Appendix C5.07

Section 3
River Finn Crossing (N14/N15 to A5 Link): SOR Addendum

Co-financed by the Connecting Europe Facility of the European Union

Structures Options Report Addendum: River Finn Crossing (A5 Link)

TEN-T Priority Route Improvement Project, Donegal

TT-BT-00-XX-RP-C-RP0005
Structures Options Report Addendum: N14-N15 to River Finn Crossing (A5 Link) (P01)

November 2021

Structures Options Report - Consultation STA-1a

Categories 1, 2 & 3

SCHEME NAME

Name and location	Ten-T Priority Route Improvement Project - Donegal

STRUCTURES

Name and nature of the Structure:	River Finn Crossing (A5 Link) (ref. N14R175)
Structures Options Report	
Reference:	TT_MGT0337-RPS-00-XX-RP-C-RP0005
Revision:	P01
Date:	10-11-2021

SUBMITTED BY:

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Date:	13 / 03 / 2022

EXECUTIVE SUMMARY

STRUCTURE

Name:	River Finn Crossing (A5 Link)
Structure Ref No:	N14R175
Primary Function:	To carry the N14-N15 to A5 link road over the River Finn and its associated floodplain
Check Category:	Category 3 (multi-span continuous bridge with span exceeding 50m)
Loading:	Normal (Load Model 1) and abnormal (Load Model 3 SV196) road traffic

PASSAGES

Primary:	N14-N15 to A5 Link Road with Active Travel cycleway on the bridge
Secondary:	Active Travel cycle way underpass under the bridge (Donegal end-span)

RECOMMENDATION

'Bridge Option 2 – 8 Span Steel Composite', which was recommended as the preferred bridge option in 2011, is still considered to be the preferred option. The latest proposed bridge deck cross section is wider to accommodate an Active Travel path on the SW side raised verge.

ESTIMATED COST

The estimated total construction cost of the recommended bridge option is €19m.

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1 INTRODUCTION

1.1 Consultant's Brief

In November 2016, Donegal County Council appointed joint venture RPS/Barry Transportation as design consultants for the Trans-European Network - Transportation (TEN-T) Priority Route Improvement Project, Donegal. The project is divided into three sections as illustrated in Figure 1-1.

Section 1 – N15/N13 Ballybofey / Stranorlar Urban Region

Section 2 – N56/N13 Letterkenny to Manorcunningham

Section 3 – N14 Manorcunningham to Lifford / Strabane / A5 Link.

The three sections of the TEN-T Priority Route Improvement Project, Donegal are considered as one project.

The project is being implemented in accordance with the TII Project Management Guidelines (PMGs), January 2019; superseding the NRA's 2010 Project Management Guidelines (PE-PMG-02004) and September 2017 updates which were used on the project up until the publication of the January 2019 PMGs. In the context of this Option Selection Report the 2019 PMGs have minor differences from the 2010 PMGs.

1.2 Background to the Scheme

Much of the TEN-T road network in Donegal does not meet the current design standards for a National Primary road in terms cross-section, horizontal and vertical alignments, junctions, overtaking opportunities, drainage, etc. Given the strategic importance of the N13, N14 and N15 routes to Donegal providing connectivity to the rest of the island, a study into the condition of the existing infrastructure was undertaken as part of the Trans-European Transport Network Corridor Needs Study, Donegal in 2015. This study reviewed the TEN-T network in Donegal, assessing the network against various technical, non-technical, economic, traffic and safety criteria. The assessment comprised a site visit, journey time surveys and a desktop study for all parts of the TEN-T network in the county, except the N15 from south of Ballybofey to the county boundary, as numerous upgrades of this section have been completed in recent times.

Six sections of the TEN-T network in Donegal were identified and ranked in order of intervention priority due to deficiencies in the existing infrastructure provision. Three sections requiring the most immediate intervention (see Figure 1-4) form part of the TEN-T Priority Route Improvement Project, Donegal:

1. The N15/N13 Ballybofey/Stranorlar Urban Region

2. The N56/N13 Letterkenny to Manorcunningham

3. The N14 Manorcunningham to Lifford/Strabane/A5 Link (now including the N14/N15 to A5 Link Scheme).

In addition to the fact these routes are strategic, nationally significant connections from Letterkenny/Donegal to the rest of the island, they also provide connectivity between key towns in County Donegal – Letterkenny, Ballybofey/Stranorlar and Lifford. Consequently, a high volume of traffic uses these routes, which has an impact on these towns. As a result, the towns suffer from issues such as congestion and a poor environment for vulnerable road users, while traffic suffers from longer journeys and poor journey time reliability.

The prioritisation of these three sections is also necessary to ensure the development of the county in line with the Donegal County Development Plan, which has long established a need for intervention at the three areas in question. Furthermore, the National Development Plan also recognises that work on these links is required. All three locations have had previous projects progressed to varying degrees and as a result, have reserved corridors for new routes in the County Development Plan.

