AtkinsRéalis

Construction Environmental Management Plan

Mayo County Council

June 2025

N58 STRADE RIVER BRIDGE REHABILITATION WORKS

Bonneagar Iompair Éireann
Transport Infrastructure Ireland

Comhairle Contae Mhaigh Eo
Mayo County Council

Notice

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Client signoff

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List of Acronyms

The following list of abbreviations have been used within this document:

- AAS – Appropriate Assessment Screening
- ACA – Architectural Conservation Area
- BRE - Building Research Establishment
- BS – British Standard
- BTEX – benzene, toluene, xylene
- CEMP – Construction Environmental Management Plan
- CFRAM - Catchment Flood Risk Assessment and Management
- CIRIA – Construction Industry Research and Information Association
- CWG – Criteria Working Group
- ECP – Environmental Control Plans
- EPA – Environmental Protection Agency
- EU – European Union
- EWC – European Waste Catalogue
- GSI – Geological Survey Ireland
- GWB – Groundwater Body
- GWS – Group Water Scheme
- IAQM – Institute of Air Quality Management
- MCC – Mayo County Council
- MTBE – Methyl tert-butyl ether
- NAPL – Non-aqueous phase liquid
- NHA – Natural Heritage Area
- NIAH – National Inventory of Architectural Heritage
- NML – Noise Monitoring Location
- NMS – National Monument Service
- NRA – National Roads Authority
- NSR – Noise Sensitive Receptor
- OPW – Office of Public Works
- PAH – Polycyclic aromatic hydrocarbons
- pNHA – proposed Natural Heritage Area
- RWMP – Resource and Waste Management Plan
- SAC – Special Area of Conservation
- SMR – Sites and Monuments Record
- SPA – Special Protection Area
- S4UL – Suitable for Use Levels
- SuDS – Sustainable Drainage System
- TMP – Traffic Management Plan
- TPH – Total Petroleum Hydrocarbon
- UST – Underground Storage Tank
- WAC – Waste acceptance Criteria

- WFD – Water Framework Directive
- ZoN – Zone of Notification
- ZoI – Zone of Influence

1. Introduction

1.1 Overview

AtkinsRéalis were appointed by Mayo County Council (MCC) for Eirspan Task Order 315 – Mayo Bridge Assessments and Strengthening 2023, comprising the assessment and rehabilitation of 10no. bridges in County Mayo. Strade River Bridge lies within the scope of this task order. AtkinsRéalis were further appointed to prepare a Construction Environmental Management Plan (CEMP) on behalf of MCC for the proposed rehabilitation works at Strade River Bridge ("the proposed works").

This report has been prepared to support MCC in their Section 177AE application to An Coimisiun Pleanála in relation to the proposed works.

The proposed works are located along the Strade River at the convergence of Knockagarraun, Strade and Knockshanbally townlands in County Mayo, c. 2.9km northeast from Ballyvary village. The location of the bridge including the direction of the Strade River (which the bridge crosses) is shown below in Figure 1-1. Figure 1-2 and Figure 1-3 show the elevations of the existing bridge structure.

The existing bridge was subject to a Stage 2 Assessment which determined the structure has a reduced 7.5t load capacity due to bond failure between the concrete and steel beams with significant delamination and spalling visible to the deck slab soffit providing evidence of the issue. The deck slab is therefore proposed to be replaced to provide a structure with a full load capacity. The aim of the proposed works is to improve the structural integrity of Strade River Bridge for the safety of road users while improving conveyance through the structure at high flow (as required by Office of Public Works, OPW), while retaining a reduced height concrete apron which will maintain a functional low flow channel (as required by Inland Fisheries Ireland, IFI).

The proposed works are not directly connected with or necessary to the management of any designated site for nature conservation. The area of the proposed works site is 0.3ha.

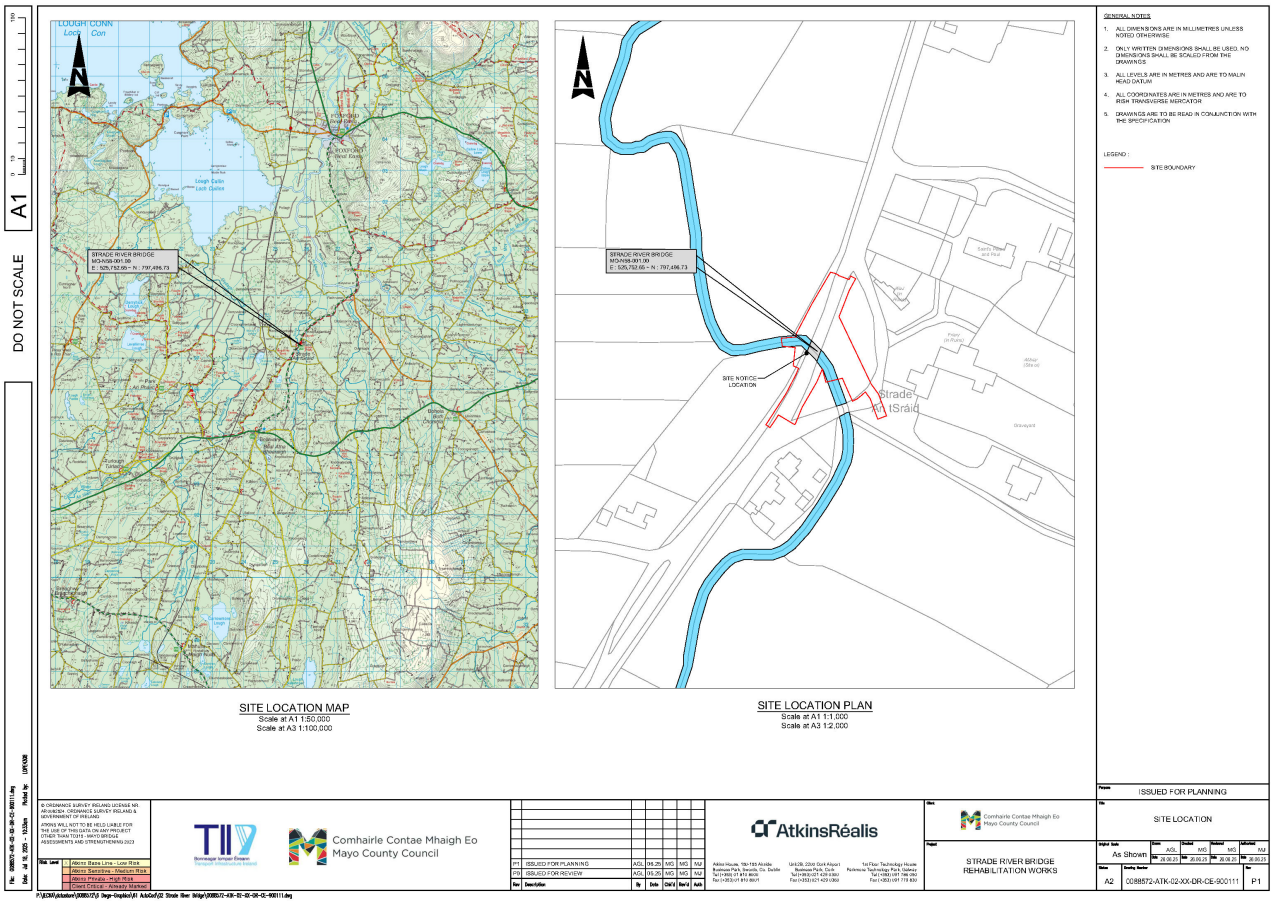

Figure 1-1 - Strade River Bridge Location in Co.Mayo

Figure 1-2 - View of the West (downstream) elevation

Figure 1-3 - View of the East (upstream) elevation

1.2 Purpose of the CEMP

The purpose of this CEMP is to provide recommended measures to avoid, minimise and control adverse environmental impacts associated with the construction of the proposed works. The CEMP will document the commitment to safeguarding the environment through the identification, avoidance, and mitigation of the potential negative environmental effects associated with the proposed works.

The works contractor will undertake the works in accordance with the provisions of the CEMP. This may be added to, to address other detailed construction matters. The CEMP will be updated by the Contractor to address any subsequent planning conditions relevant to the proposed works.

The CEMP aims to define good practice as well as specific actions required to implement mitigation requirements as identified in the following environmental reports and documents reviewed by AtkinsRéalis:

- AtkinsRéalis (2025). *Natura Impact Statement: Strade Bridge.*
- AtkinsRéalis (2025). *Environmental Impact Assessment Screening Report: Strade Bridge.*
- AtkinsRéalis (2025). *Resource Waste Management Plan: Strade Bridge*.
- AtkinsRéalis (2025). *Hydraulic Assessment: Strade Bridge*.
- Mayo County Council (2022). *Mayo County Development Plan (2022-2028).*
- Mayo County Council/TII (2025). Cultural Heritage Impact Assessment: Strade Bridge.

1.3 Structure

This CEMP has been structured as follows:

- **Section 1** outlines the purpose of the CEMP and introduces the proposed project;
- **Section 2** describes in detail the proposed project;
- **Section 3** outlines the minimum standards, legislation and guidance required by the Contractor during the development of the CEMP;
- **Section 4** identifies the relevant roles and responsibilities for developing, implementing, maintaining, and monitoring environmental management;
- **Section 5** sets out the mechanisms through which environmental requirements will be managed;
- **Section 6** sets out the general requirements of this CEMP;
- **Section 7** a summary of minimum requirements that should be implemented by the Contractor; and,
- **Section 8** sets out the procedures for the Emergency Response Plan.

2. The Proposed Project

2.1 Site Location and Surrounding Land Use

The proposed development site is located on the Strade River at the convergence of Knockagarraun, Strade and Knockshanbally townlands in County Mayo and are c. 2.9km northeast from Ballyvary village. The existing MO-N58-001.00 Strade River Bridge carries the N58 National Secondary Road over the Strade River at the location. The existing bridge comprises a two span filler beam deck with steel railway girders encased in concrete and supported on a mass concrete pier and abutments.

The ITM co-ordinates of the existing structure are:

Easting: 525753 Northing: 797497

The proposed development site is immediately upstream of a Natura 2000 site, the River Moy SAC (site code: 002298). Further downstream (> 30km) lies the Killala Bay/Moy Estuary SAC (000458) and Killala Bay/Moy Estuary SPA (004036). Lough Conn and Lough Cullin SPA (004228) lies c. 4.1km overland from Strade River Bridge. There are no other Natura 2000 sites with connectivity to Strade River Bridge.

The bridge is located in a rural location with farmland located northwest and southwest of the structure. The Michael Davitt Museum (NIAH 31307029[1]) is located to the east of the structure with Strade Friary, the Catholic Church of Saint Peter and Saint Paul (RPS 0129; NIAH 31307027[2]) and associated graveyards also located northeast of the structure. A public house and a residential premises is located southeast of the structure.

Two other protected structures are located in close proximity. Strade Bridge (RPS 0130; NIAH 31307030[3]) is located 40m upstream of the existing bridge and was in use until bypassed as part of a road realignment in 1983. The O'Donnell Mausoleum (RPS 0006, NIAH 31307028[4]) is also located east of the structure.

The bridge location is also within the Zone of Notification for MA070-067001 (Religious House - Dominican Friars); MA070-067004 (Graveslab); MA070-067005 (Religious House - Franciscan Friars); MA070-067006 (Graveyard) and other associated monuments.

2.2 Proposed Project

The proposed works to the existing Strade River Bridge to increase the load carrying capacity and structural integrity of the bridge comprise the demolition of the existing bridge superstructure and replacement with a new single span deck constructed to align with the retained existing abutments. The proposed replacement deck would be formed of precast prestressed concrete beams with an in situ concrete deck infill. The replacement deck has an approximate clear span of 10.8m and an approximate width of 11.8m.

New independent foundation supports would be located behind the existing abutment walls with the proposed foundations comprising reinforced concrete bored cast in place piles and pile caps. The existing pier and concrete

[1] https://www.buildingsofireland.ie/buildings-search/building/31307029/strade-strade-co-mayo
[2] https://www.buildingsofireland.ie/buildings-search/building/31307027/catholic-church-of-saint-peter-and-saint-paul-knockagarraun-strade-co-mayo
[3] https://www.buildingsofireland.ie/buildings-search/building/31307030/knockshanbally-strade-co-mayo
[4] https://www.buildingsofireland.ie/buildings-search/building/31307028/strade-strade-co-mayo

apron are to be demolished to improve conveyance through the structure with a new reduced height (300mm) concrete apron constructed to maintain the existing low flow channel, following consultation with the Office of Public Works (OPW) and Inland Fisheries Ireland (IFI).

In order for the new bridge soffit to meet the medium probability design flood level requirements of OPW the vertical alignment of the road is required to be raised by approximately 450mm immediately at the bridge with tie-ins to existing road levels provided on the approaches.

The existing carriageway width is to be retained across the new superstructure with the raised verges widened to achieve a minimum width of 2m. New 1.25m high reinforced concrete masonry clad parapets will be constructed over the length of the structure with safety barriers installed on both verges approaching and crossing the bridge.

Ancillary works include the reconstruction of the landowner boundary wall southeast of the bridge and diversion of existing underground Eir fibre optic cable and overhead ESB lines crossing the development site.

Works are comprehensively described in the EIA Screening accompanying this submission. The proposed site layout and design structure drawings can be seen in Figures 2-1 and 2-2 below. The area of the project site is 0.3 hectares.

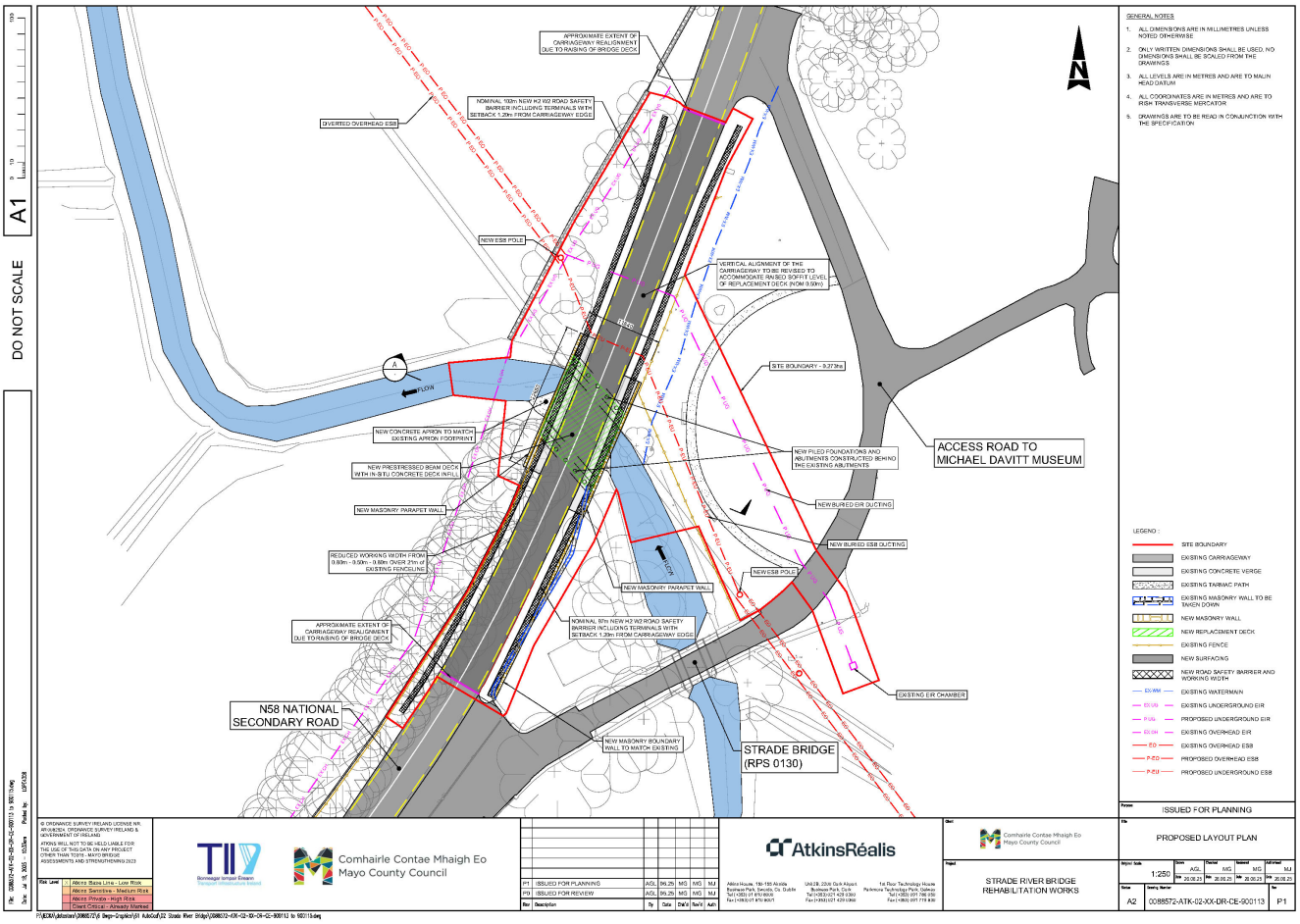

Figure 2-1 - Proposed Works Site Layout

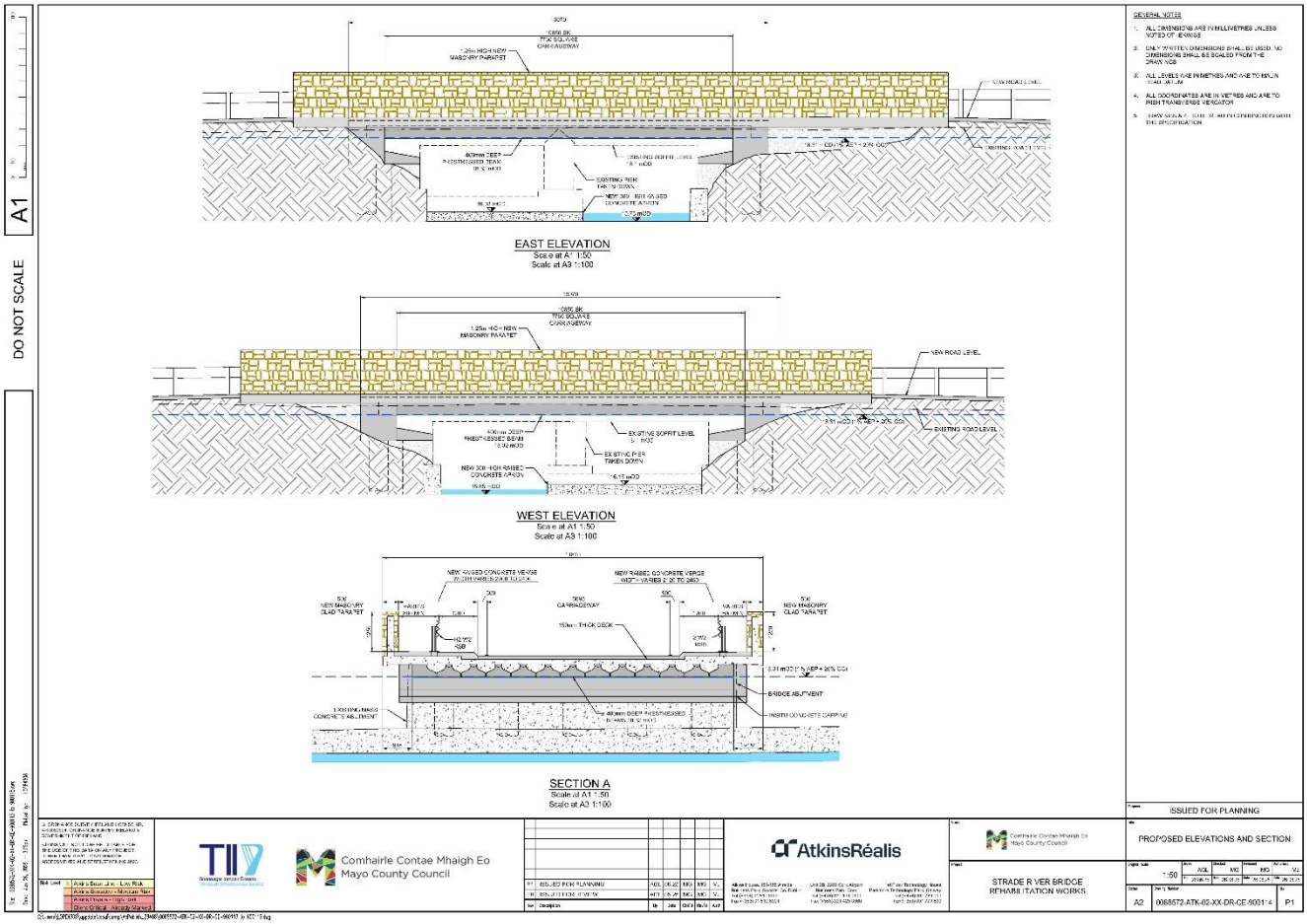

Figure 2-2 - Proposed Works Elevations and section

2.3 Key Stages

The proposed works will involve the following key phases:

- Detailed Design Stage
- Tender Stage
- Procurement and Appointment of a Contractor
- Site preparatory works, including the preparation of all required detailed Safety and Health and Environmental Management
- Site mobilisation
- Construction Stage
- Completion; and,
- Operational Stage.

