

SCREENING OF ENVIRONMENTAL ASPECTS

	NAME	POSITION	DATE
PREPARED BY	Annabelle Farrington	ENVIRONMENTAL AND SUSTAINABILITY DEGREE APPRENTICE	16/03/2023
CHECKED BY	Kay Walker	PRINCIPAL ENVIRONMENTALIST	17/03/2023
APPROVED BY	Michael Peile	PRINCIPAL ENVIRONMENTALIST	28/03/2023
RECEIVED BY	Patrick Madden	PROJECT MANAGER	06/11/2023

Project detail

PROJECT NO:	TO513 and TO453	SCHEME TITLE:	Prince of Wales Central Barrier Replacement and Resurfacing
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PROJECT DESCRIPTION

As part of the Specialist Bridges Inspection and Maintenance (SBIM) contract, Amey have been appointed by their Client, National Highways, to undertake routine maintenance and inspection works on the M4 Prince of Wales Bridge.

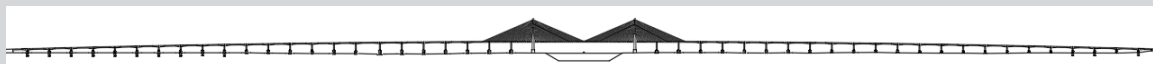


Figure 1: Prince of Wales Bridge Elevation

The Prince of Wales bridge is a long span cable stayed bridge which carries the M4 motorway between England and Wales. The M4 motorway has three live lane and a hard shoulder in both directions. The bridge consists of three sections, shown in Figure 1; a 25 span, 2103m long viaduct on the English side, a 24 span, 2077m long viaduct on the Welsh side and a 456m long cable stayed section in the centre. The structure, identified in Figure 1, crosses the Severn Estuary which is a designated Ramsar and SSSI site.

The existing rectangular hollow section (RHS) central reservation barrier on the Prince of Wales Bridge, shown in Figure 2, was installed during construction before the bridge was opened to traffic in 1996. It has exceeded its 20-year design service life.

The existing central reservation barrier, categorised as N2 normal vehicle containment, was designed to contain, and redirect errant vehicles of 1.5 tonnes in weight, impacting the fence or barrier at 110 km/hr at an angle of approach of 20 degrees. However, it was not designed to contain and redirect heavy goods vehicles (HGVs) during this impact.

Concerns have been raised about a series of accidents involving HGVs impacting safety barriers in the central median of motorways and trunk roads and either overturning or entering the opposite carriageway. This has prompted National highways to consider replacing these with higher level containment barriers.

National Highways Design Manual for Roads and Bridges CS 377 England National Application Annex outlines the following requirements:

- CD 377 E/1.5 states: “On motorways with a two-way annual average daily traffic (AADT) greater or equal to 25,000 vehicles/day where a safety barrier is required in accordance with this document and the distance P_{sb} to P_{sb} is 10 metres or less, the safety barrier shall have a minimum containment level of H1”.
- CS 377 E/1.6 states: “On motorways with a two-way AADT greater or equal to 25,000 vehicles/day where a VRS greater than 500mm in length is required in accordance with this document, and the distance P_{sb} to P_{sb} is 10m or less, the safety barrier shall be rigid, have a serviceable life of not less than 50 years, and be designed such that after testing in accordance with BS EN 1317-1 [Ref 8.N] and BS EN 1317-2 [Ref 7.N], it does not require realignment, replacement or repair.”

As the two-way AADT on the Prince of Wales Bridge is 64,700 vehicles/day a rigid concrete safety barrier similar to the proposed precast concrete barrier shown in Figure 3 should be used to replace the existing barrier along the full length of the structure.



