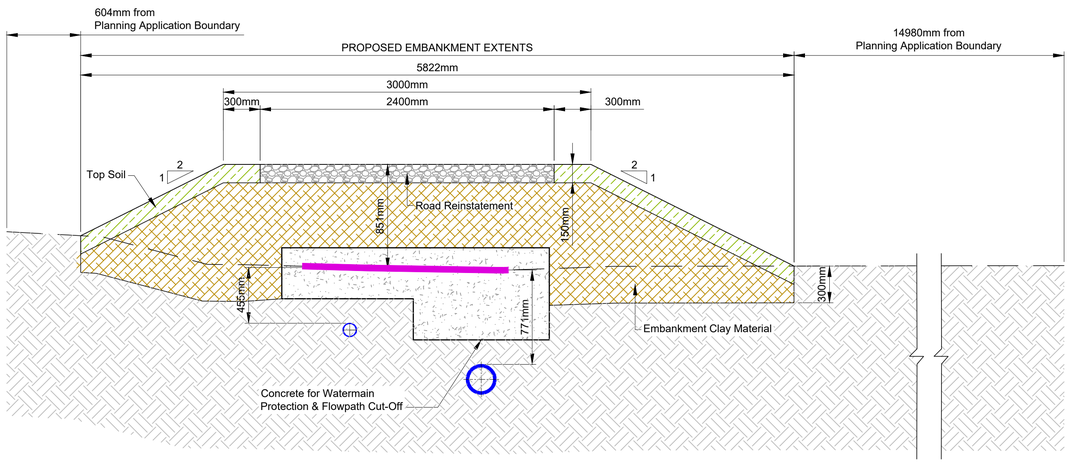


**CROSS SECTION DETAIL 1D** Scale: 1:25 @ A1

## SECTIONS - AREA 1 EMBANKMENT

Client

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| Rev | Date | Drn / Chk | Amendment / Issue | App |
|---|---|---|---|---|
| P01.03 | 01/10/24 | DB / BC | Work in Progress (WIP) | BC |
| P01.02 | 28/08/24 | DB / BC | Work in Progress (WIP) | BC |
| P01.01 | 29/07/24 | DB / BC | Work in Progress (WIP) | BC |

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Model File Identifier

Scale: 1:25 @ A1, 1:50 @ A3

Created on: 29/07/2024

Sheets: 03 of 06

Project: **CLONASLEE FLOOD RELIEF SCHEME**
**Planning Application**

Title: Figure 5-5
AREA 1 EMBANKMENT -
CROSS SECTION DETAILS

File Identifier: MDW0867-RPS-00-XX-DR-T-DG1000.dwg

Drawing No.: *MDW0867-RPS-00-XX-DR-T-DG1003.dwg*

Status: S0

Rev: P01.03

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### 5.2.1.3 Culvert Remediation

The Brittas Lake Tributary joins the River Clodiagh at the location shown in **Figure 5-6.** The Brittas Wood amenity trail crosses this small stream at that location via a culvert that is 600mm in diameter and 6.5m in length.

The culvert entrance has a history of blocking which can cause water to back up and overflow onto the Brittas trail pathway, before flowing down into Clonaslee village. To facilitate maintenance into the future and to prevent vegetation encroaching on the culvert inlet, a headwall will be installed on the upstream side.

The key features of the proposed works are as follows:

- Maintaining the existing 600mm pipeline in place thereby avoiding disturbance to the Clodiagh riverbank;
- Provide maintenance access to the upstream inlet to the culvert via localised vegetation removal; and
- Provide a new headwall on the inlet to the culvert to facilitate cleaning and maintenance into the future.

A precast concrete headwall available on the market will be used as shown in **Figure 5-7.** Culvert headwalls require edge protection. In keeping with the character of the area, a timber post and rail fence will be used.

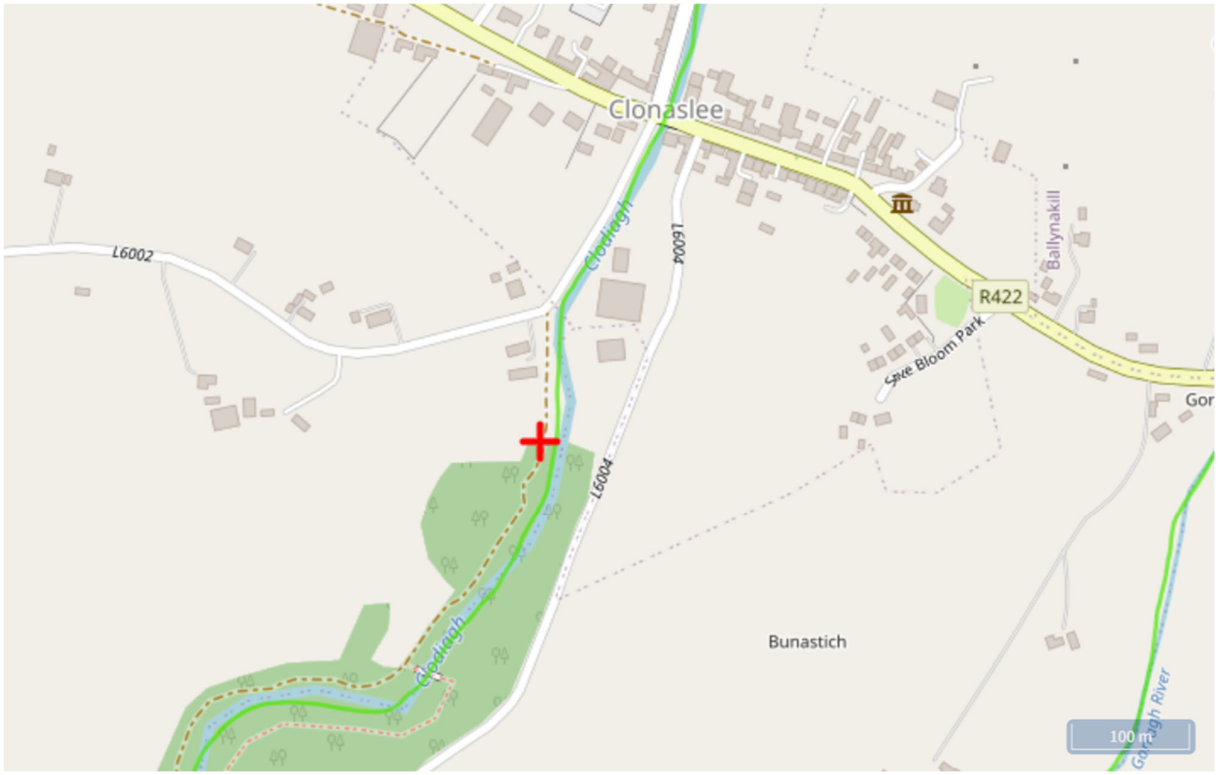


**Figure 5-6: Location where the Brittas Lake Tributary joins the Clodiagh**

The culvert will be designed and installed in accordance with the requirements of the OPW and IFI. It is possible the stream is utilised intermittently by aquatic fauna. Therefore the culvert inlet improvement will not create any barriers against the passage of aquatic fauna. The design will be discussed with IFI before finalising.

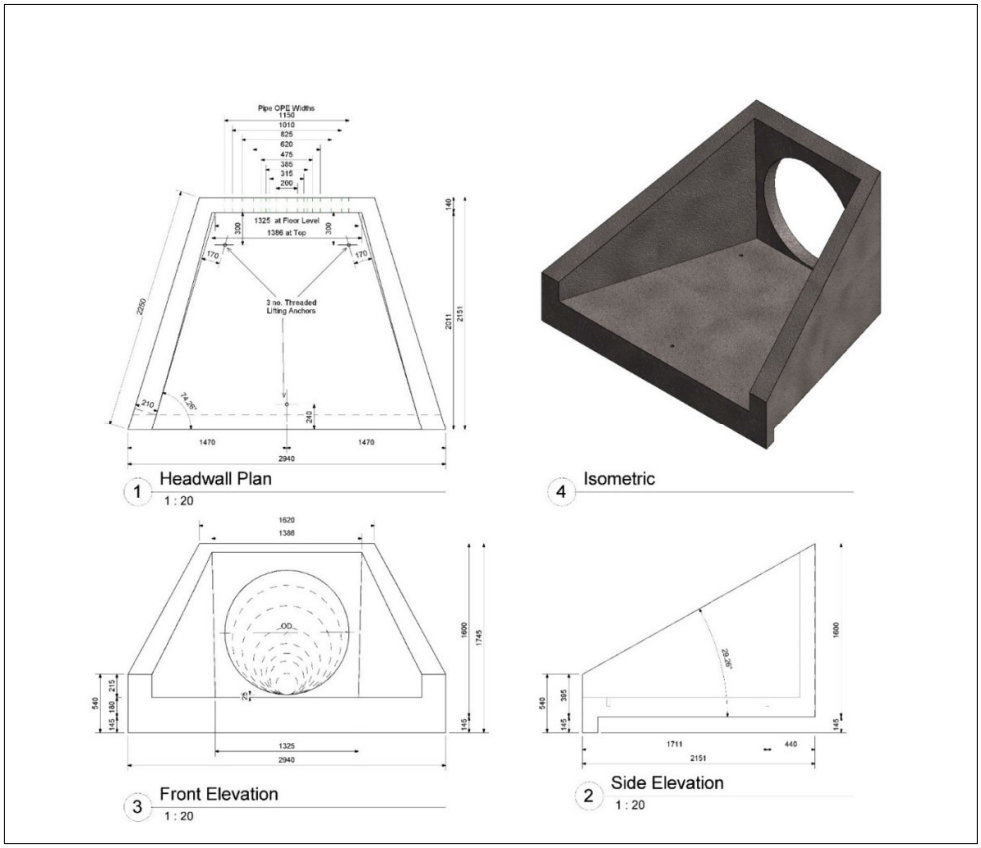


**Figure 5-7: Precast concrete headwall type to be installed on the inlet to the culvert**

### 5.2.1.4 Area 1 Supporting Temporary Infrastructure and Site Enabling Works

#### 5.2.1.4.1 Temporary Construction Compound

A temporary construction compound is needed in the vicinity of the Brittas Wood trail head entrance for welfare units, parking, set down of deliveries and storage of imported embankment material. The agricultural field north of the Brittas Wood trail head entrance has been selected for the location of this temporary construction compound (Compound A). A standard layout of this compound is shown in **Figure 5-8.** The existing entrance into this field will be widened to facilitate safe access and egress of Heavy Vehicles (HVs). The temporary construction compound field and entrance accommodating works will be reinstated to its original form post construction.

CO. LAOIS

Clonaslee

**LEGEND - Site Compound**

PLANNING APPLICATION BOUNDARY

PROPOSED SITE COMPOUND (FENCED)

PROPOSED ACCESS GATE

EXISTING RIVER

EXISTING CONTOURS 114.0

32.07m

33.06m

34.80m

50.67m

2.56m

ENTRANCE TO BE WIDENED & REINSTATED, FOLLOWING COMPLETITION

**SHEET INDEX** *Not to Scale*

- DG3001-01
- DG2001-02
- DG2001-01
- DG1001-02
- DG1001-01

**ORDNANCE SURVEY SHEET NUMBERS:**

- 3707 *(1:5,000)*

**NOTES:**

- Refer to Key Layout Plan -DG1000 for Key Layout Plan

10m SCALE 1:500

Client

**Laois County Council**
Aras an Chontae, Portlaoise, Co, Laois

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| P02 | 25/10/24 | BR BC | Issue for Review & Comment | BC |

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Model File Identifier

| | |
|---|---|
| Scale | 1:500 @ A1<br>1:1,000 @ A3 |
| Created on | 25/10/2024 |
| Sheets | 02 of 02 |
| Project | **CLONASLEE FLOOD RELIEF SCHEME**<br>**Planning Application** |
| Title | Figure 5-8<br>SITE LAYOUT PLAN -<br>CONSTRUCTION SITE COMPOUND A |
| File Identifier | MDW0867-RPS-00-XX-DR-T-DG1001-02.dwg |
| Status | S3 |
| Rev | P03 |

The sequence for establishing the compound is described further in **Section 5.5.3**.

