Natural Resources Wales

Stephenson Street Flood Defence Scheme

Environmental Action Plan (EAP)

Doc. Ref.: 274580-ARP-XX-XX-RP-EN-0006

Purpose

This Environmental Action Plan (EAP) summarises the actions required to implement the environmental mitigation for Stephenson Street Flood Alleviation Scheme (FAS). It sets out specific objectives and actions defining the way in which environmental risks should be minimised. It also details roles and responsibilities of those involved in the proposal.

These actions form part of the contract documentation and must be adhered to.

Roles

Each action in the table below will have a named person assigned at start up who is responsible for ensuring that the action is implemented. It is ultimately the Principal Contractor's responsibility for ensuring the EAP commitments, which may include planning conditions, are delivered.

The Environmental Assessment Team (EAT) in NRW are responsible for agreeing any changes to the EAP and for signing off, or agreeing to the signing off, of the actions.

The contractor and NRW Project Manager are responsible for advising EAT on any changes to method statements or the planned construction work as these may result in changes to the EAP or additional consultation with statutory consultees. EAT will assess the significance of these changes and determine the appropriate course of action.

The contractor is also responsible for implementing good environmental practice on site, in line with their own Environmental Management System (EMS). Typical issues include:

- any working hour restrictions.
- dust suppression measures.
- traffic management.
- site waste management.
- materials management.
- vehicle maintenance and management.
- pollution prevention and control (including storage, refuelling and incident response).
- response procedures e.g. services strike, contaminated land.
- hazardous materials handling and storage.
- noise management.
- securing and delineation of working areas including signage.

Environmental Audits

It is likely that audits will be undertaken during the working period

Environmental Incident Reporting System

Procedure

1. STOP
   Before you report the incident, stop the work
2. CONTAIN
   Where safe to do so, carry out any local site pollution prevention or emergency incident measures

3. NOTIFY
   Report the incident to the (24 hour) NRW incident hotline 0300 065 5111, stating that it is an NRW caused incident and giving full details of the incident, including location and contact details. Also request, and note, the incident number.
4. REPORT
   Report the incident (including the incident number) to: the EMS team (EMS.team@cyfoethnaturiolcymru.gov.uk)

All environmental incidents must be reported at the earliest opportunity to the Site Supervisor, Principal Contractor Project Manager, NRW Project Manager and NRW Environmental lead. In addition, near misses must be reported via the hotline where there was/is the potential for a significant impact and where lessons can be learned.

Initial reports for such incidents and near misses must be followed by a written report using the Principal Contractor's in-house forms. This must include the following information:

- project/location.
- date.
- contractor.
- details of what happened.
- cause of incident.
- lessons learned.

This final and comprehensive investigation report is to be provided by the contractor to the Principal Contractor Project Manager, NRW Project Manager and Safety, Health and Environment Manager within 14 days.

Summary Scope of Works

The scope of work comprises 1,350m length of improvement works to the flood defence at Stephenson Street. The proposed working area is currently considered to be circa 8.3 hectares. The earliest construction start date is Autumn 2021, subject to securing consents and final confirmation of funding.

Detailed designs of the proposed scheme are provided in Appendix C. This includes cross reference to other relevant drawings (where available) and the proposed defence levels for the various sections of flood defences. In summary the proposed flood defences comprise (north to south):

- **Orb Works Riverbank Minor Ground Raising** – south of Kingfisher Walk and adjacent to Orb Electrical Steels. Localised ground raising at two locations to tie into existing Jetty Structure Wall and ground levels with 1:2 slope and 100mm of seeded topsoil. Located 6m and c. 30m southeast of the River Usk SAC boundary respectively and within the footprint of the existing flood defence structure. Drawing Ref.: 2001.
- **Stephenson Street Riverbank Minor Ground Raising** – land abutting the eastbound carriageway of Stephenson Street, immediately adjacent to the Newport Transporter Bridge. Localised ground raising of existing riverbank adjacent to Transporter Bridge to tie into existing verge and bank with 100mm seeded topsoil and 1:2 slope. Located within the River Usk SAC boundary, but within the footprint of the existing flood defence structure. Drawing Ref.: 2002.

- **Stephenson Street Flood Embankment and Upgrade to Wales Coast Path (WCP)** – Upgrading the existing Stephenson Street flood embankment along the western boundary of Coronation Park. Raising and widening of the existing embankment with enhancement landscaping and WCP improvement including seating areas and wildflower planting. Located partly within the River Usk SAC boundary but within the footprint of the existing flood defence structure. Drawing Ref.: 2003, 2004, 2005.
- **Access Ramp** - formalised gated emergency and maintenance access from Stephenson Street to the foreshore adjacent to the Transporter Bridge. This will provide a formal access point for the emergency services and also maintenance activities (removal of debris from SAC habitat). Localised to c. 100m^2 area of degraded grassland. Drawing Ref.: 2003.
- **Coronation Park Landscaping and Planting** – Coronation Park, south of Stephenson Street. Enhancements throughout Coronation Park including an accessible walking loop, benches, bins and concrete step seating areas. Inclusion of heritage and ecological interpretation boards to Stephenson Street embankment. Tree and shrub planting to the southern boundary of the park, including three areas of dense tree planting that are known as ‘urban forests’. Located outside the River Usk SAC boundary within Coronation Park. Drawing Ref.: 2003.
- **Sheet Pile Wall and Embankment with upgraded Wales Coast Path, including replacement metal stepped access spanning the Hanson Conveyor Belt** – River Usk riverbank and Wales Coast Path from end of Coronation Park to the conveyor: construction of sheet pile flood wall and resurfacing. Upgrading the existing path would also include a variable width crest, enhancement planting, seating and observation areas. Provision of replacement stepped metal access spanning the Hanson Conveyor would improve accessibility. Located partly within the River Usk SAC boundary but within the footprint of the existing flood defence structure. Minor encroachment required to install stanchions for the replacement stepped access. Drawing Ref.: 3000, 3001, 3004.
- **Reinforced Concrete Flood Wall at Felnex Industrial Estate** – Land comprising the lateral edges of East Bank. Road, new proposed flood relief road and Hanson Conveyor crossing the Felnex Industrial Estate. Construction of a reinforced concrete flood wall adjacent to the Hanson Conveyor, extending to the site of the proposed T-junction access of East Bank Road. A secondary (larger) wall would extend from the proposed junction along the flood relief road and East Bank Road. Located c. 5m northeast of the River Usk SAC boundary behind the footprint of the existing flood defence structure. Drawing Ref.: 4000, 4001, 4002.
- **Flood Relief Road** – Land comprising the Felnex Industrial Estate, Hanson Aggregates and Marshalls sites connecting East Bank Road to the north and Corporation Road to the south. Construction of a 0.7km single carriageway flood relief road connecting from East Bank Road adjacent to KDK Metals Industrial Unit to Corporation Road adjacent to Marshalls estate. Ramped access and T-Junction access to be provided for incoming and outgoing traffic at East Bank Road with pedestrian footways. Located c. 5m northeast of the River Usk SAC boundary behind the footprint of the existing flood defence structure. Drawing Ref.: TBC.
- **Wales Coastal Path Resurfacing** – from the conveyor belt to where the Wales Coast path meets Corporation Road; resurfacing of Wales Coast Path with compacted stone. Surface water drainage for flood relief road to outfall through existing embankment. Located partly within the River Usk SAC boundary but within the footprint of the existing flood defence structure. Minor encroachment required to

install small headwall and outfall within the existing embankment. Drawing Ref.: 4003.

- **Corporation Road Flood Gate and Walls** – Railway overbridge at Corporation Road, south of WCP. Construction of two reinforced flood walls adjacent to the Corporation Road railway overbridge and installation of sliding highway flood gate which would run flush to the existing railway embankment. Located c. 330m northeast of the River Usk SAC boundary behind the Eastern Docks. Drawing Ref.: 4004 and 4005.
- **Railway Flood Wall and Access Track** – land comprising the existing Wales Coast Path to the northeast of the existing railway line and land immediately adjacent to the embankment slope. Construction of a reinforced concrete flood wall adjacent to the existing railway embankment with non-return tidal flap valve at the base. Temporary resurfacing and widening of the Wales Coast Path to be reinstated upon completion of the flood wall. A smaller maintenance track will remain permanently. Located c. 400m east of the River Usk SAC boundary behind the footprint of the existing flood defence structure. Drawing Ref.: 5000, 5001, 5002.
- **Marshalls Railway Embankment Culvert with access and maintenance hardstanding** – Railway embankment situated to the northern boundary of Marshalls. Installation of reinforced concrete culvert chamber with non-return duckbill tidal valve. Provision of 15m² concrete hardstanding to the west of the culvert for maintenance and access with reinstated fence line. Located c. 280m north of the River Usk SAC boundary behind the footprint of the existing flood defence structure. Drawing Ref.: 7000.
- **Liberty Steel Railway Embankment Culvert** – Railway embankment situated to the north eastern boundary of Liberty Steel. Installation of reinforced concrete culvert chamber with a non-return duckbill return valve. Additional provision of a gravel access and construction tracks at railway embankment. Located c. 360m north of the River Usk SAC boundary behind the footprint of the existing flood defence structure. Drawing Ref.: 7001.
- **Nash Flood Wall and Access Track** – Nash Sewerage Treatment Works. Construction of a reinforced concrete flood wall to the north of the existing Nash site with raised permanent access track (track subject to landowner agreement). Located c. 150m east of the River Usk SAC boundary (Julian's Gout outfall) behind the footprint of the existing flood defence structure. Drawing Ref.: 6000, 6001.

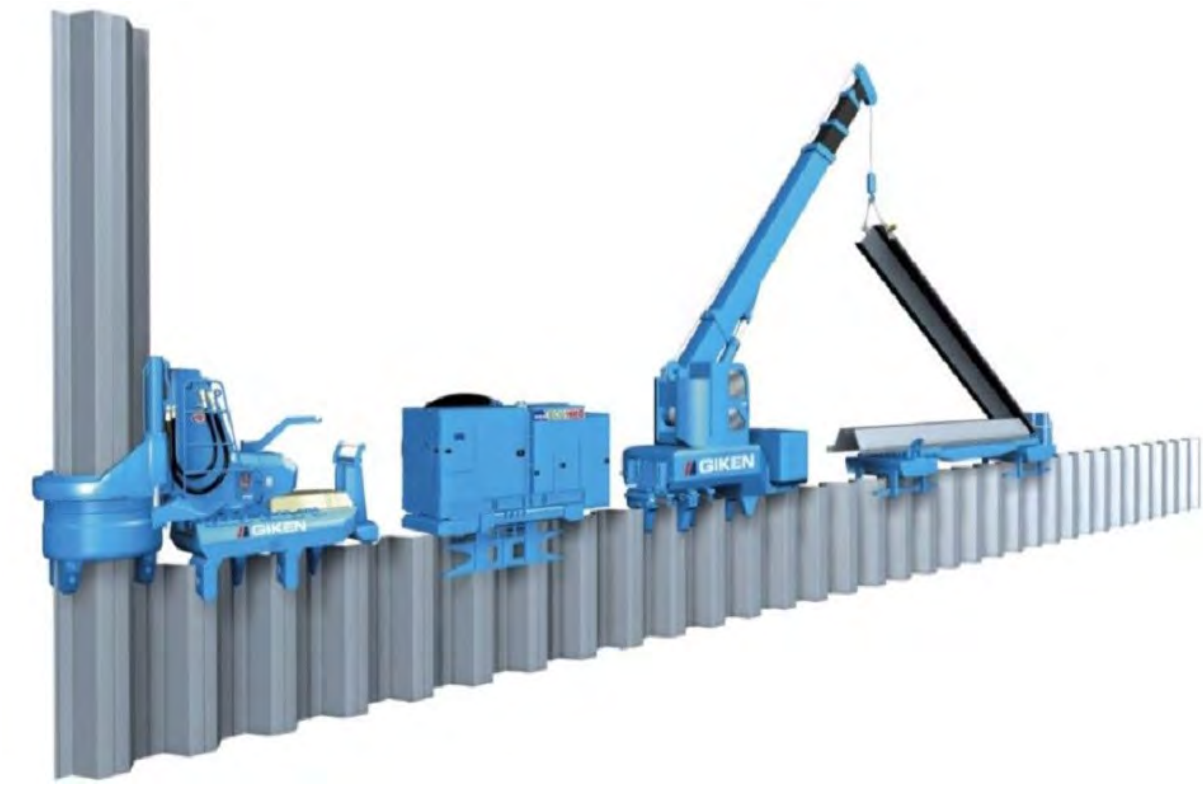
Amenity, biodiversity and landscape enhancements are detailed in the Planning Drawings within the Pre-Application Consultation pack and describe the proposed enhancements the project will deliver, focussing around Coronation Park. Upgraded access will be provided, at the entrances to Coronation Park, along the new bund section and within Coronation Park itself to provide better connection between the riverside walk and the sports pitches and creating a circular walking route. Viewing platforms will be integrated into the soil bund section to allow for resting areas and provide a connection with the riverside habitats. Additional planting will be provided within the park and wildflower planting on the inland embankment to increase local biodiversity without compromising integrity of the flood defence. Further biodiversity enhancements will be delivered by the project, including: provision of higher value habitat (three urban forests (c. 1,600 trees), reedbed habitat and wildflower planting), restriction of access to SAC / SSSI habitats to reduce damage and disturbance, provision of bins to reduce litter / dog waste and planting of c. 84 trees.

Temporary and Ancillary Works

Stephenson Street Embankment - The flood defence infrastructure has been sensitively designed to avoid encroachment beyond the existing defence footprint into the River Usk SAC and River Usk (Lower Usk) SSSI. Neither bund nor sheet pile wall installation will require a temporary access track within the foreshore during construction following specification of pile installation methodology; described further below. Raising and widening of the embankment in Coronation Park and localised ground raising north of the Transporter Bridge will be built up with imported clean soil of known origin and reused materials where appropriate.

To demonstrate NRWs commitment to avoiding potential environmental effects, NRW have committed to specifying hydraulic ('silent') piling for sheet pile installation along the Stephenson Street Embankment; this has been secured within the EAP. Hydraulic piling is a push method of piling that does not incur the percussive or vibration impacts of typical piling methods. Whilst the initial few piles will be installed using vibratory piling methods this will be a brief necessity enabling the adoption of this method. Whilst initially the reason for considering the hydraulic piling method was to avoid potential impacts on vibration-sensitive fish in the River Usk, further NRW consultation confirmed this was not a requirement due to the works being undertaken >30m from the River Usk / Mean High Water Springs (MHWS). NRW ultimately undertook the decision to commit to hydraulic piling, combined with a specialist 'service crane', to avoid the need for constructing a temporary access track within the River Usk SAC and River Usk (Lower Usk) SSSI. The Giken hydraulic piling rig and the service crane, track along the installed piles (refer to Figure 1 below) and do not rely upon a separate access track. This technique therefore avoids potential impacts on the adjacent protected sites by negating the need for temporary construction works in the River Usk SAC.