Figure 2: Existing steel central reservation barrier

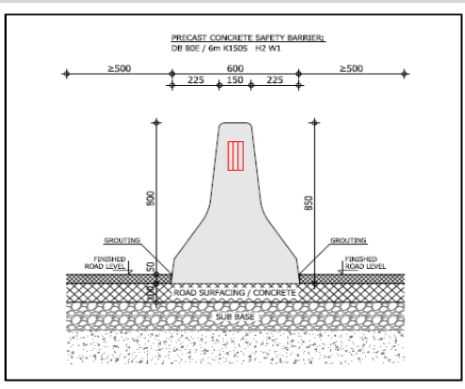


Figure 3: Proposed replacement barrier

The central barrier replacement works will be combined with the carriageway resurfacing to minimise impact on the public and traffic management requirements. The current surfacing was laid during construction and has exceeded its 15+ year design life. Local repairs have been completed however it is expected that full resurfacing will be required by 2025.

Maps



THIS PROJECT REQUIRES SCREENING OPINION (EIA REGULATIONS)	YES	NO
Screening opinion request sent to Local Authority by: [NAME]	Date	N/A
Response received:	Date	N/A
THIS PROJECT REQUIRES A SCREENING REPORT (EIA REGULATIONS) (ALL ANNEX II PROJECTS)	YES	NO
Screening report sent to Local Authority by: [NAME]	Date	N/A
Response received	Date	N/A
THIS PROJECT REQUIRES A RECORD OF DETERMINATION	YES	NO
THIS PROJECT REQUIRES ENVIRONMENTAL PERMISSIONS, LICENSES OR CONSENTS? (AMEY-ENVT-ENVTASSESS-PL-02)	YES	NO

The Severn Estuary is highly designated at this location:

- Marine Protected Area (MPA)
- Ramsar (Convention on Wetlands of International Importance Especially as Waterfowl Habitat)
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)

Consultation with the Marine Management Organisation (MMO) and Natural England (NE) (terrestrial and marine teams) is recommended given the designations of the Severn Estuary at this location, a Habitats Regulations Assessment (HRA) screening assessment and preliminary ecological survey should be undertaken regarding the nature of the works. This will identify the nature of any additional surveys of environmental windows that the works may be confined to.

As the works will be undertaken over a tidal watercourse a Marine Licence will be required. This means that whilst the risks to the marine environment are likely to be low the designations mean that this may preclude fast track licensing and early engagement is recommended to avoid delays to works as the licensing process may take several months.



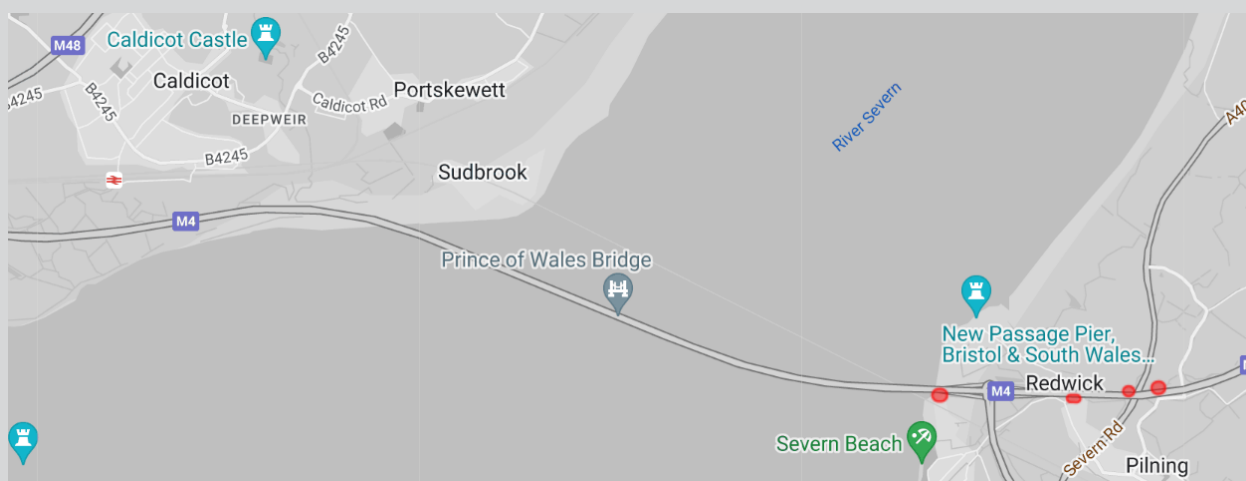
Identification of potential environmental impacts