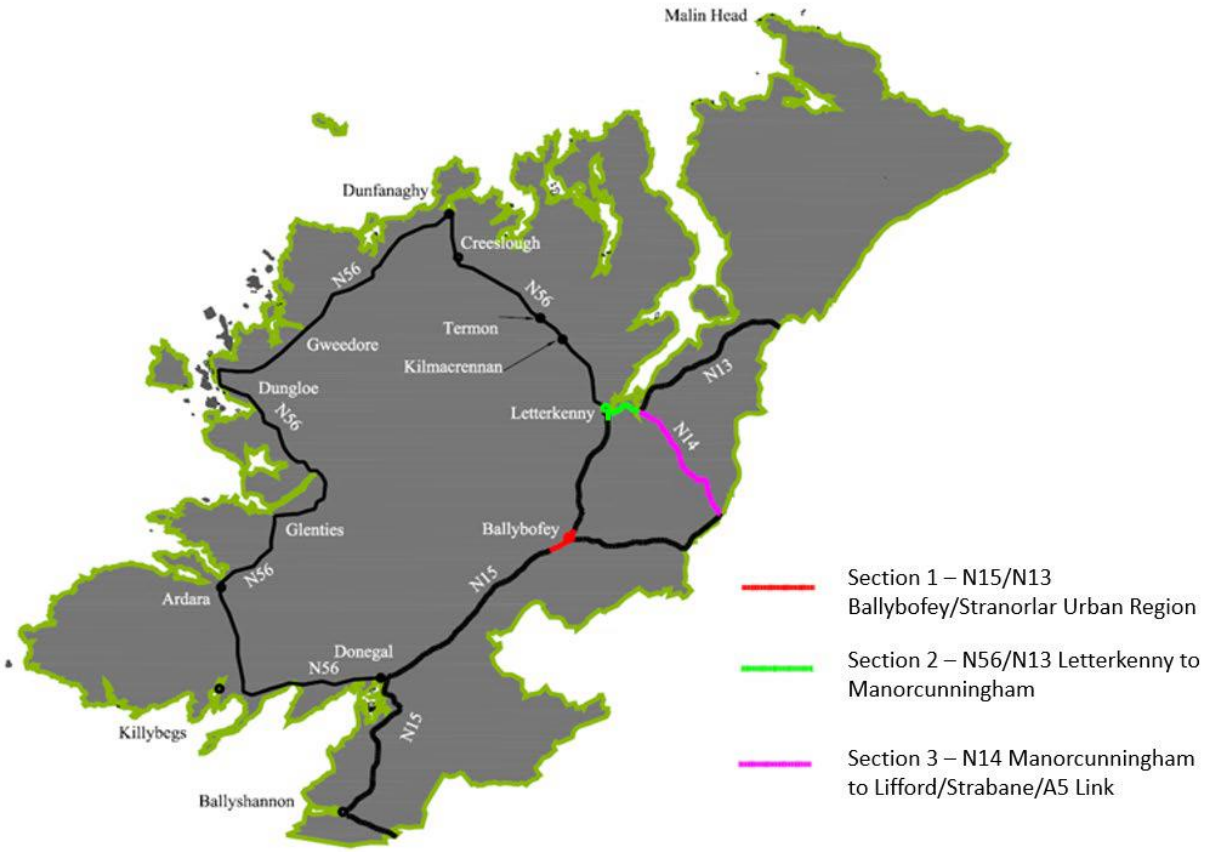


Figure 1-1: Donegal National Roads and Proposed Schemes

1.3 Previous Studies

Several reports and investigations have been previously carried out across the TEN-T network in Donegal. The fundamental reports are listed here:

- Constraints Studies – these outlined the constraints for the respective sections prior to identifying options:
  i. N14/N13 Junction (Manorcunningham) to Lifford Constraints Study; 2000; Mott MacDonald,
  ii. N15 Ballybofey/Stranorlar Bypass Constraints Study (2000); McCarthy Hyder.

- Route Selection Reports – conclude with proposals for route options:
  i. N15 Ballybofey/Stranorlar Bypass Route Selection Report (2001); McCarthy Hyder,
  ii. N14/N13 Junction (Manorcunningham) to Lifford Route Selection Report (2001); Mott MacDonald,
  iii. N56 Letterkenny Relief Road Route Selection Report, (2010) Donegal County Council.

- Environmental Impact Statements:
  i. Environmental Impact Statement Ballybofey/Stranorlar Bypass (2007); McCarthy Hyder
  ii. N14/N15 to A5 Link Environmental Impact Statement (2011).

- Other reports and assessments:
  i. N14 Four Lane Road at Letterkenny Feasibility Report Nov (2005); Michael Punch and Partners,
  ii. Various Traffic Model Studies conducted by Jacobs,
  iii. Traffic model reviews on the N14 conducted by RPS.

All three sections of the TEN-T Priority Route Improvement Project were previously advanced under separate projects to various stages of planning and design.

1.4 Scope

This report is an addendum to the 'N14-N15 to A5 Link – Bridge Options Report – River Finn Crossing – Issue 1' issued by Roughan and O'Donovan (ROD) Consulting Engineers in January 2011.