#### 5.2.1.4.2 Vegetation Removal and Replanting

Tree felling will be required within and around the construction footprint in Area 1 and also to accommodate machine movements along the amenity path. A total of 9 no trees are required to be removed, and it is proposed to cut these trees down to stump level, where possible; thus, minimising ground disturbance. The felling activities required as part of the Proposed Scheme will be the subject of a Limited Felling Licence (LFL) application to the Forest Service in accordance with the Forestry Act 2014 and the Forestry Regulations 2017 (SI 191/2017).

It is proposed to replant by hand all trees that will be removed for these works on a like for like basis within Area 1 to accommodate the Proposed Scheme. The manner and location of this replanting will be undertaken in agreement with Coillte.

#### 5.2.1.4.3 Utilities Diversion and Protection

The protection of Uisce Éireann (UÉ) infrastructure in Area 1 which is associated with the Clonalsee Wastewater Treatment plant (Area 3) is an important objective for the design, both during and the construction and operational phase of the Proposed Scheme. Please see **Section 5.5.7** for details on how utilities will be protected or diverted during the construction phase of the Proposed Scheme.

### 5.2.2 Area 2 – Chapel Street

The most prominent element of the Proposed Scheme is the works to the existing wall along Chapel Street in Clonaslee Village. This wall also extends into private property as it curves around the river bend. This wall acts as a flood defence, but its vulnerability is evident through records of past flood events in this location.

The Proposed Scheme builds onto the existing wall with a reinforced concrete ‘secondary’ wall. This will have the effect of widening the wall by approximately 0.5 m. This width includes an allowance for stone cladding to maintain the appearance of the wall.

During high water levels, one might expect to see water from the river backing up through the surface water drainage system and surcharging manholes and gullies. However, surveys have shown that the road drainage does not discharge directly to the Clodiagh, instead flowing to field drainage ditches to the north of the village. If surface water drainage lines are found discharging directly to the river, they will be installed with a non-return valve, to ensure floodwater does not back-up onto the street.

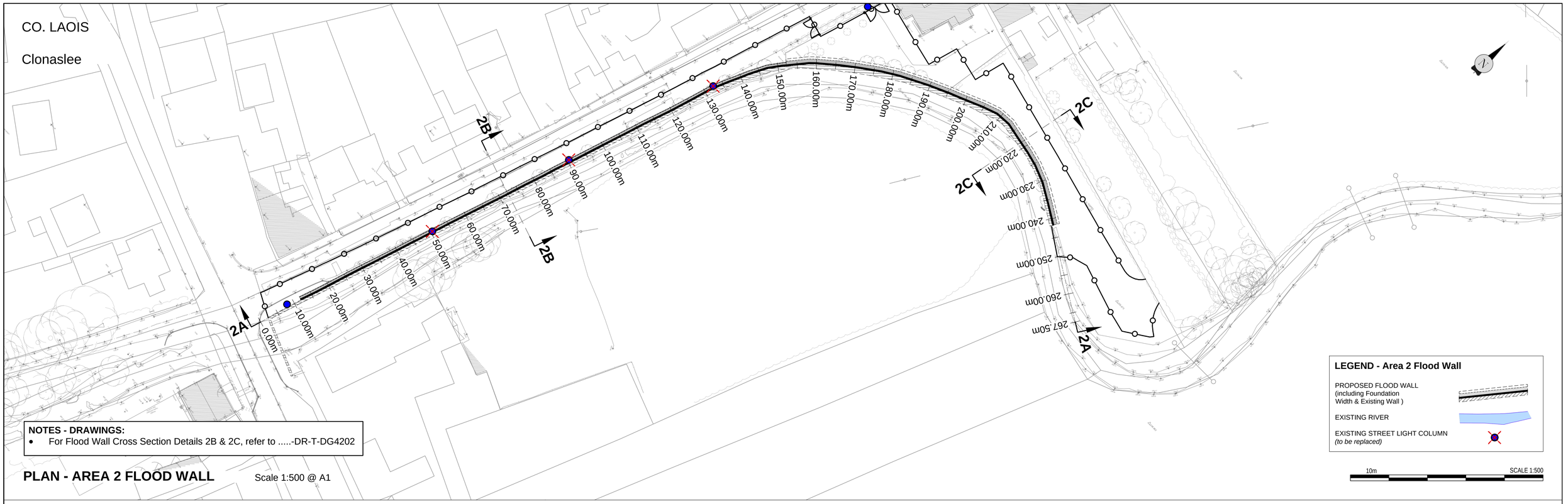
#### 5.2.2.1 Flood Defence Wall

As mentioned in **Section 5.3.2**, the existing wall structure, which is currently acting as an informal flood defence, will be retained and become part of the proposed flood defence wall. Remediation will be required on the existing wall, consisting of repointing the stonework. The main element of the wall work will be completed on the roadside of the existing wall.

Cross sections of the wall (A-A on Chapel Street and B-B in Private Property) are shown in **Figure 5-9 and Figure 5-10**. The total wall length is approximately 235m; 135m along Chapel Street and 100m in private property. It should be noted that the existing wall has sufficient height for the flood defence. The existing wall’s height ranges from 0.8 m to 1.2m from the existing adjacent road level; 0.5 m to 0.7 m higher than the predicted floodwater level. The Proposed Scheme therefore does not need to increase the existing wall height. To address the risk of water seeping underneath the wall, a trench will be dug to below bed level and backfilled with non-porous concrete.

CO. LAOIS

Clonaslee




**NOTES - DRAWINGS:**

- For Flood Wall Cross Section Details 2B & 2C, refer to .....-DR-T-DG4202

**PLAN - AREA 2 FLOOD WALL** Scale 1:500 @ A1

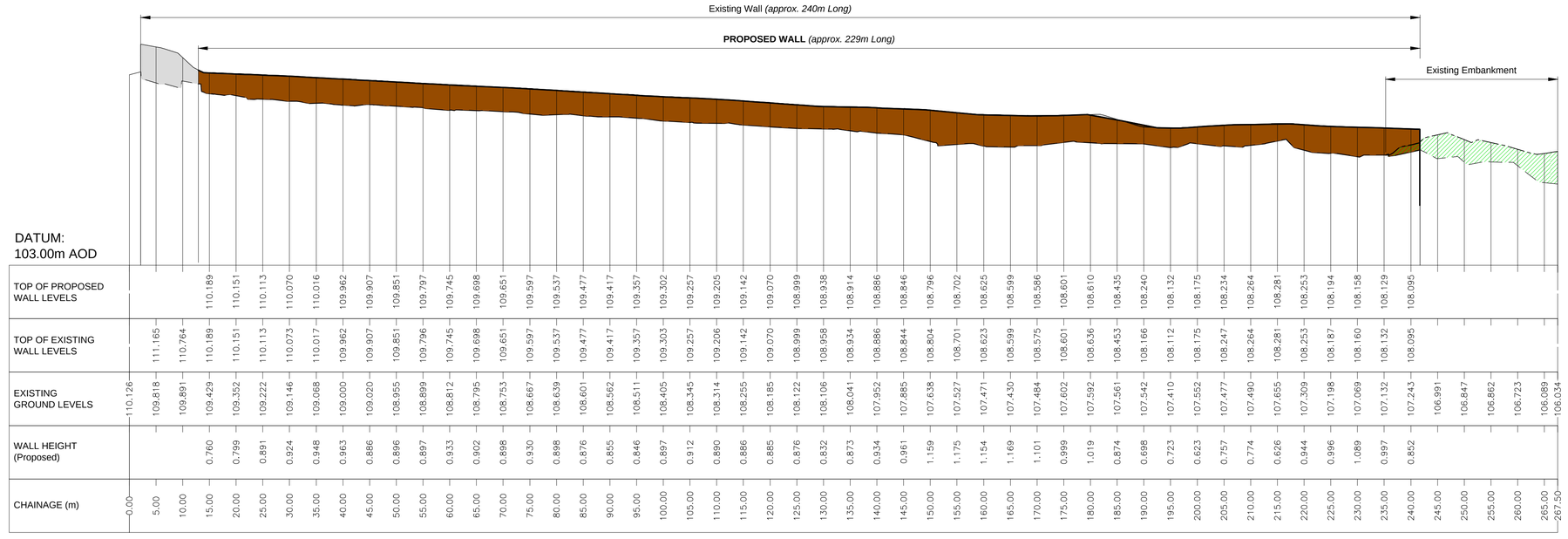
**LEGEND - Area 2 Flood Wall**

PROPOSED FLOOD WALL (including Foundation Width & Existing Wall )

EXISTING RIVER

EXISTING STREET LIGHT COLUMN *(to be replaced)*

10m SCALE 1:500




**LONG SECTION 2A - AREA 2 WALLS**

Scale: Horiz. 1:1000, Vert. 1:200 @ A1

**SECTION - AREA 2 FLOOD WALL**

Client

**Laois County Council**
Aras an Chontae, Portlaoise, Co, Laois

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| P02 | 25/10/24 | DB / BC | Issue for Review & Comment | BC |
| P01 | 16/08/24 | DB / BC | Issue for Review & Comment | BC |

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Model File Identifier

Scale: As Shown @ A1 ----- @ A3

Created on: 29/07/2024

Sheets: 01 of 02

Project: **CLONASLEE FLOOD RELIEF SCHEME**
**Planning Application**

Title: Figure 5-9
AREA 2 FLOOD WALL -
PLAN AND LONG SECTION

File Identifier: MDW0867-RPS-00-XX-DR-T-DG4200 Series.dwg

Drawing No.: *MDW0867-RPS-00-XX-DR-T-DG4201.dwg*

Status: S5

Rev: P03

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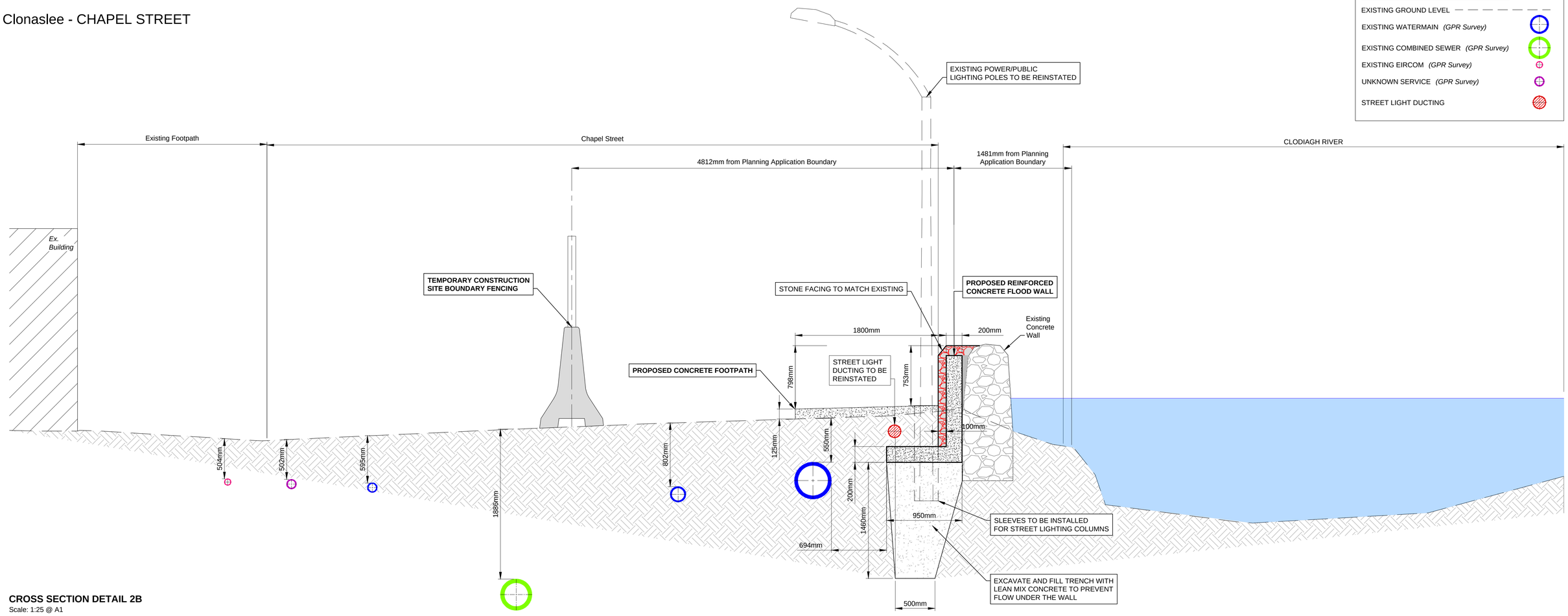
**CYAL50441412**

