AtkinsRéalis

Natura Impact Statement

Mayo County Council

June 2025

N58 STRADE RIVER BRIDGE REHABILITATION WORKS

Bonneagar Iompair Éireann
Transport Infrastructure Ireland

Comhairle Contae Mhaigh Eo
Mayo County Council

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Document history

Document title: Strade River Bridge Natura Impact Statement

Document reference: 0088572DG0045

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
0.0	Draft for comment	CD & AS	EE	POD	POD	22/05/2025
1.0	Final Issue	CD & AS	EE	POD	POD	27/06/2025

Client signoff

Client	Mayo County Council
Project	TO315 MAYO BRIDGES
Job number	0088572
Client signature/date	

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1. Introduction

1.1 Background

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 Natura Impact Statement report on behalf of MCC for 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. The 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 was therefore recommended to be replaced to provide a structure with a full 40t load capacity. The aim of the proposed works is to improve the structural integrity of Strade River Bridge for the safety of road users. The environs of the bridge have been subject to historic flooding at this location in part due to the low soffit level of the current bridge. The new structure has been designed to achieve a balance between increasing the volume of water that can be conveyed through the structure at high flow (as required by Office of Public Works, OPW), while retaining a reduced height concrete apron in one arch which will maintain the second arch as a functional low flow channel (as required by Inland Fisheries Ireland, IFI).

Works also include the lowering of the existing concrete apron to allow improved water flow through the bridge during high flow events. The proposed development is not directly connected with or necessary to the management of any designated site for nature conservation.

This report comprises the Appropriate Assessment Screening Report and Natura Impact Statement in respect to the proposed works and is intended to assist the competent authority, by providing it with sufficient evidence to make a properly informed determination in respect of the proposed works.

1.2 Location and Context

The proposed works are located in County Mayo, c. 2.9km northeast from Ballyvary village. The location of the bridge including the flow 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 existing bridge structure.

The bridge is 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 are located southeast of the structure.

[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

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.

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

1.3 Description of Existing Structure

The existing structure has square spans of 3.44m and 3.42m and skew spans of 3.82m and 3.79m for the south and north spans respectively. The overall square length of the structure is 7.59m with a skew length of 8.6m. The structure has a skew of 26° (Figure 1-2).

The overall kerb-to-kerb width on the bridge is 6.90m with the carriageway measuring 5.70m wide. Concrete verges are provided across the structure measuring 1.1m (east) and 1.7m (west) wide respectively with concrete parapets also provided measuring 900mm and 750mm high respectively. The overall width out-to-out on the structure is 10.3m square to the carriageway with a skewed width of 11.4m.

A low flow channel is provided through the north span of the structure with a raised concrete apron provided in the south span of the bridge, with a c.700mm difference in bed level between the 2no. spans (Figure 1-2). The existing concrete apron is 17.7m long and 4.4m wide (Figure 1-4).

[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

There is a protected masonry arch bridge located 40m upstream of the bridge (Figure 1-5) which forms the primary constraint to the flow at the site location with the masonry arch bridge reported to be flowing at full capacity at the time of the November flood event. The arch bridge has spans of 2.25m, 2.95m and 2.25m separated by 2no. 1.3m wide masonry piers. Raised concrete aprons were previously installed in the outer spans measuring 650mm above the bed level of the central span. From review of the structure cross sections the upstream masonry arch bridge is causing a choke on the flow upstream of Strade River Bridge which attributes to the repeated flood events that occur at the location.

Figure 1-2 – View of the west (downstream) elevation showing the existing concrete apron (on true left bank) with low flow channel in the background.

Figure 1-3 – View of the east (upstream) elevation.

Figure 1-4 – Internal view of the existing concrete apron.

Figure 1-5 – Downstream elevation of masonry arch bridge located 40m upstream of structure.

1.4 Description of Proposed Works

The proposed works to the existing Strade River Bridge structure (Figure 1-2; Figure 1-3) are to increase the load bearing capacity and structural integrity of the bridge are as follows: -

- The existing bridge superstructure is proposed to be demolished with a new single span replacement deck constructed to align with the retained substructure.
- The proposed replacement deck will be formed of precast prestressed concrete beams with an in-situ concrete deck infill.
- New independent foundation supports will 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 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 IFI. The reinstated concrete apron is 17.7m long and 4.4m wide (the same dimensions and footprint as the existing concrete apron). This will be finished with a shallow camber to shed water and avoid pooling of water on the apron. Options for finishing the surface will also be further explored at detailed design.
- 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 1.5 below. The full set of drawings are provided in Appendix A and key information shown in Figure 1-6, Figure 1-7 and Figure 1-8. The accompanying CEMP (AtkinsRéalis, 2025a) details further general requirements for onsite operatives and 'good housekeeping' guidelines to be followed by the appointed Contractor. The area of the project site is 0.3 hectares.

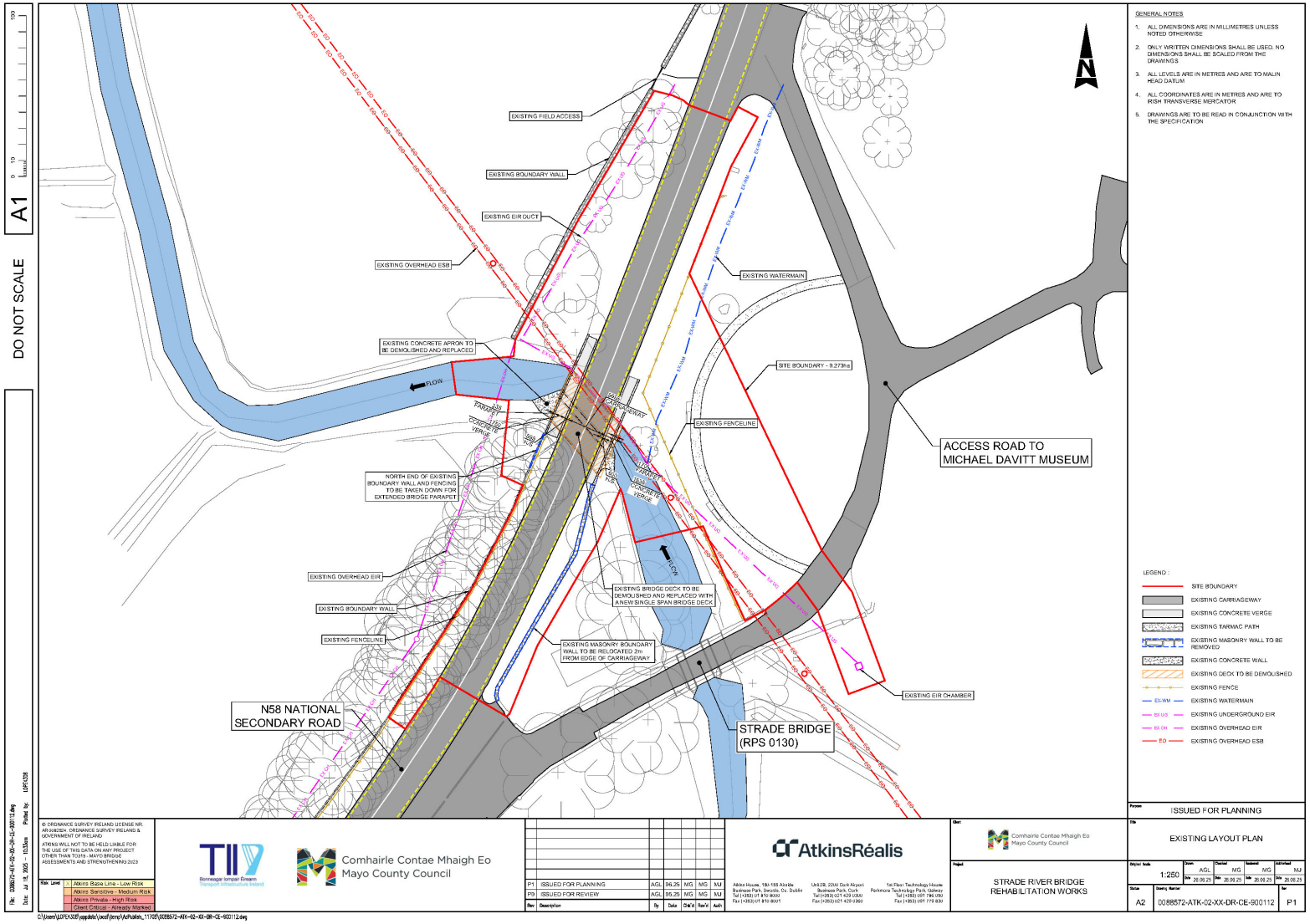

Figure 1-6 Overview of existing layout plan at Strade River Bridge.

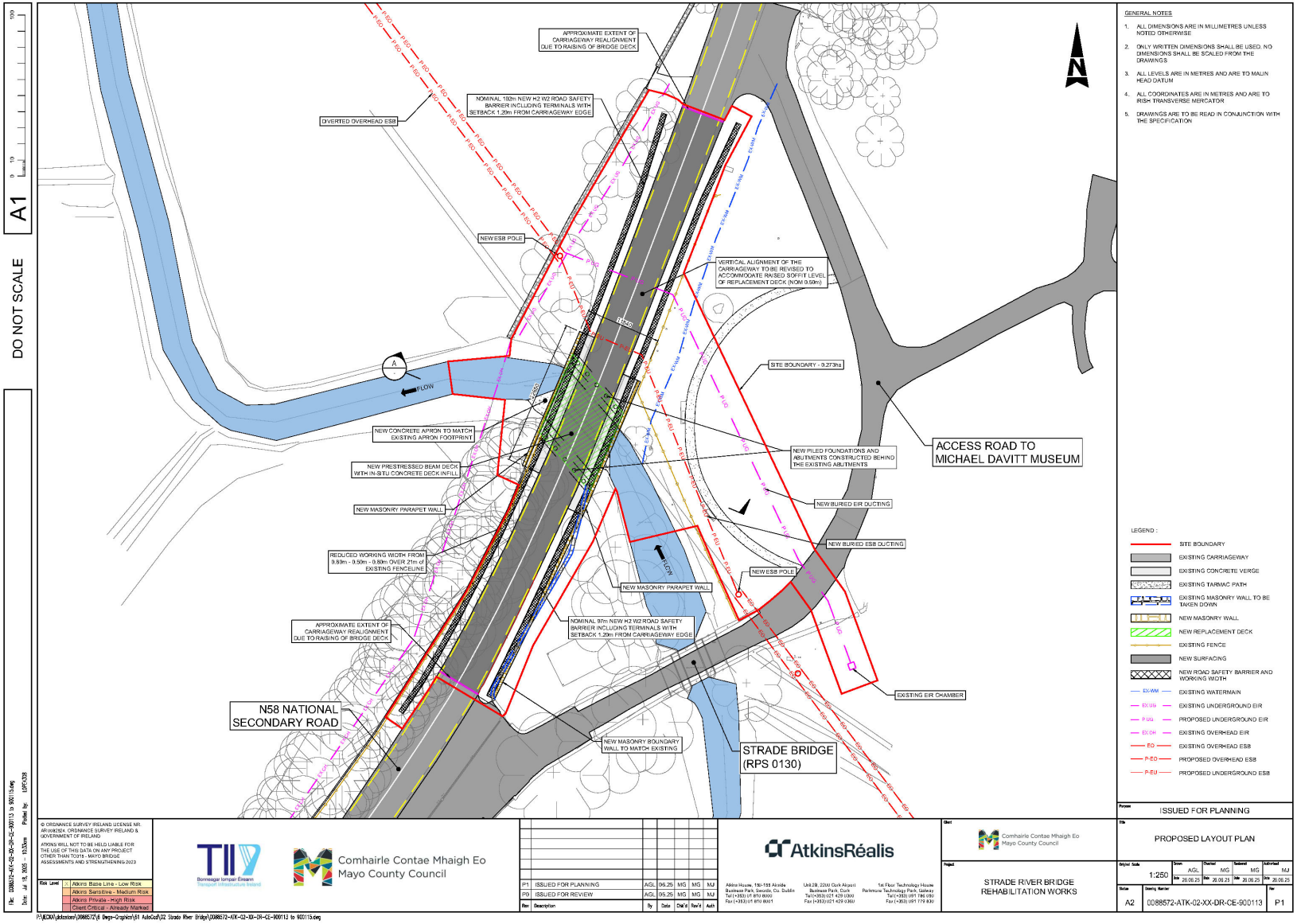

Figure 1-7 Overview of proposed works at Strade River Bridge.

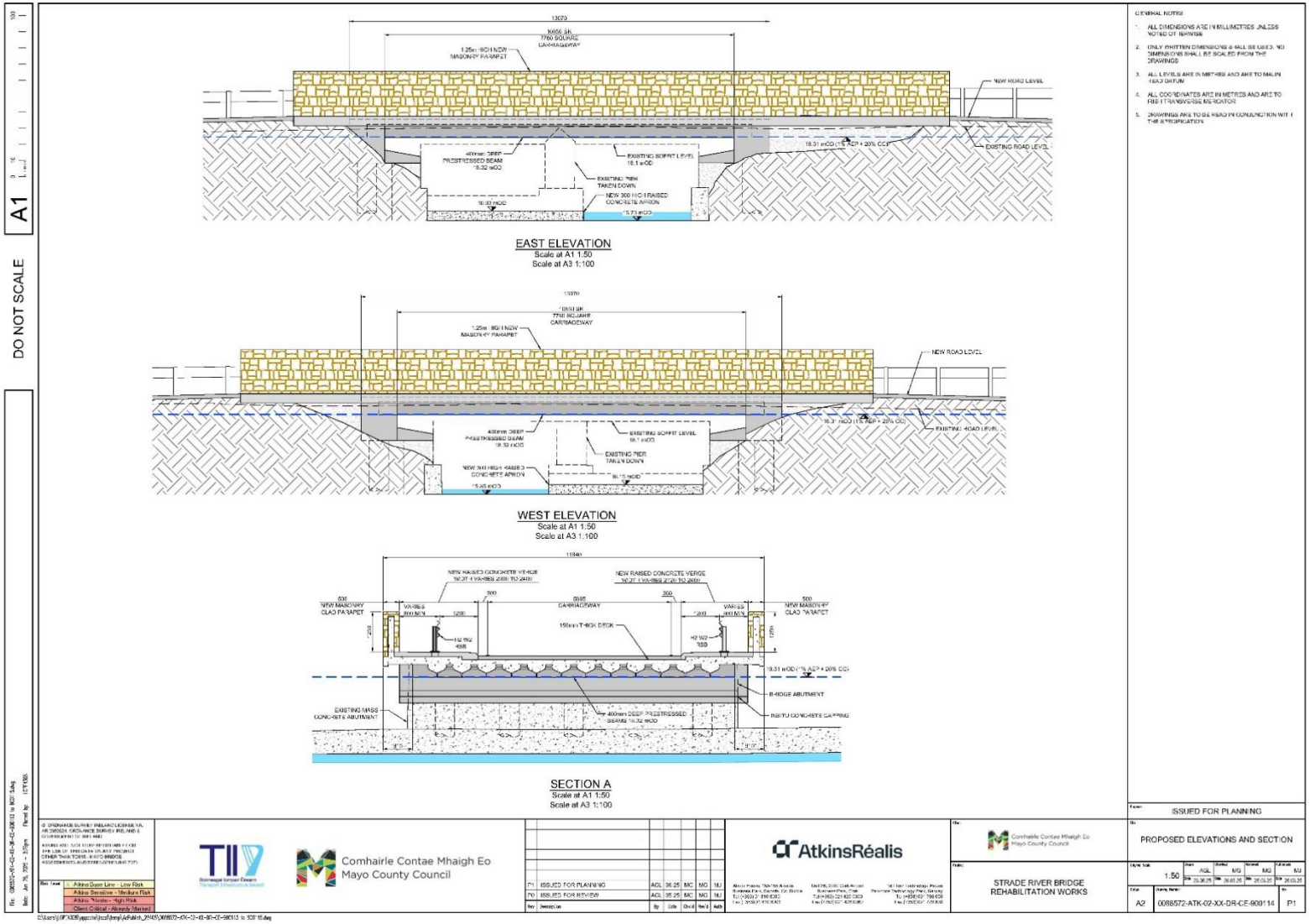

Figure 1-8 Proposed elevations and cross-section depicting pier removal and reinstatement of a concrete apron.

1.5 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 1-9) 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.

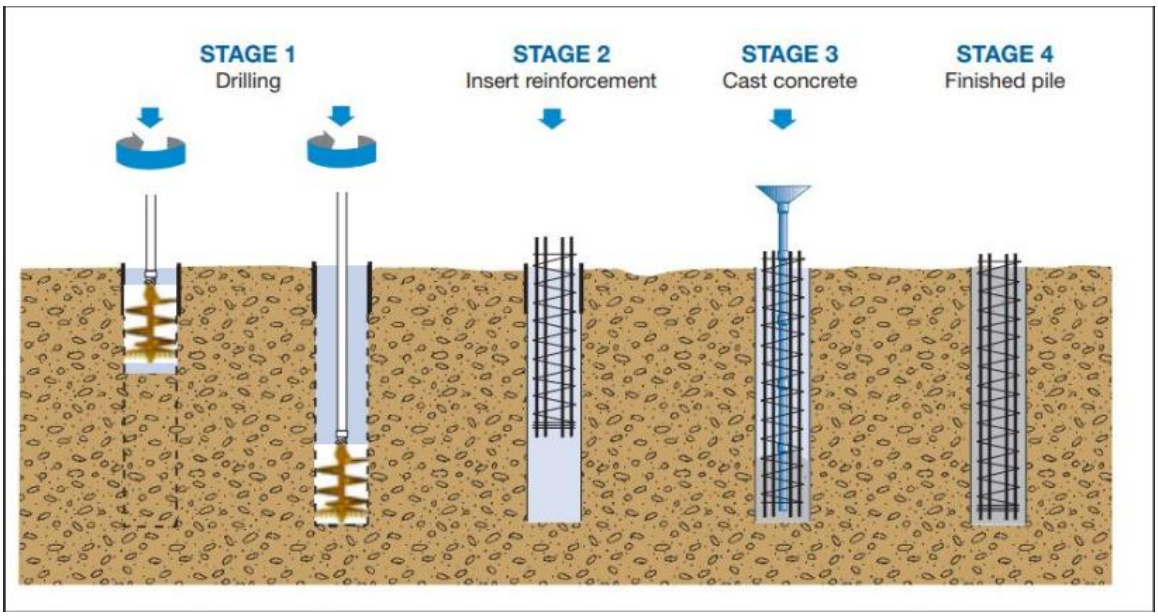

Figure 1-9 - Example of bored cast in place reinforced concrete piles (note that temporary casings which may be used to prevent bore hole from collapsing is not shown)[5].

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, 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.

    - 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 into the pool between Dam 2 and Dam 3. A 500m opening in the centre of Dam 3 will be created by hand to allow for fish passage if present. 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 1-10). 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.

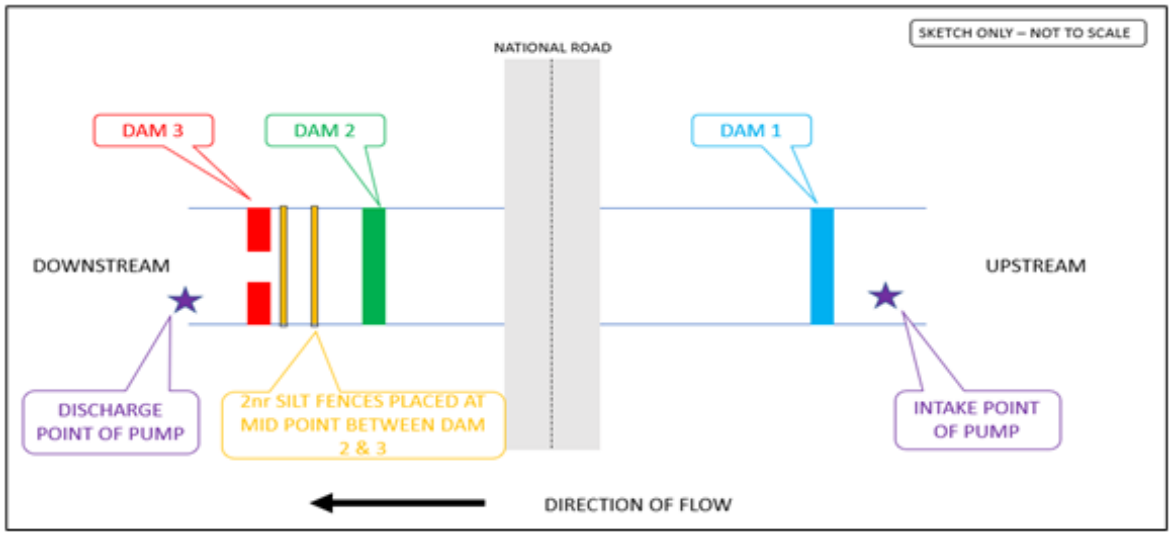

Figure 1-10 - Schematic of the 3-no. dam dewatering system proposed at Strade River Bridge.

    - 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.

1.5.1.1 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).

1.5.2 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)

1.5.3 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.

1.5.4 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.

