

A585 Windy Harbour to Skippool Improvement Scheme

TR010035

8.3 Draft Statement of Common Ground with the Environment Agency

APFP Regulation 5(2)(q)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed
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Infrastructure Planning

Planning Act 2008

The Infrastructure Planning
(Applications: Prescribed Forms and
Procedure) Regulations 2009

**A585 Windy Harbour to Skippool
Improvement Scheme**
Development Consent Order 201[]

**STATEMENT OF COMMON GROUND WITH THE
ENVIRONMENT AGENCY**

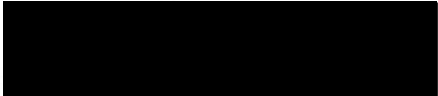
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STATEMENT OF COMMON GROUND

This Statement of Common Ground has been prepared and agreed by (1) Highways England Company Limited and (2) Environment Agency

Signed. 
Name (1) DAVID HOPKIN
Project Manager
On behalf of Highways England
Date:

Signed... 
Alexander Hazel
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On behalf of Environment Agency
Date: 11 July 2019

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1 INTRODUCTION

1.1 Purpose of this document

- 1.1.1 This Statement of Common Ground (SoCG) has been prepared in respect of the proposed A585 Windy Harbour to Skippool Improvement Scheme (the Application) made by Highways England to the Secretary of State for Transport (Secretary of State) for a Development Consent Order (the Order) under section 37 of the Planning Act 2008.
- 1.1.2 This SoCG does not seek to replicate information which is available elsewhere within the Application documents. All documents are available in the deposit locations and/or the Planning Inspectorate website.
- 1.1.3 The SoCG has been produced to confirm to the Examining Authority where agreement has been reached between the parties to it, and where agreement has not (yet) been reached. SoCGs are an established means in the planning process of allowing all parties to identify and so focus on specific issues that may need to be addressed during the examination.

1.2 Parties to this Statement of Common Ground

- 1.2.1 This SoCG has been prepared by (1) Highways England as the Applicant and (2) Environment Agency.
- 1.2.2 Highways England became the Government-owned Strategic Highways Company on 1 April 2015. It is the highway authority in England for the strategic road network and has the necessary powers and duties to operate, manage, maintain and enhance the network. Regulatory powers remain with the Secretary of State. The legislation establishing Highways England made provision for all legal rights and obligations of the Highways Agency, including in respect of the Application, to be conferred upon or assumed by Highways England.
- 1.2.3 The Environment Agency is a statutory environmental body responsible for regulating major industry and waste, treatment of contaminated land, water quality and resources, fisheries, inland river, estuary and harbour navigations, conservation and ecology. The Environment Agency is also responsible for managing the risk of flooding from main rivers, reservoirs, estuaries and the sea.

1.3 Terminology

- 1.3.1 In Section 3 of this SoCG, 'Not Agreed' indicates a final position. 'Under discussion' is used where points will be the subject of on-going discussion wherever possible to resolve, or refine, the extent of disagreement between the parties. 'Agreed' indicates where the issue has been resolved.
- 1.3.2 The SoCG only identifies issues which have been subject to further discussion to address the concerns of the Environment Agency. Where other issues of material relevance to the remit of the Environment Agency have not been included in the SoCG, it can be taken that they are satisfied with the details submitted as part of the DCO application and the approach taken in relation to those matters.

2 RECORD OF ENGAGEMENT

2.1.1 A summary of the meetings and correspondence that has taken place between Highways England and Environment Agency in relation to the Application is outlined in Table 2-1.

Table 2-1: Record of Engagement

Date	Form of correspondence	Key topics discussed and key outcomes (the topics should align with the Issues tables)
Autumn 2016	Email	Initial discussions / agreement regarding flows, climate change allowances and the use of UKCP09 for tidal modelling.
December 2017	Meeting	Discussion on the Scheme drainage design. Agreement reached that the design should comply with Design Manual for Roads and Bridges (DMRB) and CIRIA guidance.
April 2018	Meeting	Presentation of fluvial and tidal flood risk modelling results. Discussed construction phasing flood risk implications and established the need to mitigate any temporary increases in flood risk to third parties for all the events up to and including the 1% plus 30% for climate change.
July 2018	Email	Confirmation received from the Environment Agency that they were satisfied with the Water Framework Directive (WFD) scoping note. The note set out Zones of Influence, identified waterbodies with the potential to be affected and outlined Scheme activities which pose potential risks to WFD waterbodies.
July 2018	Email	Received first round of comments from the Environment Agency on the model, however, these were not formal comments.
August 2018	Email	Formal comments received on the Flood Risk Assessment (FRA) and hydraulic model of the Main Dyke. Some points of clarification raised which have since been addressed in the updated FRA (document reference TR010035/APP/5.2 – Rev 1).
October 2018	Email	Confirmation received that the Environment Agency is satisfied with the WFD Assessment (document reference TR010035/APP/5.5) and has no further comments to make.
October 2018	Meeting	Meeting held with the Environment Agency to close out / discuss outstanding comments on the FRA, protective provisions, the SoCG (this document) and permits.
December 2018	Email	Further information issued to the Environment Agency regarding the proposed configuration

Date	Form of correspondence	Key topics discussed and key outcomes (the topics should align with the Issues tables)
		and operation of a temporary floodplain compensation area.
January 2019	Email	Receipt of Relevant Representation and further detailed comments directly from the Environment Agency. Correspondence regarding UKCIP18 climate change projections.
March 2019	Email	Receipt of comments on drafts of the Consents and Agreements Position Statement (document reference TR010035/APP/5.5) and the draft SoCG.
March 2019	Email	Receipt of review comments for the enhanced tidal model of the Wyre Estuary
April 2019	Meeting	Meeting held with the Environment Agency to close out / discuss outstanding comments on the FRA, the SoCG (this document) and permits.
April 2019	Meeting	Teleconference to discuss disapplication, protective provisions and permitting.
April and May 2019	Email	Receipt of acceptance of the tidal model of the Wyre estuary, commitments added to the Outline Construction Environmental Action Plan (document reference TR010035/APP/7.2 – Rev 1) and Record of Environmental Action and Commitments (document reference TR010035/APP/7.3 – Rev 1) and supplementary information on the proposals for replacement of the Skippool Clough culvert (refer to Appendix B). Acceptance of the content and conclusions of the updated FRA (document reference TR010035/APP/5.2 – Rev 1).

2.1.2 It is agreed that this is an accurate record of the key meetings and consultation undertaken between (1) Highways England and (2) Environment Agency in relation to the issues addressed in this SoCG.

3 STATEMENTS OF COMMON GROUND

3.1 Environmental Statement (ES)

Matters of Agreement (including e.g. ES Chapter, Paragraph Reference and Sub-section)	Highways England in Agreement	Environment Agency in Agreement	Status
Scope of the Assessment			
<p>ES Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12), paragraph 12.3.1 outlines the scope of the assessment. The assessment covers the potential for the Scheme to affect baseline groundwater quality and flow regimes, surface water quality, flooding and the land drainage regime during both construction and operation.</p> <p><i>The Environment Agency agrees with the scope of the assessment.</i></p>	Agreed	Agreed - methodology in relation to the tidal model and sea level rise confirmed as acceptable – April 2019	AGREED
Assessment Methodology			
<p>ES Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12), Section 12.3, provides the methodology used to undertake the assessment on the water environment. The method adopted was taken from Volume 11, Section 3, Part 10 of the Design Manual for Roads and Bridges (DMRB) (HD45/09).</p> <p><i>The Environment Agency agrees that the methodology used to undertake the assessment is appropriate.</i></p>	Agreed	Agreed	AGREED

Matters of Agreement (including e.g. ES Chapter, Paragraph Reference and Sub-section)	Highways England in Agreement	Environment Agency in Agreement	Status
<p>ES Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12), Section 12.4 summarises the extent of the study areas used to undertake the assessments.</p> <p><i>The Environment Agency agrees the study areas used in the assessment to be appropriate.</i></p>	Agreed	Agreed	AGREED
Baseline Information			
<p>ES Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12), Section 12.4 outlines the existing baseline scenario and describes surface water features, including Main Rivers, statutory designated sites, field drains and ponds that are present in the study area. Aquifers, surface and groundwater quality, flood risk, highway drainage, abstractions and discharges within the study areas are also characterised.</p> <p><i>The Environment Agency agrees the baseline within Section 12.4 to be suitable to base the assessment upon.</i></p>	Agreed	Agreed – April 2019 - the ‘enhanced tidal model’ has been reviewed and accepted. An agreed UKCP18 allowance has been simulated in the approved model.	AGREED
Mitigation			
<p>ES Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12)</p>	Agreed	Agreed –January 2019 Relevant	AGREED

Matters of Agreement (including e.g. ES Chapter, Paragraph Reference and Sub-section)	Highways England in Agreement	Environment Agency in Agreement	Status
<p>states that an Outline Construction Environmental Management Plan (CEMP) has been prepared (document reference TR010035/APP/7.2 – Rev 2) for the Scheme together with a Record of Environmental Actions and Commitments (REAC) (document reference TR010035/APP/7.3). The Outline CEMP and REAC require a Pollution Control Plan to be prepared by the Contractor prior to the start of construction to safeguard the quality of surface water and groundwater and the downstream designated SPA / Ramsar site, drawing on best practices and relevant CIRIA publications. A draft Pollution Control Plan is appended to the Outline CEMP.</p> <p><i>The Environment Agency is content with the detail within the draft Pollution Control Plan.</i></p>		Representation	
<p>ES Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12) states that the Outline CEMP (document reference TR010035/APP/7.2 – Rev 2) and REAC (document reference TR010035/APP/7.3) require the Contractor to prepare a Dewatering Management Plan prior to construction. The Dewatering Management Plan would be prepared in consultation with the Environment Agency and would detail measures to limit the effects on groundwater levels and flows during construction. Contents would include:</p> <ul style="list-style-type: none"> • A method statement detailing dewatering techniques 	Agreed	Agreed – January 2019 Relevant Representation	AGREED

Matters of Agreement (including e.g. ES Chapter, Paragraph Reference and Sub-section)	Highways England in Agreement	Environment Agency in Agreement	Status
<p>and roles and responsibilities for this activity</p> <ul style="list-style-type: none"> • Opportunities to maximise reuse of dewatering effluent on site to reduce the amount of disposed effluent • Details of methods of disposal and a monitoring plan to ensure compliance with Environment Agency permits for dewatering and the subsequent discharge of dewatering effluents. <p><i>The Environment Agency agrees with the approach for the Contractor to develop this plan prior to construction commencing.</i></p>			
<p>ES Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12) states that the Outline CEMP – Section 1.2 (document reference TR010035/APP/7.2 – Rev 2) and REAC (document reference TR010035/APP/7.3 – Rev 2) require the Contractor to prepare an Emergency Spill Response Plan, Emergency Flood Response Plan and Construction Water Management Plan prior to construction commencing.</p> <p><i>The Environment Agency agrees with the approach for the Contractor to develop these plans prior to construction commencing.</i></p>	Agreed	Agreed – January 2019 Relevant Representation	AGREED

Matters of Agreement (including e.g. ES Chapter, Paragraph Reference and Sub-section)	Highways England in Agreement	Environment Agency in Agreement	Status
<p>ES Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12) states that modelling has identified a temporary increase in flood risk from the Main Dyke during construction of the Scheme, during larger (lower probability) flood events. This impact is limited to the duration when road embankments are being constructed prior to placement of the new open span crossing of the river and has been quantified using the hydraulic model for a range of flood events, the largest being the 1% annual exceedance probability flood event inclusive of a 30% allowance for climate change. Increases in flood extents and depths would occur in fields on the left bank of the Main Dyke behind Little Poulton Lane, also impacting Fouldrey Avenue. To mitigate this impact an area of land on the right bank of the Main Dyke immediately downstream of the A586 is included in the Scheme. This land would be temporarily lowered to provide floodplain storage and offset the temporary losses of storage caused by the road embankment during its construction. As detailed in the FRA (document reference TR010035/APP/5.2) a modelling assessment has proven the concept of this mitigation strategy in reducing flood depths and extents back towards baseline conditions. A commitment to provision of compensation storage is provided in the REAC (document reference TR010035/APP/7.3 – Rev 2). An engineering design for the floodplain compensation scheme would be developed at the detailed design stage</p>	<p>Agreed.</p>	<p>Agreed – April 2019</p>	<p>AGREED</p>

Matters of Agreement (including e.g. ES Chapter, Paragraph Reference and Sub-section)	Highways England in Agreement	Environment Agency in Agreement	Status
<p>in consultation with the Environment Agency. This would reflect the stipulated requirement to avoid any excavation or structures within 8m of the top of the bank of the Main Dyke to ensure EA access for maintenance.</p> <p>Permanent retention of the storage area is not required to manage the operational flood risk impacts of the Scheme and the land on which the storage area would be located is not available within the permanent land take limits of the Scheme.</p> <p><i>The Environment Agency agrees with the approach to temporary flood compensation and that permanent retention of this construction phase mitigation measures is not required.</i></p>			
<p>ES Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12) states that a drainage design has been developed for the operational Scheme that rapidly removes water and prevents flooding of the carriageway. The Scheme would discharge to the receiving water environment via existing and new outfalls. Attenuation would be provided to achieve agreed discharge rates, inclusive of an allowance for climate change resilience. The drainage design also includes appropriate measures to manage the quality of highway runoff. Measures include vortex oil and grit separators, vegetated treatment systems (constructed</p>	<p>Agreed</p>	<p>Agreed - April 2019</p> <p>It should be noted that drainage itself falls outside the remit of the Environment Agency, but as we have to consider Flood Risk Activity Permitting as there is an intrinsic link between drainage design and our</p>	<p>AGREED</p>

Matters of Agreement (including e.g. ES Chapter, Paragraph Reference and Sub-section)	Highways England in Agreement	Environment Agency in Agreement	Status
<p>wetlands) and shut off valves to contain pollutants in the event of an accidental spillage. Indicative drawings illustrating key elements of the drainage design are provided in Appendix E of the FRA (document reference TR010035/APP/5.2).</p> <p><i>The Environment Agency has reviewed and agrees with the Schemes drainage design, subject to confirmation of the type and location of proposed road drainage outfall structures in order to determine any future Flood Risk Activity Permitting requirements.</i></p>		regulatory activities.	
<p>The Environment Agency agrees with all mitigation measures regarding Road Drainage and the Water Environment outlined in the REAC (document reference TR010035/APP/7.3 – Rev 2).</p>	Agreed – April 2019	Agreed – April 2019	AGREED
Residual Effects and Conclusions			
<p>Construction: Surface and Groundwater Quality</p> <p>ES Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12), paragraph 12.7.1 states there is the potential for impacts on surface water and groundwater quality during construction as a result of works in / near watercourses or excavations, including for borrow pits, which may open</p>	Agreed	Agreed – January 2019 Relevant Representation	AGREED

Matters of Agreement (including e.g. ES Chapter, Paragraph Reference and Sub-section)	Highways England in Agreement	Environment Agency in Agreement	Status
<p>pollution pathways. However, with mitigation measures in place impacts are anticipated to be not significant.</p> <p><i>The Environment Agency agrees with the conclusions of the assessment outlining construction impacts on surface and groundwater quality.</i></p>			
<p>Construction: Flood Risk</p> <p>ES Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12) paragraphs 12.7.5 – 12.7.8 state that throughout the construction phase, the largest risk of flooding is linked to periods of heavy rainfall, when soils become saturated and runoff may pond in lower lying areas and collect in excavations. During the initial earthworks phase, topsoil and subsoil would be exposed and water-logging and ponding may occur more frequently. Additionally, there is a higher risk of entrained sediment in runoff, leading to blockage or reduced conveyance capacity in local drains / ditches / culverts and components of the existing highway drainage system. However, the application of good construction site management practices, would facilitate the early identification of any blocked drains or areas of rainfall ponding, and remedial action would be taken to minimise or prevent surface water flood events occurring.</p> <p>During more extreme events, which have a lower</p>	<p>Agreed -</p>	<p>Agreed – April 2019 Whilst we are agreed, the replacement culvert (refer to Appendix B) will still be subject the Environmental Permitting Regulations 2016 and further details will be required as part of a flood risk activity permit application</p>	<p>AGREED</p>