2.4 Construction Methodology – Detailed Description

The construction methodology and sequence of works are:

1. The site compound will be marked within the road closure footprint of the N58 national road. All machinery and plant will be stored on site for the duration of works along the proposed road closure route.

2. Traffic Management installed at the works location. Detailed Traffic Management Plan to be provided by the successful contractor once appointed.

3. Installation of working platform spanning 4m between the existing concrete supports below the north span of the structure to prevent material entering the watercourse during the demolition works. Minor instream access by operatives is required to facilitate the installation of the working platform. Platform decking to comprise timber planking with plastic sheeting on top to catch falling material. The platform will extend under the bridge as well as 3m upstream and downstream. The platform will be fully sealed using plastic sheeting. Minor instream footings are required for the extension of the working platform upstream and downstream of the bridge.

4. Demolition of existing bridge parapets using excavator mounted breaker positioned on the existing bridge carriageway and removal by hand. Works completed under an alternating lane closure. 11m³ material removed from site to tip. All works here will be undertaken from land and existing bridge carriageway.

5. Full closure of N58 carriageway and installation of diversion route traffic management on the N5 National Road and R321 Regional Road. Estimated 6 months closure period.

6. Removal of existing carriageway surface on the bridge extent and 5m back on the approaches by breaking and excavation with an excavator. 24m³ material removed off site to tip.

7. Existing fill material and concrete verges on top of bridge to be removed by excavator to expose deck top surface. 24m³ material removed off site to tip.

8. Excavation of made ground behind both abutments for the full 10m width of the bridge structure by 4m long to a depth of 3m below existing ground level using an excavator. 130m³ material removed off site to tip. The area of excavation is immediately behind both abutment walls, c. 1m from the river course, contained behind the existing abutments and wing walls.

9. Bored cast in place reinforced concrete piles (Figure 2-3) to then be installed to a suitable depth (depth will be informed by ground investigation works) within both excavations behind the abutments, sleeved from excavation level to pile cap level. Piles to be installed by a 40t rotary piling rig positioned on the approach carriageway and sleeved above excavation level.

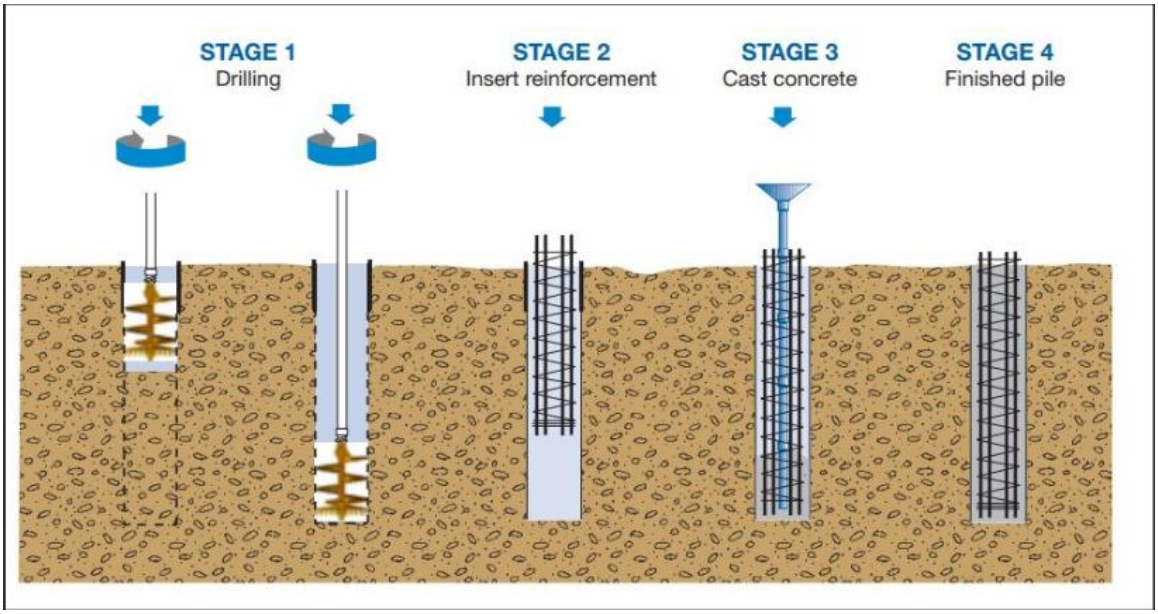

Figure 2-3 - Example of bored cast in place reinforced concrete piles (note that temporary casings which may be used to prevent bore hole from collapsing is not shown)[5].

10. Reinforced concrete OGEE pipes to be installed around each pile to provide isolation between the top of the pile and backfill to facilitate movement of the new structure. Pipes to be lifted into place using an excavator positioned on the approach carriageway.

11. Lean mix concrete backfill to be installed between pipe units and existing abutments to the bottom of pile cap level. 8m³ concrete to be pumped from on top of the approach carriageway at each abutment.

12. 6N granular material backfill to be installed to the back of both excavations to pile cap level using an excavator and compacted using hand operated compaction equipment. 50m³ imported material for each abutment. 100m³ total.

13. Pile cap reinforcement cages constructed on the existing carriageway and lifted into place using an excavator. 10m³ concrete to then be poured for each pile cap from the approach carriageways and a 7-day curing time allowed before being trafficked.

14. Additional imported 5m³ granular fill material to be placed using dumper and excavator above both pile caps to facilitate access to demolish the existing bridge superstructure.

15. Arrangement of steel filler beams to be identified and marked on the deck. Deck to be cut into single span longitudinal sections using a large blade concrete road saw. The large blade concrete road saw will contain a vacuum to improve dust control at the dust source. Deck sections to then be lifted by excavator and removed off site to tip. 29m³ total quantity.

16. Existing pier to be taken down 1.5m to the raised apron level using a breaker mounted to an excavator. The excavator will be positioned on top of the existing abutments at carriageway level. 13m³ material to be lifted from existing concrete apron and temporary working platform by grab lorry and removed from site to tip.

[5] https://theconstructor.org/geotechnical/bored-pile-foundation/84417/

17. Top sections of existing abutments to be demolished by hand and abutment height reduced by minimum 600mm to bottom of pile cap level. 11m³ material to be lifted by grab lorry and removed from site to tip.

18. The working platform will then be removed from the watercourse and the working area will be made dry, prior to the pouring of any concrete directly adjacent to or over the watercourse, and excavation of the existing concrete apron. The construction of the dry working area is as follows: -

    - There will be three sandbag dams erected in the watercourse; Dam 1 upstream of the bridge and Dams 2 and 3 situated down-stream of the bridge. Dam 2 and Dam 3 will be erected first, 300mm high on the riverbed. Dam 1 will then be erected (800mm high on the riverbed), and the river flow pumped downstream of Dam 3. Instream access by operatives is required for the installation of the sandbag dams and silt fences.

    - Dams will be constructed of one tonne bags (alternatively small sandbags) filled with pea gravel. Each bag will be double bagged and sealed thoroughly. The base of each dam will be three times the height. The dam will also be wrapped in 1000-gauge polythene. Dam height will depend on water levels at the time of erection and the 14-day predicted rainfall.

    - The sandbags for the dam will be carried by hand and placed into position within ten meters downstream of the structure, 500mm in height, across the full width to prevent downstream water returning into the work area. Dam 2 will be constructed by hand upstream of Dam 3; Dam 2 will be raised to 500mm in height. Dam 1 will then be placed within ten metres upstream of the structure on the upstream elevation; Dam 1 will be installed to its full height (Dam 2 and 3 are built up more gradually).

    - The section of river between Dam 1 and Dam 2 is required to be electro-fished by a licensed operator. All fish will be relocated downstream of the works area and discharge point of pump. Upon completion of the electro-fishing, Dam 2 will be raised to full height and a silt fence will be erected between Dam 2 and Dam 3. A second silt fence will be erected just upstream of Dam 3 (Figure 2-4). These two silt fences will act as a final filter for sediment within potential surface water run-off before it re-enters the live watercourse.

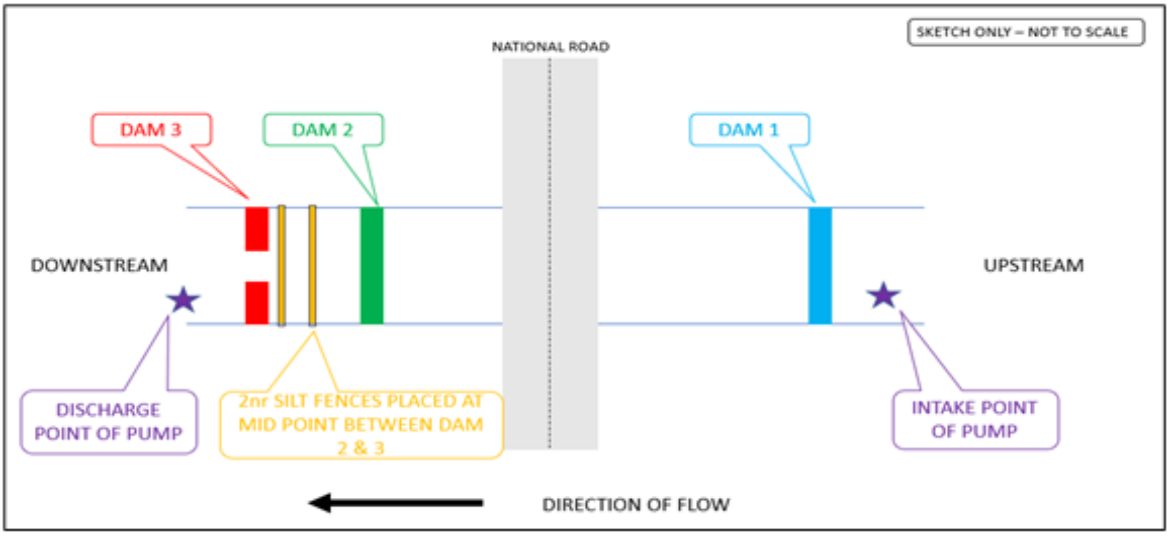

Figure 2-4 - Schematic of the 3-no. dam dewatering system proposed at Strade River Bridge.

    - The water between Dam 1 and Dam 2 will be pumped into the pooled area between Dam 2 and Dam 3 in advance of the silt fences.

    - An over pumping pipe will be placed into a 225mm non perforated pipe installed through the bridge at high level. It will be secured by temporary brackets that will be fixed along the existing abutment ledge wall. The pipe will be secured to allow for a gravity fall. The intake hose for over pumping will be positioned on the upstream side of Dam 1 and will be wrapped in a layer of silt fencing. The discharge hose will be position on

the downstream side of Dam 3. A silt bag will be placed on the end of the discharge hose to prevent discharge of any suspended solids or unwanted material into the live watercourse.

- The works area between Dam 1 and Dam 2 will be pumped out and discharged between Dam 2 and 3 and before the silt fences.

- All over pumping works will require the use of either a submersible pump or centrifugal dewatering pump, which will be used to over pump any water collected. Collected water will be discharged to the upstream side of the silt fences between Dams 2 and 3.

19. Once the dry working area is in place, the demolition of existing raised concrete apron using breaker mounted on excavator positioned on approach carriageway. Removal of 53m³ material off site to tip using grab positioned on approach carriageway.

20. Excavation to 300mm below existing bed level to formation level for the new apron by an excavator positioned on the approach carriageway. 21m³ existing material to be moved off site to tip. Excavation works will be undertaken within the dry working area. Access to dry working area is required by 5-ton excavator for access to excavations and for removal of waste material. The 5-ton excavator will be lifted into position by a crane positioned on the existing approach carriageway; the excavator will be placed on the southern span within the area of the existing apron. There is no requirement for the 5-ton excavator to access the dewatered river channel.

21. A new 600mm high raised concrete apron installed on concrete blinding with reinforcement mesh provided for crack control. 42m³ concrete to be pumped from truck positioned on top of the carriageway. The dry working area is required to be maintained throughout the duration of concrete apron demolition and installation of new.

22. Erection of shuttering on top of reduced height abutments and pouring of concrete capping from concrete truck located on approach carriageways will occur. 3.6m³ concrete to be poured for each abutment capping. Nominal reinforcing mesh to be included in capping for crack control. 20mm compressible filler board to be installed between pile cap and capping to facilitate minor movement of the structure. Wet concrete will be pumped from landside with shuttering fixed to front face of existing abutments and sealed platform tight to abutment preventing spillage to the (dry) river channel.

23. Prestressed concrete beams will be delivered to site and installed on top of pile caps by mobile crane positioned on the approach carriageway.

24. Dry pack mortar will be hand placed between beams to seal gaps with the deck reinforcement installed and tie ins to pile cap reinforcement provided. Shuttering erected to form the deck cantilevers.

25. The deck concrete infill will be pumped from concrete truck located on approach carriageway. Integral connection to be formed at pile caps. A minimum of 7 days curing time required for deck; concrete pouring/pumping works will be undertaken over the dewatered channel. 30m³ of concrete required for these works.

26. Vertical shuttering will be fixed to cantilever slabs for concrete parapet stems with reinforcement tying into starter bars from deck slab. 18m³ concrete to be pumped from concrete truck located on approach carriageway.

27. Following the completion of works to the concrete apron and all pouring of concrete works to the deck, the dewatering of the channel will be removed. The removal of the dams will be completed on a two-stage basis. The level of Dam 1 will be lowered to allow the area between Dam 1 and 2 to partially fill with water. The water within Dams 1 and 2 will be allowed to settle overnight and the remainder of the dams will then be removed completely the following morning to minimise any plumes of silt. The flow of the channel will return to existing condition.

28. The existing surfacing on the northern and southern road approaches will be planned out for a distance of 40m from the bridge with 24m³ material to be removed from site to tip. These works by nature occur set back from the watercourse along the existing roadway and are over land.

29. Additional asphalt surfacing base course and binder course construction on approaches to increase the vertical alignment to the bridge by c.400mm. 70m³ surfacing required. These works are contained on the existing road approaches to the bridge and are over land.

30. Deck surface to be cleared of all dust and debris by sweeping with collected material removed from site to tip.

31. Spray applied epoxy waterproofing system to be installed to the deck surface and parapet upstands from on top of the deck surface. 178m³ total area. 4m³ sand asphalt protection layer installed to protect the deck waterproofing. Epoxy to be sprayed by hand in proximity to the surface of the deck; works are contained on the bridge surface with no potential for materials to enter the watercourse.

32. Concrete verges will be constructed on the bridge, with 28m³ concrete pumped from the approach carriageway. Spare ducting for future utilities provided in verges. Mesh reinforcement included for crack control. Brush finished concrete surface. Concrete pumping here will be contained on the new bridge deck with no potential for material to enter the watercourse.

33. Asphalt surfacing binder course will be installed across the bridge surface with tie ins to the approaches. 100m³ quantity. Works are contained on the new bridge deck with no potential for material to enter the watercourse.

34. The N58 National Secondary Road will then open with a single lane closure remaining in place for the works. Lane closure to alternate as required for the remaining works.

35. Masonry construction to the faces of both parapets across the length of the structure. Masonry to match upstream arch bridge with lime mortar to be placed by hand on top of the structure with a temporary scaffold platform erected to construct the outside faces. The temporary scaffold platform requires the provision for instream footings at both the upstream and downstream faces of the structure. The light working decks will be sealed with plastic and will catch any accidental spillage of materials when undertaking masonry works. 105m³ quantity.

36. Surfacing course will be installed across the full extent of the works. 282m³ quantity.

37. The southeast masonry approach wall to be taken down and reconstructed further back from the edge of carriageway. 12m3 masonry. Masonry wall to be rebuilt by hand using lime mortar. Works here are over land.

38. Both verges on approaches to the structure will be regraded to align with new carriageway level. 80m³ quantity of topsoil. Verges to be seeded on completion.

