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CEREDIGION
County Council

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HIGHWAYS DEVELOPMENT: ASSET AND DESIGN SERVICES

ED3816 – Glan Y Mor PRoW Bridge Erosion Control PEA & EcIA




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1.0. Introduction

1.1. Background and Site Description

Ceredigion County Council is looking to undertake minor maintenance and erosion defence works at the Glan Y Mor Public Right of Way (PRoW) footbridge connecting the two sides of Clarach Beach (~SN 58704 84018). Due to a large sandy deposit on the southern embankment, this forces the river channel up against the northern embankment and abutment (see photo V in Appendix 1). Due to the bend in the river just upstream, scour protection boulders have previously been installed to protect the public highway (C1049).

The bridge abutment is subject to continuous erosion forces from the standard flow of the river, with some whirlpooling evident on both sides. During stormy conditions, high spring tides, or any other period of elevated river levels, these forces are likely amplified. This has had a scouring effect on the exposed concrete blocks that make up the abutment face at that height of the structure. Without remediation, the bridges structural integrity will come into question and the safety of the structure for public use.

A walkover survey of the expected works area was undertaken on 16/05/2023 to establish the baseline ecological conditions of the expected intervention area. This included an assessment of existing habitat features, the potential for the use of these features by protected species, the possible impacts of the proposed design, where relevant, alternative options to resolve the issue, and enhancement opportunities. This Preliminary Ecological Appraisal was undertaken in accordance with CIEEM guidance.

1.2. Design Proposal Summary

Bridge Maintenance: An area of up to two metres in front of the east and west parapets of the northern abutment will be shuttered off using sandbags and/or ton bags, or equivalents, and the water pumped out through sediment filter bags. Once the working areas are dry, marine-grade concrete will be used to fill the voids and the scoured areas. This will be left to dry before the shuttering is removed.

Erosion Protection: A total of 10m^3 of up to 1.5 ton boulders will be placed along the west and east face of the northern abutment (see figure 1). In the case of the east face, this will simply be a 1-2 metre extension of the pre-existing line of scour protection boulders discussed above.