CO. LAOIS

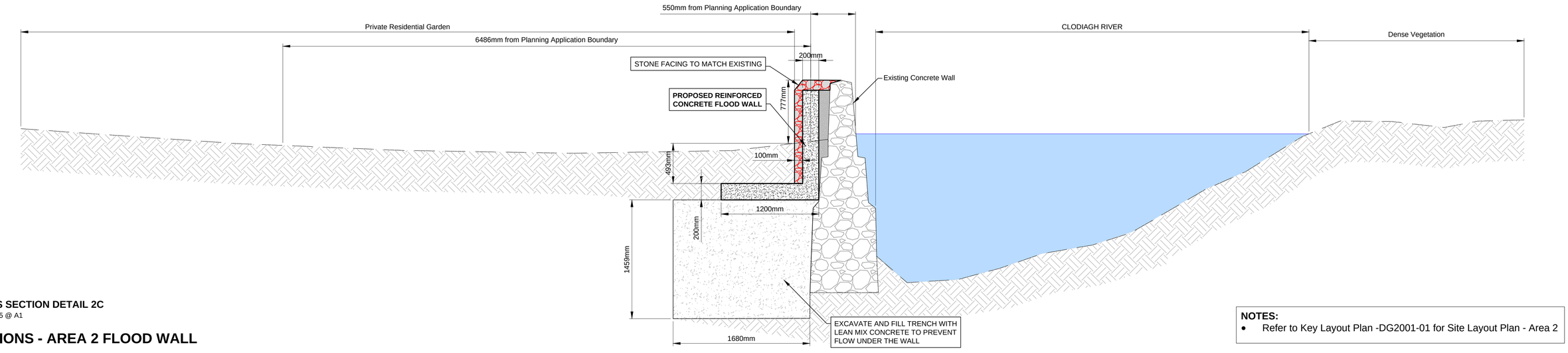
Clonaslee - CHAPEL STREET

**CROSS SECTION DETAILS KEY**

- EXISTING GROUND LEVEL
- EXISTING WATERMAIN *(GPR Survey)*
- EXISTING COMBINED SEWER *(GPR Survey)*
- EXISTING EIRCOM *(GPR Survey)*
- UNKNOWN SERVICE *(GPR Survey)*
- STREET LIGHT DUCTING




**CROSS SECTION DETAIL 2B**
Scale: 1:25 @ A1




**CROSS SECTION DETAIL 2C**
Scale: 1:25 @ A1

## SECTIONS - AREA 2 FLOOD WALL

**NOTES:**
- Refer to Key Layout Plan -DG2001-01 for Site Layout Plan - Area 2

Client

**Laois County Council**
Aras an Chontae, Portlaoise, Co, Laois

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| P02 | 25/10/24 | DB | BC | Issue for Review & Comment | BC |
| P01 | 16/08/24 | DB | BC | Issue for Review & Comment | BC |

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Model File Identifier

| | |
|---|---|
| Scale | 1:25 @ A1<br>1:50 @ A3 |
| Created on | 29/07/2024 |
| Sheets | 02 of 02 |
| Project | **CLONASLEE FLOOD RELIEF SCHEME**<br>**Planning Application** |
| Title | Figure 5-10<br>AREA 2 FLOOD WALL -<br>CROSS SECTION DETAILS |
| File Identifier | MDW0867-RPS-00-XX-DR-T-DG4200 Series.dwg |
| Drawing No. | *MDW0867-RPS-00-XX-DR-T-DG4202.dwg* |
| Status | S5 |
| Rev | P03 |

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CYAL50441412

### 5.2.2.2 Area 2 Supporting Temporary Infrastructure and Site Enabling Works

#### 5.2.2.2.1 Temporary Construction Compound

The construction site area is limited due to the fact that it is on a public road and within a private garden. For this reason, a construction compound is required and will be located in the field immediately to the north of the works area as shown in **Figure 5-17.**

The sequence for establishing the compound is described further in **Section 5.4.3**. This field has a medium voltage overhead powerline passing through it. Best practice safety control measures will be put in place when working in the vicinity of overhead power lines. The option to divert the powerline will also be discussed and agreed with the ESB in advance of any works within this area.

#### 5.2.2.2.2 Vegetation Removal and Replanting

Tree felling and hedgerow removal will be required within and around the construction footprint in Area 2, namely along Chapel St and within the garden of a private landowner. 23 no of trees are required to be removed. It is proposed to cut these trees down to stump level, where possible; thus, minimising ground disturbance. The felling activities within Brittas Wood which are required as part of the Proposed Scheme will be the subject of a Limited Felling Licence (LFL) application to the Forest Service in accordance with the Forestry Act 2014 and the Forestry Regulations 2017 (SI 191/2017). It is proposed to replant by hand all trees that will be removed in Area 2 on a like for like basis to accommodate the Proposed Scheme. The manner and location of this replanting will be undertaken in agreement with the third-party landowner and Local Authority.

#### 5.2.2.2.3 Utilities Diversion and Protection

In preparation for construction in Area 2, the area of wall construction along the roadside will have to be cleared of all utilities before commencing excavations for the wall foundations. Please see **Section 5.5.7** for details on utilities diversions and protection in this area.

CO. LAOIS

Clonaslee

## LEGEND - SITE COMPOUND

PROPOSED SITE COMPOUND (FENCED)

VEHICLE VISIBILTY SPLAY

EXISTING RIVER


R:\MDW0867 - Clonaslee Flood Relief Scheme\8.0 Drawings\DG\0000 (Planning Application)\MDW0867-RPS-00-XX-DR-T-DG5000 Series.dwg

Client

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| P02 | 25/10/24 | DB / BC | Issue for Review & Comment | BC |

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Model File Identifier

Scale: 1:500 @ A1, 1:1,000 @ A3

Created on: 25/10/2024

Sheets: 03 of 04

Project: **CLONASLEE FLOOD RELIEF SCHEME**
**Planning Application**

Title: Figure 5-11
CONSTRUCTION SITE COMPOUND B
-SITE LAYOUT (with Visibility Sightlines)

File Identifier: MDW0867-RPS-00-XX-DR-T-DG5000 Series.dwg

Drawing No.: *MDW0867-RPS-00-XX-DR-T-DG5003.dwg*

Status: S5

Rev: P03

**CYAL50441412**

### 5.2.3 Area 3 – Tullamore Road and ICW

The works to be carried out in Area 3 – Tullamore Road and ICW include an embankment and a retaining wall as shown in **Figure 5-12,** located along the western and eastern banks of the Clodiagh River, downstream of Clonaslee Village.

The proposed embankment area is located in an agricultural field to the west of the River Clodiagh and the proposed wall is located within the ICW property to the east of the River Clodiagh.

This construction site to the west of the Clodiagh River will be of sufficient size to have a welfare unit and some storage space for stripped topsoil and embankment material. Of key consideration is the safe access and egress onto the adjacent road. Some hedgerow removal will be required to allow construction traffic to utilise the existing adjacent junction layout. This hedgerow will be reinstated post construction in agreement with the third party landowner.

Storage area available in the embankment construction site will be used for wall construction material. Material will not be stored within the ICW site as the operation and maintenance of the ICW must continue during the works period.

CO. LAOIS

Clonaslee

Sewage Works

FF

CF

BALL

UND

**LEGEND - Area 3 Embankment**

- PLANNING APPLICATION BOUNDARY
- PLANNING EMBANKMENT
- PROPOSED WALL (including Footing Width)
- EXISTING RIVER

3.72m
6.72m
132.50m
130.00m
5.13m
120.00m
4.51m
110.00m
100.00m
4.00m
90.00m
80.00m
8.16m
70.00m
1.57m
5.08m
2.27m
60.00m
50.00m
2.04m
40.00m
30.00m
20.00m
10.00m
31.26m
3.03m
0.00m
70.00m
1.23m
11.77m
60.00m
1.28m
50.00m
40.00m
30.00m
20.00m
10.00m
0.00m
15.57m
21.30m

**NOTES - DRAWINGS:**

- For Embankment & Wall Plan & Long Sections, refer to .....-DR-T-DG3002.
- For Embankment & Wall Cross Section, refer to .....-DR-T-DG3003.

**ORDNANCE SURVEY SHEET NUMBERS:**

- 3649, 3650 *(1:500)*

**NOTES:**

- Refer to Key Layout Plan -DG0002 for Site Layout Details.

5m SCALE 1:250

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|---|---|---|---|---|---|
| P01.03 | 01/10/24 | DB | BC | Work in Progress (WIP) | BC |
| P01.02 | 28/08/24 | DB | BC | Work in Progress (WIP) | BC |
| P01.01 | 29/07/24 | DB | BC | Work in Progress (WIP) | BC |

A TETRA TECH COMPANY

Model File Identifier

Scale: 1:250 @ A1, 1:500 @ A3

Created on: 08/08/2024

Sheets: 02 of 03

Project: **CLONASLEE FLOOD RELIEF SCHEME**
**Planning Application**

Title: Figure 5-12
SITE LAYOUT PLAN - AREA 3

File Identifier: MDW0867-RPS-00-XX-DR-T-DG3000.dwg

Status: S0

Rev: S01.03

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#### 5.2.3.1 Embankment

The proposed embankment in Area 3 runs parallel to the Clodiagh River and Tullamore Road, west of existing embankment. It is positioned to avoid the existing mature treeline along the riverbank. The key features of the embankment are:

- The embankment will be offset from the existing embankment and treeline on the left bank of the Clodiagh River and will provide a secondary line of defence;
- It will be 130 m in length with a maximum width of 7.5 m;
- The inlet pipe to the ICW will pass under the embankment at right angles;
- The embankment will tie into the side slope of the road to the north of Area 3;
- The design level of the embankment is 0.5 m above the predicted Flood Water Level in the 1% AEP event, giving it an average height of 0.8 m above existing ground level;
- Its core will consist of non-porous clay material and extend 1m below ground level to prevent a flow path underneath the embankment;
- It will have a crest with of 2 m and side slopes of 1 in 3; and
- The embankment will be topsoil and grass seeded and fenced off on its western side to prevent livestock erosion.