Matters of Agreement (including e.g. ES Chapter, Paragraph Reference and Sub-section)	Highways England in Agreement	Environment Agency in Agreement	Status
<p>likelihood of occurring during the relatively short duration of the construction period, the Main Dyke and the tidal Wyre could also pose a source of flood risk to localised areas of the Scheme. Construction works sites would be registered to receive Environment Agency Flood Warnings for the Wyre Estuary and weather reports and water levels in the Main Dyke would be monitored. Emergency Flood response protocols on receipt of an EA warning or severe weather report would be in place. In addition, land lowering would provide floodplain storage to offset the losses and resulting increase in temporary flood risk during the period prior to construction of the new open span crossing of the Main Dyke. Effects on flood risk during construction with mitigation measures in place were therefore assessed as not significant.</p> <p><i>The Environment Agency agrees with the assessment outlining construction impacts on flood risk.</i></p>			
<p>Construction: Groundwater / Hydrogeology</p> <p>ES Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12), paragraph 12.7.11 outlines that groundwater resources in the study area, in terms of quantity are of a medium value (the Glaciofluvial deposits are likely to be an aquifer that could provide water for industrial or agricultural use). At the cutting, the drainage required during construction</p>	Agreed	Agreed – January 2019 Relevant Representation	AGREED

Matters of Agreement (including e.g. ES Chapter, Paragraph Reference and Sub-section)	Highways England in Agreement	Environment Agency in Agreement	Status
<p>could lead to a localised draining of the saturated zone in the near surface Glaciofluvial deposits. However, the drawdown effects would be local to the cutting, with a partial loss of an aquifer but with no effects on groundwater dependent terrestrial ecosystems (GWDTE) or existing abstractions. The overall significance of the effect on the Glaciofluvial Deposits superficial aquifer was determined to be not significant.</p> <p>The Environment Agency agrees with the assessment outlining construction impacts on groundwater / hydrogeology.</p>			
<p><u>Construction: Abstractions and Discharges</u></p> <p>ES Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12), paragraph 12.7.13 states that there would be no reduction in flow quantity in the Main Dyke or the Wyre Estuary during the construction of the Scheme and existing flow corridors would be maintained. The assessment on these attributes were predicted to be not significant.</p> <p><i>The Environment Agency agrees with the assessment outlining construction impacts on abstractions and discharges.</i></p>	Agreed	Agreed - January 2019 Relevant Representation	AGREED

Matters of Agreement (including e.g. ES Chapter, Paragraph Reference and Sub-section)	Highways England in Agreement	Environment Agency in Agreement	Status
<p><u>Operation: Water Quality</u></p> <p>ES Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12), paragraph 12.7.15 states that the pollution potential of the Scheme has been tested, during both routine runoff and accidental spillage scenarios, using HAWRAT. The findings, detailed in the drainage strategy, which is appended to the FRA (document reference TR010035/APP/5.2 – Rev 1), informed the drainage design. The design would include treatment measures (described in paragraph 12.6.7). With these measures in place residual effects on water quality during operation is considered to be not significant.</p> <p><i>The Environment Agency agrees with the assessment outlining operational impacts on water quality.</i></p>	<p>Agreed</p>	<p>Agreed - January 2019 Relevant Representation</p>	<p>AGREED</p>
<p><u>Operation: Flood Risk</u></p> <p>ES Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12) paragraphs 12.7.16 – 12.7.26 outlines that flood risk from Main Rivers has been assessed. Hydraulic modelling results show that, by removing an existing restriction to flow (a twin culvert) on the Main Dyke, the Scheme provides a flood risk benefit for areas upstream of the A585 crossing of the river. Baseline flood extents and</p>	<p>Agreed (April 2019) – tidal model reviewed and accepted by the EA.</p>	<p>Agreed - April 2019</p>	<p>AGREED</p>

Matters of Agreement (including e.g. ES Chapter, Paragraph Reference and Sub-section)	Highways England in Agreement	Environment Agency in Agreement	Status
<p>depths are reduced. This is therefore considered to be a significant positive effect. Downstream of the crossing in channel flood levels are predicted to increase, but with no detriment to baseline flood extents or third-party flood risk.</p> <p>Flood risk to the Scheme from tidal inundation has also been assessed. Two flood events have been modelled (the 0.5% annual chance and the 0.5% annual chance inclusive of an allowance for climate change) to define baseline flooding and any effects of the Scheme. A sensitivity test has also been undertaken to determine the risk of flooding under the UKCIP18 'worst case' scenario using an agreed methodology.</p> <p>When climate change allowance is included over the lifetime of the Scheme, model results predict that the Scheme increases baseline flood depths locally. Although baseline flood depths are increased, changes in flood extents are negligible due to the nature of the topography and the well-defined tidal floodplain. Also, the increase in the context of baseline floodwater depths of up to 1m is relatively small. However, this was considered to result in a significant effect.</p> <p><i>The Environment Agency agrees with the assessment outlining operational impacts on flood risk.</i></p>			
Operation: Groundwater / Hydrogeology	Agreed	Agreed – January 2019	AGREED

Matters of Agreement (including e.g. ES Chapter, Paragraph Reference and Sub-section)	Highways England in Agreement	Environment Agency in Agreement	Status
<p>ES Chapter 12: Road Drainage and the Water Environment (document reference TR010035/APP/6.12) paragraphs 12.7.27 – 12.7.32 states that groundwater resources supported by the Glaciofluvial deposits have been classified as having a medium value. This is because the aquifer could provide water for industrial or agricultural use. At the proposed cutting the drainage required could lead to a localised draining of the saturated zone in the near surface. The drawdown effects would be local to the proposed cutting and the magnitude of change is assessed as minor to moderate adverse (partial loss of an aquifer but with no effects on GWDTEs or existing abstractions).</p> <p>The Environment Agency agrees with the assessment outlining operational impacts on groundwater / hydrogeology.</p>		Relevant Representation	

3.2 FRA

Matters of Agreement (including e.g. Chapter, Paragraph Reference and Sub-section)	Highways England in Agreement	Environment Agency in Agreement	Status
<p>Section 6 of the FRA (document reference TR010035/APP/5.2 – Rev 1) outlines the assessment methodology adopted to determine fluvial and tidal flood risk (including hydrology, baseline fluvial hydraulic modelling, baseline tidal modelling and option modelling</p>	Agreed	Agreed (May 2019)	AGREED

Matters of Agreement (including e.g. Chapter, Paragraph Reference and Sub-section)	Highways England in Agreement	Environment Agency in Agreement	Status
<p>for both fluvial and tidal models).</p> <p><i>The Environment Agency agrees with the methodology used together with the geographical extent of the flood models.</i></p>			
<p>Section 7.1 of the FRA (document reference TR010035/APP/5.2 – Rev 1) presents the modelling results for fluvial flooding. Results demonstrate that although the Scheme is proposed in an area currently predicted to be at risk of flooding, by increasing the capacity of the existing A585 crossing (at Skippool Bridge) as part of the Scheme proposals, upstream flood extents are reduced. Therefore, the Scheme is not at risk of flooding for any of the design events assessed during operation. Downstream, there are some increases in flood levels (not extents) caused by flow in the Main Dyke not being able to discharge through the Skippool tidal gates efficiently.</p> <p>Given that the implementation of the Scheme results in a reduction in baseline flood extents, it is not considered that, based on the model results, additional floodplain compensation measures would be required once the Scheme is fully constructed. However, some temporary mitigation would be required during the construction period.</p> <p><i>The Environment Agency agrees with the results</i></p>	<p>Agreed</p>	<p>Agreed</p>	<p>AGREED</p>

Matters of Agreement (including e.g. Chapter, Paragraph Reference and Sub-section)	Highways England in Agreement	Environment Agency in Agreement	Status
<i>regarding fluvial flooding.</i>			
<p>Due to design constraints on the vertical alignment of the road at the new Main Dyke bridge location the soffit level of the new structure would not be above the 1% AEP plus 70% climate change flood level (soffit level – 5.02mAOD flood level – 5.20mAOD).</p> <p><i>The Environment Agency confirm this is acceptable.</i></p>	Agreed	Agreed - October 2018	AGREED
<p>Section 7.2 of the FRA (document reference TR010035/APP/5.2 – Rev 1) presents the modelling results for the impact of tide locking on fluvial flood levels. The results indicate that the Scheme is not at risk of fluvial flooding during any of the modelled tide locked scenarios. The flood waters do not overtop the proposed Scheme embankment or the proposed Scheme crossing of the Main Dyke.</p> <p><i>The Environment Agency agrees with the results regarding the impact of tide locking on fluvial flood levels.</i></p>	Agreed	Agreed	AGREED
<p>Section 7.3 of the FRA (document reference TR010035/APP/5.2 – Rev 1) presents the modelling results for tidal flood risk. This section states that baseline modelled flood extents demonstrate that the Scheme is at risk of flooding immediately to the east of Skippool Junction during the 0.5% AEP event, particularly when an allowance for climate change is considered. Constraints to</p>	Agreed	Agreed – June 2019 (following further update to the FWEP as Appendix Q of the Outline Construction Environmental Management Plan	AGREED

Matters of Agreement (including e.g. Chapter, Paragraph Reference and Sub-section)	Highways England in Agreement	Environment Agency in Agreement	Status
<p>the vertical alignment of the Scheme at this location, where the Scheme ties into the existing road network, prevent wholly mitigating this risk, which would therefore be managed by the Scheme operator using warning signage and road closures during extreme events.</p> <p><i>The Environment Agency agrees that the degree of tidal flood risk to the Scheme, and proposals for managing this risk are acceptable.</i></p>		<p>(CEMP) (document reference TR010035/APP/7.2 – Rev 2)).</p>	
<p>Difference grids which show the impact of the Scheme on flood extents show that the Scheme increases flood depths on the Horsebridge Dyke during the 0.5% AEP. However, less floodplain upstream on the Main Dyke is predicted in the option model.</p> <p>During the 0.5% AEP inclusive of an allowance for climate change, the impacts of the Scheme are more widespread; flood depths on the Main Dyke and the Horsebridge Dyke are increased. Although depths are increased, changes in flood extents are negligible.</p> <p>The key mechanisms driving the changes in flood depths along the Main Dyke are an increase in flows through the widened A585 bridge and, during the 0.5% AEP inclusive of an allowance for climate change event, the expansion of baseline flooding into the area in which the Scheme embankment is proposed with the resulting displacement of floodwater.</p>	<p>Agreed</p>	<p>Agreed</p>	<p>AGREED</p>

Matters of Agreement (including e.g. Chapter, Paragraph Reference and Sub-section)	Highways England in Agreement	Environment Agency in Agreement	Status
<p><i>The Environment Agency agrees with the results regarding tidal flood risk to third party lands.</i></p>			
<p>Section 7.5 of the FRA (document reference TR010035/APP/5.2 – Rev 1) presents the modelling results for the construction sequence.</p> <p>The Environment Agency was consulted on the flood risk associated with the construction phase /sequencing and confirmed that mitigation would be required to ensure that increases in flood risk to third parties were minimised for all events up to and including the 1% AEP plus 30% for climate change flood event.</p> <p><i>The Environment Agency agrees with the above.</i></p>	Agreed	Agreed – January 2019 Relevant Representation	AGREED
<p>Section 9 of the FRA (document reference TR010035/APP/5.2 – Rev 1) presents the flood risk management measures.</p> <p><i>The Environment Agency agrees with the flood risk management measures outlined.</i></p> <p>Section 10 of the FRA (document reference TR010035/APP/5.2 – Rev 1) provides the summary and conclusions drawn in the FRA. It concludes that the residual flood risks both to third parties as a result of the Scheme construction, and to the Scheme itself can be</p>	Agreed July 2019 - following agreement of a Requirement in relation to a compensatory flood storage scheme necessary to manage flood risk during construction.	Agreed – July 2019	AGREED

Matters of Agreement (including e.g. Chapter, Paragraph Reference and Sub-section)	Highways England in Agreement	Environment Agency in Agreement	Status
<p>appropriately managed.</p> <p><i>The Environment Agency agrees with the summary and conclusions of the FRA.</i></p>			

3.3 WFD Assessment

Matters of Agreement	Highways England in Agreement	Environment Agency in Agreement	Status
<p><i>The Environment Agency agrees with the methodology, assessment and conclusion 'It has been concluded that the Scheme would not compromise the current WFD status nor the achievement of set WFD objectives for waterbodies within the study area' outlined within the Water Framework Directive Assessment (document reference TR010035/APP/5.6) undertaken for the Scheme.</i></p>	Agreed	Agreed (agreed January 2019 – Relevant Representation)	AGREED

3.4 Draft Development Consent Order (DCO)

Matters of Agreement	Highways England in Agreement	Environment Agency in Agreement	Status
<p><i>The Environment Agency has reviewed the draft DCO (document reference TR010035/APP/3.1) including all Articles and Requirements and agrees with its contents.</i></p>	Agreed	Agreed – July 2019. The Environment Agency have agreed the wording of a Requirement in relation to a compensatory flood storage scheme necessary to address flood risk	AGREED

Matters of Agreement	Highways England in Agreement	Environment Agency in Agreement	Status
<i>The Environment Agency and Highways England agree that no Environmental Consents or Permits will be disapplied. Therefore, the protective provisions included in Schedule 10, Part 3 of the draft DCO (document reference TR010035/APP/3.1) will be removed.</i>	Agreed	Agreed	AGREED

Appendix A – Records of Consultation

Environment Agency Comments (NO/2018/111289/01-L01) 7 December 2018

Environment Agency Relevant Representation (NO/2019/111452/01-L01) 24 Jan 2018

Further Detailed Comments (EA Ref NO/2018/111345/02-L02) 01 Feb 2018

Response to Updated Consents and Agreements Position Statement (EA Ref NO/2018/111289/02/L01) 22 March 19

Enhanced Tidal Model Review Comments (EA Ref NO/2019/111541/01/L01) 22 March 19

Response on Horsebridge Dyke culvert replacement, engineering section drawings and Potential Flood Risk Activities (EA Ref NO/2019/111597/01/L01) 28 March 2019

Response on Summary Table of all EA comments and HE Responses (EA Ref NO/2019/111594/01/L01) 29 March 2019

Comments on Tidal Model Results Memo and FRA Modelling Annex (EA Ref NO/2019/111541/01/L03) 3 April 2019

UKCP18 Advice ((EA Ref NO/2019/111540/01/L02) 3 April 2019

Email Correspondence – various dates April 2019

Comments on Updated Tidal Model (EA Ref NO/2019/111541/02/L02) 26 April 2019

Review of Revised FRA (EA Ref NO/2019/111723/01-L01) 15 May 2019

Note: The comments and responses are tabulated in chronological order in the table below. As a result, some responses are superseded by more recently dated table entries.

