

IN THE MATTER OF AN APPLICATION TO
AN BORD PLEANÁLA

FOR APPROVAL OF THE FOYNES TO LIMERICK ROAD (INCLUDING
ADARE BYPASS) COMPRISING:

- (I) FOYNES TO RATHKEALE PROTECTED ROAD SCHEME,
2019;
- (II) RATHKEALE TO ATTYFLIN MOTORWAY SCHEME, 2019;
- (III) FOYNES SERVICE AREA SCHEME, 2019.

ABP Ref. ABP-306146-19 and ABP-306199-19

ORAL HEARING

Brief of Evidence
Biodiversity and Natura Impact Statement

By Paul Murphy
EirEco Environmental Consultants

February 2021

1. QUALIFICATIONS AND EXPERIENCE

- 1.1 My name is Paul Murphy and I am Director of EirEco Environmental Consultants. I hold a M.Sc. in Environmental Science, am a Chartered Environmentalist (Society for the Environment), a member of the Chartered Institute of Ecology and Environmental Management and a Member of the Institute of Fisheries Management. I have thirty years' experience in both temperate and tropical ecosystems specializing in nature conservation management including all aspects of ecological survey, habitat management and restoration. I have extensive experience in Environmental Impact Assessment [EIA], Appropriate Assessment [AA] and ecological mitigation design for numerous major infrastructural schemes including roads.

2. ROLE IN PROPOSED ROAD DEVELOPMENT

- 2.1 I am the Principal Ecologist for the proposed Foynes to Limerick Road (including Adare Bypass). My brief of evidence relates to the Biodiversity assessment (terrestrial and aquatic Ecology, habitats, flora and fauna) presented in Chapter 7 of the Environmental Impact Assessment Report (EIAR), as well as the Habitats Directive Screening Report and Natura Impact Statement (NIS) prepared for the proposed road development.
- 2.2 While my work on the Biodiversity assessment has covered all aspects of fauna and flora, Dr Tina Aughney, who undertook the Bat survey and assessment for the proposed road development, will present a separate Brief of Evidence in relation to that topic, and John Brophy will present a separate Brief of Evidence in relation to the assessment of impacts on Desmoulins Whorl Snail.
- 2.3 Throughout the entire process for the proposed road development from the Constraints Stage through to the preparation of the EIAR and the NIS, there has been extensive data collection in the form of existing information from documented sources and statutory authorities and field survey undertaken to establish the existing baseline ecological conditions and sensitivities. All receptors of potential ecological value have been surveyed on at least one occasion, and many sites have been re-visited on numerous occasions at different seasons to identify the full suite of associated biota. The bird survey data has benefitted from the input of the Ornithologist Gerry Murphy who has extensive local knowledge of the area and its avifauna over several decades. Consultation with various landowners has been undertaken in relation to various species and records submitted to ensure veracity. There has been on-going consultation with the National Parks and Wildlife Service during the entire process in relation to existing data, the scheme development and to ensure their requirements have been adequately addressed within the selection of the preferred route and the design of the proposed road development. There has also been continuous collaboration and integration across the various disciplines within the project team to ensure the full extent of potential impacts have been identified and described, and that the proposed mitigation in terms of avoidance, reduction or remedy are appropriately designed and detailed.

3. EXECUTIVE SUMMARY

- 3.1 The Biodiversity Chapter of the EIAR and the NIS were compiled in accordance with the relevant national and EU guidelines in relation to the assessment of impacts on Biodiversity as identified in Section 7.2 of the EIAR and Section 1.3 of the NIS. The EIAR and NIS are to be taken as read and is not replicated here. To assist the Board in its consideration of the application and to put the response to objections and submissions in context, some of the key issues pertaining to the Biodiversity assessment as detailed in Chapter 7 of the EIAR and the AA as detailed in the NIS are summarised briefly in the following paragraphs.
- 3.2 The preferred route for the proposed road development was selected following an initial process of identifying significant constraints within the study area, followed by an assessment of alternative route options. This process has been heavily influenced by the dense concentration and distribution of designated conservation areas within the central part of the study area and the avoidance of other non-designated areas of significant biodiversity value. The selected preferred route which is now before the Board has avoided most of the designated areas and other sensitive ecological receptors identified within the study area. Nonetheless, certain linear features (primarily rivers with a north-south orientation) and some sites of ecological value could not be avoided.
- 3.3 Sites of significant biodiversity value within a zone of influence of the proposed road development are termed Key Ecological Receptors (KERs). These are evaluated based on their ecological importance ranging from International to Local Importance (Higher Value). In addition to the sites within the footprint of the proposed road development, consideration was also given to sites outside of the footprint but which may be within the Zone of Influence (ZOI) of the proposed road development, such as ground water dependant sites that may be affected by drawdown or alteration of the groundwater hydrological regime.

A total of 20 separate sites were identified as KERs along the length of the proposed road development. Descriptions of these sites are presented in Section 7.3.6 of the EIAR. A total of four KERs are rated of International Importance. One site was rated of National Importance, one of County Importance and a further fourteen sites were rated as being of Local Importance (Higher Value).

- 3.4 Two of the Internationally important KERs consist of separate elements of the Lower River Shannon cSAC, namely at Churchfield Estuary (KER 2) in the west of the proposed road development, and the River Maigue crossing at Islandea (KER 26) in the east of the proposed road development. The entire Shannon Estuary to the north of the proposed road development is within the cSAC, which is also designated as the River Shannon and River Fergus Estuaries SPA. The cSAC and SPA boundary extends to include the Churchfield Estuary, while the cSAC boundary extends along the River Maigue upstream as far as Adare. The cSAC/SPA boundary at Churchfield is located just over 100m from the nearest point of the proposed road development and will not be directly or indirectly impacted by the proposed development. The proposed road development will entail a crossing of the River Maigue within the cSAC approx. 1.2km downstream of Adare. The crossing is within its estuarine reaches and

- the proposed bridge design will entail a clear-span of the entire river channel and river banks with piers set on the line of the existing flood embankments. The remaining two KERs rated of International Importance are large areas of Alkaline Fen (an Annex I listed habitat) at Ballyellinan (KER 7) and Lismakeery (KER 11) which support populations of the Annex II listed species Desmoulin's Whorl Snail (*Vertigo moulinsiana*). Modifications have been made to the proposed road alignment and design to minimise impacts on both of these sites.
- 3.5 KER 21 at Blossomhill is rated of National Importance as it supports a Limestone lake with an adjacent mosaic of Alkaline Fen and wet grassland. The fen habitat also supports a population of Desmoulin's Whorl Snail. The fen and lake will not be directly impacted by the proposed road, but the wet grassland will be marginally encroached upon by the accommodation access leading to the attenuation pond which has been designed to run as close as possible to the mainline. The impact on this KER will be slight negative if confined to temporary impacts. The design of the route at this location has considered the requirement to avoid any impacts on the hydrology of the site.
- 3.6 KER 5 at Craggs is rated of County Importance and supports a mosaic of alluvial woodland (conforming to Annex I habitat Alluvial Forest) along the Ahacronane River with oak-ash-hazel woodland, wet grassland and marsh. The proposed road development has been modified to avoid impacting on the Alluvial Forest at this site.
- 3.7 The remaining 14 KER's are all rated of Local Importance (Higher Value). The overall impact on these sites is rated as being permanent Moderate negative due to loss of habitat and dissection of the sites. The construction phase will require habitat exclusion zones to protect adjacent habitats some of which are to be retained within the CPO line.
- 3.8 A total of 20 watercourses are crossed by the proposed road development (listed in Table 7.7), many of which are within sites identified as KERs. The crossing of the River Maigue (W19) which is rated of International Importance as it is within the Lower River Shannon cSAC is dealt with in 3.19 below.
- 3.9 The River Deel (W11) is rated of National Importance as it supports good populations of salmonids along with a range of other aquatic species including Otter and Kingfisher. The proposed road development will entail a clear span structure over the River Deel.
- 3.10 The Greanagh River (crossed at two locations W17 and W18), Clonshire River (W16) and Ahacronane River (W5) are all rated of County Importance and are moderate sized watercourses ranging from 2m to 6m in width. These watercourses support populations of Brown Trout along with a range of other fish and aquatic fauna and are rated of County Importance. They will all be crossed with clear span bridge structures retaining the existing channels intact.
- 3.11 The remaining watercourses are all rated of Local Importance (Higher Value) and are heavily modified channels. A number of these minor watercourses will require some realignment to minimise the lengths of culverts. While culverting will result in the loss of habitat, this will constitute at most a moderate negative impact due to their existing artificially modified channels. The sensitively designed realignments for these watercourses and associated landscaping will provide new aquatic habitat in a short

period of time to compensate for the loss of existing channels. Uninterrupted passage of fish will be accommodated on all watercourse crossings and there will be no loss of salmonid spawning habitat.