1.5.5 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 1-7) 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

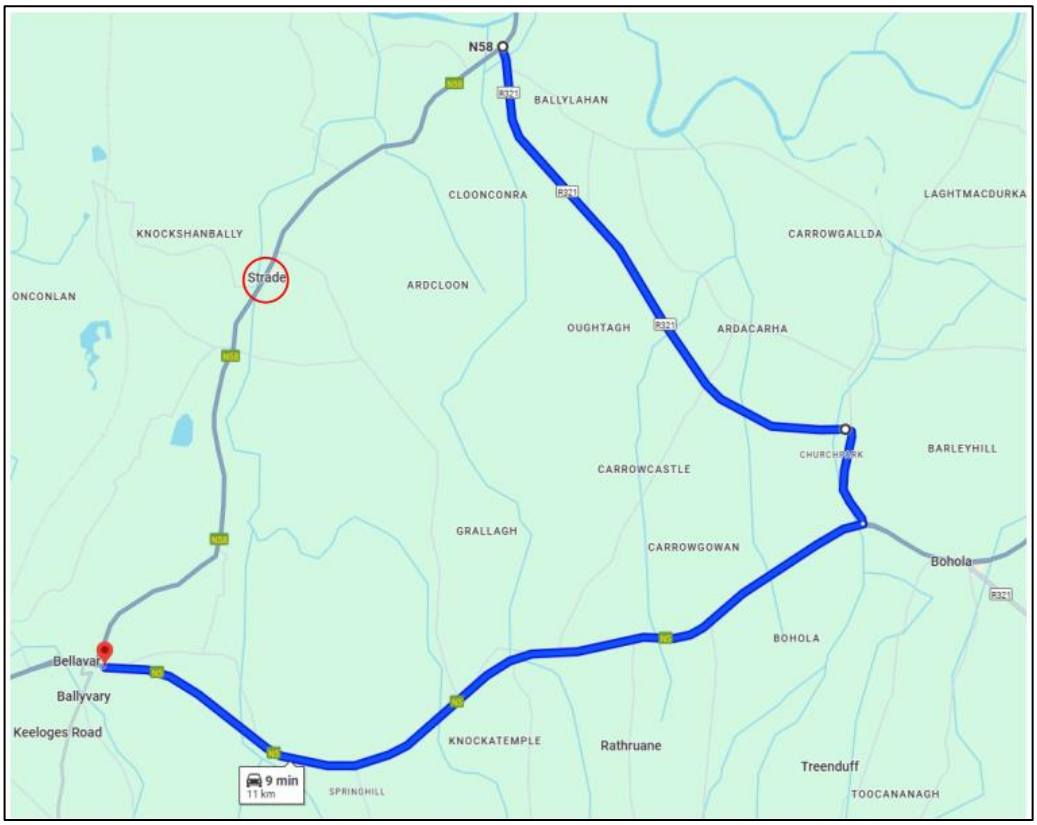

Figure 1-11 - Proposed Traffic Diversion Route (structure location circled) (Options Report; AtkinsRéalis 2025b; ref: 0088572DG0046).

2. Scope of Natura Impact Statement

2.1 Legislative Context

2.1.1 Natura 2000

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora ("the Habitats Directive") is a legislative instrument of the European Union (EU) which provides legal protection for habitats and species of Community interest. Article 2 of the Directive requires the maintenance or restoration of such habitats and species at a favourable conservation status, while Articles 3 to 9, inclusive, provide for the establishment and conservation of an EU-wide network of special areas of conservation (SACs), known as Natura 2000, which also includes special protection areas (SPAs) designated under Article 4 of Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds ("the Birds Directive"). Both SACs and SPAs are commonly referred to as "European sites" or "Natura 2000 sites".

SACs are selected for natural habitat types listed on Annex I to the Habitats Directive and the habitats of species listed on Annex II to the Habitats Directive. SPAs are selected for species listed on Annex I to the Birds Directive and other regularly occurring migratory species. The habitats and species for which a Natura 2000 site is selected are referred to as the "qualifying interests" of that site and each is assigned a "conservation objective" aimed at maintaining or restoring its "favourable conservation condition" at the site, which contributes to the maintenance or restoration of its "favourable conservation status" at national and European levels.

2.1.2 Appropriate Assessment

Article 6 of the Habitats Directive deals with the management and protection of Natura 2000 sites. Articles 6(3) and (4) set out the decision-making process, known as "Appropriate Assessment" (AA), for plans or projects in relation to Natura 2000 sites. Article 6(3) states: -

> *"Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public."*

The first sentence of Article 6(3) provides a basis for determining which plans and projects require AA, i.e., those "*not directly connected with or necessary to the management of [one or more Natura 2000 sites] but likely to have a significant effect thereon, either individually or in combination with other plans or projects*". In *Waddenzee* (C-127/02), the Court of Justice of the European Union (CJEU) ruled that significant effects must be considered "likely" if "*it cannot be excluded, on the basis of objective information*", that they would occur. This clearly sets a low threshold, such that AA is required wherever there is a reasonable possibility of significant effects on a Natura 2000 site. In the same judgment, the CJEU established that the test of significance relates specifically to the conservation objectives of the site concerned, i.e., "significant effects" are those which, "*in the light, inter alia, of the characteristics and specific environmental conditions of the site*", could undermine the site's conservation objectives. In addition to the effects of the plan or project on its own, the combined effects arising from the plan or project under consideration and other plans and projects must also be assessed (see Section 9 for more details).

The last part of the first sentence of Article 6(3) defines AA as an assessment of the "*implications [of the plan or project] for the site in view of the site's conservation objectives*". In the second sentence, Article 6(3) requires that,

prior to agreeing to a plan or project, the competent authority must "ascertain" that "*it will not adversely affect the integrity of the site concerned*". In *Sweetman v. An Bord Pleanála* (C-258/11), the CJEU ruled that a plan or project "*will adversely affect the integrity of that site if it is liable to prevent the lasting preservation of the constitutive characteristics of the site that are connected to the presence of a priority natural habitat whose conservation was the objective justifying the designation of the site in the list of sites*". On that basis, EC (2018) described the "integrity of the site" as "*the coherent sum of the site's ecological structure, function and ecological processes, across its whole area, which enables it to sustain the habitats, complex of habitats and/or populations of species for which the site is designated*". As such, the "integrity" of a specific site is defined by its conservation objectives and is "adversely affected" when those objectives are undermined. In *Waddenzee*, the CJEU ruled that the absence of adverse effects can only be ascertained "*where no reasonable scientific doubt remains*".

The "precautionary principle" applies to all of the legal tests in AA, i.e., in the absence of objective information to demonstrate otherwise, the worst-case scenario is assumed. Where the tests established by Article 6(3) cannot be satisfied, Article 6(4) applies (see explanation in Section 2.2, below).

2.1.3 Competent Authority

The requirements of Articles 6(3) and (4) are transposed into Irish law by, inter alia, Part 5 of the European Communities (Birds and Natura Habitats) Regulations, 2011 (as amended) ("the Habitats Regulations") and Part XAB of the Planning and Development Act, 2000 (as amended) ("the Planning and Development Acts"). As per the second sentence of Article 6(3), it is the "*competent national authorities*" who are responsible for carrying out AA and, by extension, for determining which plans and projects require AA. The competent authority in each case is the entity responsible for authorising a plan or project, e.g. local authorities, An Coimisiun Pleanála, a roads authority or a government minister. In all cases, it is the competent authority who is ultimately responsible for determining whether a plan or project requires AA and for carrying out the AA, where required.

2.2 Appropriate Assessment Process

The AA process is made up of three distinct stages, as described below, the need to progress to each stage being determined by the outcome of the preceding stage.

Stage 1: Screening – This stage involves a determination by the competent authority as to whether or not a given plan or project required AA. As explained in Section 2.1, AA is required in respect of any plan or project not directly connected with or necessary to the management of a Natura 2000 site, but for which the possibility of likely significant effects on one or more Natura 2000 sites cannot be excluded. In *People Over Wind* (C-323/17), the CJEU ruled that measures intended to avoid or minimise harmful effects on a Natura 2000 site cannot be considered in making this determination. Consideration of the potential for in-combination effects is also required at this stage.

Stage 2: Appropriate Assessment – This stage involves a detailed assessment of the implications of the plan or project, individually and in combination with other plans and projects, for the integrity of the Natura 2000 site(s) concerned. This stage also involves the development of appropriate mitigation to address any adverse effects and an assessment of the significance of any residual impacts following the inclusion of mitigation. In *Kelly v. An Bord Pleanála* (IEHC 400), the High Court ruled that a lawful AA must contain complete, precise, and definitive findings based on examination and analysis, and conclusions and a final determination based on an evaluation of the findings. In the same judgment, the High Court stressed that, in order for the findings to be complete, precise, and definitive, the AA must be carried out in light of best scientific knowledge in the field and cannot have gaps or lacunae. In *Holohan v. An Bord Pleanála* (C-461/17), the CJEU clarified that AA must "*catalogue the entirety of habitat types and species for which a site is protected*" (i.e. the qualifying interests of the site) and assess the implications of the plan or project for the qualifying interests, both within and outside the site boundaries, and other, non-qualifying interest habitats and species, whether inside or outside the site boundaries, "*provided that those implications are liable to affect the conservation objectives of the site*". The proposer of a plan or project requiring AA is furnishes the competent authority with the scientific evidence upon which to base its AA by way of a Natura Impact Statement (NIS) or Natura

Impact Report (NIR). If it is not possible to ascertain that the plan or project will not adversely affect one or more Natura 2000 sites, authorisation can only be granted subject to Article 6(4).

Stage 3: Article 6(4) – If a plan or project does not pass the legal test at Stage 2, alternative solutions to achieve its aims must be considered and themselves subject to Article 6(3). If no feasible alternatives exist, authorisation can only be granted where it can be demonstrated that there are imperative reasons of overriding public interest (IROPI) justifying its implementation. Where this is the case, all compensatory measures must be taken to protect the overall coherence of Natura 2000.

The three stages described above are illustrated in Figure 2-1 below.

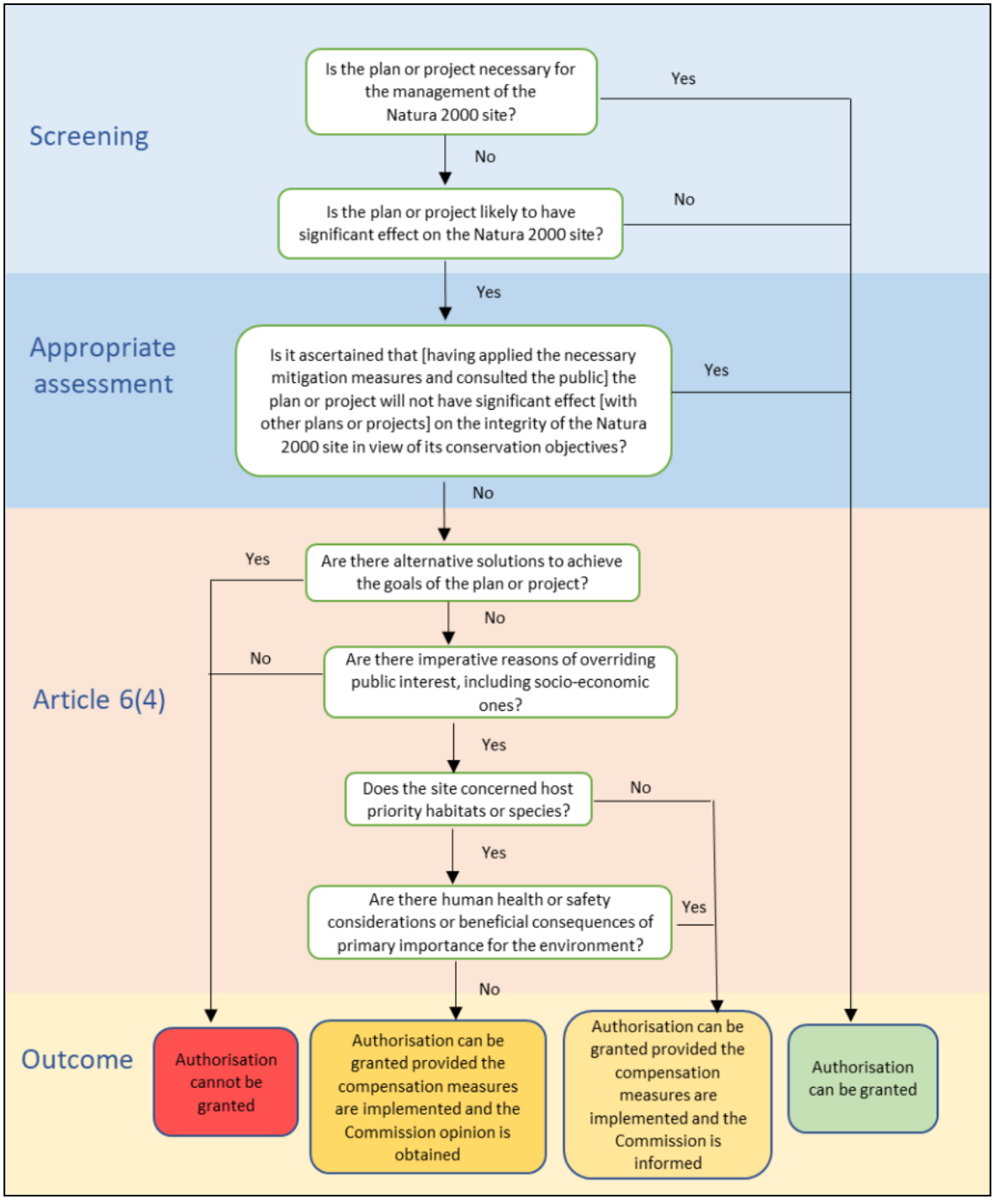

Figure 2-1 - Stages of the Appropriate Assessment process (EC, 2021a).

3. Methods

3.1 Legislative Guidance

This report was prepared with due regard to the relevant European and Irish legislation, case law and guidance, including but not limited to: -

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna. Official Journal of the European Communities L 206/7-50.
- Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds. Official Journal of the European Union L 20/7-25.
- European Communities (Birds and Natural Habitats) Regulations, 2011. S.I. No. 77/2011 (as amended) ("the Habitats Regulations").
- Planning and Development Act, 2000. No. 30 of 2000 (as amended) ("the Planning and Development Acts").
- Planning and Development Regulations, 2001. S.I. No. 600/2001 (as amended) ("the Planning Regulations").
- EC (2019). Managing Natura 2000 sites – The provisions of Article 6 of the Habitats Directive 92/43/EEC. European Commission, Brussels. Official Journal of the European Union C 33/1-62.
- EC (2021a). Assessment of plans and projects in relation to Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC. European Commission, Brussels. Official Journal of the European Union C 437/1-107.
- EC (2021b). Guidance document on the strict protection of animal species of Community interest under the Habitats Directive. C (2021) 7301. European Commission, Brussels.
- DG Env (2022a). Guidance document on assessment of plans and projects in relation to Natura 2000 sites – A summary. Directorate-General for Environment, European Commission, Brussels. Publications Office of the European Union, Luxemburg.
- DEHLG (2010a). Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Revised 11/02/2010. Department of the Environment, Heritage and Local Government, Dublin.
- DEHLG (2010b). Circular NPW 1/10 & PSSP 2/10. Dated 11/03/2010. Department of the Environment, Heritage and Local Government, Dublin.
- NPWS (2012). Marine Natura Impact Statements in Irish Special Areas of Conservation. A Working Document. April 2012. National Parks & Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin.
- NPWS (2021). Guidance on the Strict Protection of Certain Animal and Plant Species under the Habitats Directive in Ireland. National Parks & Wildlife Service Guidance Series 1, Department of Housing, Local Government and Heritage, Dublin.
- Mullen, E., Marnell, F. and Nelson, B. (2021). Strict Protection of Animal Species – Guidance for Public authorities on the Application of Articles 12 and 16 of the EU Habitats Directive to development/works undertaken by or on behalf of a Public Authority. National Parks & Wildlife Service Guidance Series 2, Department of Housing, Local Government and Heritage, Dublin.

- OPR (2021). Appropriate Assessment Screening for Development Management. OPR Practice Note PN01. Office of the Planning Regulator, Dublin.

- Case law, including Waddenzee (C-127/02), Sweetman v. An Bord Pleanála (C-258/11), Kelly v. An Bord Pleanála (IEHC 400), Commission v. Germany (C-142/16), People Over Wind (C-323/17), Holohan v. An Bord Pleanála (C-461/17), Eoin Kelly v. An Bord Pleanála (IEHC 84), Heather Hill (IEHC 450) and Eco Advocacy v. An Bord Pleanála (C-721/21).

- Sundseth, K. and Roth, P. (2014). Article 6 of the Habitats Directive – Rulings of the European Court of Justice. Ecosystems LTD (N2K Group), Brussels.

3.2 Desk Study

A desktop study was carried out to collate information available on European sites in the vicinity of the proposed works at Strade River Bridge. These areas were viewed using Google Earth[7], Google maps[8] and Bing maps[9] (last accessed on the 6th of February 2025).

The National Parks and Wildlife Service (NPWS)[10] and National Biodiversity Data Centre (NBDC)[11] online databases were reviewed concerning European sites and their features of interest in the vicinity of the proposed project.

Spatial and other data regarding rivers and other waterbodies was obtained from the Environmental Protection Agency (EPA) using its online facility EPA Maps: Water[12] (EPA, 2025). Other sources consulted included the National Biodiversity Data Centre (NBDC) Biodiversity Maps[13] (NBDC, 2025) and Tailte Éireann GeoHive Map Viewer[14] (OSi, 2025). NBDC Maps were consulted in a data gathering capacity to extract species records for the 10km x 10km grid square, which in Strade River Bridge lies; grid square M29. Results from this information extraction were further assessed in line with protected species legislation and Irish Red Lists. The conservation status of mammals within Ireland and Europe is evaluated using one or more of the following: Wildlife Acts 1976 (as amended), the Red List of Terrestrial Mammals (Marnell et al., 2019) and the EU Habitats Directive 92/43/EEC. Birds of Conservation Concern in Ireland, No. 4 (BoCCI), published by BirdWatch Ireland and the RSPB NI, is a list of priority bird species for conservation action on the island of Ireland (Gilbert *et al*., 2021) The BoCCI lists birds which breed and/or winter in Ireland and classifies them into three separate lists; Red, Amber and Green; based on the conservation status of the bird and hence their conservation priority. Birds on the Red List are those of highest conservation concern, Amber List are of medium conservation concern and Green List are not considered threatened. The conservation status of bird species within Ireland and Europe is further evaluated using the EU Birds Directive 79/409/EEC.

In order to inform the assessment of potential in-combination effects, planning applications from the surrounding area were reviewed using the *National Planning Application Database* (https://housinggovie.maps.arcgis.com/apps/webappviewer), An Coimisiun Pleanála's *Map Search* (https://www.pleanala.ie/en-ie/map-search) and the *EIA Portal* (https://www.gov.ie/en/publication/9f9e7-eia-portal/). The MCC planning enquiry system was also consulted. Search criteria were implemented to identify other plans and project with potential, in combination with the proposed works, to adversely affect the integrity of European sites.

[7] https://earth.google.com/

[8] https://www.google.com/maps/

[9] https://www.bing.com/maps/

[10] https://www.npws.ie/

[11] https://maps.biodiversityireland.ie/Home

[12] https://gis.epa.ie/

[13] https://maps.biodiversityireland.ie/Map

[14] https://www.arcgis.com/apps/webappviewer/index.html?id=3ae19cc156bf4706a929304bf8fcc4f6

3.3 Site Visit

A site visit was conducted on the 7th May 2025 by AtkinsRéalis senior ecologists Owen O'Keefe and Kevin McCaffery. The primary aim of the survey was to gather baseline data relating to the potential ecological constraints on the proposed works with a particular emphasis on identifying the potential presence of qualifying interests of Natura 2000 sites. The survey also included checks for invasive alien plant species commonly found in riparian habitats, e.g. Japanese Knotweed (*Fallopia japonica*), and any evidence of protected mammals, as well as recording of any incidental observations or evidence of presence of birds and other fauna.