#### 5.2.3.2 Flood Defence Wall

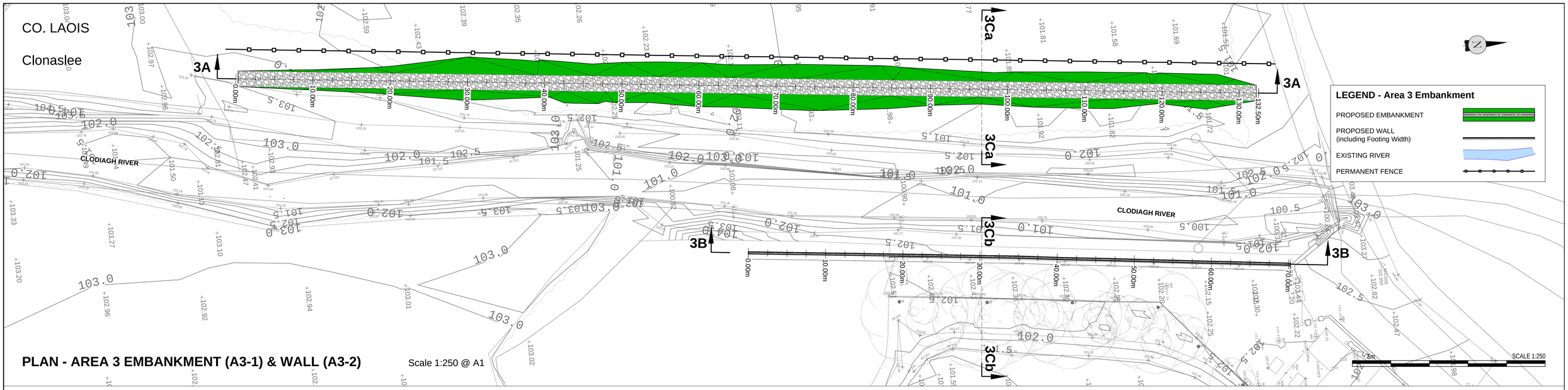
The wall will be constructed within the Uisce Éireann ICW grounds (refer to **Figure 5-13**). Key features of the wall are as follows:

- A reinforced concrete wall, 70 m in length and approximately 0.6 m in height;
- The proposed wall extends below ground by 0.6 m to prevent a flow path underneath the wall;
- The proposed wall is L-shaped, is reinforced with concrete and has a 1 m wide footing;
- The proposed wall has a shuttered concrete finish; and
- The design level of the proposed wall is 0.3 m above the predicted Flood Water Level in the 1% AEP event, giving it an average height of 0.6 m above existing ground level.

Plan, long sections and cross sections of the Area 3 defences are shown in the figures below.

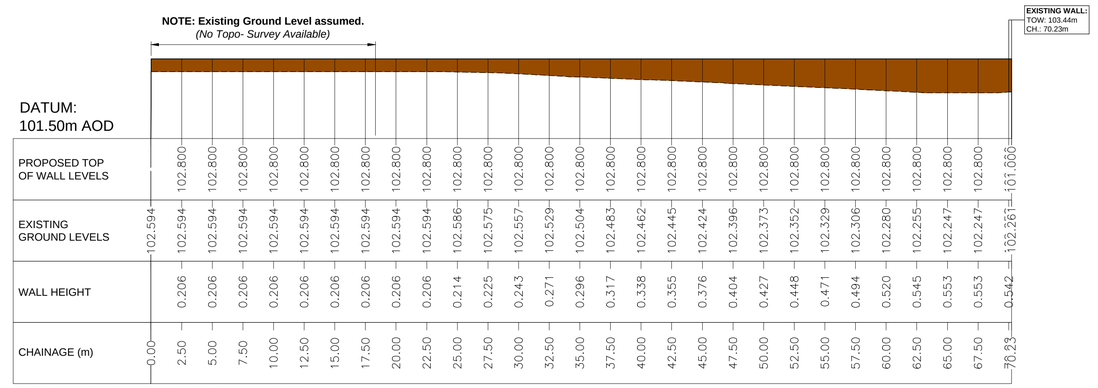
CO. LAOIS

Clonaslee

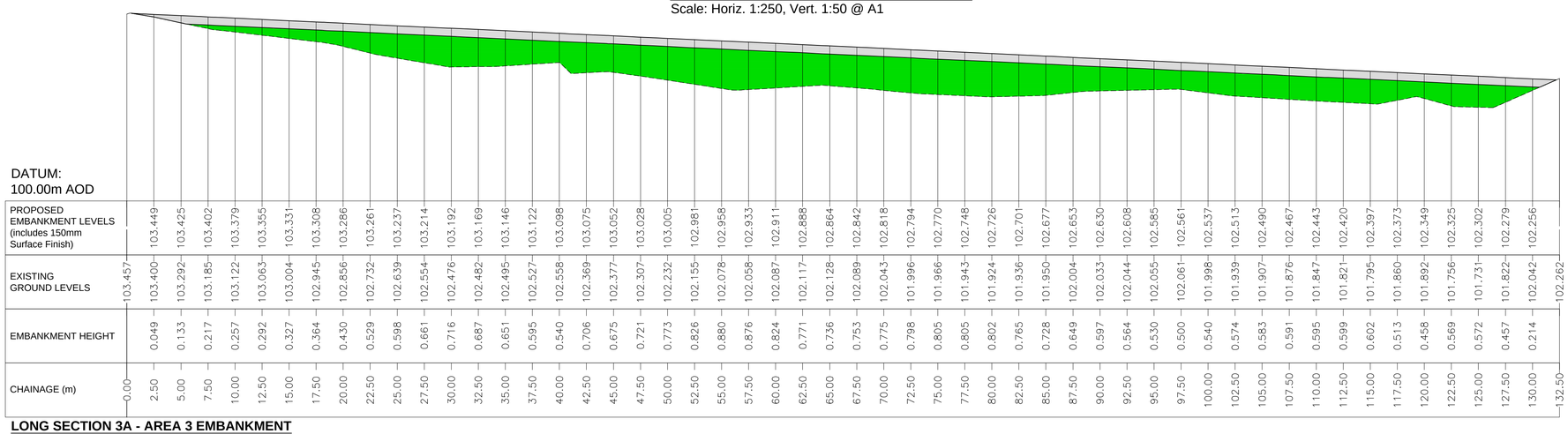



**PLAN - AREA 3 EMBANKMENT (A3-1) & WALL (A3-2)** Scale 1:250 @ A1

## SECTIONS - AREA 3
## EMBANKMENT (A3-1) & WALL (A3-2)




**LONG SECTION 3B - AREA 3 PROPOSED WALL**
Scale: Horiz. 1:250, Vert. 1:50 @ A1




**LONG SECTION 3A - AREA 3 EMBANKMENT**
Scale: Horiz. 1:250, Vert. 1:50 @ A1

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Client

**Laois County Council**
Aras an Chontae, Portlaoise, Co, Laois

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| Rev | Date | Drn | Chk | Amendment / Issue | App |
|---|---|---|---|---|---|
| P03 | 11/02/25 | DB | BC | Suitable for Review & Comment (PLANNING APPLICATION) | BC |
| P02 | 25/10/24 | DB | BC | Issue for Review & Comment | BC |
| P01 | 16/08/24 | DB | BC | Issue for Review & Comment | BC |

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Model File Identifier

| | |
|---|---|
| Scale | 1:250 @ A1<br>1:500 @ A3 |
| Created on | 08/08/2024 |
| Sheets | 01 of 02 |
| Project | **CLONASLEE FLOOD RELIEF SCHEME**<br>**Planning Application** |
| Title | Figure 5-13<br>AREA 3 EMBANKMENT & WALL<br>- PLAN AND LONG SECTIONS |
| File Identifier | MDW0867-RPS-00-XX-DR-T-DG4300 Series.dwg |
| Drawing No. | *MDW0867-RPS-00-XX-DR-T-DG4301.dwg* |
| Status | S5 |
| Rev | P03 |

**CYAL50441412**

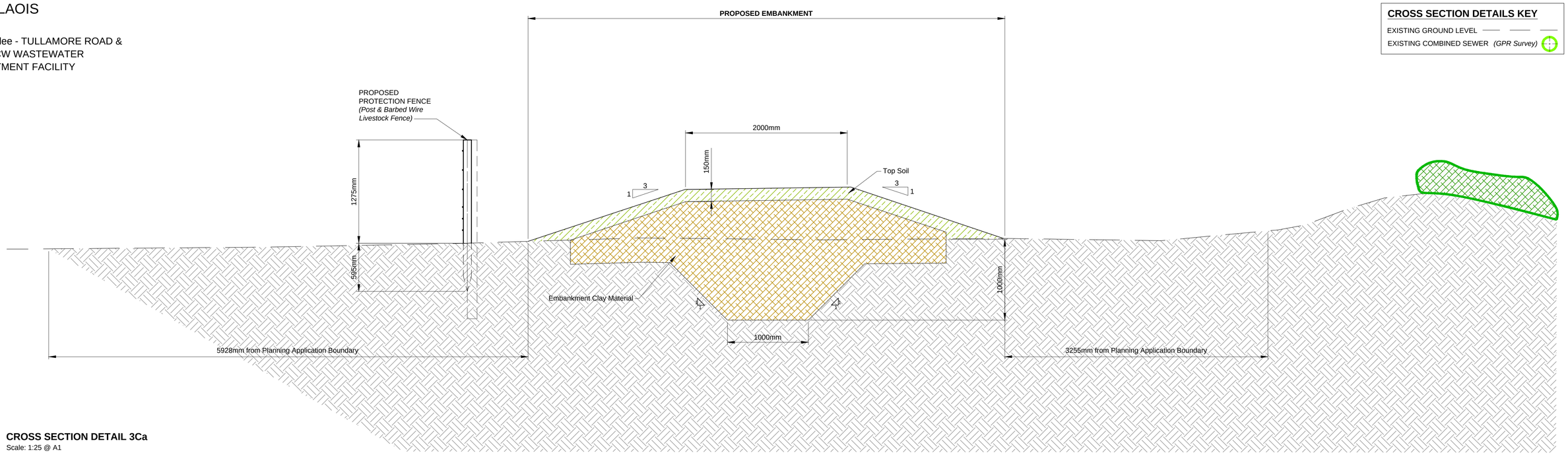
CO. LAOIS

Clonaslee - TULLAMORE ROAD &
THE ICW WASTEWATER
TREATMENT FACILITY

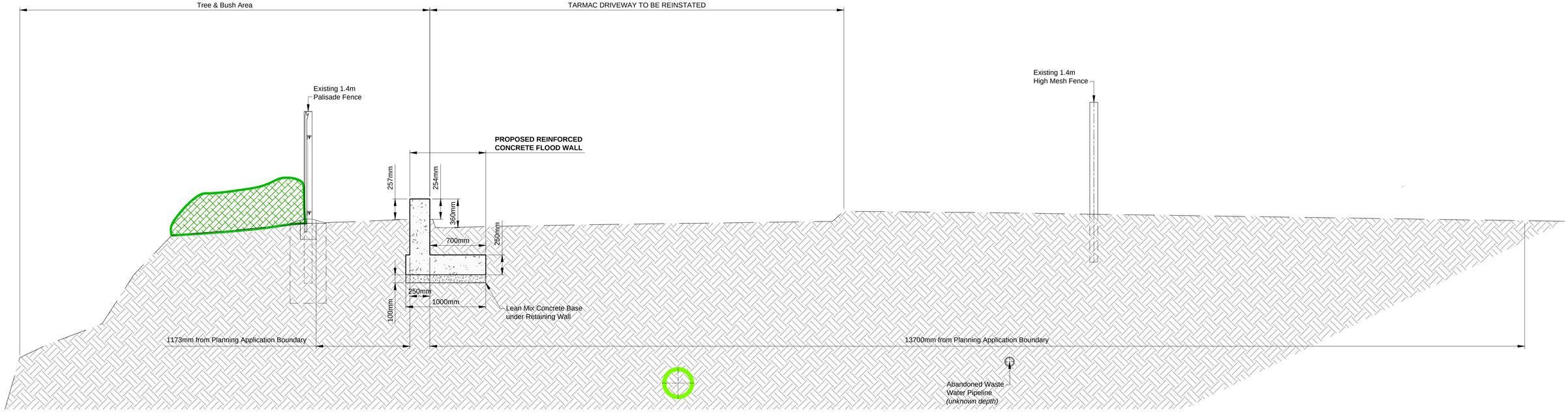
**CROSS SECTION DETAILS KEY**

EXISTING GROUND LEVEL

EXISTING COMBINED SEWER *(GPR Survey)*




**CROSS SECTION DETAIL 3Ca**
Scale: 1:25 @ A1




**CROSS SECTION DETAIL 3Cb**
Scale: 1:25 @ A1

**NOTES:**
- Refer to Key Layout Plan -DG3000-01 for Site Layout Plan - Area 3

## SECTION - AREA 3 EMBANKMENT & WALL

Client

**Laois County Council**
Aras an Chontae, Portlaoise, Co, Laois

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| Rev | Date | Drn | Chk | Amendment / Issue | App |
|---|---|---|---|---|---|
| P03 | 11/02/25 | DB | BC | Suitable for Review & Comment (PLANNING APPLICATION) | BC |
| P02 | 25/10/24 | DB | BC | Issue for Review & Comment | BC |
| P01 | 16/08/24 | DB | BC | Issue for Review & Comment | BC |