- 3.12 All watercourses are of importance for the foraging and/or movement of Otter (listed under Annex II of the EU Habitats Directive). No Otter holts have been recorded in the vicinity of any of the proposed watercourse crossing points. However, in any event, unimpeded Otter movement has been accommodated on all watercourse crossing designs and the overall impact on Otter is considered to be imperceptible.
- 3.13 No Kingfisher (listed under Annex I of the EU Birds Directive) nest sites have been recorded in the vicinity of any of the proposed watercourse crossing points. The overall impact on Kingfisher is considered to be imperceptible.
- 3.14 White-clawed Crayfish (also listed under Annex II of the EU Habitats Directive) are associated with alkaline waterbodies and are resultantly widespread in the general study area on account of the underlying geology. They were recorded in the River Deel and in the Doohyle Stream at Graigeen/Ballingarrane (KER 17) and at Kyletaun (KER 19) in 2016. However, an outbreak of Crayfish Plague was recorded on the River Deel in 2017 and this may have eliminated the population entirely from this river as well as potentially along the Doohyle Stream which is a tributary of the Deel. Crayfish plague has also been recorded from the River Maigue over the last two years (Maigue Rivers Trust, 2020). Crayfish plague is a highly infectious disease which can result in total mortality amongst crayfish populations. As per Chapter 7 of the EIAR, there is expected to be no negative residual impact for White-clawed Crayfish or any other aquatic species as a result of the proposed road development subject to the adherence of strict biosecurity protocols as outlined in the NIS and the Environmental Operating Plan (EIAR, Appendix 4.1) to prevent the transfer of infectious material.
- 3.15 A range of mammalian species afforded protection under the Wildlife Acts occur within the study area, including Otter, Badger, Pine Marten, Hedgehog, Irish Stoat, Red Squirrel, Red Fox and Irish Hare in addition to various small mammals and the non-native American Mink. A total of five active badger setts were recorded from within the footprint of the proposed road, or within 50m of the boundary of the CPO line. While these setts will be removed and the proposed road will dissect existing territories, their loss will not affect the continued survival of badgers. Dedicated mammal underpasses with appropriate guide fencing are incorporated into the road design at suitable locations along the entire length of the scheme to accommodate unimpeded movement of badgers and other mammals across their territories and avoid traffic collision on the proposed road. With the implementation of the prescribed mitigation measures, the impact of the road construction is likely to be reduced to minor negative for all mammals as per Chapter 7 of the EIAR.
- 3.16 The Barn Owl is a Red-listed species under the Birds of Conservation Concern Ireland (BoCCI), which is an assessment of the conservation status of all regularly occurring birds on the island of Ireland prepared by Birdwatch Ireland. The Barn Owl has suffered high mortality on a number of recent road scheme developments in the southwest of the country. In view of this, John Lusby of John Lusby Consulting (a recognised expert on Barn Owl who has undertaken extensive research into the effects of roads on Barn Owls on behalf of Transport Infrastructure Ireland) was commissioned

to carry out an assessment of this proposed road development on the species and detail specific mitigation measures to minimise the risks of mortality or other impacts during both construction and operation of the scheme. The report is presented in Appendix 7.3 in Volume 4A of the EIAR. The risk of owl mortality from traffic collisions is highest in juvenile birds which have not developed the behavioural awareness required to avoid collisions and are attracted to hunt along the grassed road margins. Mitigation measures prescribed for Barn Owl are based on the results of the detailed TII survey work undertaken and constitute current best practice. This road scheme will be the first to implement these measures which are aimed at discouraging owls from flying and foraging adjacent to the road and serve to deflect the flight of birds which cross the road above the height of vehicles. While a certain level of Barn Owl mortality cannot however be ruled out as a result of the proposed road development, this will be minimised by the implementation of the appropriate landscape design along the proposed road development, which will reduce the mortality rates significantly below those recorded on other road schemes in the south west of the country. On-going management of the route will ensure that the landscape design develops appropriately to ensure its effectiveness as mitigation.

- 3.17 Whooper Swan is listed on Annex I to the Birds Directive and the BoCCI Amber List and is one of the Qualifying Interests of the River Shannon and River Fergus Estuaries SPA. A series of winter counts from known foraging sites in the vicinity of the proposed road development was undertaken by Gerry Murphy (Chairperson of the Irish Whooper Swan Study Group and has been monitoring Whooper Swan in the Limerick area for many decades) over the period December 2016 to March 2017. The nearest foraging sites for wintering Whooper Swan to the proposed road development is at Cloonanna c. 3km to the north of the Mague crossing (where 19 birds were recorded in February 2017) and at Ardnanean on the River Deel callows, approximately 3km southwest of Rathkeale (where 17 birds were recorded in both January and February 2017). These sites are considered to be well beyond any potential for disturbance during either construction or operation.
- 3.18 A series of wintering bird surveys were undertaken in wetland sites in the vicinity of the proposed road development during the winter 2016-2017 in accordance with TII methodology by Gerry Murphy. The only site in the vicinity of the proposed road development which supports significant populations of wintering water-birds is the Churchfield Estuary (KER2) which is part of the Lower River Shannon cSAC and the River Shannon and River Fergus Estuaries SPA. A maximum count of 2,150 birds was recorded in December 2016, with the most abundant species being Golden Plover, Dunlin, Lapwing, Wigeon, Teal and Black-headed Gull. The construction works in the vicinity of Churchfield Estuary (KER 2) within the Lower River Shannon cSAC and River Shannon and Fergus Estuaries SPA presents a low risk of giving rise to impacts on wintering Water-birds due to the proximity of the site to the road development which is c100m at its nearest point, a small embayment at the western side of the estuary. In view of the extent of estuarine habitat available to wintering water birds in the area, this is expected to result in only a temporary and localised level of disturbance which will not adversely affect the wintering bird populations utilising the Churchfield Estuary.
- 3.19 The most significant ecological receptor along the length of the proposed road development is the Lower River Shannon cSAC which will be crossed directly at the

River Mague at Islandea (KER 26). The river at this point is tidal and undergoes a flood range of several meters. It has large flood embankments on both banks which are set back approximately 20m from the river edge. The proposed bridge design will entail a structure with piers set into the flood embankments providing a clear-span between the eastern and western flood embankments, thereby retaining the riverbanks intact. The construction will require temporary supports inside the flood embankment along with platforms to support the cranes required to lift the pre-cast beams into place. These elements will be contained within a temporary sheet piling wall erected above the riverbanks which is set back to avoid disturbance to the riverbanks within the middle and lower tidal zones. The proposed bridge design and construction sequence are shown in Figures 4.72 to 4.75 of Volume 3 of the EIAR (also included in Appendix B of this Brief). The construction methodology has been designed to avoid any direct impacts on the qualifying interests of the SAC and to ensure that all risks associated with the construction phase on species or habitats within the SAC are adequately mitigated to reduce potential impacts to a negligible level.

- 3.20 The NIS prepared for the proposed road development has demonstrated that, in the absence of mitigation measures, the proposed development would have the potential to have significant impacts on the qualifying interests of four European Sites, namely: the Lower River Shannon cSAC, the River Shannon and River Fergus Estuaries SPA, the Curraghchase Woods SAC and the Askeaton Fen Complex SAC, in view of those sites' Conservation Objectives.
- 3.21 The NIS has assessed the potential effects on these sites, prescribed appropriate mitigation measures to eliminate or minimise such effects and assessed the potential for in-combination effects with other plans or projects. The mitigation measures which have been identified, and which are included in the Schedule of Commitments, will ensure that the proposed road development will not, by itself or in combination with other plans or projects, adversely affect the integrity of any of these European Sites. This assessment has been undertaken on the basis of the best scientific knowledge in the field and adheres to the Precautionary Principle. I confirm that no reasonable scientific doubt remains as to the conclusion reached.
- 3.22 It is the recommendation of the authors of the NIS that, when carrying out its Appropriate Assessment, An Bord Pleanála as the competent authority, may determine that, given the full and proper implementation of the mitigation measures prescribed therein, the proposed development will not adversely affect the integrity of any European Site, either individually or in combination with other plans or projects.

4. RESPONSES TO SUBMISSIONS

4.1 Overview

4.1.1 A total of eleven submissions were received by An Bord Pleanála in relation to biodiversity issues associated with the proposed road development. The following submissions / objections raised points in relation to biodiversity: ENV- 4, 5, 15, and SCH-3, 30, 48,89 and FI-2, FI-4, FI-5 and FI-8.

4.1.2 The main topics raised in the submissions are:

- Removal of trees and the use of native species;
- Protection of the River Deel;
- Habitat Fragmentation;
- Lamprey, European Eel and Mitigation Measures within the NIS;
- Alternative route south of Adare;
- Excessive land take at Lismakeery;
- Route Selection at Amogan Beg;
- Areas of landtake and habitat destruction;
- Occurrence of Japanese Knotweed along the proposed route;
- And the reputed occurrence of Freshwater Pearl Mussel on the River Deel.

4.1.3 Responses to the issues raised are provided below.

4.2 Removal of Trees and the Use of Native Species

Issues Raised in Submissions / Objections

4.2.1 Submission / objection ENV-4 recommends that, with the current concerns regarding biodiversity and the richness of the limestone area being removed, provision should be made for areas where wild grasses, flowers and undergrowth can grow. The submission also requests that native Irish trees should predominate, and while native wild vegetation are likely to recolonise fallow ground, if wildflower seed is used it should be native.

4.2.2 Submission / objection ENV-5 expresses concerns that photomontages show that vast swathes of land will be laid bare, trees and their undergrowth will be removed to be replaced by a post and rail fence at a number of listed areas. Effect of such actions will be devastating on wildlife and aesthetically uninteresting to the human eye.

4.2.3 Submission / objection ENV-5 also contains recommendations as to native vegetation to be used and that fallow areas should be left to allow wild vegetation to recolonise at will.

Response

4.2.4 In response to the issues raised in submission / objection no's ENV-4 and ENV-5 regarding native vegetation, the landscape design for the proposed road development focuses almost exclusively on the use of native species. The landscape proposals (as shown in Figures 11.1 to 11.23 of the EIAR) aim to create a diverse range of ecological

habitat types along and within the land-take line which will serve to off-set habitat loss associated with the construction of the proposed road development. Natural regeneration is prescribed for areas of cut in limestone at Mulderricksfield. Where screening and scrub planting is not a requirement, semi-natural grasslands are to be allowed to establish using bare-earth regeneration techniques or green hay strewing (gathering seed from areas adjacent to the road development).

4.2.5 In response to submission / objection ENV-5, the route for the proposed road development has been carefully selected and modified to minimise the impacts on features of biodiversity value. However, it is impossible to avoid all features of ecological value, in particular treelines and hedgerows, which are ubiquitous in the landscape. While such features will be severed, the extent of loss is minimised to that required to construct the proposed road development and associated works, and their loss has been assessed as constituting a permanent slight negative impact. The landscape design for the proposed road development which has been developed collaboratively between the specialists, aims to reconnect the linear network of these important ecological corridors and over time will also visually compensate for their loss. See section 4 of Mark Boyle's Brief of Evidence for further information on the planting proposals in respect of landscape and visual impact.