Ecological survey methods were in general accordance with those outlined in the following documents, although habitat conditions and the potential impacts of the proposed works also informed the survey methodology: -

- A Guide to Habitats in Ireland (Fossitt, 2000).
- Best Practice Guidance for Habitat Survey and Mapping (Smith *et al*., 2011).
- Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (NRA, 2009).
- Maitland, P.S. (2003). Ecology of the River, Brook and Sea Lamprey. Conserving Natura 2000 Rivers Ecology Series 5. English Nature, Peterborough.
- Harvey, J. and Cowx, I. (2003). Monitoring the River, Brook and Sea Lamprey, *Lampetra fluviatilis*, *L. planeri* and *Petromyzon marinus*. Conserving Natura 2000 Rivers Monitoring Series 5. English Nature, Peterborough.
- Hendry, K. and Cragg-Hine, D. (2003). Ecology of the Atlantic Salmon. Conserving Natura 2000 Rivers Ecology Series 7. English Nature, Peterborough.
- Cowx, I.G. and Fraser, D. (2003). Monitoring the Atlantic Salmon. Conserving Natura 2000 Rivers Monitoring Series 7. English Nature, Peterborough.
- Reynolds, J.D., O'Connor, W., O'Keeffe, C. and Lynn, D. (2010). A technical manual for monitoring white-clawed crayfish *Austropotamobius pallipes* in Irish lakes. Irish Wildlife Manuals 45. National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.
- O'Connor, W., Hayes G., O'Keeffe, C. and Lynn, D. (2009). Monitoring of white-clawed crayfish Austropotamobius pallipes in Irish lakes in 2007. Irish Wildlife Manuals 37. National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.
- Peay, S. (2003). Monitoring the White-clawed Crayfish *Austropotamobius pallipes*. Conserving Natura 2000 Rivers Monitoring Series1. English Nature, Peterborough.
- Anon. (2004). *Margaritifera margaritifera* Stage 1 and Stage 2 survey guidelines. Irish Wildlife Manuals 12. National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.
- Geist, J., Moorkens, E., Killeen, I., Feind, S., Stoeckle, B.C., O'Connor, Á. and Kuehn, R. (2018). Genetic structure of Irish freshwater pearl mussels (*Margaritifera margaritifera* and *Margaritifera durrovensis*): Validity of subspecies, roles of host fish, and conservation implications. Aquatic Conservation 28(4):769-1022.
- Hastie, L.C., Boon P.J. and Young M.R. (2000). Physical microhabitat requirements of freshwater pearl mussel *Margaritifera margaritifera* (L.). Hydrobiologia 429:59-71. IFI (2010).

- Moorkens, E.A. (1999). Conservation Management of the Freshwater Pearl Mussel *Margaritifera margaritifera* - Part 1: Biology of the species and its present situation in Ireland. Irish Wildlife Manuals 8. Dúchas - The Heritage Service, Department of Arts, Heritage, Gaeltacht and the Islands, Dublin.

- Moorkens, E.A. (2000). Conservation Management of the Freshwater Pearl Mussel *Margaritifera margaritifera* - Part 2: Water Quality Requirements. Irish Wildlife Manuals 9. Dúchas - The Heritage Service, Department of Arts, Heritage, Gaeltacht and the Islands, Dublin.

- Skinner, A., Young, M. and Hastie L. (2003). Ecology of the Freshwater Pearl Mussel. Conserving Natura 2000 Rivers Ecology Series 2, English Nature, Peterborough.

- Biosecurity Protocol for Field Survey Work. December 2010. Inland Fisheries Ireland, Dublin.

Available aerial photos and site maps assisted the ecological walkover survey. The location of the proposed project and the surrounding areas were viewed using Google Earth, Google maps[15] and Bing maps[16]. The EPA online mapviewer was used to locate watercourse networks and identify hydrological connectivity to larger rivers such as the Strade River and River Moy.

3.4 Consultation

Consultation with Inland Fisheries Ireland (IFI) was done on the proposed design. IFI stated they have no objection to replacing the existing concrete apron with a 300mm apron *"provided timing and construction method is agreed beforehand".* IFI inspected the sites in March 2025 and states *"there is no issue with the proposed works on the Strade River. The existing concrete apron could be reduced by half without impacting on the dry weather flow channel. A greater reduction may also be considered if you have a level to propose".*

3.5 Statement of Authority

This NIS was prepared by Caroline Downey Graduate Ecologist at AtkinsRéalis, support from Alec Schmidt, Graduate Ecologist, and peer review and support from Owen O'Keefe, Senior Ecologist, and Paul O'Donoghue, Associate Director (Ecology) at AtkinsRéalis. Ecology surveys, including targeted aquatic surveys were undertaken by AtkinsRéalis ecologists Owen O'Keefe and Kevin McCaffrey in May 2025.

Caroline Downey is a Graduate Ecologist holding a BSc (Hons) in Ecology and Environmental Biology from University College Cork. Caroline has worked in ecological consultancy since the beginning of 2023, with a broad knowledge of Appropriate Assessment, Natura Impact Statements, Ecological Impact Statements and ecological theory and legislation, resultant of her BSc and work to date. A focus of Caroline's has been assisting Appropriate Assessment Screenings, supporting the preparation of AA and NIS, and undertaking of a range of surveys including invasive species, mammals, habitats and botanical surveys.

Alec Schmidt is a Graduate Ecologist at AtkinsRéalis, holding a BSc (Hons) in Zoology from University College Cork (2023) and a MSc in Biodiversity and Conservation from Trinity College Dublin (2024). Alec is also a Qualifying Member of the Chartered Institute of Ecology and Environmental Management (CIEEM). The main focus of Alec's work at AtkinsRéalis involves contributing to the surveying and reporting requirements necessitated by the Appropriate Assessment process.

Owen O'Keefe is a Senior Ecologist at AtkinsRéalis. Owen holds a BSc (Hons) in Ecology from University College Cork (2015) and is a Full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM).

[15] https://www.google.ie/maps

[16] https://www.bing.com/maps/?cp=53.154594%7E-6.076126&lvl=11.0

He has 9 years' professional experience in ecological consultancy, specialising in river ecosystems and Appropriate Assessment. Owen undertook the field survey work with Kevin McCaffrey.

Kevin McCaffrey has a BSc (Hons) in Applied Freshwater and Marine Biology and a MSc in Environmental Sustainability. He is a Senior Ecologist with over 12 years' experience in freshwater and marine ecology, environmental surveying, impact assessment and as an Ecological clerk of Works. He has prepared and reviewed a wide range of technical reports including Environmental Impact Assessment, AA screening, Natura Impact Assessment, and sanitary surveys. Kevin undertook the field survey work with Owen O'Keefe.

Paul O'Donoghue is an Associate Director at Atkins. Paul holds a BSc (Zoology), MSc (Behavioural Ecology) and a PhD (Avian Ecology and Genetics). Paul is a Chartered member of the Society for the Environment (CEnv) and a Full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). Paul has over 26 years' experience in ecology; including extensive experience in the preparation of Habitat Directive Assessments / Natura Impact Statements (i.e., Appropriate Assessment under Article 6(3) of the EU Habitats Directive).

4. Existing Environment

4.1 Desktop Review

This section provides a description of baseline conditions in the receiving natural environment in terms of ecology. Aspects of the receiving environment which are directly relevant to the Natura 2000 sites with connectivity to the proposed development (and, as such, are of consequence in terms of the AA process) are described in full detail.

4.1.1 Designated Sites

The Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora) forms the basis for the designation of Special Areas of Conservation. Similarly, Special Protection Areas are classified under the Birds Directive (Council Directive 2009/147/EEC on the Conservation of Wild Birds). The Habitats and Birds Directives are transposed into Irish law by the EC (Birds and Natural Habitats) Regulations 2011 (Statutory Instrument No. 477/2011). Collectively, Special Areas of Conservation (SAC) and Special Protection Areas (SPA) are referred to as the Natura 2000 network. In general terms, they are of exceptional importance for rare, endangered, or vulnerable habitats and species within the European Community. Both SACs and SPAs are commonly referred to as “European sites” or “Natura 2000 sites”. Strade River Bridge (which is in central Co. Mayo at the convergence of townlands Knockagarraun, Strade and Knockshanbally) lies immediately upstream of 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.

Natural Heritage Areas (NHAs) are nationally designated sites, which are considered important for the habitat, species, or geological heritage. NHAs are legally protected under the Wildlife Amendment Act 2000. Proposed Natural Heritage Areas (pNHAs) are sites that are of significance for wildlife and habitats, but which have not as yet been statutorily designated; however, their ecological value is recognised by Planning and Licencing Authorities. The closest NHA to Strade River Bridge is Cunnagher More Bog NHA (site code: 002420) which lies c. 6.7km northwest over land with no hydrological connectivity. The Moy Valley pNHA (site code: 002078) lies c. 4.5km downstream from Strade River Bridge. Killala Bay/Moy Estuary is also designated as a pNHA for the same species and habitats as the SAC and SPA.

Ireland currently has 6no. nationally recognised National Parks. The site does not lie within any of these sites and there is no hydrological or ecological connectivity between the site or any National Park. The closest National Park is Wild Nephin National Park which lies c. 25.4km over land from Strade River Bridge.

The downstream Killala Bay/Moy Estuary SPA is also internationally recognised as a Ramsar site as it is considered a wetland of importance.

There are 68 no. designated Wildfowl Sanctuaries in Ireland which are areas that have been excluded from the ‘Open Season Order’ so that game birds can rest and feed undisturbed e.g., shooting of birds is banned all year round. There are currently 5no. of these sites in County Mayo. Lough Conn (c. 8.7km to the northwest of Strade River Bridge) is designated as a Wildfowl Sanctuary (WFS-40).

4.1.2 Waterbodies

Strade River Bridge is located over the Strade River, an important tributary of the River Moy, the joining of which lies approximately 2.9km downstream (from the bridge). The bridge lies within the Moy_SC_070 sub catchment, within the Moy and Killala Bay catchment and hydrometric area (no. 34; EPA mapping). The River Moy rises in the Ox Mountains in Co. Sligo and flows in an anticlockwise loop before heading northwards towards Ballina, Co. Mayo and

into the sea at Killala Bay. It is one of Ireland's best salmon rivers and is known to provide good angling for sea trout (O'Reilly, 2002).

The Q-rating system is a biotic metric used by the EPA to categorise river water quality using macroinvertebrate assemblages. Upstream of Strade River Bridge c. 135m was sampled in 1989 and scored a Q-value score of 4 reflecting 'Good' status. Downstream of the bridge c. 150m was sampled in 1993 and scored a Q-value of 4-5 which reflects 'High' water quality status. The most recently sampled site within 1.5km of Strade River Bridge occurs c. 1.2km downstream; the site was sampled in 2022 and received a Q-value of 4-5. 'High' Q-values refer to unpolluted, satisfactory conditions at the site sampled. The Strade River is categorised as 'High' status under the Water Framework Directive (WFD) (2016-2021) both upstream and at Strade River Bridge, and transitions to 'Good' status downstream just before joining with the River Moy. High status as according to the EPA in terms of the WFD refers to '*No or only minor difference from reference condition – Normal community structure, sensitive species present. Ecological processes functioning normally*'.

21% of rivers within the Moy and Killala Bay catchment are categorised as 'High' status while 49% are categorised as 'Good' status, under the WFD.

4.1.2.1 Flooding

Strade River Bridge and directly adjacent lands lie within the flood zone of the Strade River. In November 2024, Storm Bert caused flooding of the Strade River which saw inaccessible roads and minor damage to infrastructure along the N58 regional road[17]. Flooding occurred to the houses and church hall upstream of the masonry arch bridge (c. 40m upstream from Strade River Bridge). At the time of this flood in November 2024 the national road did not flood at Strade River Bridge, however flooding did occur on the southern approach, adjacent residential properties where road levels are lower than those at the bridge. The lands around Strade have historically flooded as according to Flood Maps[18] and as according to National Indicative Fluvial Mapping, high flood levels are classed at 'Medium' probability (once in one hundred years) at Strade River Bridge.

4.1.3 Fauna

4.1.3.1 Aquatic Fauna

The Strade River was most recently surveyed by Inland Fisheries Ireland (IFI) in 2023 at a site c. 800m upstream from Strade River Bridge as part of an IFI catchment-wide assessment (Fleming et al., 2024). Species recorded include White-clawed crayfish (*Austropotamobius pallipes*) (two individuals found at the site) as well as Atlantic salmon (*Salmo salar*), Brown trout (*Salmo trutta*), Minnow (*Phoxinus phoxinus*), and Stickleback (*Gasterosteus aculeatus*). At the surveyed site, numbers of salmon recorded exceeded twenty individuals.

According to a search on the NBDC database of 10km grid square M29 (within which Strade River Bridge is situated), records for white-clawed crayfish exist, most recently form 2022. European eel (*Anguilla anguilla*), a critically endangered species as according to Ireland's Red List No. 5 (King et al., 2011) has also been recorded; it is noted however, that this single record exists from 1996. Other fish species recorded include Pike (*Esox lucius*), Perch (*Perca fluviatilis*), Stone loach (*Barbatula barbatula*), and the invasive species Roach (*Rutilus rutilus*). Crayfish plague (*Aphanomyces astaci*), a type of water mould which infects crayfish, has been recorded within the River Moy catchment and turned up as a NBDC record within the M29 grid square.

Freshwater pearl mussel (*Margaritifera margaritifera*) sensitive areas in the catchment of the River Moy include Moy–Tobergal, which flows into Lough Cullin. The bridge at Strade is on the Strade River which discharges to the main

[17] https://www.con-telegraph.ie/2024/11/23/storm-bert-leaves-mayo-flooding-problems-in-its-wake/

[18] https://www.floodinfo.ie/map/floodmaps/

channel of the River Moy downstream of Lough Cullin; it is therefore not hydrologically connected to Moy-Tobergal pearl mussel sensitive area. In the same way there is no connection to the Moy-Deel pearl mussel sensitive area.

The River Moy habitat assessment and management plan indicates the Strade *"is important for Salmonid recruitment with a good supply of coarse substrate".* Furthermore, it also states that

"The potential for fish passage improvement is something that should be considered whenever further infrastructure work is undertaken around the catchment, with appropriate input sought from fisheries specialists" (Pedley, 2022).

4.1.3.2 Mammals

Otter (*Lutra lutra*) are widespread throughout Ireland, including within the Strade River, River Moy and all its tributaries. Otter is protected under the Wildlife Acts, 1976 (as amended) and are a listed species on Annexes II and IV of the EU Habitats Directive. Otter use watercourses as commuting routes and foraging areas, with their banks offering places of shelter and breeding. Records of otter exist on both the NBDC and NPWS upstream of Strade River Bridge and further downstream along the River Moy. The two closest records of otter to Strade River Bridge are roadkill records, both from 2013. Agricultural use is dominant within the lands in the vicinity of Strade River Bridge, with residential properties in isolated spots throughout, such that high levels of disturbance to the river corridor (like levels which would occur in urban areas) does not occur. Therefore, the Strade River in the vicinity of Strade River Bridge has potential to support commuting, holting and foraging otter, with vegetated, largely undisturbed banks and a supply of fish (see Section 4.1.3.1 above); it is understood that otter occur within this river system.

All bat species in Ireland, and their roosts, are protected under the Wildlife Act, 1976 (as amended) and are also afforded strict protection under Article 12 of the Habitats Directive (as they are listed on Annex IV). Several bat species have been recorded within 10km grid square M29, including Brown Long-eared bat (*Plecotus auritus*), Common pipistrelle (*Pipistrellus pipistrellus*), Soprano pipistrelle (*Pipistrellus pygmaeus*), Daubenton's bat (*Myotis daubentonii*), Lesser Horseshoe bat (*Rhinolophus hipposideros*), Leisler's bat (*Nyctalus leisleri*) and Whiskered bat (*Myotis mystacinus*). Landscape association models have been constructed to provide a landscape conservation guide for Irish bats (Lundy et al., 2011). Two records of Lesser Horseshoe bat occur in Turlough (c. 6.4km from Strade River Bridge overland), most recently from 2006, according to the NBDC. Lesser Horseshoe bat are the only bat species in Ireland to be listed on Annex II of the Habitats Directive. The site at Strade River Bridge has a bat suitability score of 24%; the highest suitability scores were for Leisler's, Daubenton's and Brown Long-eared bats. Therefore, bats are likely to use the landscape in the surrounds of Strade River Bridge for foraging and commuting purposes.

Other species recorded within M29 grid square, listed within the Habitats Directive include Irish Hare (*Lepus timidus* subsp. *hibernicus*) and Pine Marten (*Martes martes*); both are Annex V listed species and most recent records for both occur from 2023. The closest Pine Marten record occurs c. 1.3km from Strade River Bridge over land, from 2021. The closest Irish Hare record occurs within an agricultural field c. 200m over land from Strade River Bridge, also from 2021.Additional M29 recorded species as protected under the Wildlife Acts include Hedgehog (*Erinaceus europaeous*), Badger (*Meles meles*), Pygmy Shrew (*Sorex minutus*), and Irish Stoat (*Mustela erminea* subsp. *hibernica*). The baseline habitats in the surrounding lands are predominantly agricultural lands (as noted above) for which it is known that species such as Badger, Irish Hare, Irish Stoat, Pygmy Shrew and Hedgehog, all widely utilise in foraging, commuting and setting capacities.

All recorded mammals as listed above are classed as Least Concern according to Irelands Red List (Marnell et al., 2019).

4.1.3.3 Reptiles and Amphibians

Common Frog (*Rana temporaria*) and Smooth Newt (*Lissotritorn vulgaris*) are both protected under the Wildlife Acts, while Common Frog is additionally protected under Annex V of the Habitats Directive. Both species have been recorded within the M29 grid square, from 2023 and 2020, respectively. Both species are also classed as Least Concern according to Irelands Red List (King *et al,* 2011).

No reptile species have been recorded in the M29 10km grid square.

4.1.3.4 Invertebrates

According to the NBDC databases several invertebrate species as listed within Irelands Red Lists No. 4 (Regan *et al,* 2010), No. 7 (Kelly-Quinn & Regan, 2012), and the Regional Red List of Irish Bees (Fitzpatrick *et al*, 2006). These include Near Threatened butterfly species, Dingy Skipper (*Erynnis tages*) and Annex II listed, Vulnerable species, the Marsh Fritillary (*Euphydryas aurinia*). The most recent record for Marsh Fritillary within M29 is from 2020 as according to the NBDC. A single mayfly species *Procloeon bifidium*, which is classed as Vulnerable, was recorded in 2001 in Derryhick Lough (c. 5.3km over land from Strade River Bridge).

Near Threatened bee species recorded within M29 include Large Red Tailed Bumble Bee (*Bombus lapidarius*), Gipsy Cuckoo Bee (*Bombus bohemicus*), Moss Carder-bee (*Bombus muscorum*), and *Megachile willughbiella*.

4.1.3.5 Birds

All birds are afforded protection under the Wildlife Act, 1976 (as amended). A sub-set of these are also afforded varying levels of protection under the Birds Directive. The search for birds on the NBDC was undertaken for 10km x 10km hectad M29, given the mobile nature of these species. A large number of birds on the *Birds of Conservation Concern in Ireland 4: 2020-2026* (BoCCI[19]) Amber and Red Lists (Gilbert *et al*., 2021) have been recorded. This list also includes species as listed on Annex I of the Birds Directive show in Table 4-1 below; this table follows a traffic light system relative to BoCCI designations (red = red list, yellow = amber list). However, it should be noted that as M29 is a 10km grid square it includes many habitats that are not present on site at Strade River Bridge and thus suitable habitat for many of these species is not present at or in the vicinity of the bridge site. It is further noted that records > 15 years old have not been included due to relevance.

Table 4-1 - Bird species within M29 grid square (colour coded according to BoCCI 2020 - 2026 classifications).

Species Name	Date of Last Record	Birds Directive
Golden Plover (*Pluvialis apricaria*)	31/12/2011	Annex I
Kingfisher (*Alcedo atthis*)	05/06/2022	Annex I
Hen Harrier (*Circus cyaneus*)	29/03/2019	Annex I
Whooper Swan (*Cygnus cygnus*)	18/02/2018	Annex I
Goldeneye (*Bucephala clangula*)	31/12/2011	-
Kestrel (*Falco tinnunculus*)	14/02/2018	-
Redshank (*Tringa totanus*)	24/05/2023	-
Snipe (*Gallinago gallinago*)	04/03/2020	-
Swift (*Apus apus*)	24/05/2023	-
Curlew (*Numenius arquata*)	31/12/2011	-
Grey Wagtail (*Motacilla cinerea*)	31/12/2011	-
Meadow Pipit (*Anthus pratensis*)	31/12/2011	-
Northern Lapwing (*Vanellus vanellus*)	31/12/2011	-
Redwing (*Turdus iliacus*)	31/12/2011	-

[19] https://birdwatchireland.ie/birds-of-conservation-concern-in-ireland/

Species Name	Date of Last Record	Birds Directive
Barn Swallow (*Hirundo rustica*)	22/05/2015	-
Black-headed Gull (*Larus ridibundus*)	31/12/2011	-
Linnet (*Carduelis cannabina*)	31/12/2011	-
Sandpiper (*Actitis hypoleucos*)	24/05/2023	-
Starling (*Sturnus vulgaris*)	20/04/2023	-
Eurasian Teal (*Anas crecca*)	31/12/2011	-
European Greenfinch (*Carduelis chloris*)	08/04/2023	-
Goldcrest (*Regulus regulus*)	08/04/2023	-
Cormorant (*Phalacrocorax carbo*)	08/03/2017	-
Greylag Goose (*Anser anser*)	20/09/2018	-
House Martin (*Delichon urbicum*)	31/12/2011	-
House Sparrow (*Passer domesticus*)	08/04/2023	-
Lesser Black-backed Gull (*Larus fuscus*)	31/12/2011	-
Mallard (*Anas platyrhynchos*)	08/10/2022	-
Mew Gull (*Larus canus*)	31/12/2011	-
Mute Swan (*Cygnus olor*)	18/09/2017	-
Northern Wheatear (*Oenanthe oenanthe*)	31/12/2011	-
Sand Martin (*Riparia riparia*)	31/12/2011	-
Sky Lark (*Alauda arvensis*)	19/03/2023	-

4.1.4 Flora

Upon review of Google Maps and the Streetview function, species identified to be present at the bridge site and along the N58 road in the vicinity of the bridge include Sycamore (*Acer pseudoplatanus*) or likely another Maple species (*Acer* sp.), hydrangea species (*Deutzia scabra*), Brambles (*Rubus fruticosus*), Nettles (*Urtica dioica*), bracken/fern species, grasses along the road verges, Hawthorn (*Crataegus monogyna*), willow species (*Salix* sp.), Ash (*Franxinus excelsior*), and Colt's foot (*Tussilago farfara*).