39. Safety barriers will be erected on both approaches and across the bridge.

40. Road marking will be completed.

41. Removal of traffic management.

42. Demobilisation from site and restoration of site compound area (in this case, the N58 road) to pre-works condition.

2.4.1.1 Demolition

Demolition works are required for the removal of all bridge material requiring replacement. This comprises of removal of existing surfacing and verges, parapet walls and pier. All material will be removed off site and disposed of at an appropriate waste disposal facility (also referred to as tip).

2.4.2 Machinery

Machinery will be refuelled within site compound area away from watercourse. No refuelling of heavy machinery is permitted at works site (adjacent to the river); all refuelling will be done within the site compound. Small jerry cans for usage for generators are permitted. Machinery required for the proposed works is as follows:

- 13-ton or 25-ton excavator, as appropriate (with mounted breaker)
- 5-ton excavator
- 40-ton rotary piling rig
- Hand operated compaction equipment
- Large blade concrete road saw (fitted with vacuum)
- Mobile crane
- Concrete truck
- 9-ton dumper
- Grab lorry
- Lorry and trailer (for removal of material off-site to tip)

2.4.3 Programme

Works are expected to take a total of nine months to complete and are anticipated to commence in Q3 of 2026 at the earliest. Works are limited to daytime working hours and follow the standard programme of 8am to 7pm midweek and 8am to 1pm on Saturdays.

2.4.4 Site Compound

As agreed with MCC, the successful contractor will utilise the area of road closure along the N58 national road as a site compound for the duration of works. There may be a requirement for temporary (mobile) lighting within the site compound area along the N58 should works extend to winter months, however this is not foreseen given the works window of July to September[6] required to facilitate instream works.

Upon completion of works the site compound area will cease to exist and will revert to fully operational road use.

2.4.5 Traffic Management

The proposed deck replacement will require the closure of the N58 National Road for an estimated 6-month duration. A proposed traffic diversion has been identified (Figure 2-5) which diverts southbound traffic from the N58 north of Strade onto the R321 Regional Road before joining the N5 National Primary Road west of Bohola. N58 northbound traffic joining from the N5 will instead be diverted further east along the N5 onto the R321 Regional Road west of Bohola before joining the N58 carriageway north of Strade.

[6] https://www.fisheriesireland.ie/sites/default/files/migrated/docman/2016/Guidelines%20Report%202016.pdf

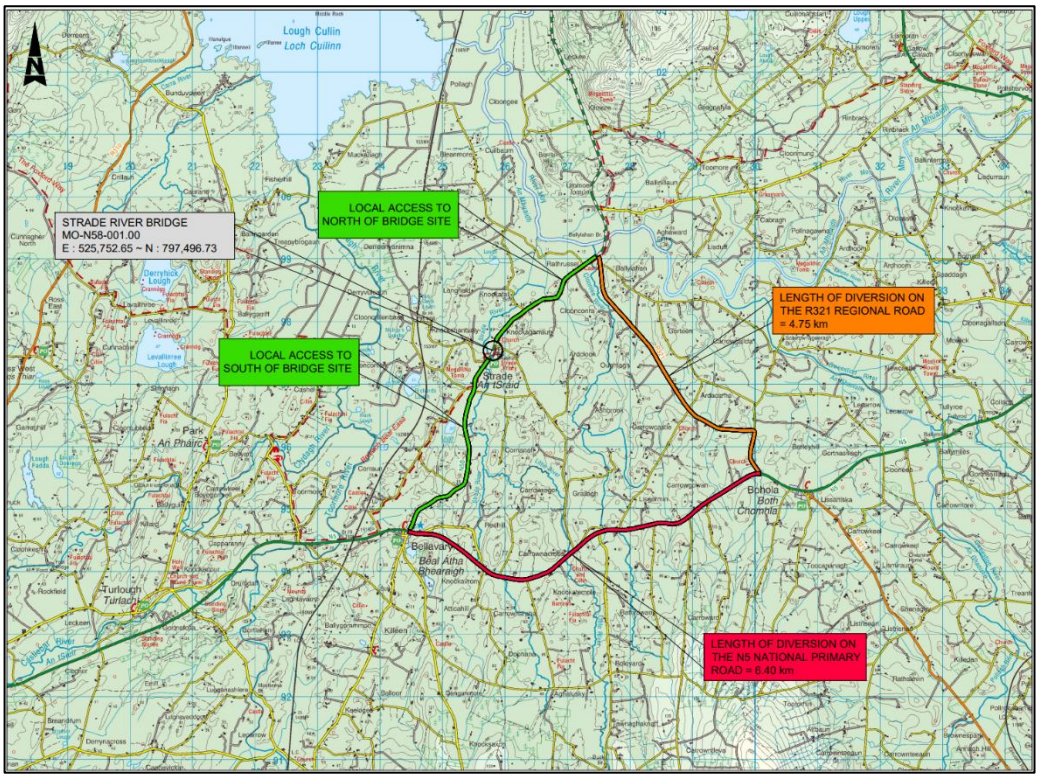

Figure 2-5 - Proposed Traffic Diversion Route (structure location circled)

2.5 Environmental Constraints

This section summarises the main environmental constraints that relate to the construction phase:

2.5.1 Noise and Vibration

The study area is within rural lands.Noise will be generated during construction activities with increased traffic to the site, but this will be restricted to during the construction period. The works, when in operation, is not anticipated to have any direct noise and vibrational impact on the near-by sensitivity receptors which include residential dwellings, agricultural farmyards, Michael Davitt Museum, Church of St. Peter and Paul Straide, Strade Friary, Templemore Old Burial Ground, Copper Beech Lounge and Straide National School. There may be an indirect increase in noise and vibrations from an increase in the amount of traffic that will utilise the new safer bridge. Due to the nature of this proposed works, increases in ambient noise and vibration are not expected to be significant.

2.5.2 Air Quality

The current air quality in the area of the proposed works site is recorded by the EPA as 'good', with an Air Quality Index of '2'. The closest Air Quality Monitoring Station to the proposed works is Castlebar, Co. Mayo (Station 26) located ca. 13.67km southwest of the site (EPA Maps, 2025). Dust arising from excavation/demolition and importation of construction materials to the proposed site, along with vehicle movement as well as emissions from construction vehicles and plant will contribute to temporary reduced air quality. Some activities including infilling of soil, excavation of trenches, stockpiling and movement of materials, and construction vehicle movements will temporarily contribute to generating ambient dust.

2.5.3 Soils and Geology

The quaternary sediment of this site is classed as 'Till derived from limestones'. Teagasc records the soil type as 'Grey Brown Podzolics, Brown Earths (medium-high base status)' directly underneath the site (GSI, 2025). The bedrock geology 100k of the works is made up of Dark limestone & shale, sandy oolite of the Castlebar River Fm. / Lough Akeel Formation (GSI, 2025). There are no recorded landslide events within the vicinity of the site, the closest landslide event (GSI_LS03-0071) occurred ca. 8km from the works. Landslide susceptibility within the site is 'Low' (GSI, 2025).

GSI (2025) indicates that the site is underlain by a Regionally Important Aquifer - Karstified (conduit), and there is a geological fault line ca.270m south of the works which runs in a northeast-south-westerly direction. GSI (2025) has classified the groundwater vulnerability directly beneath the proposed works as 'High' with the larger surrounding area as 'Moderate' and nearby smaller patches of 'Extreme' and 'Rock at or near Surface or Karst'. This indicates that groundwater is potentially shallow and vulnerable to contamination. There are no karst features within the vicinity of the proposed works. The closest karst feature is listed as a spring (IE_GSI_Karst_40K_5221), situated ca. 8 km east of the site (GSI, 2025). There are no GSI reported wells or springs in the surrounds of the Strade village. The closest is a spring located 7km southeast of the site (GSI ID: 1127NEW006) reported to 5km locational accuracy.

A review of GSI (2025) indicates that there are no Geological Heritage Areas (GHA) within the site. The closest GHA is River Moy (MO089) located ca. 2km northeast of the site and is described as "*A 100km long river flowing into the Moy River Estuary at Ballina".*

Ground investigations are planned to be undertaken following submission of planning. The Ground Investigation locations will be located on top of existing carriageway contained and away from the watercourse.

2.5.4 Ecology

A Natura Impact Statement was conducted by AtkinsRéalis (2025), which concluded there is no. 1 Special Areas of Conservation (SAC); the River Moy SAC, no Special Protection Areas (SPAs), National Heritage Areas (NHAs) or proposed National Heritage Areas (pNHAs) within the proposed works site.

The report identified 4no. European sites (SPAs, SACs) within the potential Zone of Influence (ZoI):

43. River Moy SAC (002298), situated directly to the west of the site;
44. Killala Bay/Moy Estuary SAC (000458),situated >30km downstream from the site;
45. Killala Bay/Moy Estuary SPA (004036).situated >30km downstream from the site;
46. Lough Conn and Lough Cullin SPA (004228), situated 4.3km from the site.

The NIS Report concluded that:

'*Given the prescription of the mitigation measures detailed in Section 7 of this NIS, it can be concluded beyond reasonable scientific doubt that the proposed development will not, either individually or in combination with other plans or projects, give rise to any impacts which would constitute adverse effects on the River Moy SAC or any other Natura 2000 site, in view of their conservation objectives..*'

There are no. 2 NHAs and no.6 pNHAs within 15km of the study area including:

- Moy Valley pNHA (002078) is located ca. 3.37km to the north of the site. There is possible indirect hydrological connectivity between this pNHA and the site via. the River Strade and the River Moy.

From inspection of the Wetlands Surveys Ireland WSI (2024) map viewer application 5 wetlands within 2km of the proposed works were identified with no hydrological connectivity to the site via. nearby streams.

The proposed site does not lie within a Nature Reserve or National Park. There are no National Parks or Nature Reserves within 15km of the works.

2.5.5 Landscape and Visual Amenity

According to the Landscape Appraisal for County Mayo accompanying the Mayo County Development Plan 2022-2028, the proposed works lies within the Area K: East-Central Drumlin Spine Landscape Character Unit. This area is described as '*This area is made up of glacial drumlins that are uniform at its western end near its transition with the distinct drumlins of Clew Bay. In the east, these become less uniform and severe, and the terrain merges into several sets of geologically distinct and isolated hills as the unit encapsulates the towns of Castlebar, Swinford, and Charlestown. The land cover is a mixture of bog/moorland, poor quality pasture and transitional woodland scrub with better quality pasture to the east and south.*'

The N58 upon which the works is being built is designated as a robust area in the County Mayo Landscape Appraisal. In robust areas: *'(a) New development shall sustain and reflect the character of the area (b) Frontages on to the existing streets shall reflect the character of the street through careful design and use of materials (c) Development should reflect the character of the townscape generally but fresh approaches to design will be considered*'. Policy with Regard to Areas Designated as Robust state that; '*These are areas of concentrated existing development and infrastructure. Appropriate new development in these areas can reinforce the existing desirable landuse patterns. Regard must be had to site*

development standards namely density, building lines, height of structures and design standards. The overall aim is to ensure that the inherent character of the town and village centres is maintained.'

The N58 is not designated as a scenic route. As this bridge crosses over the Strade River it is designated as a vulnerable landscape area due to being along the riverbank of the River Strade. The policy with Regard to Areas Designated as Vulnerable states that; '*These areas or features designated as vulnerable represent the principal features which create and sustain the character and distinctiveness of the surrounding landscape. To be considered for permission, development in the environs of these vulnerable areas must be shown not to impinge in any significant way upon its character, integrity or uniformity when viewed from the surroundings. Particular attention should be given to the preservation of the character and distinctiveness of these areas as viewed from scenic routes and the environs of archaeological and historic sites'*.

The proposed works lies within the Policy Area 4 which according to MCC as it is a road-based project has '*low potential to create adverse impacts on the existing landscape character.'*

There are no land use zonings for Strade Village.

2.5.6 Lighting

Works will take place during daylight hours only. Temporary (mobile) lighting may be required for the site compound area along the N58 during winter months and will be limited to the construction phase however this is not foreseen given the works window of July to September required to facilitate instream works. The lighting will be designed to minimise the effects of light pollution on neighbouring properties. Low energy LED lighting will be used to illuminate areas. All lighting used will be subject to relevant wildlife legislation to minimise disturbing bats or birds as a result of light pollution.

2.5.7 Water Resources

The Strade River Bridge crosses over the 4th order Strade River (IE_WE_34S040800) which is a tributary to the River Moy (IE_WE_34M020750) ca.2km downstream. The River Moy and this part of the River Strade itself are part of the River Moy SAC. The latest Q-value taken in 2022 for the closest downstream station located ca. 870m downstream on the River Strade from the proposed works was from the Bridge upsteam of Moy River confluence (RS34S040800) station was listed as Q4/5 – 'High' (EPA,2025). The River Strade has a 'High' status for the 2016-2021 monitoring period and is 'Not at Risk' of failing to meet relevant Water Framework Directive (WFD) by 2027 (EPA,2025). The latest Q-value taken in 2022 for the closest downstream station on the River Moy is located ca. 3.3km downstream from the works was from the Bleanmore (RS34M020750) station, was listed as Q4/5 – 'High' (EPA,2025). The River Moy has a 'Good' status for the 2016-2021 monitoring period and is 'Not at Risk' of failing to meet relevant Water Framework Directive (WFD) by 2027 (EPA,2025).

The proposed works is within the STRADE_010 River Sub Basin, the Moy & Killala Bay (34) Water Framework Directive (WFD) Catchment area and the Moy_SC_070 sub-catchment. The proposed works is within the Swinford Groundwater Body (GWB) which is reported by EPA (2025) as having 'Good' WFD status for the 2016-2021 monitoring period and is 'Not at Risk' of failing to achieve relevant WFD objectives by 2027.

There are no Ground Water Drinking Water Source Protection Areas within 10km of the proposed works. The Group Scheme Preliminary Source Protection Areas 'Pollavaddy GWS' is the closest drinking water protection area and is located ca. 10.7km south of the proposed works.

2.5.8 Flood Risk

The proposed site was assessed to see if there is any potential for future flooding. Historic and predicted flood risk mapping published by the OPW on the Flood Hazard Mapping website (http://www.floodinfo.ie/) were reviewed. Historical flood maps data indicate there was 1no. recorded flood event within the proposed site boundary reported on the 30/09/1995. The National indicative fluvial flood extents for the Strade River if it were to flood would occur in the vicinity of the works with both Medium and Low Probability.

A Hydraulic Assessment was conducted by AtkinsRéalis (2025) in line with OPW requirements which concluded that; '*The proposed soffit level of the new bridge is 220mm above the soffit of the existing bridge and provides a single span opening with the pier removed to improve flow through the structure. The proposed bridge deck replacement therefore does not add any additional constraint to the existing channel with the upstream masonry arch bridge remaining the primary constraint. As the design flood level determined by hydraulic assessment did consider any beneficial effects from the masonry arch bridge the proposed bridge structure is also future proofed against any future works to the masonry arch bridge'*.

2.5.9 Cultural Heritage

A search of the National Monuments Service (NMS, 2025) indicates there are no National Inventory of Architectural (NIAH), or Sites and Monuments Records (SMR) listed features within the site of the proposed works. There are numerous SMRs and NIAHs within 1km to the east of the site consisting of; churches, mausoleum, graves and other religious monuments none of which are expected to be affected by the works. The closest historic feature to the works is an NIAH feature (31307030: bridge) located 40m southeast from the site, this bridge is also upstream the same Strade River that this projects bridge will be.

A Cultural Heritage Impact Assessment of Proposed N58 Strade River Bridge Works was completed by Richard Gillespie, Project Archaeologist of Mayo Co Council/TII (March, 2025). This report concluded '*Due to its location and restricted scope, there is a no predicted Cultural Heritage impact on any known cultural heritage receptors.'* However, *'The proposed project site is in close proximity to, and within the zone of notification for an early medieval friary (National Monument No. 172, RMP No. MA070-067). As it is a National Monument Ministerial, consent is required for these works. There is no predicted direct impact on the Abbey, however there is potential for further subsurface archaeological remains. Archaeological monitoring of the ground works including ground investigations is recommended. Predevelopment testing of external works areas such as storage areas and compounds is also recommended. The archaeologist should be facilitated in examining, recording, excavating, sampling and analysing any archaeological deposits, features or objects that might be discovered, and will be required to report on same. This will require Ministerial consent via the National Monuments Service and should be included in the method statement as part of the Ministerial Consent application.'*

2.5.10 Traffic and Transportation

The bridge is situated on the N58 within the village of Strade, between the exit for the L5796 to the south and the L1714 exit to the north. There is also the Knockgauraun access road to the Michael Davitt Museum, which provides a link road to either side of the bridge. The proposed deck replacement will require the closure of the N58 National Secondary Road for an estimated 6 months duration. A proposed traffic diversion has been identified as shown in Figure 2-3 below, which diverts southbound traffic from the N58 north of Strade onto the R321 Regional Road before joining the N5 National Primary Road west of Bohola. N58 northbound traffic joining from the N5 will instead be diverted further east along the N5 onto the R321 Regional Road west of Bohola before joining the N58 carriageway north of Strade.