Figure 1: Giken Hydraulic Piling Rig and Service Crane



Ancillary Works - Minor encroachment into the SAC boundary, c. 100m^2 of degraded grassland (refer to Stephenson Street Embankment NVC Report; Doc. Ref.: 274580-ARP-XX-XX-RP-EN-0016) will be required to install a maintenance access ramp onto the foreshore from Stephenson Street, adjacent to the eastern access to the Newport Transporter Bridge. The access ramp is required to allow the continued access for [1] emergency access to the River Usk for emergency services and [2] continued maintenance access to remove debris deposited by the tidal river onto SAC / SSSI habitats.

Further minor encroachment (<10m^2) is proposed, as detailed in the Planning Drawings within the Pre-Application Consultation pack, to accommodate a new viewing platform; refer to the LVA - 274580-ARP-XX-XX-RP-LA-0002. The design can be constructed from the bund and does not require a separate access track into the SAC / SSSI and will be installed using a no excavation method, a decking type structure will be placed onto the ground surface.

Access along the Wales Coast Path / Public Right of Way (PRoW) over the conveyor belt is currently via metal steps. Newport City Council asked NRW to improve access over the conveyor belt and so a replacement footbridge will be provided as the steps are at the end of their life. Sensitive design has ensured that the raised structure will have a negligible effect beyond the existing footprint with temporary access only required to install the supporting stanchions. A permanent loss of <10m^2 is anticipated.

To accommodate the new raised highway / flood defence in the Felnex and Marshalls Estates, SuDS Approval Body (SAB) compliant sustainable drainage is proposed to encourage infiltration and remove sediment and any hydrocarbons prior to discharge. In accordance with the SuDS Manual and SAB requirements, petrol interceptors are not encouraged, since the green infrastructure proposed adequately manages any risk. Swales will traverse each side of the road, leading to an attenuation basin with an overflow through the existing flood embankment to a new surface water outfall periodically discharging to a gabion mattress (c. 6m x 20m) providing erosion protection. The erosion protection is anticipated to become vegetated over time, without affecting its function, but will allow restoration of habitat. A non-return tidal flap valve will be installed on the outfall to prevent the outfall becoming a conduit during flood events.

Railway Wall and Nash Wall – the flood defence walls will be cast in situ to reduce the scale of construction access necessary to accommodate pre-cast units. Pre-cast units may be a viable option in the Felnex Estate and will be confirmed at a later stage.

Appendix A and B show the environmental and ecological constraints respectively. Sensitive features include the following:

- Wales Coast Path / Public Right of Way (PRoW).
- River Usk Special Area of Conservation (SAC).
- River Usk (Lower Usk) Site of Special Scientific Interest (SSSI).
- Local receptors directly adjacent to the scheme include a number of industrial units, the Newport Dogs Home and a few residential properties.
- Vegetation clearance is required, ecological constraints and mitigations will be applied.
- Historic Environment Records:
  - Statutory Sites / Features: None.

- Non-Statutory Sites / Features: Historic Environment Record (HER) – 'Seawall', East Bank Road (PRN: 09580g) located at TP2, TP3 and WS1; NGR: ST 33123 85416.
- Unknown Archaeology: Works located within Newport City Council Area of Archaeological Sensitivity, Moderate to High Potential; Archaeological Watching Brief required for all deep excavations >1m in depth. Should piling methodology change and require excavation of obstructions; an archaeological watching brief will be required.

Relevant Contact Details

Project Sponsor	Tim England
Project Executive	Jared Gethin
NRW Project Manager	Eva Neville
NRW Environmental Project Manager	Laura Cotton
ECW	To be confirmed
Archaeological Watching Brief	To be confirmed
Contractor	Walters
Consultant Project Manager	Jamie Lancaster [Arup]
Consultant Ecologist	Kathryn Jones [Arup – Ecology Lead]
Other Specialists	Gareth McIlquham [Arup – Environmental Lead] Ian Meyrick [Arup – Environmental Consultant] Stephanie Chapman [Arup – Environmental Consultant]

Environmental Action Plan (EAP)

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
Pre-construction						
Humans						
A1.1	**Minimise disruption to Wales Coast Path.**	The alignment of the temporary PRoW / Wales Coast Path diversion during the construction phase to be agreed with NCC and NRW in advance of works	*Contractor*	*Site meeting with Luke Stacey and NRW 14/04/21*		
		Temporary pedestrian access to be provided during installation of Corporation Road Flood Gate to allow access to industrial units only. PRoW users are to use the temporary diversion along Corporation Road.	*Contractor*			
		Apply for a diversion order for the realigned bund and PRoW	*Arup on behalf of NRW*	*Diversion Order*	Submitted – determination typically within 6-12 months.	
A1.2	**Minimise disruption to the local road network.**	Contractor to liaise with Newport City Council Highways as required. Aim to: • Maintain vehicle access. • Limit period of obstruction. Adhere to / develop Construction Traffic Management Plan which includes measures for pedestrian safety and transport of materials along the PRoW / Wales Coast Path / National Cycleway.	*Contractor*	*CTMP*		
A1.3	**To communicate information about the proposed scheme.**	Inform the local community of the proposed scheme objectives and program of works; including NRW contact name and number.	*NRW*			
		Inform adjacent and local landowners/tenants of the nature and duration of construction and provide contact name and number.	*NRW*			

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
A1.4	**To prevent damage to structures and the local road network.**	Undertake a pre-construction survey of local roads and structures along the route that will be impacted by works.	*Contractor*			
Archaeology						
A3.1	**Identify all potential risks to archaeological features**	Should design changes or temporary works be required which extend into the designated area of the listed bridge, this should be considered further by a competent and qualified expert; an application for Listed Building Consent may need to be submitted.	*NRW*			
A3.2	**Minimise the risk of potentially damaging uncovered archaeological features**	Archaeological watching brief required for all intrusive works deeper than 1m (e.g. any additional ground investigation works) to mitigate risk of unknown archaeology (GGAT requirement).	*Contractor*	*NRW Email from Glamorgan—Gwent Archaeological Trust; Historic Environment advisors to Newport City Council.* *Archaeological Desk-Based Assessment (Archaeology Wales, 2020).* *Written Scheme of Investigation (WSI) –* ***PENDING [Construction Phase Action by contractor]*** *Meeting minutes Cadw and GGAT agreeing watching brief requirement*	Archaeologist to undertake archaeological watching brief on all intrusive works. Written Scheme of Investigation (WSI) to be submitted to GGAT for approval prior to construction start	
Surface Water Bodies						

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
A4.1	**Maintain water quality of surrounding watercourses and River Usk SAC / SSSI**	Prior to commencement of works, the Contractor will produce a Construction Environmental Method Statement (CEMP) to ensure pollution to the River Usk is avoided. Adherence to relevant CIRIA and Guidance for Pollution Prevention (GPP) guidance; in particular, GPP 5: Works and maintenance in or near water. Indicative Silt Mitigation Measures are provided in Appendix D. Any fuel / plant storage or refuelling to undertaken in accordance with relevant GPPs. Refer to B5.1 for details. NRW Environment Team to be notified seven days prior to works commencing.	*Contractor*	http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/ CIRIA C741 'Environmental Good Practice On Site'; Fourth Edition (2015). See B5.1 for details. Indicative Silt Mitigation Measures; Appendix D.	Guidance to be integrated into Contractor CEMP and Risk Assessment Method Statement (RAMS).	
A4.2	**To prevent flooding caused by obstructions in a main river or works to flood defences.**	FRAP to be submitted for both temporary and permanent elements of the project. New consents (i.e. planning permission, FRAPs etc) issued will be reviewed and relevant conditions incorporated into the EAP. Contractor to comply with FRAP requirements.	*Arup on behalf of NRW – Permanent FRAP* *Contractor – Temporary works FRAP*	*NRW Flood Maps: https://maps.cyfoethnaturiolcymru.gov.uk/Html5Viewer/Index.html?configBase=https://maps.cyfoethnaturiolcymru.gov.uk/Geocortex/Essentials/REST/sites/Flood_Risk/viewers/Flood_Risk/virtualdirectory/Resources/Config/Default*		
Ecology						

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
A5.1	**To minimise the risk of spreading Invasive Non-Native Species (INNS)**	Ecological supervision and confirmation of presence of invasive species, in areas of clearance (including areas of access). Any disturbed / removed invasive species must be treated and disposed of appropriately, to ensure none are illegally spread from the site. Consider treated areas of Japanese knotweed as still active until proven otherwise. Treated and untreated areas of Japanese knotweed identified in Appendix A (Environmental Constraints and Opportunities Plans). Giant hogweed (*Heracleum mantegazzianum*) was identified at one location, along the bank of the ditch, east of the railway line (TN11 Nash Wall and Access PEA 274580-ARP-XX-XX-RP-EN-0014). Contractor to include measures in the RAMS to ensure the affected area is segregated from the construction works. Appropriate biosecurity measures to be integrated in RAMS and adhered to by contractors including washing of equipment and footwear upon leaving site.	*NRW – Japanese knotweed treatment in June and September 2021.* *Contractor – RAMS, INNS Management, Pre-construction survey*	Nash Wall and Access PEA)		
A5.2	**To prevent killing or injury of breeding birds (including destruction of nests or eggs).**	Where possible undertake vegetation clearance outside bird nesting season (1st March to 1st September). Pre-construction breeding bird checks to be carried out by Contractor's Ecologist (including areas used for access) if vegetation clearance required in nesting season. If nests found, exclusion zone to be set up until young have fledged (size as directed by ECoW). If clear, clear vegetation immediately to prevent use.	*Contractor – Ecological Surveys / Pre-Construction Ecological Survey*			

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
A5.3	**To prevent killing or injury of otters**	Pre-clearance / construction checks will be undertaken, in accordance with best practice survey guidance for otter resting / breeding places, within 50m of the works. If any otter breeding / resting areas are found during pre-construction checks, further survey work and mitigation measures may also be required, in addition to a European Protected Species licence which would be obtained from NRW.	*Contractor - Pre-Construction Ecological Survey and any detailed checks needed*			
A5.4	**To prevent killing or injury of Bats**	Tree TN10 (Railway Wall Access - Appendix A) is recorded as maintaining a moderate potential bat roost. Neither emergence surveys nor inspection surveys were possible due to tree species, location adjacent to / over water and local H&S issues. A Precautionary Method of Working will be prepared and agreed with NRW Species Team prior to construction in the vicinity of TN10. The Precautionary Method of Working shall be prepared to minimise the risk to the potential roost and any bats potentially present, provide precautionary mitigation (e.g. bat boxes to provide alternative roosts) and ensuring site preparation works are under the supervision of a suitably qualified ecologist as directed by the agreed method of working.	*NRW – Preparation of* Precautionary Method of Working *and agreement with NRW Species Team.* *Contractor – all other*			
A5.5	**To prevent killing or injury of badgers**	A pre-construction (including enabling works) inspection of suitable habitat for badger, within 50m of the works, will be carried out to ascertain whether the badger's home range has expanded, and any setts are present. Further monitoring to be undertaken in accordance with best practice survey guidelines, as required pending the initial pre-construction assessment. A badger licence to be obtained from Welsh Government (WG) if any setts will be disturbed or lost by the works.	*Contractor*			

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
A5.6	**To prevent killing or injury of water vole**	Pre-clearance / pre-construction checks, in accordance with best practice survey guidance will be undertaken for water vole resting / breeding places, within 50m of the works. If any water vole breeding / resting areas are found during pre-construction checks, further survey work and mitigation measures may also be required, in addition to a Protected Species licence which would be obtained from NRW.	*Contractor*			
A5.7	**To avoid effects on other protected species.**	Should signs of any protected species be identified, all works will stop, NRW consulted and a Protected Species Licence application submitted to enable works to progress.	*Contractor*			
		Toolbox Talks will be provided by a suitably experienced ecologist to all site personnel to inform them of ecological features at the Site.	*Contractor, with input from ECoW*			
A5.8	**Any trees or vegetation should be inspected prior to removal for roosting bats and breeding birds.**	Tree and shrub removal should be avoided where possible. Undertake pre-construction surveys for nests of breeding birds prior to any significant vegetation clearance between March and September. Refer to A5.4 - Tree TN10 (Railway Wall Access - Appendix A) is recorded as maintaining a moderate potential bat roost. Either emergence surveys (inspection surveys not possible due to tree species and location adjacent to / over water) are required to confirm status or an application for an EPS licence will need to be submitted to NRW to allow the tree to be felled and / or disturbing activities to be undertaken in the vicinity.	*Contractor - Pre-Construction Ecological Survey and any detailed checks needed*			

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
A5.9	**To avoid effects on locally protected sites**	SSSI Saltmarsh Monitoring – surface water outfall works area – the Contractor is to and minimise the works area as far as practicable and safe to do so and delineate the area with appropriate fencing to avoid vehicles tracking on the adjacent saltmarsh. Silt management measures are to be integrated as described in A4.1 and B5.1. The Contractor is to undertake a pre-construction National Vegetation Classification (NVC) survey, using a suitably qualified and experienced botanist, of the surface water outfall works area. Specific locally-important and SSSI plants such as *Lepidium latifolium* (dittander), *Althaea officinalis* (marsh-mallow) and *Lathyrus sylvestris* (narrow-leaved everlasting pea), should be demarcated prior to construction works using temporary fencing (e.g. Heras fencing) and translocated where necessary under the supervision of a suitably qualified ecologist. The proposed elevated road alignment that provides a flood defence within the Felnex Estate will avoid effects on the Marshall SINC. Vegetation clearance along the Stephenson Embankment to be minimised as far as practicable.	Contractor			
A5.10	**Protection of vegetation to be retained**	Updated Tree Protection Plans and an Arboricultural Method Statement will be prepared at the Construction Phase, following the appointment of a Contractor and will be informed by construction method statements. The Contractor will be required to implement arboricultural requirements in full in full during construction.	*Contractor*			
Land use						

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
A6.1	**To minimise deterioration to land quality.**	A pre-construction photographic record should be made of all working areas and the site compound to ensure that they are reinstated to pre-construction conditions as a minimum.	*Contractor*	Design Drawings		
A6.2	**To minimise disruption to local business operations**	Contractor to liaise with Hanson Ready-mixed Concrete to ensure construction activities to do not disrupt access to and operation of the conveyor belt.	*Contractor*			
Nuisance						
A7.1	**To minimise disturbance to local residents and businesses**	Liaise with residents and businesses in close proximity to works in advance of construction phase.	*NRW – Prior to mobilisation to site* *Contractor – Site mobilisation and set up*			
Biosecurity						
A8.1	**Plant Health Minimising Risk from Pests and Diseases**	Assess any existing Plant Health risks in the project area. Information to be reviewed at 6 monthly intervals.	*NRW - EAT to consult NRW's Plant Health Team*			
		If Larch trees are present on or adjacent to site, then the current status of *Phytophthora ramorum* must be checked and any measures required must be strictly adhered too.	*NRW - EAT to consult NRW's Plant Health Team*			
A8.2	**Biosecurity**	Ensure Biosecurity Risk Assessments are in place for any surveyors / contractors.	*Contractor - to prepare for approval by NRW*			
		Understand the possible pathways for introduction of pests and pathogens for a site and document these in a Site-Specific Biosecurity Risk Assessment.	*Contractor*			
Landscape						