NOISE, AIR QUALITY & ODOUR

KEY BASELINE CONDITIONS:

To determine the baseline for noise, air quality and odour, a desktop study was carried out using resources from the Department for Environment, Food and Rural Affairs (DEFRA) and the Extrium England Noise and Air Quality Map Viewer.

- The southern extent of the works located within a Noise Action Plan Important Area – ID 3784, and within close proximity to Noise Action Plan Important Areas IDs 3785, 3786, and 3787.
- The works are not located within an Air Quality Management Area (AQMA).



- There are residential buildings within 300 metres of the works, the closest are approximately 50 metres from the southern extent of the Bridge.
- Dominant noise sources are the M4 and M49, as determined from Extrium England Noise Map Viewer.
- There are no sensitive addresses within 300 metres of the works.
- The works will take place at night.
- There will not be noticeable unpleasant odours, fumes etc or any noxious discharges from the works into the atmosphere of nearby premises.

POTENTIAL IMPACTS:

- The Scheme is likely to increase local atmospheric particulate levels at nearby premises. However, this is anticipated to only last for the duration of the works.
- The Scheme is anticipated to cause an increase in noise levels within the works area. However, this is anticipated to only last for the duration of the works.
- It is also unknown at this stage if application for consent to undertake the works is warranted under Section 61 of the Control of Pollution Act (CoPA) 1974 as no prior assessment of the construction phase impacts of noise and vibration on sensitive receptors has been undertaken.

MITIGATION/CONTROL MEASURES (IF KNOWN AT THIS STAGE):

- Best Practicable Means (BPM) should be employed during construction, for example, vehicle idling time should be minimised, and dust should be dampened down as necessary.
- Best practicable means of noise control, as described within BS 5228-1:2009+ A1:2014 'Code of Practice for Noise and Vibration Control on Construction and Open Sites' should be implemented in order to minimise the risk of disturbance. The British Standard provides specific detail on suitable measures for noise control in respect to construction operations.
- Site staff should adopt and follow best practice measures at all times to ensure dust control and minimise impacts as required by the dust management plan. Where a dust management plan is not available site staff will ensure adoption of best practice control measures as described within IAQM Guidance <http://iaqm.co.uk/text/guidance/construction-dust-2014.pdf> (see Section 8 Site Specific Mitigation Measures).

- All plant and fuel-requiring equipment utilised during construction should be well maintained in order to minimise emissions.
- Effective traffic management with adequate signage should be in place to ensure traffic flows are maintained at all times.
- Operatives should receive training to effectively employ techniques to reduce noise. Unnecessary noise should be avoided when carrying out manual operations and when operating plant and equipment.
- Site staff should be instructed to follow the relevant best practice guidance documents published by EA and DEFRA- <https://www.gov.uk/guidance/pollution-prevention-for-businesses>

SCREENING RECOMMENDATIONS

YES

NO

LANDSCAPE & LANDUSE

To determine the key baseline features of landscape and land use around the scheme, the Multi Agency Geographical Information for the Countryside (MAGIC) application were used. The works area is on the Prince of Wales Bridge, which carries the M4 over the River Severn Estuary.

The works area is on the Prince of Wales Bridge, which carries the M4 over the River Severn Estuary;

- The southern extent of the Scheme is located in Severn and Avon Vales National Character Area (NCA)
- The land use around the works is predominately over water with areas of grassland and semi-urban at the northern and southern extent of the works.
- The Scheme will not require any permanent land-take.
- The Scheme will not require any temporary land-take.
- The Scheme requires structural changes to the existing central reservation and carriageway surfacing.
- There are trees within 20 metres of the Scheme. However, the Scheme will not require the removal of trees.
- The works are not within an Area of Outstanding Natural Beauty (AONB).
- The Scheme will be highly visible from Public Rights of Way (PRoW) or nearby buildings. However, the works will not obstruct any PRoWs.