It records any changes to design constraints and any resulting changes to the recommended Bridge Option 2 (8 span multi-girder bridge). Bridge Option 2 is still considered to be the preferred design with a few minor modifications, so only Bridge Option 2 is discussed in this report.

Bridge Option 2 has already received planning approval in Northern Ireland, and the project management team have requested that no design changes are made on this side of the border.

To ease cross-referencing, this report uses the same structure as the original version issued in 2011. The contents of the report issued in 2011 are mostly still applicable although a few details are clarified / amended, as stated in the corresponding sections of this report.

The proposed TEN-T scheme design requires 52 bridges in total, which are categorised as follows:

- Underbridges carry the proposed mainline carriageway over side roads (e.g. local & link roads)
- Overbridges carry side roads over the proposed mainline carriageway
- Riverbridges carry the proposed mainline carriageway over rivers
- Footbridges carry pedestrians, cyclists and non-motorised users (NMU's) over the proposed mainline carriageway
- Underpasses (buried box / frame structures) which enable private roads and paths to pass under the proposed mainline carriageway

On the scheme, Structures Options Reports (SOR's) are prepared for each of the following structures / family of structures:

- Underbridge family of structures
- Overbridge family of structures
- Footbridge family of structures
- Riverbridge family of structures
- Each 'signature' major river bridge crossing

An SOR will not be prepared for the Underpasses as these are expected to be buried box/portals and are straightforward to design.

The SOR reports will be prepared in accordance with the template in DN-STR-03001, 'Technical Acceptance of Road Structures on Motorways & Other National Roads'.

2 SITE AND LOCATION

2.1 Introduction

The corresponding Section 2.1 of the 2011 Bridge Options report is still applicable except for the following changes:

- The proposed road cross section now includes a 6.0m raised verge on the SW side. This accommodates a 3m wide Active Travel path, carriageway setback and 0.5m lateral clearance to parapet. Therefore, the typical road width including raised verges is now 24.0m.
- The proposed road width flares within a distance of 50m and 20m of the Donegal and Tyrone roundabouts respectively. Therefore, the flares on the roundabout road approaches now sit on the end spans of the proposed bridge. The max width road width on the bridge including raised verges is 28.5m.

Refer to Appendix 2 for an updated General Arrangement drawing of Bridge Option 2.

The structure is assigned Structure Ref N14R175 according to the following convention:

- N14 – indicates that the bridge is located near to the proposed National Primary Route Number N14. Where a structure is on a Link Road, the Structure Ref still refers to the nearby mainline national primary route number.
- R – indicates that it is a riverbridge
- 175 – represents the chainage of the nearby mainline National Primary Route is Ch 17+500. Where a structure is on a Link Road, the Structure Ref refers to the chainage of the nearby mainline national primary route.

2.2 River Finn Crossing

The corresponding Section 2.2 of the 2011 Bridge Options report is still applicable except for the following change(s):

- The latest 100-year flood plan and level is 7.1m AOD, as shown on the general arrangement drawings in Appendix 2.

3 DESCRIPTION OF STRUCTURES AND OPTIONS CONSIDERED

3.1 General Key Constraints

The corresponding Section 3.1 of the 2011 Bridge Options report is still applicable except for the following change(s):

- The River Finn and its floodplain is now an SAC (rather than cSAC)
- The min required soffit level of the proposed bridge deck is approx. 7.5m AOD. This is based on a 100yr design flood level of 7.1m AOD, plus 0.5m freeboard.
- The construction works associated with the bridge piers must be setback from the banks of the River Finn to avoid impacts on the Qualifying Interests (QI's) for the SAC. Provision of permanent maintenance access tracks over the SAC should be minimised as far as reasonably possible.

3.2 Description of Bridge Options

The corresponding Section 3.2 of the 2011 Bridge Options report is still applicable.

3.3 Option 1 – 4 Span Steel Composite

N/A

3.4 Option 2 – 8 Span Steel Composite

The corresponding Section 3.4 of the 2011 Bridge Options report is still applicable except for the following change(s):

- An updated general arrangement drawing for Option 2 is provided in Appendix 2.
- The feasibility of monolithic pier / bridge deck connections would be confirmed with analysis at Preliminary Design Report (PDR) stage, however in our view, it is likely to only be feasible for the middle piers rather than the ones near the abutments.

3.5 Option 3 – 5 Span Steel Composite with Tied Arch

N/A

3.6 Option 4 – Span Asymmetric Cable Stayed Bridge

N/A

4 TECHNICAL EVALUATION

4.1 Span Arrangement

The corresponding Section 4.1 of the 2011 Bridge Options report is still applicable except for the following clarifications:

- The river and floodplain are now an SAC, rather than an cSAC. The latest environmental requirement is for a 5m wide 'no working zone' beyond the crest of the Donegal riverbank and Tyrone berm. On the Donegal side, this is satisfied as the pile cap is set back 6.6m from the riverbank crest. Sheet piles could be installed outside of this 'no working zone' to enable de-watering and excavation, and the pile cap could be cast directly against these. On the Tyrone side, the pile cap is set back only 2.4m from the river berm, although it is set back 9.2 to 10.5m from the water's edge. The bridge design on the Tyrone side has already received planning approval so no change is proposed.
- The bridge deck soffit of Option 2 is 10.1m AOD, which is higher than the 7.6m AOD min bridge deck soffit level required for hydraulic conveyance.
- The total length of Bridge Option 2 is 287m and consists of the following span arrangement:
    - Donegal back-spans: 26m + 5*33m
    - Main river span: 63m
    - Tyrone back-span: 33m

4.2 Structural Depth

The corresponding Section 4.2 of the 2011 Bridge Options report is still applicable, except for the following updates:

- Due to the increased width of the proposed bridge deck, the updated proposed girder arrangement is 8 no. girders at 3.14m spacing with 1.5m cantilevers. The structural depth and span parameters of Bridge Option 2 are now as follows:
    - Main river span - midspan:
        - Structural depth: 1.45m
        - Span to depth ratio 43
        - Depth to clearance ratio: 0.15
    - Main river span – piers:
        - Structural depth: 2.95m
        - Span to depth ratio: 21
        - Depth to clearance ratio: 0.40
    - Back-spans:
        - Structural depth: 1.45m
        - Span to depth ratio: 23
        - Depth to clearance ratio 0.18
- An extra trimmer girder or splayed girders would be needed at the end span to accommodate the 28-29m deck width at the abutment due to the road flares on the roundabout approaches.

4.3 Cross Section

The corresponding Section 4.3 of the 2011 Bridge Options report is still applicable, except for items discussed below.

The typical width of the proposed bridge deck is 25.0m, although the ends of the bridge deck flare at the interface with the roundabouts. Table 1 shows the revised cross section details for Option 2.

Table 1 - Cross section

Cross section	Central reserve incl. hard strip	Hard strip	Carriageway	Raised verges	Parapet upstand	Total
Typical cross section	1.5m	2x0.5m	2x7.0m	1.5m+6.0m	2x0.5m	25.0m
Flared cross section at Donegal abutment	3.0m	2x0.5m	2x7.0m	1.5m+6.0m	2x0.5m	26.5m
Flared cross section at Tyrone abutment	1.5m	2x0.5m	10.4m+7.0m	1.5m+6.0m	2x0.5m	28.4m

5 ECONOMIC EVALUATION

5.1 Estimated Construction Costs

The estimated construction cost of the recommended Bridge Option 2 is €19m. This is based on a bridge cost rate of 2700 €/m^2 and a bridge deck area of 7125m^2.

5.2 Whole Life Costs

The bridge design will include durability features to minimise maintenance costs.

Weathering steel will be specified where possible and this avoids the need for paint maintenance works every 20-30 years, although a painted protective finish will likely be required at deck end joints and where the 'cantilever width : girder depth ratio is less than 1.

Monolithic pier to deck connections will be explored at PDR stage and will be specified where feasible. Piers specified with a monolithic connection would not require bearings, and therefore the cost of bearing replacement works every 30-50 years would be avoided. It is likely that due to the length of the bridge, monolithic connections would only be feasible for the piers around the middle of the bridge.

6 AESTHETIC EVALUATION

The corresponding Section 6 of the 2011 Bridge Options report is still applicable.

7 EVALUATION OF DURABILITY AND MAINTENANCE REQUIREMENTS

7.1 General

The corresponding Section 7.1 of the 2011 Bridge Options report is still applicable except for the following clarification:

- Weathering steel should generally be appropriate however it a painted protective finish would be required in the vicinity of deck end expansion joints, and on the outside face of the edge girders at the river piers where the cantilever to girder depth ratio is less than 1.

7.2 Option 1 – 4 Span Steel Composite

N/A

7.3 Option 2 – 8 Span Steel Composite

The corresponding Section 7.3 of the 2011 Bridge Options report is still applicable except for the following clarification:

- In our opinion, monolithic pier to deck connections will only be feasible for piers around the middle of the bridge, rather than near the abutments. The feasibility will be explored with analysis at PDR stage. Where monolithic connections are not possible, bearings would be specified and these would require replacement every 30-50 years.
- To avoid the need for a permanent maintenance access track over the SAC floodplain, we could explore the feasibility of craning materials and equipment from the bridge deck down on to permanent hardstanding areas (e.g., compacted hardcore) around the base of each pier. Alternatively, temporary maintenance tracks could be constructed only when bearing replacement works were needed and removed afterwards.

7.4 Option 3 – 5 Span Steel Composite with Tied Arch Span

N/A

7.5 Option 4 – 5 Span Concrete Box with Steel composite drop in span

N/A

7.6 Option 5 – 3 Span Asymmetric Cable Stayed Bridge

N/A

8 HYDRAULIC CONSIDERATION

The corresponding Section 8 of the 2011 Bridge Options report is updated as below.

A 2D hydraulic analysis of the site has been carried out as part of this commission, allowing for bridge substructures and road embankment volume. The output indicates a 100-yr flood level (including 20% climate change allowance) of 7.0m AOD with minimal increase in flood levels (approx. 16mm) due to the proposed development. This satisfies the environmental requirement to avoid changing the current hydrological regime over the SAC river and floodplain.