4.2.6 The overall extent of the loss of habitats as a result of the proposed development (as assessed in Section 7.4 of the EIAR) is considered to constitute a permanent moderate negative impact. However, the provision of sensitive landscaping and the various measures facilitating faunal movement will serve to compensate for habitat loss and avoid the effects of habitat fragmentation, thereby offsetting the severity of these impacts.

4.3 Protection of the River Deel

Issues Raised in Submissions / Objections

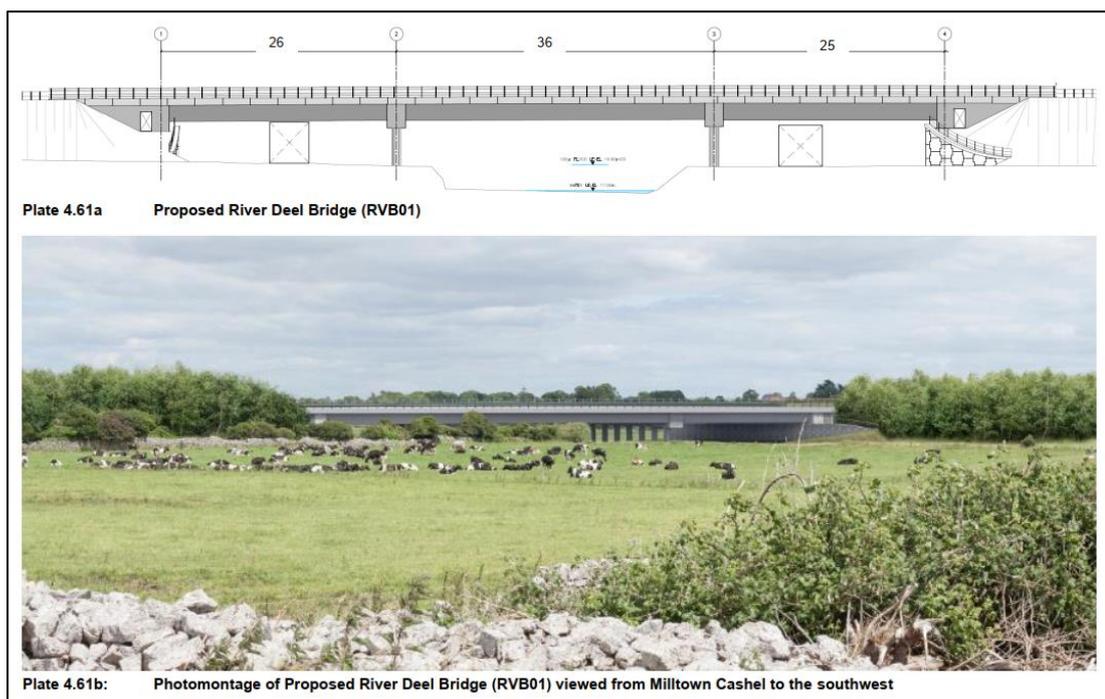
4.3.1 Submission / objection SCH-3 raises a request to ensure that safe access is maintained at the proposed bridge, to access the existing right of way to the River Deel for fishing and / or shooting.

4.3.2 The submission also requests that the Salmon and Trout spawning grounds flowing into the River Deel are protected.

Response

4.3.3 The bridge design for the River Deel is a clear-span structure which will retain the river banks intact and allow unimpeded access for anglers along both banks of the river with a minimum clearance of 4.5m under the structure.

4.3.4 All salmonid river crossings will entail clear-span structures which will avoid any alteration of the instream channels. A comprehensive suite of measures is prescribed in section 7.5.3 of the EIAR which is aimed at avoiding any risks to water quality during either the construction or operational stages of the road. Where stream re-alignments are required on some of the smaller watercourses, the designs will incorporate sinuosity and varied flow regimes with substrate composition to reconstruct a natural river system in both plan and profile. Where the gradient allows, this will provide suitable spawning habitat for salmonids.



4.4 Lamprey, European Eel and Mitigation Measures within the NIS Issues Raised in Submissions / Objections

- 4.4.1 Submission / Objection ENV-15 from IFI comments that the EIAR and NIS are unclear as to whether Sea Lamprey occur in the River Maigue. The submission reports that they have been recently determined as present in the river in the vicinity of Adare Manor and on this basis should have been screened into the NIS. Submission / objection ENV-15 also notes the operation of a monitoring station at Adare for the catadromous European Eel, which is classified as critically endangered by the International Union for the Conservation of Nature. Submission FI-4 also raised concerns in relation to sea lamprey, high-lighting the occurrence of three different species in Ireland and their importance both in riverine ecology and as relic species of agnathan (jawless) stage in vertebrate evolution.
- 4.4.2 The IFI submission / objection (ENV-15) recommends that pre-works water quality monitoring is extended to a 12-month period to capture any seasonal variation in parameters.
- 4.4.3 IFI detail specific requirements in the submission in relation to both watercourse crossing design and measures required during construction to avoid any impacts on aquatic species, habitat connectivity or water quality.
- 4.4.4 IFI stipulate that the timing for any instream works is confined to the Period July to September inclusive.
- 4.4.5 Finally, IFI require to be consulted by the appointed contractor in relation to the final Construction Environmental Management Plan, Environmental Operating Plan and specific works method statements for watercourse crossings.

Response

- 4.4.6 Sea Lamprey, like the closely related River Lamprey, are anadromous, spending their adult life in the marine environment and returning to freshwater in the early summer to spawn. Brook Lamprey spend their entire lifecycle in freshwater. The upstream movement of both Lamprey species on the Mague system is potentially impeded by the presence of a series of weirs, thus likely confining their spawning to the lower reaches of the river. The NIS has presented an assessment and mitigation proposals in relation to River Lamprey, and the results of that assessment equally apply to the Sea Lamprey. Page 63 of the NIS states: *'The proposed bridge over the River Mague and all other watercourse crossings will not, however, alter existing flow regimes in any way nor otherwise result in any barrier or impediment to upstream or downstream migration of salmon or lamprey species during either construction or operation.'* The main variable between the two species relates to the marginally earlier movement of River Lamprey upstream (March and April) while the Sea Lamprey typically move upstream in May to June.
- 4.4.7 Sea Lamprey were included in the assessment of the NIS as outlined in the Further Information Response document submitted to An Bord Pleanála on 30th September 2020. This response clarified that Sea Lamprey would now be included in the evaluation of the potential significant effects in Section 4 of the NIS. It is confirmed that the mitigation measures outlined in Section 5 of the NIS are sufficient for the protection of Sea Lamprey and while the title of section 5.2.2 of the NIS should now be updated to read "Sea Lamprey (*Petromyzon marinus*) [1095], River Lamprey (*Lampetra fluviatilis*) [1099] and Atlantic Salmon (*Salmo salar*) [1106]", there are no other updates required to the text thereunder. The Further Information Response reaffirmed the conclusions presented within the NIS regarding the Annex II species (Section 6.2) following the implementation of mitigation measures. The conclusion has not changed and remains as stated in the NIS.
- 4.4.8 The European Eel has undergone a dramatic decline in population in recent decades prompting its classification as critically endangered. Unlike Salmon and Lamprey species, the Eel is not however afforded protection under the EU Habitats Directive. The passage of eels (either as silver eels returning to the sea or as elvers ascending the river) will not be impeded on the Mague or any other river system where they occur. The vulnerability of eels on passage through the works area is highlighted within the Sections 7.4 .7 and 7.4.8.1 of the EIAR and rated comparable with both Salmon and Lamprey. The mitigation for all species is similar and aimed at avoiding any instream impacts (and thus effects on movement) and ensuring no deterioration in water quality during construction or operation. Eel movement occurs primarily at night and so the species would be considered less vulnerable to disturbance effects from construction activity which will be primarily confined to daylight hours. As noted on page 81 of the NIS: *'Neither temporary nor permanent lighting will be provided at the Mague Bridge and there will be no impact on the movements of these nocturnal species.'*
- 4.4.9 The recommendation in relation to extending pre-works water quality monitoring to a 12-month period, in order to capture any seasonal variation in parameters, has been considered and has been responded to as part of the Further Information Response submitted to An Bord Pleanála on the 30th September 2020. The response outlined

that, although Section 6.8.2 of the Environmental Operating Plan (Appendix 4.1 of the EIAR) currently includes pre-construction water quality monitoring for a minimum of six months, on a monthly basis prior to construction to establish baseline conditions for a number of receiving watercourses, this monitoring period will be extended to provide 12 months of monthly samples prior to construction to account for seasonal variations. Accordingly, it is confirmed that the following text will be added to the Schedule of Commitments:

“Water quality monitoring in the receiving watercourses listed in section 6.8.2 of the Environmental Operating Plan (Appendix 4.1 of the EIAR) shall entail 12 no. monthly samples to be taken prior to construction to establish baseline conditions. This testing shall include (but not be limited to) those parameters listed in Section 6.8.2 of the abovementioned plan.”

- 4.4.10 A number of measures are prescribed in the submission / objection in relation to both watercourse crossing design and measures required during construction to avoid any impacts on aquatic species, habitat connectivity or water quality. The mitigation measures already outlined within Section 7.5 of the EIAR and Section 5.2 of NIS for the proposed road development, have been adopted in accordance with the IFI Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (2016) and the Biosecurity Protocol for Field Survey Work (2010). The list of measures proposed by IFI have been reviewed and any additional measures have been incorporated into the Schedule of Commitments to ensure they are adhered to.
- 4.4.11 The timing of any instream works being confined to the period July to September inclusive conforms to the commitment given in Section 7.5.3 of the EIAR (unless otherwise agreed with IFI).
- 4.4.12 It is acknowledged that IFI require to be consulted by the appointed contractor in relation to the final CEMP, EOP and specific works method statements for watercourse crossings and it is confirmed that these measures have been incorporated in the Schedule of Commitments.
- 4.4.13 In a further submission made by IFI (submission FI-5), they have indicated that they are satisfied in relation to the Applicant's response relating to water quality monitoring and sea lamprey, and have no further comment on the application as submitted.