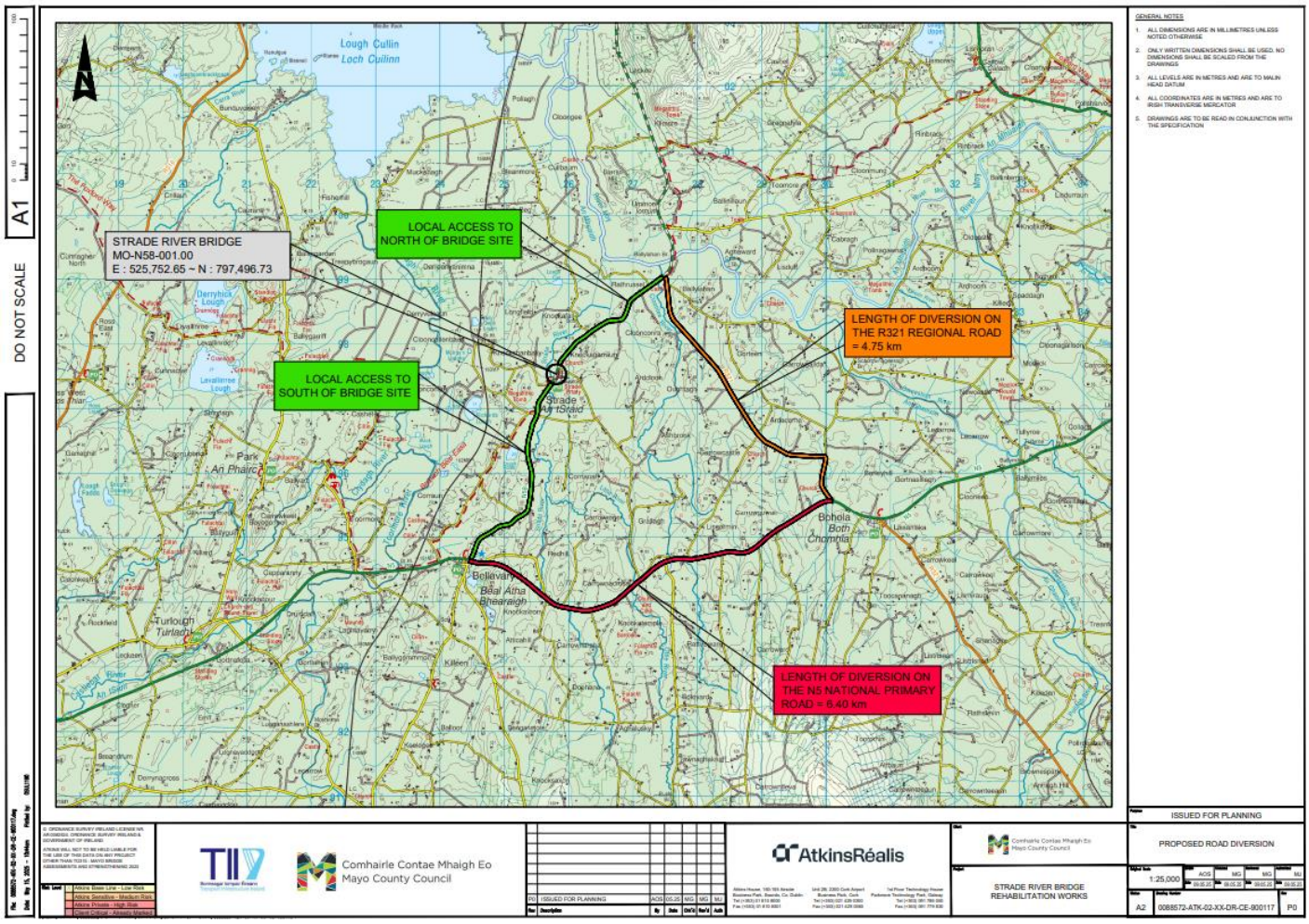

Figure 2-6 - Proposed Traffic Diversion Route

2.5.11 Local Amenities and Other Sensitive Receptors

Sensitive receptors within 1km of the works include residential dwellings, agricultural farmyards, Michael Davitt Museum, Church of St. Peter and Paul Straide, Strade Friary, Templemore Old Burial Ground, Copper Beech Lounge and Straide National School.

2.5.12 Population and Human Health

The proposed works are along the N58 at the point it crosses the River Strade which is located just within the Electoral Division (ED) of Bellavary and borders the Strade division. The population of Bellavary according to CSO 2022 data is 1,084 people and the population of Strade was 647 people (CSO, 2022). The area of Strade is quite rural with scattered residential properties and farmyards located in the wider vicinity of the works. Sensitive receptors within 1km of the works include residential dwellings, agricultural farmyards, Michael Davitt Museum, Church of St. Peter and Paul Straide, Strade Friary, Templemore Old Burial Ground, Copper Beech Lounge and Straide National School.

2.5.13 Material Assets

2.5.13.1 Waste Facilities

There are no industrial sites or waste facilities in the vicinity of the site. The closest EPA licensed waste facility is ‘McGrath Industrial Waste Ltd’ (W0143), situated ca. 6.3km southwest of the site (EPA, 2025). There are no Seveso Establishments within 15km of the study area (HSA, 2025).

3. Legislation and Guidance

All parties, contractors and consultants working on this project shall be subject to the Irish laws and the various international/regional protocols and agreements to which Ireland is a party. In the event legislation is updated, the latest version will be followed. All relevant new legislation will be followed as appropriate. This document outlines most current legislation at the date of issue. It is the responsibility of the Contractor to ensure that they are up to date with the details of the latest iterations of legislation relevant to the project throughout the duration of the contract.

The Designer should be aware of all key environmental risks and associated measures set out within this CEMP, and the final detailed design should take due cognisance of these.

The Contractor should set out the detailed CEMP in a clear format and should address all key environmental risks and associated measures. The Contractor must be aware of and comply with the legislation and guidance set out in this document, any specific planning conditions which may be associated with the proposed works, and other relevant documentation as prescribed by the Employer and planning authority.

3.1 Legislation

Tthe appointed Contractor will be required to be aware of their obligations under legislation. Such legislation, includes, but is not restricted, to:

- Planning and Development Act and subsequent amendments, 2000-2024;
- Planning and Development Regulations 2001 to 2025;
- The Birds Directive: Council Directive of 2 April 1979 on the conservation of wild birds (79/409/EEC);
- The Birds Directive: Council Directive 2009/147/EC on the conservation of wild birds;
- The Habitats Directive: Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora;
- The European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. 477 of 2011), as amended, 2015 (S.I. No. 355 of 2015);
- Water Framework Directive (WFD): Directive 2000/60/EC of the European Parliament and Council establishing a framework for Community Action in the field of water policy, as amended;
- European Communities Environmental Objectives (Surface Waters) Regulations, 2009, S.I. No. 272 of 2009, as amended, 2012 (S.I. No. 327 of 2012), 2015 (S.I. No. 386 of 2015), 2019 (S.I. No. 77 of 2019), 2021 (S.I. No. 659 of 2021), 2022 (S.I. No. 288 of 2022), 2023 (S.I. No. 410 of 2023);
- European Communities Environmental Objectives (Groundwater) Regulations 2010, S.I. No. 9 of 2010, as amended, 2016 (S.I. No. 366 of 2016), 2022 (S.I. No. 287 of 2022);
- European Communities (Environmental Liability) Regulations, 2008, S.I. No. 547 of 2008, as amended, 2011 (S.I. No. 307 of 2011), 2015 (S.I. No. 293 of 2015);
- European Communities (Shipments of Hazardous Waste Exclusively within Ireland) Regulations 2011, S.I. No 324 of 2011;
- European Communities (Transfrontier Shipment of Waste) Regulations 1994 (S.I. No. 121 of 1994);
- European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014), as amended 2019 (S.I. No. 233 of 2019);
- European Union (Drinking Water) Regulations, 2014, S.I. No. 122 of 2014, as amended 2017 (S.I. No. 464 of 2017), as amended (S.I. No. 286 of 2022), 2023 (S.I. No. 99 of 2023);

- Waste Framework Directive 2008/98/EC of the European Parliament and Council on waste, as amended 2018 (S.I. No. 851 of 2018);
- Waste Management Acts of 1996 to 2021;
- The Water Pollution Acts of 1977 & 1990;
- Water Framework Directive (WFD): Directive 2000/60/EC of the European Parliament and Council establishing a framework for Community Action in the field of water policy, as amended;
- The Wildlife Acts 1976 to 2024;
- Water Policy Regulations 2003, S.I. No. 722 of 2003, as amended, 2005 (S.I No. 413 of 2005), 2008 (S.I No. 219 of 2008), 2010 (S.I. No. 93 of 2010) and Amendment (No. 2) Regulations, (S.I. 326 of 2010) & EU Water Policy Regulations 2014 (S.I 350 of 2014), 2018 (S.I. No. 261 of 2018), 2022 (S.I. No. 166 of 2022);
- Water Conservation Regulations 2008, S.I. No. 527 of 2008;
- Guidelines on protection of fisheries during construction works in and adjacent to waters (IFI, 2016);
- Litter Pollution Act of 1997, as amended, 2017 (Bill 58 of 2017);
- Litter Pollution Regulations 1999, S.I. No. 359 of 1999);
- Waste Management (Facility Permit and Registration) Regulations 2007, S.I. No. 821 of 2007, as amended, 2008 (S.I. No. 86 of 2008), 2015 (S.I. No. 198 of 2015), 2019 (S.I. No. 250 of 2019), 2023 (S.I. No. 471 of 2023);
- Waste Management (Collection Permit) Regulations 2007, S.I. No. 820 of 2007), as amended, 2015 (S.I. No. 197 of 2015), 2016 (S.I. No. 24 of 2016), 2023 (S.I. No. 63 of 2023 & S.I. No. 104 of 2023);
- Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004) as amended 2010 (S.I. No. 350 of 2010);
- Environment (Miscellaneous Provisions) Act 2011, as amended 2015;
- Waste Management (Landfill Levy) Regulations 2008, S.I. No. 199 of 2008, as amended 2009, (S.I. No. 550 of 2009), 2010 (S.I. No. 31 of 2010), 2012 (S.I. No. 221 of 2012), 2013 (S.I. No. 194 of 2013), 2015 (S.I. No. 189 of 2015), 2019 (S.I. No.182 of 2019), 2023 (S.I. No. 398 of 2023), 2024 (S.I. No. 442 of 2024);
- Waste Management (Hazardous Waste) Regulations, 1998, as amended, 2000 (S.I. No. 73 of 2000);
- Waste Management (Shipment of Waste) Regulations 2007, S.I. No. 419 of 2007;
- Waste Management (Movement of Hazardous Waste) Regulations, 1998 (S.I. No. 147 of 1998);
- Waste Management (Transfrontier Shipment of Waste) Regulations 1998, as amended, 2014 (S.I. No. 861 of 2014);
- Waste Management (Tyres and Waste Tyres) Regulations 2007 (S.I. No. 664 of 2007), 2017, as amended (S.I. No. 400 of 2017) and 2018 (S.I. No. 96/2018);
- European Union Batteries and Accumulators Regulations 2014, S.I. No. 283 of 2014, as amended, 2014 (S.I. No. 349 of 2014), 2015 (S.I. No. 347 of 2015);
- Waste Management (Registration of Brokers and Dealers) Regulations 2008, S.I. No. 113 of 2008;
- Waste Management (Prohibition of Material Disposal by burning) Regulations 2009, S.I No. 286 of 2009, as amended 2013 (S.I. No. 504 of 2013), 2017 (S.I. No. 599 of 2017), 2019 (S.I. No. 684 of 2019), 2022 (S.I. No. 51 of 2022), and 2023 (S.I. No. 16 of 2023);
- European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011, as amended 2016 (S.I. No. 315 of 2016) and (S.I. No. 323 of 2020);
- European Waste Catalogue (EWC) and Hazardous Waste List 2002, 2015 and 2018;
- Waste Management (Food Waste) Regulations 2009, S.I. No 508 of 2009, as amended, 2015 (S.I. No. 430 of 2015), 2024 (S.I. No. 294 of 2024);
- Protection of the Environment Act 2003;
- European Union (Properties of Waste Which Render It Hazardous) Regulations 2015, S.I. No. 233 of 2015, as amended, 2018 (S.I. No. 383 of 2018);

- Air Pollution Act, 1987 (Air Quality Standards) Regulations, 1987, as amended, 2002 (S.I. No. 271 of 2002), 2011 (S.I. No. 180 of 2011), 2016 (S.I. No. 659 of 2016), 2022 (S.I. No. 739 0of 2022);
- Air Pollution Act, 1987 (Emission Limit Values for use of Asbestos) Regulations, 1990 (S.I. No. 28 of 1990);
- European Communities (Control of Emissions of Gaseous & Particulate Pollutants from Non-Road Mobile Machinery) Regulations 2007, S.I. No.147 of 2007, as amended, 2011 (S.I. No. 263 of 2011), 2012 (S.I. No. 407 of 2012), 2013 (S.I No. 417 of 2013), 2016 (S.I. No. 2016/1628);
- The EU Regulation 2037/2000 (CFC's, HCFC's, Halons) - Ozone Depleting Substances. Control of Substances that Deplete the Ozone Layer Regulations 2006, S.I. No 281 of 2006, as amended, 2011 (S.I. No. 465 of 2011);
- European Communities 2008/50/EC - Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive, 2008;
- Air Quality Standards Regulations 2011, S.I. No. 180 of 2011.
- EU Directive 2008/50/EC – Ambient air quality Directive European Communities (Ambient Air Quality Standards Regulations), 2022 (S.I. No. 739 of 2022);
- EU F Gas Regulations 2006, as amended, 2014, S.I. No. 517 of 2014, 2019 (S.I. No. 367 or 2019);
- Environmental Protection Agency Act 1992 (Noise) Regulations, 1994 S.I. 174 of 1994;
- Environmental Noise Regulations 2006, S.I. No. 140 of 2006, as amended 2018 (S.I. No. 549 of 2028), 2021 (S.I. No. 663 of 2021);
- European Communities (Noise Emission by Equipment for use Outdoors) Regulations, 2001, S.I No. 632 of 2001, as amended, 2006 (S.I No. 241 of 2006);
- European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Amendment Regulations 1996, S.I No. 359 of 1996 and 2001, S.I No. 632 of 2001);
- Local Government (Planning and Development) Act 1963 (S.I. No. 28 of 1963), as amended 1993 (S.I. No. 12 of 1993);
- European Communities Conservation of Wild Bird Regulations 1985, S.I. No. 291 of 1985, as amended, 1986 (S.I. No. 48 of 1986), 1995 (S.I. No. 31 of 1995), 1997, (S.I. No. 210 of 1997), 1998 (S.I. No. 154 of 1998), (S.I. No. 131 of 1999), 2005 (S.I. No. 716 of 2005), 2010 (S.I. No. 65 of 2010), 2011 (S.I. No. 626 of 2011), 2012 (S.I. No. 84 of 2012), 2013 (S.I. No. 281 of 2013), 2019 (S.I. No. 178 of 2019);
- Noxious Weed Act, 1936, S.I. No. 38 of 1936;
- Noxious Weed Order, 1937, S.I. No. 103 of 1937;
- Flora (Protection) Order, 2015 (S.I. No 356 of 2015), 2022 (S.I. No. 235 of 2022);
- The Forestry Act, 1946, S.I. No. 13 of 1946, as amended, 2009 (S.I. No. 40 of 2009) & Forestry Act, 2014 (S.I. No. 31 of 2014);
- Forestry Regulations, S.I. No. 191 of 2017, as amended 2020 (S.I. No. 31 of 2020, S.I. No. 39 of 2020 & S.I. No. 416 of 2020), 2023 (S.I. No. 445 of 2023);
- The National Monuments Act 1930, S.I. No. 2 of 1930, as amended, 2004 (S.I. No. 22 of 2004);
- European Union (Environmental Impact Assessment and Habitats) (Section 181 of the Planning and Development Act 2000) Regulations, 2013 (S.I. No. 403 of 2013), 2015 (S.I. No. 301 of 2015), 2019 (S.I. No. 418 of 2019);
- European Union (Environmental Impact Assessment and Habitats) (Environmental Impact Assessment) Regulations, 2018, S.I. No. 296 of 2018;
- Safety, Health and Welfare at Work (Exposure to Asbestos) (Amendment) Regulations 2006 (S.I. No. 386 of 2006), 2010 (S.I. No. 589 of 2010);and,
- The Water Action Plan 2024.

3.2 General

The Contractor will be required to have a recognised environmental management system such as ISO 14001:2015 or be able to demonstrate that they are actively working towards implementing such a system.

The works Contractor will undertake the works in accordance with the provisions of the CEMP. The CEMP will be updated by the Contractor to address any subsequent planning conditions relevant to the proposed works and will be reviewed by the Employer and/or the Employer's Representative. The Contractor will review and update the CEMP as appropriate and shall issue an updated CEMP. A record of the review and any recommendations will also provide (for review and approval by the Employer and/or the Employer's Representative) Environmental Control Plans (ECP), which will be maintained and updated in accordance with the CEMP.

ECPs will include (if applicable), but will not be restricted to:

- Air Quality Control Plan;
- Construction Noise and Vibration Control Plan;
- Waste Management Plan;
- Pollution Prevention Control Plan;
- Water Resources and Energy Use Control Plan;
- Ecological Control Plan;
- Light Pollution Control Plan;
- Archaeological and Cultural Control Plan;
- Traffic Management Control Plan;
- Contamination Land Control Plan;
- Soil Erosion and Sedimentation Control Plan; and,
- Emergency and Fire Control Plan.

Guidance on the development of the Control Plans is in Section 7 of this document.

3.3 Industry Guidance

The contractor should take due consideration of, and incorporate best practice guidance, including but not limited to the following:

- BS 5837/2012. Trees in relation to design, demolition and construction;
- BS 3998; 2010. Tree Work. Recommendations;
- CIRIA (2001). C532. Control of water pollution from construction sites. Guidance for consultants and contractors;
- CIRIA (2006). C648. Control of water pollution from linear construction projects. Technical Guidance;
- CIRIA (2008). C679. Invasive species management for infrastructure managers and the construction industry.;
- CIRIA (2015). C741. Environmental Good Practice on Site;
- SP156 Control of water pollution from construction sites – guide to good practice (Murnane, 2002), |
- C750 Groundwater control: design and practice (Preene et al., 2016) |
- Guidance on Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI, 2016);
- CIRIA (2015). C753. The SuDS Manual;
- Environmental Protection Agency (2021). 'Best Practice Guidelines for the preparation of resources & waste management plans for construction & demolition projects';
- ESB Networks (2019) Code of Practice for Avoiding Danger from Overhead Electricity Lines;
- Invasive Species Ireland (2016). Best Practice Management Guidelines. Japanese knotweed;
- National Roads Authority (NRA) (2008). Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes;

- NRA (2005). Guidelines for the Treatment of Badger Prior to the Construction of National Road Schemes;
- NRA (2008). Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes;
- NRA (2006). Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes;
- NRA (2010). Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (Revision 1); and,
- Sustainability & Environmental Appraisal (March 2020) LA 120 Environmental Management.

4. Project Roles and Responsibilities

For the purposes of clarity, the roles and responsibilities of the project team for the proposed works should be determined at the very outset of the Construction Stages of this project. Key roles are listed below. These are typically performed by the Client, Engineer, and Contractor as presented below. Specific details will be determined upon the Detailed Design and Contract Stage.

Table 4-1 - Roles and Responsibilities

Employer	**Planning Agents**
The Client: Mayo County Council Tel: 094 906 4000 Contact: Kieran Irwin	Consultant: AtkinsRéalis Tel: 01 8108000 Contact: Mark Gilsenan
Employers Representative	**Civil, Structural and Environmental Team**
Consultant: AtkinsRéalis Tel: 01 8108000 Contact: Mark Gilsenan	Consultant: AtkinsRéalis Tel: 01 8108000 Contact: Mark Gilsenan
Project Supervisor for the Design Process (PSDP)	
Consultant: AtkinsRéalis Tel: 01 8108000 Contact: Richard Joyce	
Contractor	**Project Supervisor Construction Stage (PSCS)**
Contractor: to be confirmed Tel: to be confirmed Contact to be confirmed	Contractor: to be confirmed Tel: to be confirmed Contact: to be confirmed

4.1 The Client/Employer

The client will be responsible for ensuring that competent parties are appointed to undertake the construction and that sufficient resources are made available to facilitate the appropriate management of risks to the environment.