The min soffit level of the proposed Option 2 bridge deck is 10.1m AOD, which is 3.1m higher than the post-development 100yr flood level.

9 HEALTH AND SAFETY CONSIDERATION

The corresponding Section 9 of the 2011 Bridge Options report is still applicable except for the following clarification:

- Barry Transportation, rather than ROD, are now appointed as Project Supervisor Design Process (PSDP).

10 CONSTRUCTION AND BUILDABILITY

10.1 General

The corresponding Section 10.1 of the 2011 Bridge Options report is still applicable.

10.2 Option 1 – 4 Span Steel Composite

N/A

10.3 Option 2 – 8 Span Steel Composite

The corresponding Section 10.1 of the 2011 Bridge Options report is still applicable, except the following clarification:

- Hard standing areas prepared during construction for the cranes would be removed following completion of the construction works to avoid permanent environmental impacts on the SAC floodplain.
- Permanent hard standing areas will need to be constructed around the base of each pier with bearings. These would each be approx. 5x30m.
- During construction, specific measures to mitigate the risk of any untreated surface water run-off into the River Finn will be required.

10.4 Option 3 – 5 Span Steel Composite with Tied Arch Span

N/A

10.5 Option 4 – 5 Span Concrete Box with Steel Composite Drop in Span

N/A

10.6 Option 5 – 3 Span Asymmetric Cable Stayed Bridge

N/A

11 GROUND CONDITIONS

11.1 General

The corresponding Section 11.1 of the 2011 Bridge Options report is still applicable.

11.2 Alluvium and organic deposits

The corresponding Section 11.2 of the 2011 Bridge Options report is still applicable with the following additions:

- Review of the Soil Mechanics Report issued 2011 and the Geophysical Survey Report issued 2021 suggests that there is very soft silt and loose sand to 25m depth BGL, underlain by stiff clay and dense gravel to 45m depth BGL.

11.3 Underlying bedrock

The corresponding Section 11.3 of the 2011 Bridge Options report is still applicable with the following additions:

- Review of the Soil Mechanics Report issued 2011 and the Geophysical Survey Report issued 2021 suggests that the depth to bedrock is 25 – 45m BGL.

11.4 Foundation design

The corresponding Section 11.3 of the 2011 Bridge Options report is still applicable with the following additions:

- Piled foundations are still considered appropriate based on review of the Geophysical Survey Report issued 2021.

12 CONSULTATION WITH RELEVANT AUTHORITIES

The list of project stakeholders in the corresponding Section 12.0 of the 2011 Bridge Options Report is still applicable, although please note the following clarifications:

- National Roads Authority is now Transport Infrastructure Ireland
- Roads Service Northern Ireland is now DfI Roads
- Inland Fisheries Ireland and the National Parks and Wildlife Service for protection of the aquatic and terrestrial environments in Ireland.

Both formal and informal consultations have been held to date with a number of authorities and affected private landowners.

The scheme will be subject to the planning permission process which includes a statutory consultation process with prescribed bodies. This will act as the primary medium for formal consultation with the majority of the relevant authorities. The remainder will be consulted with during preliminary design stage.

13 ENVIRONMENTAL CONSIDERATIONS

13.1 Environmental – Ecological Impacts

Habitats and Flora

The corresponding Section 13.1 of the 2011 Bridge Options report is still applicable.

Fauna

The corresponding Section 13.1 of the 2011 Bridge Options report is still applicable.

River Finn SAC / River Foyle and Tributaries SAC

The corresponding Section 13.1 of the 2011 Bridge Options report is still applicable, except for additions / clarifications below.

The primary environmental constraint at this location is the River Finn and floodplain. The bridge crosses the River Finn Special Area of Conservation (SAC) (Site Code: 002301) and the River Finn flows into the River Foyle and tributaries SAC (Site Code: UK0030320).

The River Finn flows east between Ballybofey and Stranorlar to the confluence with the River Mourne at Lifford. The SAC runs longitudinally along the River Finn and the Northern Ireland border. The Qualifying Interests (QI's) of the SAC which are within the zone of influence of the proposed works are Salmo Salar (Salmon) [1106] and Lutra lutra (Otter) [1335]. The main channel of the River Finn is a designated Salmonid Water and is considered one of Ireland's premier spring salmon waters.

The setback of the works should be sufficient to ensure there is no modification within a 5m riparian zone of the riverbanks during construction, and in-stream works should be avoided. The construction methodology will include a suite of specific measures to mitigate the risk of any untreated surface water run-off into the river.

A Natura Impact Statement will be prepared to assess the impacts on the site and prescribe appropriate measures to avoid any significant impact.

Bridge Options

The corresponding Section 13.1 of the 2011 Bridge Options report is still applicable with the updates discussed below.