4.5 Habitat Fragmentation

Issues Raised in the Submissions / Objections

- 4.5.1 Submission / objection SCH-30 refers to Ch. 7 Biodiversity and suggests that habitat fragmentation should be comprehensively assessed throughout the length of the road and feed into the design elements.
- 4.5.2 Submission / objection SCH-30 also refers to Lesser Horseshoe Bats and argues that measures should not be conditional and should be integrated into the overall design of the scheme. The submission also claims that underpasses should be more frequent and designed into the proposed road development.

Response

- 4.5.3 The objective of avoiding habitat fragmentation effects arising from the proposed road development is one of the main priorities in the mitigation detailed in Section 7.5 of the EIAR Mitigation and Monitoring Measures for Biodiversity. During the operational phase, the greatest potential impact to fauna relates to the fragmentation effect of the road with a significant risk of mortality from traffic collision for any animals attempting to cross the carriageway. The design of the scheme has aimed to allow for the movement of wildlife across the proposed road using either dedicated culverts, farm underpasses or by the provision of clear-span structures along the larger watercourses which retain riverbanks intact.
- 4.5.4 Smaller watercourses that will be culverted will have either mammal ledges or adjoining mammal culverts which will facilitate the continued movement of otter and other mammal, while dedicated mammal culverts are provided at suitable locations along the entire scheme. All these facilities will have appropriate landscaping to increase their attractiveness and tie-in with existing linear (hedgerows and treelines) or other habitat features.
- 4.5.5 The locations recommended for mammal passage are listed in Tables 7.12a to 7.12d and presented on Figures 7.25 to 7.47 (Volume 3), which also details key areas of habitat in close proximity to the proposed road development which will require protection during construction.
- 4.5.6 The issue raised regarding Lesser Horseshoe Bat mitigation is comprehensively addressed by Dr Tina Aughney in her Brief of Evidence on Bats.

4.6 Alternative Route South of Adare

Issues Raised in Submissions / Objections

- 4.6.1 Submission / objection SCH-30 suggests that the previous alternative of a bypass south of Adare outside the SAC has not been assessed as part of the NIS and it is therefore deficient.

Response

- 4.6.2 The option of a route to the south of Adare (and therefore outside of the Lower River Shannon cSAC) was considered as Route Corridor K in Stage 1 of the route selection process (Section 3.7.1 of the EIAR). This option, which followed the route of the 2010 proposal for a bypass of Adare, was examined and discounted from further consideration for a number of reasons including:
- An additional length of over 2.5km of road compared to the northern bypass options around Adare now under consideration with broad route corridor J;
 - Increased construction costs;
 - Longer journey times; and
 - Higher carbon emissions.
- 4.6.3 While a southern bypass of Adare would avoid crossing the River Maigue where it falls within the Lower River Shannon cSAC, it would entail a crossing of the Maigue in its freshwater reaches. In view of the potential for both salmon and lamprey spawning

habitat in these reaches, the impacts of a bridge at this location, albeit outside of the cSAC, could have significant effects on these qualifying interest species with consequences for the conservation objectives for these species within the cSAC. The freshwater reaches of the River Maigue in the vicinity of the southern Adare option are likely to support ex-situ habitat for Atlantic salmon, Lamprey species and otter, all conservation interests for the cSAC. The proposal now before the Board is based on a suitable design including the provision of a clear-spanning bridge of the river and its banks will not adversely affect the cSAC or any of its qualifying interest species or habitats.

4.7 Excessive Land Take at Lismakeery

Issues Raised in Submissions / Objections

- 4.7.1 Submission / objection SCH-48 argues that habitat replacement and land take is excessive, referring to the proposed acquisition of fen habitat at Lismakeery.

Response

- 4.7.2 This issue is comprehensively addressed by John Brophy in his Brief of Evidence on the Vertigo Snail.

4.8 Route Selection at Amogan Beg

Issues raised in Submissions / Objections

- 4.8.1 Submission / objection SCH-89 claims that the section of the preferred route option at Amogan Beg is not consistent in relation to the impact on the environment. The submission claims that the route selection process was flawed and that "*the corridor options assessment tables are completely falsified*". Included with his submission is a copy of an Ecological Survey prepared by Donnacha O'Cathain on the Foynes to Limerick Route Corridor at Blossomhill and Clogh Rathkeale dated 23rd May 2017, which provides an assessment by Mr O'Cathain of the ecological issues for the three route options at Blossomhill culminating in a preference for the southern blue route.
- 4.8.2 In an email dated 28th May 2017 from Mr Madden to NRDO, which is included within submission SCH- 89, he suggests that insufficient consideration was given in the Route Selection Report to the occurrence of Fen habitat in the vicinity of Blossom Hill and Doohyle Loughs. Mr Madden also cites the attention given to fen habitat at Dromore and Bleach Lough in the RSR.

Response

- 4.8.3 The report prepared by Donnacha O'Cathain has been reviewed. It specifically addressed the ecological features affected by the proposed route corridors of the Foynes to Limerick road at Blossomhill, Clogh West and Amogan Beg at Rathkeale/Croagh Co. Limerick. There are two newly considered options (pink and green) in addition to a previously selected (blue) option from north to south respectively.

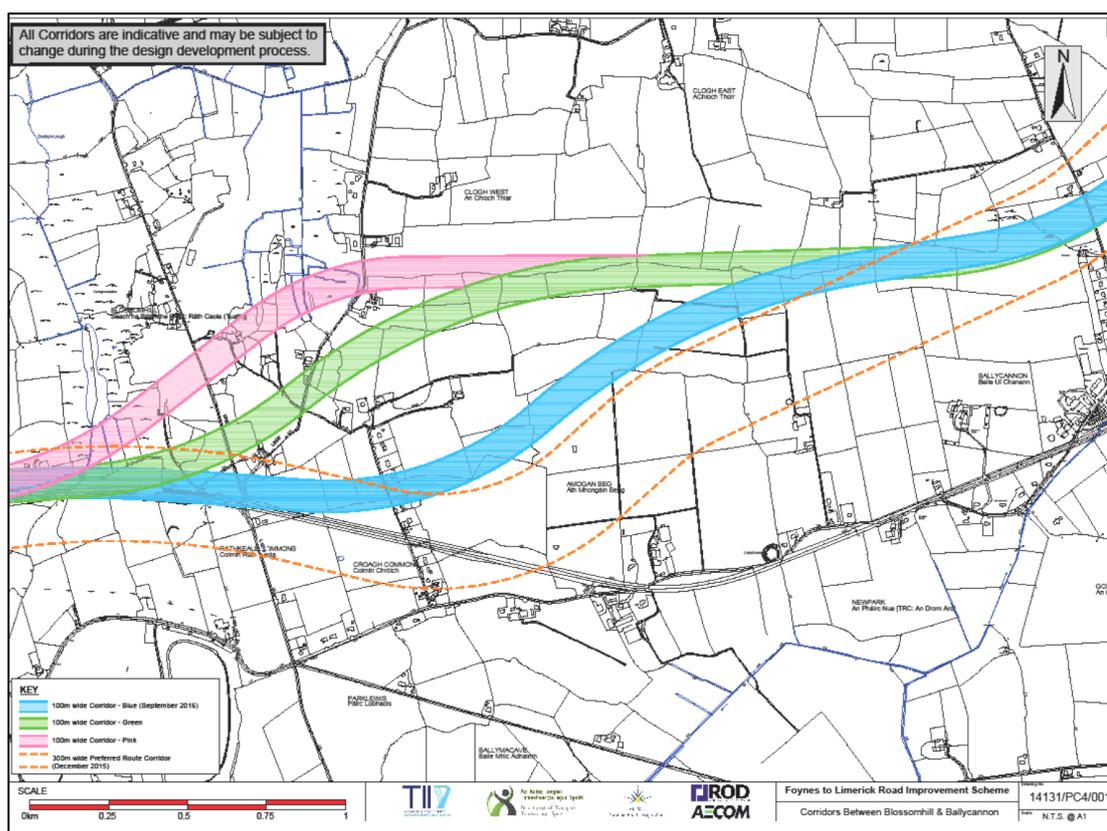


Plate 1

- 4.8.4 The habitats at Blossomhill (KER 21) within the study area were evaluated as being of National Importance and considered of ecological importance in the context of the wider landscape which consists largely of intensively managed agricultural grassland. The O’Cathain report concluded that the blue option is preferable, followed by the green with the pink option least preferable. This conforms to the result of the assessment by EirEco Environmental Consultants in relation to the three route options considered at this location under the criteria of Ecology.
- 4.8.5 While the blue option was preferred under the heading of Ecology, it emerged as being the least favourite under the overall heading of Environment once assessed under all eleven criteria. The green option was selected as the preferred option on the basis of the general Environmental assessment and overall assessment. Seamus MacGearailt has provided further responses to this submission under **Issue 3(e): Route Selection in Blossomhill Area** of his Engineering Brief of Evidence (Part B), while the selection of the preferred route at Blossomhill is outlined in Section 3.9.3 of Chapter 3 Alternatives Considered of the EIAR.
- 4.8.6 The attention given to fen habitat at Dromore and Bleach Lough in the RSR is explained by the fact that these loughs are within a proposed Natural Heritage Area and therefore constitute sites of National Importance. Within Appendix 1 of the Ecology Report submitted as part of the Route Selection Report, site 68 covers Dohyle Lake and fen extending south to include Blossomhill Lake. This site was also assigned a National (B) importance rating on account of the habitat present including Alkaline lakes and Fen.