No flora species as listed on the Flora (Protection) Order, 2022 ("the FPO"[20]), have been recorded within the M29 10km grid square. Both the NPWS FPO Bryophyte Viewer[21] and FPO Vascular Plants, Charophytes and Lichens Viewer were consulted however as above no records for any protected flora species occurred at or in the wider environs of Strade River Bridge (within 3km radius). Within 5km of the bridge (outside M29 grid square), recent records (within 25 years) of FPO species, the Killarney Fern (*Trichomanes speciosum*), exist from 2016. Older records exist from the 1900s and 1800s for species including Heath Cudweed (*Omalotheca sylvatica*), Small-white Orchid (*Pseudorchis albida*), and Great Burnet (*Sanguisorba officinalis*); however, these records have been omitted due to relevance and age of records.

[20] Flora (Protection) Order, 2022. SI No. 235/2022. https://www.irishstatutebook.ie/eli/2022/si/235/

[21] http://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=71f8df33693f48edbb70369d7fb26b7e

4.1.5 Invasive Species

Invasive Alien Species (IAS) are non-native species that threaten the biological diversity and are introduced and/or spread outside their natural distribution and may cause economic or environmental harm. While non-native invasive species are not an ecological feature of value, they are considered as a potential ecological constraint. The EU Regulation 1143/2014 on Invasive Alien Species entered into force on 1st January 2015 and was transposed into Irish law by the IAS Regulations[22] in 2024 This IAS Regulation provides a set of measures to prevent, minimise and mitigate the adverse impacts of the introduction and spread (both with and without intention) of invasive alien species on biodiversity as well as other adverse impacts on human health or the economy (European Commission, 2017). The core of the Regulation is the list of Invasive Alien Species of Union concern (Union List). The species included on this list are subject to restrictions and measures set out in the Regulation. These include restrictions on keeping, importing, selling, breeding, growing, and releasing into the environment The Third Schedule list of the European Communities (Birds and Natural Habitats) Regulations 2011 [S.I.477/2011][23] identifies species of which there is prohibition on introduction, dispersal, breeding or selling.

As according to the NBDC species search for the M29 grid square, a single 'High-impact' Third Schedule, species of Union Concern has been recorded; Indian balsam (*Impatiens glandulifera*). These records (most recently from 2019) are located in Turlough, to the southwest of Strade approximately 6.5km over land. No additional legally restricted species were noted upon review of Google Street View along the N58, nor during review of bridge inspection photos (AtkinsRéalis, 2024; 2025).

A single additional 'Medium-impact; (O'Flynn *et al*., 2014) species was recorded within M29; Sycamore (*Acer pseudoplatanus*). This species can be seen growing on the western banks of the river at Strade Bridge on Google Street View and within bridge inspection photos. A cotoneaster (*Cotoneaster* sp.) plant is growing adjacent to the bridge (noted in bridge inspection photos) however it was unable to be identified to a species level through desktop review alone.

No invasive species were identified within the vicinity of the bridge structure during the site visit.

[22] https://www.irishstatutebook.ie/eli/2024/si/374/made/en/print

[23] https://invasives.ie/app/uploads/2021/10/S.I.477-ThirdSchedule_SppLists_FromSource.pdf

4.2 Site Visit

A site visit was undertaken by AtkinsRéalis ecologists Kevin McCaffrey and Owen O'Keefe on the 7th May 2025.

There was no evidence of freshwater pearl mussel (*Margaritifera margaritifera*) or white-clawed crayfish (*Austropotamobius pallipes*) recorded within the vicinity of the bridge structure. The riverbed at the location of the bridge structure is generally clean and in good ecological condition. There are several locations both upstream and downstream of the bridge structure that are capable of supporting redds, and fry were recorded at locations both upstream and downstream of the bridge structure. A small number of older trout / salmon were also observed within the river channel in the vicinity of the bridge structure, with a range of sizes. Approximately 15-20m downstream of the bridge, areas of silt are present that may provide suitable area for lamprey ammocoetes.

Dipper (*Cinclus cinclus*) was recorded within the vicinity of the bridge, with an active nest recorded immediately upstream of the bridge structure. Mammal prints were present within 2m of the structure however were not identified as otter, rather a small dog or cat.

There was no evidence of invasive alien species, either aquatic or terrestrial, within the vicinity of the bridge structure.

Plate 4-1 - Strade River flowing underneath Strade River Bridge (upstream face).

Plate 4-2 - Downstream face of Strade River Bridge.

Plate 4-3 – Minnow recorded within Strade River during aquatic survey.

Plate 4-4 - Strade River looking downstream of the Strade River Bridge

Plate 4-5 - Gravel deposits downstream of the Strade River Bridge.

Plate 4-6 - Existing wetted channel of Strade River Bridge.

Plate 4-7 - Aquatic vegetation growth within the Strade River.

Plate 4-8 - Agricultural land in the vicinity of the Strade River Bridge.

5. Connectivity to Natura 2000 sites

5.1 Zone of Influence

The "*Zone of Influence*" of a plan or project is the area which may experience ecological effects as a result of its implementation, including any ancillary activities. The various impacts of a plan or project will each have their own characteristics, e.g. nature, extent, magnitude, duration etc. Accordingly, the area subject to each impact ("zone of impact") will vary depending on characteristics of the impact and the presence of pathways for its propagation. Ecological features within or connected to one or more zones of impact could, depending on their sensitivities, be affected by the plan or project under consideration. The area containing such features may be regarded as the Zone of Influence. As such, in establishing the Zone of Influence for a plan or project, regard must be had to the characteristics of its potential impacts, potential pathways for impacts and the sensitivities of ecological features in the receiving environment.

In its guidance on selecting Natura 2000 sites to include in AA, *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities* (DEHLG, 2010a) recommends inclusion of sites in the following three categories:

- Any Natura 2000 sites within or adjacent to the plan or project area,
- Any Natura 2000 sites within the Zone of Influence of the plan or project (to be established on a case-by-case basis for projects, having regard to the nature, scale and location of the project, the sensitivities of the ecological receptors and the potential for in-combination effects), and
- Following the precautionary principle, any other Natura 2000 sites for which the possibility of significant effects cannot be excluded, e.g. for a project with hydrological impacts, it may be necessary to check the full extent of the catchment for Natura 2000 sites with water-dependent qualifying interests.

In addition, *Assessment of plans and projects in relation to Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC* (EC, 2021a) recommends consideration of Natura 2000 sites hosting fauna which could move to the plan or project area or its zone(s) of impact, and the potential for the plan or project to sever ecological connectivity within or between Natura 2000 sites. *Appropriate Assessment Screening for Development Management* (OPR, 2021) emphasises the importance of employing the source-pathway-receptor model when selecting Natura 2000 sites for inclusion in AA.

Based on the above considerations, the Zone of Influence for the proposed works was defined as the combination of the following zones of impact: -

- For direct impacts, all areas within and immediately adjoining the works area.
- For temporary disturbance to birds and mobile species such as otter and other fauna, as well as effects associated with the spread of invasive alien species, all areas within a precautionary buffer of 500m from the works area.
- For water quality impacts, the Strade River, within and downstream of the works area, the River Moy and the River Moy SAC.
- For indirect effects, all other areas with potential ecological connectivity to the above zones of impact, i.e. downstream of the proposed works on the River Moy.

Using QGIS, spatial data for waterbodies and catchments from *EPA Geoportal* were viewed in conjunction with aerial imagery from *Bing Maps* to identify pathways and zones of impact from the proposed works, and other potential ecological connections to the wider landscape. These were then mapped in relation to Natura 2000 sites using spatial data from *NPWS: Maps and Data*.

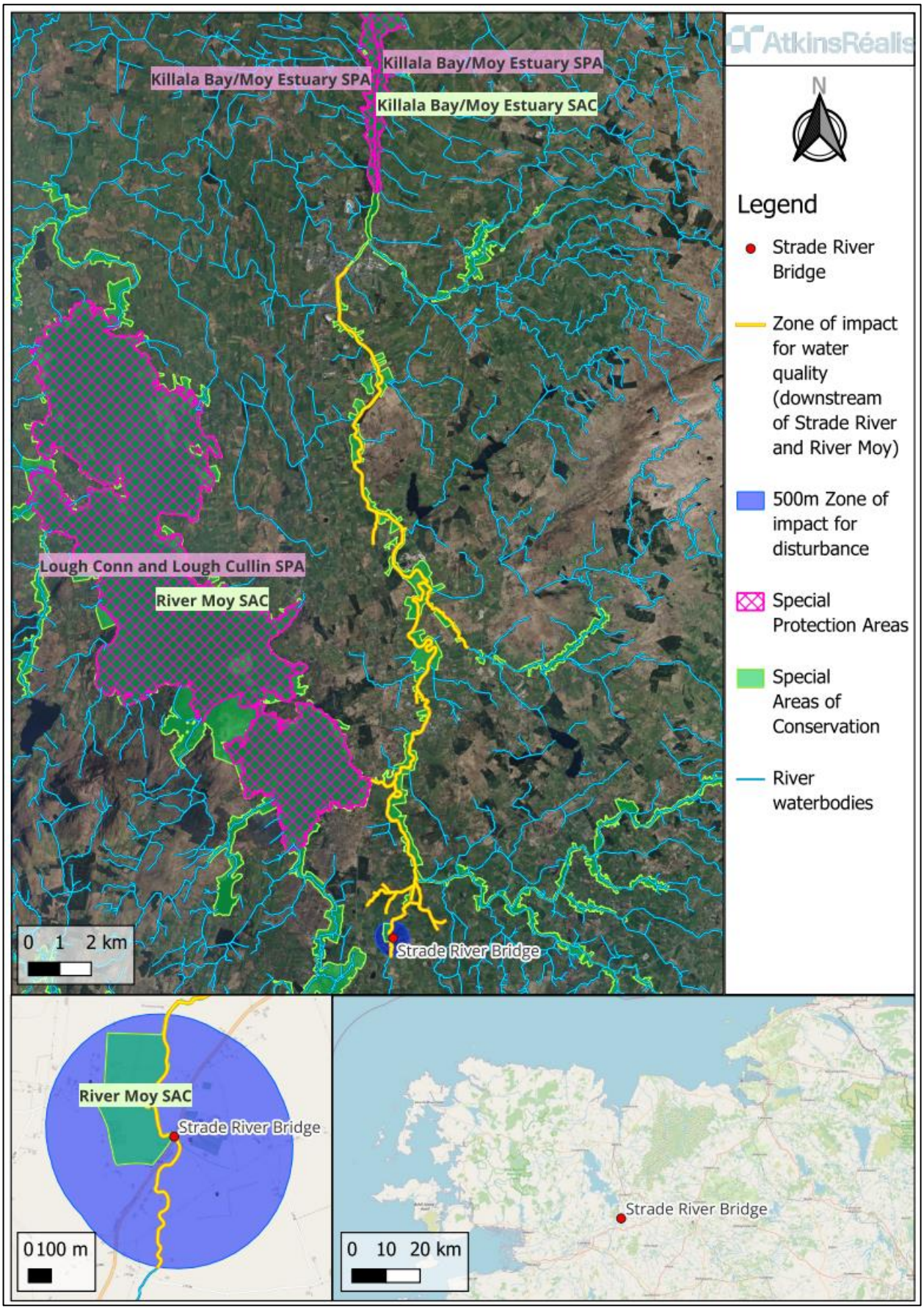

Figure 5-1 - Zone of Influence of the proposed works at Strade River Bridge.

5.2 Identification of Sites

5.2.1 Direct Impacts

Direct impacts include those such as habitat loss and fragmentation which occur as a direct result of works, change of land use or management, or presence of new or in this case altered structures. Such impacts are limited to the works area and immediate vicinity. The River Moy SAC (site code: 002298) occurs immediately upstream of Strade River Bridge. Therefore, this SAC occurs within the immediate vicinity of the works area; thus, pathways for direct impacts are present.

5.2.2 Disturbance and Invasive Alien Species

Disturbance impacts include noise, visual and other forms of disturbance to animal species. The extent of such impacts is highly dependent on their magnitude and the sensitivity of the receptors. In the case of the proposed works a precautionary distance of 500m from the works was used. The proposed works is immediately upstream from the River Moy SAC, which is selected for a number of aquatic species which are sensitive to disturbance from human activities. Therefore, there is potential for disturbance impacts to this Natura 2000 site. There are no other Natura 2000 sites within the precautionary 500m buffer for such impacts.

Given the uncertainty and complexity of effects relation to the spread of invasive alien species it is not possible to define a zone of impact. However, species such as Rhododendron (*Rhododendron ponticum*) are considered to pose a threat to the integrity of alluvial forest and other woodland habitats along the River Moy system. However, given that the proposed development does not entail any works or other activities near any example of these forest habitat types, it cannot contribute to the spread of invasive alien species of concern in this Natura 2000 site.

5.2.3 Water-related Impacts

Water quality impacts include pollution of surface waters and groundwater by sediment, hydrocarbons (e.g. diesel, hydraulic oils and lubricating oils), concrete and other cementitious materials, and other deleterious matter arising during construction and operation. In the case of the proposed works, these could include dust and fine sediment arising from concrete cutting of existing structure to be taken down, fuels and other hydrocarbons from vehicles, plant and machinery, cementitious materials required for construction, waste from on-site welfare facilities, and surface water run-off during operation. The zone of impact covers the Strade River and the downstream River Moy. The River Moy SAC occurs within this zone of impact and is designated for aquatic species and habitats sensitive to water-quality impacts.

5.2.4 Indirect and Uncertain Effects

There are several additional Natura 2000 sites within or intersecting zone of impact for indirect impacts, i.e. the River Moy. Natura 2000 sites within the wider zone of impact include:

- Lough Conn and Lough Cullin SPA
- Killala Bay/Moy Estuary SPA
- Killala Bay/Moy Estuary SAC

Lough Conn and Lough Cullin SPA (site code: 004228) lies 4.1km overland northwest of the proposed works (the discharge from Lough Cullin to the River Moy is downstream of the Strade confluence with the Moy). This SPA is designated for several marine and freshwater bird species including Tufted Duck [A061], Common Gull [A182], Greenland White-fronted Goose [A395], and wetlands and waterbirds. There is no hydrological connectivity between

this SPA and the proposed works area thus given this lack of hydrological connectivity and distance over land, there are no pathways for impacts. Killala Bay/Moy Estuary SAC (site code: 000458) and Killala Bay/Moy Estuary SPA (site code: 004036) are located >30km downstream of the proposed works area. There is therefore a significant distance and substantial dilution capacity in the intervening waters. As well as being a qualifying interest of the River Moy SAC, sea lamprey is also a qualifying interest of Killala Bay/Moy Estuary SAC. It is considered with respect to Strade Bridge in the context of Moy River SAC. Impacts to lamprey in Killala Bay/Moy Estuary SAC are not anticipated.

5.2.5 Summary

Based on the above examination of the zone of impacts and hydrological connectivity from the proposed works on the Strade River to the River Moy SAC and that in-stream works will occur, this SAC cannot be screened out for potential impacts at this stage, in relation to disturbance to fauna and water quality impacts. Therefore, a single European site has been selected for the inclusion in the screening assessment –

- River Moy SAC (site code: 002298)

The sections below outline the qualifying interests of this European site and discusses whether further consideration is necessary in relation to the potential for likely significant effects on this SAC as a result of the proposed works.

Figure 5-1 above shows the location of the proposed works on the Strade River in relation to the River Moy SAC.

5.3 Description of Natura 2000 Sites

The description of the Natura 2000 sites presented in this section are based on the Site Synopsis, Conservation Objectives and Natura 2000 Standard Data Form documents for the sites concerned, augmented by information from the supporting documents available on the site-specific pages of the NPWS website.

Annex I habitat types marked with an asterisk (*) are “priority habitat types”, i.e., natural habitat types in danger of disappearing and for the conservation of which the EU has a particular responsibility given the proportion of their natural ranges falling within the European territory of Member States.

5.3.1 River Moy SAC

5.3.1.1 Overview

The Site Synopsis (NPWS, 2020a)[24] states:

> “*This site comprises almost the entire freshwater element of the River Moy and its tributaries including both Loughs Conn and Cullin. The system drains a catchment area of 805 sq. km. Most of the site is in Co. Mayo, though parts are in west Sligo and north Roscommon. Apart from the Moy itself, other rivers included within the site are the Deel, Bar Deela, Castlehill, Addergoole, Clydagh and Manulla on the west side, and the Glenree, Yellow, Strade, Gweestion, Trimogue, Sonnagh, Mullaghanoe, Owengarve, Eighnagh and Owenaher on the east side. The underlying geology is Carboniferous Limestone for the most part, though Carboniferous Sandstone is present at the extreme west of the site, with Dalradian Quartzites and schists at the south-west. Some of the tributaries at the east, the south of Lough Conn and all of Lough Cullin are underlain by granite. There are many towns adjacent to but not within the site. These include Ballina, Crossmolina, Foxford, Swinford, Kiltimagh and Charlestown…*

[24] https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY002298.pdf

*…Aspen (*Populus tremula*), Silver Birch (*B. pendula*) and the shrubs Guelder-rose (*Viburnum opulus*), Buckthorn (*Rhamnus catharticus*) and Spindle (*Euonymus europaeus*). The ground flora is usually composed of Bilberry (*Vaccinium myrtillus*), Great Wood-rush (*Luzula sylvatica*), Wood-sorrel (*Oxalis acetosella*), buckler-ferns (*Dryopteris aemula *and* D. dilatata*), Hard Fern (*Blechnum spicant*), Common Cow-wheat (*Melampyrum pratense*) and Bracken (*Pteridium aquilinum*). The rare Narrow-leaved Helleborine (*Cephalanthera longifolia*), protected under the Flora (Protection) Order, 2015, occurs in association with the woodlands. Also found in these woodlands is the snail* Spermodea lamellata*, a species associated with old natural woodlands.*

Alluvial woodland occurs at several locations along the shores of the lakes but is particularly well developed along the river at Coryosla Bridge. Principal tree species are willows (including Salix cinerea *subsp.* oleifolia*) and Alder (*Alnus glutinosa*). Herbaceous species include Royal Fern (*Osmunda regalis*), Meadowsweet (*Filipendula ulmaria*) and Reed Canary-grass (*Phalaris arundinacea*). The woods are flooded by seasonal fluctuations in lake level.*

*On higher ground adjacent to the woodlands is blanket bog with scattered shrubs and trees on the drier areas. The rocky knolls often bear Juniper (*Juniperus communis*) or Gorse (*Ulex europaeus*), with some unusual rare herb species such as Intermediate Wintergreen (*Pyrola media*) and Lesser Twayblade (*Listera cordata*). Within the site are a number of raised bogs including those at Kilgarriff, Gowlaun, Derrynabrock, Tawnaghbeg and Cloongoonagh. These are examples of raised bogs at the north-western edge of the spectrum and possess many of the species typical of such in Ireland, including an abundance of Bog Asphodel (*Narthecium ossifragum*), Carnation Sedge (*Carex panicea*) and the moss* Campylopus atrovirens*. Some of the bogs include significant areas of active raised bog habitat. Well-developed pool and hummock systems with quaking mats of bog mosses (*Sphagnum *spp.), Bog Asphodel and White Beaked-sedge (*Rhynchospora alba*) are present. Many of the pools contain a diversity of plant species, including Bogbean (*Menyanthes trifoliata*), the bog moss* Sphagnum cuspidatum*,* Campylopus atrovirens*, Common Cottongrass (*Eriophorum angustifolium*), Great Sundew (*Drosera anglica*) and occasional Lesser Bladderwort (*Utricularia minor*). Several of the hummock-forming mosses (*Sphagnum fuscum *and* S. imbricatum*) which occur here are quite rare in this region and add to the scientific interest of the bogs within the overall site.*

*Depressions on the bogs, pool edges and erosion channels, where the vegetation is dominated by White Beaked-sedge comprise the habitat '*Rhynchosporion *vegetation'. Associated species in this habitat at the site include Bog Asphodel, sundews, Deergrass (*Scirpus cespitosus*) and Carnation Sedge.*

*Degraded raised bog is present where the hydrology of the uncut bogs has been affected by peat cutting and other land use activities in the surrounding area, such as afforestation and associated drainage, and also the Moy arterial drainage. Species typical of the active raised bog habitat may still be present but the relative abundances differ. A typical example of the degraded habitat, where drying has occurred at the edge of the high bog, contains an abundance and more uniform cover of Heather (*Calluna vulgaris*), Carnation Sedge, Deergrass and sometimes Bog-myrtle (*Myrica gale*). Occurring in association with the uncut high bog are areas of wet regenerating cutover bog with species such as Common Cottongrass, bog mosses and sundew, while on the drier areas, the vegetation is mostly dominated by Purple Moor-grass (*Molinia caerulea*). Natural regeneration with peat-forming capability will be possible over time with some restorative measures.*