The following are environmental considerations for Bridge Option 2:

- The proposed river piers are setback approx. 10m and 11m from the water's edge on the Donegal and Tyrone side respectively, which equates to a setback of approx. 8m and 4m from the crest of the riverbank/berm on the Donegal and Tyrone side respectively. The proposed clear spanning of the river and riverbank/berm should avoid any impacts to otter and salmon which are the selection features for the SAC. The construction works could be scheduled to avoid main salmon migratory periods and avoid water pollution into the river.
- The piers on the Donegal SAC floodplain are considered acceptable as these would not impact the otter or salmon. Whilst they would result in loss of wet grassland habitat, this is not a QI of the SAC.
- The bridge abutment embankments at each end of the bridge are beyond the extent of the SAC, although they would result in some loss of flood storage volume. This would be offset with a flood attenuation pond which would avoid any change to the hydrological regime of the floodplain.
- On the Donegal side, the river pier pile cap is setback approx. 6.6m from the crest of the riverbank. During construction, surface water run-off into the river would be avoided by establishing a 5m wide no working zone beyond the crest of the riverbank. Sheet piles would likely be needed to enable dewatering of the

excavation and to avoid surface water run-off into the river. Construction methodology could include measures to further mitigate the risk of surface run-off into the river.

- On the Tyrone side, the river pier pile cap is setback approx. 2.4m from the crest of the berm, which is insufficient to establish the ideal 5m wide no working zone beyond the berm crest. The bridge design has received planning approval on the side of the border therefore no changes are considered feasible. The construction methodology would need measures to mitigate the risk of surface run-off into the river. This could include installing sheet piles to act as a working boundary, and also to enable dewatering of the excavation and to catch any surface water run-off. The pile cap could cast directly against the sheet piles to minimise the working width needed for the works.
- The feasibility of monolithic pier to bridge deck connections will be explored at PDR stage and specified where appropriate. However, if bearings are considered necessary, then access arrangements need to be considered to enable bearing replacement every 30-50 years. The feasibility of the following bearing replacement access options will be considered at PDR stage (a) provide permanent access tracks over the floodplain and around the relevant piers to enable vehicles to transport the bearings and equipment, (b) provide permanent hand standing areas at ground level around each pier on to which equipment could be craned down from the bridge deck, or (c) construct temporary maintenance access tracks when bearing replacement works are necessary and remove afterwards.

13.2 Environmental – Archaeology and Cultural Heritage Impacts

The corresponding Section 13.2 of the 2011 Bridge Options report is still applicable.

Bridge Options

The corresponding Section 13.2 of the 2011 Bridge Options report is still applicable.

13.3 Environmental – Agricultural Impacts

The corresponding Section 13.3 of the 2011 Bridge Options report is still applicable.

13.4 Environmental – Socio-economic impacts

The corresponding Section 13.4 of the 2011 Bridge Options report is still applicable.

13.5 Environmental – Air Quality

The corresponding Section 13.5 of the 2011 Bridge Options report is still applicable.

13.6 Environmental – Noise and Vibration

The corresponding Section 13.6 of the 2011 Bridge Options report is still applicable.

13.7 Environmental – Landscape and Visual Impact

The corresponding Section 13.7 of the 2011 Bridge Options report is still applicable with the following additions:

- Any lighting over the bridge would need to be assessed, and in the event that it is needed, it should be minimised and sufficiently cowled to avoid any light spill into the river

13.8 Environmental – Construction Impacts

The corresponding Section 13.8 of the 2011 Bridge Options report is still applicable with the following clarifications:

- If there are no in-stream works, construction works may not need to be scheduled to avoid main salmon migratory periods provided there are measures to avoid impact on water quality, light spill and confining pile driving activities to daylight hours (as fish mostly run at night).
- The construction methodology should include a suite of specific measures to mitigate the risk of any untreated surface water run-off into the river.

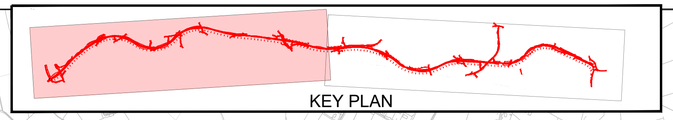
13.9 Environmental – Conclusion

The corresponding Section 13.9 of the 2011 Bridge Options report is still applicable

14 CONCLUSION AND RECOMMENDATIONS

The corresponding Section 14 of the 2011 Bridge Options report is still applicable. 'Option 2 – 8 Span Steel Composite' is still recommended as the preferred bridge option.