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Model File Identifier

Scale: 1:25 @ A1, 1:50 @ A3

Created on: 08/08/2024

Sheets: 02 of 02

Project: **CLONASLEE FLOOD RELIEF SCHEME**
**Planning Application**

Title: Figure 5-14
AREA 3 EMBANKMENT & WALL
- CROSS SECTION DETAIL

File Identifier: MDW0867-RPS-00-XX-DR-T-DG4300 Series.dwg

Drawing No.: *MDW0867-RPS-00-XX-DR-T-DG4302.dwg*

Status: S5

Rev: P03

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**CYAL50441412**

#### 5.2.3.3 Area 3 Supporting Temporary Infrastructure and Site Enabling Works

In preparation for construction in this area, some enabling works are required. The construction site is located in on pastoral land adjacent to a narrow straight section of local road (Tullamore Road), with vegetation lining the road on either side. Consideration will be given to the ICW wastewater treatment area, its incoming pipelines and associated infrastructure.

##### 5.2.3.3.1 Temporary Construction Compound

Temporary construction compound B will be the main supporting compound for Area 3. Please see Section 5.3.2.2.1 for details on location and standard layout. Construction methodology is detailed in Section 5.5.3.

##### 5.2.3.3.2 Vegetation Removal and Replanting

Tree felling and vegetation removal will be required within and around the construction footprint in Area 3. One tree and some hedgerow/bushes are required to be removed. It is proposed to cut these trees down to stump level, where possible; thus, minimising ground disturbance where possible. The felling activities required as part of the Proposed Scheme will be the subject of a Limited Felling Licence (LFL) application to the Forest Service in accordance with the Forestry Act 2014 and the Forestry Regulations 2017 (SI 191/2017).

It is proposed to replant by hand all trees that will be removed for these works on a like for like basis within Area 3. The manner and location of this replanting will be undertaken in agreement with third party landowners and Uisce Éireann.

### 5.2.4 Summary of Proposed Physical Works

**Table 5-3** contains a summary of all proposed flood defence elements to be delivered under the Clonaslee Flood Relief Scheme.

**Table 5-3: Proposed Works**

| Area | Location | Emerging preferred option description | Dimensions | Materials |
|---|---|---|---|---|
| Area 1 | Brittas Loop Walk path | New embankment | 135m x 3m x 0.80m (L x W x H) 1:3 slope | Impermeable Clay |
| | | Debris Trap | 7.0m x 3.5m x 1.2m (L x W x D) | Concrete |
| | | Culvert Headwall | 3m x 2m x 1.6m ((L x W x H)) | Concrete |
| Area 2 | Along Chapel Street/ landowner boundary | Bolstering existing stone wall | 235m x 0.50m x 1.5m (L x W x H) | Reinforce Concrete Stone finish |
| Area 3 | Tullamore Road, left bank field upstream of ICW access bridge | New embankment | 140m x 2m x 0.77m (L x W x H) 1:3 slope | Impermeable Clay |
| | Irish Water ICW, right bank upstream of entrance to ICW | New retaining wall | 70m x 0.25m x 0.95m (L x W x H) | Reinforce Concrete |

### 5.2.5 Freeboard and Resilience to Climate Change

The objective of the Proposed Scheme is to design for current predicted flooding and make sure that the scheme is adaptable for climate change. To assess the possible future upgrades that may be required to accommodate climate change, flood modelling has been carried out for two standard climate change scenarios:

- The Mid-Range Future Scenario (MRFS) represents the central projections for the impact of climate and other future catchment changes (such as urbanisation and land-use changes), on Flood Risk

Management in Ireland. Peak flows are anticipated to increase by 20% under the Mid-Range Future Scenarios.

- The High-End Future Scenario (HEFS) represents projections at the high end of what could happen if the worst climate and catchment changes are realised. For the HEF Scenarios, peak flows are projected to increase by 30%.

A comparative analysis of flood water level increments across both scenarios has been carried out for Area 1, 2 and 3 and each defence element within Area 1,2, and 3, with the Proposed Scheme incorporating allowances for freeboard. Freeboard is typically applied to compensate for the unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood, such as uncertainty of the effect of bridges, hydrological uncertainty and uncertainty in roughness values applied to the model. Freeboard allowances are set as per the criteria in **Table 5-4**. As demonstrated in **Table 5-4**, the proposed defence heights will cater for the High-End Future Climate Change Scenario, albeit with a reduced freeboard.

**Table 5-4: Freeboard Criteria**

| Location | Proposed Defences | Design Freeboard | Reduction in current Freeboard when peak flow is increased by 30% under Climate Change HEFS |
|---|---|---|---|
| Area 1 - Brittas Wood | Embankment | Freeboard of 0.50m for the current 1% AEP | Freeboard reduced to 0.23m in the HEFS |
| Area 2 - Chapel Street | Flood Wall | Minimum Freeboard requirement of 0.30m for the current 1% AEP<br>Building to the existing wall height provides a freeboard of over 0.6 m | Freeboard reduced to 0.55m in the HEFS |
| Area 3 - Tullamore Rd | Embankment | Freeboard of 0.50m for the current 1% AEP | Freeboard reduced to 0.34m in the HEFS |
| Area 3 - Tullamore Rd | Flood wall | Freeboard of 0.30m for the current 1% AEP | Freeboard reduced to 0.14m in the HEFS |

## 5.3 Construction Phase – Specific Methodologies

This section details the construction methodologies of the flood defence elements proposed for Area 1, 2 and 3.

### 5.3.1 Area 1 Brittas Wood

The proposed construction methods for each element in Area 1 are described in the following sections.

#### 5.3.1.1 Debris Trap

Construction of the debris trap is the only element of the Proposed Scheme that is considered 'in-stream' work. All works proposed are subject to the provisions of the Local Government (Water Pollution) Act 1977 (as amended) and the Fisheries (Consolidation) Act 1959 (as amended). The general control measures described further in Section 5.5.11 will apply to these works in addition to the specific method described in the following sections.

##### 5.3.1.1.1 River Flow Management

The construction of the debris trap will be limited to the instream works window of July to September, unless otherwise approved by Inland Fisheries Ireland.

The appointed Contractor must have a Flood Warning Action Plan in place prior to commencing works. Upon a flood warning being issued by Met Éireann all plant and equipment will be removed from the channel and any excavations backfilled and compacted to replicate the conditions prior to the works.

Measures to protect the water environment during the construction works will follow:

- The relevant section of the NRA's documents *Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes* (NRA, 2005).
- The fisheries board documents *Maintenance and protection of the inland fisheries resource during road construction and improvement works* (2007).
- Requirements of the *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters 2016* would also be followed where relevant.

The concrete base of the debris trap will be poured in two parts to facilitate diverting the river to one side of the riverbed for each stage of works. The works area will be dammed on three sides using large sandbags. Pumping will be required from within the works area to deal with water seeping through the temporary dams or through the ground. This water will be passed through filter bags before returning to the river.

##### 5.3.1.1.2 Concrete Base Pours

The concrete base will be poured within trench boxes to prevent unnecessary over-excavation of the riverbed. The debris trap base will be constructed in the following steps:

- Access of all personnel, plant, concrete deliveries etc. will be via the Brittas Wood trail head entrance.
- Following river flow diversion works, the foundation will be excavated, and trench supports installed, in consultation with a competent temporary works designer.
- Excavated material will be transported to temporary construction Compound A.
- A blinding layer of concrete will be placed at the bottom of the excavation to seal the bottom of the excavation.
- Dewatering will continue within the trench during all concrete placement, via a submersible pump placed in a sump, to ensure positive flow into the excavation rather than escaping outwards. Pumped water containing cementitious fines will require additional treatment prior to discharge to the river;
- Reinforcement cages will be pre-tied where possible and lifted into position using the excavator.
- Concrete will be placed within designed formwork using 14-tonne excavator and a concrete skip and will be compacted using a 2" poker.

- Formwork joints will be sealed to prevent grout loss.
- Slots to receive the debris trap poles will be cast into the base.

#### 5.3.1.1.3 Debris Pole Installation and Riverbed Restoration

The debris trap poles will be precast off-site and delivered when ready to install. They will be dropped in place in the foundation, propped for line and level and grouted/concreted in place. Excavated riverbed material will be saved and reinstated over the debris trap base once all concrete and grout have come up to design strength, as verified by laboratory testing. The riverbed shall be fully reinstated before re-diverting flows over the area.

#### 5.3.1.1.4 Maintenance/Access Slipway

Upon completion of the debris trap construction, the construction access slipway will be regraded and surfaced to provide an access to the debris trap for future maintenance and debris removal. The operation and maintenance activities are described further in **Section 5.5**.

A description of the slipway makeup is as follows:

- Geotextile fabric will be placed along the regraded area.
- Placement and compaction of crushed stone evenly along the slipway.
- The surface structure will be honeycomb with anti-sliding studs. The material type will be recycled UV-Stabilised high-density polyethylene (HDPE).
- The voids will be filled with gravel or soils for seeding grass or similar.
- A locked gate and fence will be installed across the slipway which will be opened only to facilitate machine access to the debris trap during maintenance works.

### 5.3.1.2 Culvert Remediation

The culvert crossing the Brittas Loop path is sufficiently sized to transfer flows from the Brittas lake tributary to the Clodiagh River. The remediation of the culvert is specifically to prevent the regular blocking on the upstream side.

To prevent blockage in the future the following is proposed:

- Clearing of the culvert inlet zone of small trees and bushes.
- Temporarily over-excavate around the culvert inlet.
- Install a precast concrete headwall at the culvert inlet. (Note: a stonework headwall built around the culvert outfall to the Clodiagh is in good condition and should be retained).
- Backfill around new headwall and install edge protection rails.

This work should be done during the summer months when the stream is dry.

### 5.3.1.3 Embankment

As outlined in Section 5.2.1 above, the proposed embankment provides flood protection in the event that the debris trap is blocked during a flood event. The embankment will be constructed of impermeable clay along the footprint of the existing trail path. A stone road surfacing will be reinstated on top of the new embankment, with the side-slopes topsoiled and allowed regenerate naturally.