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
A9.1	**Landscape**	Responsible sourcing of plants and trees. Contract Growing - If time allows within a contract programme Contract Growing should be considered as an opportunity to minimise the risk of spreading pests and diseases. (see Landscape Institute guidance on this practice).	*NRW - NRW Landscape architect and procurement to address benefits of setting up a contract to supply plants for a specific project.*			
		When planting on NRW land Contractors will need to register with APHA as a 'Professional Operator' in order to comply with Plant Health Legislation.	*NRW - NRW Landscape Architect and Procurement to check this is in place.* *Contractor – to implement.*			
Arboriculture						
A10.1	**Arboriculture**	Contractors shall meet the requirements of B3998: Tree work – Recommendations for Avoiding Transmission of pests and pathogens'.	*Contractor*			
		Any cases of ill health found in trees across the UK should be reported immediately using the Forestry Commission's Tree Pest and Pathogen sightings reporter: Tree Alert www.forestry.gov.uk/treealert	*All*			
		All operations to minimise the movement of arisings and soil. All arisings must be appropriately disposed of.	*Contractor - Details to be checked by ECW and agreed with NRW*			
		Any pre-construction work to be carried out at the appropriate time of year	*Contractor*			
		Any untreated timber to be removed from site for logs should be free from soil. Any infected timber should be disposed of in a suitable manner.	*Contractor*			
During construction						
Humans						

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
B1.1	**Ensure safety of pedestrians using the Wales Coast Path**	All Sections - The alignment of the temporary PRoW / Wales Coast Path diversion during the construction phase will be agreed with NCC and NRW in advance of works and will likely follow the paved access from the PRoW at the southern extent of Corporation Road (NGR: ST 33169 85468) to link with the PRoW at Stephenson Street. Railway Wall – A Construction Traffic Management Plan (CTMP - 274580-ARP-XX-RW-RP-PL-0002) will include measures for pedestrian safety during upgrade and trafficking of materials along the PRoW / Wales Coast Path / National Cycleway; alternatively, a temporary closure application will be submitted to NCC. Corporation Road Flood Gate - Temporary pedestrian access will be provided during installation to allow access to industrial units only. PRoW users are to use the temporary diversion along Corporation Road.	*Contractor*	*Temporary Diversion Order*		
B1.2	**To minimise disruption to the local road network.**	Contractor to confirm traffic management, liaise with Newport Highways. Contractor to appoint a liaison officer to provide project updates to stakeholders. Avoid blocking or restricting access to the Newport Transporter Bridge and businesses operating within the Felnex Estate.	*Contractor*	*CTMP*		
Access						
B2.1	**Minimise disruption to local road network**	Follow parking and access arrangements as agreed.	*Contractor*	*CTMP*		
Soils						
B3.1	**Minimise damage to topsoil and subsoil from incorrect storage, handling and trafficking of soils.**	Topsoil shall not be handled or trafficked during, or shortly after, heavy precipitation; in a waterlogged condition; when the ground is frozen or covered by snow; and when there	*Contractor*	*British Standard 3882:2007: Specification for topsoil and requirements for use will*		

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
		are pools of water on the ground surface. Topsoil spreading, levelling and loosening should not be carried out during or immediately after heavy rain. Soils generally gain strength and become more resistant to damage as they lose moisture; they shall thus be handled only in the appropriate conditions of weather and soil moisture, and with suitable machinery; Topsoil and subsoil must be stored separately and covered to prevent runoff, minimise handling of any soils; Material excavated and intended as waste should be stored separately and labelled accordingly. When stockpiling topsoil, heaps should be tipped loosely; the surface firmed and shaped to shed water; Stockpiles of topsoil should be as long, narrow and shallow as possible (as an adequate oxygen supply is unlikely to penetrate more than 1m from the stockpile surface); Keep stockpiles clear of injurious or pernicious weeds and sharps, plastics and other non-soil forming materials; Topsoil should be reinstated over loosened subsoil (it is particularly important that the subsoil is not over compacted. This should ensure that plant roots can extend into it and excess water can drain away through it); and Trafficking of soils should be kept to a minimum.		*be applied.*		
B3.2	**To minimise the risk of polluting soils.**	An earthworks specification will be produced by Arup for the construction of the scheme which will include chemical limits to ensure soils do not pose a risk to the environment or site end users. This will be verified through regular sampling and laboratory testing of soil samples. This will apply to both imported soils	*Contractor*			

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
		and any excavated soils to be reused on site Any soils which do not meet the limits of the earthworks specification will be taken off site to a licensed waste disposal or soil recycling facility. Any material encountered during the construction displaying visual or olfactory evidence of contamination will be safely stockpiled to ensure there is no leaching of contamination to other areas prior to appropriate disposal.				
B3.3	**Manage non-hazardous and hazardous waste.**	Contractor to define the suitability of arisings implementing the CI:aire code of practice for material reuse. Contractor to include appropriate testing, management of waste materials and and reuse via the CI:aire Code of Practice into a Materials Management Plan.	*Contractor*			
Archaeology						
B4.1	**Maintain archaeological value of features affected by the works.**	An archaeological watching brief will be undertaken following an approved Written Scheme of Investigation (WSI) for all works requiring >1m depth excavation. This is considered to mitigate potential effects on previously unrecorded archaeological remains if present. Where archaeological mitigation is not possible (i.e. installation of sheet piling), should the construction methodology change (e.g. to remove an obstruction), a watching will be undertaken by a suitably qualified archaeologist.	*Contractor to appoint Archaeologist*	*Archaeological Desk-Based Assessment (Archaeology Wales, 2020).* *Written Scheme of Investigation (WSI)*	Post-Investigation Report to be submitted to GGAT to record outcomes.	
Surface Water Bodies						
B5.1	**Maintain water quality of surrounding watercourses**	Adherence to the Construction Environmental	*Contractor*	CIRIA C741 'Environmental Good		

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
	and River Usk	Management Plan (CEMP) and refinement of silt management measures; such as silt fencing, sediment retention ponds (or silt busters where space is constrained), surface roughening, containment, rock check dams and highway control measures will be implemented to prevent silt or contaminants from being released into connecting watercourses. Indicative silt management measures are provided in Appendix D and will be refined during preparation of the CEMP. Additional pollution prevention measures include the following: • Ensure that equipment and any fuel storage facilities are protected by secure fences and locked where possible to prevent accidental spillages as a result of vandalism. • Drip trays to be used underneath standing equipment. • Any drip tray with a mixture of water and contaminant will be emptied into a 25l plastic container using a funnel. The container will be disposed of at the end of construction or when full. • Emergency spill kits and trained personnel will be available. • All vehicles, including fuel bowsers, will carry emergency spill kits.		Practice On Site'; Fourth Edition (2015). PPG 1 Understanding your Environmental Responsibilities – Good Environmental Practices. GPP 5 Works and Maintenance In or Near Water. PPG 6 Working at Construction and Demolition Sites. PPG 7 Safe Storage – The Safe Operation of refueling Facilities. GPP 8 Safe Storage and Disposal of Oils. GPP 13 Vehicle Washing and Cleaning. GPP 20 Dewatering Underground Ducts and Chambers. GPP 21 Pollution Incident Response Planning. GPP 22 Dealing with Spills.		

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
		• Bulk fuel will be stored in a double bunded tank inside the compound. The tank will be covered to prevent rainwater build up in the bund. Filling hose and nozzle will be kept within the bunded area and locked when not in use. Diesel and petrol in clearly marked suitable containers will be stored in bunded areas inside the secure storage container. There should be no refueling outside of the site compound. All refueling to be done over hardstanding away from watercourses; • Any stockpiles of clay will be managed to shed rainwater and avoid run off to watercourses. • All stockpiles should be sealed to contain runoff. • All mechanical plant to use minimal safe fuel quantities for in-watercourse works.		http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/ Indicative Silt Mitigation Plans; Appendix D.		
Ecology						
B6.1	**To minimise the risk of spreading invasive species**	Contractor to undertake INNS management, engaging a specialist contractor as required, in works areas containing treated or new stands of Japanese knotweed; refer to Appendix A. Scope to be agreed with NRW in advance of construction / early works and in accordance with best practice. Alternatively, no works within 7m of treated or untreated Japanese knotweed to avoid risk of	*Contractor*	*Appendix B: Ecological Constraints Plan* Check Clean Dry protocol: http://www.nonnativespecies.org/checkcleandry/index.cfm		

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
		spread; aim for removal and appropriate disposal in advance. Biosecurity measures will be employed as required to ensure that no invasive species are imported to the site. Biosecurity measures to be integrated into Contractor RAMS and adhered to on site. If these species or any other which are listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) are recorded they will be removed immediately in line with guidance from the Department for Environment, Food and Rural Affairs (Defra, 2003) . The Contractor should prepare a Biosecurity Risk Assessment to evaluate potential risks at each site and relevant biosecurity precautions. The transfer of amphibian and fish diseases as well as INNS should be minimised by undertaking cleaning and disinfection of equipment. All debris, plant fragments and mud should first be scrubbed off footwear and rinsed with water. Disinfection should comprise soaking in a bleach solution (1 measure of household bleach to 9 measures of water) for 15 minutes or using Virkon solution (1mg/ml) for 1 minute. Fabrics can be washed on a 40' C cycle (with detergent, ensuring sufficient rinsing). All used disinfectants should be disposed of appropriately. To minimise the risk of spreading *Phytophthora* at woodland sites, scrub all visible soil and debris from footwear using water, spray with Propeller and leave until it has evaporated. Vehicle access along tracks should be kept to a minimum and mud should be cleaned from car wheels, wheel arches and footwells of cars. This should be repeated at each site visited. Biosecurity advice on ash dieback disease – identified within study area 2017. *Chalara*, can be found via the link in the further		Chalara (Ash die-back): https://www.forestresearch.gov.uk/tools-and-resources/pest-and-disease-resources/ash-dieback-hymenoscyphus-fraxineus/chalara-manual-1-introduction-and-contents/ https://www.gov.uk/government/publications/chalara-management-plan Amphibian Disease: *https://www.arguk.org/info-advice/advice-notes/324-advice-note-4-amphibian-disease-precautions-a-guide-for-uk-fieldworkers-pdf-2*		

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
		information column.				
B6.2	**To prevent killing or injury of breeding birds (including destruction of nests or eggs).**	Vegetation clearance within the breeding bird season (March-August inclusive) should be avoided to prevent damage or destruction of occupied nests or harm to breeding birds. If this cannot be achieved, works within the core bird nesting season will require an inspection for breeding birds and their occupied nests by a suitably experienced ecologist no more than 24 hours prior to any works commencing. If nesting birds are found during the pre-construction checks, a buffer around the nest will be implemented of at least 5 metres as agreed with the ecologist and further work within the immediate and surrounding area will be delayed until young have fledged and left the nest, and the nest is no longer in use.	*Contractor*			
B6.3	**To avoid effects on other protected species.**	Toolbox Talks will be provided by a suitably experienced ecologist to all site personnel to inform them of ecological features at the Site.	*Contractor / ECoW*			
		Access to the working areas will be via designated access routes only, and storage of materials will be at pre-agreed locations	*Contractor*			
		Bats - Removal of tree TN10 (Railway Wall Access - Appendix A) is to be undertaken in compliance with the requirements of either: [1] an agreed Precautionary Method of Working, or [2] a European Protected Species (EPS) Licence.	*Contractor*	European Protected Species Licence (if required)		
		If any resting / breeding places (e.g. badger) found of protected species, a licence will be obtained from NRW / Welsh Government to cover the works and which will include appropriate mitigation.	*Contractor*			

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
		If any task lighting is required outside daylight hours (typically 30 minutes after sunrise and up to 30 mins before sunset), directional lighting (towards the ground) with minimal upward spill will be implemented, to avoid light spill into adjacent habitats to avoid disturbance to commuting and foraging protected species.	*Contractor*			
		Materials or plant will not be left overnight in an area that may prohibit access for commuting otters or badgers and excavations will not be left uncovered overnight. If any excavations are required to be left open overnight, a ramp will be provided to allow any animals to escape.	*Contractor*			
B6.4	**To prevent damage to trees**	Retained trees – an Arboricultural Watching Brief will be employed on sensitive areas of development; to be agreed with Newport City Council Tree Officer before construction start. Retained trees will be protected during development by establishing a Construction Exclusion Zone (CEZ) around their Root Protection Areas (RPAs). RPAs should be treated as a precautionary area within which activities such as ground compaction, excavation, the storing of materials, ground level changes and other construction activity are likely to cause damage to trees and should therefore be excluded. This CEZ can be achieved by the erection of barriers at the locations shown on the Tree Protection Plan in the AIA (274580-ARP-XX-XX-RP-EN-0005). Tree protection barriers (refer to AIA and Tree Protection Plans) must be installed before any demolition or construction works start, and, unless approved by the Local Planning Authority or by an arboriculturist approved by them, should remain in place until all construction activity has been completed. An Arboricultural Consultant should review	*Contractor*	Arboricultural Impact Assessment, Tree Protection Plans, Arboricultural Method Statement Landscape Masterplan / Planning Drawings		

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
		any landscape operations that involve any work within the RPAs of retained trees and input additional site-specific methodology where necessary.				
B6.5	**To avoid effects to Section 7 Species and Amphibians**	Clearance of vegetation suitable for smaller species (long grass, hedges and scrub) will be avoided or kept to a minimum during the active season (March to October). If required during this time, clearance will be subject to a Toolbox Talk and Precautionary Methods of Working written and overseen by a suitably experienced ecologist. This is likely to include two-staged directional strimming towards retained habitat.	*Contractor*			
Land Use						
B7.1	**To minimise deterioration to land quality.**	Maintain the quality of the subsoil and topsoil within all working areas by following the mitigation measures outlined in B3.1.	*Contractor*	*British Standard 3882:2007: Specification for topsoil and requirements for use*		
Nuisance						
B8.1	**To minimise noise disturbance to the local residents and users of the Wales Coast Path.**	Working hours will be restricted to the hours of 7am-7pm on weekdays and 7am-1pm on Saturdays, subject to any third party limitations There will be no working on Sundays or Bank Holidays. Local residents will be consulted in advance by NRW on any requirements for out-of-hours work; • Deliveries will only be made during working hours; • Implementation of agreed hydraulic piling technology for sheet pile installation. Initial Movax installation to be undertaken within agreed working hours (if required).	*Contractor*	*British Standard guidelines BS5228:2009 – Code of practice for noise and vibration control on construction and open sites*		