POTENTIAL IMPACTS

- The Scheme will result in an improvement to the structural stability and overall structure of the bridge.
- There will be temporary visual impact, for the duration of the works.
- The permanent visual impact from the replacement of higher-level containment barriers. However, this is anticipated to be minimal due to distance of the works from residential properties.
- If mitigation is followed there should be no further impacts anticipated.

MITIGATION MEASURES (IF KNOWN AT THIS STAGE)

- Sites must be tidy and well organised during and after the works completion to minimise visual impact.
- Works should be undertaken in accordance with BS5837: 2012: Trees in relation to design, demolition and construction, and no materials stored at the base of the trees.

- Construction team to check for Tree Preservation Orders. Environment & Sustainability will undertake this task if instructed to do so.

SCREENING RECOMMENDATIONS

YES

NO

ARCHITECTURE & CULTURAL HERITAGE

KEY BASELINE CONDITIONS:

A desktop study was undertaken to identify cultural heritage assets within the works area, this was through the use of the heritage gateway database and MAGIC maps.

- The Prince of Wales Bridge is not a listed structure.
- There are no listed buildings within 300m of the works, the closest is Severn Tunnel East Portal (BSW1101) grade II* structure, approximately 323 metres from the southern extent of the works.
- There are 14 grade II listed buildings within 2km of the site.
- There are no scheduled monuments within 2km of the site.
- There are no registered battlefields within 2km of the site.
- There are no registered parks and gardens within 2km of the site.

POTENTIAL IMPACTS

- The Scheme is confined to the Prince of Wales Bridge; therefore, risk of uncovering archaeology is considered low. The works are a maintenance scheme and will not have an impact.
- None predicted, all sites are located too far away from the Scheme for any impacts to occur.

MITIGATION/CONTROL MEASURES (IF KNOWN AT THIS STAGE)

- Should human remains or archaeological finds which may be deemed to be treasure under the Treasure Act (1996) be encountered, then all work should cease, and the appropriate authorities informed. Further advice can be obtained from the Environment and Sustainability (E&S) Team.
- Given the works are confined to the superstructure of the bridge, any excavations below ground are not required.

SCREENING RECOMMENDATIONS

YES

NO

BIODIVERSITY**KEY BASELINE CONDITIONS:**

To define the baseline for biodiversity in this scheme, MAGIC map was used to identify areas of European and National designated sites whilst aerial photographs and Google Maps were used to identify other habitats of interest.

- There are trees within 20 metres of the works.
- There are records of Japanese Knotweed and Himalayan Balsam within 2km of the works.
- The works pass directly over the Ramsar Site and Marine Protected Area (MPA), the Severn Estuary.
- There are 4 Site of Special Scientific Interest (SSSI) within 2km of the Scheme: Gwent Levels – Magor and Undy, Nedern Brook Wetlands, Caldicot, Bushy Close, and the Severn Estuary. The latter passing directly beneath the works.
- There is one Special Area of Conservation (SAC) within 2km of the Scheme, the Severn Estuary, passing directly beneath the works.
- There is one Special Protection Area (SPA) within 2km of the Scheme, the Severn Estuary, passing directly beneath the works.
- There are 3 SACs within 30km of the Scheme with bats as a qualifying feature or primary reason for site selection: Wye Valley and Forest of Dean Bat Sites, Wye Valley Woodlands, and North Somerset and Mendip Bats.
- The works are located within the Severn Estuary Important Bird Area.