Issue/Topic	EA Comments	Highways England Response / Plan of Action
EA Comments Received 7 December 2018 (NO/2018/11289/01-L01)		
Draft Consents and Agreements Position Statement	We are generally satisfied with the content of the report and the approach taken insofar as it relates to our remit, but some of the details are not necessarily accurate. These would ideally be discussed with the Environment Agency, as indicated.	Noted – no further response required.
Environmental permitting – flood risk activities	<p>Table 4-1, point 1 – This discusses the need to acquire Environmental Permits for Flood Risk Activities (FRAPs) from the Environment Agency. Although the table does state that a meeting with the Environment Agency is being sought to discuss permitting, we wish to point out the range of flood risk activities for which an Environmental Permit are required. It is the responsibility of the applicant to identify the flood risk activities they will be under taking across the site and apply for the necessary Environmental Permits.</p> <p>The Environmental Permitting (England and Wales) Regulations 2016 require a permit to be obtained for any activities which will take place:</p> <ul style="list-style-type: none"> <input type="checkbox"/> on or within 8 metres of a main river (16 metres if tidal) <input type="checkbox"/> on or within 8 metres of a flood defence structure or culvert (16 metres if tidal) <input type="checkbox"/> on or within 16 metres of a sea defence <input type="checkbox"/> involving quarrying or excavation within 16 metres of any main river, flood defence (including a remote defence) or culvert 	<p>Noted – Table 4-1 in the Consents and Agreements Position Statement (document reference TR010035/APP/5.5) has been updated to reflect when a FRAP is required.</p> <p>Arcadis has submitted a drawing to show potential flood risk activities within 8m and 16m of EA Main Rivers.</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>□ in a floodplain more than 8 metres from the river bank, culvert or flood defence structure (16 metres if it's a tidal main river) and you don't already have planning permission. For further guidance please visit https://www.gov.uk/guidance/flood-risk-activitiesenvironmental-permits.</p> <p>We advise that you consult with us at the earliest opportunity. The developer can contact us at cmbln-c-pso@environment-agency.gov.uk to apply for an Environmental Permit.</p> <p>An additional a minor point, but it has been noted in Table 4-1 (point 1), incorrectly refers to Horsebridge Dyke as 'Horsebridge Dyke (Skipool Creek)'. The names of the Main Rivers are Horsebridge Dyke and Main Dyke (Skipool Creek).</p>	
Ecology	<p>We have no comments regarding issues within our remit, but please note that the works taking place at the Skipool Bridge end of the scheme could require a HRA/CRoW assessment due to their proximity to the designated sites (SPA/SSSI/Ramsar). This could require formal consultation with our Defra partners, Natural England.</p>	<p>Noted. A HRA has been submitted to support the application (document reference TR010035/APP/5.4). There has been extensive consultation with Natural England regarding the HRA.</p>
Groundwater	<p>In summary, the right issues have been identified, but some of the details are not necessarily accurate. These would ideally be discussed with the Environment Agency as indicated.</p>	

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>Table 4-1, point 3, Details – Abstractions are required for quantities greater than 20m³/day, not less than 20 as stated.</p> <p>Table 4-1, point 4 – A permit for temporary dewatering and subsequent discharge may be required. It is not possible to summarise this without precise details of the activities. Full details of the requirements are here: https://www.gov.uk/government/publications/temporary-dewatering-fromexcavations-to-surface-water/temporary-dewatering-from-excavations-to-surfacewater https://www.gov.uk/guidance/water-management-abstract-or-impound-water</p>	<p>Updated in the Position Statement (document reference TR010035/APP/5.5).</p> <p>Updated in the Position Statement (document reference TR010035/APP/5.5). This detail will not be available until the detailed design stage once a Contractor has been appointed.</p>
Environmental permitting – water discharge activities	Table 4-1 mentions to the requirement for Environmental Permits for water discharge activities following dewatering and trade effluent consents. However, discharges from welfare facilities, e.g. kitchen and toilets, may be considered as domestic sewage in nature, and so could potentially require an Environmental Permit for surface water or groundwater activities, depending on the volume and receiving environment.	Updated and clarified in the Position Statement (document reference TR010035/APP/5.5).
Environmental permitting – waste	<p>Table 4-1, point 4 – The fact you are proposing to dewater excavation material gives reason to believe you may be using the waste on site. We note that you propose to have a meeting with us to discuss the de-watering of this material, so this might be the time to explore your intentions for this waste.</p> <p>Table 4-1, point 12 – There is the possibility that waste material might be used in construction and there is</p>	<p>Updated and clarified in the Position Statement (document reference TR010035/APP/5.5).</p> <p>Once a Contractor has been appointed and the detailed design stage has commenced</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>reference made to get various contractors to register any relevant exemptions, but there have been no discussions with us to date. Before any such discussions take place, you would need to calculate what sort of quantity of waste and waste types you would be considering, as the amounts you wish to use may be outside the limits of the exemptions, in which case, you would need to consider applying for a permit and this might considerably slow things down.</p>	<p>calculations regarding quantities and waste types to be reused will be calculated and discussed with the Environment Agency.</p>
	<p>Table 4-1, point 6 – It has not been stated what will happen with the waste from the demolition of the two buildings referred to.</p>	<p>Updated and clarified in the Position Statement (document reference TR010035/APP/5.5).</p>
	<p>Table 4-1, point 10 – This refers to mobile plant licences which it is expected contractors to get to cover crushing activities. You may also need to speak to local authorities to cover this activity, as it will need a local authority authorisation (T7) as well as an exemption from the Environment Agency (T5). Again, it will be necessary to ensure quantities, etc, comply with the exemption.</p>	<p>Updated and clarified in the Position Statement (document reference TR010035/APP/5.5).</p>
	<p>We wish to clarify that while it might be acceptable for material to be dug out of borrow pits and used on the development (if it is clean and uncontaminated), any dug pits must not then be used for the purpose of waste disposal.</p>	<p>Noted. The borrow pits would not be used for the purpose of waste disposal. A note of this will be included within the Record of Actions and Commitments (REAC) (document reference TR010035/APP/7.3) appended to the Outline Construction Environmental Management Plan (CEMP) (document reference TR010035/APP/7.2). Proposed to be submitted at Deadline 1 with tracked changes.</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
Environmental permitting – advice	<p>For further guidance please visit https://www.gov.uk/guidance/check-if-you-need-anenvironmental-permit or contact our National Customer Contact Centre by telephone (03702 422 549) or by email (enquiries@environment-agency.gov.uk).</p> <p>For pre-application permitting advice please visit GOV.UK website and complete the form: https://www.gov.uk/government/publications/environmental-permit-preapplication-advice-form</p>	Noted – no further response required.
Draft Protective Provision	<p>Our Legal Services have considered the draft Protective Provision, and it is not clear what the purpose of the Protective Provision is in this case, as you are not seeking to disapply any permits/consents within our remit, that we have been made aware of.</p>	The Project Team is seeking a meeting with the Environment Agency to discuss the Protective Provisions in the dDCO (document reference TR010035/APP/3.1).
	<p>We consider that including the Protective Provision in the Development Consent Order (DCO) is not therefore the best way forward. If a Protective Provision is included in the DCO it would mean you / the developer would have to apply through both the Protective Provision and the Environmental Permitting Regulations process.</p> <p>If the you/the developer is still seeking to include the Protective Provision, please clarify the purpose of it if Environment Agency permits are not being disapplied. Your clients solicitors may wish to discuss this with our Legal Services if you have any queries.</p>	The Project Team is seeking a meeting with the Environment Agency to discuss the Protective Provisions in the dDCO (document reference TR010035/APP/3.1).
Additional comments	This response is based on the information you have made available at this time. It is based on current national	Noted – no further response required.

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>planning policy, associated legislation and environmental data / information. If any of these elements change in the future then we may need to reconsider our position.</p> <p>If you require further planning advice in relation to your proposals we may be able to provide this through the existing agreement. We will forward to you in due course the agreement costs to date and address whether additional hours need to be added on to the agreement to ensure there are no delays.</p>	<p>Noted – no further response required.</p>
<p>Relevant Representation NO/2019/111452/01-L01 24th January 2019</p>		
<p>Flood Risk</p>	<p>The scheme is partly located within Flood Zone 3 (high probability of flooding) on the Environment Agency Flood Map for Planning.</p> <p>The submitted Flood Risk Assessment (document reference TR010035/APP/5.2, Rev 0, dated October 2018) considers this development to be ‘essential infrastructure’. According to the National Policy Statement for National Networks, applications proposing essential infrastructure within Flood Zone 3, must demonstrate that the Exception Test is passed. This includes the requirement for the development to be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, reducing flood risk overall.</p> <p>We are pleased that some of the concerns and issues raised by the Environment Agency during pre-application consultation have been considered and addressed.</p>	<p>Discussions with the Environment Agency are on-going with regard to flood mitigation measures to reach a position of agreement.</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>However, there are aspects relating to the assessment and mitigation of flood risk impacts that will require further consideration and remain of concern to us.</p> <p>If these concerns are overcome, we consider it is likely to be necessary to include a specific requirement within the DCO to ensure that the final agreed flood mitigation measures will be implemented.</p> <p>We have engaged with Highways England's consultants on several occasions from an early stage in the process to discuss flood risk in particular. However, there are still some issues relating flood risk that will need to be addressed and further detailed discussion and consultation with us will be required.</p>	
<p>Impacts on third party flood risk – fluvial flooding</p> <p>Compensation floodplain storage, REF to works plan HE548643-ARC-HGN-SZ-ZZ0-DR-D-046</p>	<p>The proposed compensatory storage areas that are proposed to mitigate for the temporary increase in flood risk from the Main Dyke during construction of the Scheme will need be developed into detailed design. The compensatory storage area has only been modelled at present and as yet, to the best of our knowledge has not been developed into detailed design.</p> <p>We will need to see detailed design proposals that we could agree will function as intended and that would allow us to permit the works under the Environmental Permitting Regulations.</p>	<p>The Scheme is not currently at detailed design stage and a Contractor is not on board at this stage. A recommendation has been added to the revised FRA to ensure that detailed design proposals for the compensation areas are agreed with the Environment Agency by the Contractor during the next stage of the Scheme. This commitment will be secured through inclusion in the REAC(document reference TR010035/APP/7.3).</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
Replacement culvert – Horsebridge Dyke	<p>Clarification on the proposed replacement Horsebridge Dyke culvert needs to be provided and design of any replacement agreed with us.</p> <p>If a FRAP for this structure is to be dis-applied, detailed info needs to be submitted with the DCO application. We do not consider it to be the best approach to go down the disapplication route.</p>	<p>Further detail on the Skippool Clough (Horsebridge Dyke) culvert is included in Section 5.3 of the modelling annex submitted to the Environment Agency – 15 February 2019.</p> <p>The Project Team is seeking a meeting with the Environment Agency to discuss permitting. It is unlikely anything could be dis-applied without a Contactor on board.</p>
Modelling and investigation	<p>We have not been given the opportunity to review the ‘enhancements’ to the tidal model, but we are aware that Highways England’s consultant is currently working on this.</p> <p>An Environment Agency 2D only model of the River Wyre Estuary has been enhanced and used to assess both the risk of tidal flooding to the scheme and any change in tidal flood risk to third parties. On the basis that we have not had been provided with the opportunity to review the enhanced model, we have to take the findings and assumptions made in the report at face value.</p> <p>As such, we need to be provided with opportunity to review the enhanced tidal modelling that has been undertaken prior deciding the application.</p>	<p>The tidal model has been sent to the Environment Agency (February 2019).</p>
Climate Change - Allowances	<p>We consider that climate change allowances should be revisited to ensure that a suitable and up to date evidence base is used in determining whether the development will be safe for its lifetime and to inform detailed design of the project. The following issues will need to be addressed:</p>	<p>An additional UKCP18 sensitivity test has been run in the tidal model. Discussions with the EA informed the methodology that has been followed, which is documented in a</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<ul style="list-style-type: none"> □ The allowances need updating to reflect UK Climate Projections 18 (UKCP18), which has recently been published. □ The H++ scenario should be considered and assessed given the safety critical aspects of the scheme. □ In relation to the above, the lifetime of the development should be clearly stated. <p>In addition to this, since the modelling for this project was undertaken, the UKCP18 have been released. The new guidance that has been released suggests that those proposing new infrastructure projects with a lifetime of at least 100 years should assess the impact of both the current allowance in 'Flood risk assessments: climate change allowances' and the 95th percentile of UKCP18 'RCP 8.5' scenario (high emissions scenario) standard method sea level rise projections of UKCP18. The sea level rise allowances beyond 2100 should be found by extrapolating the UKCP18 dataset.</p> <p>The above is in line with National Policy Statement for National Networks 4.42 which states, "The applicant should take into account the potential impacts of climate change using the latest UK Climate Projections available at the time and ensure any environment statement that is prepared identifies appropriate mitigation or adaptation measures. This should cover the estimated lifetime of the new infrastructure. Should a new set of UK Climate Projections become available after the preparation of any</p>	<p>UKCP18 Memo, submitted on the 6 February 2019.</p> <p>Text regarding the potential lifetime of the development has been added to the updated FRA and will be clarified in the meeting that the Project Team is seeking to arrange with the Environment Agency.</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>environment statement, the Examining Authority should consider whether they need to request additional information from the applicant.”</p> <p>The H++ allowances apply when assessing flood risk for developments that are very sensitive to flood risk and with lifetimes beyond the end of the century, for example, infrastructure projects or developments that significantly change existing settlement patterns. Due to the nature of this proposal, we therefore also suggest that the H scenario is assessed, as set out in the guidance. This scenario will be useful to establish if there are any cliff edge effects, where the management of the infrastructure may need to change, or a managed adaptive approach be put in place. This is needed in order for us to ensure that this infrastructure will be safe for its lifetime, which is a key part of passing the Exception Test.</p> <p>Section 7.1.4 of the submitted FRA states, “An assessment was carried out to ensure that the proposed development was not at increased risk of flooding over its lifetime due to climate change, this used the 3 climate change scenarios as described in Section 3 for the 1% AEP event: 30%, 35% and 70% fluvial inflows”. The use of the 70% upper Climate Change Allowance for North West River Basin District to cater for 2080’s (2070-2115) scenario therefore suggests the anticipated lifespan of scheme is minimum of 100 years. However, it is not clear what the proposed lifetime of this scheme is, as it is not explicitly stated.</p>	

Issue/Topic	EA Comments	Highways England Response / Plan of Action
Environmental permitting – flood risk activities	<p>Outside of the DCO process, environmental permits will be required for certain elements of this development where flood risk activities will take place:</p> <ul style="list-style-type: none"> <input type="checkbox"/> on or within 8 metres of a main river (16 metres if tidal) <input type="checkbox"/> on or within 8 metres of a flood defence structure or culverted main river (16 metres if tidal) <input type="checkbox"/> on or within 16 metres of a sea defence <input type="checkbox"/> involving quarrying or excavation within 16 metres of any main river, flood defence (including a remote defence) or culvert <input type="checkbox"/> in a floodplain more than 8 metres from the river bank, culvert or flood defence structure (16 metres if it's a tidal main river) and without having planning consent in place. <p>In particular, flood risk activity permits will be required several permanent structures within 8 metres of the main rivers, Horsebridge Dyke and Skippool Creek (Main Dyke): the replacement Horsebridge Dyke culvert, replacement Skippool Bridge and surface water outfalls.</p> <p>Permits will also be required for any other flood risk activities which meet the above criteria for any temporary works or structures during construction.</p>	<p>Flood risk activity permits for all relevant temporary (construction stage) activities and for permanent works would be prepared in consultation with the Environment Agency by the Contractor during the detailed design stage of the Scheme.</p> <p>The Project Team is seeking a meeting with the Environment Agency to discuss permitting.</p>
Contaminated land	<p>We have reviewed the submitted information, including ES Chapter 13: Geology and Contaminated Land, and we are satisfied with the details covered in relation to land contamination that may impact controlled waters.</p>	<p>Noted – no further response required.</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>A review of our mapping and information confirms that there are no areas that are classified as contaminated land, or any indication that landfills or contaminated made ground exists within the DCO boundary.</p> <p>We would agree that there is a potential for some of the development to be on moss that is known to be methane generating.</p> <p>We would agree with the recommendation that no actual monitoring of the development is necessary, as the values of lead, copper and zinc in ground-waters are regarded as background.</p> <p>Insofar as it relates to impacts on controlled waters from land contamination, there is no requirement for any further investigation or reporting upon this development. However we are supportive of the inclusion of Requirement 6 - Contaminated land and groundwater, within the draft DCO, to manage unexpected land contamination.</p>	
Groundwater	<p>We have reviewed the submitted information, including ES Chapter 13: Geology and Contaminated Land and Chapter 12: Road Drainage and the Water Environment, and we are satisfied with the details covered in relation to groundwater.</p> <p>Most of the groundwater related activities are covered by permits that are required outside of the DCO process. It is the Highways Authority who have the primary responsibility to control the discharge of highways run-off, and include adequate pollution prevention techniques. However,</p>	Noted. The Project Team is seeking a meeting with the Environment Agency to discuss permitting.