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
		• Plant used during construction will be suitably sized for the works to limit noise and vibration; • Plant will be of a good modern standard and maintained to ensure unnecessary vibration or noise from exhaust systems or loose panels is eliminated; • Any stationary plant (e.g. generators and compressors) will be positioned as far as practically possible away from residential properties and screened to reduce noise emissions; • All plant will be shut down when not in use to eliminate any unnecessary noise; • Where possible, quieter electrically powered plant will be used as opposed to diesel or petrol-driven equipment; • Avoid unnecessary revving of engines and switch off equipment when not required; • Use rubber linings in, for example, chutes and dumpers to reduce impact noise; • Minimise drop height of materials; and • Start-up plant and vehicles sequentially rather than all together.				
B8.2	**To minimise the effect on air quality to the local residents**	• Working areas will be kept neat and tidy; • Road going vehicles will be restricted to running on hard surfaces where feasible; • Wheel cleaning facilities will be available (hose pipe, brush) and if required a jet wash will be employed; • Vehicles travelling off site will be observed to minimise mud/debris on the road; • Control measures will be in place for	*Contractor*	*CTMP*		

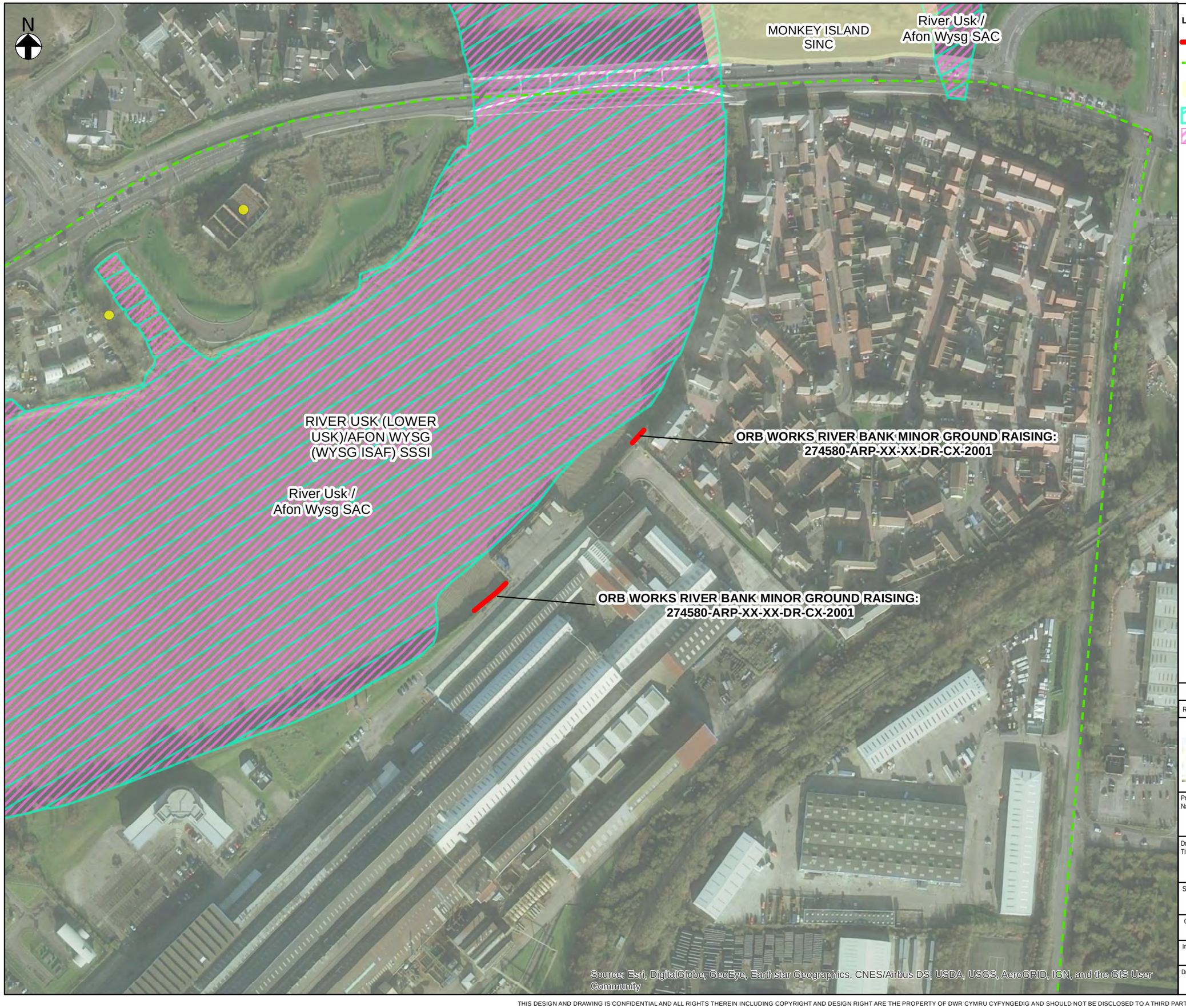
Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
		disposal of rubbish; • Machinery/vehicles to be well maintained, regularly serviced and comply with MOT emissions standards; • Deliveries to site will be controlled to avoid queuing; and • Engines will be switched off when not in use.				
Biosecurity and Plant Health						
B9.1	**Plant Health -** **Minimising Risk from Pests and Diseases**	Ensure all Operatives on site attend the Plant Health Toolbox talk and sign audit sheet.	*NRW - ECW*			
		Ensure any woody arisings do not become a vector for spreading disease to other areas. Identify and follow any specific instructions if there is known to be infected material on site	*Contractor*			
		Avoid bringing any untreated timber on to site e.g. packing cases, boxes, crates, drums, pallets, box pallets and pallet collars and dunnage (loose wood used to protect goods and their packaging) Solid wood packaging must meet the ISPM15 international standards if you import it from outside the EU.	*Contractor*			
		Comply with all measures to protect soils and existing vegetation detailed in other clauses within EAP as this is key to minimising the risk of disease.	*Contractor*			
		Be aware of signs and symptoms of ill health in plants	*NRW - ECW*			
		Any cases of ill health found in trees across the UK should be reported immediately using the Forestry Commission's Tree Pest and Pathogen sightings reporter: Tree Alert www.forestry.gov.uk/treealert	*All*			

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
		Comply fully and swiftly with any advice or Statutory Plant Health Notices that may be issued.	*All*			
B9.2	**Biosecurity**	Implement requirements of the Biosecurity Risk Assessment. Ensure this includes the scope of all sub-contractors such as landscape or tree surgeons. This may be checked for Audit purposes.	*Contractor*			
		PPE / Footwear - Ensure all PPE and personal wear is kept clean and dry minimising the risk to transporting pathogens through soil, water or organic material.	*All*			
		Machinery and tools should be visibly free from soil and organic matter when it arrives at work site. Wherever possible it should be parked up on clean hard standing away from standing water. If hiring machinery – ask the company where the plant was used last and check for any biosecurity risks.	*Contractor*			
		Ensure that disinfecting operations do not contaminate soils and water on site	*Contractor*			
		Display biosecurity posters and provide site specific information within the site cabins.	*Contractor*			
B9.3	**Landscape**	Arrange Nursery visit to check stock proposed for site. (NB Standard checklists can be provided for visits)	*NRW - Landscape Architect* *Contractor*			
Post-construction						
Humans						

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
C1.1	**To keep public informed of work progress.**	Notify local residents / businesses once work is complete.	*NRW*			
C1.2	**Prevent permanent disruption to PRoW / footpaths**	Re-instate footpaths to baseline condition or better. Contractor to liaise with the Council as needed.	*Contractor*			
Ecology						
C3.1	**Re-vegetate areas that are within the proposed area of vegetation clearance / construction.** **Replacement Tree Planting**	SSSI Saltmarsh Monitoring – surface water outfall works area – the Contractor is to undertake a post-construction National Vegetation Classification (NVC) survey, using a suitably qualified and experienced botanist, of the surface water outfall works area. Annual monitoring for three years thereafter to record recovery. The survey is to include the erosion protection (gabion mattress), which is anticipated to become vegetated over time. Allow areas within protected sites to revegetate naturally. The Contractor is to ensure that landscape planting is delivered as per design. Monitor the establishment of new tree planting and replace any that fail or are damaged within the first five years. The Contractor is to ensure that no Invasive Non-Native Species colonise the area including Japanese knotweed and Himalayan balsam. If these species or any other which are listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) are recorded they will be removed immediately in line with guidance from the Department for Environment, Food and Rural Affairs (Defra, 2003) .	*Contractor*			

Ref no	Objective	Action	Responsibility	Reference to further information	Progress and Further Action	Sign off and date
		Long-term Landscape Management Plan and maintenance strategy to be agreed with key stakeholders.	*NRW*	Landscape planting as per Planning Drawings		
C3.2	**Scrub monitoring**	Monitoring for signs of scrub colonisation and encroachment into wetland and grassland areas. Where there is encroachment, scrub should be cleared sensitively and removed from the SAC / SSSI.	*NRW*			
Land Use						
C4.1	**To reinstate site compound and all other working areas.**	Access routes, structures and site compound areas to be subject to post-construction inspection (against pre-construction survey details) to ensure that reinstatement has been carried out to an acceptable level, no areas of compacted soil are present following works.	*Contractor*			
Biosecurity and Plant Health						
C5.1	**Biosecurity**	Sign off Biosecurity Risk Assessment.	*NRW – ECW* *Contractor*			
C5.2	**Landscape**	Landscape Contract to be drawn up using detailed and current guidance from NRW and other appropriate professional bodies. Including the Landscape Institute Plant Health and Biosecurity consultants toolkit.	*NRW - Landscape Architect* *Contractor*			
		Responsible Sourcing of Plants and Trees. All planting stock must be sourced from a nursery located in the UK and must be free of pests and pathogens. Plants must be UK grown.	*NRW - Landscape Architect to specify and supervise.* *Contractor - to deliver.*	*Evidence will be required from the Nursery*		
		Ensure all Plant Passport information is retained as part of the Audit process.	*NRW - Landscape Architect* *Contractor*	*Evidence will be required from the Nursery*		

Appendix A – Environmental Constraints and Opportunities Plans (ECOPs)



A3

LEGEND

- Proposed Works
- Wales Coast Path
- Site of Importance for Nature Conservation (SINC)
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- Listed Buildings

ARUP

0 12.5 25 50 75 100 Metres

Rev.	Date.	Drawn	Description.	Chkd.	Appd.	Date.
F1	2021-02-16	IM	For Issue	GM	GM	2021-02-24

Cyfoeth Naturiol Cymru Natural Resources Wales

Project Name. STEPHENSON STREET FLOOD DEFENCE SCHEME

Drawing Title. ENVIRONMENTAL CONSTRAINTS AND OPPORTUNITIES PLAN **APPENDIX A1 - ORB WORKS GROUND RAISING**

Suitability.	Suitability Code.
For Issue	2021-02-16

Originator	Designer	Date.
IM	GM	2021-02-16

Internal Project Number	Scale	Rev.
245404	1:2,500	F1

Drawing Number. 005

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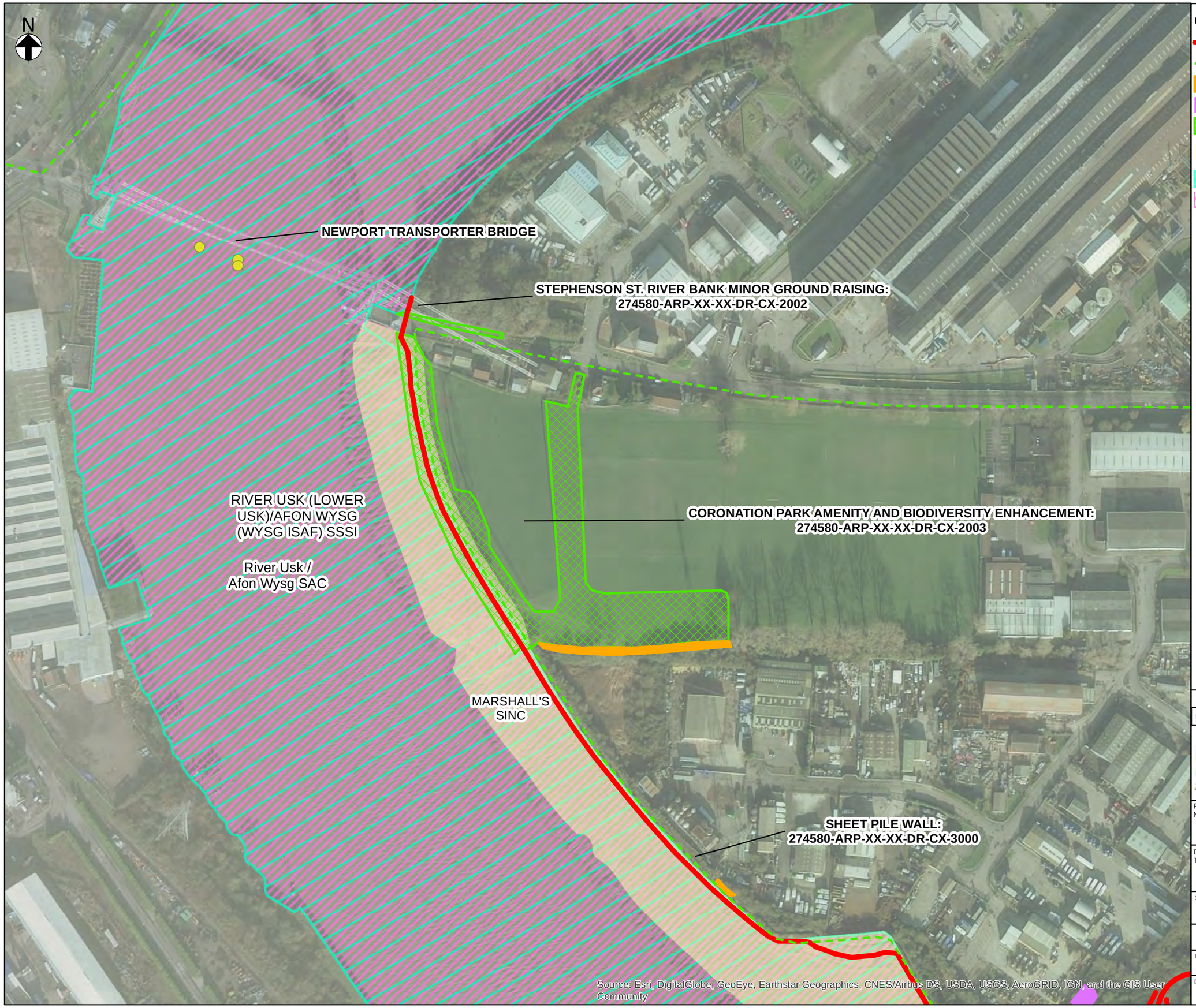

A3

LEGEND

- Proposed Works
- Wales Coast Path
- Japanese Knotweed (Treated)
- Japanese Knotweed
- Amenity and Biodiversity Enhancement
- Site of Importance for Nature Conservation (SINC)
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- Listed Buildings

ARUP

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Rev.	Date.	Drawn.	Description.	Chkd.	Appd.	Date.
F1	2021-02-16	IM	For Issue	GM	GM	2021-02-24