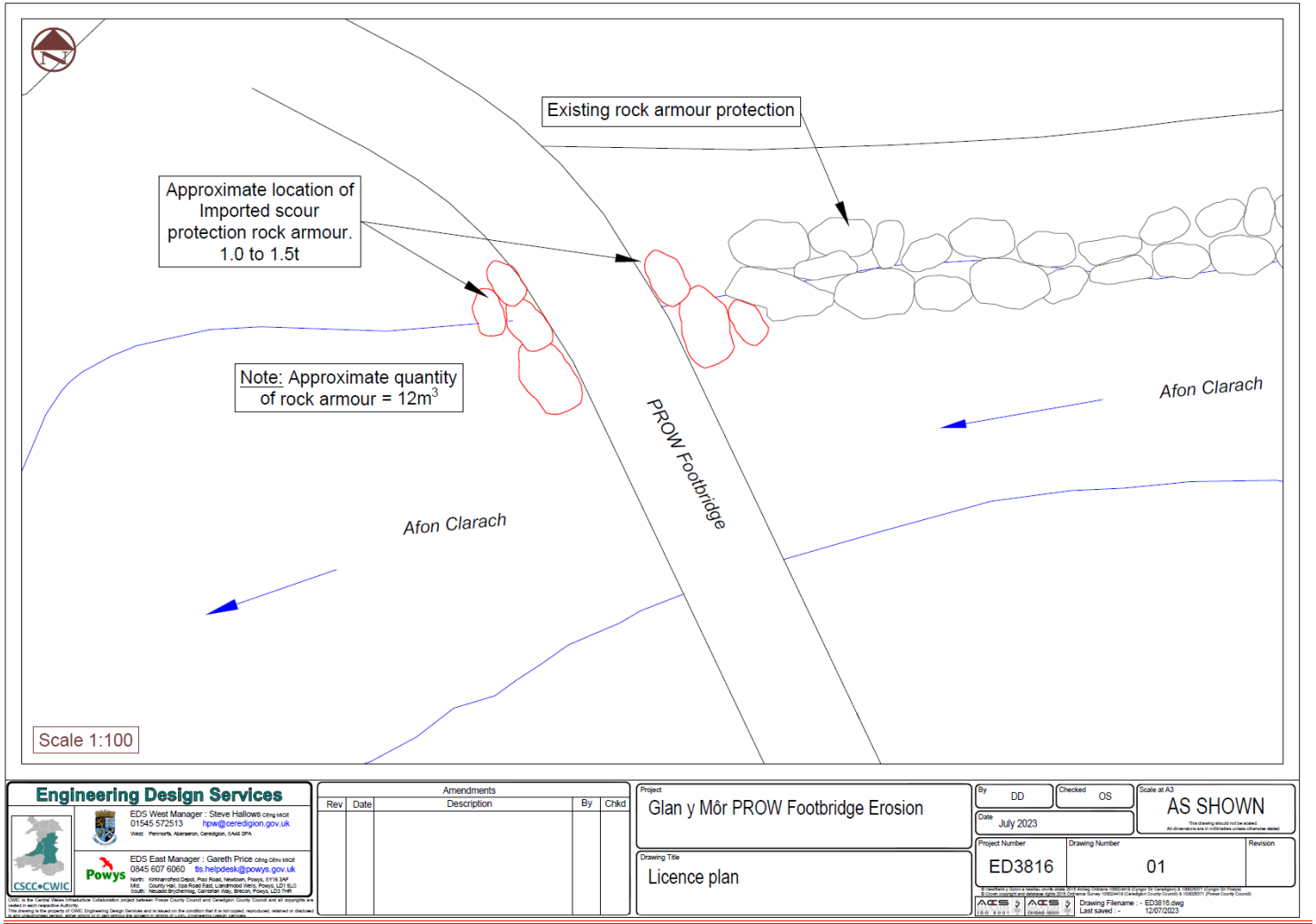

Figure 1: The design schematic for the proposed scour protection boulders.

2.0. Methodology

A Preliminary Ecological Appraisal (PEA) comprises a Phase 1 Habitat Survey and an assessment for protected species with the aim of identifying ecological constraints and opportunities, as well as the need for more specific habitat or species surveys.

2.1. Data Search

A background data search was conducted on 12/05/23, which was multifactorial, and involving the following:

- Records for priority species, species of conservation concern, locally important species and Invasive and Non-Native Species (INNS) from the WWBIC database, as obtained via CCC membership of Aderyn Lerc Wales.

- Designated Sites from the UK governments Magic Mapping facility and CCC's QGIS database.

- Trees and woodland patches with Tree Protection Orders (TPO's) via CCC's QGIS database.

2.2. Field Survey

The field survey of the areas depicted in figure 1 followed the standard methodology for Phase 1 Habitat survey (JNCC, 2010), but included a broader evaluation of habitat value, as well as an assessment of habitat suitability. A search for field signs of any protected or priority species, which could potentially make use of the site or be impacted by the proposed works was also undertaken. These findings were mapped. Due to the small scale of the works, and the lack of on-site necessity, no target notes were taken.

2.2.1. Badgers

The areas within the scope of the works were assessed for its suitability for foraging and sett creation. Any incidental badger signs such as paths, setts, latrines, footprints, or foraging signs were recorded if encountered. The survey included (where possible) a buffer of 30m to the works area as far as access was permitted.

2.2.2. Bats

A general assessment of bat roosting, foraging, and commuting potential was undertaken. This extended to the scheme area plus a buffer of around 100m (where possible) for visual assessment.

2.2.3. Otters and Water vole

The survey included an assessment of potential for otter resting, commuting, feeding and the presence of any activity indicators, such as spraints and footprints. The survey extended to the scheme area plus a buffer (where possible) of up to 30m.

Areas were assessed for water vole suitability. The survey extended to the scheme area plus a buffer of up to 10m (where possible).

2.2.4. Reptiles and Amphibians

The habitats on-site were assessed for their potential to support reptiles and amphibians. This included vegetation composition and structure as well as availability of shelter, food, and connectivity with other suitable habitats. The survey extended to the scheme area plus a buffer of up to 10m.