APPENDIX 1: SITE LOCATION MAP



UNDERBRIDGE - N14U094

OVERBRIDGE - N14O076

OVERBRIDGE - N14O051

OVERBRIDGE - N14O062

UNDERBRIDGE - N14U018

UNDERBRIDGE-N14U026

UNDERPASS-N14A027

UNDERBRIDGE-N14U044

UNDERPASS-N14P021

UNDERBRIDGE-N14U034

OVERBRIDGE - N140003

LEGEND:

OVERBRIDGE

UNDERBRIDGE

RIVERBRIDGE

UNDERPASS

FOOTBRIDGE

0.00km 0.5km 1km 1.5km 2km 2.5km

Scale Bar

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\\etramfs02\Projects\HalcrowBarry\Y16 Projects\Y16112 - TEN-T Priority Route provement Project Donegal\Civil-CAD\WIP\Prelim Design\STR\DWGs\TT_Y16112-BT-1A-SGN-S3-DR-Z-00001_Bridge_Locations_P04.dwg

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Notes

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Rev.	Date	Drawn	Description	Chk'd	Appr.
P04	15/10/21	DG	ISSUED FOR REVIEW	MC	ED
P03	30/09/21	LRB	REVIEW & COMMENTS	MC	ED
P02	04/05/21	LRB	ISSUED FOR INFORMATION	MC	ED
P01	25/02/21	LRB	ISSUE FOR REVIEW AND COMMENTS	EC	ED

Project Title: TEN-T Priority Route Improvement Project, Donegal
Section 3 - N14 Manorcunningham to Lifford/Strabane/A5 Link

Drawing Title: SECTION 3 - BRIDGE LOCATIONS SHEET 1 OF 2

Status: S0

Designed:	EC	Date: JUNE 2020	Model File Identifier: TT_Y16112-BT-1A-SGN-S3-DR-Z-00001_Bridge_Locations
Drawn:	LRB	Scale @ A1: 1:12500	Rev: P04
Approved:	ED	@ A3: 1:25000	File Identifier: Y16112-0000-002
Checked:	EC	Sheet: 1 OF 2	

KEY PLAN

UNDERPASS-N14A143
OVERBRIDGE-N14O161
RIVER BRIDGE-N14R144
UNDERPASS - N14P142
UNDERPASS-N14A167
OVERBRIDGE - N14O132
OVERBRIDGE - N14O108
UNDERPASS-N14A170
SWILLY BURN
RIVER BRIDGE - N14R114
UNDERBRIDGE-N14U146
FOOTBRIDGE-N14F174
UNDERBRIDGE-N14U140
RIVER BRIDGE N14R175
UNDERBRIDGE - N14U122

LEGEND:

- OVERBRIDGE
- UNDERBRIDGE
- RIVERBRIDGE
- UNDERPASS
- FOOTBRIDGE

0.00km 0.5km 1km 1.5km 2km 2.5km
Scale Bar

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Rev.	Date	Drawn	Description	Chk'd	Appr.
P04	14/10/21	DG	FOR REVIEW	MC	ED
P03	30/09/21	LRB	REVIEW & COMMENTS	MC	ED
P02	04/05/21	LRB	ISSUED FOR INFORMATION	MC	ED
P01	25/02/21	LRB	ISSUE FOR REVIEW AND COMMENTS	EC	ED

Project Title: TEN-T Priority Route Improvement Project, Donegal
Section 3 - N14 Manorcunningham to Lifford/Strabane/A5 Link

Drawing Title: SECTION 3 - BRIDGE LOCATIONS

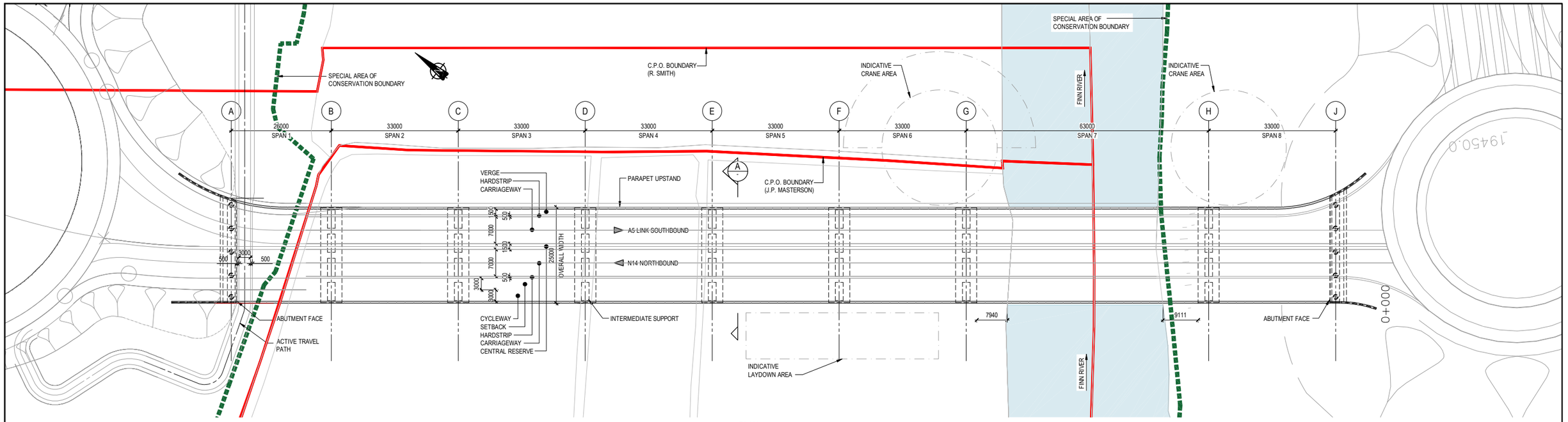
Status: S0

Designed:	EC	Date: JUNE 2020	Model File Identifier: TT_Y16112-BT-1A-SGN-S3-DR-Z-00001_Bridge_Locations
Drawn:	LRB	Scale @ A1: 1:12500	
Approved:	ED	@ A3: 1:25000	File Identifier: Y16112-0000-003
Checked:	EC	Sheet: 2 OF 2	