There are three records of European Protective Species licenses granted within 2km of the Scheme:

- Great Crested Newts
- The Common Pipistrelle Bat
- The Common Otter
- There are also records of nesting birds, badger, slow worm, hedgehog, water vole and bats within 2km of the proposed works.

POTENTIAL IMPACTS

- Potential to encounter and disturb protected species.
- Potential for pollutants to enter the estuary as a result of the works.
- Potential to disturb nesting birds and the bird species and the designated species of the Severn Estuary SPA (both breeding and over wintering populations).

MITIGATION/CONTROL MEASURES (IF KNOWN AT THIS STAGE)

A HRA screening is required along with liaison with Natural England and the MMO to identify the need for and scope of mitigation measures. Such measures may include but are not necessarily limited to:

- If any protected/invasive species are suspected or found on site, all work must stop, and the Environment and Sustainability (E&S) Team contacted immediately;
- Works may be limited to certain environmental windows;
- Night-time work is required, task lighting should be used in such a way that light spill is minimised, and wide-angle illumination must be avoided as this will be more disturbing to foraging and commuting bats, migratory fish as well as other wildlife;
- Ensure that no materials or equipment are stored on soft estate. All storage of materials and plant should be kept to the carriageway.

SCREENING RECOMMENDATIONS

YES

NO

- The works are due to take place between March and September inclusive, a nesting bird check is required.
- Liaison with NE, and a preliminary ecological appraisal is required to establish environmental widows in which to undertake the works and identify potential mitigation measures and a Habitat Regulation Assessment screening on the SAC, SPA and Ramsar site;
- Assessment of the works area under the bridge for bat roost potential
- A Marine Licence will be required from the MMO as the works are being undertaken over a tidal watercourse. As the works are also within a European Designated Site and an MPA, this may preclude fast track licensing, and early engagement is recommended to avoid delays.

WATER ENVIRONMENT & DRAINAGE

KEY BASELINE CONDITIONS:

A desktop study using Flood Map for Planning and the DEFRA MAGIC Map application were used to determine the baseline for drainage and water environment.

- The Scheme is not within a Source Protection Zone (SPZ).
- The works are located over a Flood Zone 3, indicating a high probability of flooding.
- A Flood Risk Assessment (FRA) may be necessary if the Scheme is an area with critical drainage problems, as notified by the Environment Agency, or identified of being at increased flood risk in the future by local authority's strategic FRA.
- The Scheme passes over the Severn Estuary, a Ramsar Site and SSSI Site.
- There are no ponds within 250 metres of the works.

POTENTIAL IMPACTS

- There will be no permanent or temporary physical changes to watercourses within the Scheme.
- The works will have no increase traffic flow or changes of number or changes of the number or type of junctions.
- There is the potential for spillage, leakage, and/or seepage of the fuels, chemicals, dust, and oils escaping to soil and the Severn Estuary watercourse and drainage system which may pollute/enter downstream watercourses.

MITIGATION/CONTROL MEASURES (IF KNOWN AT THIS STAGE)

- Under Environmental Permitting (England and Wales) Regulations 2010 it is an offence to cause or knowingly permit a water discharge activity unless you are complying with an environmental permit or exemption.
- Contractor should have a spillage response plan in place.
- Contractor to follow best practice and guidance as published by EA and Defra – <https://www.gov.uk/guidance/pollution-prevention-for-businesses>.
- Spill kits must be available on site at all times and all subcontractors and personnel must be trained/briefed on their use.
- All storage and refuelling areas (if required) should be located at least 10m from any road drainage and watercourses.
- All gullies to be covered to prevent any materials entering the gully pot. All liquid discharge should be collected and taken away to be treated before disposal at the licensed facility.
- Effluent from drainage cleaning to be disposed of offsite to ensure contamination does not occur.
- Stockpiles should be stored outside of the floodplain.
- Refer to Amey documents [AMEY-ENVT-PP-GD-03](#) Guidance on Drainage Systems, and [AMEY-ENVT-PREVENTPOLLUTION-CRC-01](#) Pollution Prevention
- Refer to Amey documents [ENVT-PPG-GD-12](#) Pollution Response Planning, [ENVT-PPG-GD-13](#) Dealing with spills.