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>infiltration of run-off to ground is not a major component of the scheme with the water quality impact assessments focussing on surface waters.</p> <p>The development is anticipated to be subject to passive de-watering in the Lodge Lane crossing. The potential impacts of this have been quantified within ES Chapter 12. The outcomes of this are noted, and there are no further issues to raise on this matter.</p> <p>We welcome the inclusion of Requirement 4 – Construction and Handover Environmental Management Plan and also Requirement 6 - Contaminated land and groundwater of the draft DCO, to manage unexpected land and water contamination.</p> <p>Environmental permits for discharging treated trade/sewage effluent to ground waters may be required for welfare facilities during the construction phase.</p>	
Water quality	<p>We have considered the potential impacts on surface water quality and we are satisfied with the details covered in the ES Chapter 12: Road Drainage and the Water Environment. Provided the pollution prevention measures are implemented as proposed we have no concerns.</p> <p>We have also reviewed the Outline Construction Environmental Management Plan and we have no issues to raise in this regard. We support the inclusion of Requirement 4 – Construction and handover environmental</p>	Noted. The Project Team is seeking a meeting with the Environment Agency to discuss permitting.

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>plan and we are happy to review details regarding water quality in relation to the discharge of this requirement.</p> <p>Environmental permits for discharging treated trade/sewage effluent to surface waters may be required for welfare facilities during the construction phase.</p>	
Aquatic environment – ecology and geomorphology	<p>We have reviewed the submitted information, including ES Chapter 8: Biodiversity and the Water Framework Directive Assessment (Volume 5), and we are satisfied with the details covered in relation to aquatic ecology and geomorphology.</p> <p>We welcome the inclusion of Requirement 7 – Protected species, within the draft DCO, which allows for the identification and appropriate protection of protected species.</p>	Noted – no further response required.
Environmental Permitting – Waste	<p>We have reviewed the submitted information, including ES Chapter 14: Materials, and our comments previously given to Highways England’s consultants (in December 2018), in relation to the draft Consents and Agreements Position Statement, regarding waste permitting still apply.</p> <p>The borrow pits are identified within the DCO boundary and so are part of the scheme and would be considered as ‘site won’ material. Although the scheme area is largely rural/agricultural, unknown previously deposited waste or contaminated land may be present and measures to deal with this waste need to be in place. As part of the development, two houses are proposed to be demolished and it is stated that the waste from this demolition will be</p>	Noted. The Project Team is seeking a meeting with the Environment Agency to discuss permitting.

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>used on site. Waste materials from demolition works of this nature are not suitable for use in constructing this highway and disposal routes should be set up for the waste material. It has not been identified if the imported material to be used in the scheme would require a permit.</p> <p>Recycled and secondary aggregate would have to have been produced to Waste and Resources Action Programme (WRAP) protocol to not be considered as waste. If not then a permit may be required.</p> <p>Given the above, we welcome further discussion with the developer/consultants to ensure they are in compliance with Environmental Permitting Regulations and pollution does not result.</p> <p>We are supportive of the inclusion of Requirement 6 - Contaminated land and groundwater, within the draft DCO, to manage unexpected land contamination</p> <p>Given the above, we welcome further discussion with the developer/consultants to ensure they are in compliance with Environmental Permitting Regulations and pollution does not result.</p> <p>We are supportive of the inclusion of Requirement 6 - Contaminated land and groundwater, within the draft DCO, to manage unexpected land contamination.</p>	
Protective Provisions	Highways England did not seek disapplication of any of the Environment Agency's consenting regimes in the version of	The Project Team is seeking a meeting with the Environment Agency to discuss the

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	the draft DCO submitted with the application, therefore our initial view is that the protective provisions for our benefit included in the draft Order are unnecessary and would result in duplication. We are continuing to discuss this issue with Highways England and their consultant and will comment in further detail in our written representations.	Protective Provisions in the dDCO (document reference TR010035/APP/3.1).
Consents and Agreements Position Statement	The version of this document is the same as that which we have recently provided advice on to Highways England's consultants. We recommend that the document is updated in view of our comments, as there were several matters which needed clarification in regard to environmental permitting outside of the DCO.	The Position Statement (document reference TR010035/APP/5.5) has been updated and re issued to the Environment agency for comment – 22 February 2019.
Detailed Comments from the EA NO/2018/111345/02-L02 1 February 2019		
1. Temporary compensatory flood storage	<p>Our flood risk officers are not qualified to provide opinion on this <i>[regarding volumes and cascade reservoirs]</i>. It is for the operator to be satisfied that their proposal would not fall under the Act, and you are therefore advised to seek specialist advice.</p> <p>We will not permit any excavations or structures within 8m of the top of the bank of Main Dyke, which is a designated main river. We require permanent unrestricted access for maintenance and improvements. A Flood Risk Activity Permit is required for excavations within 16m of Main Dyke.</p> <p>In relation to the proximity of works, we require permanent unhindered access along the existing riverbank crest levels, which should remain accessible to tracked plant, including swing radius for tracked excavators.</p>	<p>Noted. We have sought advice from a qualified Panel Engineer on this matter, and further clarification will be provided in the updated FRA.</p> <p>The Scheme is not currently at detailed design stage and a Contractor is not on board. A recommendation has been added to the revised FRA to ensure that detailed design proposals for the compensation areas are agreed with the Environment Agency by the Contractor during the next stage of the Scheme. This commitment will be secured</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>Thank you for the confirmation at this stage about the temporary nature. We have raised the question about permanent retention through the DCO consultation process.</p>	<p>through inclusion in the REAC (document reference TR010035/APP/7.3).</p> <p>Following the construction of the Scheme and the replacement of Skippool Bridge and the constricting twin culvert the fluvial flood plain is reduced significantly. Therefore there is no requirement for the flood compensatory areas to be a permanent feature.</p>
<p>2. Climate change allowances – enhanced tidal model</p>	<p>In Claire Gibson's recent email (1 February 2019), the following approach has been suggested following the publication of UKCP18:</p> <p><i>Further to your comment on the UKCP18 scenarios, I've had a look at the data for Heysham and it looks like an increase of 0.85m on the 0.5% AEP tidal boundary would be appropriate. The current increase applied (as supplied in the JBA model) is 0.69m.</i></p> <p><i>We are planning to set this running over the weekend and the results from this should facilitate an understanding of how the climate change risk might increase in future. We have considered this approach and we are in agreement with what is suggested.</i></p> <p>We look forward to receiving the completed tidal model for review.</p>	<p>The tidal model has been sent to the Environment Agency (February 2019).</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
<p>3. Comments on documents/plans submitted with the DCO</p> <p>Document Title: 6.12 Environmental Statement Chapter 12: Road Drainage and the Water Environment</p>	<p>We also some additional detailed comments set out below following our review of the DCO application documents, as submitted to the Planning Inspectorate. We considered that it was not appropriate to provide such detail in our Relevant Representation, however they are still relevant. Some of the comments may be duplicated, but they have been included for completeness and a record of outstanding matters which at to be addressed.</p>	<p>Noted – no further response required.</p>
<p>12.6.8</p>	<p>Issue</p> <p>Important statement in relation to temporary increase in flood risk from the Main Dyke during construction of the Scheme: <i>As detailed in the FRA (document reference TR010035/APP/5.2) a modelling assessment has proven the concept of this mitigation strategy in reducing flood depths and extents back towards baseline conditions. A commitment to provision of compensation storage is provided in the REAC (document reference TR010035/APP/7.3) and a detailed floodplain compensation scheme would be developed at the next stage of design in consultation with the EA.</i></p> <p>Comment</p> <p>We are working with you to address flood risk and permitting issues associated with the compensatory storage area. See comments above in relation to your 14 December 2018 email. At present the compensatory</p>	<p>The Scheme is not currently at detailed design stage. A recommendation has been added to the revised FRA to ensure that detailed design proposals for the compensation areas are agreed with the Environment Agency by the Contractor during the next stage of the Scheme. This commitment will be secured through inclusion in the REAC (document reference TR010035/APP/7.3).</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>storage area has only been modelled at present and you are developing it into a detailed design. Clearly, one of our in principal requirements to provide flood risk mitigation is not satisfactorily resolved at DCO submission stage, as stated in our Relevant Representations.</p> <p>Suggested solution</p> <p>Further consultation with us on this issue is required. We will assist in the progress of a detailed design proposal that we could agree will function as intended and that would allow us to permit the works under the Environmental Permitting Regulations.</p>	
12.6.13	<p>Issue</p> <p>It has now been confirmed that the replacement of the existing Horsebridge Dyke culvert is proposed.</p> <p>Comment</p> <p>No detailed plans have been submitted to us for review or with the DCO. If the Flood Risk Activity Permit for this structure is to be disapplied, the detailed plans required for a permit would need to be submitted with the DCO and disapplication of the permit agreed with us in advance. At present, it is not clear if we have seen drawing HE548643-ARC-GEN-A585-RP-S-3034. This is an area of significant interest to us. We are looking to undertake capital works at this location.</p>	<p>Flood risk activity permits for all relevant temporary (construction stage) activities and for permanent works would be prepared in consultation with the Environment Agency by the Contractor during the detailed design stage of the Scheme.</p> <p>The Project Team is seeking a meeting with the Environment Agency to discuss permitting. It is unlikely anything could be disapplied without a Contactor on board.</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>Suggested solution</p> <p>Detailed design needs to be aligned with the general design principals stated in the reports, e.g. <i>Culvert inverts would also be buried below existing bed levels to allow baseline bed levels, slopes and bed materials to be maintained. Suitable mammal ledges would be provided and bankside vegetation would be reinstated. These measures would reduce the effects of culverting on flood risk, riverine habitats, mammal passage and geomorphology.</i></p> <p>We will need to be satisfied in principal with the proposals at the earliest possible stage. This is one of the key areas of development and detailed design. Ongoing and detailed discussion and consultation needs to take place with us. Highways England need to confirm whether they wish to disapply any Flood Risk Activity Permits for permanent structures, as it needs to be agreed with us (our Flood Risk team and Legal Services). Given the stage in the DCO process and that we have not been consulted on any detailed designs, we do not consider it to be the best approach to go down the disapplication route.</p>	
12.7.22	<p>Issue</p> <p>Impact of climate change allowances on tidal flooding following the publication of UKCP18.</p> <p>Comment</p>	<p>An additional UKCP18 sensitivity test has been run in the tidal model. Discussions with the EA informed the methodology that has been followed, which is documented in a UKCP18 Memo, submitted on the 6 February 2019.</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>Please refer to our Relevant Representations (EA Ref: NO/2019/111452/01-L01), as submitted to the Planning Inspectorate on 24 January 2019, and comment above following Claire Gibson's email dated 1 February 2019.</p> <p>Note in relation to FRA Part 1, Section 6.5.4 (pg. 35): Tidal boundary conditions were left unchanged from the supplied model. The 0.5% AEP was assessed as this event is used to define Flood Zone 3 when referring to tidal flooding. A climate change scenario was assessed which was based on the medium emission 95th percentile UKCP09 scenario for the year 2115. A baseflow was applied to the Main Dyke and Horsebridge Dyke to aid model stability.</p> <p>Suggested solution</p> <p>Please refer to our Relevant Representations (EA Ref: NO/2019/111452/01-L01), as submitted to the Planning Inspectorate on 24 January 2019, and comment above following Claire Gibson's email dated 1 February 2019.</p>	
12.7.25 & 12.7.26	<p>Issue</p> <p>The increase in tidal flows propagating upstream through the widened A585 Skippool Bridge result in changes in flood depths along the Main Dyke and Horsebridge Dyke.</p> <p>Comment</p> <p>Although in terms of the EIA Regulations this effect is considered 'Significant', the change does not increase flood risk to properties. So, although the scheme proposals are</p>	Noted – no response required.