2.2.5. Nesting Birds

An assessment of habitat suitability for nesting birds was undertaken as well as any incidental evidence of nesting recorded. The survey extended to the scheme area plus a buffer of up to 10m.

2.2.6. Invasive and Non-Native Species (INNS)

The area of works plus a buffer zone of up to 50 metres (where possible) were inspected thoroughly for the presence of INNS, particularly in relation to Japanese Knotweed and Himalayan Balsam.

2.2.7. Fisheries and River Dynamics

The works area was investigated for spawning suitability and the potential to impact migrating species, which included consultation with NRW's Fisheries Officer. An on-site evaluation of the proposals was also made in relation to the existing river dynamics.

2.2.8. Habitat Quality and Other Species

All other species were noted when/if encountered, including UK, national, and local priority species. Casual assessments of habitat quality were made based on the encountered diversity of species, the relative proportion of botanical species, the presence or absence of aggressively competitive species, INNS, nutrient level indicators, as well as historical and current land use indicators. Any worthwhile details are noted in the main results sections.

3.0. Results

3.1. Data Search

3.1.1. Aerial Photography

A view of the scheme area and surroundings can be viewed in figure 2 below. To the west of the bridge is Clarach Beach (mostly shingle and cobbles, but some areas of sand/fine sediment) and the dynamic mouth of the river Clarach. To the north sits the Aber Bay Holiday Park and a few caravan parks. The land then rises above this point, leading to some nice soft-rock cliffs and coastal grassland. The beach continues south of the works area, with some poor-quality grassland, shops, car parks, and further caravan parks.

East and southeast of the works area is marshy grassland fringed with reeds near the river and along intersecting ditches. This area is of large ecological significance. Beyond this are agricultural fields used for grazing by sheep.

Figure 2: Aerial photography of the general scheme area and surrounding countryside.

3.1.2. Records Search

A single-point search on the Aderyn Lerc database, from the bridge location and a buffer of 250 metres returned a total of 70 records within the vicinity. Of those 70 records, there was a total species retrieval of 37, 21 of which were priority species, 15 were species of Conservation Concern, whilst 1 was a locally important species.

64 of these records were for birds associated with the beach, Cardigan Bay, and cliffs, and were mostly coastal species. None are likely to have an important association with the works area aside from passing through.

Of the remaining 6 records, 3 were for notable mammals: two Water Vole locations from 2004 and one Otter spraint record from 2019. The latter was recorded 37 metres away from the bridge on the bend upstream. One of the Water Vole records is also 37 metres away, but downstream on the beach. A look at the details of this record suggests the location is erroneous as the habitat description does not match the location – it seemingly refers to the area of marshy grassland upstream of the bridge. The remaining Water Vole record is from some of the drainage ditches in this grassland.

The final three records were for 2 Cinnabar moths and 1 Thornback Ray egg-case at locations more than 100 metres away. There were no INNS records.

3.1.3. Designated Areas, Assessments, Permits, and Licences

The works location is just outside the border of the Craigyfulfran and Clarach SSSI, 30 metres away from the Borth to Clarach SSSI, whilst it is also within the Marine Licensable Zone. Due to the latter, the works will require a band 2 marine licence before commencing, which can take up to 4 months to obtain. Natural Resources Wales will consider potential impacts upon the SSSI's during internal consultation phases of the marine licence.

The border of the Pen Llyn a'r Sarnau Special Area of Conservation is also located just 25 metres west of the works site whilst the West Wales Marine SAC and Northern Cardigan Bay Marine SPA are 135 metres west, with the works site being hydrologically connected to all three. This means potential impacts on their protected features will need to be considered

in a Habitat Regulations Assessment (HRA). This assessment will need to be included as part of the Marine Licence submission package. The first stage of the assessment (Test of Likely Significant Effect) will identify any potential impact pathways, and if necessary, to condition for relevant mitigation in a stage 2 Appropriate Assessment.