Alkaline fen is considered to be well developed within the site. An extensive stand occurs as part of a wetland complex at Mannin and Island Lakes on the Glore River. Key diagnostic species of the Schoenus *association characteristic of rich fens include the bryophytes* Campylium stellatum*,* Aneura pinguis *and* Scorpidium scorpioides*, and the herbaceous species Long-stalked Yellow-sedge (*Carex lepidocarpa*), Grass-of-parnassus (*Parnassia palustris*) and Common Butterwort (*Pinguicula vulgaris*). Other fen species include Black Bog-rush (*Schoenus nigricans*), Purple Moor-grass, Marsh Helleborine (*Epipactis palustris*), Meadow Thistle (*Cirsium dissectum*) and Blunt-flowered Rush (*Juncus

subnodulosus*). The rare moss* Bryum uliginosum *occurs on exposed marl at a ditch to the east of Island Lake.*

*This site is one of the most important in the country for the habitat 'lowland hay meadow'. Just over 9ha of the habitat were recorded by the Grassland Monitoring Survey (2015-2017) within the River Moy SAC, with significant areas found adjacent also. In 2017, indicator species for this habitat such as Meadow Foxtail (*Alopecurus pratensis*), Knapweed (*Centaurea nigra*), Meadowsweet , Cat's-ear (*Hypocharis radicata*), Meadow Vetchling (*Lathyrus pratensis*), Autumn Hawkbit (*Leontodon autumnalis*), Oxeye Daisy (*Leucanthemum vulgare*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Ribwort Plantain (*Plantago lanceolata*), Self-heal (*Prunella vulgaris*), Meadow Buttercup (*Ranunculus acris*), Yellow-rattle (*Rhinanthus minor*), Great Burnet (*Sanguisorba officinalis*) and Red Clover (*Trifolium pratense*) were recorded. Great Burnet is of particular note, being a rare species in Ireland. It is listed on the Flora (Protection) Order, 2015, and the recent Red Data List for Vascular Plants categorise it as 'Vulnerable'…*

…The open water of Loughs Conn and Cullin is moderately hard with relatively low colour and good transparency. The phytoplankton of the lake is dominated by diatoms and blue-green algae and there is evidence that the latter group is more common now than in former years. This indicates that nutrient inflow is occurring. The changes in Lough Conn appear to represent an early phase in the eutrophication process. Stoneworts still present include Chara aspera, C. delicatula *and* Nitella cf. opac. *Other plants found in the shallower portions include pondweed species (*Potamogeton *spp.). Where there is a peat influence Intermediate Bladderwort (*Utricularia intermedia*) is characteristic, while Water Lobelia (*Lobelia dortmanna*) often grows in sand. Narrow reedbeds and patches of Yellow Water-lily (*Nuphar lutea*) occur in some of the bays.*

*Drainage of the Moy in the 1960s lowered the level of the lakes, exposing wide areas of stony shoreline and wet grassland, which are liable to flooding in winter. This increased the habitat diversity of the shoreline and created a number of marginal wetlands, including fens and marshes. Plant species of note in the lake-margin include Heath Cudweed (*Omalotheca sylvatica*), Great Burnet and Irish Lady's-tresses (*Spiranthes romanzoffiana*). These three species are listed on the Irish Red Data list and are protected under the Flora (Protection) Order, 2015.*

*Other habitats present within the site include wet grassland dominated by rushes (*Juncus spp.*) grading into species-rich marsh in which sedges are common. Among the other species found in this habitat are Yellow Iris (*Iris pseudacorus*), Water Mint (*Mentha aquatica*), Purple Loosestrife (*Lythrum salicaria*) and Soft Rush (*Juncus effusus*).*

*Rusty Willow (*Salix cinerea *subsp.* oleifolia*) scrub and pockets of wet woodland dominated by Alder (*Alnus glutinosa*) have become established in places throughout the site. Ash (*Fraxinus excelsior*) and Downy Birch (*Betula pubescens*) are common in the latter and the ground flora is typical of wet woodland with Meadowsweet, Wild Angelica (*Angelica sylvestris*), Yellow Iris, horsetails (*Equisetum *spp.) and occasional tussocks of Greater Tussock-sedge (*Carex paniculata*).*

Small pockets of conifer plantation, close to the lakes and along the strip both sides of the rivers, are included in the site.

*The Moy system is one of Ireland's premier salmon waters and it also encompasses two of Ireland's best lake trout fisheries in Loughs Conn and Cullin. Although the Atlantic Salmon (*Salmo salar*) is still fished commercially in Ireland, it is considered to be endangered or locally threatened elsewhere in Europe and is listed on Annex II of the E.U. Habitats Directive. The Moy is a most productive catchment in salmon terms and this can be attributed to its being a fingered system with a multiplicity of 1st to 5th order tributaries which are large enough to support salmonids < 2 years of age while at the same time being too small to support significant adult trout numbers and are therefore highly productive in salmonid nursery terms.*

Salmon run the Moy every month of the year. Both multi-sea-winter fish and grilse are present. The salmon fishing season is 1st February to 30th September. The peak of the spring fishing is in April and the grilse begin running in early May. The average weight of the spring fish is 9 lb and the grilse range from about 3-7 lb. In general spring fish are found more frequently in the rivers at the western extent of the Moy system.

*The Arctic Char (*Salvelinus alpinus*), an interesting relict species from the last ice age, which is listed as threatened in the Irish Red Data Book has been recorded from Lough Conn and in only a few other lakes in Ireland. The latest reports suggest that it may now have disappeared from the site.*

The site is also important for the presence of four other species listed on Annex II of the E.U. Habitats Directive, namely Sea Lamprey, Brook Lamprey, Otter and White-clawed Crayfish. The Sea Lamprey is regularly encountered in the lower stretches of the river around Ballina, while the Otter and White-clawed Crayfish are widespread throughout the system. In addition, the site also supports many of the mammal species occurring in Ireland. Those which are listed in the Irish Red Data Book include Pine Marten, Badger, Irish Hare and Daubenton's Bat. Common Frog, another Red Data Book species, also occurs within the site…

…The site supports populations of several species listed on Annex II of the E.U. Habitats Directive, and habitats listed on Annex I of this Directive, as well as examples of other important habitats. The presence of a fine example of broadleaved woodland in this part of the country increases the overall habitat diversity and adds to the ecological value of the site, as does the presence of the range of nationally rare and Red Data Book plant and animal species".

5.3.1.2 Qualifying Interests and Site-Specific Conservation Objectives

The River Moy SAC was selected for the following qualifying interests:

- Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510]
- Active raised bogs [7110]*
- Degraded raised bogs still capable of natural regeneration [7120]
- Depressions on peat substrates of the Rhynchosporion [7150]
- Alkaline fens [7230]
- Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]
- Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0]*
- Austropotamobius pallipes (White-clawed Crayfish) [1092]
- Petromyzon marinus (Sea Lamprey) [1095]
- Lampetra planeri (Brook Lamprey) [1096]
- Salmo salar (Salmon) [1106]
- Lutra lutra (Otter) [1355]

The site-specific conservation objectives of the River Moy SAC for the habitats for which the site was selected are to restore the favourable conservation condition of Active raised bogs [7110]', and to maintain the favourable

conservation condition of 'Alkaline fens [7230]', Old sessile oak woods [91A0]', and 'Alluvial forests [91E0]'. For 'Degraded raised bags [7120], the long-term aim is that peat-forming capabilities are re-established; therefore, the conservation objective for this habitat is inherently linked to that of 'Active raised bogs [7110]' and a separate conservation objective has not been set within the River Moy SAC. Similarly, for 'Depressions on peat substrate of 'Rhynchosporion [7150]', this habitat is an integral part of good quality 'Active raised bogs [7110] and a separate conservation objective has not been set for this habitat within the River Moy SAC.

The site-specific conservation objectives of the River Moy SAC for the species for which the site was selected are to maintain the favourable conservation condition of 'White-clawed crayfish [1092]', 'Sea lamprey [1095]', 'Brook lamprey [1096]', 'Salmon [1106]', and 'Otter [1355]'.

5.3.1.3 Threats, Pressures and Activities

As according to the Site Synopsis of the River Moy SAC (NPWS, 2020a) land use within the site is as follows: -

> "*Agriculture, with particular emphasis on grazing, is the main land use along the Moy. Much of the grassland is unimproved but improved grassland and silage fields are also present. The spreading of slurry and fertiliser poses a threat to the water quality of this salmonid river and to the large lakes. Fishing is the main tourist attraction on the Moy and there are a large number of Angler Associations, some with a number of beats. Fishing stands and styles have been erected in places. The North Western Regional Fishery Board have erected fencing along selected stretches of the river as part of their salmonid enhancement programme. Other aspects of tourism are concentrated around Loughs Conn and Cullin.*
>
> *Afforestation has occurred in the past around the shores of Loughs Conn and Cullin. The coniferous trees are due for harvesting shortly. It is proposed to replant with native tree species in this area. Forestry is also present along many of the tributaries and in particular along the headwaters of the Deel. Forestry poses a threat in that sedimentation and acidification can occur. Sedimentation can cover the gravel beds resulting in a loss of suitable spawning grounds. The Moy was arterially dredged in the 1960s. Water levels have been reduced since that time. This is particularly evident along the shores of Loughs Conn and Cullin and in the canal-like appearance of some river stretches. Ongoing maintenance dredging is carried out along stretches of the river system where the gradient is low. This is extremely destructive to salmonid habitat in the area*."

Table 5-1 below lists the threats, pressures and activities with negative impacts on the site, as per its Nature 2000 Standard Data Form[25].

Table 5-1 - Threats, pressures, and activities with negative impacts on the River Moy SAC (NPWS 2020a).

Rank	Threat, pressure, or activity [code]	Threat, pressure, or activity [description]	Inside / Outside / Both [i / o / b]
H	H01.05	Diffuse pollution to surface waters due to agricultural and forestry activities	b
M	D04.02	Aerodrome, heliport	b
H	B01	Forest planting on open ground	b
M	C01.03	Peat extraction	b
H	I01	Invasive non-native species	b

[25] https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF002298.pdf

Rank	Threat, pressure, or activity [code]	Threat, pressure, or activity [description]	Inside / Outside / Both [i / o / b]
H	B05	Use of fertilizers (forestry)	b
H	A02.01	Agricultural intensification	b

NPWS, 2020a.

6. Assessment of Adverse Effects

6.1 Identification of potential impacts

This section identifies potential impacts on the qualifying interests of the Natura 2000 sites concerned following the source-pathway-receptor model, i.e. by identifying the impacts from the proposed development (sources) to which the qualifying interests (receptors) are sensitive and establishing whether are not there are pathways for those impacts.

6.1.1 River Moy SAC

Table 6-1 - Identification of potential impacts on the River Moy SAC.

Qualifying Interest	Identification of potential impacts	Potential impact
Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) [6510]	The closest example of this terrestrial habitat occurs c. 6.2km downstream from Strade River Bridge along a section of land adjacent to the River Moy. No nearer examples outside of the SAC were identified during the desk study or field surveys which informed this NIS. Although occurring on fertile river planes[26], this habitat is terrestrial in nature and therefore there are no direct hydrological links to any example of this habitat type. Thus, there are no pathways for impacts to this habitat type from the area of proposed works. Given the lack of pathways, there is not a complete the source-pathway receptor chain for impacts from the proposed works to this qualifying interest. Therefore, adverse effects on the conservation objectives for this qualifying interest can be ruled out at this stage.	No
Active raised bogs [7110]	These is a terrestrial habitat which is regularly found occupying former lakes or shallow depressions in the landscape. Active raised bog systems are generally fed by rainwater and are very acidic[27]. The closest examples of this habitat type as according to Map of Irish Wetlands Raised Bogs of Ireland Viewer[28] occur >19km over land from Strade River Bridge with no hydrological connectivity (see also Maps 3 and 4; River Moy SAC Conservation Objectives document (NPWS, 2016)). No examples of this habitat type was identified downstream of the proposed works area in the desktop study and no example was identified during field surveys undertaken to inform this NIS. Although wet in nature, this habitat is as noted, fed by rainwater and terrestrial such that there are no direct	No

[26] https://www.bsbi.org/wp-content/uploads/dlm_uploads/Lowland_Hay_Meadows_6510-1.pdf

[27] https://sac.jncc.gov.uk/habitat/H7110/

[28] https://www.wetlandsurveys.ie/news/the-raised-bogs-of-ireland-story-map-launched

Qualifying Interest	Identification of potential impacts	Potential impact
	hydrological links to any example of this habitat type. Therefore, there are no pathways for impacts to this habitat type from the area of proposed works. Given the lack of pathways, there is not a complete the source-pathway receptor chain for impacts from the proposed works to this qualifying interest. Therefore, adverse effects on the conservation objectives for this qualifying interest can be ruled out at this stage.	
Degraded raised bogs still capable of natural regeneration [7120]	This is a terrestrial habitat which is found in areas of bog where there has been widespread disturbance to the structure and function of the peat body. No examples of this habitat type were identified within or outside of the SAC downstream of the proposed works area in the desktop study and no examples were identified during field surveys undertaken to inform this NIS. Although wet and acidic, this habitat by nature has damaged hydrological function and is terrestrial such that there are no direct hydrological links to any example of this habitat type from the site of proposed works. Therefore, there are no pathways for impacts to this habitat type from the area of proposed works. Given the lack of pathways, there is not a complete the source-pathway receptor chain for impacts from the proposed works to this qualifying interest. Therefore, adverse effects on the conservation objectives for this qualifying interest can be ruled out at this stage.	No
Depressions on peat substrates of the Rhynchosporion [7150]	This terrestrial habitat type occurs in complex mosaics with lowland wet heath and valley mire vegetation, in transition mires, and on the margins of bog pools and hollows in both raised and blanket bogs. The closest example of this terrestrial habitat occurs within the fringe transition mire habitat of Lough Cullin c. 4.5km northwest over land from Strade River Bridge and the site of proposed works (according to the NPWS Article 17 viewer). No nearer examples outside of the SAC were identified during the desk study or field surveys which informed this NIS. There is no hydrological connectivity to any example of this habitat type as according to available datasets. Therefore, considering the terrestrial nature of this habitat, there are no pathways for impacts to this habitat type from the area of proposed works. Given the lack of pathways, there is not a complete the source-pathway receptor chain for impacts from the proposed works to this qualifying interest. Therefore, adverse effects on the conservation objectives for this qualifying interest can be ruled out at this stage.	No

Qualifying Interest	Identification of potential impacts	Potential impact
Alkaline fens [7230]	The closest example of this terrestrial habitat occurs within the fringe transition mire habitat of Lough Cullin c. 4.5km northwest over land from Strade River Bridge and the site of proposed works (according to the NPWS Article 17 viewer). No nearer examples outside of the SAC were identified during the desk study or field surveys which informed this NIS. There is no hydrological connectivity to any example of this habitat type as according to available datasets. Therefore, considering the terrestrial nature of this habitat, there are no pathways for impacts to this habitat type from the area of proposed works. Given the lack of pathways, there is not a complete the source-pathway receptor chain for impacts from the proposed works to this qualifying interest. Therefore, adverse effects on the conservation objectives for this qualifying interest can be ruled out at this stage.	No
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]	The closest example of this terrestrial habitat occurs within the SAC at the lake margins of Lough Cullin c. 7.1km over land from the site of proposed works at Strade River Bridge (see Map 6; (River Moy SAC Conservation Objectives document (NPWS, 2016)). No nearer examples outside of the SAC were identified during the desk study or field surveys which informed this NIS. There is no hydrological connectivity to any example of this terrestrial habitat type as according to available datasets. Therefore, considering the terrestrial nature of this habitat, there are no pathways for impacts to this habitat type from the area of proposed works. Given the lack of pathways, there is not a complete the source-pathway receptor chain for impacts from the proposed works to this qualifying interest. Therefore, adverse effects on the conservation objectives for this qualifying interest can be ruled out at this stage.	No
Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) [91E0]	This habitat type is directly sensitive to water quality impacts and occurs along the riparian corridors of rivers in Ireland. The closest example of this habitat type is c. 19.9km northwest overland from the site of proposed works to the north of Lough Conn (Map 6; River Moy SAC Conservation Objectives document (NPWS, 2016)). There are no other examples of this qualifying interest habitat type within the SAC. There is no hydrological connectivity to any example of this riparian habitat type as according to available datasets. Therefore, considering the terrestrial nature of this habitat, there are no pathways for impacts to this habitat type from the area of proposed works. Given the lack of pathways, there is not a complete the source-pathway receptor chain for impacts from the proposed works to this qualifying interest.	No

Qualifying Interest	Identification of potential impacts	Potential impact
	Therefore, adverse effects on the conservation objectives for this qualifying interest can be ruled out at this stage.	
Austropotamobius pallipes (White-clawed Crayfish) [1092]	The closest record of this species lies c. 4.5km upstream of Strade River Bridge while multiple records of this species occur throughout tributaries within the River Moy catchment (see Map 7; River Moy SAC Conservation Objectives document (NPWS, 2016)). While this aquatic species was not identified during aquatic site surveys, there is potential for this species to occur. White-clawed crayfish are sensitive to disturbance and water quality impacts which may arise, particularly during construction. As such, there is a complete source -pathway-receptor chain for impacts from the proposed works to this qualifying interest and therefore, adverse effects on the conservation objectives for this qualifying interest cannot be ruled out at this stage. The likelihood of adverse effects on these qualifying interests is assessed in more detail in Section 6.2 below.	**Yes**
Petromyzon marinus (Sea Lamprey) [1095]	These aquatic species occur widely in Irish river systems, utilising gravels for spawning and corridors for commuting purposes. Both Sea and Brook Lamprey are sensitive to disturbance and water quality impacts which may arise, particularly during construction. As such, there is a complete source -pathway-receptor chain for impacts from the proposed works to these qualifying interests and therefore, adverse effects on the conservation objectives for this qualifying interest cannot be ruled out at this stage. The likelihood of adverse effects on these qualifying interests is assessed in more detail in Section 6.2 below.	**Yes**
Lampetra planeri (Brook Lamprey) [1096]		
Salmo salar (Salmon) [1106]	This species is known to occur in the River Moy system and its tributaries which includes the Strade River. During aquatic surveys salmon fry and several older fish were recorded (likely salmon). Salmon are sensitive to disturbance and water quality impacts which may arise, particularly during construction. As such, there is a complete source-pathway-receptor chain for impacts from the proposed works to these qualifying interests and therefore, adverse effects on the conservation objectives for this qualifying interest cannot be ruled out at this stage. The likelihood of adverse effects on these qualifying interests is assessed in more detail in Section 6.2 below.	**Yes**
Lutra lutra (Otter) [1355]	This species is known to occur widely in Ireland, using rivers and riparian corridors for commuting, foraging and holting purposes. This species is likely to occur on the Strade River system. Otter is sensitive to noise and visual disturbance which may arise, particularly during construction. As such, there is a complete source-pathway-receptor chain for impacts from the proposed works to these qualifying interests and therefore,	**Yes**

Qualifying Interest	Identification of potential impacts	Potential impact
	adverse effects on the conservation objectives for this qualifying interest cannot be ruled out at this stage. The likelihood of adverse effects on these qualifying interests is assessed in more detail in Section 6.2 below.	

6.1.2 Summary

As detailed in Table 6-1 above, it has been possible at this stage to rule out impacts from the proposed development on the following qualifying interests:

- Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) [6510]
- Active raised bogs [7110]
- Degraded raised bogs still capable of natural regeneration [7120]
- Depressions on peat substrates of the Rhynchosporion [7150]
- Alkaline fens [7230]
- Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]
- Alluvial forests with *Alnus glutinosa* and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0]

The qualifying interests for which adverse effects could not be ruled out at this stage are as follows: -

- *Austropotamobius pallipes* (White-clawed Crayfish) [1092]
- *Petromyzon marinus* (Sea Lamprey) [1095]
- *Lampetra planeri* (Brook Lamprey) [1096]
- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]

The potential impacts on these qualifying interests are analysed and the significant of their effects evaluated in Section 6.2.

6.2 Analysis and Evaluation of Effects

This section analyses the potential impacts identified in Section 6.1 and evaluates the significance of their effects in view of the relevant conservation objectives, as defined by their specific attributes and targets.

6.2.1 'Do Nothing' Impact

In the case of the proposed works, the 'do nothing' approach would involve not replacing the bridge deck and reducing the height of the existing concrete apron at the bridge. As the existing bridge deck is experiencing corrosion and integral damage to its load bearing capacity, this corrosion will continue and could ultimately results in structural failure of the culvert.

6.2.2 Current Status of Qualifying Interests

6.2.2.1 White-clawed Crayfish

White-clawed crayfish (*Austropotamobius pallipes)* in Ireland is protected under Annex II and Annex V of the Habitats Directive due to its importance and vulnerability to threats such as invasive species and crayfish plague. It is also protected under the Wildlife Acts in Ireland which regulates activities that may impact the species. In Ireland this species is widespread in watercourses within lowland areas with influence from limestone (Reynold, 1998). In the Moy catchment, White-clawed crayfish have been recorded on all major tributaries of the River Moy, specifically those that feed Lough Conn and Lough Cullin. Within the Strade River system crayfish have been recorded upstream within the Little River (a tributary of the Strade River), most recently in 2015 (according to NPWS available datasets). A 2023 catchment wide survey undertaken by IFI recorded White-clawed crayfish at a site c. 800m upstream from Strade River Bridge (Fleming *et al*., 2024). According to Map 7 of River Moy SAC Conservation Objectives document (NPWS, 2016) this species has not been recorded anywhere downstream of the proposed works from where the Strade River joins the River Moy.