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>predicted to increase baseline flood depths on the Horsebridge Dyke and Main Dyke by up to 0.1m. The baseline flood extents are not increased.</p> <p>Suggested solution</p> <p>None required, as the changes are therefore accepted as a result of widening the bridge, which has other benefits.</p>	
<p>5.2 Flood Risk Assessment Part 1 1.1.1 (pg. 8) & 6.5.2</p>	<p>Issue</p> <p>Our 2015 tidal model has been ‘enhanced’ and <i>used to assess both the risk of tidal flooding to the Scheme and any change in tidal flood risk to third parties</i>, but we have not had the opportunity to review and verify the output. As the lead flood risk management authority, it is essential that we have the opportunity to review the model prior to any consideration of decision on the scheme.</p> <p>Comment</p> <p>Given the above, there is a potential for impact on the DCO process, and we therefore have to take the findings and assumptions made in the report at face value, at this stage. The proposed scheme involves changes to structures (culverts/bridges, etc) on the main river network. The flood risk change scenarios associated with the scheme and new flood risk baseline scenario and attendant potential required amendments to flood map means the without our review, due diligence cannot be seen to have been followed.</p>	<p>An additional UKCP18 sensitivity test has been run in the tidal model. Discussions with the EA informed the methodology that has been followed, which is documented in a UKCP18 Memo, submitted on the 6 February 2019.</p> <p>The tidal model has been sent to the Environment Agency (February 2019).</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>We are aware that you still working on the model and have had technical issues, which has delayed its completion. In addition, prior to completing the model, we have advised in our Relevant Representations that you revisit the climate change allowances following the publication of UKCP18.</p> <p>Suggested solution</p> <p>It is recommended that you take UKCP18 into account with regard to climate change allowances and that we are provided with opportunity to review the enhanced tidal modelling as soon as possible, so that any emerging issues can then be addressed in a timely manner.</p>	
6.6.2	<p>Issue</p> <p>Flood risk critical work has still to be undertaken and work is ongoing with regard to the replacement Skippool Clough culvert.</p> <p>Comment</p> <p><i>It is stated that, it has been identified that the Skippool Clough culvert on the Horsebridge Dyke needs remedial work and that this should be carried out at the same time as the Scheme. At this stage, the modelling has not been updated to assess these works as a final decision on the design of a replacement culvert has not been made'</i></p>	<p>Further detail on the Skippool Clough (Horsebridge Dyke) culvert is included in Section 5.3 of the modelling annex submitted to the Environment Agency – 15 February 2019.</p> <p>The Project Team is seeking a meeting with the Environment Agency to discuss permitting. It is unlikely anything could be disappplied without a Contactor on board.</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>There is ambiguity around whether the flood risk critical structures on Horsebridge Dyke will be replaced and by what, as part of the scheme.</p> <p>No detail drawings on which we can comment have been provided at up to and including the DCO submission stage. We are of the opinion that the culvert should be replaced as part of the scheme in order that it is fit for purpose for the lifespan of the development.</p> <p>Suggested solution</p> <p>Further consultation with us is required to ensure an acceptable design that would be granted a Flood Risk Activity Permit.</p>	
7.1.3	<p>Issue</p> <p>The modelling work shows that there are increases in flood levels downstream of the A585 and upstream of the Skippool tidal gates.</p> <p>Comment</p> <p>This is resulting from additional water passing through the new geometry of the A585 bridge. The water cannot then pass as rapidly through the tidal gates. While flood extents are not increased due to the channel geometry, levels are.</p> <p>Suggested solution</p>	<p>This item is tabled for further discussion at the meeting the Project Team is arranging with the Environment Agency. However, it is our position that mitigation is not required, as the effects of the Scheme are minor and do not cause any additional out of bank flooding on third party land.</p> <p>At the meeting this position was agreed with the EA.</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>It should be considered with additional mitigation can and should be provided to allow the tidal control structure to discharge more efficiently thereby reducing flood depth. Further work needs to be undertake by Arcadis and ourselves to investigate if any detriment could potentially be mitigated.</p>	
7.1.4	<p>Issue</p> <p>There is some ambiguity in relation to the proposed lifespan of scheme. It should be made explicitly clear in documentation.</p> <p>Comment and suggested solution Please refer to our Relevant Representations (EA Ref: NO/2019/111452/01-L01), as submitted to the Planning Inspectorate on 24 January 2019.</p>	Text regarding the potential lifetime of the development has been added to the updated FRA and will be clarified in discussion with the Environment Agency at the forthcoming meeting that the Project Team is arranging.
7.4 Implication of Results for the Scheme pg. 42 onwards. 7.4.3	<p>Issue</p> <p>Potential conflict with statements made elsewhere (6.12 Environmental Statement Chapter 12: Road Drainage and the Water Environment) about potential permanent retention of compensatory storage provision.</p> <p>Comment</p> <p>This section states: <i>Given that the implementation of the Scheme results in a reduction in baseline flood extents, it is not considered that, based on the model results, additional floodplain compensation measures would be required once the Scheme is fully constructed. However, as discussed in</i></p>	Following the construction of the Scheme and the replacement of Skippool Bridge and the constricting twin culvert the fluvial flood plain is reduced significantly. Therefore there is no requirement for the flood compensatory areas to be a permanent feature.

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p><i>Section 7.5, some mitigation would be required for the duration of the construction period.</i></p> <p>We are unable to find reference to permanent retention. The question around permanent retention of compensatory storage should not be ruled out at this stage.</p> <p>Suggested solution</p> <p>Compensatory storage in the Main Dyke floodplain corridor should be the subject of further and on-going discussion.</p>	
<p>7.4.5 Table 10: Modelled Tidal Flood Levels and Risk to the Scheme</p>	<p>Issue</p> <p>The scheme will be at risk of tidal flooding east of Skippool Junction.</p> <p>Comment</p> <p>This section indicates the potential depth of flooding in particular East of Skippool Junction.</p> <p>We are advised that due to road alignment and level tie in issues, this flood risk scenario cannot be mitigated and will need to be managed over the lifetime of the development. If mitigation cannot be designed into the Scheme so that it is not impacted in a design flood with climate change, reliance will be placed on flood warning and evacuation.</p> <p>Suggested solution</p>	<p>A Flood Warning and Evacuation Plan is currently in preparation.</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>The acceptance of the potential future tidal flooding east of Skippool Junction, is one of the main flood risk topics to consider.</p> <p>An appropriate flood warning and evacuation plan should be developed in discussion emergency services, and included and submitted as part of the DCO.</p>	
7.5.1 – 7.5.12	<p>Comment only (no issues) These points cover the resulting changes in baseline in flood levels and extents are illustrated in Figures D23 to D33 in Appendix D.</p>	Noted – no further response required.
7.5.11 & 7.5.12	<p>Issue</p> <p>Impacts on third parties are, in the main, constrained to open fields rather than property, with the latter only observed in the higher magnitude, less probable, events.</p> <p>Comment</p> <p>We have confirmed that mitigation would be required to ensure that increases in flood risk to third parties were minimised for all events up to and including the 1% AEP plus 30% for climate change flood event. Refer to comment on 12.6.8</p> <p>Suggested solution</p>	The Scheme is not currently at detailed design stage and a Contractor is not on board at this stage. A recommendation has been added to the revised FRA to ensure that detailed design proposals for the compensation areas are agreed with the Environment Agency by the Contractor during the next stage of the Scheme.

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	Further consultation with us is required in relation to the detailed design of the mitigation proposals to ensure they are acceptable and that flood risk is not increase.	
7.5.13 – 7.5.15	<p>Issue</p> <p>Insufficient information on the mitigation measures in relation to the accommodation of floodplain storage to offset that removed by the road embankment during construction, which has been the subject of high-level discussion only.</p> <p>Comment</p> <p>While the proposal seems acceptable in principal. We retain some concerns in relation to the proximity of any proposed excavations in the vicinity of the Main Dyke, which is a designated main river.</p> <p>As previously mentioned, we are also not clear as to exactly how the compensatory flood storage area (CFSA) would function.</p> <p>Suggested solution</p> <p>It seems likely the works will be relevant to Environmental Permitting for Flood Risk Activities. We will not be in a position to issue our permit(s) until we are satisfied that access to the main river, stability of the river bank, suitability of any drain down structures or engineering are acceptable. As such, further discussion with us and the provision of detailed designs are required.</p>	<p>The Scheme is not currently at detailed design stage and a Contractor is not on board at this stage. A recommendation has been added to the revised FRA to ensure that detailed design proposals for the compensation areas are agreed with the Environment Agency by the Contractor during the next stage of the Scheme. This commitment will be secured through inclusion in the REAC (document reference TR010035/APP/7.3).</p> <p>The Project Team is seeking a meeting with the Environment Agency to discuss permitting.</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>Note that a Flood Risk Activity Permit is required for excavations within 16m of a main river.</p>	
7.5.16	<p>Issue</p> <p>Insufficient information on haul roads in relation to impacts on flood risk.</p> <p>Comment</p> <p>The one short paragraph and reference to Figure 24 is all that is provided in this part of the FRA on the subject. The paragraph states that “there are no additional routes proposed that are in the floodplain, and thus there is no change in flood risk as a result of any haul roads.”</p> <p>However, it would appear from Figure 24 that the site haul road and access points shown in the black dashed line will encroach into the area at risk of fluvial flooding. Haul roads tend to require the importation of material to create an engineered and somewhat elevated running surface for drainage and ground protection purposes.</p> <p>The FRA does not direct us to further information of the haul roads, in terms of specification and location. Haul roads have the potential to divert or obstruct flood waters. Haul roads in the floodplain would be classed as a flood risk activity and would require a permit.</p> <p>Suggested solution</p>	<p>New drawing included in the updated FRA which shows the locations of haul roads and site compounds relative to flood risk and distance from the Main Dyke.</p> <p>Additional commitments regarding specifications added to the updated FRA and REAC (document reference TR010035/APP/7.3).</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>Further information is required on the specification and location of the proposed haul road in the Main Dyke floodplain.</p>	
7.5.17	<p>Issue</p> <p>Insufficient information on site compounds, their location, specification and usage, which has been discussed with us at high level only.</p> <p>Comment</p> <p>Site compounds within 8m of the top of the bank of Main Dyke would not be permitted. Compounds in the floodplain would be considered a flood risk activity and are likely to require a permit.</p> <p>Suggested solution</p> <p>Further information needs to be provided on the specification and location of the proposed site compounds, especially those that are located in Flood Zone 3 or in close proximity to any designated main rivers.</p> <p>Where site compounds are adjacent to main rivers, plans should be provided which demonstrate an 8m wide strip (measured from the top of the riverbank) that is free from development will be retained.</p>	<p>Additional commitments regarding specifications added to the updated FRA and REAC (document reference TR010035/APP/7.3).</p>
9.1.4	<p>Issue</p>	<p>Further detail has been added to the Tidal Modelling Results Memo, submitted February</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>Increases in tidal flood depth in the 0.5% AEP plus climate change event resulting in property damage.</p> <p>Comment</p> <p>The rise of 10cm is considered insignificant in relation to baseline flood depth increases of approximately 1m. It is stated that, <i>the change is hence unlikely to significantly alter property damages experienced should a significant tidal flood event occur in the Wyre Estuary' over the lifetime of the Scheme.</i> It is not clear from the information provided as to the level of background assessment undertaken, or if the property damages alluded to are at existing flood risk, or if flood risk is increased.</p> <p>Suggested solution</p> <p>Further information should be provided on the identification of any potential for property damages identified.</p>	<p>2019, and to the updated FRA (not yet submitted). This includes a summary of the number of properties positively and detrimentally impacted by changes in baseline flood levels during the 0.5% and 0.5% plus climate change events, and the magnitude of water level changes within the following bands <1cm, 1cm to 5cm, 5cm to 6cm and > 6cm.</p>
9.2.1	Typographical error – '2eithfdsfds'	Amended.
10.1.3	<p>Issue</p> <p>Reference to the Wyre Tidal model which was obtained from the EA and enhanced for use in this FRA.</p> <p>Comment and suggested solution</p> <p>See previous comments on the enhance tidal model</p>	<p>The tidal model has been sent to the Environment Agency (February 2019).</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
10.1.16	<p>Issue</p> <p>Provision of detail on ‘appropriate management’ in relation to residual flood risks.</p> <p>Comment</p> <p>It is stated that, <i>it is considered that the residual flood risks both to third parties as a result of the Scheme construction, and to the Scheme itself can be appropriately managed.</i> However, it is not clear at present as to how or what the detail of ‘appropriate management’ is.</p> <p>Suggested solution</p> <p>Our understanding is that the detail design is yet to be progressed. Further consultation with us is required to address this issue to ensure flood risk is not increased.</p>	<p>A draft Flood Warning and Evacuation Plan will be submitted as part of the DCO application.</p>
5.2 Flood Risk Assessment Part 2 3.14.4, Catchment 3, VII	<p>Issue</p> <p>Two new outfalls to Main Dyke have been proposed, however it is unclear as to what is happening with the old outfall structures.</p> <p>Comment</p> <p>The above works are subject to Environmental Permitting (Flood Risk Activities). The operator building any future scheme will need to apply for permits for any new outfall structures discharging to main rivers as part of the scheme.</p>	<p>Arcadis has submitted a drawing illustrating locations of all works within 8m and 16m of the top of bank of main rivers and Environment Agency assets. This is tabled for further discussion at the meeting that the Project Team is seeking with the Environment Agency.</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>Permits may also be required for any other work and activities with 8m of fluvial main rivers or defences or 16m if tidal.</p> <p>Suggested solution</p> <p>Provide early clarification on intended amendments and/or modifications to any existing structures in, over, under or with 8m of the top of bank of the main river, defence or asset or 16m if tidal.</p>	
5.5 Consents and Agreements Position Statement	This is the same version as one we previously commented on in December 2018. As such, our comments still apply.	Noted the Position Statement (document reference TR010035/APP/5.5) has been updated and issued to the Environment for comment – 22.02.2019.
2.3 Work Plans HE548643-ARCHGN-SZ_ZZ0-DRD-3046	<p>Issue</p> <p>Flood risk issues associated with Temporary Construction Compound, as it is located in the floodplain.</p> <p>Comment</p> <p>This compound could be exposed to flood water, resulting in damage to materials and assets and pollution to water environment, and there is a potential to increase in flood risk elsewhere.</p> <p>Suggested solution</p>	<p>New drawing included in the updated FRA which shows the locations of site compounds relative to flood risk and distance from the Main Dyke.</p> <p>Additional commitments regarding specifications added to the updated FRA and REAC (document reference TR010035/APP/7.3). These include, for example, use of open link fencing at compounds situated in the floodplain, to ensure minimal disruption to floodwater flow paths and restrictions on land raising in compounds.</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	Operator will need to carefully consider layout, levels, storage and fencing type. As such, further discussions with us is required to ensure acceptable proposals.	
HE548643-ARCHGN-SZ_ZZ0-DRD-3046	<p>Issue</p> <p>Temporary Flood Compensation Areas indicated as very close to Main Dyke, which is designated a main river. We may not be in position to permit proposals as currently proposed.</p> <p>Comments</p> <p>Excavations may compromise bank stability of Main Dyke. Narrow neck of land could breach resulting in sudden release of water into Main Dyke and the floodplain. Flood risk could be increased to receptors downstream. Our access requirements for maintenance would be prejudiced if suitable access strip in not maintained. Also, see previous comments on this issue.</p> <p>Suggested solution</p> <p>Further discussions with us is required to ensure the proposals are acceptable in relation to Environmental Permitting and flood risk. Suitable plans should be provided to demonstrate that our access is not restricted and where excavations will take place. Such plans should include 8m and 16m distances measured from the top of the bank and mapped along the length of Main Dyke. The 16m</p>	<p>The Scheme is not currently at detailed design stage and a Contractor is not on board at this stage. A recommendation has been added to the revised FRA to ensure that detailed design proposals for the compensation areas are agreed with the Environment Agency by the Contractor during the next stage of the Scheme. This commitment will be secured by inclusion in the REAC (document reference TR010035/APP/7.3)</p> <p>The Project Team is seeking a meeting with the Environment Agency to discuss permitting.</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	delineation is in regard to excavations near any main river regardless of tidal influence.	
2.5 General Arrangement Plans HE548643-ARCHGN-SZ_ZZ_000-DR-D-3057	See above comments in relation to Works Plans.	Noted – no further response required.
2.6 Engineering Section Drawings All drawing in this package.	<p>Issue</p> <p>The engineering sections are difficult to read and don't identify our areas of interest in terms of main rivers, etc.</p> <p>Comment</p> <p>We cannot provide meaningful comment on the basis of the information provided.</p> <p>Suggested solution</p> <p>Detailed sections should be developed as part of detailed design process and to inform pre-application Flood Risk Activity Permit discussions. See comments in relation to Works Plans: sections should delineated 8m and 16m distances in relation to Environmental Permitting.</p>	<p>The detailed design stage has not commenced yet on the Scheme. Once a contractor has been appointed this will begin. The drawings submitted as part of Volume 2 follow guidance and meet required standards. We have provided 'zoomed in' section drawings to the Environment Agency which show areas they would be interested in.</p>
2.9 Outline Drainage Works Key plan HE548643-ARCHDG-SZ_ZZ_000-DR-D-3098 4 Sheets	<p>Issue</p> <p>At present due to lack of detailed design on temporary flood compensation area, as discussed elsewhere, we are not clear about how these areas will drain down.</p>	<p>The Scheme is not currently at detailed design stage. A recommendation has been added to the revised FRA to ensure that detailed design proposals for the compensation areas are agreed with the Environment Agency by the Contractor during the next stage of the</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
<p>HE548643-ARCHDG-SZ_ZZ_000-DR-D-3099/100/101/102</p>	<p>Comment</p> <p>Plans include key plan to the four sheets. Plans show catchment areas and where catchments outfall to. In relation to main rivers, outfalls are proposed to Main Dyke and Horsebridge Dyke.</p> <p>Sheet 099 appears to five catchment outfalls location between Skippool Junction and Skippool Bridge Junction. Sheet 100 shows three catchment outfall locations to Main Dyke.</p> <p>Sheet 101 shows two catchment outfalls to non-main river. Sheet 102 shows two catchment outfalls locations to non-main river sections. The drawings 099 and 100 also show the temporary flood compensation areas. It would appear that there are only a small number of proposed new outfalls to the main river.</p> <p>Suggested solution</p> <p>Further information should be provided on the type and location of proposal outfall structures in order that we can further reference proposals with Flood Risk Activity Permitting requirements.</p>	<p>Scheme. This commitment will be included in the REAC (document reference TR010035/APP/7.3).</p> <p>The Project Team is seeking a meeting with the Environment Agency to discuss permitting.</p>
<p>Response to Updated Consents and Agreements Position Statement (EA Ref NO/2018/11289/02/L01) 22 March 19</p>		
Issue/Topic	EA Comments	Highways England Response/Plan of Action
<p>Abstraction Licences</p>	<p>For section 3.2.3, we wish to point out that the abstraction licences are not currently issued under the Environmental Permitting Regulations 2016, but Section 21 of the Water</p>	<p>Section 3.2.3 has been updated</p>