It will also be necessary to undertake a Water Framework Directive Assessment on the Cardigan Bay North waterbody (GB621009600000).

The project will not require a Sustainable Drainage Scheme (SuDS) application.

There are no trees in the works area, let alone any with Tree Protection Order (TPO) status.

3.2. Phase 1 Habitat Survey

The results of the phase 1 habitat survey are depicted in Figure 3. Please note that the mapping shapes and extents are indicative.

The works area around the northern abutment itself is largely devoid any vegetation, being dominated by a mixture of sand and shingle, although it is mostly just the latter immediately in-front of the abutment parapets. At the parapet faces, some of the river flow branches off and swirls before re-joining the main current, creating the scouring effect described above. Pre-existing scour protection boulders predominate for the remaining upstream embankment, terminating only at the bend in the river where marginal reed beds are present, whilst a further stretch occurs near the downstream side on the border of the former beach carpark. At the top of the upstream embankment is a thin stretch of Poor Semi-Improved Grassland, which is considered to be poor due to the domination of vigorously growing grasses, frequent cutting/strimming for amenity purposes, as well as frequent trampling and compaction by pedestrians and vehicles. The border area with the scour protection boulders offers the greatest value, with the odd patch of Thrift.

The southern embankment is mainly composed of sand, becoming a mixture of sand and shingle further downstream on the beach area.