4.8.7 Full consideration of the occurrence and significance of fen habitat has also been given in the route options assessment for the variation at Amogan Beg. During this assessment, the preferred route option from the ecological perspective was the Blue route which avoided the site entirely, with second preference been given to the Green route (skirting the southern boundary of the site). The Pink route was rated as the least preferred option on account of its potential impact on the fen and other habitats in the vicinity of Blossomhill. The final route selection assessment at this location however confirmed the green route to be the preferred option overall when considering the full suite of factors.

4.9 Areas of Landtake and Habitat Destruction

Issue Raised in Submissions / Objections

4.9.1 Submission Ref FI-2 has raised concerns in relation to the areas of landtake and habitat loss along the length of the proposed road development.

Response

4.9.2 A total of 36.67km of hedgerow and treeline will be removed as part of the proposed development, but a total of 45.18km of hedgerow and treeline will be planted. In addition 181ha will be planted (as detailed on Drawings 11.1 to 11.24 of the EIAR) which will comprise screen planting (37.2 ha) and specific landscape measures (85.4 ha) to re-connect severed habitats, provide compensatory habitat including woodland around attenuation ponds (21.1 ha) and as part of the specific mitigation planting for Barn Owls (37.3 ha).

4.9.3 The Further Information document submitted to An Bord Pleanála on 30th September 2020 also provides three additional areas of planting. Two of these areas comprise the cuttings in the Ardaneer area (Ch.1+500, Section A) and the Mulderricksfield area (Ch.5+100 to Ch.6+450, Section A) as shown in Plates 2, 3 and 4 below. These plates provide extracts taken from Figures R11.1, R11.3 and R11.4 as per the RFI document. These areas will be divided into zones with both woodland planting and scrub planting provided, in order to comply with the TII guidance on maintaining clear zones, and are illustrated as Specific Landscape Measure 20 (SLM 20). Scrub planting will be in place in areas within the clear zone and woodland will be planted in the remaining areas. The total area to be planted will amount to 10ha. The third area to the north of the alignment from Ch.20+600 to Ch.20+900, as illustrated in Plate 5 below, will be planted with native woodland species and comprises an area of 0.94ha. The image shows an extract of figure R11.7 as per the RFI document, with the area identified as SLM 21.