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	Resources Act 1991 (amended by the Water Act 2003). Indeed this is already mentioned in section 3 of Table 4.1	
General	The document refers in several places to the Environmental Permitting Regulations 2010. This should be corrected to 2016.	This has been corrected
Flood Risk Activity Permits	<p>Table 4-1, Point 1, Flood Risk Activity Permit (page 5): the timing of submission – our determination period should be changed from 3 to 2 months.</p> <p>Table 4-1, Point 10, Mobile plant licences (page 11) – this may need an associated exemption/permit to cover the activity.</p>	<p>Updated</p> <p>Not updated as the existing text states ‘Consultation with the Local Authority (T7) and Environment Agency (T5) required to apply for the relevant authorisations / exemptions.’.</p>
Waste Permits	Table 4-1, Point 12, states that discussions are still to be arranged with the Environment Agency to discuss waste permits. This really needs to be progressed as it relates to the construction of the scheme.	Removed reference to seeking a meeting with the EA. There was a meeting on the 1 April 2019 and Arcadis discussed with the EA that the Scheme is at the preliminary design stage. Once a Contractor is appointed they will commence the detailed design of the Scheme and waste permits will be applied for in due course.
Trade Effluent Discharge	<p>Table 4-1, Point 9, Trade effluent:</p> <ul style="list-style-type: none"> • Proposing to discharge to non-mains – if you wish to discharge effluent after appropriately treating it to groundwater or surface water permit under the Environmental Permit Regulations 2016 will be required. • Proposing to discharge to mains – a trade effluent consent or a trade effluent agreement with the relevant water and sewerage company (United 	<p>Updated</p> <p>Updated.</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	Utilities) must be obtained before trade effluent can be discharged to a public foul sewer or a private sewer that connects to a public foul sewer.	
Permitting Programme	Due to the length of time the Environment Agency is allowed by legislation to process and issue a permit, it may be necessary to think ahead as waiting until a contractor is appointed and then having to apply for the permit could delay the scheme.	Noted, however permits cannot be applied for until detailed design information is available from the appointed Contractor.
Enhanced Tidal Model Review Comments (EA Ref NO/2019/111541/01/L01) 22 March 19		
Issue/Topic	EA Comments	Highways England Response/Plan of Action
Enhanced tidal model	Technical comments on the enhanced tidal model received. Details of the comments, Highways England Responses and subsequent correspondence to resolve all of the comments raised are provided separately in the Flood Risk Assessment Modelling Annex.	Initial responses provided to the EA and discussed at the EA meeting 1 April. Detailed responses provided 03/04/19. Meeting action - address all outstanding matters to achieve EA sign off of the tidal model by 19/4/19.
Horsebridge Dyke Culvert Replacement, Engineering section drawings and Potential Flood Risk Activities (EA Ref NO/2019/111597/01/L01) 28 March 2019		
Issue/Topic	EA Comments	Highways England Response/Plan of Action
Horsebridge Dyke culvert	Works drawing HE54864-ARC-SMNS1-ML002-DR-S-3001-P1 We have concerns regarding the route of the new culvert as shown on the above drawing. We would want to see the proposed culvert linking into the existing inlet and outlet	Culvert replacement was discussed at a meeting with the EA 1 April 2019. Agreed action for Highways England to prepare a

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>structures. The drawings show that the current culvert would be decommissioned, but does not explain what will happen with the inlet and outlet.</p> <p>The drawing shows that the proposed new inlet and outlet are not in line with the existing watercourse channel and therefore have the potential to cause erosion and scour to the existing channel. This does not appear to have been accounted for.</p>	<p>Technical Note providing the EA information on:</p> <ul style="list-style-type: none"> • Why the culvert has to be replaced offline • Why an online replacement simply cannot be accommodated • The impact of the realigned culvert on scour / erosion • Management of scour and erosion • Management of blockage risks <p>Technical Note to be submitted to the EA 12/4/19.</p>
Horsebridge Dyke culvert	<p>We would also want to see the new culvert modelled to provide evidence it does not increase the flood risk in the area</p>	<p>The new culvert dimensions have been included in the fluvial model (Option runs) to assess its effects on baseline flood risk.</p> <p>The enhanced tidal model simulates a scenario whereby the tidal flap on the outfall of this structure is closed (as would be expected during an extreme tidal flood event).</p>
Horsebridge Dyke culvert	<p>We currently maintain the tidal outfall and the future maintenance of the new proposed structures would need to be agreed.</p>	<p>Details of future maintenance responsibilities to be included in the updated FRA report and also covered in the Technical Note referenced above.</p>
Potential Flood Risk Activities	<p>Ref drawing HE54864-ARC-EWE-SZ-ZZ-0-DR-LE-4031</p>	<p>Works constituting potential flood risk activities were discussed at a meeting with the</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>We consider that the drawing is not required as part of the DCO application, but it could be more helpful if the following observations were addressed:</p> <ul style="list-style-type: none"> • Due to the scale of the drawing, it is not possible to ascertain whether or not the 8m and 16m 'buffer zones' are correct, and also whether or not they are measured from the top of the bank of the main river. • The drawing does not actually show where you consider flood risk activities to be taking place, other than the approximate location of three highway drainage outfalls. <p>We suggest that a better approach would be to break the overall scheme up into separate sections with the known and possible flood risk activities annotated.</p> <p>We would also recommend annotating that any construction compounds next to any main rivers should be more than 8m from the top of the bank of the main river so our access to the watercourse can be retained.</p>	<p>EA 1 April 2019. Agreed action for Highways England to provide the EA with a package of GIS drawing files to include:</p> <ul style="list-style-type: none"> • Scheme red line boundary • 8m and 16m buffer zones (measured from the top of bank of the Main Dyke and Horsebridge Dyke and Wyre) • Drainage outfall/headwall locations • Drainage ponds • Temporary floodplain storage areas • Main dyke crossing • Horsebridge Dyke replacement culvert alignment, plus inlet/outlet structures • Dwarf walls <p>File issue to the EA by 12/4/19.</p>
Engineering Section drawings	We have no comments to make on these drawings	Noted.
Response on Summary Table of all EA comments and HE Responses (EA Ref NO/2019/11594/01/L01) 29 March 2019		
Issue/Topic	EA Comments	Highways England Response/ Plan of Action
Draft Protective Provision / page 5	This should be updated to reflect that our Legal Services will discuss this directly with the Highways England's solicitor, and contact has already been made.	Noted.

Issue/Topic	EA Comments	Highways England Response / Plan of Action
Replacement culvert – Horsebridge Dyke / page 7	We have provided feedback to you on this on 28 March 2019	Noted – see actions above.
Climate change allowances / UKCP18	<p>Our supplied JBA model includes climate change level increases based on UKCP09 95th Percentile ‘medium’ emission scenario, with the single allowance for T200 climate change allowance for 2115.</p> <p>Due to lack of detailed internal and no external guidance, we provided best information available at the time in relation to your UKCP18 memo. Our understanding has increased since this time. Providing you have extrapolated to 2125 using appropriate dataset, then the end allowance at end of design life should be appropriate. How sensitivity test climate change using UKCP18 is being factored into FRA and mitigation is currently unknown.</p>	<p>UKCP18 discussed at the EA meeting 1 April 2019. Plan of action agreed whereby the EA confirm a suitable uplift to be applied to the enhanced tidal model.</p> <p>EA have confirmed this uplift and an updated UKCP18 scenario will be run through the model and reported on in the updated FRA report.</p>
Tidal model review	<p>Comments in relation to the tidal model should be updated as we have provided feedback to you, on 22 March 2019. Following our review of your enhanced tidal model. We identified significant errors that need to be addressed and, as it stands, we consider that the model is not suitable for intended purpose.</p> <p>You are currently working to address these issues.</p>	See response and actions above.
Temporary compensatory flood storage area / page 16	You have stated that there is no requirement for the flood compensatory areas to be a permanent feature, which is noted. However, we would ask you and Highways England to consider retaining this area for non-critical flood risk management purposes and habitat creation. A wetlands area, for instance, could also provide ecology benefits which could contribute to the objectives of the	The temporary floodplain compensation areas are located in an area of temporary land take which Highways England are committed to re-instate following completion of construction of the Scheme. A net gain can be demonstrated by the Scheme in Environment Statement

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	Government's 25 Year Environment Plan (published in January 2018). The 25 Year Environment Plan recommends taking a net gain approach for biodiversity within the planning system. We recommend discussing this with Natural England.	Appendix 8.9: Biodiversity Metric Calculations (document reference TR010035/APP/6.8.9).
7.4.5 – Table 10: Modelled Tidal Flood Levels and Risk to the Scheme / Flood warning and evacuation plan / page 25	The flood warning and evacuation plan (FWEP) should include consideration of increased consequence and probability of tidal flood risk as a result of climate change sea level rise.	The FWEP will include consideration of climate change sea level rise. A draft of the plan will be shared with the EA for comment.
5.2 Flood Risk Assessment Part 2 3.14.4, Catchment 3, VII / page 31	This comment should be updated as we have provided feedback to you, on 28 March 2019, in relation to your drawing illustrating flood risk activities in relation to 8m and 16m distances from main river watercourses. This drawing is not an essential part of the DCO application, but it will enable our flood risk teams to identify resourcing requirements so the construction of the scheme is not delayed.	Noted – see response and actions above.
Comments on Tidal Model Results Memo and FRA Modelling Annex (EA Ref NO/2019/111541/01/L03) 3 April 2019		
Issue/Topic	EA Comments	Highways England Responses/Plan of Action
Tidal Model Results Memo Page 1. 2. Impact of the Scheme on Peak Flood	This needs revising when the updated UKCP18 SLR recommendations have been modelled and impacts digested. We have flagged up that the 0.85m UKCP18 SLR allowance is an underestimation and in addition only considers SLR to 2100. We have stated the SLR need to	The memo was provided to the EA as a means of early engagement on the results of the tidal model, with the aim of gaining agreement on the acceptability of the results prior to submitting the full FRA report.

Issue/Topic	EA Comments	Highways England Response / Plan of Action
Levels 2.1.1	<p>be extrapolated to 2120. Flood depth and flood extents considered in the report are likely to underrepresent depths and extents.</p> <p>Solution Update memo with revised SLR extrapolated to 2120.</p>	<p>We acknowledge that the memo findings with regard to tidal flood risk in the UKCP18 climate change scenario are now superseded. The revised, EA agreed, UKCP18 allowances will be applied to the enhanced tidal model and the results of the new simulations will be discussed with the EA and reported in the updated FRA report (to be submitted to the EA prior to Deadline 2 (17 May 2019)).</p>
Page 3. Section 2.1.7 0.5% AEP plus UKCP18 Climate Change Allowance Sensitivity Test	<p>While this statement may well hold true its needs to be cross referenced with updated UKCP18 recommendations</p>	<p>Noted – updates will be made, as necessary, in the revised FRA report.</p>
Page 4 3 Impacts on Property Flooding 3.1.1	<p>Changes in predicted flood levels grouped by property level impact presented in this section may change when revised UKCP18 level up to and including 2120 are factored in. Number of properties experiencing detriment may increase.</p>	<p>Noted – updates will be made, as necessary, in the revised FRA report.</p>
Page 5 4 Impacts to the Scheme from Tidal Flood Events	<p>This section is effectively the conclusion of the memo. As with all comments above. The finding presented in this memo are based on the UKCP18 sensitivity test allowance of 0.85m that we do not recognise. Therefore, this section needs revising.</p>	<p>Noted – updates will be made, as necessary, in the revised FRA report.</p>
Flood Risk Assessment Modelling Annex	<p>Essentially this document, and reference to the 0.85m increase to present day 0.5% AEP tidal flood levels, has now been superseded and assumptions made will need to be revisited.</p>	<p>Noted – updates will be made, as necessary, in the revised FRA report.</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
<p>Page 17. 4.2 Tidal Model Boundaries 4.2.2- 4.2.6</p>	<p>These sections discuss climate change scenarios and methodology for still water levels. Section 4.2.6 concludes with sentence stating that 'EA have been consulted on this approach'. We have provided a written response to the Acadis UKCP18 memo. More recently we have confirmed the 0.85m is an Underestimation.</p> <p>Solution</p> <p>All documents needs to be updated and cross referenced.</p>	
<p>Page 22 4.2.13</p>	<p>Talks about</p> <ul style="list-style-type: none"> • Application of a 0.85m increase the present day 0.5% AEP still water levels • Maintained UKCP09 wave overtopping volumes <p>Application of 0.85m has now been superseded and assumptions made will need to be revisited.</p>	<p>Noted – updates will be made, as necessary, in the revised FRA report.</p>
<p>Page 27 7.1.4 Proposed mitigation Flood Compensation Areas (FCA's)</p>	<p>Discussions around FCA's are ongoing. Providing caveats give us confidence that the proposals can be controlled through DCO, then we will be satisfied.</p> <p>Highways England should provide information that would confirm an acceptable in principal proposal that could be secured through DCO and in future would enable us to permit the temporary FCA's.</p>	<p>At the meeting on 1 April 2019 it was agreed that Highways England will write into the Outline Construction Environmental Management Plan (CEMP) and Record of Environmental Actions and Commitments (REAC) commitments regarding maintaining EA access to Main Rivers, safeguarding bank stability, maintaining bank levels and avoiding sudden dips in ground levels etc. The contractor would be bound by these commitments and would base further detailed designs of the FCAs on these principles. The</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
		contractor would further consult with the EA to prepare relevant consent/permit applications.
Page 32 7.2 Completed Scheme	This section talks about measures required to mitigate for the slight lowering in elevation of the Scheme, and that a dwarf wall is proposed alongside the eastbound carriageway (north side of the road). Its position and proposed elevation is illustrated in Figure 22. Proposal for dwarf walls are relevant to Environmental permitting for flood risk activities.	Further detail will be provided, in due course, by the appointed contractor to progress permit position discussions.
UKCP18 Advice ((EA Ref NO/2019/111540/01/L02) 3 April 2019		
Issue/Topic	EA Comments	Highways England Responses/Plan of Action
	<p>Following our meeting, and in discussion with our national colleagues and model reviewer, we have worked together to test the data and the process.</p> <p>We can confirm our agreement on the following:- JBA T200 (ESL1236) = 6.67mAOD (Base Year 2016) Final sea level, inclusive of incremental rise from 2016 is now 7.603mAOD. Sea level rise allowance for 2016 to 2100 is 0.933m.</p> <p>Sea level rise from 2016 to 2120 is 1.253m. This should be applied to all boundary condition points 1222, 1226, 1228, 1230 and 1236. Final 2120 sea level (for point 1236) is 7.923mAOD</p>	These revised UKCP18 allowances will be applied to the enhanced tidal model and the results of the new simulations will be discussed with the EA and reported in the updated FRA report (to be submitted to the EA prior to Deadline 2 (17 May 2019).