Seepage underneath the embankment will be prevented by a concrete cut-off underneath the embankment. This mass concrete will also serve to provide a protective slab to the water abstraction watermain pipes located within the footprint. The construction of the flood embankment will involve the following steps:

- Topsoil will be stripped from the working area and stored on site to be reinstated upon completion;
- The trail path surfacing will be stripped and relocated for reuse as construction hardstanding if possible;

- The location of each water pipe will be determined via slit trenching in consultation and agreement with Uisce Éireann;
- Material over each watermain will be excavated to within 200 mm of the pipe, in no longer than 6 m lengths. The protective concrete will be placed before excavating over the next section;
- Suitable embankment clay material will be imported to site. This will be stored within the temporary construction Compound A and brought to required locations using an excavator and dumper;
- Embankment front and back slopes will be profiled to meet the required gradient of 1 in 3;
- The trail path will be reinstated over the embankment using timber edging and rolled compacted stone;
- The embankment side slopes will be reinstated with the original topsoil and allowed to regrow naturally;
- Drainage will be installed at the toe of the embankment, and through the embankment, to ensure natural run-off to the river can be conveyed.

### 5.3.2 Area 2 Chapel Street

The proposed construction methods for each element in Area 2 are described in the following sections.

#### 5.3.2.1 Flood Wall Construction

As outlined in **Section 5.2.2**, the existing wall will be retained and bolstered with a designed flood retaining wall. The overall wall structure is required to hold back flood water and prevent flows from seeping under the wall. It will be built in stages as outlined in the following sections.

A 'cut-off' trench is required to prevent flood water from seeping underneath the wall and will be delivered in the following steps:

- A temporary works design will be required for support of the existing wall, particularly during the excavation stage of the works;
- With suitable supports in place, the cut-off trench will be dug in sections, using a trench box for side supports;
- Due to the proximity to the River Clodiagh, water ingress to the trench will be actively managed. Dewater methodologies are discussed further in Section 5.4.12;
- The type of pumps will be chosen to minimise noise impact (i.e. submersible electric pumps should be used, running from a silenced generator placed a sufficient distance from any sensitive receptors), especially if needed to run overnight or over weekends;
- The cut-off will be achieved by backfilling the trench with dry, low strength concrete, that will set to form an impermeable barrier. To prevent washout of cementitious material through the porous ground into the river, dewatering pumping will need to continue within the trench while the concrete sets to maintain a net flow into the excavation. Pumped water containing cementitious fines will require additional treatment prior to discharge to the river;
- This process will be completed in sections along the wall, as dictated by the temporary works design and the Contractor programme.

The reinforced concrete wall will be delivered in the following steps:

- The cut-off trench concrete will provide a suitable working surface for completion of the reinforced concrete wall element;
- The wall will be designed to be poured in sections (6m long approximately) to allow for ease of construction, and to allow for concrete shrinkage and movement once complete;
- Base steel cages will be pre-fixed off site to for time and safety benefit on site;
- Once the steel is in place, the base will be shuttered and poured. Seepage of concrete into the river will be less of a risk at this stage but careful management of concrete placement and truck wash-out etc. will still be enforced;

- For the vertical section of the wall, a single shutter will be placed on the roadside, using the existing wall as the inside shutter;
- A compressible filler board will be placed along the existing wall before fixing the wall steel and pouring. This is to create a structural separation between the old and new wall. This is required to allow movement in the new wall thus preventing cracking;
- All concrete will be placed using an excavator and concrete skip and best practice concrete spillage and washout control measures implemented.

The wall finishing will be delivered in the following steps:

- The top of the wall base will be kept below ground level to allow the laying of drainage, other services and planting along the new wall face;
- The wall itself will be clad with stone. The final design will be completed in consultation with a Grade 1 Conservation Architect;
- Existing styles crossing the wall will be retained and constructed on the new side, where possible, please see **Appendix 16-8 Conservation Report** for recommendations);
- Street lighting will be reinstated post construction.

### 5.3.3 Area 3 Tullamore Road

The proposed works in Area 3 will be served by the temporary construction Compound B and the proposed construction methods for each element in Area 3 are described in the following sections.

#### 5.3.3.1 Embankment

As outlined in **Section 5.2.3**, the proposed embankment provides a formal flood defence outside of an existing embankment underneath the Clodiagh River west bank treeline. The embankment will be constructed of impermeable clay with a capping of topsoil of 150mm in depth to allow for grass seeding. Seepage underneath the embankment will be prevented by a 1 m deep cut-off, created by a trench backfilled with compacted impermeable clay. The construction of the flood embankments will involve the following steps:

- Topsoil will be stripped from the working are and stored onsite to be reinstated upon completion;
- Suitable embankment clay material will be imported to site. This will be stored within the working area and brought to required locations using an excavator and dumper;
- Excavation of the cut-off trench will be undertaken by an excavator, and clay placed and compacted in layers until the defences have reached the necessary height;
- Embankment front and back slopes will be profiled to meet the required gradient of 1 in 3. A steeper slope may be used if deemed appropriate for maintenance;
- The embankment will be topsoiled and sown in grass;
- Drainage will be installed at the toe of the embankment, and through the embankment, to ensure natural run-off to the river can be conveyed;
- Finally, the embankment will be fenced off to prevent erosion from livestock into the future.

#### 5.3.3.2 Retaining Flood–Wall - ICW

This wall will prevent out of bank flooding, ensuring flooding to the ICW will not increase as a result of the Proposed Scheme. A standard flood wall detail is shown in **Figure 5-14** above.

The wall will be constructed from cast in-situ reinforced concrete in the following steps:

- Stripping and storage of topsoil for reuse;
- Removal of existing footpath / asphalt, small trees and vegetation will be required along the entrance of the ICW;

- Excavation to the required depth will be undertaken up to 1.10m below existing ground level;
- 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;
- Temporary works designs will be required for all trench supports and concrete formwork;
- Standard concrete pollution control measures and wash-out protocols will be followed considering the proximity to the river.

## 5.4 Construction Phase – General Information

The delivery of the Proposed Scheme will be supported by the development of a Construction Environmental Management Plan (CEMP). The CEMP will include the mitigation and monitoring measures detailed in the preliminary CEMP that supports this planning application (and reiterated in **Chapter 20 Schedule of Environmental Commitments)**, as well as any conditions and additional measures that may form part of a planning consent. The mitigation and monitoring measures detailed therein will be implemented by the appointed contractor to ensure the protection of the environment and human health as assessed within the EIAR.

### 5.4.1 Construction Programme and Phasing

The construction activities are planned to take place during a 24-month construction campaign. The specific schedule for activities within each area of the Proposed Scheme will be finalised on appointment of a Contractor. Preference will be given to working during the summertime to avoid water high river and groundwater levels. There will be restrictions on the instream works discussed as a result of fish spawning season.

A likely construction programme is shown in **Figure 5-15** and will largely depend on the time of year that works commence.

## CHAPTER 5 - PROJECT DESCRIPTION

1. 24 months total works programme

| | | Year 1 | | | | | | | | | | | | Year 2 | | | | | | | | | | | | Year 3 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Works Area** | **Works Description** | **January** | **February** | **March** | **April** | **May** | **June** | **July** | **August** | **September** | **October** | **November** | **December** | **January** | **February** | **March** | **April** | **May** | **June** | **July** | **August** | **September** | **October** | **November** | **December** | **January** | **February** | **March** | **April** | **May** | **June** | **July** | **August** | **September** | **October** | **November** | **December** |
| All | Utility diversions (enabling works) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Area 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Req. Vegetation Clearance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Embankment | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Culvert Headwall Installation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Debris Trap | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Area 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Req. Vegetation Clearance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Excavation and cut-off | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Conc Wall Construction | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Area 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Req. Vegetation Clearance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Embankment | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Wall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Enabling Works

Embankment Construction Crew

Instream Works

Wall Construction Crew

**Figure 5-15: Projected Construction Programme**

### 5.4.2 Site Access Points

Access to the construction site in Area 1 will be via the existing amenity trail head entrance. This trail head entrance also includes a public amenity carparking space.

The Area 1 construction site is 80 m south of the trail head entrance along an existing amenity trail path. Construction machinery will be required to use the amenity path to reach the construction works area. Enabling works to make this pathway suitable to act as a construction site entrance will include the following:

- Erecting 'heras' fencing (or similar) on either side of the path to keep construction traffic within the footprint of the existing path;
- Designated passing zones will be set up where the path width allows. This measure will protect grassed and vegetated areas to either side of the path;
- Where necessary, tree protective barriers will be installed in consultation with an Arborist; and
- Laying of geotextile on the existing path and overlaying with compacted hardcore.

Removal of imported hardstanding and reinstatement work will be carried out upon completion in consultation and agreement with Coillte.

Access to the wall section on private property in Area 2 will be via an adjacent field which will also be used as a supporting temporary construction compound (Compound B).

Access to construction sites in Area 3 will be via an existing entrance to the embankment field. Accommodating works in the form of entrance widening will require some tree removal and vegetation removal. Tree removal will be undertaken under licence and all will be replanted post construction on a like for like basis in agreement with the landowner.

Access to all construction compound A and B will be via existing gate entrances. Accommodating works in the form of entrance widening and vegetation removal will be required. Both entrances will be reinstated to pre-construction form in agreement with landowners.

### 5.4.3 Construction Compounds

The appointed Contractor will set up the temporary construction compounds. Compounds will include site offices, welfare facilities, bunded fuel storage areas, designated storage area and construction staff parking. Wastewater will connect to foul sewer networks where available. Where not available, the contractor will provide welfare facilities in accordance with best practice.

The locations of potential temporary compounds are shown in **Figures 5.8** and **5.11**, and listed below:

- **Compound Site A Brittas Wood** – This area is intended to store embankment material, and dealing with large delivery vehicles that will not be able to access the Brittas Wood works area; and
- **Compound Site B Chapel Street** - This location will house the main compound for welfare/offices etc. Wall reinforcement steel and formwork will be stored here.

The sequence for establishing site compounds will be as follows:

1. Erect advance warning, site entrance and other temporary road signage to a Traffic Management Plan agreed with the Local Authority;
2. Erect perimeter hoarding/fencing in consultation with the Tree Protection Plan (See **Appendix 17-2**);
3. Set pest control measures around the perimeter;
4. Widen existing access gate areas and install site gate with suitable setback hoarding;
5. Strip topsoil from required hardstanding areas;
6. Store topsoil to best practice standards to avoid rainwater erosion, compaction, nuisance weed growth etc;

7. Hardstanding to be laid on a geotextile layer;
8. Surface water run-off from the hardstanding area will be prevented from flowing onto the public road or directly into a watercourse;
9. Set up required welfare units and site offices;
10. Water supply, wastewater connections, power connection etc. to be agreed with utility providers;
11. Designated pedestrian, parking, set-down areas to the clearly demarcated with barriers and signage.

### 5.4.4 Construction Hours

It is proposed that standard construction working hours will apply as follows: Monday to Friday: 07:00 to 19:00; Saturdays: 07:00 to 13:00; and no work on Sundays and Bank Holidays. Deviation from these times will only be allowed where prior written approval has been received from the local authority.

### 5.4.5 Construction Plant

The following plant could be required (to be confirmed by the appointed Contractor) for the purposes of construction activities. **Table 5-5** outlines the equipment required within the construction plant.