Cyfoeth Naturiol Cymru
Natural Resources Wales

Project Name.
STEPHENSON STREET
FLOOD DEFENCE SCHEME

Drawing Title.
ECOP
APPENDIX A2 - STEPHENSON STREET BUND, MINOR GROUND RAISING, ENHANCEMENTS & SHEET PILE WALL

Suitability.	Suitability Code.
For Issue	2021-02-16

Originator	Designer	Date.
IM	GM	2021-02-16

Internal Project Number	Scale	Rev.
245404	1:2,500	F1

Drawing Number.
006

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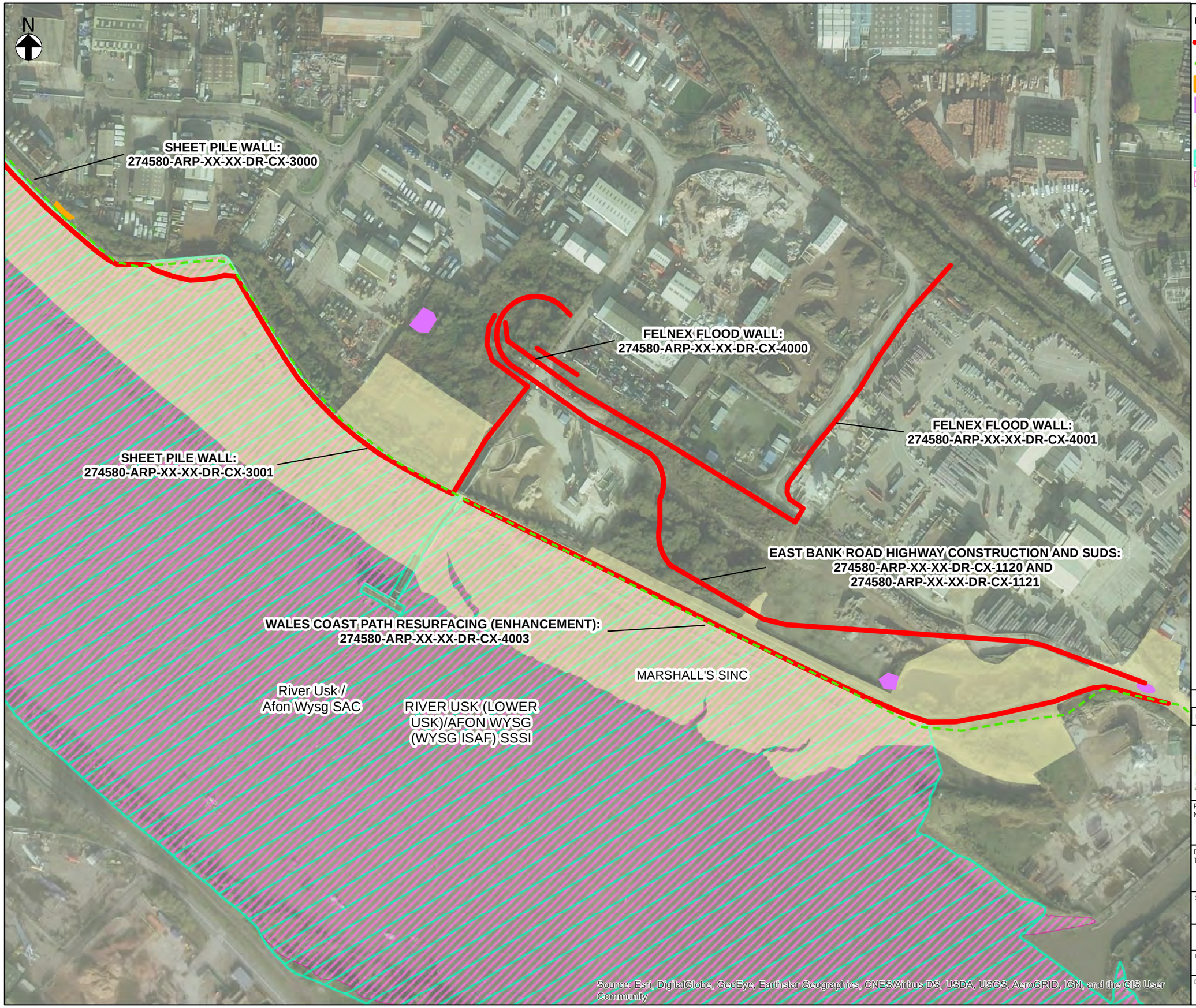

A3

LEGEND

- Proposed Works
- Wales Coast Path
- Japanese Knotweed (Treated)
- Japanese Knotweed
- Site of Importance for Nature Conservation (SINC)
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)

ARUP

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Rev.	Date.	Drawn.	Description.	Chkd.	Appd.	Date.
F1	2021-02-16	IM	For Issue	GM	GM	2021-02-24

Cyfoeth Naturiol Cymru
Natural Resources Wales

Project Name.
STEPHENSON STREET
FLOOD DEFENCE SCHEME

Drawing Title.
ECOP
APPENDIX A3 - SHEET PILE WALL, FELNEX FLOOD WALL & RAISED HIGHWAY

Suitability.	Suitability Code.
For Issue	2021-02-16

Originator	Designer	Date.
IM	GM	2021-02-16

Internal Project Number	Scale	Rev.
245404	1:2,500	F1

Drawing Number.
007

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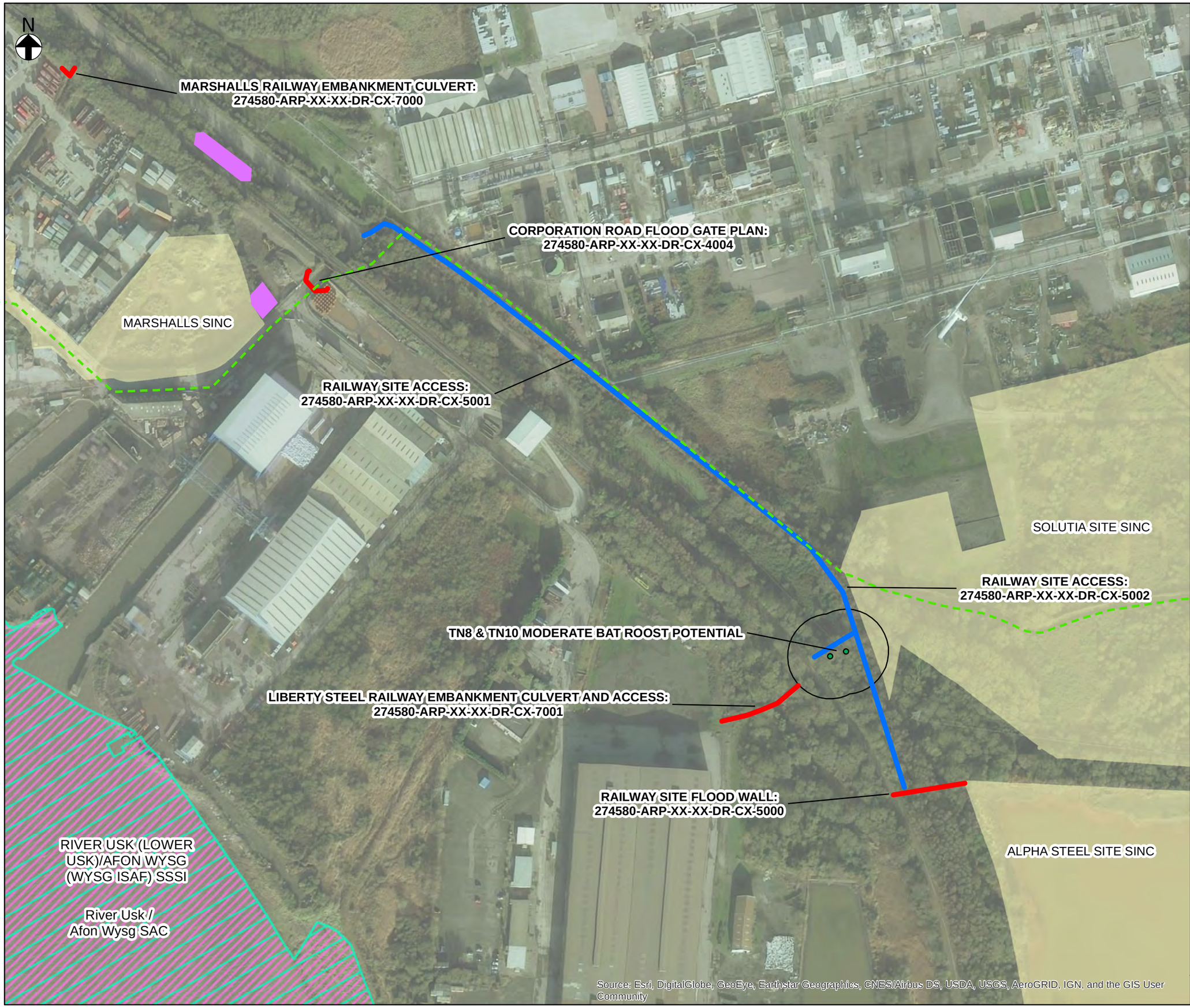

A3

LEGEND

- Proposed Works
- Wales Coast Path
- Access
- 30m Buffer
- Japanese Knotweed
- Site of Importance for Nature Conservation (SINC)
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- Bat Roost Potential

ARUP

0 12.5 25 50 75 100 Metres

Rev.	Date.	Drawn.	Description.	Chkd.	Appd.	Date.
F1	2021-02-16	IM	For Issue	GM	GM	2021-02-24

Cyfoeth Naturiol Cymru
Natural Resources Wales

Project Name.	STEPHENSON STREET FLOOD DEFENCE SCHEME
Drawing Title.	**ECOP - APPENDIX A4 - RAILWAY WALL & ACCESS, MARSHALLS & LIBERTY CULVERTS & CORPORATION RD FLOOD GATE**
Suitability.	For Issue
Suitability Code.	2021-02-16
Originator	IM
Designer	GM
Date.	2021-02-16
Internal Project Number	245404
Scale	1:2,500
Rev.	F1
Drawing Number.	008

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A3

LEGEND

- Proposed Works
- Access
- 30m Buffer
- Site of Importance for Nature Conservation (SINC)
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- Bat Roost Potential

ARUP

0 10 20 40 60 80 Metres

Rev.	Date.	Drawn.	Description.	Chkd.	Appd.	Date.
F1	2021-02-16	IM	For Issue	GM	GM	2021-02-24

Cyfoeth Naturiol Cymru
Natural Resources Wales

Project Name.
STEPHENSON STREET
FLOOD DEFENCE SCHEME

Drawing Title.
ENVIRONMENTAL CONSTRAINTS AND OPPORTUNITIES PLAN
APPENDIX A5 - NASH WALL & ACCESS

Suitability.	Suitability Code.
For Issue	2021-02-16

Originator	Designer	Date.
IM	GM	2021-02-16

Internal Project Number	Scale	Rev.
245404	1:2,227	F1

Drawing Number.
009

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Appendix B – Ecological Constraints Plans

A3

Target Notes
TN1: Tree with low bat roost suitability.
TN2: Wading bird. Species unidentified.
TN3: Fox footprints along entire length of saltmarsh up to bridge, adjacent to housing.
TN4: Silted pond.

TN1
TN2
TN3
TN4

A

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- Target Note
- A2.2 - Scrub - scattered
- A3.1 - Broadleaved parkland/scattered trees
- No Access
- A1.1.1 - Broadleaved woodland - semi-natural
- A2.1 - Scrub - dense/continuous
- G1 - Standing water
- H1.1 - Intertidal - mud/sand
- H2.6 - Saltmarsh - dense/continuous
- J1.2 - Cultivated/disturbed land - amenity grassland
- J1.5 - Other vegetation
- J3.6 - Buildings

Issue	Date	By	Chkd	Appd
F1	2019-06-13	KJ	CP	PC

Metres
0 37.5 75 150

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www.arup.com

Client
Natural Resources Wales

Job Title
Stephenson Street

Extended Phase 1 Habitat Survey

Scale at A3
1:3,000

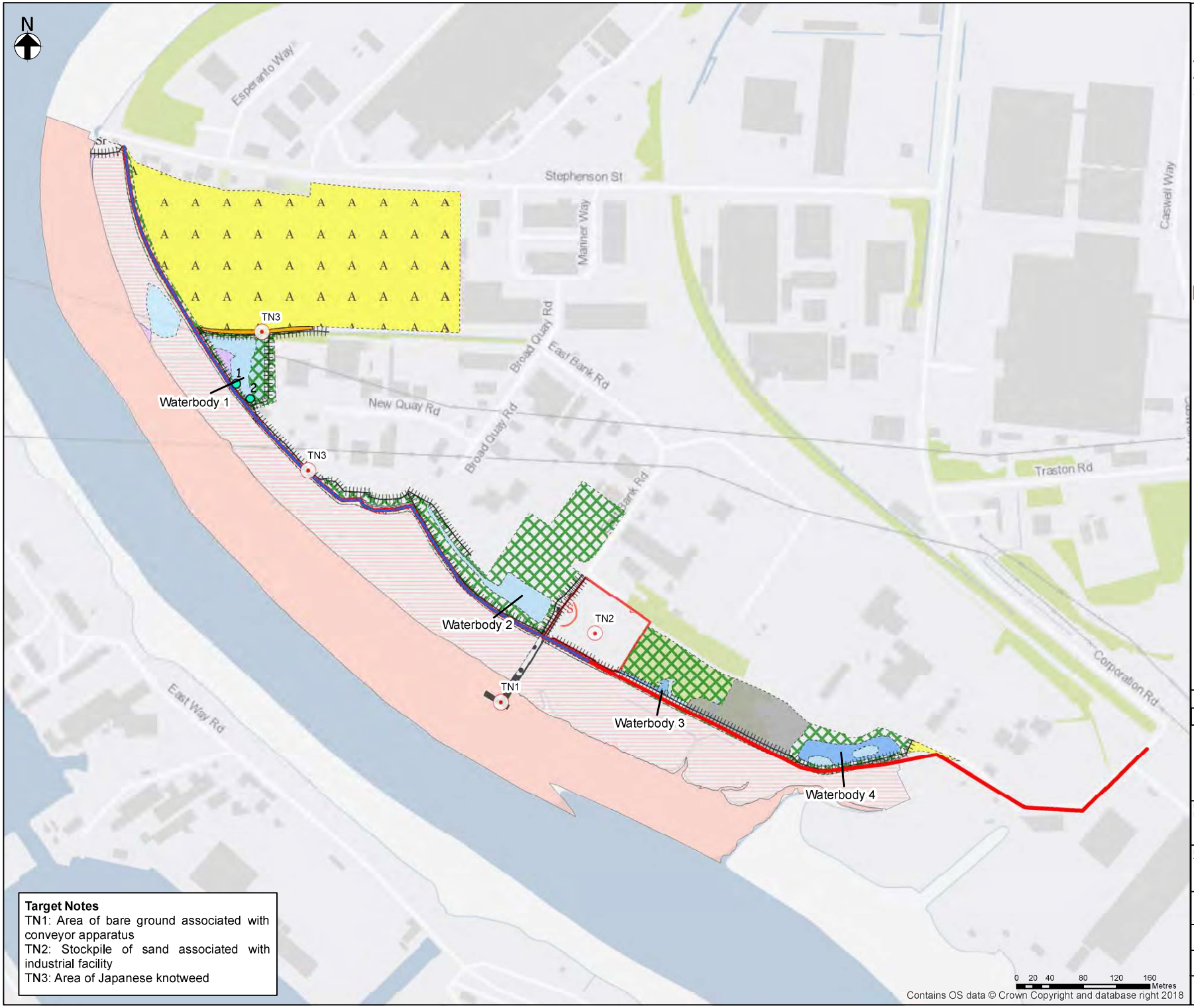
Job No	Drawing Status
246344	For Issue

Drawing No	Issue
001	F1

31/07/2019 15:49:30

\\globa\europe\Cardiff\Jobs\246000\246344-00\4 Internal Project Data\4-80 GIS\4-84 Map Documents\ENV_Environment\Extended phase 1 plan_updatedv3.mxd