In the Moy catchment, according to a 2008 report (O'Connor & McDonnell, 2008), drainage maintenance across the catchment has been a significant threat to crayfish populations within several SAC river corridors, including the River Moy. Additionally, a major threat to White-clawed crayfish populations in the River Moy and tributaries is crayfish plague (*Aphanomyces astaci*). According to Invasives.ie[29] crayfish plague has been confirmed within the River Moy catchment as of June 2023.

As according to the River Moy SAC Conservation Objectives (CO) document (NPWS, 2016), the CO for White-clawed crayfish within the SAC is to maintain the favourable conservation condition of this species, as defined by attributes including distribution, population structure (recruitment), negative indicator species, disease, water quality and habitat quality (heterogeneity).

6.2.2.2 Sea Lamprey and Brook Lamprey

Sea lamprey (*Petromyzon marinus*) and Brook lamprey (*Lampetra planeri*) are similar species, both protected under Annex II of the Habitats Directive. The NPWS have conducted several catchment wide surveys for these species including within the Moy catchment. In 2004 (O'Connor, 2004), the site at Strade River Bridge was sampled for the purpose of assessing juvenile lamprey populations as well as several areas downstream of Strade River Bridge along the River Moy and a single site upstream on the Little River. In 2004 a total of 14 no. juvenile lamprey were recorded between the Strade River Bridge sampled site and the site upstream at Little River. Records of lamprey occur throughout the River Moy catchment including in lakes such as Lough Cullin and Lough Conn (Kurz & Costello, 1999).

[29] https://invasives.ie/species-alerts/crayfish-plague-disease/

The 2025 site visit also indicated that approximately 15-20m downstream of the bridge, areas of silt may provide suitable area for lamprey ammocoetes.

As according to the River Moy SAC Conservation Objectives (CO) document (NPWS, 2016), the CO for Sea lamprey and Brook lamprey within the SAC is to maintain the favourable conservation condition of both species, as defined by attributes including distribution (extent of anadromy), population structure of juveniles, juvenile density in fine sediment, extent and distribution of spawning habitat, and availability of juvenile habitat.

6.2.2.3 Atlantic Salmon

Atlantic salmon (*Salmo salar*) are widespread in river systems in Ireland and are protected under Annex II and V of the Habitats Directive. Salmon are also classed as 'Vulnerable' in Ireland (King et al., 2011). As noted in Section 4 above, IFI most recently surveyed upstream of Strade River Bridge in 2023; this survey recorded >20 individuals of Atlantic salmon. Both fry and older fish (thought likely to be salmon) were recorded in the river at Strade River Bridge during aquatic surveys undertaken to inform this NIS in May 2025. Salmon are widespread throughout the Moy catchment, the River Moy, and its tributaries including the Strade River. Furthermore, there are a number of locations both upstream and downstream of the bridge structure that are capable of supporting redds, and fry were recorded at locations both upstream and downstream of the bridge structure.

According to the Marine Institutes published document 'Year in Review 2023' (MI, 2024) which included a comprehensive count of wild salmon across Ireland, demonstrates the declining population of wild salmon across a period from 2019 to 2023. The report highlights that poor adult return rates and productivity is negatively affected by environmental factors in freshwater.

As according to the River Moy SAC Conservation Objectives (CO) document (NPWS, 2016), the CO for Atlantic Salmon within the SAC is to maintain the favourable conservation condition of the species, as defined by attributes including distribution (extent of anadromy), adult spawning fish, salmon fry abundance, out-migrating smolt abundance, number and distribution of redds, and water quality.

6.2.2.4 Otter

Otter is the only mammalian qualifying interest species of the River Moy SAC. Otter are taken to be widespread across Irelands riparian habitats, using even narrow, shallow streams as commuting routes (Bailey & Rochford, 2006; Reid et al., 2013). This species is protected under the Wildlife Acts and Annex II and IV of the Habitats Directive. There are multiple records for otter within the River Moy and its tributaries include the Strade River. As noted in Section 4 above, the two nearest records of otter to Strade River Bridge are roadkill records, both from 2013. The Moy catchment was identified in 2005 as one of the most important for otter in Ireland (Bailey & Rochford, 2006). In Ireland, despite a decline in status from 88% in 1980/1981 to c. 70% at present, otter as a species remains widespread throughout the country with no apparent reduction in range[30].

As according to the River Moy SAC Conservation Objectives (CO) document (NPWS, 2016), the CO for Otter within the SAC is to maintain the favourable conservation condition of the species, as defined by attributes including distribution, extent of terrestrial habitat, extent of freshwater habitat ((i) rivers and (ii) lakes), couching sites and holts, fish biomass available, and barriers to connectivity.

[30] https://www.npws.ie/sites/default/files/general/otter-conservation-status-report.pdf

6.2.3 Potential Impacts during Construction

6.2.3.1 Direct Impacts

Given the nature and scale of proposed works, i.e., replacement of existing bridge deck and reduction in apron height requiring full dewatering of channel over a period of 9no. months, and their location on an upstream boundary of the River Moy SAC, there are risks for potential direct impacts to mobile species for which the SAC is designated. No examples of qualifying interest habitats occur within the zone of impact of proposed works such that there will be no direct impact upon any of these habitats (as ruled out in Table 6-1 above). Potential impacts include the loss or fragmentation, degradation, pollution or disturbance of species (or habitats upon which qualifying interest species depend) within any European sites because of the proposed works.

6.2.3.2 Indirect Impacts

Given the nature and scale of proposed works, i.e., replacement of existing bridge deck and reduction in height of existing apron requiring full dewatering of channel over a period of 9 no. months with use of heavy machinery and plant in proximity to the river there is a risk of impact to water quality. However, mitigation measures to prevent the introduction of hydrocarbons and cementitious material into the watercourse are considered necessary in relation to preventing adverse effects on White-clawed crayfish, Sea lamprey, Brook lamprey, Salmon, and Otter.

There is the potential for the accidental release of polluting matter, e.g. hydrocarbons and oils, from equipment and machinery. All machinery and equipment will be located within the existing road footprint at the bridge location and therefore and potential accidental release of pollutants is limited. However, to remove any risk to the river appropriate mitigation measures are set out below.

The proposed works involve the requirement of bored cast in place concrete piles to ensure the correct load bearing capacity of the new deck at Strade River Bridge. These piles are set back from the watercourse behind the existing abutment walls; the construction of piles requires use of a 40t rotary piling rig. These works will give rise to noise disturbance at the site of proposed works and within the zone of impact disturbance buffer of 500m. However, to remove any risk to the riparian environment and associated species appropriate mitigation measures are set out below.

There are no otter holts within the environs of Strade River Bridge (as of May 2025). A pre-construction survey for holting otter is required prior to the commencement of construction works[31]. It is also considered likely that this mobile species utilises the Strade River corridor and downstream River Moy for commuting, foraging and breeding purposes. Otter is sensitive to noise and visual disturbance, therefore there is potential for indirect disturbance to otter that may forage or commute along the Strade River due to the presence of personnel and machinery at this river section.

No invasive species, aquatic or terrestrial, were recorded at Strade River Bridge during site visits. There are no records for any legally restricted invasive species within the zone of impact of works at Strade River Bridge thus it is considered there is no potential for the spread of IAPS due to the proposed works. The proposed works site lies within the River Moy catchment which is positive for invasive mould *Aphanomyces astaci* which is the primary cause for crayfish plague in Ireland. Given the potential for this disease to occur, biosecurity protocols as a mitigation measure are detailed below.

6.2.4 Potential Impacts during Operation

No impacts are anticipated during the operational phase of the project.

[31] https://www.tii.ie/media/wsmlbxmv/guidelines-for-the-treatment-of-otters-prior-to-the-construction-of-national-road-schemes.pdf

7. Mitigation

7.1 Requirement and Approach

As demonstrated in Section 6 above, the proposed works have the potential to adversely affect the integrity of a Natura 2000 site, specifically the River Moy SAC, in view of its conservation objectives. This section prescribed mitigation measures to further control any impacts from the proposed works to minimise the potential for such effects in combination with other plans or projects.

The development of the mitigation measures has followed the “mitigation hierarchy”, which prioritises avoidance over reduction, and actions at source over pathway over receptor, as follows:

1. Eliminate the source of the impact
2. Minimise or reduce the impact at its source
3. Block or weaken the pathway for effects, and
4. Abate effects at the receptor.

This approach assists with more complete removal of the effects, minimises the risk of effects occurring by less obvious pathways, also protects non-target receptors, and minimises the risks of unintended harm associated with measures focussed at or near the receptors.

7.2 Mitigation Measures

7.2.1 General Measures

- A Project Ecologist 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 Project Ecologist will be a suitably qualified and experienced ecologist, which will be appointed by MCC or TII. The Project Ecologist 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.

7.2.2 Specific Measures

7.2.2.1 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[32] (*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.

[32] https://www.tii.ie/media/wsmlbxmv/guidelines-for-the-treatment-of-otters-prior-to-the-construction-of-national-road-schemes.pdf

7.2.2.2 Watercourse Protection

- A dry working area will be achieved at the bridge site by setting up a dam system. There will be 3no. 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 (further 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.

7.2.2.3 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.

7.2.3 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.

8. Assessment of Residual Effects

Table 8-1 to Table 8-5 below summarise the potential for adverse effects to screened-in species of the River Moy SAC assuming the implementation of mitigation measures, which have been integrated into the design of how works will be undertaken.

Table 8-1 - Attributes of 1092 White-clawed crayfish (*Austropotamobius pallipes*), and comments on potential for impact.

1092	**White-clawed crayfish (*Austropotamobius pallipes*)**		
To maintain the favourable conservation condition of White-clawed Crayfish in River Moy SAC, which is defined by the following list of attributes and targets:			
Attributes	**Measure**	**Target**	**Comment**
Distribution	Occurrence	No reduction from baseline (see Map 7 of River Moy SAC CO document (NPWS, 2016))	This species was not recorded during site survey. Given the mitigation measures (order of works and dams and silt fences) and scale of works there will be no adverse effects on Distribution.
Population structure: recruitment	Occurrence of juveniles and females with eggs	Juveniles and/or females with eggs in all occupied tributaries	This species was not recorded during site survey. Given the mitigation measures (order of works and dams and silt fences) and scale of works there will be no adverse effects on Population structure: recruitment.
Negative indicator species	Occurrence	No alien crayfish species	Given that the biosecurity measures will be followed during the proposed works, the spread of alien crayfish species will not occur.
Disease	Occurrence	No instances of disease	Given that the biosecurity measures will be followed during the proposed works, the spread of disease will not occur.
Water quality	EPA Q value	At least Q3-4 at all sites sampled by EPA	Given the watercourse protection measures to be implemented, there will be no adverse effects on water quality which could alter the Q value at the site, within the SAC.
Habitat quality: heterogeneity	Occurrence of positive habitat features	No decline in heterogeneity or habitat quality	Given the scale, nature of works and the mitigation measures there will be no adverse effects on Habitat quality: heterogeneity within the SAC.

NPWS, 2016.

Table 8-2 - Attributes of 1092 Sea Lamprey (*Petromyzon marinus*), and comments on potential for impact.

1095	**Sea Lamprey (*Petromyzon marinus*)**		
To maintain the favourable conservation condition of Sea Lamprey in River Moy SAC, which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Comment**
Distribution: extent of anadromy	Percentage of river accessible	Greater than 75% of main stem length of rivers accessible from estuary	Given the mitigation measures (order of works, instream barriers only during open season from July 1st to September 30th) there will be no adverse effects on anadromy.
Population structure of juveniles	Number if age/size groups	At least three age/size groups present	There will be no adverse effects on Population structure of juvenile. Given the mitigation measures (order of works and dams and silt fences) and scale of works.
Juvenile density in fine sediment	Juveniles/m²	Mean catchment juvenile density at least 1/m²	Given the mitigation measures (order of works and dams and silt fences) and scale of works there will be no adverse effects on Juvenile density in fine sediment within the SAC.
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds	Given the mitigation measures (order of works and dams and silt fences) and scale of works there will be no adverse effects on spawning habitat within the SAC.
Availability of juvenile habitat	Number of positive sites in 3rd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive	Given the mitigation measures (order of works and dams and silt fences) and scale of works there will be no adverse effects on Juvenile density in fine sediment within the SAC.

NPWS, 2016.

Table 8-3 - Attributes of 1096 Brook Lamprey (*Lampetra planeri*), and comments on potential for impact.

1096	**Brook Lamprey (*Lampetra planeri*)**		
To maintain the favourable conservation condition of Brook Lamprey in River Moy SAC, which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Comment**
Distribution: extent of anadromy	Percentage of river accessible	Access to all watercourses down to first order streams	Given the mitigation measures (order of works, instream barriers only during open season from July 1st to September 30th) there will be no adverse effects on
Population structure of juveniles	Number if age/size groups	At least three age/size groups of brook/river lamprey present	There will be no adverse effects on Population structure of juvenile. Given the mitigation measures (order of works and dams and silt fences) and scale of works.
Juvenile density in fine sediment	Juveniles/m²	Mean catchment juvenile density of brook/river lamprey at least 2/m²	Given the mitigation measures (order of works and dams and silt fences) and scale of works there will be no adverse effects on Juvenile density in fine sediment within the SAC.
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds	Given the mitigation measures (order of works and dams and silt fences) and scale of works there will be no adverse effects on spawning habitat within the SAC.
Availability of juvenile habitat	Number of positive sites in 3rd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive	Given the mitigation measures (order of works and dams and silt fences) and scale of works there will be no adverse effects on Juvenile density in fine sediment within the SAC.

NPWS, 2016.

Table 8-4 - Attributes of 1106 Salmon (*Salmo salar*), and comments on potential for impact.

1106	**1106 Salmon (*Salmo salar*)**		
To maintain the favourable conservation condition of Salmon in River Moy SAC, which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Comment**
Distribution: extent of anadromy	Percentage of river accessible	100% of river channels down to second order accessible from estuary	There will be no adverse effects on extent of anadromy given the mitigation measures (order of works, instream barriers only during open season from July 1st to September 30th).
Adult fish spawning	Number	Conservation Limit (CL) for each system consistently exceeded	Given the mitigation measures (order of works and dams and silt fences) and scale of works there will be no adverse effects on spawning habitat within the SAC.
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling	Given the mitigation measures (order of works and dams and silt fences) and scale of works there will be no adverse effects on salmon fry abundance within the SAC.
Out-migrating smolt abundance	Number	No significant decline	Given the mitigation measures (order of works, instream barriers only during open season from July 1st to September 30th) there will be no adverse effects on Out-migrating smolt abundance
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes	Given the mitigation measures (order of works and dams and silt fences) and scale of works there will be no adverse effects on Number and distribution of redds within the SAC.
Water quality	EPA Q value	At least Q4 at all sites samples by EPA	Given the mitigation measures (order of works and dams and silt fences) and scale of works there will be no adverse effects on Water quality within the SAC.

NPWS, 2016.

Table 8-5 - Attributes of 1355 Otter (*Lutra lutra*), and comments on potential for impact.

1355	Otter (*Lutra lutra*)		
To maintain the favourable conservation condition of Otter in River Moy SAC, which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Comment**
Distribution	Percentage positive survey sites	No significant decline	No signs of otter were recorded during site survey. The proposed works are temporary and are to be carried out during day-time hours with instream works restricted from July 1st to September 30th. No works are required at any identified holting or couching site. As such there will be no adverse effects on the distribution of otters.
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 1068.8ha	There will be no loss of terrestrial habitat due to the works.
Extent of freshwater (river) habitat	Kilometres	No significant decline. Area mapped and calculated as 479.4km	There will be no loss of river habitat associated with the works.
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 1248.2ha	There is no lake or lagoon habitat near the works area.
Couching sites and holts	Numbers	No significant decline	No couching sites were recorded at the site of proposed works. As such there will be no adverse effects on couching sites or holts.
Fish biomass available	Kilograms	No significant decline	IFI will be informed prior to works. Further, as the will be no adverse effects on the availability of lamprey and salmon species there will not be no adverse effects on the availably of fish as a food source for otter as a result of the works.
Barriers to connectivity	Number	No significant increase See Map 8 of River Moy SAC CO document (NPWS, 2016)	This refers to barriers within the SAC which the proposed works are not directly in but rather border. There will be no impact given correct implementation of mitigation measures and daylight working hours.

NPWS, 2016.

8.1 Overall Assessment of Residual Effects

In view of best scientific knowledge, and on the basis of objective information, and given the full and proper implementation of the mitigation prescribed above, the proposed works at the Strade River, individually, will not adversely affect any of the qualifying interests of the River Moy SAC, or on any European site.

9. Potential In-combination Effects

9.1 Requirement for Assessment

The requirement for AA arising out of Article 6(3) of the Habitats Directive covers plans and projects that, "*either individually or in combination with other plans or projects*", are likely to have a significant effect on one or more European sites. This means that AA is required for any plan or project that, in combination with other plans or projects, would have a significant effect on one or more European sites, irrespective of the presence or absence of such effects from that plan or project on its own. Therefore, regardless of the significance of the effects of the plan or project individually, the potential for significant effects in combination with other plans and projects must be considered in all cases.

9.2 Approach and Methodology

The objective of this requirement is to capture significant effects potentially arising from the cumulation or other interaction of non-significant effects from multiple plans and projects. Consequently, the assessment of potential in-combination effects is not a pair-wise assessment, rather, it considers the totality of the effects arising from all plans and projects affecting the European site(s) in question. In identifying the plans and projects to be included in this assessment, it is important to define an appropriate geographical scope and timescale over which potential in-combination effects are to be considered and the sources of information to be consulted, as described below. It is also important to consider the nature of the interactions between effects, which may be additive, antagonistic, synergistic, or complex.

9.2.1 Geographical Scope

In defining the geographical scope for identifying potential in-combination effects, it is important to remember that effects are evaluated in view of the conservation objectives of the European site(s) concerned. As such, two or more effects relating to the same conservation objective for a given European site would combine even if their geographical extents did not overlap. For example, the loss of a small area of an Annex I habitat type listed as a qualifying interest of a European site would combine with the loss of an entirely unconnected area of the same habitat type from a remote part of the same site to produce an in-combination effect, the significance of which would need to be evaluated in view of the relevant conservation objective. On that basis, the scope of the assessment of in-combination effects extends to all plans and projects affecting the same conservation objectives as the plan or project under consideration, irrespective of whether those effects are significant or not.

As assessed in Section 5, the proposed works provide for no impacts whatsoever on 'Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*)', 'Active raised bogs', 'Degraded raised bogs still capable of natural regeneration', 'Depressions on peat substrates of the *Rhynchosporion'*, 'Alkaline fens', 'Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles', and 'Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)' in the River Moy SAC. As the proposed works will have no impacts whatsoever on these qualifying interests, there is no possibility of likely significant effects thereon in combination with other plans or projects.

The proposed works do provide for some impacts (not constituting likely significant effects) on '*Austropotamobius pallipes* (White-clawed Crayfish)', '*Petromyzon marinus* (Sea Lamprey)', '*Lampetra planeri* (Brook Lamprey)', '*Salmo salar* (Salmon)' and '*Lutra lutra* (Otter)' in the River Moy SAC. Thus, the geographical scope of the in-combination assessment covered all areas which influence the conservation condition of these qualifying interests in the Zone of Influence of the proposed works.

9.2.2 Timescale

As stated in Section 1, the proposed works are to be undertaken over a period of 6 months. As explained in the preceding sections, impacts potentially arising from the proposed works include disturbance to fauna, as well as impacts on water quality. Any non-significant effects arising from disturbance to species, or water quality impacts, will be brief or temporary, i.e. there will be full recovery of any effects within one year.

On that basis, other plans and projects considered in this assessment included those with effects arising from disturbance or water quality.

9.2.3 Sources of Information

The following sources of information were consulted to gather information on other plans and projects: -

- Local authority development plans and their AA documents.
- Local authority online planning enquiries (Mayo County Council).
- *EIA Portal* < https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html >
- *Flood Maps* <https://www.floodinfo.ie/map/floodmaps/>

The threats, pressures and activities with negative impacts on the River Moy SAC are listed in Section 6, along with the relative importance of each threat, pressure or activity and whether it occurs inside or outside the site concerned. This information was used to identify plans and projects which, by their nature, are likely to give rise to potential impacts on the sites concerned.

9.3 Assessment

9.3.1 Plans

The **Water Action Plan 2024**: A River Basin Management Plan for Ireland provides a comprehensive overview of Ireland's strategy to protect and restore water quality under the Water Framework Directive. This Water Action Plan sets out a roadmap to restore Ireland's water bodies to the equivalent of 'good status' or better and to protect water from any further deterioration. Ireland's water quality has declined in spite of actions taken to date. This decline in water quality is putting Ireland's 'clean and green' image at risk – as well as the livelihoods of farmers and those working in industries such as food and tourism that depend directly on this green image of Ireland. This plan focuses on protecting and restoring water quality by preventing and reducing pollution, by restoring the natural ecosystem functions of rivers and by continuing to invest in water infrastructure.