**Table 5-5: Construction Plant List**

| Equipment | Description |
|---|---|
| Mobile telescopic crane | Used for installation/removal of 1-ton sandbags for cofferdams |
| Chain saw | Tree felling, likely only in use for 2 or 3 days |
| Mini excavator with hydraulic breaker | Breaking out footpaths etc., 1 day or less at any given location |
| Mini tracked excavator | Trench excavation for foundations |
| Articulated dump truck (tipping fill) | Loading/unloading of truck with rubble/fill |
| Concrete pump + cement mixer truck (discharging) | Concrete pours at construction stage |
| Dumper (idling) | General use |
| Vibratory roller | Only to be used for 1 or 2 weeks (not in tandem w/ excavator or concrete truck) |
| Mini planer | May not be required |
| Articulated dump truck | 1 per hour |
| Hand-held circular saw (petrol) | Cutting footpaths, road surface etc., 1 day or less at any given location, stone cladding of walls |

### 5.4.6 Construction Personnel

It is anticipated that 20-25 persons will be involved in the construction activities with 5 to 6 persons working across different areas simultaneously.

All project personnel and contractors will be required to be fully compliant with their responsibilities as defined by:

- Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005);
- Safety, Health and Welfare at Work (General Application) (Amendment) Regulations 2023 (S.I. No.255 of 2023);
- Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021( S.I. No. 528/2021).
- The Safety, Health and Welfare at Work (Diving) Regulations 2018

- All other appropriate legislation in force at the time of their deployment
- All applicable Code of Practices to the works.

### 5.4.7 Utilities Diversion and Protection

A review of existing utilities and associated infrastructure was undertaken as part of the design development process. The utility providers identified within, or adjacent to, the footprint of the Proposed Scheme include:

- **Electricity Supply:** ESB Networks
- **Water Mains and Foul Sewers:** Uisce Éireann
- **Telecommunications:** Eir, Virgin Media, E-Net
- **Gas Networks:** Gas Networks Ireland

The interactions of the Proposed Scheme with utilities linked to each of the providers are provided in **Chapter 15: Material Assets Utilities and Waste**. Interactions will be considered on an individual basis and each conflict location will be discussed with the relevant utility provider.

#### 5.4.7.1 Area 1

##### 5.4.7.1.1 Water Abstraction Infrastructure

Protection of Uisce Éireann (UÉ) infrastructure in Area 1 which is associated with the Clonalsee Water Treatment plant (Area 3) is an important objective for the design, both during and the construction and operational phase of the Proposed Scheme. As is described further in **Section 5.4.1.3**, a protective concrete slab has been incorporated into the embankment design. This protection slab will be completed as enabling works prior to the progression of any other construction works in the area. Exclusion zones around water abstraction points will be fenced off at the same time to prevent any unintentional incursion on the borehole areas.

#### 5.4.7.2 Area 2

The area of wall construction along the roadside will have to be cleared of all utilities before commencing excavations for the wall foundations.

Access to the wall section in private property will be via an adjacent field which will also be used as a supporting temporary construction compound (Compound B).

Data requests from utility providers have identified the following underground services in the Chapel Street roadway. These have been verified by GPR survey. Their location and level will be verified by slit trenching prior to completion of detailed design. **Figure 5-16** shows the extent of services in the road.

There are also overhead low voltage power lines and public lighting columns along the wall alignment. Power line diversions will be developed and agreed with the ESB in preparation for the utility diversion works.

Temporary diversions will be required for:

- Low Voltage ESB overhead powerlines;
- Individual property power connections; and
- Street lighting columns.

The detailed design of these diversions will be developed with the ESB and will ensure only a minor interruption to service for the residents.

The nearest service to the wall is the trunk watermain supplying Tullamore town. This 381mm diameter cement watermain will be protected during construction. A temporary works design will be required for the protection measures.

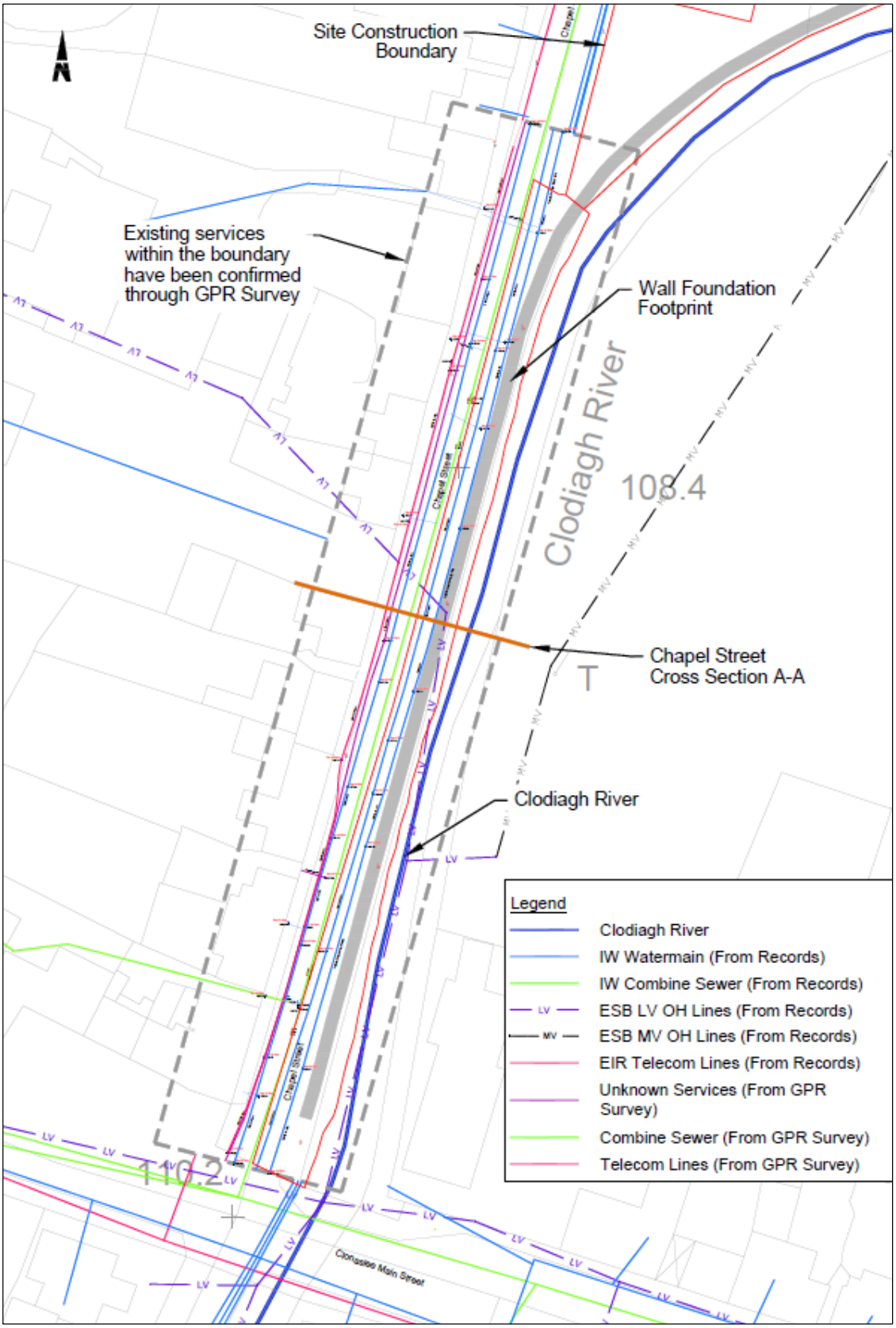


**Figure 5-16: Utility Survey of Chapel St**

**Figure 5-17** shows a cross section of the road at location A-A as indicated above.

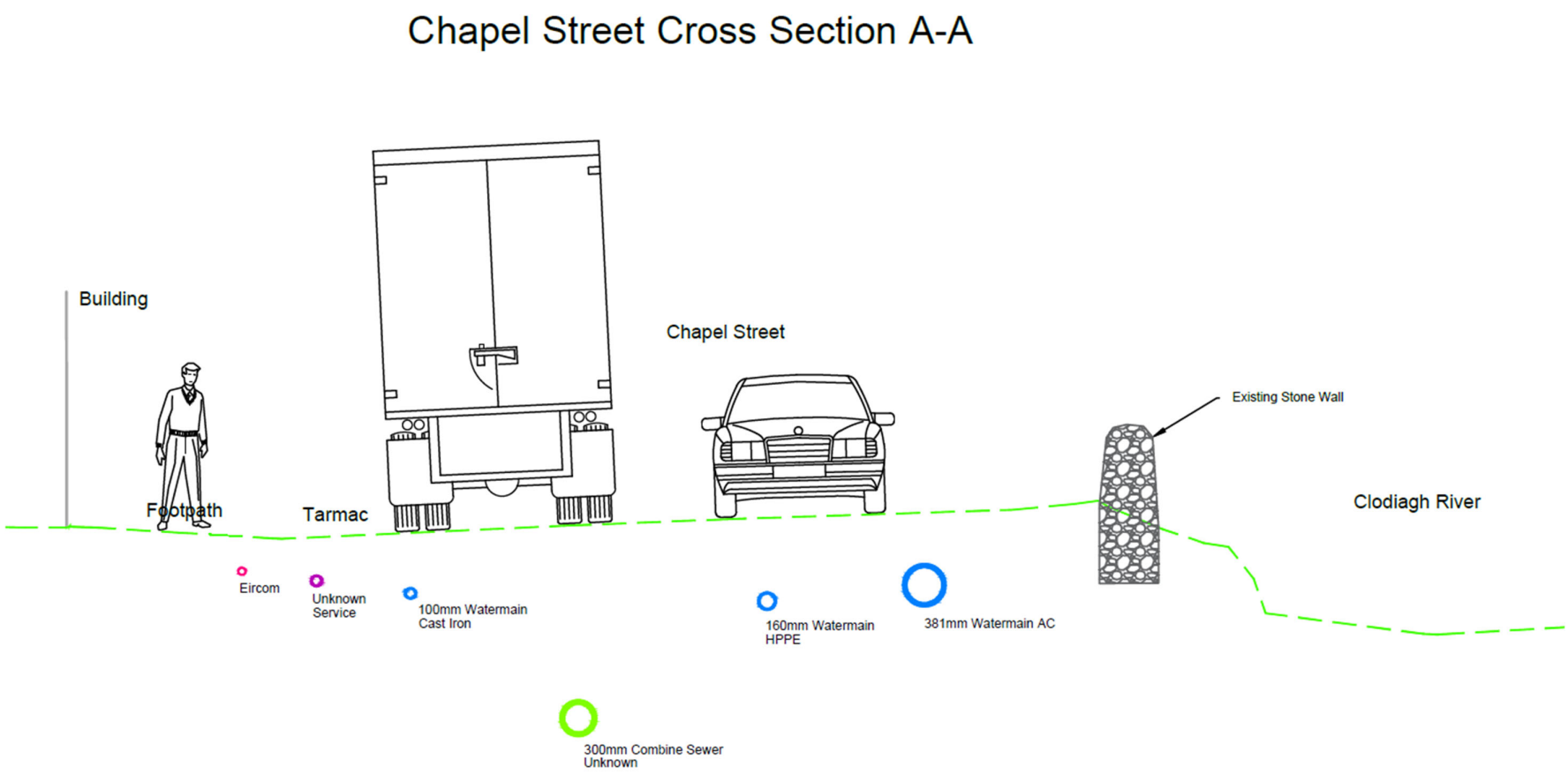


**Figure 5-17: Chapel St Existing Services Cross-Section**

#### 5.4.7.3 Area 3

Utilities in this area are associated with inlet wastewater pipelines to the ICW. There are key water supply and wastewater pipelines in the works area:

- Wastewater pipeline from Clonaslee Village entering the ICW Treatment Plant; and
- Trunk watermain serving Tullamore.