4.2 Environmental Manager

An Environmental Manager will be appointed by the Contractor to ensure that the CEMP is effectively implemented. The Environmental Manager will be a suitably qualified, competent, and experienced professional that will perform the necessary tasks, review environmental procedures, and consult with the members of the construction team and stakeholders as required. The Environmental Manager will be responsible for:

- Ensuring that the CEMP and all relevant documents such as environmental control plans are developed, implemented, and maintained on site;
- Updated the CEMP to address any subsequent planning conditions relevant to the proposed project;

- Ensuring compliance with the Conditions of the Planning Permission and any other relevant permits/ consents required;
- Ensuring that construction occurs in accordance with the relevant environmental requirements and that such compliance is adequately recorded and documented;
- Conducting regular environmental inspections and compiling an environmental compliance report on a monthly basis;
- Attending site and stakeholder meetings as required;
- Keeping up to date with relevant environmental best practice and legislative changes;
- Ensuring all staff have undertaken adequate environmental inductions, awareness briefings and training;
- Dealing with environmental complaints; and,
- Managing and responding to environmental incidents and ensuring that all incidents are recorded and reported in an appropriate manner.

4.3 Ecological Clerk of Works

An Ecological Clerk of Works (ECoW) will be appointed and will supervise all aspects of the critical works on site, in particular initial site set up, dam/ silt fence installation, and pouring of concrete. The ECoW will be a suitably qualified and experienced ecologist, which will be appointed by the successful Contractor. The ECoW will ensure compliance of mitigation measures on site and liaise with IFI and NPWS staff where required.

4.4 Construction Director

The Construction Director will be responsible for the overall execution and organisation of all environmental related activities, as appropriate. Some responsibilities of the Construction Director will comprise the following:

- Overall responsibility for the implementation of the CEMP;
- Allocating the correct resources to ensure the successful implementation of the CEMP; and,
- Assisting in the management review of the CEMP for suitability and effectiveness.

4.5 Construction Manager

The Construction Manager is directly responsible to the Construction Director in assisting with the successful execution of the proposed project. The responsibilities of the construction manager in respect of the CEMP comprise the following:

- To report to the Construction Director on the on-going performance and development of the CEMP;
- To discharge his/her responsibilities as per the CEMP; and,
- To support and augment the Construction Management Team through the provision of adequate resources and facilities for the duration of the implementation of the CEMP.

5. Environmental Management Procedures

5.1 Environmental Policy

Contractors shall have an environmental policy dated and signed by the most senior person in the company. The policy shall:

- Be appropriate to the nature, scale and environmental impacts of the organisation's activities, products and services;
- Include a commitment to continual improvement in environmental performance;
- Include a commitment to comply with all applicable legislation and with other requirements to which the organisation subscribes which relate to its environmental aspects;
- Provide a framework for setting and reviewing objectives and targets;
- Be documented, implemented, and maintained;
- Be communicated to all persons working for or on behalf of the organisation; and,
- Be available to the public.

5.2 Environmental Aspects

Contractors are expected to use a qualitative approach to identify and evaluate potential environmental aspects along with any controls to prevent or mitigate environmental damage. A simple risk matrix (as follows in Table 5-1) facilitates quick reference and assignment of risk levels for each environmental aspect:

- Extreme/serious risk;
- High risk;
- Moderate risk; and,
- Low risk.

All environmental aspects rated as High or Extreme/Serious will be classified as significant and will require control or mitigation measures to manage the risk. All environmental aspects covered by a legal requirement, for example an Environmental Permit condition will also be classified as significant even if the risk is low or moderate.

Table 5-1 - Example of Qualitative Risk Matrix

					Probability				
Severity	**People**	**Assets**	**Environment**	**Reputation**	**Impossible /Rare**	**Improbable /Possible**	**Probable /Likely**	**Very Likely /Often**	**Certainty /Frequent**
Catastrophic	Multiple fatalities or permanent total disabilities	Extensive damage	Massive Effects	International impact			Extreme/ Serious		

					Probability			
Severe/ Major	Single fatality or permanent total disability	Major damage	Major effect	National impact		High Risk		
Critical/ Moderate	Major injury or health effects	Local Damage	Localised effect	Substantial impact				
Marginal/ Minor	Minor injury or health effects	Minor damage	Minor effect	Minor impact		Moderate Risk		
Negligible/ Insignificant	Slight injury or health effects	Slight damage	Slight effect	Slight impact	Low Risk			

The contractor shall record the results of the qualitative risk analysis in an Aspects and Impacts Register (Table 5-2).

Table 5-2 - Example of Aspects and Impacts Register

Environmental Aspect	Environmental Impact	Risk Rating	Control/ Mitigation Measures	Risk Rating After Control
Use of fuel storage tanks on site	Potential contamination of water and land	High Risk	Double skinned tank, bunding, location on hard standing, emergency spill procedure and equipment and training.	Moderate Risk

5.3 Training, Awareness and Competence

The Contractor (and their sub-contractors) will be selected with due consideration of relevant qualifications and experience. The Contractor will be required to employ construction staff with appropriate skills, qualifications, and experience appropriate to the needs of the works to be carried out during construction.

A site induction will be provided to all construction staff before they commence work on site. Where appropriate, the Contractor will identify specific training needs for the construction workforce and will ensure that appropriate training requirements are fulfilled. A baseline level of environmental awareness will be established though the site induction programme. Site inductions will cover the following as a minimum:

- Introduction to the Environmental Manager;
- The requirements of the CEMP and consequences of non-compliance;
- The requirements of Emergency Procedures;

- Reporting requirements;
- The requirements of due diligence and duty of care;
- Identification of environmental constraints and potential impacts of the work;
- Procedures associated with incident notification and reporting including procedures for dealing with damage to the environment; and,
- The benefits of improved environmental and sustainability performance; and the potential consequences of departure from specified procedures, work instructions and method statement.

5.4 Meetings

The Environmental Manager will be responsible for arranging and holding monthly meetings with the Employer and/or Employer's Representative. The Environmental Manager will develop and distribute minutes on monthly meetings accordingly.

5.5 Monitoring and Inspections

For the duration of the contract, the environmental performance of the Contractor will be monitored through site inspections and audits. The programme for monitoring, inspections and audits shall be specified in the contract. The Contractor shall develop, implement, and maintain an Environmental Inspections and Monitoring Plan.

Record of all inspections carried out should be recorded and all actions should be closed out in a reasonable time. If additional monitoring and inspections are required due to any subsequent planning conditions, these will be added to the CEMP.

5.5.1 Monitoring

Mitigation and monitoring will be carried out so that construction activities are undertaken in a manner that does not give rise to significant negative effects.

The results of all environmental monitoring activities would be reviewed by the Environmental Manager on an ongoing basis to enable trends or exceedance of criteria to be identified and corrective actions to be implemented as necessary.

5.5.2 Inspections

Inspections of construction activities will be carried out by the Environmental Manager daily to ensure all necessary environmental measures relevant to the construction activities are being effectively implanted by construction staff, ensuring legal and contractual conformity.

5.5.2.1 Daily Inspections

The daily inspections should include, but not be limited to, checking that:

- The site boundary is marked out and respected;
- All waste is appropriately stored and segregated;
- Waste skips are covered to prevent wind-blown litter;
- Drip trays are in place for all stored equipment and plant;

- All chemicals/fuels are stored with appropriate containment/bunds/cover;
- Emergency spill kits will be available on site and staff will be trained in their use;
- Operators will check all equipment, machinery and vehicles on a daily basis before starting work to confirm the absence of leakages;
- Construction noise is within permitted limits and does not create a nuisance;
- Dust does not create a nuisance; and,
- Fencing/hoarding is secure.

5.5.2.2 Weekly Inspections

The inspections should include, but not be limited to confirming that:

- Daily checklists have been completed;
- Waste storage areas have been checked and there is no build-up of waste materials;
- Spill kits have been checked and contain all relevant materials;
- The performance of all pollution control equipment has been checked and the equipment is working effectively;
- Noise reduction/monitoring equipment has been checked and is operating effectively;
- Septic tanks are not overfull/discharging; and,
- Special control measures identified in Permit/Planning Conditions and CEMP are adhered to.

5.6 Nonconformity and Corrective and Preventative

The Contractor shall establish, implement, and maintain procedures to deal with actual and potential non-conformities and for taking corrective and preventative action.

Non-conformities may be identified through:

- Internal contractor audits;
- Audits by the Employer and/or the Employer's Representative;
- Audits undertaken by external certification bodies;
- Audits undertaken by regulatory authorities; and
- General observations.

The Contractor procedures shall define the requirements for:

- Identifying and correcting non-conformities;
- Mitigating the environmental impacts of non-conformities;
- Investigating non-conformities including identify root causes and implementing appropriate actions to avoid their reoccurrence;
- Evaluating the need for actions to prevent non-conformities and implementing appropriate actions designed to avoid their reoccurrence;
- Setting realistic timeframes for undertaking effective corrective and preventative actions;
- Recording the results of corrective and preventative actions taken; and
- Reviewing the effectiveness of corrective and preventative actions.

All actions identified should be appropriate to the nature and magnitude of the issue and the environmental impacts encountered.

5.7 Reporting

The Contractor will be required to submit a report, the frequency to be agreed with the Contractor and Employer and/or the Employer's Representative to the Employer and/or the Employer's Representative for review and approval. The report shall address the following as minimum:

- Summary of compliance with the CEMP including identification of any non-conformances;
- Interpretation of the result of ongoing monitoring;
- Detailed description of any issues and/or non-conformances identified during inspections and/or audits;
- Record of incidents and corrective actions (including Corrective Actions Reports as appropriate);
- Synopsis of environmental complaints received/queries raised by stakeholders; and,
- Records of environmental training undertaken (as appropriate).

5.8 Environmental Records

The Contractor shall maintain records of all environmental documentation including monitoring, test results, method statements and plans. All records will be kept up-to-date and be made available for audits, inspections and periodical reporting. The Contractor will maintain the following environmental records (as a minimum) that will be made available for inspection to the Employer and/or the Employer's Representative and the relevant authorities if required:

- Management plans;
- Records of environmental incidents;
- Environmental reports;
- Records of environmental training;
- Register of environmental complaints;
- Corrective Action Reports;
- Environmental inspection and audit reports;
- All monitoring data;
- Waste and chemical inventories; and,
- Health and Safety records.

6. General Requirements

The Contractor will be legally required to ensure compliance and to avoid and/or reduce significant adverse effects that have been identified where practicable. Where the Contractor intends to vary the methodologies and working areas outlined herein and/or defined in the granted planning consent and associated conditions that may be granted, it would be the responsibility of the Contractor to obtain the relevant licenses, permits and consents prior to implementing any such changes.

6.1 Good Housekeeping

The Contractor will employ a 'good housekeeping' policy at all times. This will include, but not be restricted, to the following:

- General maintenance of working areas and cleanliness of welfare facilities and storage areas;
- An area for the provision of spill clean-up equipment;
- The provision of dedicated labelled waste skips where waste material can be deposited. As part of the weekly site audit, these skips will be audited to ensure that there is no cross-over of waste types;
- Provision of site layout map showing key areas such as first aid posts, material storage, spill kits, material and waste storage, welfare facilities etc;
- Maintain all plant, material and equipment required to complete the construction work in good order, clean and tidy;
- Ensure adequate provision of spill kits throughout the site;
- Keep construction compounds, access routes and designated parking areas free and clear of excess dirt, rubbish piles, scrap wood, etc. at all times;
- Details of site managers, contact numbers (including out of hours) and public information signs (including warning signs) will be provided at the boundaries of the working areas;
- Details of contact numbers for the Local Authority, EPA, National Parks and Wildlife Services, local fire station and Garda;
- Provision of adequate welfare facilities for site personnel;
- Installation of appropriate security, lighting, fencing and hoarding;
- Effective prevention of oil, grease or other objectionable matter being discharged from the working area;
- Provision of appropriate waste management at each working area and regular collections to be arranged;
- Excavated material generated during construction will be reused on site as far as practicable and surplus materials/soils shall be recovered or disposed of to a suitably authorised waste facility site;
- Effective prevention of infestation from pests or vermin;
- No discharge of site run-off or water discharge without agreement of the relevant authorities; and
- Maintenance of public rights of way, diversions and entry/exit areas around working areas for pedestrians and cyclists where practicable and to achieve inclusive access.

6.2 Site Compound

As agreed with MCC, the successful contractor will utilise the area of road closure along the N58 national road as a site compound for the duration of works. There may be a requirement for temporary (mobile) lighting within the site compound area along the N58 should works extend to winter months, however this is not foreseen given the works

window of July to September required to facilitate instream works. Upon completion of works the site compound area will cease to exist and will revert to fully operational road use.

The site compound will act as a storage centre for construction materials. Site access for all personnel and visitors will be strictly controlled and all visitors will report to the site compound prior to entering the construction area. The site compound will be fenced to keep public out of working area and should be secured. Regular inspections of the hoarding will be undertaken to ensure that the safety of any vehicles or personal are not compromised. Storage of materials will be minimal. No large materials will be stored on site until such times as they are required. At no time during the works will materials or other items be placed outside the hoarding line. Machinery refuelled on site in site compound area away from watercourse. Fuel not to be stored on site apart from small jerry cans for generators etc.

6.3 Hours of working

6.3.1 Core Working Hours

The timing of construction activities, core working hours and the rate of progress of construction works are a balance between efficiency of construction and minimising nuisance and significant defects. The core construction working hours for the proposed works are the standard working hours seen below:

- Monday to Friday: 08:00 to 19:00;
- 08:00 to 13:00 on Saturdays; and,
- No work on Sundays and Public Holidays.

Any works outside these hours must be agreed by Mayo County Council in advance.

6.3.2 Start-up and Shutdown

The Contractor may require a period of up to one hour before and one hour after core working hours for start-up and shutdown activities in working areas. Activities permitted may include deliveries and unloading of materials, movement of staff to their place of work, maintenance and general preparation works. The use of plant machinery likely to cause disturbance, will not be permitted outside of the core working hours.

6.3.3 Additional working hours

It may be necessary in exceptional circumstances to undertake certain activities outside of the construction core working hours. Any construction outside of the construction core working hours will be agreed by the Contractor in advance with Mayo County Council, scheduling of such works shall have regard to nearby sensitive receptors.

In the case of work required in an emergency or which if not completed would be unsafe or harmful to workers, the public or local environment, Mayo County Council will be informed as soon as reasonably practicable of the reasons and likely duration and timing (outside of the core working hours).

6.4 Security

Security will be the responsibility of the Contractor who will provide adequate security to prevent unauthorised entry to or from the site. The following measures may be used to prevent unauthorised access:

- Install CCTV and security systems where required;
- Consult with neighbouring properties and local crime prevention officers including MCC and An Garda Siochana on site security matters where required;
- Prevent access to restricted areas and neighbouring properties by securing equipment on site such as ladders and scaffolding; and,
- When there is no site activity, close and lock site gates and set appropriate site security provisions as required.

6.5 Hoarding and Fencing

A site boundary in the form of hoarding or fencing will be established around each of the working areas before any significant construction activities commences in that working area. The hoarding/fencing shall provide a secure boundary to what can be a dangerous environment for those that have not received the proper training and are unfamiliar with construction operations.

Site hoarding also performs am important function in relation to minimising nuisance and effects including:

- Noise emissions (by providing a buffer);
- Visual impact (by screening the working areas, plant and equipment); and,
- Dust minimisation (by providing a buffer).

6.6 Services and Utility

Site services shall be installed as part of the works. Working areas will be powered by mains supplies or diesel generators where an electrical supply is not available.

The Contractor will be responsible for undertaking their own service to establish full extent of underground services prior to the commencement of construction to support any surveys already undertaken as part of early design work and statutory consent applications.

6.7 Welfare Facilities

Welfare facilities will be provided for the estimated number of workers on the site, as appropriate for construction staff and site personnel such as locker rooms, toilets, showers, chemical toilet, etc.

6.8 Reinstatement of Working Areas on Completion

The Contractor will reinstate all working areas as work proceeds during construction. All plant, equipment, materials, temporary infrastructure and vehicles will be removed at the earliest opportunity and the surface of the ground restored as near as practicable to its original condition.

On completion of construction works the Contractor will ensure that all waste and polluting material is removed from the site and is disposed of using appropriately authorised contractors. The Contractor shall, as appropriate, undertake visual inspections of site compound and other areas no longer to be used by the Contractor. Following site clearance and rehabilitation the Employer or Employer's Representative will undertake a final inspection of the site. Any environmental issues identified during the final inspection will be raised with the Contractor. Mitigation measures and timeframes for

completion will be agreed between the Contractor and the Employer's Representative in line with agreed procedures prior to final sign off.

6.9 Health and Safety

The Contractor will ensure all relevant health and safety, fire safety and security requirements are in place prior to the commencement of construction and in accordance with the relevant legislation requirements in addition to the specifications of the client.

Relevant Irish and EU health and safety legislation would be complied with at all times by all construction staff and personnel during construction. Further, the Contractors would also have to ensure that all aspects of their works comply with good industry practice and all necessary consents, licenses and authorisations have been put in place for the proposed works.

7. Environmental Management and Controls

It should be noted that this section provides a summary of minimum requirements that will be developed by the Contractor when preparing the CEMP.

7.1 Waste Management

Construction activities produce a broad range of wastes. This section identifies the potential types of waste which may arise from construction and provides guidance on the management, control, and disposal of waste.

7.1.1 Risk Identification

Contractors will undertake a qualitative waste management risk assessment or appraisal prior to the commencement of construction activities. An example assessment is shown is Table 7-1.

Table 7-1: Example of waste management risk assessment

Risk Assessment		Example Procedure
01	Identify the location of all sensitive receptors within or adjacent to the construction site.	Mark up on a site plan with the location of all adjacent housing/commercial centres, schools and educational establishments, agricultural land and other potential receptors. This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for high-risk activities such as waste storage areas.
02	Identify the construction activities and sources that may result waste production and waste storage, segregation and disposal requirements.	These could include excavations, chemical and materials use etc., waste storage and bulking areas etc.
03	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage waste: 1. Prevent - Do not generate the waste in the first place. 2. Re-use – Can you re-use without treatment? 3. Recycle – Make sure that wastes are properly segregated to aid recycling. 4. Disposal with energy recovery. 5. Disposal without energy recovery.

7.1.2 Resource Waste Management Plan

Contractors will develop, implement, and maintain a Resource Waste Management Plan for the duration of the works. This plan will provide specific details in terms of proposed permitted haulage contractors and permitted / licenced waste disposal / recovery facilities.