SCREENING RECOMMENDATIONS	YES	NO
<ul style="list-style-type: none"> • Consultation with the Environment Agency (EA) is required as the works lie over an area of the Severn Estuary that is classed as a main river. It is possible that a permit or the registration of an exemption may be required. Works unlikely to qualify for an exception due to numerous adjacent protected areas. • Consultation with the EA and MMO regarding the nature of the works and the location will indicate whether any permissions or exemptions are required at this location. 		

COMMUNITY EFFECTS**KEY BASELINE CONDITIONS:**

- The works will be completed at night.
- The works will cause disruption and/or striction of access for through traffic. However, this is only anticipated to last for the duration of the works.
- It is unknown at this stage if the works are regarded as an accident black spot.
- No Public Rights of Way (PRoW) across the Scheme or within close proximity.

POTENTIAL IMPACTS

- The Scheme will not cause permanent disruption and/or restriction of access to residences, other businesses and, through traffic.
- No changes in journey times or land use are anticipated on completion of the works.
- The works will require traffic management and phased lane closures for central barrier replacement and carriageway resurfacing.
- The works are unlikely to impact on the physical, mental, or social wellbeing of any nearby receptors or users of the road network.

MITIGATION/CONTROL MEASURES (IF KNOWN AT THIS STAGE)

- Letter drop to residences and businesses two weeks before work commences.
- Ensure that parked vehicles do not obstruct site access and egress points or private access.
- Warnings of the works and any access restrictions to properties or footpaths, complete with signage should be given well in advance of works – the designer should contract affected parties prior to construction.
- A diversion route study should be undertaken should the scheme require full carriageway closures during the night (23:00 – 07:00) to enable construction works to take place.
- Advance notice of works to minimise disruption to road users.

SCREENING RECOMMENDATIONS	YES	NO

GEOLOGY & SOILS**KEY BASELINE CONDITIONS:**

A desk study was carried out to identify the baseline of the Scheme using the MAGIC application the British Geological Survey (BGS) Geology Britain Interactive Mapping Tool.

POTENTIAL IMPACTS	<ul style="list-style-type: none">• The Scheme will not involve any excavation works.• The site has not previously been excavated.• There are no historic landfill sites within proximity to the works.• There are no active landfill sites within proximity to the works.• Soilscape in the Scheme area is mainly sea, with areas of loamy and clayey soils of coastal flats with naturally high groundwater.• The Bedrock for the area of the works is mudstone.	
	<ul style="list-style-type: none">• Contamination of soils and underlying aquifers from oils and fuels.• There is the potential to deposit materials, repair chemicals, and dust within the River Severn watercourse and the floodplain. This may pollute/enter adjacent watercourses and potentially alter its flow regime.	
MITIGATION/CONTROL MEASURES (IF KNOWN AT THIS STAGE)		
<ul style="list-style-type: none">• Contractor to follow best practice and guidance as published by EA and Defra- https://www.gov.uk/guidance/pollution-prevention-for-businesses.• Avoid stockpiling of spoil/excavated materials at a location that could enter the watercourse.• Encapsulate the works area during blasting and painting works to ensure paint particles do not pollute the estuary.• Follow guidance contained in the Pollution Prevention Guideline: Works and maintenance in or near water.• Consult with local authorities/regulators to obtain consents if required.• Stockpiles of excavated materials should be stored outside of the floodplain.• No further assessment will be required if mitigation measures are followed e.g., careful excavation and compliant and correct disposal of any spoil. (see below regarding waste transfer).		
SCREENING RECOMMENDATIONS	YES	NO