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	For due diligence testing we would advise the figures referred to are used for sensitivity testing in the FRA.	
E-mail Correspondence (Various dates April 2019)		
Issue/Topic	EA Comments	Highways England Response/Plan of Action
Enhanced tidal model EA technical Review (11/04/2019 – 17/04/2019)	Exchange of comments and responses. On the 17 April, the EA model reviewer confirmed their technical acceptance of the enhanced tidal model.	Noted – no response required.
Tidal Flooding Impacts (24/04/2019)	The EA are happy in principal and find the general scale of the presented Scheme effects on baseline tidal flood risk to be acceptable.	Noted – no response required.
Consents and Agreements Position Statement (25/04/2019)	<p>The EA accept that the purpose of this document is to outline the consents and permits that are likely to be required by the project and that the project is not yet at its detailed design stage.</p> <p>The EA accept that the detailed information required to inform the consents identified as likely to be required is not available at this time but will be during the detailed design stage. Such consents are outside the DCO process.</p> <p>It is accepted that in due course the appointed contractor would prepare relevant permit applications in consultation with relevant permitting teams at the EA. The EA recommend that permitting advice is sought as early as possible by the contractor. The EA Waste team, in particular, are concerned that discussions have not started and delays to the project construction could result.</p>	Noted – no response required.

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>The EA understand the reasons for including an item on permitting in the draft SoCG, however, based on the currently available information, although we have not identified any showstoppers, we are unable to guarantee that permits outside the DCO application would be forthcoming. For this reason, we cannot agree to including the statement in the SoCG.</p>	<p>Item covering the Consents and Agreements Position Statement has been removed from the draft SoCG.</p>
Comments on Updated Tidal Model (EA Ref NO/2019/111541/02/L02)		
Issue/Topic	EA Comments	Highways England Response / Plan of Action
Enhanced tidal model	<p>Following our comments and advice you have updated your enhanced tidal model. Having reviewed your updated model, we have now found it to be fit for purpose. All relevant documentation which is based on the enhanced tidal model should now be revised accordingly.</p>	<p>Update the FRA report and relevant parts of Chapter 12 of the Environmental Statement using the results of the approved model.</p>
Comments on Updates to the Register of Environmental Actions and Commitments (REAC) and the Outline Construction Environment Management Plan (CEMP) (EA Ref NO/2019/111673-01-L02)		
Issue/Topic	EA Comments	Highways England Response / Plan of Action
Updates to the outline CEMP	<p>We are satisfied with the Action/Commitment(s) tabled at this stage.</p> <p>The Emergency Flood Response Plan prepared by the successful appointed contractor will need to be discussed/agreed with us.</p>	<p>Noted - no response required</p> <p>Noted - no response required</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>Clarification to be provided on the organisation/role/individuals responsible for briefing contractors, and what form the briefing/training will take. We suggest that all work force have to complete a structured induction before being provided with accreditation to be allowed to undertake work on site.</p> <p>Table 6.1 We suggest the following wording is used/adapted: The Environmental Permitting (England and Wales) Regulations 2016 require a permit to be obtained for any activities which will take place:</p> <ul style="list-style-type: none"> • on or within 8 metres of a main river (16 metres if tidal) • on or within 8 metres of a flood defence structure or culvert (16 metres if tidal) • on or within 16 metres of a sea defence • involving quarrying or excavation within 16 metres of any main river, flood defence (including a remote defence) or culvert • in a floodplain more than 8 metres from the river bank, culvert or flood defence structure (16 metres if it's a main river) and you don't already have planning permission 	<p>Noted – this is the responsibility of the appointed contractor.</p> <p>Noted – wording in Table 6.1 has been updated in line with the EA recommendation.</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
Updates to the REAC	<p>8B - This section needs to be revised with reference to recommendation made above</p> <p>8W - We would prefer it if the wording is changed to state something such as, "to include provision of minimum 8 metre unrestricted buffer zone.</p> <p>8Z - We would have to be satisfied that the construction of any haul roads across areas of floodplain (Flood Zone 3), would not constitute a 'Flood Risk Activity. Therefore, should any haul roads need be raised above existing ground levels in the floodplain (Flood Zone 3) then the contractor will have to assess any likely impacts and satisfy themselves that the works are not applicable to the above listed activity. The same applies to any other temporary ground raising or stockpiling of materials in the floodplain.</p>	Noted – suggested amendments to the wording of commitments 8B, 8W and 8Z have been included.
Comments on Revised Flood Risk Assessment (EA Ref NO/2019/111723/01-L01)		
Issue/Topic	EA Comments	Highways England Response / Plan of Action
Flood Risk Assessment content and conclusions	We have reviewed the above FRA and we are generally satisfied with its content and that in principal, and being subject to further detailed design, the FRA demonstrates that the proposed development will not be at an unacceptable risk of flooding or exacerbate flood risk elsewhere, either as the permanent proposal or during the construction phase.	Noted – no response required

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	<p>We are satisfied that section 11, Recommendations, Securing of commitments, and subsequent sub paragraphs 11.1.1 to 11.1.21 adequately addresses the associated flood risk requirements to be secured, acknowledging that in particular and in common with the design for the compensation storage, that these aspects will be developed during the next stage of design, and in particular, but not exclusively, the compensation area and other works relevant would be subsequently consented and the detail agreed in accordance with the requirements of the Environmental Permitting Regulations 2016.</p>	
DCO Requirement	<p>We will discuss with you in due course the wording for the Requirement we wish to be included in the Development Consent Order in relation to the temporary compensatory flood storage area.</p>	<p>Noted – we look forward to these discussions to agree a suitably worded Requirement</p>
EA role and remit	<p>We request that the wording of bullet point 4 in section 9.3.2 (page 49) is amended to clarify our role and remit as what is currently stated is not accurate:</p> <p>Current wording: <i>Lack of maintenance of the Main Dyke Channel - the Main Dyke is an EA main river and hence the responsibility for its maintenance lies with this agency. Highways England should work in conjunction with the EA to ensure that maintenance is carried out</i></p> <p>Suggested wording: Lack of maintenance of the Main Dyke Channel - the Main Dyke is a main river which is maintained by the Environment Agency in accordance with its statutory powers contained in the Water Resources Act 1991. The Environment Agency's funding for undertaking</p>	<p>The suggested wording will be included in the Deadline 2 FRA submission.</p>

Issue/Topic	EA Comments	Highways England Response / Plan of Action
	maintenance activities are prioritised, accordingly Highways England should work with the Environment Agency to understand what maintenance is currently carried out at this location and if necessary explore opportunities for securing funding to ensure that maintenance is carried out.	

Appendix B – Skippool Clough Culvert Technical Note

Appendix B – Skippool Clough Culvert Technical Note

Project A585 Windy Harbour to Skippool Improvement Scheme Date 26th April 2019

Subject Skippool Clough Culvert Ref HE548643-ARC-SMN-A585-TN-C-4001
Version 1.0

Author Paul Thomas

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Prepared by	Paul Thomas	Date	15/04/2019
Checked by	Lisa Driscoll / Kate Burrows	Date	15/04/2019
Approved by	Nick Henderson	Date	15/04/2019

Revision Status	Amendments	Date
2.0	Issued to Environment Agency for information	26 th April 2019

1 INTRODUCTION

1.1 Purpose of this document

1.1.1 This document responds to queries related to the Skippool Clough Culvert (Horsebridge Dyke) raised by the Environment Agency at the meeting held with Highways England on 1st April 2019.

1.1.2 The queries raised were:

- Why is it proposed to replace the culvert offline?
- Why can online replacement not be used?
- How does the realigned culvert design manage scour / erosion and how is the design resilient to the tidal flow conditions that dominate at the culvert outlet?
- How does the realigned culvert design manage blockage risks?

1.2 Existing culvert

1.2.1 Skippool Clough culvert carries Horsebridge Dyke (a Main River) under the A585 at Skippool roundabout to the tidal part of the watercourse that drains to the Wyre Estuary. It was originally constructed by Lancashire County Council around 1969 as part of the construction of Thornton-Cleveleys Bypass (now known as Amounderness Way). It was subsequently extended at both ends around 1971. In 1980 the A585 became a trunk road from the M55 to Fleetwood. The culvert structure is managed and maintained by Highways England, but the tidal flap valve fixed to the north headwall is the responsibility of the Environment Agency (Grid Ref: SD35484 40609).

1.2.2 The culvert is recorded as being about 88m long, formed from two distinct construction types. The central section beneath the current roundabout is a 1.52m internal diameter precast concrete pipe (45m long). The sections on either side of the central concrete pipe are constructed of 1.6m internal diameter corrugated steel pipes (upstream 21m long, downstream 22m long). Two concrete / masonry chambers link the corrugated steel pipes to the central concrete pipe section and the more southerly chamber has a manhole access that is within the roundabout carriageway. The northerly chamber has no manhole access and is strictly to link the corrugated steel pipe to the central concrete pipe and act as a highway drain inlet.

1.2.3 There are four changes of direction along the existing culvert with a total angular deviation of 100° being: at the upstream headwall = 17°; internal at first chamber = 38°; internal upstream of second chamber = 27°; internal at second chamber = 18°. These are shown in Figure 1-1.

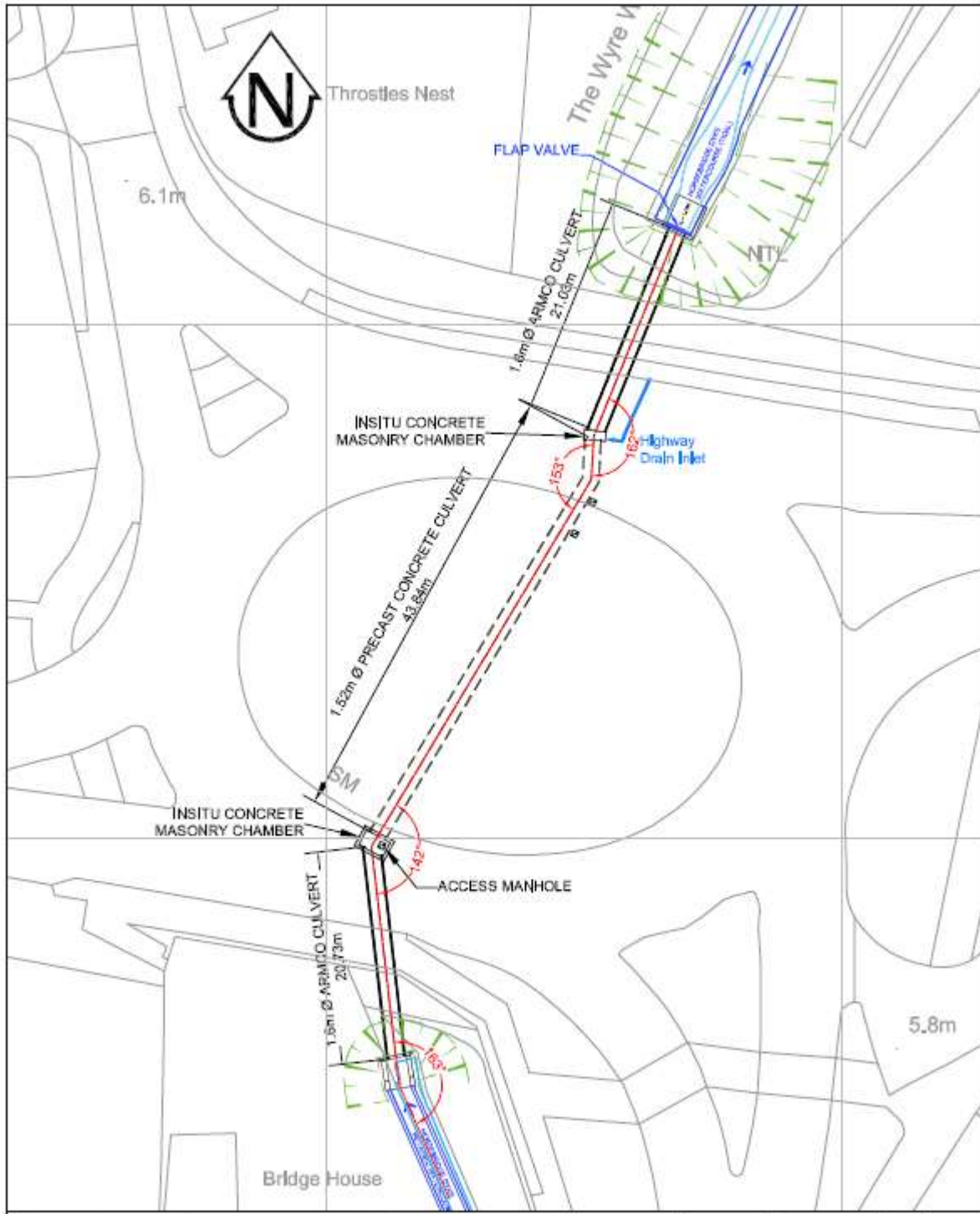


Figure 1-1: Existing Culvert Plan View

- 1.2.4 Upstream of the existing south headwall, the watercourse passes through a masonry lined channel that is typically about 1.5m wide at its base and 1.2m deep.
- 1.2.5 The headwalls and wingwalls are formed from a mix of concrete and masonry (Figure 1-2). The invert of the culvert at the southern end is 2.53m AOD, falling to 1.78m AOD at the northern end. The culvert falls at a gradient of approximately 1 in 120 from south to north.



Existing south headwall



Existing north headwall

Figure 1-2: Existing culvert headwalls

2 ENVIRONMENT AGENCY QUERIES

2.1 Preliminary design considerations

- 2.1.1 During the preliminary design stage, it was identified that the existing culvert would be affected by the change in layout of the road passing over the culvert. Following remodelling of the junction, the central concrete pipe section of the culvert, which is largely located beneath the roundabout central island, would be exposed to traffic loading. Furthermore, the southern in-situ chamber would be located in one of the slip road carriageways.