The plan should include but not be restricted to the mitigation measures below (Table 7-2).

Table 7-2: Waste Management Mitigation Measures

Activity	Mitigation Measures
General	An approved person, such as a site/contract/resource manager, will be given responsibility for good site practices and control, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site. Contractors will apply the waste prevention principles of the waste management hierarchy: 1. Prevent – Do not generate the waste in the first place. 2. Re-use – Can you re-use without treatment? 3. Recycle – Make sure that wastes are properly segregated to aid recycling. 4. Disposal with energy recovery. 5. Disposal without energy recovery. The Contractor will ensure that all construction staff are trained in good waste management practice and chemical handling procedures.
Collection and Storage of Waste	Contractors will provide designated waste storage areas for the bulk storage of waste prior to removal off- site. A site plan showing the designated site will be provided and approved by the Construction Manager. Only appropriately authorised contractors and sites will be used for the transport and disposal of waste. Contractors will ensure that no wastes shall enter into the live channel. Any debris must be collected within the dry work area, removed from the work area and disposed of appropriately off site at a licenced/permitted facility. The Contractor will provide adequate facilities for the collection and storage of waste material including litterbins and waste skips. Waste containers/skips/bins will be provided with nets or lids to prevent waste being carried around by scavengers or by the wind. Waste containers will not be overfilled.

	Appropriate measures will be employed to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers. Industrial and construction waste including redundant hazardous equipment, tyres, used oil cans/drums, contaminated soil etc. will be separated and put into segregated bins for removal and disposal by an appropriately authorised contractor. All loaded trucks entering and exiting the work areas will be appropriately secured and covered.
Waste Reduction and Sustainability	Good management and control can prevent the generation of significant amounts of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Purchase materials in the quantity required for the project to minimise unused leftovers. Scheduling and planning the delivery of materials will be carried out on an 'as needed' basis to limit any surplus materials. Purchase materials that do not use excessive amounts of packaging to minimise the quantity of used packaging for subsequent disposal/processing. Segregate and store different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal. Collect and segregate waste metals including redundant plant and equipment, metal construction materials and cans. Recycle unused chemicals or those with remaining functional capacity.
Disposal of Wastes	All waste will be disposed of at approved sites using appropriately approved contractors. The Contractor must provide copies of valid waste collection permits for trucks carrying wastes off site for re-use/disposal. EPA Waste licenses and Local Authority Waste Permits (including those relating to their subcontractors or brokers, where applicable) for collection and waste treatment/disposal/export facilities. Records of waste disposal, recycling and recovery will be maintained. The contractor will provide sufficient secure waste disposal points and regular collection for disposal. No waste will be disposed of or buried on site. Dumping of waste, including roadside dumping is prohibited. Works that involve onsite filling with material other than virgin excavated natural material is encouraged where material is potentially suitable. Burning any waste on site is prohibited. Divert construction, demolition and land clearing debris from landfill disposal. Redirect recyclable recovered resources back to manufacturing process. Redirect reusable materials to appropriate sites.

	Waste will be segregated in onsite waste skips and recyclable waste material will be stored prior to collection by a licenced waste contractor. Consider recycling cardboard, metal, brick, acoustic tile, concrete, plastic, clean wood, glass, gypsum wallboard, carpet and insulation. Identify approved haulers and recyclers to handle the designated materials. All non-recyclable waste will be disposed of by an appropriately authorised waste contractor. The contractor will follow approved procedures for the classification, sampling, transport, and disposal of hazardous waste.
Storage and Stocking of Material	All spoil should be removed off site as quickly as possible and should not be stockpiled on site. Any spoil that must be stored on site for a period of time must be covered. The Contractor will comply with best practice when sourcing imported materials for site works, including NRA (2006) A Guide to Landscape Treatments. Imported material will be from a reputable source who can confirm that it has been screened for potential presence of invasive species.

7.2 Air Quality

Construction activities have the potential to impact on air quality through the creation of dust and emissions to air from vehicles and plant, along with activities including infilling of soil, excavation of trenches, stockpiling and movement of materials may all contribute to generating ambient dust. This section identifies the potential causes of air pollution which may arise from construction and provides guidance on the management and control of emissions from site.

7.2.1 Risk Identification

Contractors will undertake a qualitative risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7-3.

Table 7-3: Example of Air Quality Risk Assessment

Risk Assessment		Example Procedure
01	Identify the location of all sensitive receptors within or adjacent to the construction site.	Mark a site plan with the location of all adjacent housing/commercial centres, schools and educational establishments, agricultural land and other potential receptors. This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for high-risk activities such as material storage areas, refuelling points and haul routes.

02	Identify the construction activities and sources of pollution that may result in emissions to air.	These could include excavations, demolition, concrete use, transport, materials storage, traffic management etc.
03	Evaluate the risk of the construction activities resulting in emissions to air.	Assess the likelihood of an activity causing pollution. Assess the significance of the harm pollution would cause to a particular receptor. For example, the impact of dust in a populated urban area would be significantly greater than dust in an unpopulated rural area.
04	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: 1. Remove the risk (different construction methods/activities); 2. Control the source (modify construction methods, covers for storage areas); 3. Protect the receptor (provide hard standing and covering for compounds/storage areas, filter, control, contain emissions, ensure appropriate environmental permits are in place); and 4. Put emergency procedures in place.

7.2.2 Air Quality and Management Plan

Contractors will develop, implement, and maintain an Air Quality Management Plan. The plan should include but not be restricted to the mitigation measures below (Table 7-4).

Table 7-4: Air Quality Mitigation Measures

Activity	Mitigation Measures
General	The Contractor is required to implement the 'standard mitigation', as stated in the NRA Guidelines for the Treatment of Air Quality during the Planning and Construction of National Roads Schemes (2011). Standard measures should be taken which will minimise dust from demolition and construction activities, at a minimum adhering to standard good practice which includes the Building Research Establishment (BRE) document entitled 'Control of Dust from Construction and Demolition Activities' and Institute of Air Quality Management document 'Guidance on the Assessment of Dust from Demolition and Construction' (IAQM, 2014).
Air Quality	Avoid excessive vehicular traffic and movement. Locate haul routes away from sensitive receptors. Plan vehicle movements to minimise duration of dust generation. Stockpiles of fine material such as sand, topsoil material, cement, excavated material etc. will be covered/ protected from wind. Use dust suppression systems such as a rotary water atomizer (or equivalent) to damp down stockpiles and construction roads etc. during dusty conditions and to control dust from site-based activities. Due

	consideration should be given to the use of appropriate water resources for use in dust suppression, see Section 7.4. Dust generating activities will cease during excessively windy periods. Construct dust screens/wind breaks as necessary. Fence off work areas with geotextile type liners. Encourage progressive rehabilitation of disturbed land or stockpiles by establishing temporary or permanent vegetation. Contractors will regularly inspect stockpiles; exposed work areas and construction works practices to ensure compliance. Vehicle speeds will be restricted on un-surfaced roads and tracks to less than 30km/hr to minimise dust. Cover and/or maintain appropriate freeboard (+ 0.3m) on trucks hauling any loose material that could produce dust when travelling. Dust monitoring must occur during the construction stage.
Traffic, Vehicle, Plant and Equipment Emissions	Produce, implement, and maintain a comprehensive Traffic Management Plan (TMP). Undertake regular construction vehicle, plant and equipment maintenance. Undertake regular maintenance on particulate traps/filters on trucks. Implement minimum exhaust requirements in line with national standards on equipment (including temporary power generators) and vehicles. Switch plant and vehicles off when not in use. Use public/shared transportation for workers.
Other emissions	No fires will be allowed on the construction site. Burning of waste materials on site will be prohibited. Limit volatile substance emissions/fine particle releases. Local sourcing of construction materials such as the recycling of material won on excavations for reuse on site. Reducing the idle times by providing an efficient material handling plan that minimises the waiting time for loads and unloads. Reducing idle times could save up to 10% of total emissions during construction phase. Turning off engines when not in use for more than five minutes. This restriction will be enforced strictly unless the idle function is necessary for security or functionality reasons. Regular maintenance of plant and equipment, and technical inspection of vehicles to ensure they will perform the most efficiently.

7.3 Construction Noise and Vibration

Construction activities can produce a significant amount of noise and vibration with the potential to impact adversely on a range of receptors. This section identifies the potential causes of noise and vibration which may arise from construction and provides guidance on management and control.

7.3.1 Risk Identification

An example risk assessment is shown in Table 7-5.

Table 7-5: Example of Noise and Vibration Risk Assessment

Risk Assessment		Example Procedure
01	Identify the location of all sensitive receptors within or adjacent to the construction site.	Mark up on a site plan the location of all nursing homes, housing/commercial centres, schools and educational establishments, agricultural land and other potential receptors. This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for noisy activities or activities likely to cause vibration such as generators, compressors, haul routes and drilling.
02	Identify the construction activities that may affect the receptors identified.	These could include excavations, dewatering, traffic movements, warning sirens, use of machinery and plant etc.
03	Evaluate the risk of the construction activities impact on receptors.	Assess the likelihood of an activity causing noise pollution. Assess the significance of the noise impact on particular receptors. For example, the impact of noise from construction activities adjacent to housing would be significantly greater than the impact of noise in an uninhabited rural area.
04	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: 1. Remove the risk (different construction methods, substitution of materials for less noisy options). 2. Control the source (modify construction methods, provide adequate baffling). 3. Protect the receptor using noise barriers, screening etc. 4. Put emergency procedures in place.

7.3.2 Noise and Vibration Management Plan

Contractors will develop, implement and maintain a Noise and Vibration Management Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7-6) and the mitiagion measures given in the Natura Impact Statement for the works.

Table 7-6: Noise and Vibration Mitigation Measures

Activity	Mitigation Measures
General	The contractor shall comply with the contents and recommendations of BS 5228 – 1:2009 + A1:2014: Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise & Part 2: Vibration. The contractor shall comply with the contents and recommendations of BS 6471:2008: Guide to Evaluation of Human Exposure to Vibration in Building, Part 1: Vibration Sources other than Blasting. The contractor shall ensure that each item of equipment complies with the noise limits quoted in the European Commission Directive 2000/14/EC. As far as practical construction methods that are likely to cause high levels of noise and vibration e.g., concrete and excavation work, will be restricted to daytime hours only. Approval from the local authority should be obtained prior to undertaking work at night. Local residents and people likely to be affected by noise and vibration should be informed prior to the commencement of work.

Access roads to the site will be positioned such that vehicular movements cause minimum disturbances to residential buildings (if possible).

There are no otter holts near the bridge. However, a pre-construction survey for otter will be carried out upstream and downstream of the culvert within one month of commencement of works on site. Should any Otter signs be recorded, all works will be undertaken in accordance with the TII guidelines32 (*Guidelines for the treatment of otter prior to the construction of national road schemes*).

To mitigate potential impacts to otter, working hours shall be restricted to standard working hours only and there shall be no overnight artificial lighting of the site.

Piling works will give rise to noise disturbance, this example best practice mitigation measures to be considered are as follows:

- All plant and equipment to be switched off when idling.

- The use of white noise reversing alarms.

- Restriction on the dropping and loading of materials to less sensitive hours.

- The use of local screening for noisy activities or works with hand tools.

- Ensure all plant and equipment is well maintained and clean, all lubrication in line with manufacturers' guidelines.

Replace noisy plant with less noisy alternatives, shield/screen noise making plant especially during the evening and night periods or provide plant which is specifically designed with noise inhibitors such as generators and compressors with silencers and muffled jackhammers.

Construct a solid barrier around the generators.

Use plant in accordance with manufacturer's specifications. Orientate machinery away from noise sensitive residential areas.

Where machines are fitted with engine covers these shall be kept closed.

Ensure all stationary and mobile equipment, construction plant, machinery and vehicles are well maintained on a regular basis, and in good working order.

Delivery routes used by trucks and lorries should avoid residential areas to prevent likely vibration impacts from construction traffic to and from the site.

Vibrations must be minimised at any neighbouring premises. Residents of neighbouring premises must be warned of possible vibrations prior to the commencing the activity.

Complaints will be responded to within 24 hours and mitigation measures checked and improved within 48 hours.

Should a substantiated noise complaint be received by the Contractor, an appropriate noise monitoring campaign shall be instigated by the Contractor to determine the noise source. If necessary, appropriate noise mitigation measures, such as noise barriers, will be implemented.

Install noise barriers around the construction site. Complete noise monitoring during the construction phase.

7.4 Prevention of Soil and Water Pollution

Construction activities have the potential to cause pollution to groundwater and/or soils and surface water. This section identifies the potential causes of pollution which may arise from construction and provides guidance on the management and control.

7.4.1 Risk Identification

Contractors will undertake a qualitative pollution risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is presented in Table 7-7.

Table 7-7:Example of Soil and Water Pollution Risk Assessment

Risk Assessment		Example Procedure
01	Identify the location of all sensitive receptors within or adjacent to the construction site.	Mark up on a site plan with the location of all water courses, surface water features, boreholes, field drains, ecologically sensitive areas, surface and foul drainage systems and other potential receptors. This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for high-risk activities such as chemical/fuel storage areas, refuelling points, haul routes and wash out areas.
02	Identify sensitive receptors off site or downstream of the construction project that could potentially be affected by the works. For example, water courses, ecologically sensitive areas.	Undertake baseline assessment of water, ground, and surface water quality prior to construction. Establish monitoring regime during construction as appropriate.
03	Identify the construction activities and sources of pollution that may affect the water receptors identified.	These could include excavations, dewatering, water course crossings, as well as general sources of pollution such as surface water runoff, chemical/fuel storage, wash down areas, fuelling areas and concrete use.
04	Evaluate the risk of the construction activities polluting the identified water receptors.	Assess the likelihood of an activity causing pollution. Assess the significance of the harm pollution would cause to a particular water receptor. For example, the impact of polluting a water receptor used for potable water would be significantly greater than the pollution of a foul water system.
05	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: 1. Remove the risk (different construction methods/activities). 2. Control the source (change location, modify construction methods, provide adequate bunding for fuel and other storage areas, install measures such as silt fences or ditches to control runoff). 3. Protect the receptor (provide hard standing for compounds/storage areas, filter, control, contain discharges, ensure appropriate environmental permits are in place).

4. Put emergency procedures in place.

7.4.2 Pollution Prevention Management Plan

Contractors will develop, implement, and maintain a Pollution Prevention Management Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7-8) and the mitigation measures outlined in the Natura Impact Statement for the works .

Table 7-8: Soil and Water Mitigation Measures

Activity	Mitigation Measures
General	Excavations will not be carried out during or following times of prolonged rainfall. Ensure that appropriate permits/consents (if required) are in place prior to commencing dewatering activities. All operations shall be in accordance with C532 Control of water pollution from construction sites. Guidnace for Consultabnts and Contractors. All operations shall be in accordance with SP156 Control of water pollution from construction sites – guide to good practice (Murnane, 2002). All oprations shall be in accordance with Guidance on Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI, 2016). Sample collections as required, such as for wastewaters and discharges to the ground and surface waters to facilitate characterisation of contaminants in the event of a leakage or spill that may impact soil or groundwater quality. Appropriate sampling of discharges, to include key parameters to ensure discharges meet appropriate criteria. Carry out regular inspections/audits of hazardous materials usage, handling and storage areas and regular/thorough maintenance of vehicles and hydraulic systems and sanitary/welfare facilities. Avoid impacting adjacent sites by ensuring all contractors activities, equipment and waste storage is confined to the approved site boundary. The stockpiling of excavated materials will not be permitted on any vegetated surface or within proximity to any watercourses. Where waste waters do not meet approve quality criteria they should be contained and disposed of via an approved disposal route. Ensure regular and controlled disposal of waste using appropriately authorised contractors. Where vehicle access is required off pre-existing roads, bog mats shall be used in areas of soft ground

Storage and handling of hazardous substances	Hazardous substances include, but are not limited to human excrement, fuel, lubrication oils, hydraulic and brake fluid, acids, paints, anti-corrosives, pesticides, detergents, cement etc. All hazardous material, including chemicals and fuels, will be stored at a designated site. Hazardous materials will be stored in adequately sized (110%) bunded containers. No fuel or oil will be stored outside of the site compound. Fuels, lubricants and hydraulic fluids for equipment used onsite, as well as any solvents, oils, etc. will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice. Contractors should minimise the amount of diesel, oil, paint, thinners, and other chemicals stored on site that pose potential spillage environmental hazards and use materials that minimise environmental impact such as lead-free paints, asbestos free materials etc. Contractors will keep a list of all hazardous substances present on site and the MSDS for these substances shall be readily available. Hazardous wastes are the by-products and wastes associated with the use of hazardous substances as well as potentially hazardous items such as spent batteries, used oil filters, light bulbs, circuit boards, sharp objects etc. which require special collection and handling. Each receptacle containing dangerous goods will be marked with the correct technical name of the substance it contains. All markings shall be legible and in appropriate language. Incompatible materials will not be placed in common containment. All refuelling and fuel drum loading operations will take place at a designated site and the ground under the refuelling and fuel drum loading areas will be protected against pollution caused by spills and/or tank overfills. Fill nozzles will be kept within the bunded area when not in use and padlocked. Collection systems will be provided/bunded if necessary, under machinery or equipment that may leak hydrocarbons/hazardous substances. Bunds should typically be provided at refuelling stations, under any container with hazardous substances (oil, fuel, paints, solvents etc.) or any piece of machinery (i.e., generators) which may leak fuel, lubricants or hydraulic fluids. It is good practice to provide drip trays under construction vehicles prone to leaking lubricants/and oil. Locate storage areas away from drains/trenches/wastewater collection devices. All hazardous liquids will be stored in an impervious bund area where the volume of the storage bund is >110% of the largest storage tank contained within the bund until collected for off-site disposal by an approved waste contractor at an approved site. Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from works areas for disposal or recycling. All flammable liquids will be stored under cover and in well ventilated areas. No electrical equipment will be used within 10 metres of the storage area. Cylinders of compressed gas or flammable gases will be stored upright in secure racks and out of direct sunlight or heat source.