The Moy_070 is identified as an Area for Action in the Water Action Plan. LAWPRO are required to confirm significant pressures and work with implementing bodies and stakeholders to promote the implementation of appropriate restoration measures in each Area for Action (restoration) where environmental objectives are not being met (Action 5.3). These significant pressures have not yet been determined by LAWPRO[33].

The **Mayo County Development Plan (2022-2028)**[34] sets out the vision, core strategy, aims and policy objectives for the proper planning and sustainable development of County Mayo. The plan contains a large number of policy

[33] Subcatchment Assessment

[34] https://www.mayo.ie/planning/county-development-plans/2022-2028

objectives relating to biodiversity. The plan was subject to AA, including the preparation of a Natura Impact Report (NIR), which assessed, at a strategic level, the implications of the plan for European sites, including the River Moy SAC. Where potential adverse effects were identified, the plan was amended to mitigate those effects. Following these amendments, the adopted plan now contains specific text in relation to the protection of these and other European sites, as well as river corridors, floodplains and wetlands. These includes restrictions on development within riparian corridors, requirement for assessment under Article 6 of the Habitats Directive for development likely to have a significant effect on European sites, use of sustainable urban drainage systems (SUDS), and commitments to develop green infrastructure to support European sites and biodiversity generally, in line with Article 10 of the Habitats Directive and Article 3 of the Birds Directive.

The policy objectives in the Mayo County Development Plan contribute to mitigating the negative effects of development on the River Moy SAC and other European sites and provide for the enhanced resilience of these sites through the development of green infrastructure/ecological networks. Therefore, there will be no adverse effects from the proposed works in combination with this plan, which will itself mitigate any in-combination effects arising from other projects.

9.3.2 Projects

Projects identified on the *EIA Portal* within the geographical scope of this assessment included: -

- Flood relief works in the vicinity of the River Moy and its tributaries in Ballina, Co. Mayo (Portal no. 2025060 – Decision due 13/10/2025).
- Infilling of land using inert soil and stone, with reseeding of the site following completion in Ballina, Co. Mayo. Total area to be infilled is approximately 12,000m2 (Poral no. 2024069).
- Construction of a 13-turbine wind farm and 80 MW hydrogen plant along with the associated related works including a 110kV grid connection, interconnector and upgrade works on the local roads. Conversion of an existing mill building ruin approximately 4km north-east of Bunnyconnellan, Co. Mayo (Portal no. 2023113).

Given the nature of most of these projects and their remoteness from the River Moy SAC, they are unlikely to have any effect on these sites and, therefore, have no potential to give rise to any in-combination effects. Where projects have or will occur within or in close proximity to the River Moy SAC, the nature of these projects requires extensive environmental assessment and associated mitigation measures, which means that these projects are also unlikely to give rise to any in-combination effects. Taken together; given the nature, timeframe, scale and geographical spread of these projects, they are not likely to give rise to significant effects in combination with the proposed works.

9.3.2.1 Small-scale Projects

Searches of *Mayo County Council Planning Viewer*[35] found that in the past five years (c. April 2020), there have been over 1,500 planning applications to this local authority for projects within c. 1km of the River Moy and connected waterbodies, downstream of Strade River Bridge.

The nature and scale of these projects vary considerably, but they are of less importance in terms of their potential environmental effects than those identified through the *EIA Portal* (though there is some overlap). They include a large number of domestic projects such as retention of existing dwelling houses and associated structures, or modifications to same, or the construction of new domestic dwellings or extensions to dwellings, including new connections to the public wastewater network, or associated septic tanks or other on-site treatment. Regarding

[35] https://mayococo.maps.arcgis.com/apps/webappviewer/

potential impacts to water quality, such projects must comply with the EPA's *Code of Practice Domestic Waste Water Treatment Systems (Population Equivalent ≤ 10)* (EPA, 2021).

9.3.2.1.1 Mayo TO315 Contract

Rehabilitation works are proposed to take place at Knockavrony Bridge, c. 4km upstream from Strade River Bridge under the Mayo Task Order 315 contract as called up by AtkinsRéalis on behalf of MCC. A NIS is also currently being prepared for these works (AtkinsRéalis, 2025c). The potential for in-combination impacts will be considered in the development of the design, works and appropriate mitigation measures at Knocknavrony. However, given the scale and duration of works at Knockavrony Bridge (and correct implementation of mitigation measures), it is anticipated that the risk of any in combination with works proposed at Strade River Bridge can be eliminated.

9.3.3 Other activities

Farmers and landowners undertake general agricultural operations in areas adjacent to the Strade River, the River Moy and its tributaries that could potentially give rise to effects on the same qualifying interests the proposed works. Most such operations are periodic, not continuous, and qualify as 'activities requiring consent' that require prior consultation with the NPWS, e.g. reclamation, infilling or land drainage within 30 m of a river, removal of trees or any aquatic vegetation within 30 m of a river, and harvesting or burning of reed or willow (NPWS, 2023a). Such operations must also comply with the European Communities (Environmental Impact Assessment) (Agriculture) Regulations, 2011 (as amended) in relation to:

- Restructuring of rural land holdings,
- Commencing use of uncultivated land or semi-natural areas for intensive, and
- Land drainage works on lands used for agriculture.

Stage 2 AA is required under Section 9 of those Regulations if the activity is likely to have a significant effect on a European site. The drainage or reclamation of wetlands is controlled under the Planning and Development (Amendment) (No. 2) Regulations, 2011 and the European Communities (Amendment to Planning and Development) Regulations, 2011. Therefore, any in-combination effects from agricultural operations and the proposed works are not likely to be significant.

9.4 Conclusion

As detailed in the preceding sections within this NIS, it can be concluded that, based on the scale of the proposed works at each location, the mitigation measures that will be followed to minimise adverse effects and the brief duration of both the works themselves and any impacts arising from them, they will not give rise to likely significant effects on the River Moy SAC or any other European site, in combination with other plans or projects.

10. Conclusion

This NIS has examined the details of the proposed works at Strade River Bridge, in Strade, Co. Mayo, and the Natura 2000 sites in its Zone of Influence. It has analysed the potential impacts of the proposed works on the receiving natural environment and evaluated their effects, both individually and in combination with other plans and projects, in view of the conservation objectives of the relevant Natura 2000 sites. This report has been prepared in line with the Habitats Directive, as transposed into Irish law by the Habitats Regulations, relevant case law and guidance from the European Commission, the Department of the Environment, Heritage and Local Government and the Office of the Planning Regulator, on the basis of objective information and adhering to the precautionary principle.

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. Therefore, it is the recommendation of the authors of this report that An Coimisiun Pleanála, as the competent authority in this case, may determine that the proposed development, either individually or in combination with other plans or projects, will not adversely affect the integrity of any Natura 2000 site, provided that the mitigation prescribed in this NIS is fully and properly implemented.

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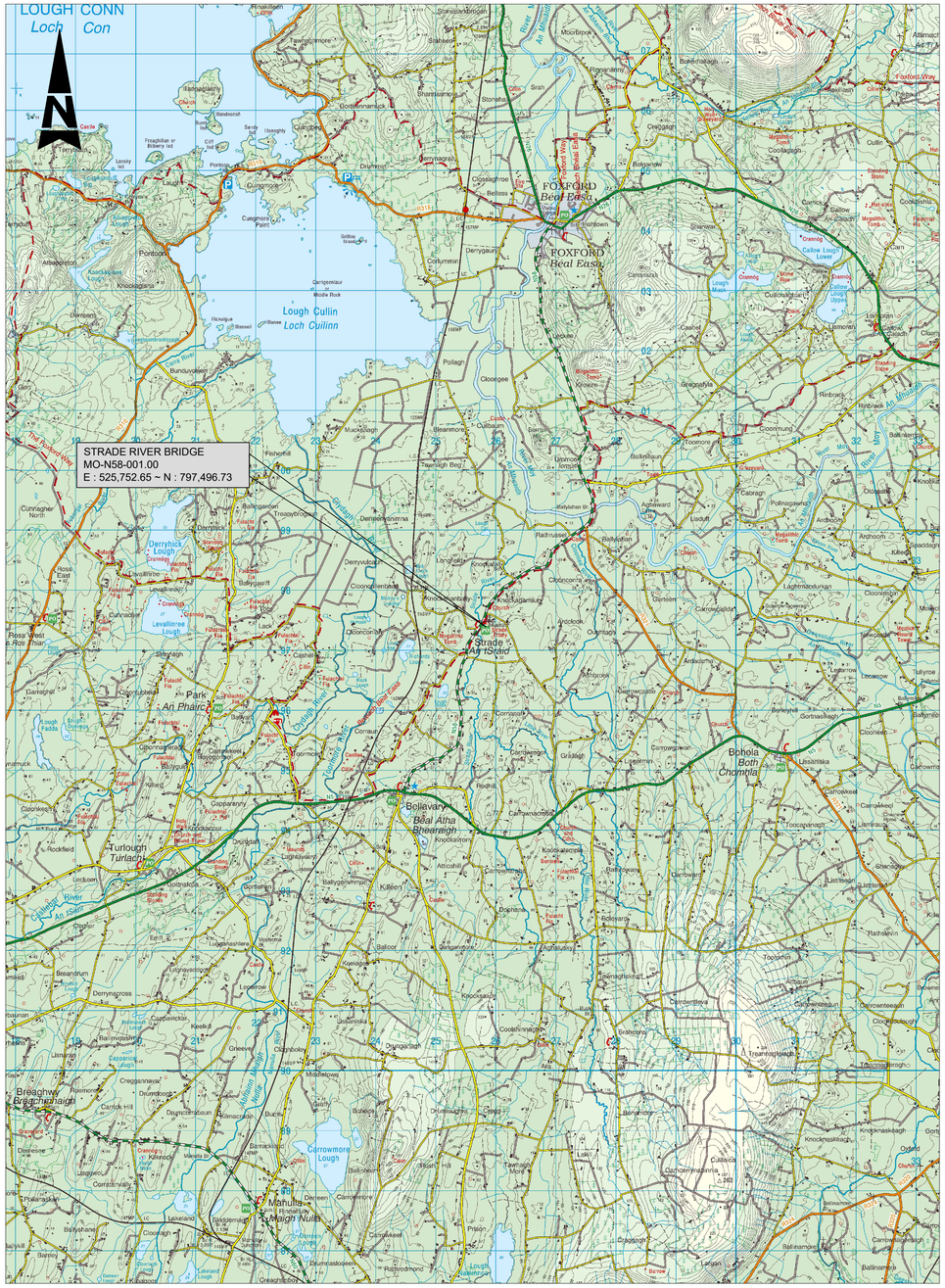
APPENDICES

Appendix A. Drawings



SITE LOCATION MAP

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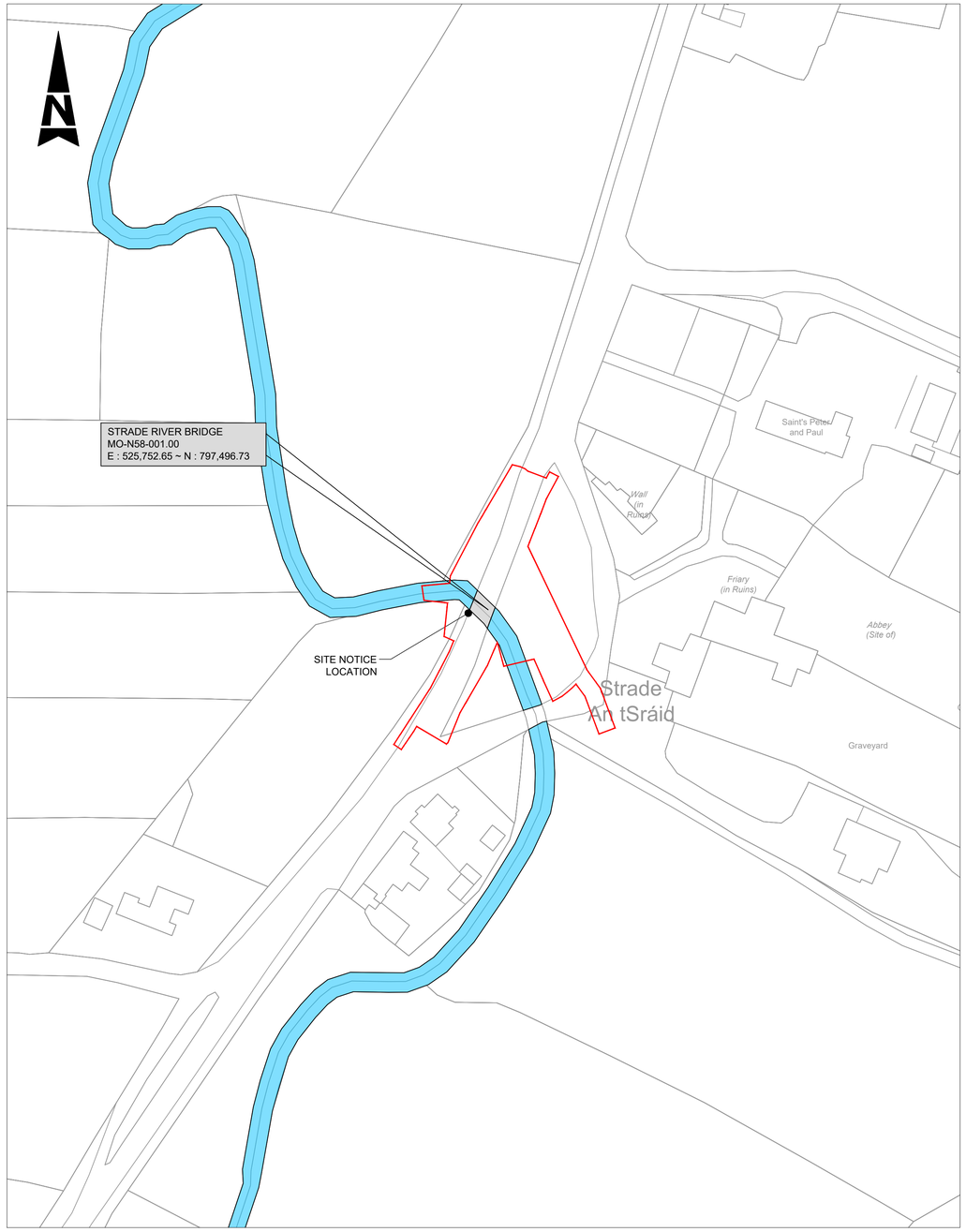
Scale at A3 1:100,000



SITE LOCATION PLAN

Scale at A1 1:1,000
Scale at A3 1:2,000

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE
2. ONLY WRITTEN DIMENSIONS SHALL BE USED. NO DIMENSIONS SHALL BE SCALED FROM THE DRAWINGS
3. ALL LEVELS ARE IN METRES AND ARE TO MALIN HEAD DATUM
4. ALL COORDINATES ARE IN METRES AND ARE TO IRISH TRANSVERSE MERCATOR
5. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE SPECIFICATION

LEGEND :

SITE BOUNDARY

DO NOT SCALE

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Risk Level		
	X	Atkins Base Line - Low Risk
		Atkins Sensitive - Medium Risk
		Atkins Private - High Risk
		Client Critical - Already Marked

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Transport Infrastructure Ireland

Comhairle Contae Mhaigh Eo
Mayo County Council

Rev	Description	By	Date	Chk'd	Rev'd	Auth
P1	ISSUED FOR PLANNING	AGL	06.25	MG	MG	MJ
P0	ISSUED FOR REVIEW	AGL	05.25	MG	MG	MJ

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Tel (+353) 091 786 050
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Client: Comhairle Contae Mhaigh Eo Mayo County Council

Project: STRADE RIVER BRIDGE REHABILITATION WORKS

Purpose: ISSUED FOR PLANNING

Title: SITE LOCATION

Original Scale	Drawn	Checked	Reviewed	Authorised
As Shown	AGL Date 26.06.25	MG Date 26.06.25	MG Date 26.06.25	MJ Date 26.06.25

Status	Drawing Number	Rev
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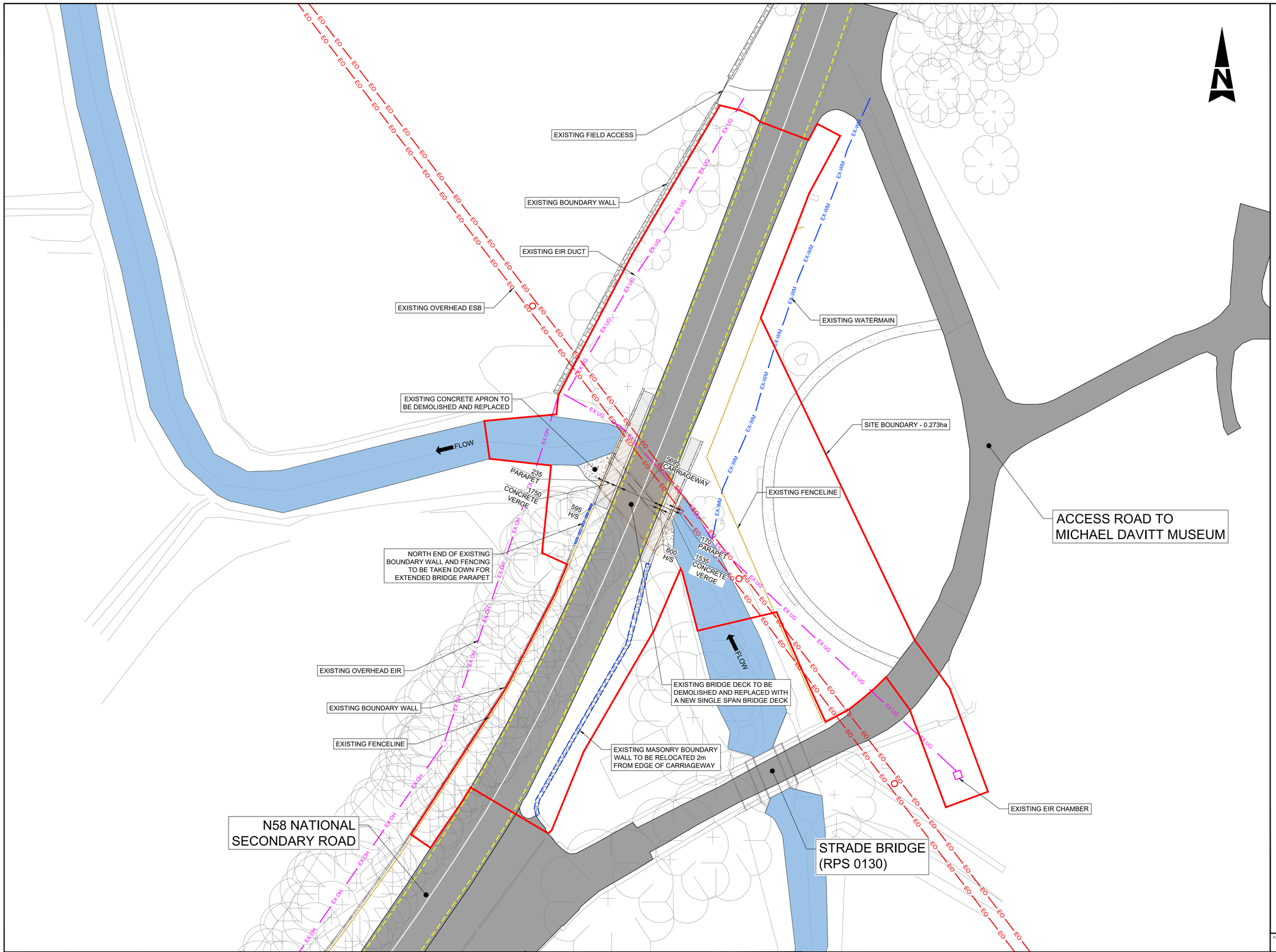

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LEGEND :

- SITE BOUNDARY
- EXISTING CARRIAGEWAY
- EXISTING CONCRETE VERGE
- EXISTING TARMAC PATH
- EXISTING MASONRY WALL TO BE REMOVED
- EXISTING CONCRETE WALL
- EXISTING DECK TO BE DEMOLISHED
- EXISTING FENCE
- EX-WM — EXISTING WATERMAIN
- EX UG — EXISTING UNDERGROUND EIR
- EX OH — EXISTING OVERHEAD EIR
- EO — EXISTING OVERHEAD ESB

Risk Level

X	Atkins Base Line - Low Risk
	Atkins Sensitive - Medium Risk
	Atkins Private - High Risk
	Client Critical - Already Marked

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Rev	Description	By	Date	Chk'd	Rev'd	Auth
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Client: Comhairle Contae Mhaigh Eo Mayo County Council