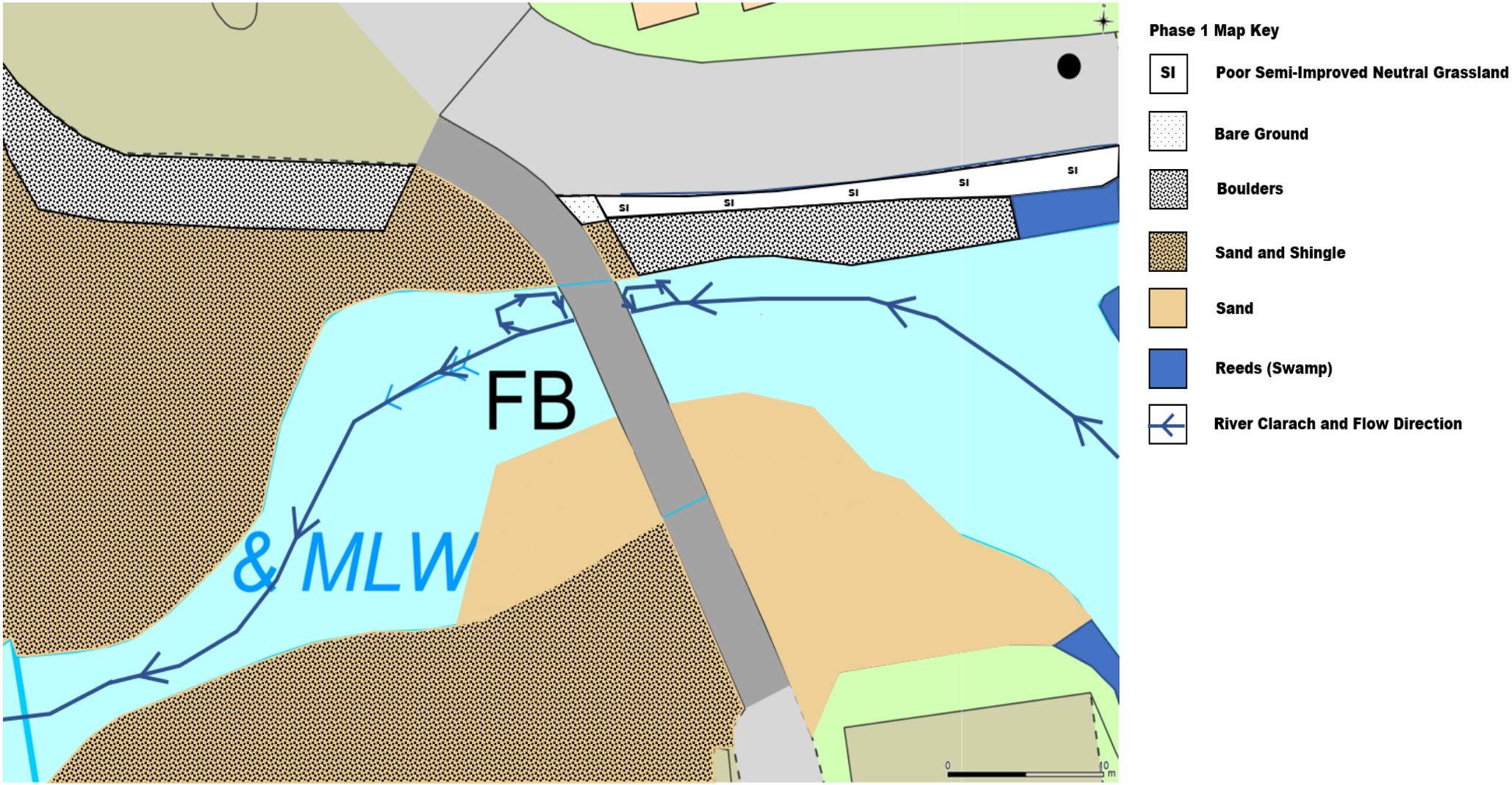

Figure 3: Results of the phase 1 habitat survey of the works and surrounding area.

3.3. Protected Features, Species, and Others

3.3.1. Badgers

The likelihood of Badger activity is negligible in the works area, with little to no foraging habitat or opportunities for sett creation. The vicinity is also poor for Badgers, with the nearest location of at least low potential being in the marshes east of the bend in the river.

3.3.2. Bats

The area is likely to be used by bats for foraging and navigating, such as along the watercourse, and in the marshes north of the works area. The works will not infringe on this, whilst the bridge structure itself offers negligible bat roost potential. There are no features of bat roost potential where the maintenance and erosion works will occur.

3.3.3. Otters and Water Vole

No evidence for the recent activity of Otters was noted at the works area during the walkover survey, and neither was there any evidence of holt activity. The potential of the latter is negligible in the works area, and moderate in the vicinity (upstream). Otters are very likely to be present as they forage or navigate the watercourse, especially given previous spraint records, and will likely be sprainting at suitable locations. The works will likely have a negligible impact on this activity, especially as it will be daytime hour working for the project when the location is already abuzz with human activity.

The works area is also highly unsuitable for water vole, however, as noted above, habitats in the vicinity are high potential and were known to harbour populations in 2004. As there are no foraging or burrowing opportunities in the area of works, no further mitigation is required.

Given the above, the required action is to undertake a pre-commencement check by CCC's Highways Ecologist for both species. This will be to ensure that any individuals in the area at the time of commencement vacate of their own accord.

3.3.4. Reptiles and Amphibians

There is negligible potential for reptiles in the works areas given the habitats described above. Risks to this group are also minimal as the works do not involve any vegetation clearance. The potential for amphibians is low in the works area. As with the water voles, the nearest area of moderate to high potential is in the marshes and ditches upstream, which will be unaffected by the works.

3.3.5. Nesting Birds

The potential for breeding birds in the works area is similarly negligible and given there will be no vegetation clearance (as there is none to clear) these risks are minimised further. The bridge structure itself has features of low breeding bird potential, but these are made further unpalatable by the frequent disturbance from people using the bridge (who are visible from under the deck), and also walking on the southern embankment beneath the bridge, often with dogs as noted on the site visit. The works are also scheduled to take place outside of the breeding bird season (Winter 2023-2024).

3.3.6. Invasive and Non-Native Species (INNS)

No Invasive and Non-Native Species were observed during the survey. Imported stone material must be from an accredited source (as local as possible) and the contractor will be required to ensure that all plant and machinery used arrives to site clean.

3.3.7. Fisheries and River Dynamics

The river is likely to be used by migrating Sea Trout and (less frequently) by Salmon. As such, the river is subject to the winter embargo period of the 15th of October to the 15th of April inclusive, however, because of the coastal location of the site, the small scale of the works, and that free passage to fish within the main channel will be maintained, the likelihood of disturbance is negligible. The fish are highly unlikely to be spawning this close to the sea, whilst they will be unhindered in their journeys to gravel beds upstream. Given this, the works are exempt from this embargo (as discussed with NRW's Fisheries Officer, Chloe Hatton).