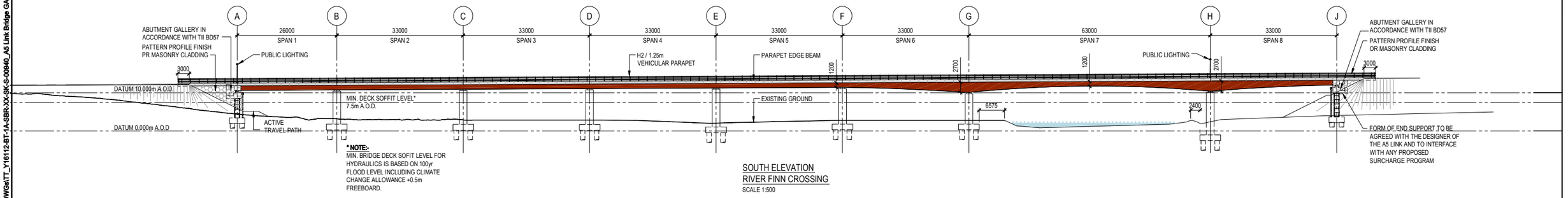
Rev: P04

APPENDIX 2: DRAWINGS AND IMAGES

The images in the corresponding Appendix 2 of the 2011 Bridge Options report are still applicable. The latest Bridge Option 2 general arrangement drawing is appended and has been updated based on the latest mainline alignment and road width.

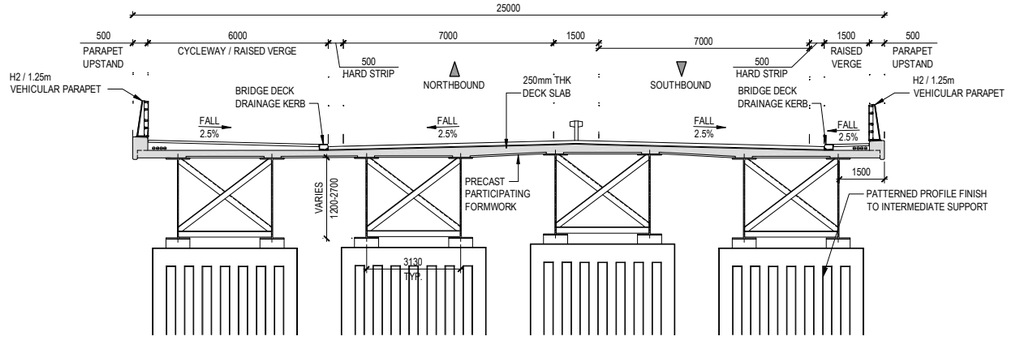


PLAN
RIVER FINN CROSSING
SCALE 1:500



*** NOTE:-**
MIN. BRIDGE DECK SOFIT LEVEL FOR HYDRAULICS IS BASED ON 100yr FLOOD LEVEL INCLUDING CLIMATE CHANGE ALLOWANCE +0.5m FREEBOARD.

SOUTH ELEVATION
RIVER FINN CROSSING
SCALE 1:500



SECTION A-A
RIVER FINN CROSSING
SCALE 1:100

NOTES:

1. LEVELS IN METERS TO MALIN HEAD
2. CO-ORDINATES TO IRISH TRANSVERSE MERCATOR (ITM)
3. WEATHERING STEEL TO BE CONSIDERED AND AGREED WITH AUTHORITY

LEGEND:

C.P.O. BOUNDAY

SPECIAL AREA OR CONSERVATION BOUNDARY (S.A.C.)

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Rev.	Date	Drawn	Description	Chk'd	Appr.
P01	10/11/2021	DG	FOR REVIEW	MC	WL

Project Title: TEN-T Priority Route Improvement Project, Donegal
Section 3 - N14 Manorcunningham to Lifford/Strabane/A5 Link

Drawing Title: N14-N15 TO A5 LINK - RIVER FINN CROSSING (REF N14R175) GENERAL ARRANGEMENT

Status: S3

Designed:	MC	Date: OCTOBER 2021	Model File Identifier: TT_Y16112-BT-1A-SBR-S3-SK-S-00940_Finn River Crossing GA.dwg
Drawn:	DG	Scale @ A1: AS SHOWN	
Approved:	WL	@ A3: AS SHOWN	File Identifier: TT_Y16112-BT-1A-SBR-S3-SK-S-00940
Checked:	MC	Sheet:	

Rev: P01

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APPENDIX 3: DESIGN OPTIONS STUDY – DESIGNER'S RISK ASSESSMENT

The corresponding Appendix 3 of the 2011 Bridge Options report is still applicable.