Project: STRADE RIVER BRIDGE REHABILITATION WORKS

Purpose: ISSUED FOR PLANNING

Title: EXISTING LAYOUT PLAN

Original Scale	Drawn	Checked	Reviewed	Authorised
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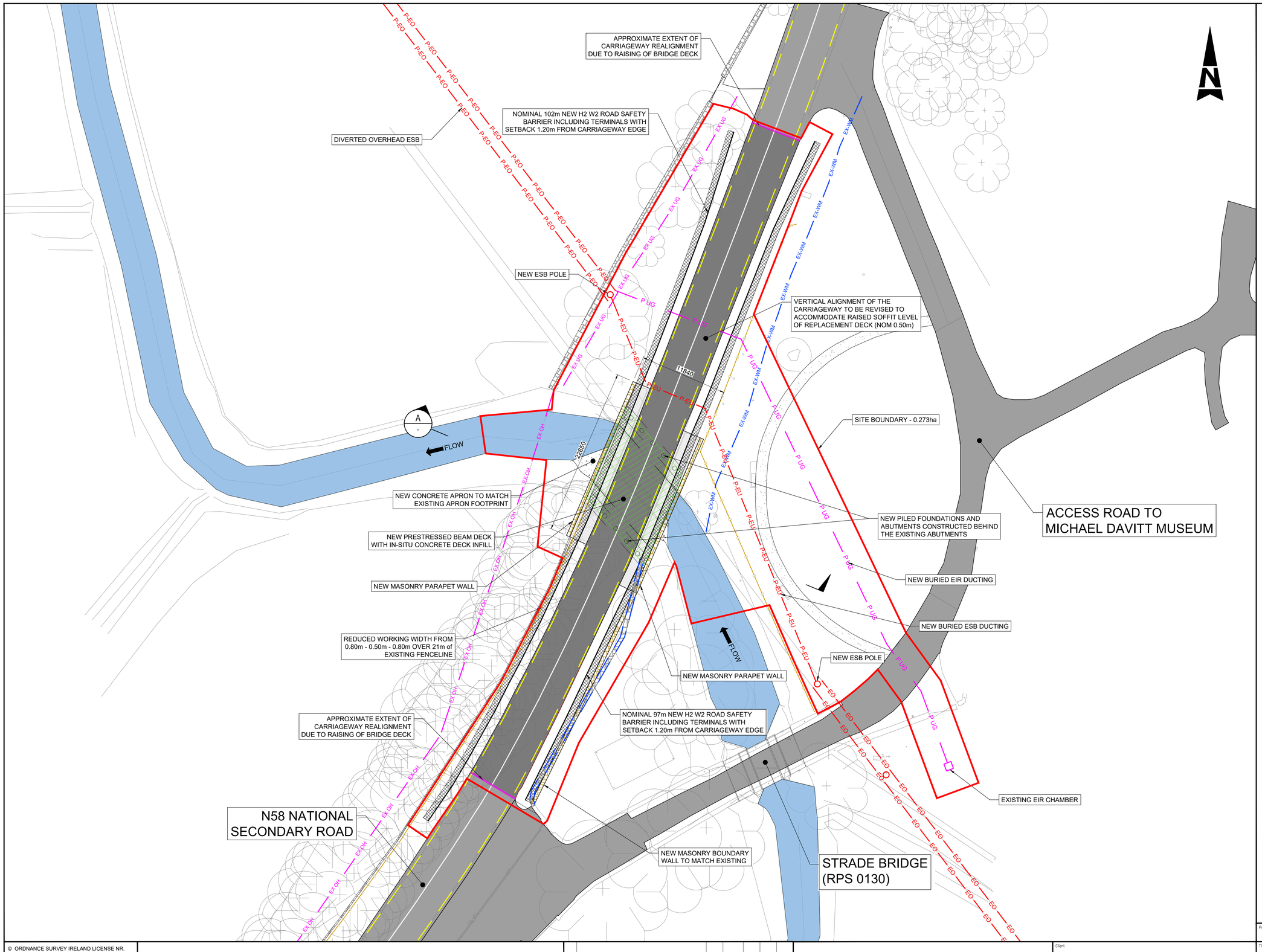

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4. ALL COORDINATES ARE IN METRES AND ARE TO IRISH TRANSVERSE MERCATOR
5. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE SPECIFICATION

LEGEND :

- SITE BOUNDARY
- EXISTING CARRIAGEWAY
- EXISTING CONCRETE VERGE
- EXISTING TARMAC PATH
- EXISTING MASONRY WALL TO BE TAKEN DOWN
- NEW MASONRY WALL
- NEW REPLACEMENT DECK
- EXISTING FENCE
- NEW SURFACING
- NEW ROAD SAFETY BARRIER AND WORKING WIDTH
- EX-WM — EXISTING WATERMAIN
- EX UG — EXISTING UNDERGROUND EIR
- P UG — PROPOSED UNDERGROUND EIR
- EX OH — EXISTING OVERHEAD EIR
- EO — EXISTING OVERHEAD ESB
- P-EO — PROPOSED OVERHEAD ESB
- P-EU — PROPOSED UNDERGROUND ESB

Purpose: ISSUED FOR PLANNING

Title: PROPOSED LAYOUT PLAN

Project: STRADE RIVER BRIDGE REHABILITATION WORKS

Client: Comhairle Contae Mhaigh Eo / Mayo County Council

Original Scale	Drawn	Checked	Reviewed	Authorised
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P0	ISSUED FOR REVIEW	AGL	05.25	MG	MG	MJ

Risk Level		
	X	Atkins Base Line - Low Risk
		Atkins Sensitive - Medium Risk
		Atkins Private - High Risk
		Client Critical - Already Marked

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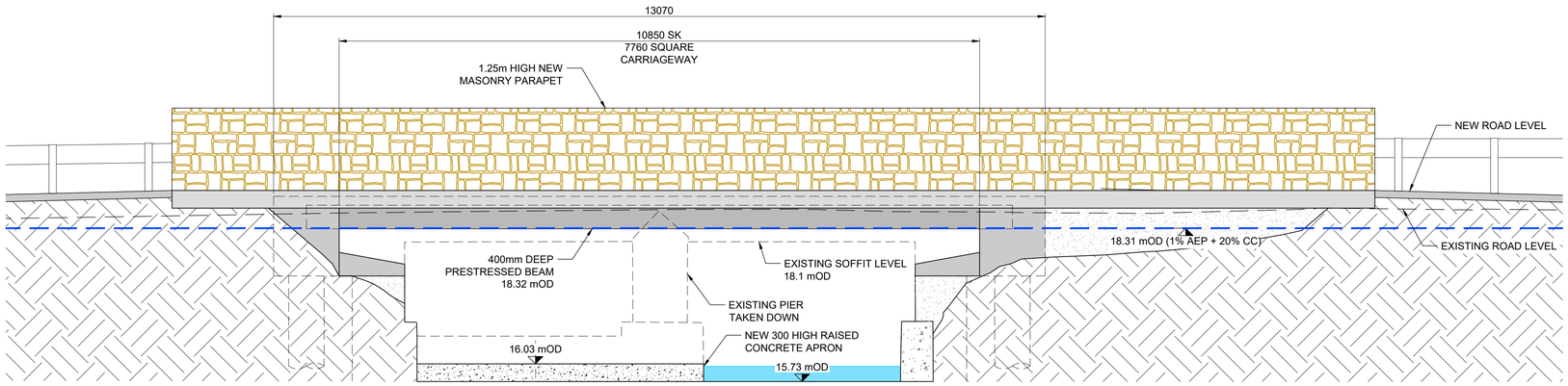

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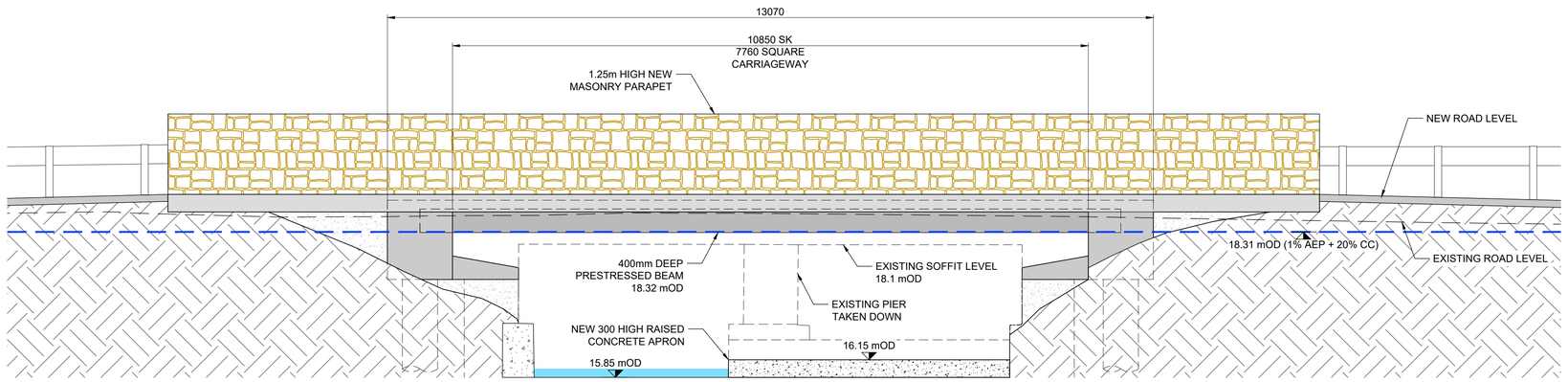

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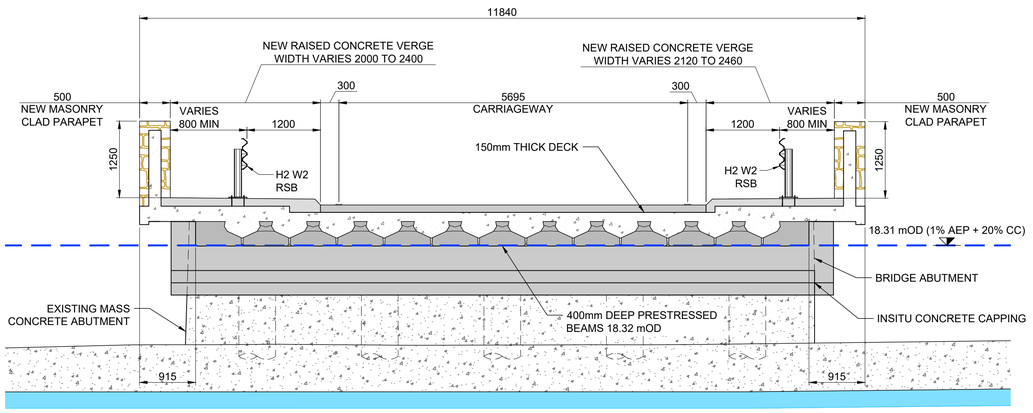

SECTION A
Scale at A1 1:50
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GENERAL NOTES

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2. ONLY WRITTEN DIMENSIONS SHALL BE USED. NO DIMENSIONS SHALL BE SCALED FROM THE DRAWINGS
3. ALL LEVELS ARE IN METRES AND ARE TO MALIN HEAD DATUM
4. ALL COORDINATES ARE IN METRES AND ARE TO IRISH TRANSVERSE MERCATOR
5. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE SPECIFICATION

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	Atkins Sensitive - Medium Risk
	Atkins Private - High Risk
	Client Critical - Already Marked

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Rev	Description	By	Date	Chk'd	Rev'd	Auth
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P0	ISSUED FOR REVIEW	AGL	05.25	MG	MG	MJ

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Client: Comhairle Contae Mhaigh Eo Mayo County Council

Project: STRADE RIVER BRIDGE REHABILITATION WORKS

Purpose: ISSUED FOR PLANNING

Title: PROPOSED ELEVATIONS AND SECTION

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Rev: P1

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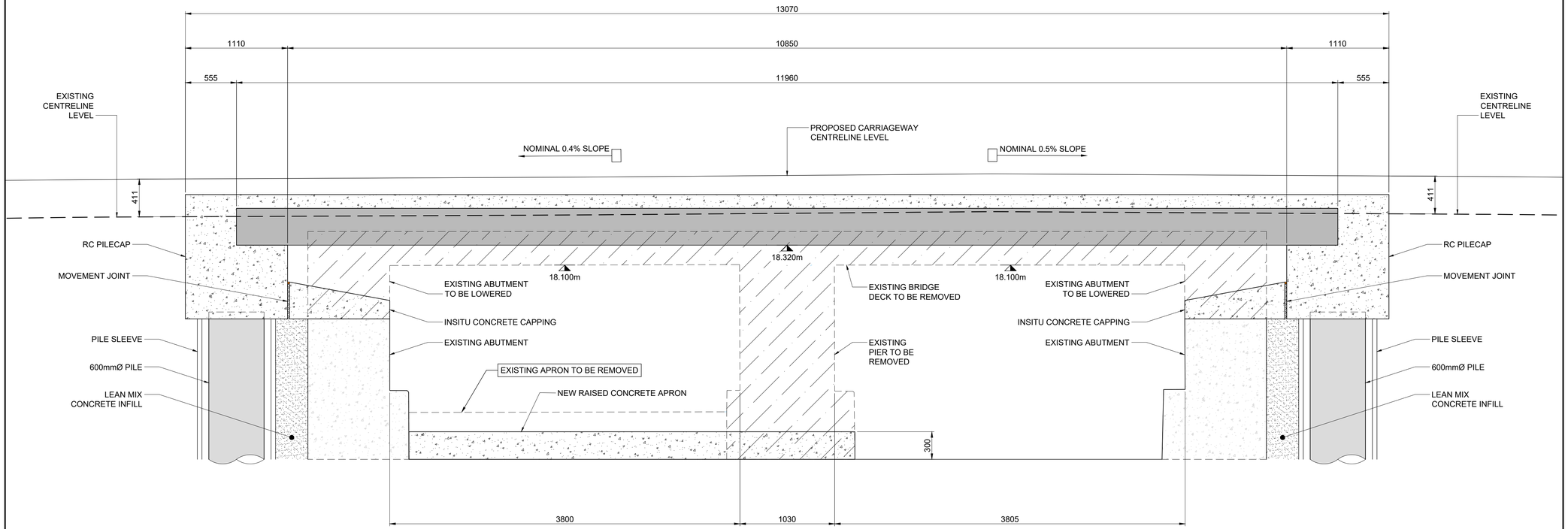

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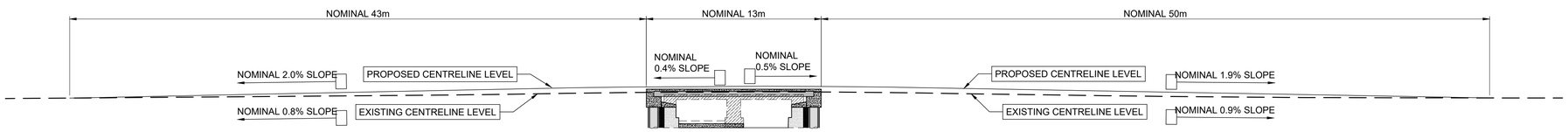

OVERALL LONGITUDINAL SECTION

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GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE
2. ONLY WRITTEN DIMENSIONS SHALL BE USED. NO DIMENSIONS SHALL BE SCALED FROM THE DRAWINGS
3. ALL LEVELS ARE IN METRES AND ARE TO MALIN HEAD DATUM
4. ALL COORDINATES ARE IN METRES AND ARE TO IRISH TRANSVERSE MERCATOR
5. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE SPECIFICATION

Risk Level		
	X	Atkins Base Line - Low Risk
		Atkins Sensitive - Medium Risk
		Atkins Private - High Risk
		Client Critical - Already Marked

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Mayo County Council

Rev	Description	By	Date	Chk'd	Rev'd	Auth
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P0	ISSUED FOR REVIEW	AOS	03.25	MG	MG	MJ

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Client: Comhairle Contae Mhaigh Eo Mayo County Council

Project: STRADE RIVER BRIDGE REHABILITATION WORKS

Purpose: ISSUED FOR PLANNING

Title: PROPOSED LONGITUDINAL SECTION

Original Scale	Drawn	Checked	Reviewed	Authorised
As Shown	AGL Date 26.06.25	MG Date 26.06.25	MG Date 26.06.25	MJ Date 26.06.25

Status	Drawing Number	Rev
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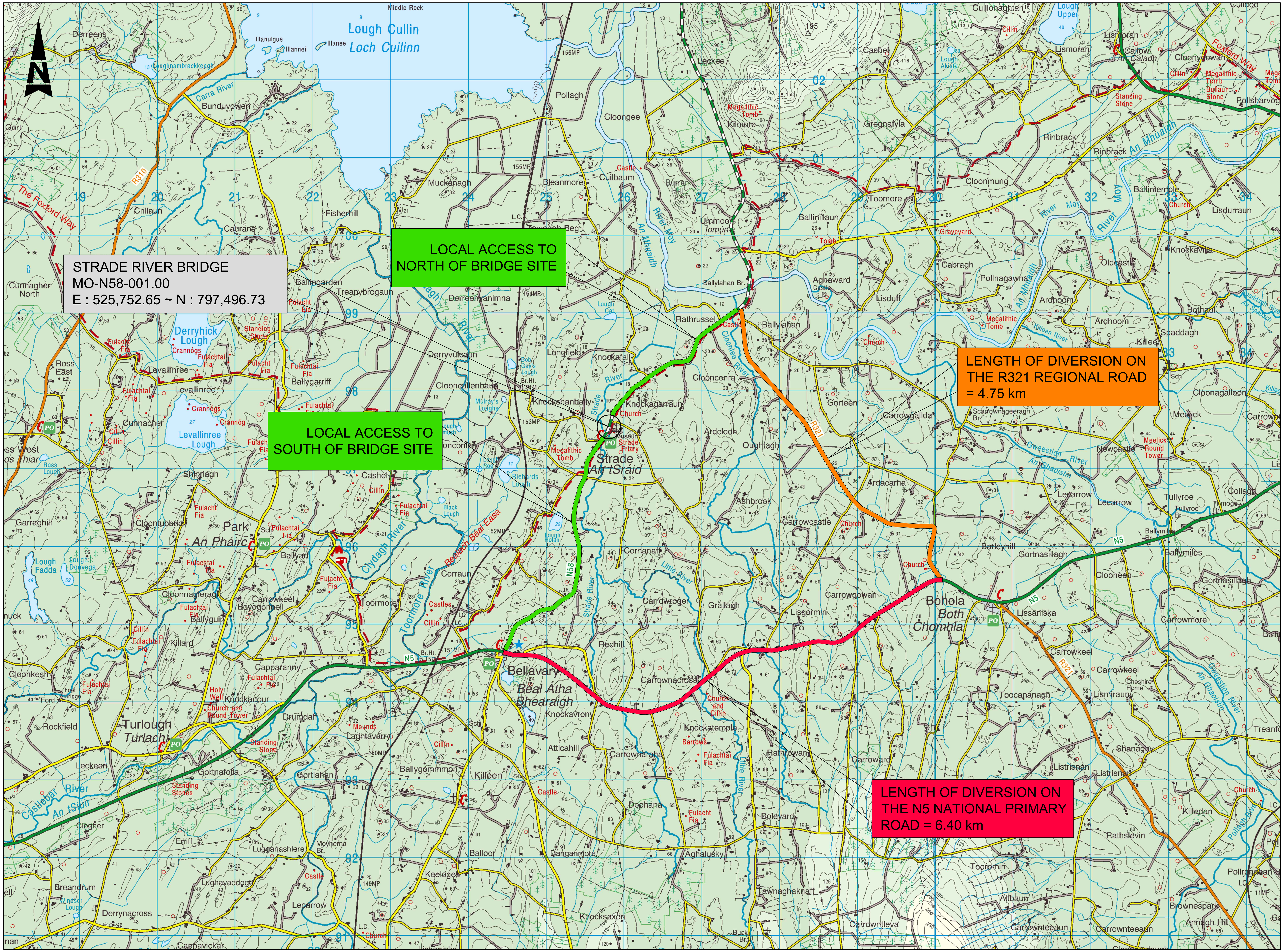

A1

DO NOT SCALE

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE
2. ONLY WRITTEN DIMENSIONS SHALL BE USED. NO DIMENSIONS SHALL BE SCALED FROM THE DRAWINGS
3. ALL LEVELS ARE IN METRES AND ARE TO MALIN HEAD DATUM
4. ALL COORDINATES ARE IN METRES AND ARE TO IRISH TRANSVERSE MERCATOR
5. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE SPECIFICATION

Risk Level		
	X	Atkins Base Line - Low Risk
		Atkins Sensitive - Medium Risk
		Atkins Private - High Risk
		Client Critical - Already Marked

Bonneagar Iompair Éireann
Transport Infrastructure Ireland

Comhairle Contae Mhaigh Eo
Mayo County Council

Rev	Description	By	Date	Chk'd	Rev'd	Auth
P1	ISSUED FOR PLANNING	AOS	06.25	MG	MG	MJ
P0	ISSUED FOR REVIEW	AOS	05.25	MG	MG	MJ

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Client: Comhairle Contae Mhaigh Eo Mayo County Council

Project: STRADE RIVER BRIDGE REHABILITATION WORKS

Purpose: ISSUED FOR PLANNING

Title: PROPOSED ROAD DIVERSION

Original Scale	Drawn	Checked	Reviewed	Authorised
1:25,000	AOS	MG	MG	MJ
	Date 26.06.25	Date 26.06.25	Date 26.06.25	Date 26.06.25

Status	Drawing Number	Rev
A2	0088572-ATK-02-XX-DR-CE-900116	P1

File: 0088572-ATK-02-XX-DR-CE-900116.dwg Date: Jun 26, 2025 - 3:19pm Plotted by: LOPE4308

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