Oppositely, Eels are known to be present in the River Clarach, and will likely be migrating through the area in the Spring from March onwards. It is therefore recommended that the works are completed before the 01st of March 2024.

The placement of the boulders is unlikely to have a noticeable effect on the existing dynamics of the river. Even following boulder placement, it is likely some of the flow will continue to branch off the main current and swirl as depicted in Figure 3 before re-joining the current. The only change in physical regime will be in a hyper-localised area between the boulders and the abutment, necessarily removing energy from the water in order to afford protection. Given the location and scale of the boulders in relation to the remaining channel, this is unlikely to result in changes in sediment mobilisation or deposition.

3.3.8. Designated Areas

Potential impacts on the marine SAC's and SPA have been considered in the separate Habitat Regulations Assessment. This found no likely significant effect on the protected features from the works as proposed.

Craigyfulfran and Clarach SSSI – this designation is primarily geological, for features associated with the cliff areas and foreshore south of the works area, such as the Aberystwyth Grits, Caledonian structures, and Tertiary sediments. The works area does not include these features, whilst there are no impact pathways. The stone used for scour protection will be sourced as locally as possible to aid in matching geological character, but likeness to the existing lines of scour protection boulders will also be considered.

The biologically protected features of the SSSI also include offshore Honeycomb Worm Reefs, as well as Saltmarsh, Fenugreek, Narrow-Everlasting Pea, Yellow Juiced Poppy, and Dwarf Mallow. None of these features occur in the works area, whilst the pollution prevention, pre-commencement, and other measures discussed minimises hydrological dispersal risks.

Borth to Clarach SSSI – this designation is combined geological and biological. In the case of the former, this includes Caledoninan rock exposures in the cliff areas around Clarach and the Aberystwyth Grits. As stated above, the works area does not include these features, and there are no impact pathways.

Many of the biological features include intertidal and off-shore features, such as Honeycomb Worm reefs, various Alga, Kelps, Bryozoans, Sponges, Crustaceans, Molluscs, and Worms.

None of these, including the species detailed in the SSSI citation document were observed to occur at the works site, whilst the pollution prevention, pre-commencement, and other measures discussed minimises hydrological dispersal risks. Skylark, Linnets and Otter are also protected features of this SSSI, but impact risk is negligible.

4.0. Assessment of Problem, Design Options, and Recommendations

The proposed works are proportionate to the scour issue experienced by the northern abutment, and will ensure that more invasive works to replace the abutment won't be necessary for a longer period of time. Following the advice and proposals of this report, as well as the pollution prevention plan, the works can be completed with minimal ecological risk and disturbance.

4.1. Enhancement

Opportunities for enhancement are limited by the nature and small scale of the works, however, if positioned appropriately, the scour protection boulders will provide new sprainting locations for Otters. They could also provide them with places of short rest, especially during strong flows, including for any Water Voles in the area at the time.

5.0. References

CIEEM (2013) Guidelines for Preliminary Ecological Appraisal. Chartered Institute of Ecology and Environmental Management, Winchester.

CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.

JNCC (2010) Handbook for Phase 1 habitat survey - A technique for environmental audit. Joint Nature Conservation Committee, Peterborough.

Appendix 1: Additional Photos

I. View of east/upstream parapet with the upstream line of scour protection boulders. **II.** As I, but from the southern embankment, showing the small gap between existing scour protection boulders and the east parapet. **III.** View of scour on west/downstream parapet. **IV.** As III, but from southern embankment – scour protection boulders of former carpark also visible.

V. View of river channel underneath bridge, highlighting the interaction with the northern abutment. **VI.** End view of existing upstream scour protection, as well as the bend in the river, marginal reeds, and marshy grassland behind. **VII.** View of eastern parapet from beach. **VIII.** View of scour protection boulders for former carpark.