© Arup



Target Notes
TN1: Area of bare ground associated with conveyor apparatus
TN2: Stockpile of sand associated with industrial facility
TN3: Area of Japanese knotweed

Legend

- Target note
- Otter Camera Locations
- Phase 2 Works
- Phase 1 Works- Flood Defence Improvements
- Fence
- Wall
- Japanese knotweed
- Dense scrub
- Scattered scrub
- Poor semi-improved grassland
- Swamp
- Standing water
- Running water
- Intertidal mud/sand
- Saltmarsh dune interface
- Mud/sand above mean high water
- Spoil
- Amenity grassland
- Buildings
- Bare ground
- Gravel and concrete

A3

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Rev.	Date.	Drawn	Description.	Chkd.	Appd.	Date.
P0	2018-05-21	EA	Preliminary	GM		2018-07-24

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Natural Resources Wales

Project Name.
Stephenson Street Embankment

Drawing Title.
FIGURE 2
EXTENDED PHASE 1 PLAN

Suitability.	Suitability Code.
Preliminary	2018-05-21

Originator	Designer	Date.
EA	GM	2018-05-21
Internal Project Number	**Scale**	**Rev.**
245404	1:4,250	P0

Drawing Number.
002

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A3

Target Notes
TN1: Multiple rubble piles.
TN2: Brash pile.
TN3: Burned fly tipping.
TN4: Willow tree with ivy cover, could not access but may have low bat suitability.
TN5: Mammal paths leading into scrub.
TN6: Japanese knotweed

TN1
TN2
TN3
TN4
TN5
TN6

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- A3.1 - Broad-leaved parkland/scattered trees
- TN - Target note
- A3.1 - Broadleaved parkland/scattered trees
- J2.4 - Fence
- G1 - Standing water
- A1.1.1 - Broadleaved woodland - semi-natural
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- C3.1 - Other tall herb and fern - ruderal
- G1 - Standing water
- J1.4 - Introduced shrub

Issue	Date	By	Chkd	Appd
F1	2020-01-28	KJ	CP	PC

Metres
0 25 50 100

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Client
Natural Resources Wales

Job Title
Stephenson Street

Extended Phase 1 Habitat Survey Marshall's

Scale at A3
1:2,000

Job No	Drawing Status
246344	**For Issue**

Drawing No	Issue
001	**F1**

28/01/2020 10:37:21

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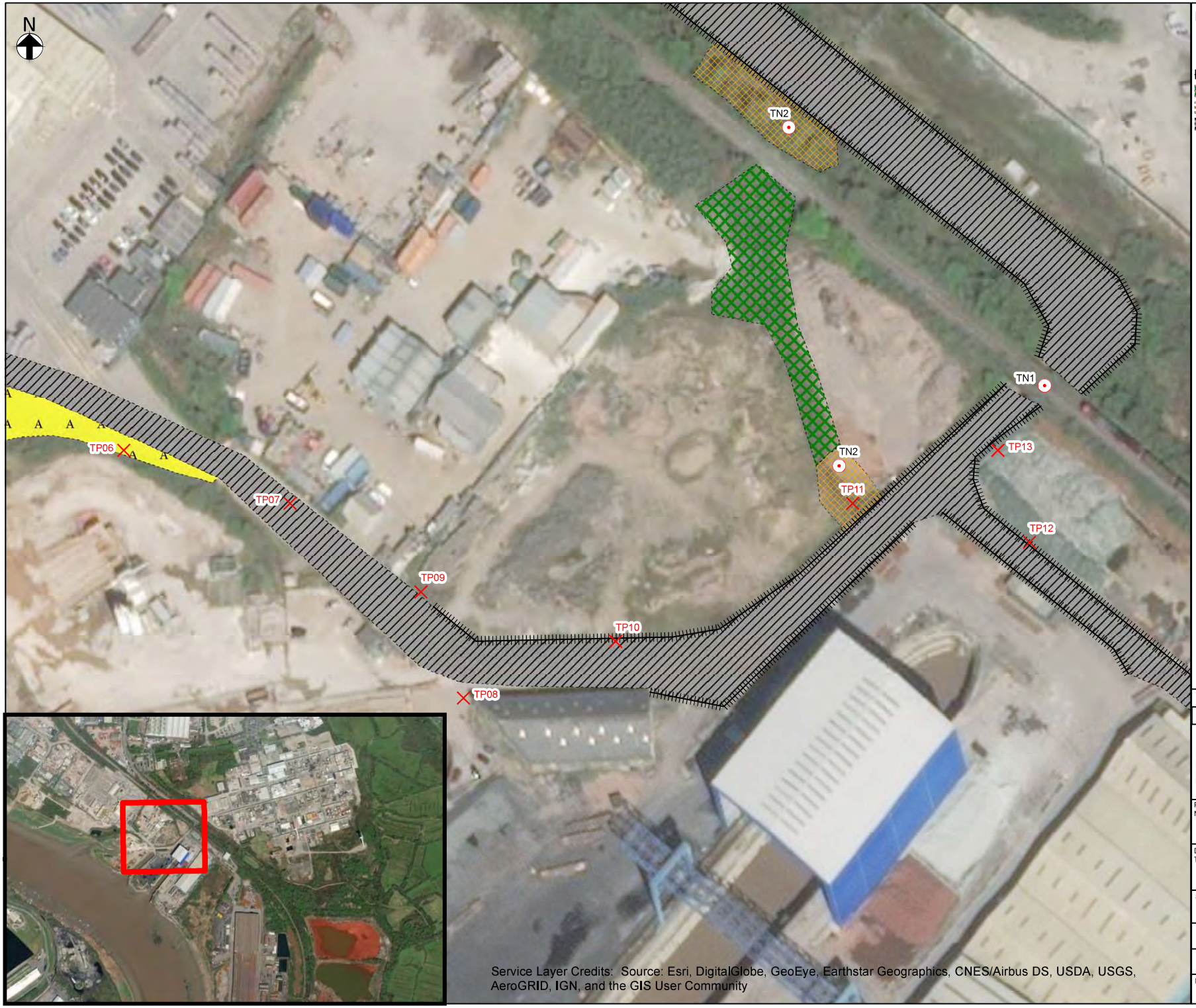

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

A3

LEGEND

- Trial pits
- Target note
- Fence
- Dense scrub
- Japanese knotweed
- Tarmac

ARUP

0 5 10 20 30 40 Metres

Rev.	Date.	Drawn	Description.	Chkd.	Appd.	Date.
F1	2019-02-08	EA	For Issue	CP	PC	2019-02-21

Cyfoeth Naturiol Cymru
Natural Resources Wales

Project Name. Stephenson Street

Drawing Title. EXTENDED PHASE 1 HABITAT SURVEY
MAP 2 OF 2

Suitability. For Issue

Suitability Code. S1

Originator	Designer	Date.
EA	CP	2019-02-21

Internal Project Number	Scale	Rev.
246344	1:1,000	F1

Drawing Number. 003

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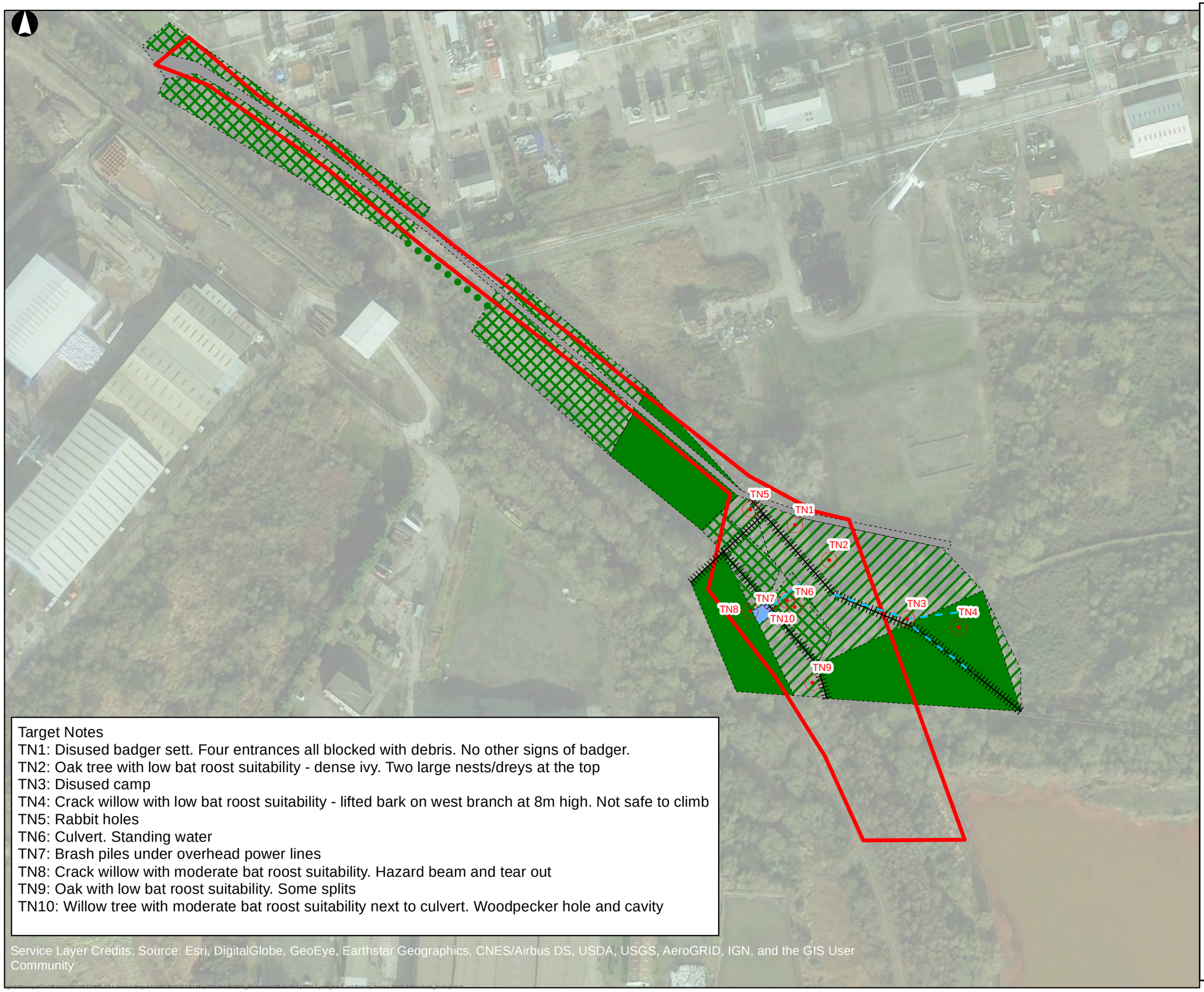
A3



Target Notes
TN1: Disused badger sett. Four entrances all blocked with debris. No other signs of badger.
TN2: Oak tree with low bat roost suitability - dense ivy. Two large nests/dreys at the top
TN3: Disused camp
TN4: Crack willow with low bat roost suitability - lifted bark on west branch at 8m high. Not safe to climb
TN5: Rabbit holes
TN6: Culvert. Standing water
TN7: Brash piles under overhead power lines
TN8: Crack willow with moderate bat roost suitability. Hazard beam and tear out
TN9: Oak with low bat roost suitability. Some splits
TN10: Willow tree with moderate bat roost suitability next to culvert. Woodpecker hole and cavity

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

04/10/2020 17:29:30

Legend

- Proposed Access Route
- A3.1 - Broadleaved parkland/scattered trees
- J2.6 - Dry ditch
- J2.4 - Fence
- G1 - Standing water
- A1.1.1 - Broadleaved woodland - semi-natural
- A1.1.2 - Broadleaved woodland - plantation
- A2.1 - Scrub - dense/continuous
- G1 - Standing water
- J5 - Gravel/hard standing
- TN - Target note

Issue	Date	By	Chkd	Appd
F1	2020-09-24	AK	CP	PC

Metres
0 25 50 100

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Client
Natural Resources Wales

Job Title
Stephenson Street Embankment Railway Wall Access Route

Extended Phase 1 Habitat Survey

Scale at A3
1:2,000

Job No	Drawing Status
	For Issue

Drawing No	Issue
001	**F1**

© Arup

A3

LEGEND

- Trial pits
- Target note
- Standing water
- Wall
- Semi-natural broadleaved woodland
- Broad-leaved plantation
- Dense scrub
- Swamp
- Standing water
- Gravel and concrete

Great crested newt habitat suitability index

- Average (0.6-0.69)
- Below average (0.5-0.59)
- Poor (<0.5)

ARUP

0 10 20 40 60 80 Metres

Rev.	Date.	Drawn	Description.	Chkd.	Appd.	Date.
F1	2019-02-08	EA	For Issue	CP		2019-03-05

Cyfoeth Naturiol Cymru
Natural Resources Wales

Project Name. Stephenson Street

Drawing Title. ECOLOGICAL CONSTRAINTS PLAN

Suitability. For Issue

Suitability Code. 2019-02-08

Originator EA

Designer CP

Date. 2019-02-08

Internal Project Number 246344

Scale 1:2,000

Rev. F1

Drawing Number. 002

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A3

Legend

- Target Notes
- A3.1 - Broadleaved parkland/scattered trees
- J2.4 - Fence
- J2.4.2 - Fence with scattered scrub
- G2 - Running water
- A2.1 - Scrub - dense/continuous
- H1.1 - Intertidal - mud/sand
- J5 - Gravel/hard standing
- A3.1 - Broadleaved parkland/scattered trees
- G2 - Running water
- G1 - Standing water
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- C3.1 - Other tall herb and fern - ruderal
- F1 - Swamp
- J1.2 - Cultivated/disturbed land - amenity grassland

Issue	Date	By	Chkd	Appd
F1	2019-07-31	KSJ	CP	NH

Metres
0 15 30 60

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Client
Natural Resources Wales