The location and depth of these pipelines will be confirmed by slit trenching prior to detailed design. A 'Build over Agreement' with Uisce Éireann will be in place to ensure all parties are satisfied that the wastewater assets are protected *in-situ* and allowances and contingencies are in place for potential future upgrades.

### 5.4.8 Demolition Works

The demolition requirements for the implementation of the Proposed Scheme are detailed in **Chapter 15: Material Assets- Waste/Utilities**. The main element of demolition comprises the existing road excavation required to construct the wall foundations in Area 1 and Areas 3. This will generate waste associated with kerbing, road surfacing, road drainage etc. Where possible material will be reused in the construction of new infrastructure, e.g., gully pots retained for use. Material that cannot be reused will be disposed at an appropriate licenced waste disposal facility.

### 5.4.9 Excavations

Excavation requirements for the implementation of the Proposed Scheme are summarised in **Chapter 15: Material Assets- Waste/Utilities**. It is unlikely that excavated material from embankments and walls will be used elsewhere as part of the works. Excess material will be disposed of at a licenced waste disposal facility.

### 5.4.10 Sediment and Erosion Control

A sediment control system will be provided in all works areas; including appropriate erosion and silt controls (e.g., settling ponds/tanks, silt fence, silt curtains) to prevent any flow of surface water from the site into the River Clodiagh and its tributaries.

An updated CEMP will be prepared by the Contractor prior to the commencement of any works in line with all conditions and obligations which apply to any relevant grant of permission.

If approval is granted for the Proposed Scheme, the CEMP will be updated in line with the requirements of any relevant planning conditions and additional mitigation that may form part of a grant, and the most up-to-date best practise guidelines and measures at the time of construction.

Further details regarding erosion and sediment control are provided in the **Chapter 9: Biodiversity and Chapter 11 Water**.

### 5.4.11 Instream Works

Instream works will be required to facilitate construction of the Debris Trap in Area 1 of the Proposed Scheme. Works will be undertaken during low level conditions as far as practicable and within the seasonal restrictions placed on the programme relating to fisheries. The remaining works (the embankments and flood walls) will be completed outside the River Clodiagh, avoiding the need for instream works. Appropriate sediment control measures will be placed to avoid material entering the river.

### 5.4.12 Water Management

During construction, water management measures will be implemented as outlined in **Chapter 11: Water**.

All works will be completed in accordance with the following guidance which the contractor is required to adhere to during construction phase:

- Construction Industry Research and Information Association (CIRIA) guidance – Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (CIRIA, 2001)

- Control of Water Pollution from Linear Construction Project: Technical Guidance (CIRIA, 2006)
- Control of Water Pollution from Linear Construction Projects. Site Guide (CIRIA, 2006)
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI, 2016)

There will be no direct discharge of water from any element of the works without suitable attenuation and treatment. Treated water will be discharged back into the watercourse. If over pumping is proposed treatment and/or settlement of water may be required prior to discharging back to the watercourse.

Wherever possible, vehicles will be refuelled off- site, particularly for regular road-going vehicles. On-site refuelling of machinery will be carried out at designated refuelling in the temporary construction compounds. All refuelling will be carried out at a minimum of 50m from the nearest watercourse. Only designated trained and competent operatives will be authorised to refuel plant on-site. Mobile measures such as drip trays and fuel absorbent mats will used during refuelling operations as required. All plant and machinery will be equipped with fuel absorbent material and pads to deal with any event of accidental spillage.

### 5.4.13 Construction Materials

The range of materials to be used during construction are captured in the Carbon Assessment in **Chapter 13: Climate**. This information is based on the quantities calculated at preliminary design stage and the materials and quantities will be revised, if and where required, as part of the detailed design stage.

The most significant imported material will be concrete and aggregates used for temporary hardstanding, flood defence below-ground construction and reinforced concrete construction.

For the purpose of traffic and climate assessments it is assumed that stone and concrete will be delivered to site from Tullamore town, the nearest, large town on a direct route from the Proposed Scheme, with several operating licenced quarries.

### 5.4.14 Risk of Flooding During Construction

#### 5.4.14.1 Area 1

Along the Brittas Lake tributary flood risk will be managed by:

- Monitoring of weather events to ensure the stream has a clear discharge to the river when excessive rainfall is forecast;
- Completion of the works in a forecast dry spell to minimise flood risk;
- An over-pumping temporary works design should allow for a safe overflow route in the event that a flood event occurs when over-pumping is in place.

River flow management during construction of the debris trap may be vulnerable to flood events. This risk will be managed by:

- Monitoring of weather events;
- Works will be scheduled in July – September which should correspond to low water levels;
- Management of flow through the works will be via gravity and pumping will be avoided;
- Works will incorporate an overflow route through the works area should a flood event occur.

#### 5.4.14.2 Area 2

The existing Chapel St wall acts as a flood defence in low return period rainfall events. Measures will be put in place to ensure this wall does not become more vulnerable to breaching during construction. This will include some or all of the following measures:

- Monitoring of weather events;
- Phasing of the works to ensure a section of wall is not exposed for a prolonged period of time;

- Use of temporary flood defence measures in areas of works (e.g., sandbags, water dam structures or similar);
- Removal of existing flood defences, if necessary, in discrete sections to minimise flood risk.

### 5.4.15 Traffic Management and Road Closures

Please see the **Construction Traffic Management Plan** for full details on the proposed traffic management measures that will be in place during the construction phase. A summary is provided below:

**Area 1** – Public access to the Brittas Loop Trail will be restricted, and signage erected at the trail head to direct people to the alternative entrance on the eastern side of the Clodiagh River.

**Area 2** – It is envisioned that the wall works will to be completed under a single lane closure.

**Area 3** – No closures will be required in this Area. Close co-ordination with Uisce Éireann Operations will be required to ensure unhindered access to the ICW.

Site Compounds – A Construction Traffic Management Plan will determine the traffic management and standard warning signage associated with plant access and egress requirements in these locations.

Construction traffic arising from the works themselves are assessed in the **Traffic Management Plan** and **EIAR Chapter 6: Traffic and Transport**.

#### 5.4.15.1 Construction Traffic

Detailed information on anticipated traffic movements is detailed in **Chapter 6 Traffic and Transport**. Indicative daily movements for one construction team operating on site are provided below:

- Six vehicles (cars/vans) will arrive on site in the morning (07:00 – 08:00) and depart in the evening (18:00 – 19:00)
- An average of 16 HV will arrive and depart the site throughout the typical working day (07:00 – 19:00) with a maximum of 32 HV movements per day

For the purpose of the traffic assessment, a total of 3-4 crews operating at all times has been assumed. Total traffic movements will depend on construction methodology and actual number of crews during construction stage.

#### 5.4.15.2 Road/Lane Closures

The proposed road/lane closures and diversions required for the construction activities to be undertaken are detailed in **Chapter 6: Traffic & Transportation**.

### 5.4.16 Construction Lighting

During construction, lighting will be required during hours of darkness. Low-energy LED options will be utilised where feasible. Emergency back-up lighting will be provided.

Security lighting will be required at night-time in designated areas such as the temporary construction compounds. Directional lighting will be used to ensure minimal disturbance to bats by avoiding light spill onto boundary features (hedgerows, scrub, and trees) and by avoiding uplighting.

### 5.4.17 Waste Management

The Contractor will be responsible for a Waste Management Plan (WMP), which will outline the best practice procedures during the construction phases of the Proposed Scheme. The WMP will detail the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of construction of the Proposed Scheme. Disposal of waste will be seen as a last resort.

The WMP will be produced in line with the EPA's 2021 document 'Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects' 2021. The Waste Management Act 1996 and its subsequent amendments provide for measures to improve performance in relation to waste management, recycling and recovery. The Act also provides a regulatory

framework for meeting higher environmental standards set out by other national and EU legislation. The Act requires that any waste related activity has to have all necessary licenses and authorisations.

It will be the duty of the Waste Manager on the Site to ensure that all contractors hired to remove waste from the Site have valid Waste Collection Permits. It will then be necessary to ensure that the waste is delivered to a licensed or permitted waste facility. The hired waste contractors and subsequent receiving facilities must adhere to the conditions set out in their respective permits/licenses and authorisations.

The Contractor will be in charge of the implementation of the objectives of the WMP, ensuring that all hired waste contractors have the necessary permits/licenses and authorisations and that the waste management hierarchy is adhered.

The WMP will provide systems that will enable all arisings, movements and treatments of construction waste to be recorded. This system will enable the contractor to measure and record the quantity of waste being generated. It will highlight the areas from which most waste occurs and allows the measurement of arisings against performance targets. The WMP can then be adapted with changes that are seen through record keeping.

#### 5.4.17.1 Resource Management

The principal objective of sustainable resource and waste management is to use material resources more efficiently, to reuse, recycle and recover material and reduce the amount of waste requiring final disposal.

**Chapter 15: Material Assets Waste/Utilities** provides details on the anticipated quantities of materials that will arise during site clearance, demolition and excavations. One of the key objectives is to ensure the reuse of material generated by the construction of the Proposed Scheme where feasible and fit for purpose.

The main types of materials that will be brought to site during the construction phase include embankment clay material, granular material, concrete, steel reinforcement, pipework and stone.

As outlined in **Chapter 15: Climate**, materials with a reduced environmental impact will be incorporated into the design through either the re-use of materials or incorporation of recycled materials in place of conventional building materials. The following materials will be considered for the construction phase:

- Ground Granulated Blast Furnace Slag (GGBS) and Pulverised Fuel Ash - Used as replacements for Portland cements to increase sustainability and reduce carbon footprint of civil and structural works.
- Locally sourced and supplied, where possible, stone, bricks, pavers, coping etc.

### 5.4.18 Commitments Register

A register of the environmental commitments (i.e., the mitigation measures and monitoring to be undertaken during the construction phase, operational and maintenance phase of the Proposed Scheme) is provided in **Chapter 20: Schedule of Environmental Commitments**.

This summary (along with the complete EIAR) will be used to inform the commitments register in the updated CEMP, which will be developed by the appointed Contractor. Any conditions of planning (should consent be granted) and any commitments made during the consent application process will also be added to the commitments register. The Contractor will be required to implement the Schedule of Environmental Commitments during the construction and operation phases under supervision from Laois County Council (LCC). An Environmental Monitoring Group will be set up to ensure adequate implementation of the Schedule of Environmental Commitments which will include representatives from LCC and OPW.

## 5.5 Operation and Maintenance Phase

It is expected that the operation and maintenance activities required will be undertaken by existing Laois County Council maintenance personnel.

The following sections provides a description of the operations associated with the maintenance of the Proposed Scheme.

An Operation and Maintenance Plan will be prepared for the Proposed Scheme. **Table 5-6** provides a description of the expected maintenance activities required for the Proposed Scheme.

**Table 5-6: Operational and Maintenance Activities**

| Element | Activity | Frequency |
|---|---|---|
| Flood walls | Inspections | Annually |
| | Repairs | As required |
| | Vegetation control | Annually |
| Debris Trap | Inspections | Monthly |
| | Repairs | As required |
| | Removal of debris | As required |
| Culverts | Inspections | Annually |
| | Repairs | As required |
| | Removal of trash and vegetation | Quarterly |
| Embankments | Inspections and maintenance | Annually |
| | Vegetation control | Annually |
| | Vermin control | Bi-annually |
| | Back drainage improvements | Bi-annually |

### 5.5.1 Waste Arisings and Management

**Chapter 15: Material Assets- Waste/Utilities** outlines the waste materials that will arise during operation.

### 5.5.2 Emissions

There will be no point source of emissions to air resulting from the operation of the Proposed Scheme. During flood events surface water will be naturally flow to the River Clodiagh, i.e., there will be no pumping and its associated emissions.