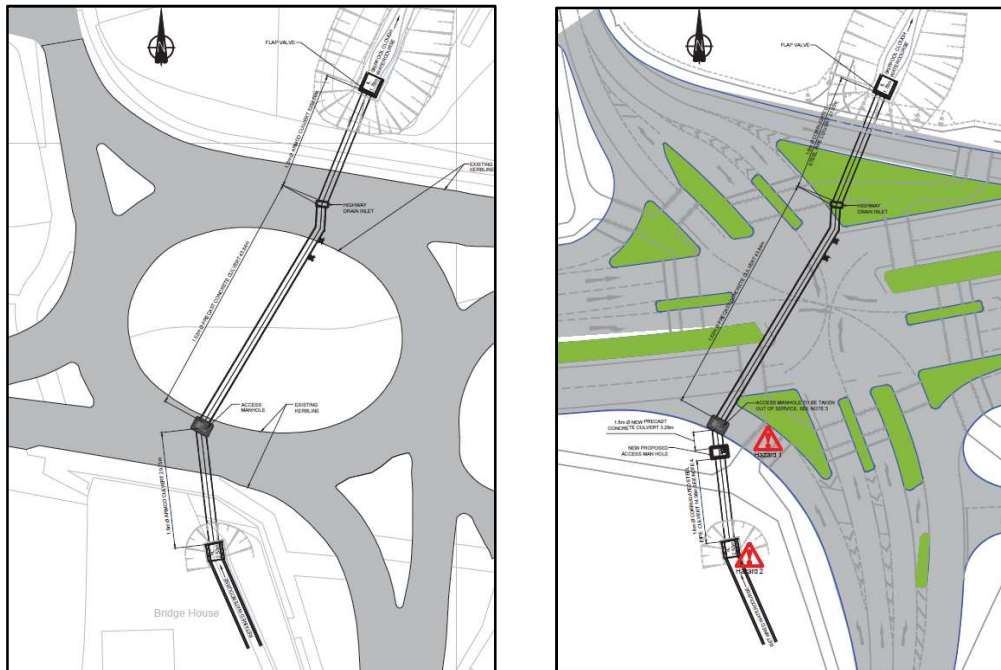


Figure 2-1: Existing culvert shown against existing and proposed road layouts

- 2.1.2 Discussions were held with Highways England structural specialists who considered that, due to the change in traffic loading on the culvert and the age of the existing structure, an assessment of its structural capacity should be carried out to determine its load capacity and hence ability to carry the revised highway arrangement. The assessment identified that internal CCTV inspection and intrusive investigation of both the corrugated steel pipe and concrete pipe sections would be necessary to collect the information required to carry out a comprehensive load assessment. To gather the required information, deep trial trenches would be required to extend to below the invert of the culvert, and cores of the pipe materials from within the in-service culvert structure would be needed. To undertake such investigatory work, a number of health and safety risks would be encountered, including confined spaces and working in water.

- 2.1.3 Three options were considered:

Strengthen existing culvert

- 2.1.4 In order to successfully carry out a culvert strengthening design, data gathered from intrusive site works and surveys, described in 2.1.2, would be needed. Undertaking these intrusive investigations would be significantly disruptive to road users, as well as carrying health and safety risks. It was therefore concluded that there was not a practicable solution which would strengthen the 50-year-old structure to ensure it had sufficient capacity to withstand the increased loading over the lifetime of the proposed Scheme.

Protect existing culvert

- 2.1.5 Protection of the existing culvert by means of a protective slab over the top of both the concrete and steel sections, which would distribute the traffic loading over a greater area, was considered. To implement this option, excavation above the length of the culvert would be necessary, requiring works phasing and traffic management during construction of the slab. Again, intrusive surveys would also be required to allow the existing culvert strength to be determined and hence determine the portion of loading which the culvert would need to be protected from.

Replace existing culvert offline

- 2.1.6 Replacement of the culvert with a new concrete pipe (nominally 1.8m internal diameter to allow for some additional flow capacity for climate change resilience) and headwalls would need to be conducted as “dry weather works” to minimise risks of detriment to downstream water quality, as well as to reduce the health and safety risks associated with working in water. Asbestos has been detected in the north headwall of the culvert therefore specialist contractors would need to be used during works affecting that part of the structure.
- 2.1.7 The existing Skippool Clough culvert would be decommissioned by filling with lightweight concrete or grout. The existing inlet and outlet headwalls would be demolished once the new headwalls were constructed and the watercourse diverted into the new culvert. The ground around the new headwalls would be regraded to complete the decommissioning of the existing culvert.

2.2 Preferred solution

- 2.2.1 Further discussions were held with Highways England structure specialists, the Major Projects team and the Highways England Operations Directorate; it was concluded that replacement of the existing culvert was the preferred solution due to the uncertainty relating to the condition and capacity of the existing structure. It was assessed that it would be more cost effective to replace the existing culvert at this time than try and strengthen it or delay works to a future date, as the 50-year-old culvert is likely to be reaching the end of its life.
- 2.2.2 The whole of the culvert structure, including the upstream and downstream headwalls, would become the future maintenance responsibility of Highways England. The outfall (northern) headwall would include for provision of a new tidal flap valve and davit crane that would be in Environment Agency ownership, as is the case with the existing outfall headwall. The design would also provide for suitable access to the flap valve such that, in future, the Environment Agency can conduct their statutory duties. In addition, highway drainage outfalls at this location would have flap valves but these would remain the responsibility of Highways England.

2.3 Why can an on-line replacement not be used?

- 2.3.1 The issues associated with external online replacement are outlined in paragraph 2.1.4. The construction methodology for an internal online replacement would comprise either the insertion of a liner inside the existing culvert or application of a sprayed compound inside the pipe. In doing so, the existing changes in diameter and bends would be maintained and the flow capacity of the culvert would be reduced. The Fluvial Design Guide¹ sets out key principles of culvert design. Table 1 summarises the relevant principles and describes how the proposed solution for the Skippool Clough culvert complies with these.

Principle	Comment
Choose a size which readily accommodates the design flow	Hydraulic model results show that the existing culvert is surcharged for the 1% AEP plus 70% climate change allowance. Therefore, any reduction in diameter resulting from internal lining will increase flood levels upstream. The new 1.8m diameter culvert is not surcharged for this event.
Adopt the shortest length possible.	A new offline, straightened culvert has a shorter length than the existing bending culvert.
Avoid bends, steps and changes of cross section	The new culvert has removed all the existing bends and changes in cross section.

Table 1 Principles of culvert design

- 2.3.2 During construction, temporary over-pumping of flows in the Horsebridge Dyke would be necessary and there is no readily available alternative route for this.
- 2.3.3 Due to the age of the structure it is possible that it may contain asbestos elements, and these would have to be safely removed if encountered during demolition of the existing culvert structure.

2.4 Why is an off-line replacement proposed?

- 2.4.1 The main benefits of the off-line replacement culvert are:
 - Delivery of the opportunity to provide for additional flow conveyance capacity to accommodate future climate change predictions. The pipe would have an internal diameter of 1.8m giving an increased cross-

¹ Environment Agency <http://evidence.environment-agency.gov.uk/FCERM/en/FluvialDesignGuide/Chapter8.aspx?pagenum=6>

sectional area of about 40% compared to the existing culvert.

- Removal of bends and changes in cross section.
- Provision of a shorter overall length.
- Highways England would have structural confidence in the new culvert and future maintenance burden would be minimised.
- During the majority of the duration of constructing the new culvert, the existing culvert would be retained to deal with flows from Horsebridge Dyke thereby avoiding the need for over-pumping.

2.5 What are the proposals to manage scour?

Upstream of new culvert

- 2.5.1 The watercourse upstream of the culvert is currently within a masonry lined channel with a concrete base. The proposed culvert would include a new headwall and its wing walls would be of similar construction. The concrete apron upstream of the headwall would connect to the existing concrete channel base that would resist scour (Figure 2-2).

Downstream of new culvert

- 2.5.2 It is understood that the Environment Agency is concerned that the preliminary design for the proposed outfall from the new culvert would be offset from the existing culvert outfall by approximately 4.8m (Figure 2-3).
- 2.5.3 The layout of the north headwall has been modified to provide improved access to the Wyre Way on both sides of the watercourse and the height of the main headwall increased to 6.7m for tidal flood protection (Figure 2-4).
- 2.5.4 In respect of scour protection and resilience to the tidal flow conditions in this location, it is proposed that a concrete apron and revetments either side of the apron would be provided and this would extend for about 6m in front of the headwall, allowing the apron to link to the existing watercourse channel. However, this arrangement would be reviewed as part of the detailed design stage and discussed with the Environment Agency.

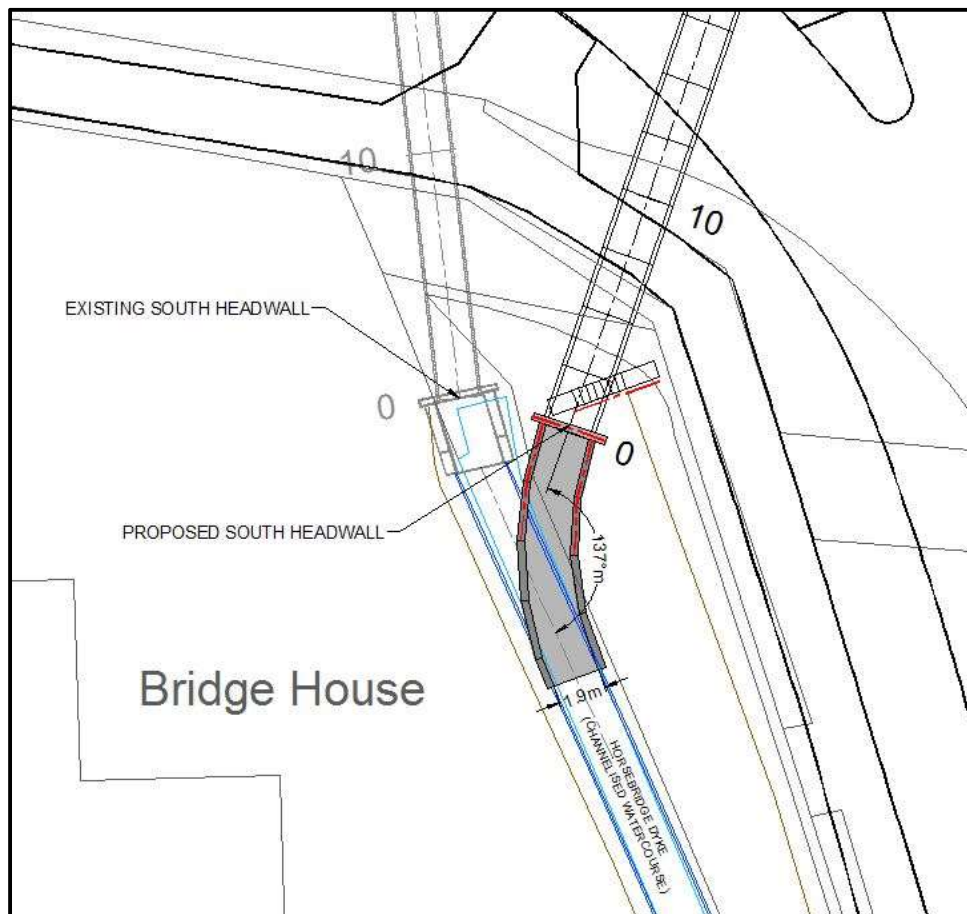


Figure 2-2: South headwall plan

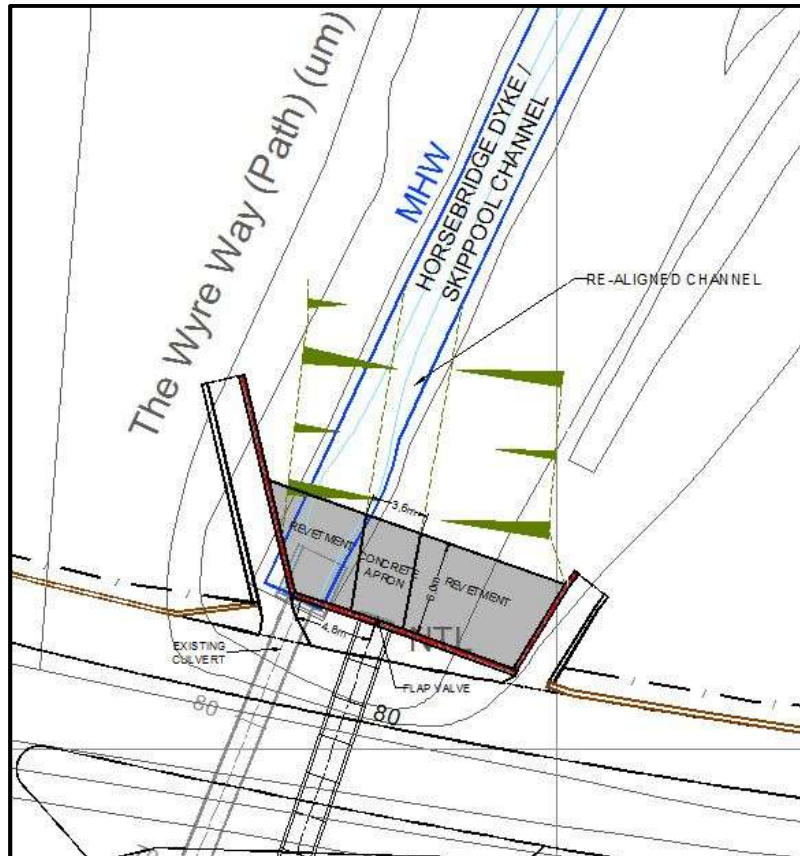


Figure 2-3: North headwall plan

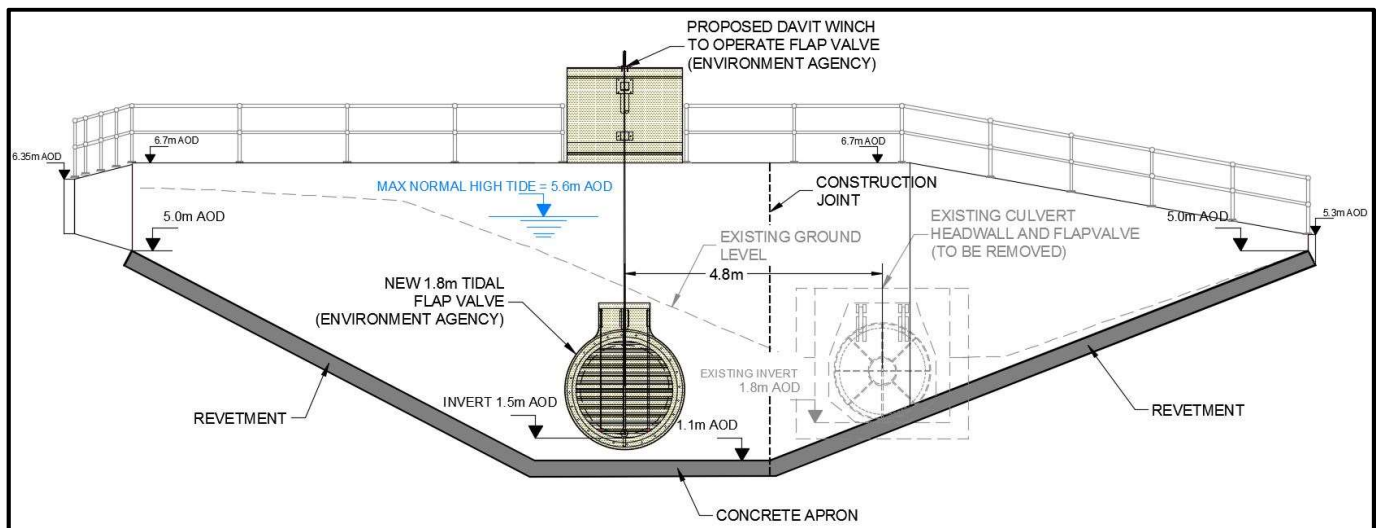


Figure 2-4: Elevation of north headwall

2.6 How would the replacement culvert design manage blockage risks?

- 2.6.1 It is considered that the existing culvert, with its three changes of direction within the confined structure, its two concrete chambers, and change of direction at the existing southern headwall, presents a relatively high blockage risk.
- 2.6.2 The proposed culvert would be straight horizontally and have a continuous gradient from the inlet to outlet and this would reduce the risk of an internal blockage within the proposed culvert.
- 2.6.3 The preliminary design has also been reviewed and it is now proposed that the angle between the proposed culvert and the existing watercourse at the upstream end, being about 43°, would be designed so that the

wingwalls would be curved to connect with the existing masonry walls of the channelised watercourse and its concrete invert to provide a smoother change of flow direction that would limit the potential for scour and subsequent risk of blockage.