Job Title
Stephenson Street

Extended Phase 1 Habitat Survey

Scale at A3
1:1,250

Job No	Drawing Status
246344-00	For Issue

Drawing No	Issue
001	F1

31/07/2019 15:34:17

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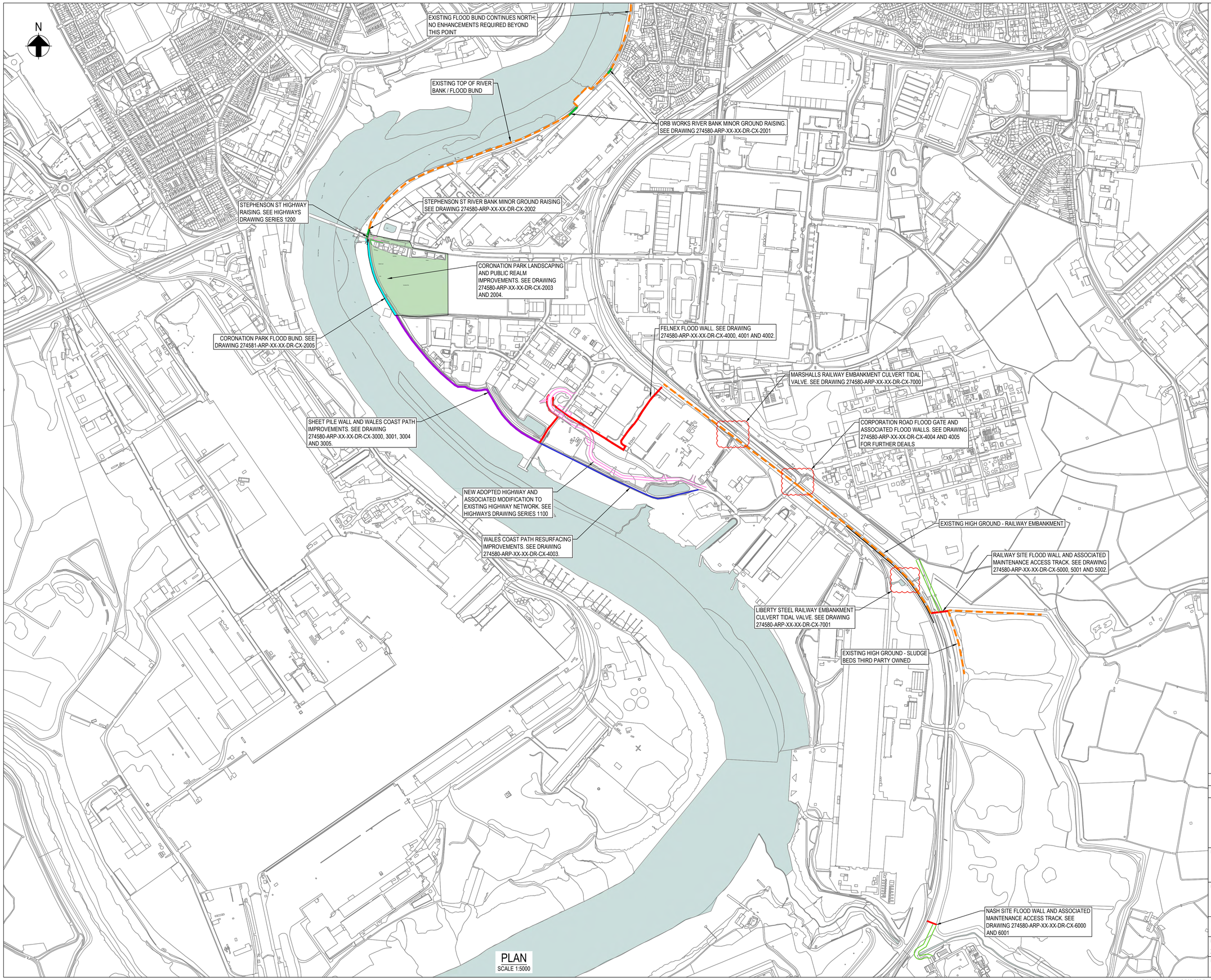
Appendix C – Design Solution: Overview Drawing

Detailed drawings available in the Planning Drawings within the Pre-Application Consultation pack.



PLAN
SCALE 1:5000

A1

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS, SPECIFICATIONS AND CONTRACT DOCUMENTS. NOTIFY THE PROJECT MANAGER OF ANY DISCREPANCIES.
2. ALL DIMENSIONS IN MILLMETERS AND ALL LEVELS IN METERS ABOVE ORDNANCE DATUM UNLESS NOTED OTHERWISE.
3. DO NOT SCALE FROM DRIWING.

LEGEND:

- EXISTING HIGH GROUND
- GROUND RAISING
- BUND
- SHEET PILE WALL
- REINFORCED CONCRETE WALL
- WALES COASTAL PATH RESURFACING
- MAINTENANCE ACCESS TRACKS
- ADOPTED HIGHWAY
- LANSCAPING AND PUBLIC REALM ENHANCEMENTS

0 50 100 200 Metres
Scale 1:5000

Rev.	Description	Drawn	Chkd.	Appd.	Issue Date
P01	DRAFT FOR COMMENT	SG	JL	RC	19.02.21

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Project Name.
STEPHENSON ST FLOOD DEFENCE SCHEME

Drawing Title.
SCHEME KEY PLAN

Suitability.	Suitability Code.
DRAFT FOR COMMENT	S2

Internal Project Number.	Scale.	Rev.
274580	AS SHOWN	P01

Drawing Number.
274580-ARP-XX-XX-DR-CX-2000

J:\274000\274580-00\4 Internal Project Data\4-30 Drawings\4-31 Issue drawings\274580-ARP-XX-XX-DR-CX-2000.dwg

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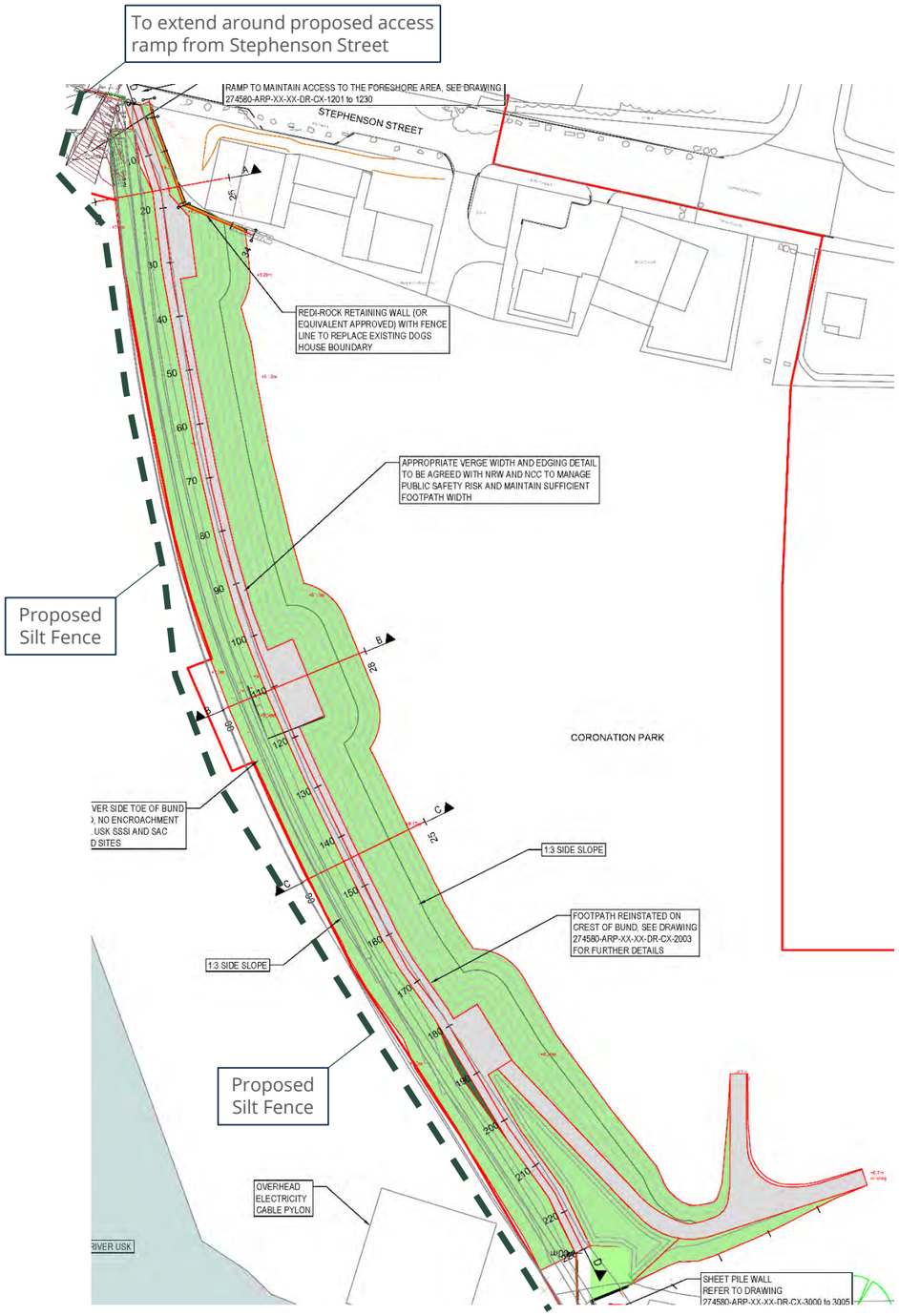
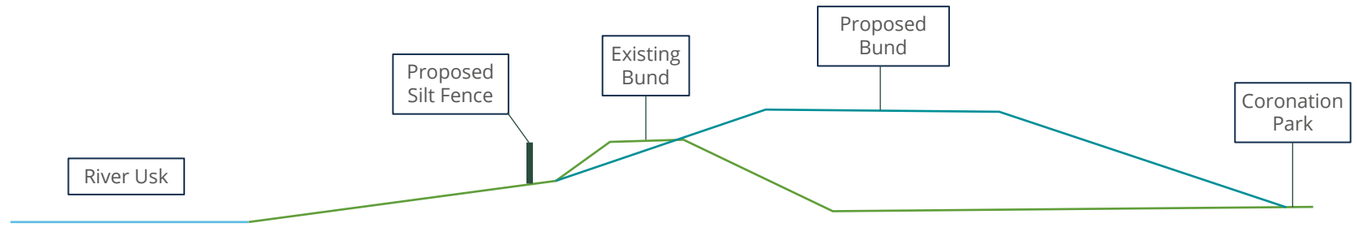
Appendix D – Indicative Silt Mitigation Measures

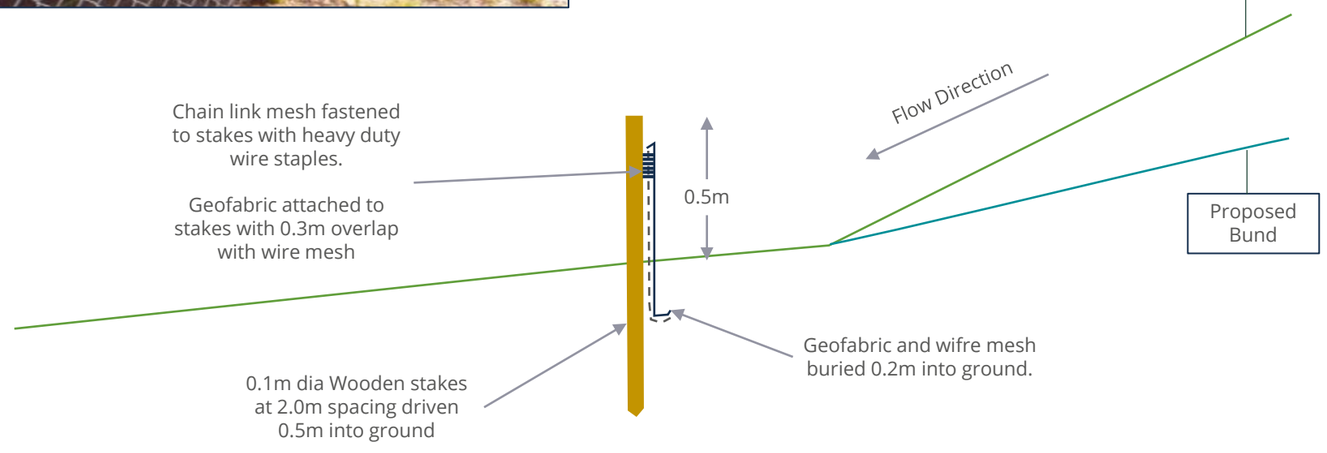


Plan of proposed bund and line of silt fence



Section through proposed bund at B-B

Due to the potential of river water levels rising to this height, we are going to reinforce the silt fence with a chain link mesh.



Type A Silt fence detail

Project Title: Stephenson Street FAS ECI		
Drawing Name: Silt Control Measures 1 of 7, Coronation Bund		
Client: Natural Resources Wales		
Drawn: DT	**Checked:** OC	**Date:** 14/05/2021
Approved: OC	**Scale:** NTS	**DWG Ref:** C1394.SK01

Full details of surface water management to be provided within Construction Environmental Management Plan once detailed design is completed.