	The contractor will ensure that there is adequate fire-fighting equipment at the fuel and hazardous materials storage area. Firefighting equipment should be well maintained and tested periodically in line with manufacturers recommendations. All contractors handling hazardous materials will keep appropriate spill clean-up material/spill kits adjacent to storage and maintenance areas and take immediate action to contain/clean up the spill using sand/suitable absorbent material. Contaminated soil, rags and other clean up material will be disposed of via an approved waste contractor at an approved site. Spill kits will be inspected on a regular basis. Used spill kits will be replaced immediately after use. Used or waste fuel or other waste chemicals will be stored in a bunded area until collected for off-site disposal by an approved waste contractor at an approved site. Waste material or water containing waste chemicals such as thinners, oil, and mineral spirits will not be pumped or disposed of into storm water drains, sanitary sewers or into the ground. The contractor will comply with all permit conditions, environmental regulations and legislation with regards to the safe storage and handling of hazardous substances. The contractor is responsible for the training of all personnel on site who will be handling hazardous materials about its proper use, handling, disposal and spills procedures and to provide all staff with appropriate personal protective equipment. All plant and machinery will be serviced before being mobilised to each work areas. No plant maintenance will be completed at work areas, any broken-down plant will be removed from proposed development to be fixed. A response procedure prepared by the contractor will be put in place to deal with any accidental spill events. Any spillage of fuels, lubricants or hydraulic oils will be immediately contained by the contractor and the contaminated soil removed from the proposed development and properly disposed of in accordance with all relevant waste management legislation.
Maintenance and wash down of vehicles and machinery	Ensure all equipment is well maintained and in good working order. A collection system shall be provided (i.e., trays or impervious linings) under machinery or equipment that may leak hydrocarbons/hazardous substances (e.g., generator and pumps). All routine truck and plant maintenance to be carried out off site at contractor depot. Vehicle/machinery repair whether minor or major on open ground or at the side of roads is forbidden. Emergency repairs, mechanical servicing and maintenance of Vehicles/equipment/site plant to be undertaken at designated workshop area designed to contain any spillage. Oil or lubricants only to be changed at designated workshops.

	The ground under the servicing areas shall be constructed of an impervious material and bunded as necessary. It is prohibited to allow wash water to cause pollution of the ground, surface water or ground water. Vehicle and equipment wash down shall only be undertaken at designated areas. The ground under the wash down area shall be impervious and designed to collect wash water. Install oil interceptors and silt traps where wastewater may be contaminated. Wash water will be re-used where possible (such as vehicle washing, dust suppression) and excess water collected and disposed of by an approved contractor to an approved site. Refuelling of equipment (e.g., generators) will be completed in a controlled manner using drip trays at all times; Fuel containers will be stored within a secondary containment system, e.g., drip tray for mobile stores; Procedures and contingency plans will be set up to deal with emergency accidents or spills; An emergency spill kit with oil boom, absorbers etc. will be kept within vehicles for use in the event of an accidental spill. A specific team of staff will be trained in the use of spill containment; The highest standards of Site management will be maintained, and utmost care and vigilance followed to prevent accidental contamination or unnecessary disturbance to land and surrounding environment during construction activities. The Environmental Manager will be given the task of overseeing the pollution prevention measures to ensure that they are operating safely and effectively. The contractor will ensure that all plant and equipment utilised on-site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the work areas. This will minimise the risk of surface water becoming contaminated through Site activity.
Sanitary facilities	Adequate sanitary facilities including restrooms, showers, water tanks, cold drinking water facilities and sewage waste collection facilities will be provided as appropriate and will drain to a lined septic tank collection system to prevent leakage and infiltration to ground and groundwater. The siting of the facilities will be agreed with Uisce Éireann (UÉ). Holding tanks will be fitted with overflow alarms and will be emptied on a regular basis at a frequency which ensures no overflow of sewage effluent by an approved waste disposal company to an approved site. It is prohibited to discharge sewage onto the open ground. It is prohibited to use open ground for sanitary purposes including bathing, defecating, urination, cooking, washing (dishes or clothing). Disposal of settled solids in accordance with permit conditions. Sludge will also be disposed of on a regular basis in accordance with regulations. Contamination of underground infrastructure such as sewage lines prior to excavation.

7.5 Water Resources and Energy Use

Construction activities have the potential to use significant volumes of water and energy. This section identifies the potential impacts associated with water and energy use which may arise from construction and provides guidance on the management and control of water and energy on site.

7.5.1 Risk Identification

Contractors will undertake a qualitative water resources and energy use assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7-9.

Table 7-9: Example of Water Resources and Energy Use Risk Assessment

Risk Assessment		Example Procedure
01	Identify all items and activities on the construction site with high water and/or energy demands.	Mark up on a site plan with the location of all items and activities with high water and/or energy demands. This will help the planning of the overall layout of the construction site and enable the identification of efficiency opportunities.
02	Implement mitigation to eliminate or reduce water and/or energy demand.	Use the following hierarchy promote water and energy efficiency: 1. Remove the requirement (different construction methods, substitution of materials for that require less water and/or energy). 2. Control the use (modify construction methods, monitoring, target setting, procedures, switch off, training).

7.5.2 Water Resources and Energy Use Management

Contractors will develop, implement and maintain a Water Resources and Energy Use Management Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7-10).

Table 7-10: Water Resources and Energy Use Management Plan

Activity	Mitigation Measures
General	Reduce water consumption through recovery strategies. Conserve water by maximising opportunities for infiltration runoff. Conserve water by matching water quality with its intended use and using water saving devices. Contractors will carry out regular inspections/audits of water resource and energy use. In the event of excessive water use/leaking pipes etc., immediate action will be taken to repair equipment or reassess water needs. Use an irrigation system which utilises cooling water, condensate, TSE or other wastewater.

Water arising from vehicle and equipment wash-down will be treated to remove silt and reused where possible. For example, wetting down roads and stockpiles.

Turn out the lights at night and only light areas as required for safety and comfort (employment of lighting sensors).

Ensure that the light source is the minimum intensity for the required purpose. Ensure that fittings are chosen that direct light accurately to where it is needed. Vehicles will not be allowed to idle for long periods.

Machinery and generators shall be regularly maintained and operated in an efficient manner.

The use of solar powered instruments/machines should be considered.

Temporary site offices should be well insulated to retain heat or cool, utilise energy efficient bulbs and energy efficient cooling systems.

Choose locally sourced building materials and products thereby reducing the environmental impacts from transportation.

Choose rapidly renewable materials over finite raw and long cycle renewable materials.

Use timber and wood, including that used in construction, from a certified sustainable source, or be postconsumer re-used timber, or similar.

7.6 Ecology – Natural Habitats, Flora and Fauna

Construction activities can have adverse impacts on natural habitats, flora and fauna. This section identifies potential adverse impacts which may arise from construction and provides guidance on management and control. The Contractor will follow the mitigation measures given in the Natura Impact Statement for the works.

7.6.1 Risk Identification

Contractors will undertake a qualitative ecology assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7-11.

Table 7-11: Example of Ecology Risk Assessment

Risk Assessment		
01	Identify the location of all sensitive ecological receptors within or adjacent to the construction site.	Mark on the site plan the location of all water courses, surface water features, ecologically sensitive areas and habitats, other potential receptors including key wildlife populations. Particular attention should be paid to existing ecological features within the project area. This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for high-risk activities such as chemical/fuel storage areas, refuelling points, haul routes and wash out areas.

	Identify sensitive receptors off site or downstream of the construction project that could potentially be affected by the works. For example, water courses, ecologically sensitive areas and habitats.	Undertake baseline assessment of water quality prior to construction. Establish monitoring regime during and post construction.
	Identify the construction activities and sources of pollution that may affect the water/ecological receptors identified.	These could include excavations, dewatering, water course crossings, as well as general sources of pollution such as surface water runoff, fuel storage and concrete use.
	Evaluate the risk of the construction activities polluting the identified receptors.	Assess the likelihood of an activity causing pollution, damage or harm.
	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: 1. Remove the risk (different construction methods/activities). 2. Control the source (modify construction methods, provide adequate bunding for fuel and other storage areas, install measures such as silt fences or ditches to control runoff). 3. Protect the receptor (provide hard standing for compounds/storage areas, filter, control, contain discharges, ensure appropriate environmental permits are in place). 4. Put emergency procedures in place.

7.6.2 Ecology Management Plan

Contractors will develop, implement and maintain an Ecology Management Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7-12) and the requirements of the Natura Impact Statement for these works.

Table 7-12: Ecology Mitigation Measures

Activity	Mitigation Measures
General	Where practicable maintain areas of natural vegetation. All site work to consider the requirements of the Natura Impact Statement that was prepared for this project. Maintain good water quality as outlined in the Pollution Prevention Plan. No disposal of waste on site - adhere to the Resource and Waste Management Plan.

	Minimise the impact of erosion and sedimentation by the management strategies described in the Erosion and Sedimentation Management Plan. Wildlife awareness talk to staff if in /near to sensitive areas. Do not handle or kill any animal on the site. The following activities shall be prohibited: ▪ Disposal or burial of waste on site; ▪ Illegal dumping, including roadside dumping and illegal land filling; and, ▪ Burning of waste on site.
AtkinsRéalis (2025). *Natura Impact Statement*	This report concluded that: *'Given the prescription of the mitigation measures detailed in Section 7 of this NIS, it can be concluded beyond reasonable scientific doubt that the proposed development will not, either individually or in combination with other plans or projects, give rise to any impacts which would constitute adverse effects on the River Moy SAC or any other Natura 2000 site, in view of their conservation objectives..'* The below was the mitigation measures suggested being carried out by the report: General Measures ▪ An Ecological Clerk of Works (ECoW) will be appointed and will supervise all aspects of the critical works on site, in particular initial site set up, dam/ silt fence installation, and pouring of concrete. The ECoW will be a suitably qualified and experienced ecologist, which will be appointed by the successful Contractor. The ECoW will ensure compliance of mitigation measures on site and liaise with IFI and NPWS staff where required. ▪ All operations will be in accordance with, but not limited to, the following guidelines: ▫ C532 Control of water pollution from construction sites. Guidance for consultants and contractors (Masters-Williams et al., 2001), ▫ SP156 Control of water pollution from construction sites – guide to good practice (Murnane, 2002), ▫ C750 Groundwater control: design and practice (Preene et al., 2016) ▫ Guidance on Protection of Fisheries during Construction Works In and Adjacent to Waters (IFI, 2016). ▪ The site manager will monitor the 10-day weather forecast. The works are not permitted take place during high river flows or prior to forecasts of heavy rainfall. High river flows constitute river flows that will top the dams or will be in excess of pumping capabilities. If such conditions are forecast, the works area will be secured and all materials, including the elements of the dam system (sandbags, silt fences, pumps and associated pipes and silt socks) will removed from the works area and riverbanks. Upon subsidence of flows, the dam system shall be re-instated upstream and downstream of the culvert and the works area de-watered before works can re-commence. This shall be supervised by the Project Ecologist. ▪ All site staff will be informed of best practice methodologies to be employed on site via the dissemination of a tool-box talk. This shall include the requirement for protection of aquatic

habitats, the sensitivity of the SAC and the potential presence of invasive species pending a pre-construction survey.

- Works will be carried out during standard working day-time hours.
- Any chemical, fuel and oil stores will be located on an impervious base within a secured bund with a storage capacity 110% of the stored volume.
- Only biodegradable oils and fuels are permitted to be used.
- Drip trays will be placed underneath any standing machinery to prevent pollution by oil/fuel leaks. Refuelling of vehicles and machinery will be carried out on an impermeable surface in one designated area well away from any watercourse or drainage (at least 20m).
- Emergency spill kits will be available on site and staff will be trained in their use. A reporting system will be established on site to record accidents and/or spillages on site and the resultant action taken to remedy the incident.
- Operators will check all equipment, machinery and vehicles on a daily basis before starting work to confirm the absence of leakages. Any leakages should be reported immediately and addressed.
- Daily checks will be carried out and records kept on a weekly basis and any items that have been repaired/replaced/rejected noted and recorded. Any items of plant machinery found to be defective will be removed from site immediately or positioned in a place of safety until such time that it can be removed. All items of plant will be checked prior to use before each shift for signs of wear/damage.
- There shall be no excavation of the riverbed within the dry working area, nor is access to the riverbed permitted by heavy machinery at any stage.

Specific Measures

Protection for Fauna

- As there is no Otter holt near the bridge, no physical damage or disturbance to an otter holt shall occur. However, a pre-construction survey for otter will be carried out upstream and downstream of the culvert within one month of commencement of works on site. Should any Otter signs be recorded, all works will be undertaken in accordance with the TII guidelines (Guidelines for the treatment of otter prior to the construction of national road schemes).
- If a new otter holt is recorded during the pre-construction survey and is likely to be damaged or disturbed by the proposed works, a derogation licence will be applied for from NPWS. Any further mitigation measures required by the derogation licence shall be implemented. To mitigate potential impacts to otter, working hours shall be restricted to standard working hours only and there shall be no overnight artificial lighting of the site.
- The river channel and riverbanks will not be artificially lit during hours of dusk and darkness.

Watercourse Protection

- A dry working area will be achieved at the bridge site by setting up a dam system. There shall be three dams in total; one upstream of the bridge and two downstream of the bridge. Each dam will consist of tightly packed sandbags that are filled with clean sand. The sandbags will be double lined and sealed by tying. Only sealed sandbags will be used to create the dams. No clay or soil material is permitted to ‘seal’ the sandbag dams. A geotextile membrane may be used to aid the creation of a watertight dam.

- The integrity of the sandbag dams must be monitored to ensure that the works area is isolated from the live channel. This shall be monitored by the Site Manager twice daily; in the morning before the commencement of works and at the end of the day prior to leaving site.
- Two silt fences shall be installed between the two sandbag dams situated downstream of the culvert. Any water pumped into this dammed area shall be in advance of the silt fences. Thus, all water pumped from the work area must pass through both silt fences before re-entering the river.
- The pipe used to flume flows through the works area will be fitted with a filter to ensure no fish enter the pipe. The outfall of the pipe will be fitted with a silt sock. The silt sock shall be changed and/ or cleaned at regular intervals. The interval for replacing the silt sock will be dependent on the turbidity of the watercourse and therefore this shall be monitored by the site manager twice daily at a minimum; in the morning before the commencement of works and at the end of the day prior to leaving site.
- The temporary working platform, i.e. heavy-duty geotextile layer and 250mm thick layer of granular capping, must be clean and free of any foreign debris before being installed on the existing riverbed gravels.
- There can be no entry of debris and/ or waste material from the works area to the live channel. The debris must be collected within the dry work area, removed from the work area and disposed of appropriately off site at a licenced waste facility.
- Any water arising in the work area, as seepage through the upstream dam, will be pumped from the working area into the area between the two downstream dams in advance of the silt fences. The pump will be located on the temporary working platform and fitted with a drip tray. All associated pipes will be fitted with a silt sock and/ or de-watering bag.
- Primer products or products requiring curing shall be applied to surfaces in the morning of a workday. This is to ensure that the required 6-hour curing time can be achieved before leaving the site at the end of the day. Primer products shall not be applied to surfaces within 48 hours of a heavy rain forecast.
- Only quantities of primer products required for use in that working day shall be available at the site. These shall be kept is a bunded container located at least 20m from the watercourse until required for use.
- At no point will any equipment be washed out within the work area or adjacent to a watercourse.
- Sandbag dam no. 3 (furthers downstream) and the silt fences shall be left in place until any unforeseen sediment plume has dissipated.
- The gravel area on which the temporary working platform was located will be loosened, as it may have been compacted during the works. This area will be reinstated with washed and clean gravel. Gravel being sourced off site will be of the same type and pH as the existing gravel, as pH is an important factor in riverine environments.
- All material used on site, including the sandbags, silt fences and components of the temporary working platform, will be removed from site and disposed of at a licenced waste facility.

Noise Control

- Piling works will give rise to noise disturbance, this example best practice mitigation measures to be considered are as follows:
- All plant and equipment to be switched off when idling.
- The use of white noise reversing alarms.
- Restriction on the dropping and loading of materials to less sensitive hours.

- The use of local screening for noisy activities or works with hand tools.
- Ensure all plant and equipment is well maintained and clean, all lubrication in line with manufacturers' guidelines.

Biosecurity Protocols

- The following biosecurity protocols shall be implemented during the proposed project to prevent the introduction of invasive species. Biosecurity protocols implemented on site will follow the 'Clean-Check-Dry' principle.
- It should be noted that the biosecurity risk with respect to the proposed project is the potential introduction of non-native species and diseases, such as crayfish plague, to the site via machinery and equipment and the spread of crayfish plague to other aquatic environments post-completion of the works. The field survey for the proposed works did not record any non-native invasive plant species listed on the 3rd Schedule of the EC (Birds and Natural Habitats) Regulations 2011, as amended.
- The excavator intended to be used at the site shall be dry, clean and free from debris prior to being brought to site. The excavator will have been dried for a minimum of 48 hours prior to being brought to site. This will be inspected by the Site Manager on site on arrival.
- There are no instream works associated with the proposed works and no machinery or plant equipment is anticipated to come in contact with the Strade River. Other equipment including dam materials will be washed down using a power washer at a suitable remote location away from the river. Under no circumstances is power washing of any equipment permitted to be carried out adjacent to the river channel and watercourse.
- All washed equipment will then be left unused for 48 hours once dry. Equipment is not permitted be used until 48 hours have elapsed from when it is dry.
- Operatives who have entered the Strade River to install silt fences and sandbags dams will disinfect their boots and waders using a disinfectant. The disinfectant that will be used is Milton, Virkon Aquatic (3mg/l), or Proxitane (30mg/l). Disinfection of PPE will be carried out a minimum of 20m from the riverbank. The disinfectant will be allowed to soak to ground. Under no circumstances will disinfection of PPE be carried out adjacent to the river channel.

7.7 Light Pollution

Obtrusive light from a construction site is a form of pollution. Construction lights can cause glare and light trespass. These are forms of obtrusive light which may cause nuisance to others.

7.7.1 Risk Identification

Contractors will undertake a qualitative light pollution risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7-13.

Table 7-13: Example of Light Pollution Risk Assessment

Risk Assessment	Example procedure

01	Identify the location of all sensitive receptors within or adjacent to the construction site.	Mark a site plan with the location of all potential receptors including housing, schools, hospitals, roads and key wildlife populations. This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for lighting.
02	Identify the construction activities and sources of light pollution that may affect the receptors identified.	These could include depots, storage areas, night working activities etc.
03	Evaluate the risk of the construction activities creating light pollution for the identified receptors.	Assess the likelihood of an activity causing pollution, damage or harm.
04	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: 1. Remove the risk (different construction methods/activities); 2. Control the source (modify construction methods; provide adequate screening, directional light); 3. Protect the receptor (screens); and 4. Put emergency procedures in place.

7.7.2 Light Pollution Control Plan

Contractors will develop, implement and maintain a Light Pollution Control Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7-14).