WASTE	
KEY BASELINE CONDITIONS:	<ul style="list-style-type: none">• The works are expected to generate planings and metals.• It is unknown at this stage if any waste generated is likely to be hazardous.• The cost of the works is expected to exceed £300,000.
POTENTIAL IMPACTS	<ul style="list-style-type: none">• If waste is generated and not contained and disposed of appropriately, it could lead to environmental harm.
MITIGATION/CONTROL MEASURES (IF KNOWN AT THIS STAGE)	
<ul style="list-style-type: none">• It is considered good practice for a site waste management plan is produced for works costing more than £300,000.• All waste should be segregated appropriately and stored in a safe manner for duty of care compliance.• A register is to be kept of all waste types created or managed by Amey accounts, which details the correct EWC code, approved waste carrier and destination of the waste after it leaves Amey's possession.• Waste to be considered for reuse/recycling, suitable on and offsite options should be considered, but must remain appropriate to the scheme value.• All sub-contractors removing waste from site must possess a current Waste Carrier's Licence.	

- Sites used for disposal / recycling of waste must be suitably licensed and copies of their licences kept on file.
- Waste transfer notes are required for all waste. Any hazardous waste should only be disposed of by a specialist waste contractor under a hazardous waste consignment note.

SCREENING RECOMMENDATIONS

YES

NO

SUSTAINABILITY

KEY BASELINE CONDITIONS:

A desk study including information in the environmental alert form was used to determine the baseline for this scheme

- Recycling/reuse options have been considered possibly regarding the recycling of the existing barrier and reuse/recycling of the planned material. This is being currently considered in the feasibility stage of the project.
- At this stage, no recycling/reuse options have been considered with respect to materials imported to site.
- Fuel and water use

POTENTIAL IMPACTS

- Raw material consumption including fuel and water resulting in natural resource depletion.
- Carbon footprint of transporting materials to site.
- If generated waste ends up in landfill site, this is not sustainable.

MITIGATION/CONTROL MEASURES (IF KNOWN AT THIS STAGE)

- Surplus materials imported to site to be stored appropriately and used for other works.
- Possible recycle/reuse options to be considered where possible.

SCREENING RECOMMENDATIONS

YES

NO

Screening recommendations

DOES THE PROJECT FALL UNDER THE RELEVANT THRESHOLDS WITHIN ANNEX I OF DIRECTIVE 2014/52/EU (AMENDING DIRECTIVE 2011/92/EU)?

Yes

No – Go to next question

DOES THE PROJECT FALL UNDER THE RELEVANT THRESHOLDS WITHIN ANNEX II OF DIRECTIVE 2014/52/EU (AMENDING DIRECTIVE 2011/92/EU)?

Yes

No – EIA is not mandatory however non-statutory EIA is potentially required in line with best practice

DOES THIS PROJECT REQUIRE RECORD OF DETERMINATION (ROD)

Yes

No

DOES THIS PROJECT REQUIRE SCREENING OPINION FROM THE RELEVANT AUTHORITY	Yes	No
DOES THIS PROJECT REQUIRE ENVIRONMENTAL PERMISSIONS, LICENSES OR CONSENTS?	Yes	No
DOES THIS PROJECT REQUIRE STAKEHOLDER CONSULTATION (INCLUDING STATUTORY BODIES)	Yes – please record detail below	No

A HRA screening report is required. Liaison with the MMO and Natural England (NE) will be required due to the location of the works within highly designated sites, and to identify the requirement for and scope of mitigation measures and environmental windows relating to nesting birds, overwintering birds, migratory fish etc.

Further surveys e.g., assessment of the works area under the bridge for bat roost potential may be required.

A Marine License will be required from the MMO as the works are being undertaken over tidal waters. As the works are also within a European Designated Site this is likely to preclude fast track licensing without prior contact with NE. Early engagement with the MMO is therefore recommended.

Consultation with local businesses and community is also recommended via letter drops.

Revision history

VERSION	DATE	AMENDMENTS	OWNER	AUTHORISER
1.0	04/08/2017	New document	Group Environmental Business Partner	Group HSEQ Director