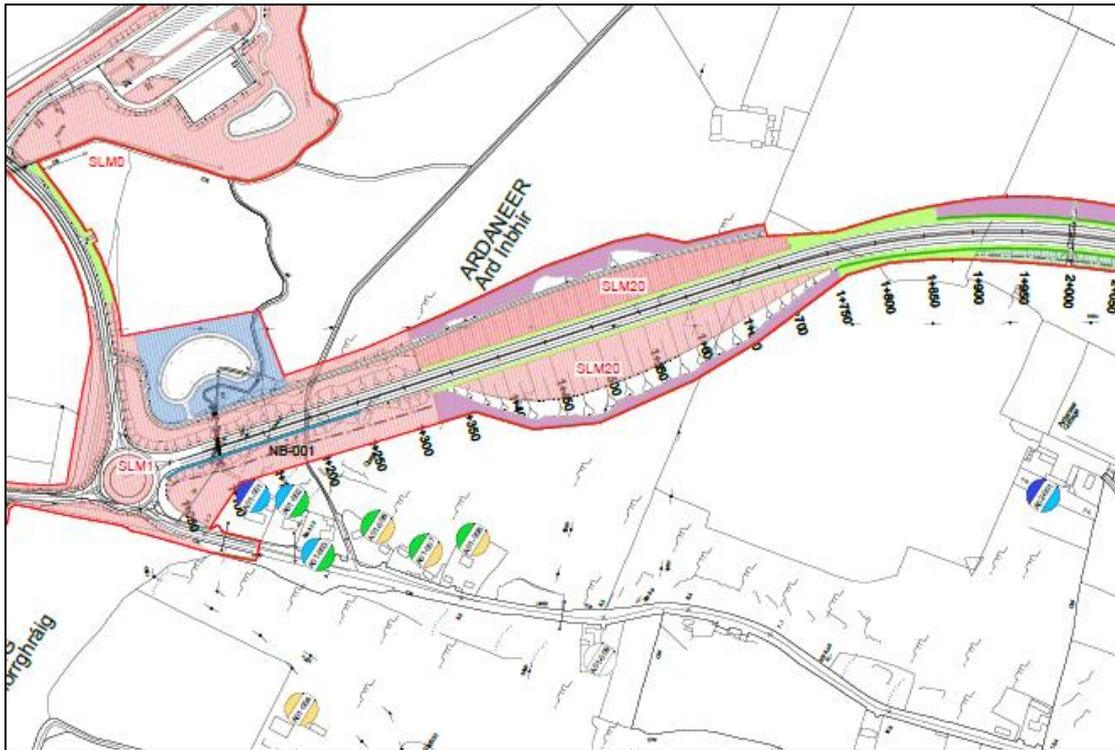


Plate 2

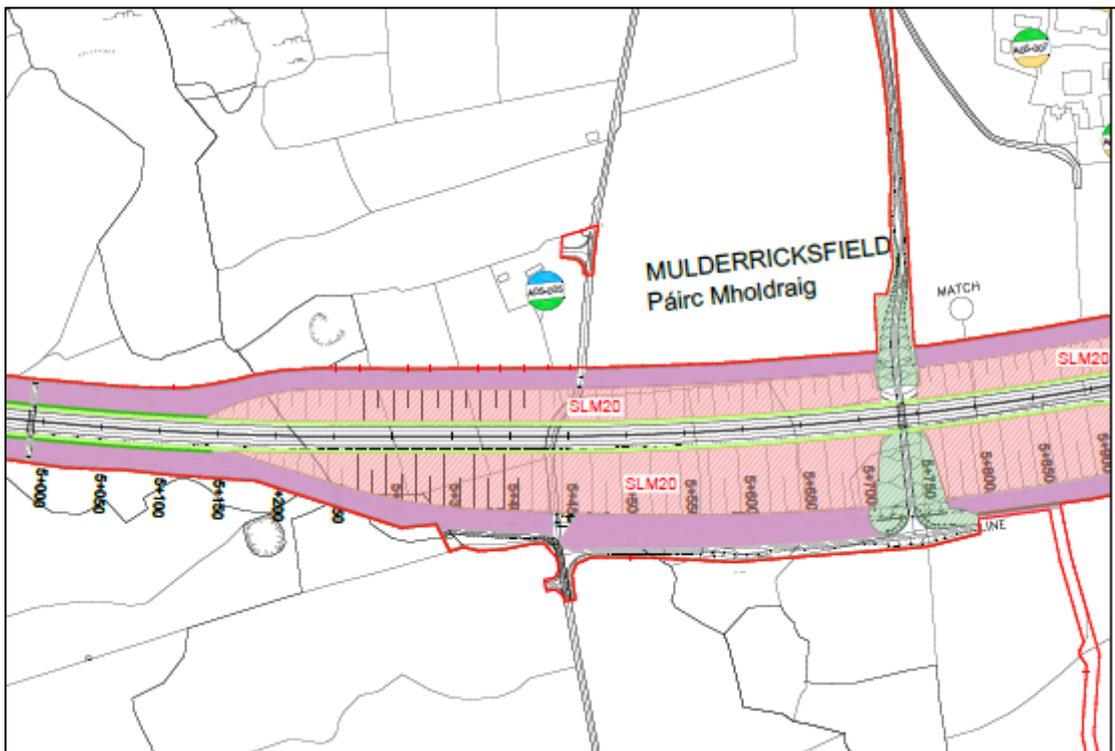


Plate 3

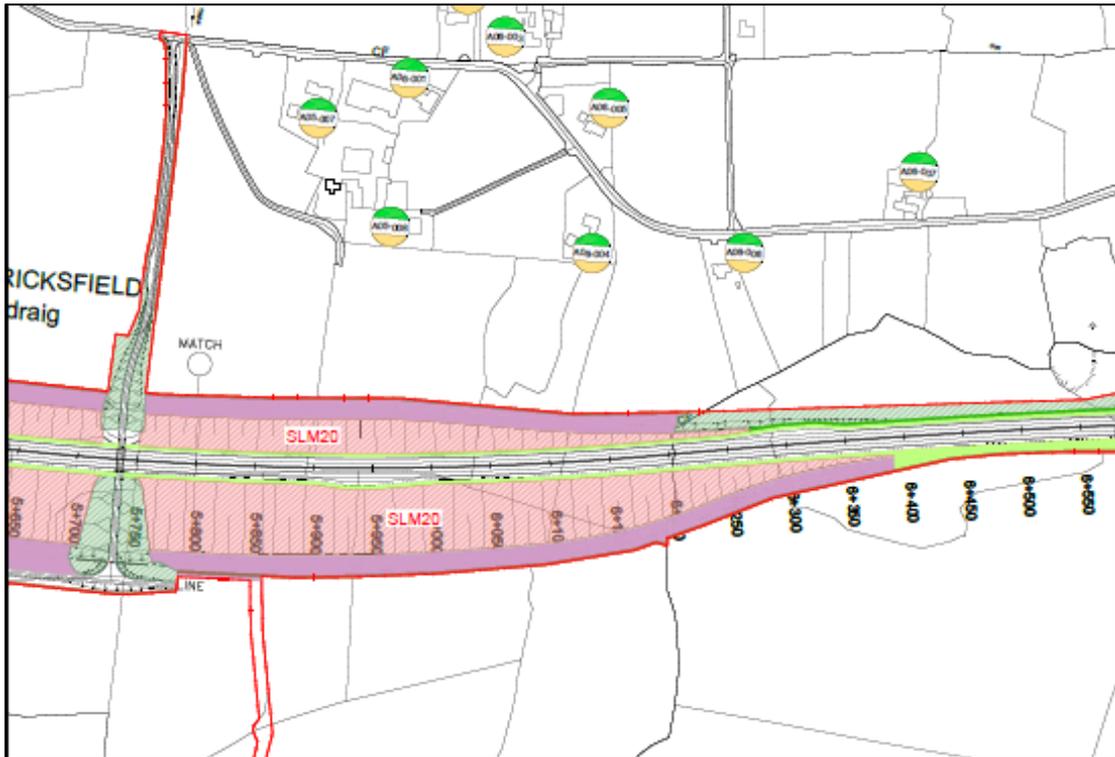


Plate 4

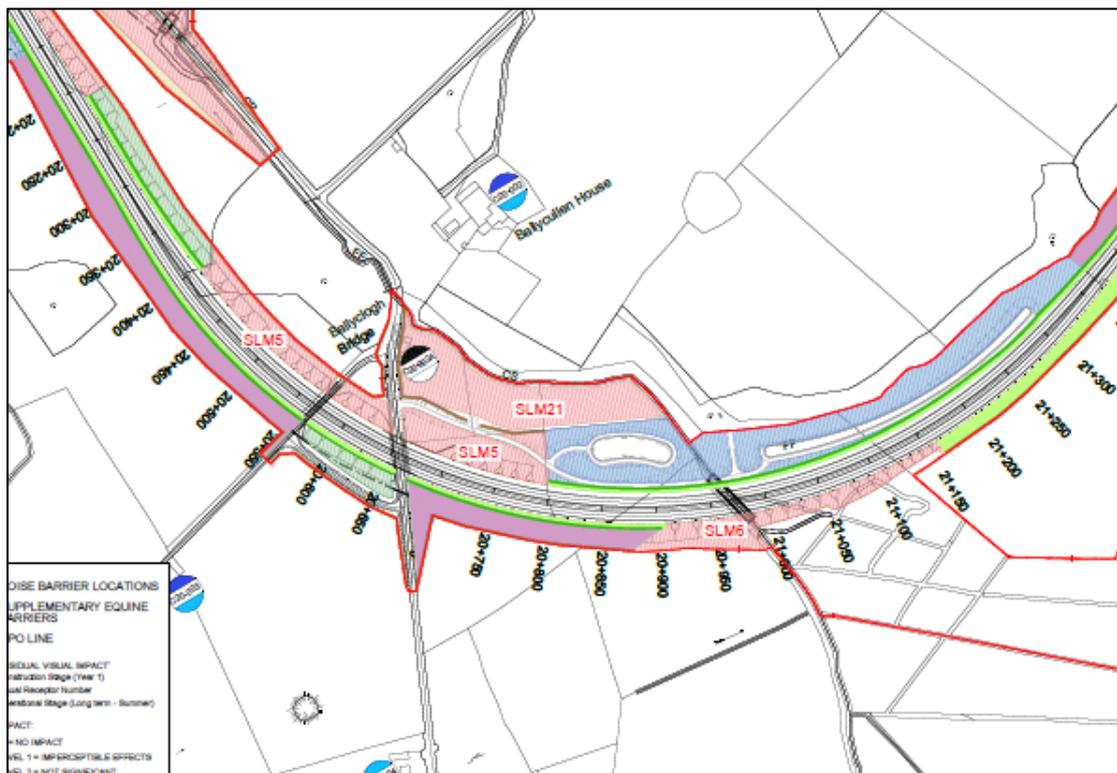


Plate 5

4.10 Occurrence of Japanese Knotweed Along the Proposed Route

Issue Raised in Submissions / Objections

- 4.10.1 Submission Ref FI-2 has also raised concerns that there was no evidence of Japanese Knotweed (*Reynoutria japonica*) recorded from along the proposed route during the survey work undertaken. Mr Enright queried the timing of the walkover surveys undertaken to inform the assessment and requests that further surveys should be provided to reinforce this statement.

Response

- 4.10.2 Japanese Knotweed is widespread in the Foynes – Askeaton area as alluded to by the submission and indicated on the National Biodiversity Data Centre and Botanical Society of Britain and Ireland websites. However, the distribution of this invasive plant species (which is listed under the Third Schedule to the Habitats Regulations 2011) is confined primarily to urban or roadside locations where it has been unwittingly spread in the past by mowing, disturbance and dumping. As the majority of the proposed road development is through green field lands, the plant has fortunately not had the opportunity to establish. The timing and frequency of surveys undertaken to inform the biodiversity assessment of the proposed road development are detailed in section 7.2.5 of the EIAR. While habitat mapping surveys were undertaken during the growing season, it should be noted that the stalks of Japanese Knotweed are robust and persist throughout the winter period being instantly recognizable to anyone familiar with the plant.
- 4.10.3 In view of the occurrence of three Invasive plant species listed under the Habitats Regulations along the line of the proposed road development (namely Giant Hogweed, Floating Fairy Fern and Himalayan Balsam), specific measures for their management are included in the Environmental Operating Plan of the EIAR (Appendix 4.1 in Volume 4A). These measures will be enforced during construction to ensure accidental spread does not occur on machinery or materials to and from the site. Section 9.6 of this plan also provides that a pre-construction Invasive Alien Plant Species (IAPS) survey shall be carried out, taking in the entirety of the site of the proposed development.

4.11 Reputed Occurrence of Freshwater Pearl Mussel on the River Deel

Issue Raised in Submissions / Objections

- 4.11.1 Submission Ref FI-8 claims that there are records of Freshwater Pearl Mussel (*Margaritifera margaritifera*) from the River Deel as recorded by an un-named student from the University of Limerick in 2003. They also allude to records of White-clawed crayfish (*Austropotamobius pallipes*) and Smooth newt (*Lissotriton vulgaris*) from the river, which they acknowledge has been addressed within the EIAR.

Response

- 4.11.2 Both Freshwater Pearl Mussel and White-clawed crayfish are listed under Annex II of the EU Habitats Directive. However, their ecological requirements differ markedly in that the former (with the exception of the subspecies *M. margaritifera durrovensis* which is confined to the River Nore) is associated with waters with a low pH, while White clawed Crayfish are only associated with alkaline waters. Thus, the two species are never found in the same river systems. The chemistry of the River Deel and all the other watercourses within the vicinity of the proposed road development, reflect

the underlying limestone geology and have pH values in the alkaline spectrum (i.e. >pH7). The reputed record of Freshwater Pearl Mussel from the River Deel is therefore invariably a Duck Mussel (*Anodonta anatina*) which to the untrained eye has the overall appearance of the Pearl Mussel. The most obvious distinguishing feature between these species is the thickness of the shell. Duck mussel has been recorded from the river by the EPA (1987-1993) and are primarily associated with flowing water and coarse substrates.

5. CONCLUSION

- 5.1 With the implementation of the mitigation measures detailed in Chapter 7 of the EIAR and Section 5 of the NIS and their incorporation into the Schedule of Commitments, which, if the development is consented, will become a condition of planning, the residual impacts of the proposed road development will be localised and mostly temporary in nature.
- 5.2 The NIS in relation to the proposed road development concludes that, in view of best scientific knowledge and on the basis of objective information, the proposed road development either individually or in combination with other plans or projects, will not adversely affect the integrity of any European Sites in view of the sites' conservation objectives. Overall, the proposed road development will have no negative effect on water quality within any watercourses, all of which drain to the River Shannon and thus to the Lower River Shannon cSAC and River Shannon and River Fergus Estuaries SPA.
- 5.3 The contents of the submissions made does not change the assessment undertaken or the conclusions in the EIAR or NIS for the proposed road development.

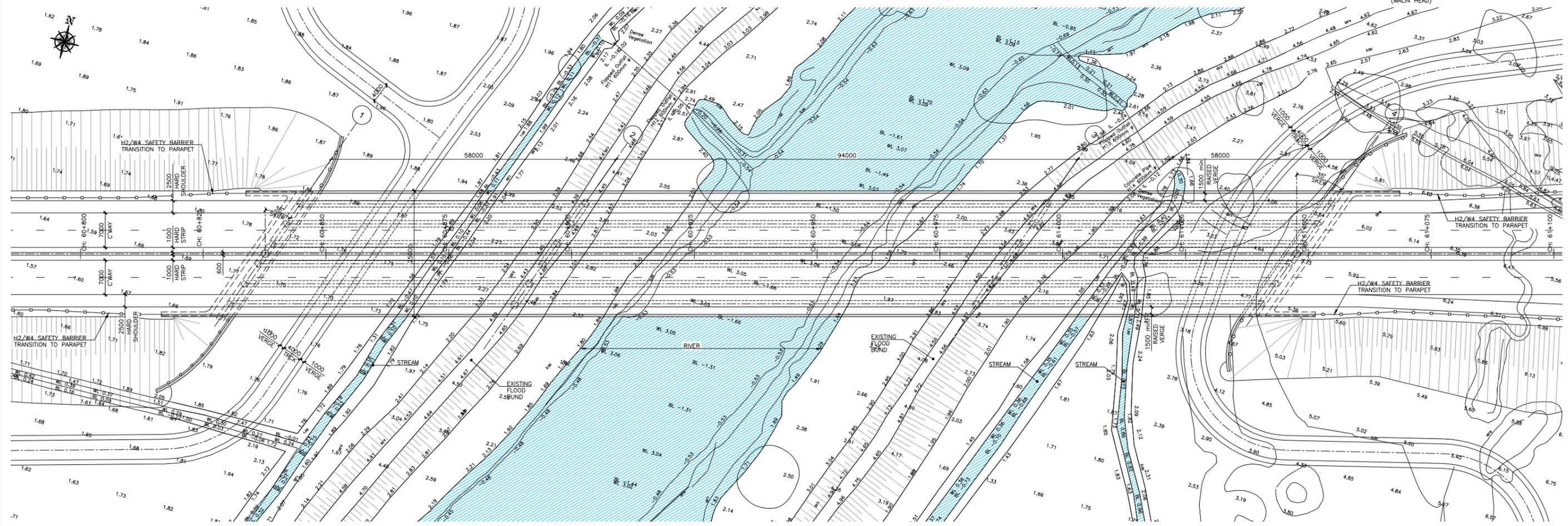
Appendix 1

The following submissions have been responded to in this Brief of Evidence:

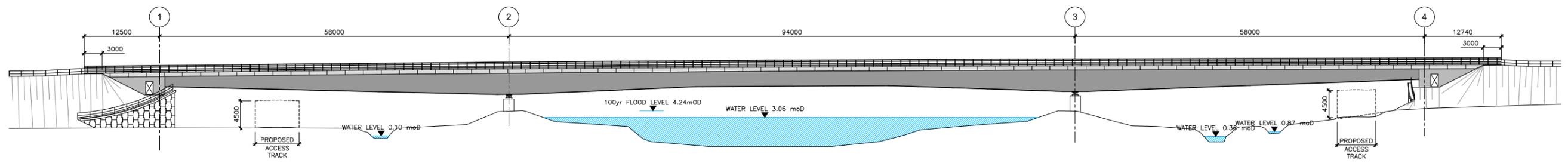
Submissions Responded to in this Brief of Evidence	
ENV-	4,5,15
SCH-	3, 30, 48, 89
FI-	2,8

Appendix 2: Figures 4.72 to 4.75 of Volume 3 of the EIAR

- NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
 2. ALL LEVELS ARE IN METRES TO ORDNANCE DATUM (MALIN HEAD)



RIVER BRIDGE RVB04
PLAN
A1 SCALE 1:400
A3 SCALE 1:800



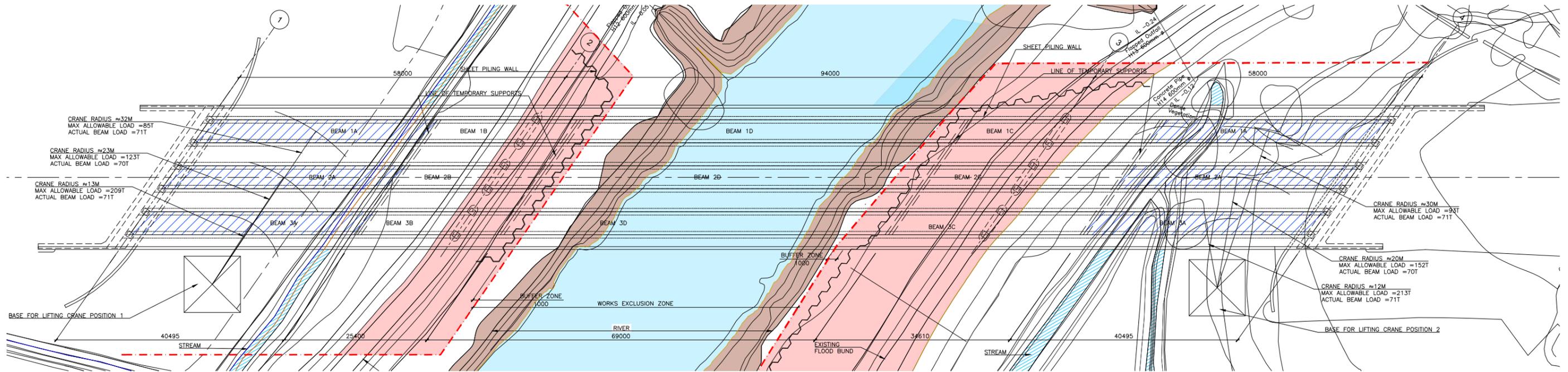
RIVER BRIDGE RVB04
ELEVATION
A1 SCALE 1:350
A3 SCALE 1:700

Ordnance Survey Ireland Licence No Licence No. 2019/09/CCMA/Limerick City & County Council
© Ordnance Survey Ireland and Government of Ireland.

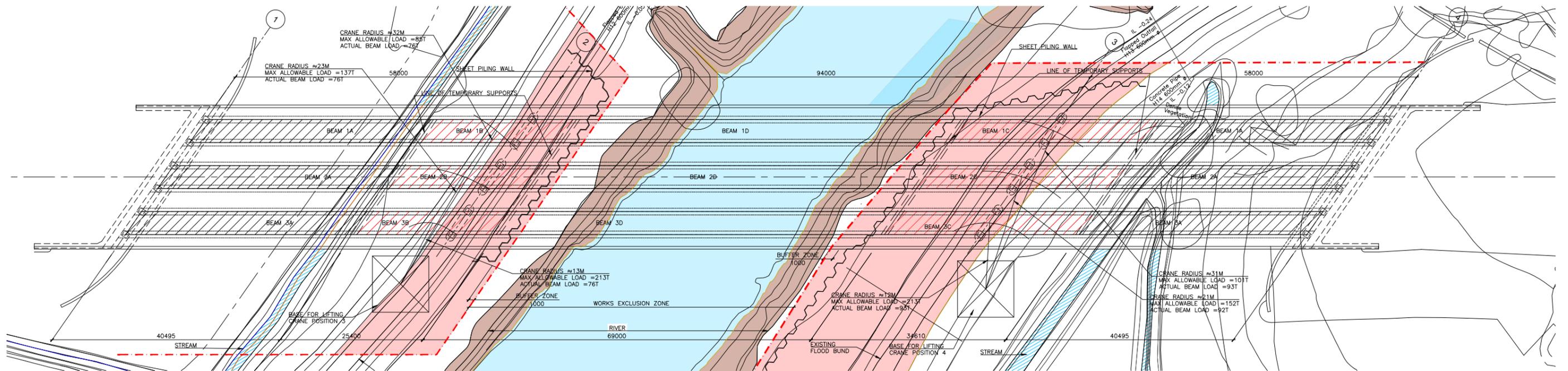
						Arena House, Arena Road, Sandyford, Dublin 18. Tel : +353 (1) 2940800 Fax : +353 (1) 2940820 e-mail : info@rod.ie Website : www.rod.ie www.aecom.com	Project Foynes to Limerick Road (including Adare Bypass)	Drawing Title: RIVER MAIGUE CROSSING RIVER BRIDGE RVB04 GENERAL ARRANGEMENT DETAILS					
							Environmental Impact Assessment Report	<table border="1"> <tr> <td>Designed: RH</td> <td>File:</td> <td>Status: E.I.A.R.</td> </tr> <tr> <td>Drawn: LA</td> <td>Job No: 14.131</td> <td></td> </tr> <tr> <td>Checked: MC</td> <td>Scale: N.T.S. (@ A3)</td> <td>Drawing No: Fig. 4.72</td> </tr> <tr> <td>Approved: SMG</td> <td>Date: December 2019</td> <td>Rev: -</td> </tr> </table>	Designed: RH	File:	Status: E.I.A.R.	Drawn: LA	Job No: 14.131
Designed: RH	File:	Status: E.I.A.R.											
Drawn: LA	Job No: 14.131												
Checked: MC	Scale: N.T.S. (@ A3)	Drawing No: Fig. 4.72											
Approved: SMG	Date: December 2019	Rev: -											

DO NOT SCALE USE FIGURED DIMENSIONS ONLY

NOTES:
 1. ALL DIMENSIONS ARE IN MILLIMETRES.
 2. ALL LEVELS ARE IN METRES TO ORDNANCE DATUM (MALIN HEAD)



STAGE 1: 1) CONSTRUCTION OF TEMPORARY SUPPORTS & TEMPORARY SHEET PILING WALLS.
 2) CONSTRUCTION OF BASE FOR CRANE POSITIONS 1 AND 2.
 3) LIFTING OF BEAMS 1A, 2A & 3A.



STAGE 2: 1) CONSTRUCTION OF BASE FOR CRANE POSITIONS 3 AND 4.
 2) SHIFT CRANE TO POSITIONS 3 AND 4.
 3) LIFTING OF BEAMS 1B, 2B, 3B, 1C, 2C, & 3C.
 4) SPLICING BEAMS IN BETWEEN GRIDLINES 1 & 2 AND GRIDLINES 3 & 4.
 5) REMOVE TEMPORARY SUPPORTS BETWEEN GRIDLINES 1 & 2 AND GRIDLINES 3 & 4.

Ordnance Survey Ireland Licence No Licence No. 2019/09/CCMA/Limerick City & County Council.
 © Ordnance Survey Ireland and Government of Ireland.



Tionscald Éireann
 Project Ireland
 2040



An Roinn Iompair
 Turasoireachta agus Spóirt
 Department of Transport,
 Tourism and Sport



Comhairle Cathrach
 & Contae Luimnigh
 Limerick City
 & County Council



Roughan & O'Donovan-AECOM
 Alliance

Arena House, Arena Road,
 Sandyford, Dublin 18.
 Tel: +353 (1) 2940800
 Fax: +353 (1) 2940820
 e-mail: info@rod.ie
 Website: www.rod.ie
 www.aecom.com

Project

Foynes to Limerick Road
 (including Adare Bypass)

Environmental Impact
 Assessment Report

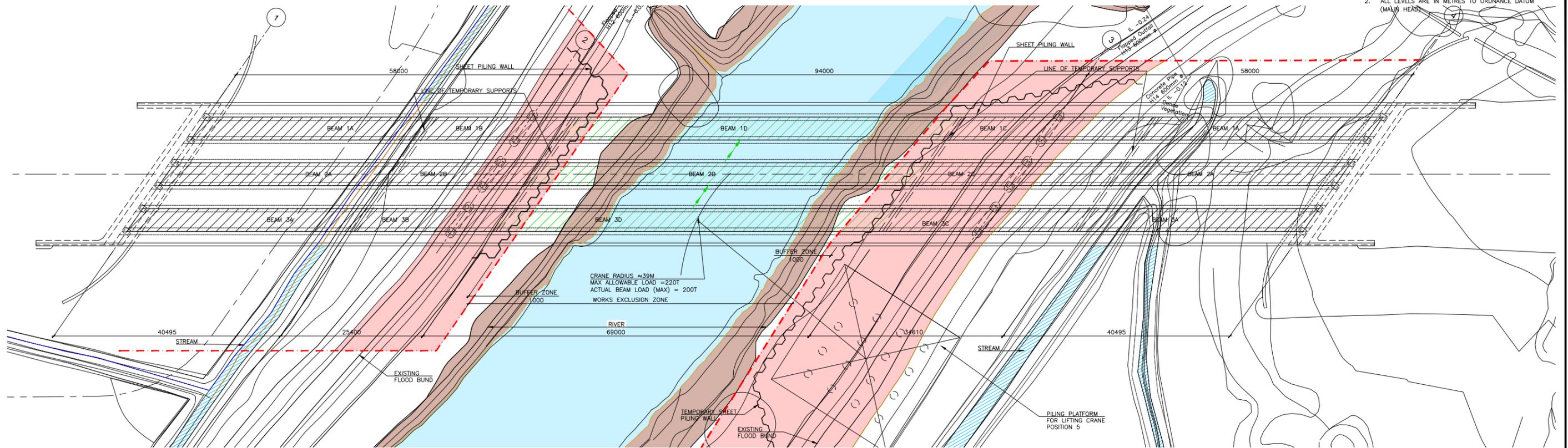
Drawing Title:

RIVER MAIGUE CROSSING
 RIVER BRIDGE RVB04 - CONSTRUCTION SEQUENCE
 SHEET 1 OF 3

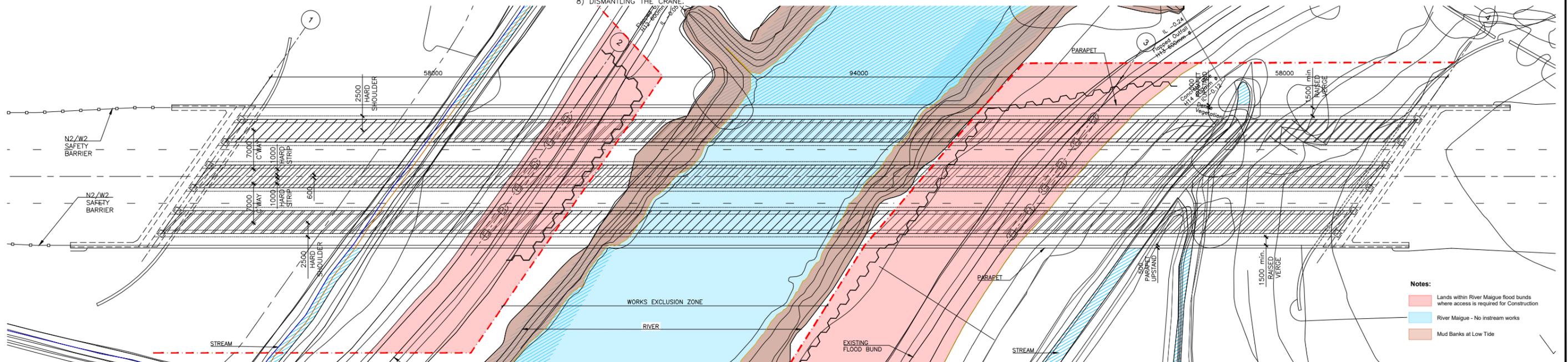
Designed: RH	File:	Status: E.I.A.R.
Drawn: LA	Job No: 14.131	
Checked: MC	Scale: N.T.S. (@ A3)	Drawing No: Fig. 4.73
Approved: SMG	Date: December 2019	Rev: -

DO NOT SCALE USE FIGURED DIMENSIONS ONLY

NOTES:
 1. ALL DIMENSIONS ARE IN MILLIMETRES.
 2. ALL LEVELS ARE IN METRES TO ORDNANCE DATUM (M.A.S. HEAD)



- STAGE 3:**
- 1) CONSTRUCTION OF BASE FOR CRANE POSITION 5.
 - 2) SHIFT CRANE TO POSITION 5.
 - 3) LIFTING OF BEAM 1D AND SLIDING OVER TEMPORARY SUPPORTS TO ITS POSITION.
 - 4) LIFTING OF BEAM 2D AND SLIDING OVER TEMPORARY SUPPORTS TO ITS POSITION.
 - 5) LIFTING OF BEAM 3D.
 - 6) SPLICING BEAMS IN BETWEEN GRIDLINES 2 & 3.
 - 7) REMOVE TEMPORARY SUPPORTS IN BETWEEN GRIDLINES 2 & 3.
 - 8) DISMANTLING THE CRANE.



- STAGE 4:**
- 1) CONSTRUCTION OF DECK.
 - 2) LAYING OF SURFACING AND FINISHES
 - 3) INSTALLING PARAPETS.

Notes:

- Lands within River Maigue flood bunds where access is required for Construction
- River Maigue - No instream works
- Mud Banks at Low Tide

Ordnance Survey Ireland Licence No Licence No. 2019/09/CCMA/Limerick City & County Council
 © Ordnance Survey Ireland and Government of Ireland.



Roughan & O'Donovan-AECOM Alliance

ROD AECOM

Arena House, Arena Road,
 Sandyford, Dublin 18.
 Tel : +353 (1) 2940800
 Fax : +353 (1) 2940820
 e-mail : info@rod.ie
 Website : www.rod.ie
 www.aecom.com

Project

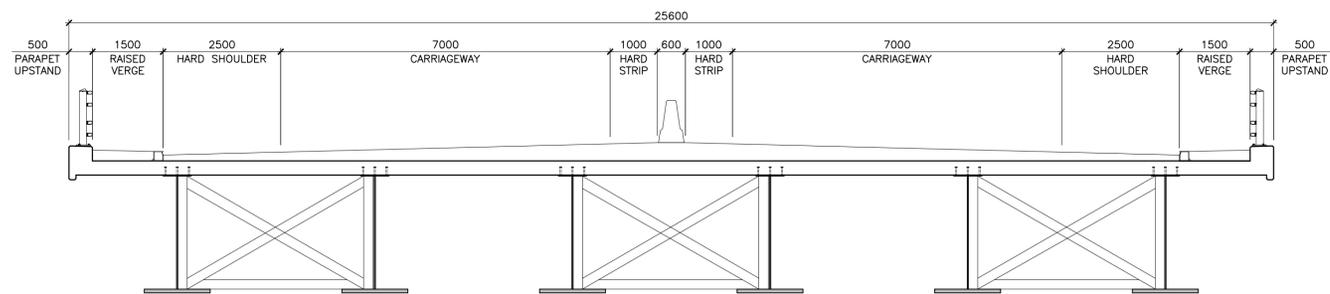
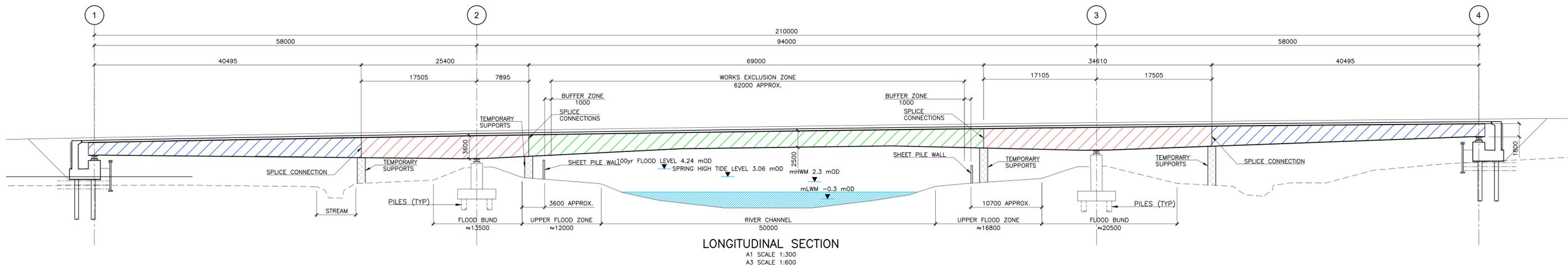
Foynes to Limerick Road (including Adare Bypass)

Environmental Impact Assessment Report

Drawing Title: RIVER MAIGUE CROSSING RIVER BRIDGE RVB04 - CONSTRUCTION SEQUENCE SHEET 2 OF 3			
Designed: RH	File:	Status:	E.I.A.R.
Drawn: LA	Job No: 14.131	Checked: MC	Scale: N.T.S. (@ A3)
Approved: SMG	Date: December 2019	Fig. 4.74	Rev: -

DO NOT SCALE USE FIGURED DIMENSIONS ONLY

- NOTES:**
1. ALL DIMENSIONS ARE IN MILLIMETRES.
 2. ALL LEVELS ARE IN METRES TO ORDNANCE DATUM (MALIN HEAD)



KEY:

- FIRST BEAM LIFTING STAGE
- SECOND BEAM LIFTING STAGE
- THIRD BEAM LIFTING STAGE

Ordnance Survey Ireland Licence No. 2019/09/CCMA/Limerick City & County Council.
© Ordnance Survey Ireland and Government of Ireland.



Tionscaldal Éireann
Project Ireland
2040



Ah Roinn Iompair
Turasóireachta agus Spóirt
Department of Transport,
Tourism and Sport



Bonneagar Iompair Éireann
Transport Infrastructure Ireland



Comhairle Cathrach
& Contae Luimnigh
Limerick City
& County Council

**Roughan & O'Donovan-AECOM
Alliance**

PROD
ROUGHAN & O'DONOVAN
AECOM

Arena House, Arena Road,
Sandyford, Dublin 18.
Tel : +353 (1) 2940800
Fax : +353 (1) 2940820
e-mail : info@rod.ie
Website : www.rod.ie
www.aecom.com

Project

**Foynes to Limerick Road
(including Adare Bypass)**

**Environmental Impact
Assessment Report**

Drawing Title:			
RIVER MAIGUE CROSSING RIVER BRIDGE RVB04 - CONSTRUCTION SEQUENCE SHEET 3 OF 3			
Designed: RH	File:	Status:	E.I.A.R.
Drawn: LA	Job No: 14.131		
Checked: MC	Scale: N.T.S. (@ A3)	Drawing No:	Fig. 4.75
Approved: SMG	Date: December 2019	Rev:	-

DO NOT SCALE USE FIGURED DIMENSIONS ONLY