Table 7-14: Light Pollution Mitigation Measures

Activity	Mitigation Measures
General	Maintain levels of lighting acceptable for health and safety and avoid over lighting areas. Dim or switch off lights when task is finished. Minimise the spread/glare of light by assessing/managing direction. Lower the height of lights to minimise glare. Use screens, shields, baffles and louvers to help reduce light spill. Use specifically designed lighting equipment to minimise the upward spread of light near to and above the horizontal.

7.8 Archaeology and Cultural Heritage

Heritage is an irreplaceable resource, so it is recognised that cultural resources must be safeguarded for future generations. Construction activities have the potential to impact on archaeology and heritage through the destruction or disturbance of sites or artefacts.

7.8.1 Risk Identification

Contractors will undertake a qualitative archaeological and heritage risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7-15.

Table 7-15: Example of Archaeology and Cultural Heritage Risk Assessment

Risk Assessment		Example Procedure
01	Identify the location of all sensitive receptors within or adjacent to the construction site.	Mark a site plan with the location of all potential receptors including villages, forts, palaces, houses, and towers. The site plan must be updated and approved by the appointed project archaeologist. This will help the planning of the overall layout of the construction site.
02	Identify the construction activities that may affect the receptors identified.	These could include depots, storage areas, excavation, waste storage, haul roads etc.
03	Evaluate the risk of the construction activities damaging the identified receptors.	Assess the likelihood of an activity causing pollution, damage or harm.
04	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: 1. Remove the risk (different construction methods/activities). 2. Control the source (modify construction methods or operations - alternative haul roads). 3. Protect the receptor (screens). 4. Put emergency procedures in place.

7.8.2 Archaeology and Cultural Heritage Management

Contractors will develop, implement and maintain an Archaeology and Heritage Management Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7-16).

Table 7-16: Example of Archaeology and Cultural Heritage Mitigation Measures

Activity	Mitigation Measures
General	If intact and/or important archaeological or cultural items are identified during construction activities, work must stop and Mayo County Council and the Department of Arts, Heritage and the Gaeltacht and the National Museum of Ireland should be notified immediately. Work should not recommence until authorised by Mayo County Council and the Department of Arts, Heritage and the Gaeltacht and the National Museum of Ireland. Records should be maintained of all finds.

	Where practicable remains should be preserved in situ using appropriate engineering methods: 1. Raising ground levels 2. Using suitable materials and loading Maintenance of Hydrological regimes.
Cultural Heritage Impact Assessment (MCC/TII, 2025)	The proposed works site is in close proximity to, and within the zone of notification for an early medieval friary (National Monument No. 172, RMP No. MA070-067). As it is a National Monument Ministerial consent is required for these works. There is no predicted direct impact on the Abbey, however there is potential for further subsurface archaeological remains. Archaeological monitoring of the ground works including ground investigations is recommended. Predevelopment testing of external works areas such as storage areas and compounds is also recommended. The archaeologist should be facilitated in examining, recording, excavating, sampling and analysing any archaeological deposits, features or objects that might be discovered, and will be required to report on same. This will require Ministerial consent via the National Monuments Service and should be included in the method statement as part of the Ministerial Consent application. There are three Recorded Protected Structures (RPS) in the vicinity. Strade Bridge (RPS No. 0130) is the closest, c. 20 m from the development. There is no predicted impact on these Structures, however measures should be put in place to prevent inadvertent impacts from the works.

7.9 Traffic Management

Accidents involving construction vehicles and/or mobile equipment have the potential to cause serious injury or death and damage to the environment. Work zones on construction sites are used to move traffic in an approved direction and are typically identified by signs, cones, barrels, and barriers.

7.9.1 Risk Identification

Contractors will undertake a traffic management risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7-17.

Table 7-17: Example of Traffic Management Risk Assessment

Risk Assessment		Example Procedure
01	Identify the location of all traffic sensitive areas within or adjacent to the construction site.	Mark a site plan with the location of all potential traffic sensitive areas including villages, forts, palaces, houses, schools, shopping districts, commercial/leisure areas roads and other rights of way. This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for vehicle/pedestrian entrances, storage areas etc.
02	Identify the construction activities may affect the traffic sensitive areas identified.	These could include depots, storage areas, excavation, waste storage, haul roads etc.

03	Evaluate the risk of the construction activities impacting on traffic sensitive areas.	Assess the likelihood of an activity causing harm or obstruction.
04	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: 1. Remove the risk (different construction methods/activities). 2. Control the source (modify construction methods or operations- alternative haul roads). 3. Protect the receptor (screens, signs, barriers). 4. Put emergency procedures in place.

7.9.2 Traffic Management Control Plan (TMP)

Contractors will develop, implement and maintain a construction stage Traffic Management Control Plan. The Plan forms an important management tool that acts as the catalyst for reducing the negative transport effects of construction work (e.g., congestion, air pollution and noise) on local communities, residents, businesses and the environment. By promoting efficient working practices, shorter haulage routes and reducing deliveries, the implementation of the Plan not only gives rise to the above benefits, but also helps saves costs.

The Plan should include but not be restricted to the mitigation measures below (Table 7-18).

Table 7-18: Traffic Management Mitigation Measures

Activity	Mitigation Measures
General	Contractors will ensure that all operators are fit and competent to operate vehicles, machines and attachments by: ▪ Undertaking checks when recruiting drivers/operators or hiring contractors; ▪ Providing appropriate training for drivers and operators; ▪ Managing the activities of visiting drivers; and, ▪ Ensuring that signallers, flag men and bank men are appropriately trained and authorised. Access to vehicles will be restricted to prevent unauthorised access. Routes will be clearly marked and where practicable turning circles will be provided to prevent reversing. Contractors will ensure that all roads and footpaths are maintained free of mud and debris.

	All visitors to the site will be required to undertake a site induction and wear high visibility clothing/PPE. All roads and footpaths affected by construction activity will be appropriately reinstated/repaired.
Travel Plan	The plan will be prepared to ensure access to the site by sustainable travel modes is encouraged. The following measures should be considered where relevant: ▪ The provision of showers/change rooms for construction staff; ▪ The provision of cycle parking for staff; and, ▪ The promotion of car sharing among staff, including van pooling travel between different work sites.
Pedestrian Safety	Contractors will provide clear warning signage, lighting and barriers at construction works. Where practicable the contractor will provide separate entrances and exits for vehicles and pedestrians in work areas. Contractors will ensure that drivers driving onto public roads can see and be seen before moving on to it. Appropriately trained signallers/flag man/banks men will be used to control vehicle and plant movement on public roads. Contractors will ensure that, as far as practicable, construction works do not block/obstruct walkways and roads.

7.10 Contaminated Land

The term ‘land contamination’ covers a wide range of situations where land is contaminated in some way by previous use. This is often associated with industrial processes or activities that have now ceased, but where waste products or remaining residues present a hazard to the general environment.

7.10.1 Risk Identification

Contractors will undertake a contaminated land risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7-19.

Table 7-19: Example of Contaminated Land Risk Assessment

Risk Assessment		Mitigation Measures
01	Identify the location of contamination risks by undertaking site visits and	Mark a site plan with the location of all potential contamination risks including waste deposits, petrol stations, oil stores etc.

	desk-based studies of relevant documents - EIA etc.	
02	Identify the construction activities that may give rise to potential contaminated land.	These could include depots, storage areas, waste storage, etc.
03	Evaluate the risk of the construction activities leading to ground contamination.	Assess the likelihood of an activity causing pollution, damage or harm.
04	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: 1. Remove the risk (different construction methods/activities); 2. Control the source (modify construction methods or operations); 3. Protect the ground (screens); and, 4. Put emergency procedures in place.

7.10.2 Contaminated Land Control Plan

Contractors will develop, implement and maintain a Contaminated Land Control Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7-20).

Table 7-20: Contaminated Land Mitigation Measures

Activity	Mitigation Measures
General	The contractor will manage and control the potential contamination of land from construction activities through the implementation of the CEMP and method statements as appropriate. The contractor will notify employers representative immediately if contaminated land is discovered or suspected. Any contaminated material will be fully characterised by an appropriately qualified and experienced environmental consultant in terms of lateral and vertical extent, and a detailed assessment of the potential environmental and human health impacts will be undertaken in accordance with industry standard best practice. All soil requiring disposal offsite will require waste classification in accordance with Environmental Protection Agency (EPA) requirements as set out in the documents 'Waste Classification List of Waste & Determining if Waste is Hazardous or Non-hazardous' (EPA, 2015), and 'Determining if waste is hazardous or non-hazardous' (EPA, 2018), and all relevant waste management legislation. In addition to screening against relevant Waste Acceptance Criteria (WAC), the preparation of a waste classification tool (HazWaste online / EPA paper tool or similar etc.) will be required to be carried out

in order to determine the relevant LoW / EWC code for the transport of any waste soils which require offsite removal and disposal.

The contractor will work with employer's representative to:

- Undertake a risk assessment of the potential contamination.
- Evaluate options for remediation including:
  - Containment;
  - Monitoring;
  - Treatment; and,
  - Removal/Disposal

The contractor will implement remediation strategy and monitor as appropriate.

7.11 Soil Erosion and Sedimentation

Soil eroded during land disturbance can wash away and contaminate storm water drains and nearby water bodies. The plan establishes a series of mitigation and management measures to control and minimise these issues if required. Water erosion potential depends on the intensity of the rainfall and/or construction discharges, the soil type and topography. This section identifies the potential causes of erosion and sedimentation which may arise from construction and provides guidance on the management, control and disposal of waste.

7.11.1 Risk Identification

Contractors will undertake a qualitative soil erosion and sedimentation risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7-21.

Table 7-21: Example of Soil Erosion and Sedimentation Risk Assessment

Risk Assessment		Example Procedure
01	Identify the location of all activities that could result in erosion and sedimentation, for example dewatering, and sensitive receptors within or adjacent to the construction site.	Mark a site plan with the location of all water courses, surface water features, boreholes, field drains, ecologically sensitive areas including surface and foul drainage systems and other potential receptors. This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for high-risk activities such as dewatering, haul routes and wash out areas.
02	Identify sensitive receptors off site or downstream of the construction project that could potentially be	Mark a site plan with sensitive receptors outside the site boundary.

	affected by the works. For example, water courses and ecologically sensitive areas/nature reserves.	This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for high-risk activities such as dewatering, haul routes and wash out areas.
03	Identify the construction activities and sources of sedimentation/erosion that may affect the water receptors identified.	These could include excavations, dewatering, water course crossings, as well as general sources of pollution such as surface water runoff and concrete use.
04	Evaluate the risk of the construction activities polluting the identified water receptors.	Assess the likelihood of an activity causing pollution. Assess the significance of the harm sedimentation/erosion would cause to a particular water receptor.
05	Evaluate the risk of the construction activities contributing to and/or being affected by the groundwater table.	Assess the likelihood of an activity contributing to raised groundwater levels or being affected by these. Assess the significance of the harm additional water would cause to groundwater or other projects/receptors and the significance of the high-water table on construction.
06	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: 1. Remove the risk (different construction methods/activities). 2. Control the source (modify construction methods, provide adequate bunding for storage areas, install measures such as silt fences or ditches to control runoff). 3. Protect the receptor (provide hard standing for compounds/storage areas, filter, control, contain discharges, ensure appropriate environmental permits are in place). 4. Put emergency procedures in place.

7.11.2 Soil Erosion and Sedimentation Management Plan

Contractors will develop, implement, and maintain an Erosion and Sedimentation Management Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7-22).

Table 7-22: Soil Erosion and Sedimentation Mitigation Measures

Activity	Mitigation Measures
Soil Erosion	Methods to control erosion need to consider the factors causing erosion – rainfall discharge intensity, soil type and topography. Erosion control measures may include, but are not limited to the following:

	▪ Avoid the creation of steep slopes. Consider implementing terraces instead of long steep slopes to avoid runoff from precipitation; ▪ Do not release heavy discharges of water onto the soil; ▪ Prevent over-watering of loose areas for dust suppression; ▪ All excavated materials will be stored away from excavations on the temporary works area, to protect the grounds condition in an appropriate manner at a safe and stable location. The maximum height of temporary stockpiles will be 3m; ▪ All excavations will be carefully backfilled with the excavated material; ▪ Consider covering temporary roads and routes within site with either asphalt or stone. Appropriate rehabilitation will need to be applied; ▪ Undertake regular leak monitoring and maintenance of dewatering pipes; ▪ Maintain recommended maximum vehicle weightings to avoid destabilization and subsequent erosion of soil surface; ▪ Provide collection systems under machinery or equipment during wash down to prevent erosion from runoff; and, ▪ Flow attenuation - Employ mechanisms to control run off of precipitation such as temporary structures to slow running water to facilitate pollutant removal and infiltration and reduce runoff.
Sediment Control	Possible sedimentation control measures may include but are not limited to the following: ▪ Place sediment traps on all drainage lines such as geotextile lining. ▪ Construct collection channels capable of collecting all runoff water during storms if it contains fine clay particles. ▪ Use contained concrete washout control facility. ▪ Treat and discharge runoff water from retention basin at controlled flow rate through storm water discharge network. ▪ Inspect and clean the collection channels and retention basin on regular basis to prevent sediment build up. ▪ Stabilise the site as soon as possible after construction.

8. Emergency Response Plan

The contractor shall establish, implement and maintain procedures to identify and manage potential environmental emergency situations and potential accidents. The contractor shall respond to actual emergency situations and prevent and mitigate adverse environmental impacts.

The contractor should periodically test, review and update emergency preparedness and response procedures.

8.1 Key Requirements

In the event of an emergency, the first response is to locate the source of that which is giving rise to the environmental impact where appropriate and stop continuation of the situation, followed by the containment, control and mitigation of the situation.

For the construction the site Emergency Response Procedure will be displayed within the Site Office / compound.
A copy of the Material Safety Data Sheets for all the chemicals used on the project site will also be kept at the site office.
The main objectives of the Emergency Response Plan are to:

- Ensure that all means are available to contain the consequences of an accidental spill, fire or release of oil/fuel;
- Ensure that employees are suitably trained to respond to fire and spill;
- Ensure that proper reporting takes place; and,
- Ensure that proper investigation is undertaken.

All contractor personnel and sub-contractors will be instructed and rehearsed, as appropriate, in the requirements of the emergency response procedure. Following control of an incident or emergency, an investigation will be conducted, and corrective actions identified and addressed. The Contractor's Environmental Manager will verify the close out of environmental related actions and notify the Employer and/or the Employer's Representative of any emergency.

8.2 Emergency Incidents

Emergency incidents are those occurring that rise to significant negative environmental effects including but not limited to the following:

- Any malfunction of any mitigation measure and/or environmental protection system;
- Any emission that does not comply with requirements of the contract and relevant licenses/permits;
- Any circumstance with potential environmental pollution; or,
- Any emergency that may give rise to environmental effects (e.g., significant spillages or fire outbreak).

8.3 Spill Contingency Plan

The main causes of contamination can occur through:

- Spillage of hazardous material including fuel oils, waste materials or chemicals;
- Spillage of wastewater sewage and other liquid effluents; and,
- Spillage of contaminated wash down water with oils, chemicals etc from vehicles, equipment and machinery.

Prior to commencing activities on site, Contractors should develop, implement and maintain a Spill Contingency Management Plan. The Plan should include but not be restricted to the mitigation measures below (Table 8-1).

Table 8-1: Spill Mitigation Measures

Activity	Mitigation Measures
Mitigation Actions /Emergency Response	Contractors will carry out regular inspections/ audits of hazardous materials usage, handling and storage areas and regular/thorough maintenance of vehicles and hydraulic systems and inspections of sanitary facilities and disposal. All contractors handling hazardous materials will keep appropriate spill clean-up material adjacent to storage and maintenance areas. Minimise the amount of diesel, oil, paint, thinners and other chemicals stored on site that pose potential spillage environmental hazards and use materials that minimize environmental impact such as lead-free paints, asbestos free materials etc. Storage areas will be located away from drains/trenches/wastewater collection devices in an impervious bund area (volume of the storage bund >110% of the largest storage tank contained within the bund). Collection systems will be provided/bunded if necessary under machinery or equipment that may leak hydrocarbons/hazardous substances. The contractor shall be responsible for training all staff in the procedures for handling spills and shall provide all staff with appropriate personal protective equipment. The contractor shall provide all staff with appropriate personal protective equipment. Avoid impacting adjacent sites by ensuring all contractors activities, equipment and waste storage is confined to the allocated site boundary. In the event of a spill: ▪ Identify and stop the source of the spill and alert people working in the vicinity; ▪ Notify the Environmental Manager immediately giving information on the location, type and extent of the spill so that they can take appropriate action; ▪ If applicable, eliminate any sources of ignition in the immediate vicinity of the incident; ▪ Contain the spill using spill control materials, track mats or other materials as required. Do not spread or flush away the spill; ▪ If possible, cover or bund off any vulnerable areas where appropriate such as drains, watercourses and/or sensitive habitats; ▪ If possible, clean up as much as possible using the spill control materials; ▪ Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with appropriate permits so that further contamination is limited; ▪ The Environmental Manager shall inspect the site as soon as practicable and ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring; and, ▪ The Environmental Manager will notify the appropriate stakeholders such as MCC, National Parks and Wildlife Service and/or the EPA.

8.4 Emergency Incident Response Plan

The Contractor will be required to detail emergency incident procedures in the detailed CEMP and develop an Emergency Incident Response Plan. The Plan will contain emergency phone numbers and method of notifying local authorities, statutory authorities and stakeholder. The Plan will include contact numbers for key personnel. The Contractor will ensure that all staff and personnel on site are familiar with the emergency requirements.

In the case of work required in an emergency, or which if not completed would be harmful or unsafe to workers, the public to local environment, Mayo County Council will be informed as soon as reasonably practicable of the reasons and likely duration. Examples may include where the ground needs stabilising if unexpected ground conditions are encountered or equipment failure.

In the event of an emergency incident occurring, the Contractor will be required to investigate and provide a report to include the following, as a minimum:

- A description of the incident, including location, type of incident and the likely receptor;
- Contributory causes;
- Negative effects;
- Measures implemented to mitigate adverse effects; and,
- Any recommendations to reduce the risk of similar incidents occurring.

Further, if any sensitive receptor is impacted, the appropriate environmental specialists will be informed and consulted with accordingly.
Any response measures will be incorporated into an updated Emergency Incident Response Plan.

8.5 Emergency Access

The Contractor will be required to maintain emergency access routes throughout construction and identify site access points for the working area.

8.6 Extreme Weather Events

The Contractor will consider the impacts of extreme weather events and related conditions during construction. The detailed CEMP should consider all measures deemed necessary and appropriate to manage extreme weather events and should specifically cover training of personnel and prevention and monitoring arrangements for staff. As appropriate, method statements should also consider extreme weather events where risks have been identified.

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