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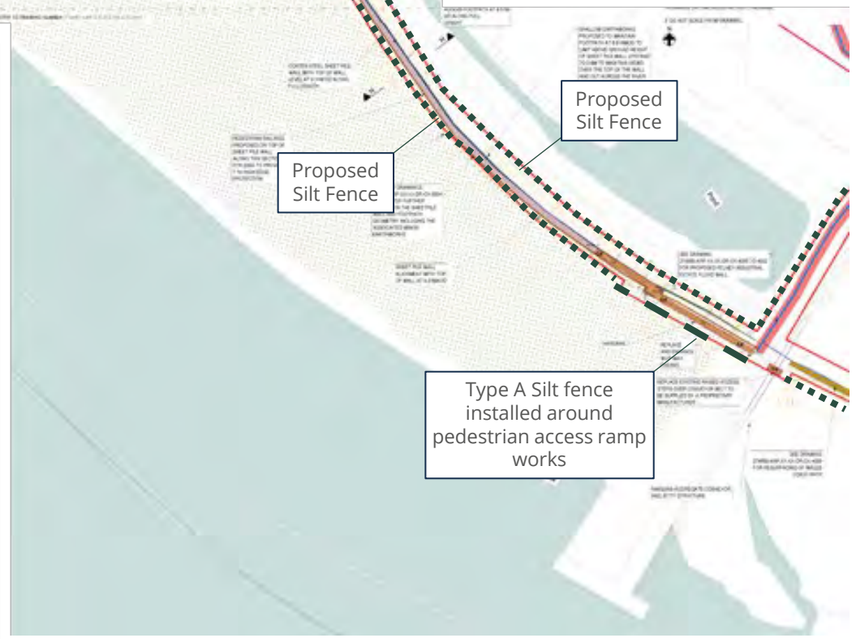
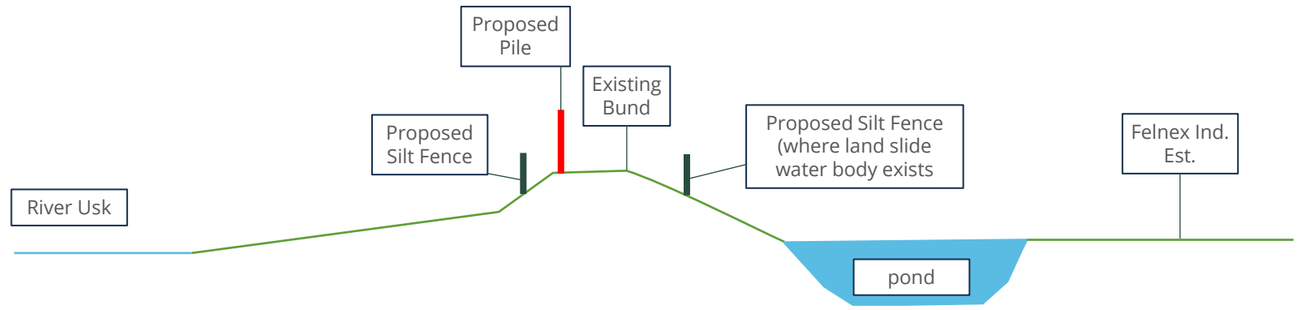
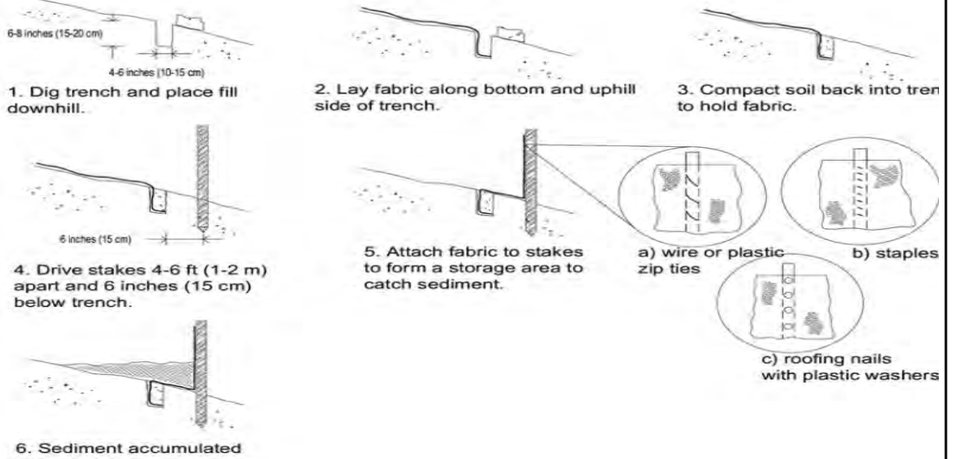


Plan of proposed piling and line of silt fences



Section through proposed bund at H-H

Along the piled wall section the netting can be installed higher up the bund which is less susceptible to high water levels, here it won't require reinforced netting as shown below.



Type B Silt Fence construction detail and approach

Example Type B Silt Fence

Project Title: Stephenson Street FAS ECI		
Drawing Name: Silt Control Measures 2 of 7, Piled Wall		
Client: Natural Resources Wales		
Drawn: DT	**Checked:** OC	**Date:** 14/05/2021
Approved: OC	**Scale:** NTS	**DWG Ref:** C1394.SK02

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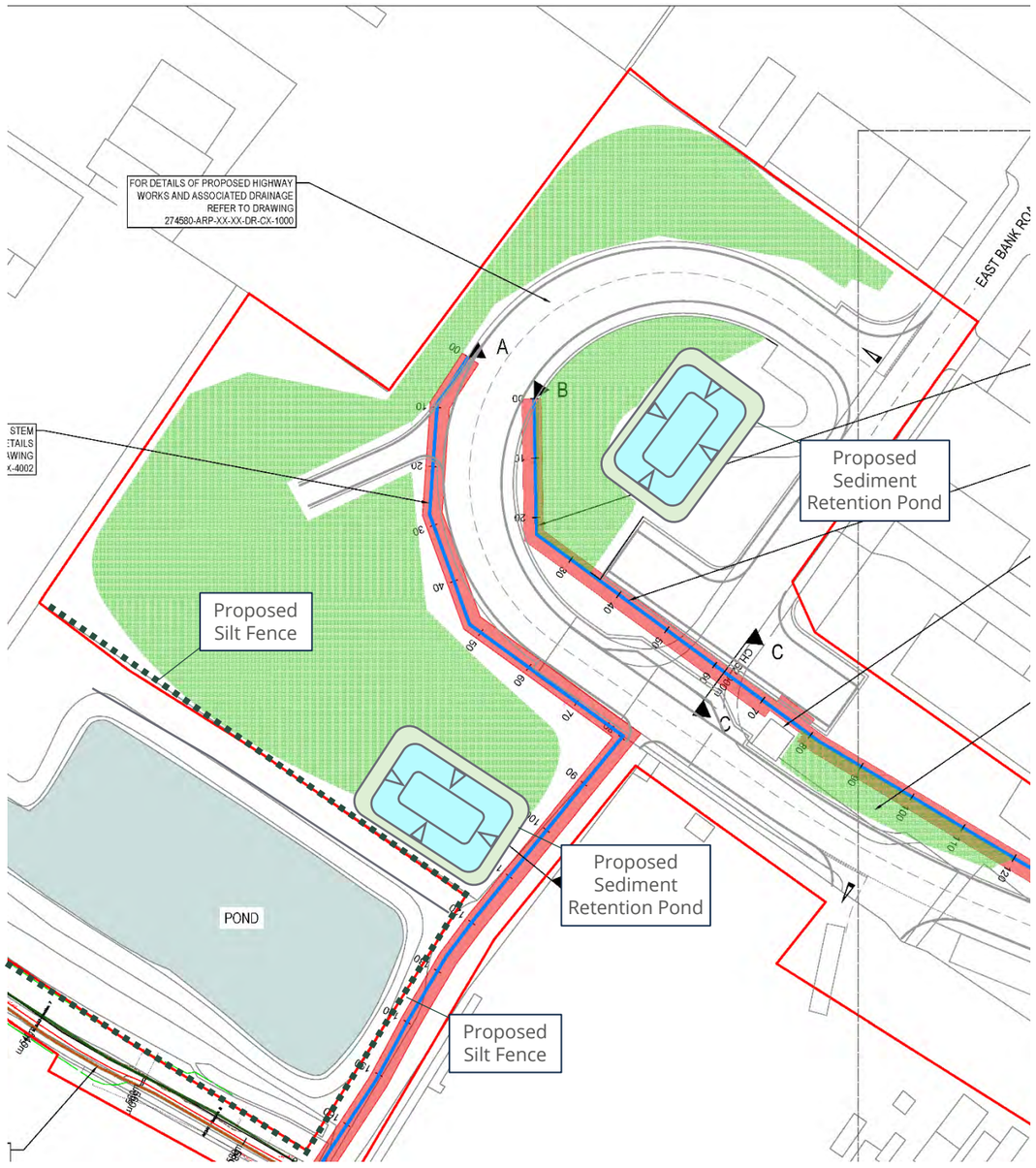
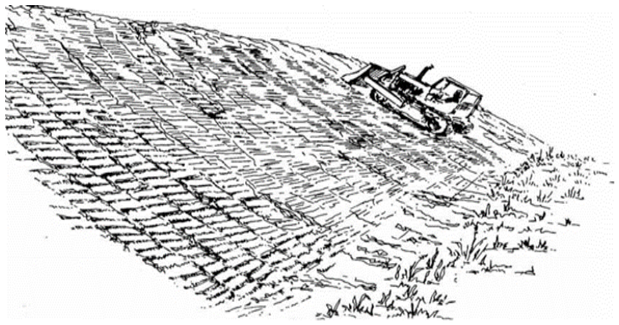


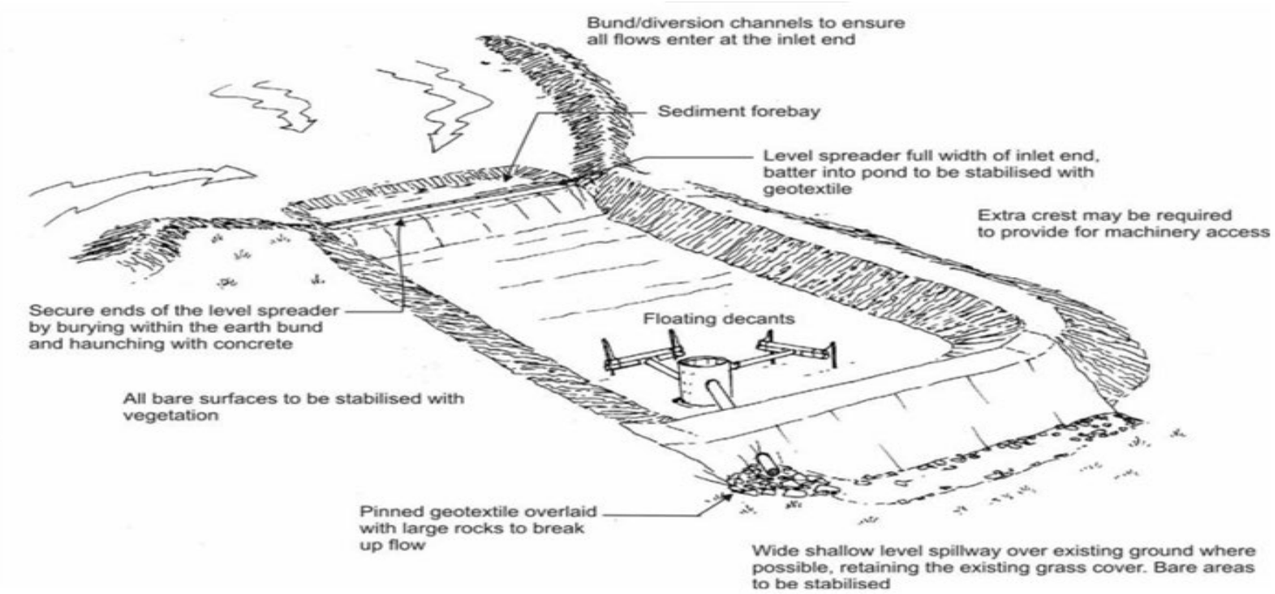
Plan arrangement of area

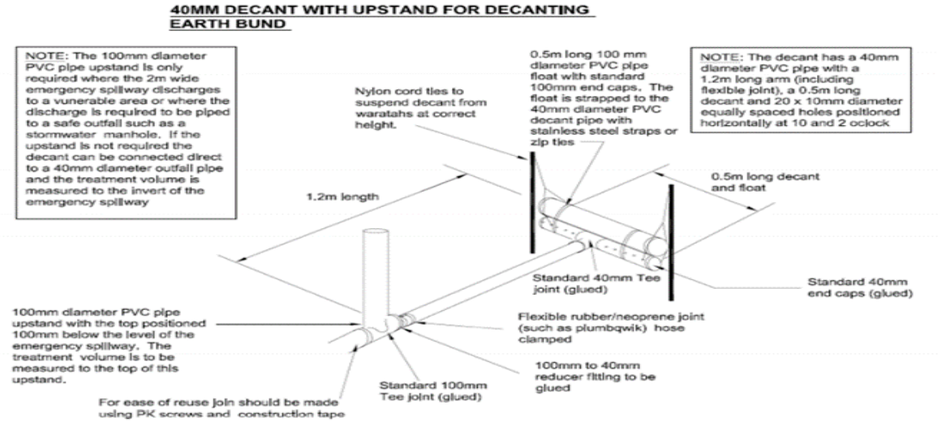
Surface Roughening will be used to reduce runoff velocity, promote infiltration and capture small quantities of sediment. This will be undertaking using tracked equipment to install horizontal groves across bare earth surfaces



Surface Roughening

Sediment Detention Ponds will be used to treat sediment laden run off from Carousel construction works.





Proposed Sediment Retention Pond

Project Title: Stephenson Street FAS ECI		
Drawing Name: Silt Control Measures 3 of 7, Carousel		
Client: Natural Resources Wales		
Drawn: DT	**Checked:** OC	**Date:** 14/05/2021
Approved: OC	**Scale:** NTS	**DWG Ref:** C1394.SK03

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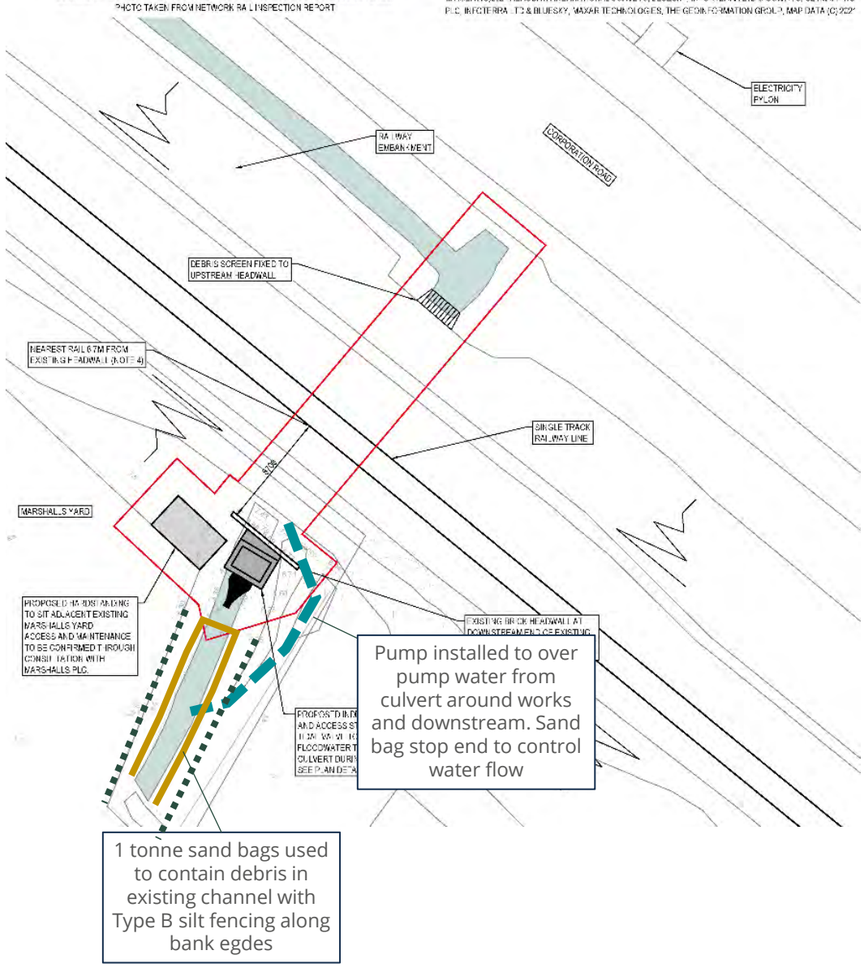
VIEW OF EXISTING CONTEXT

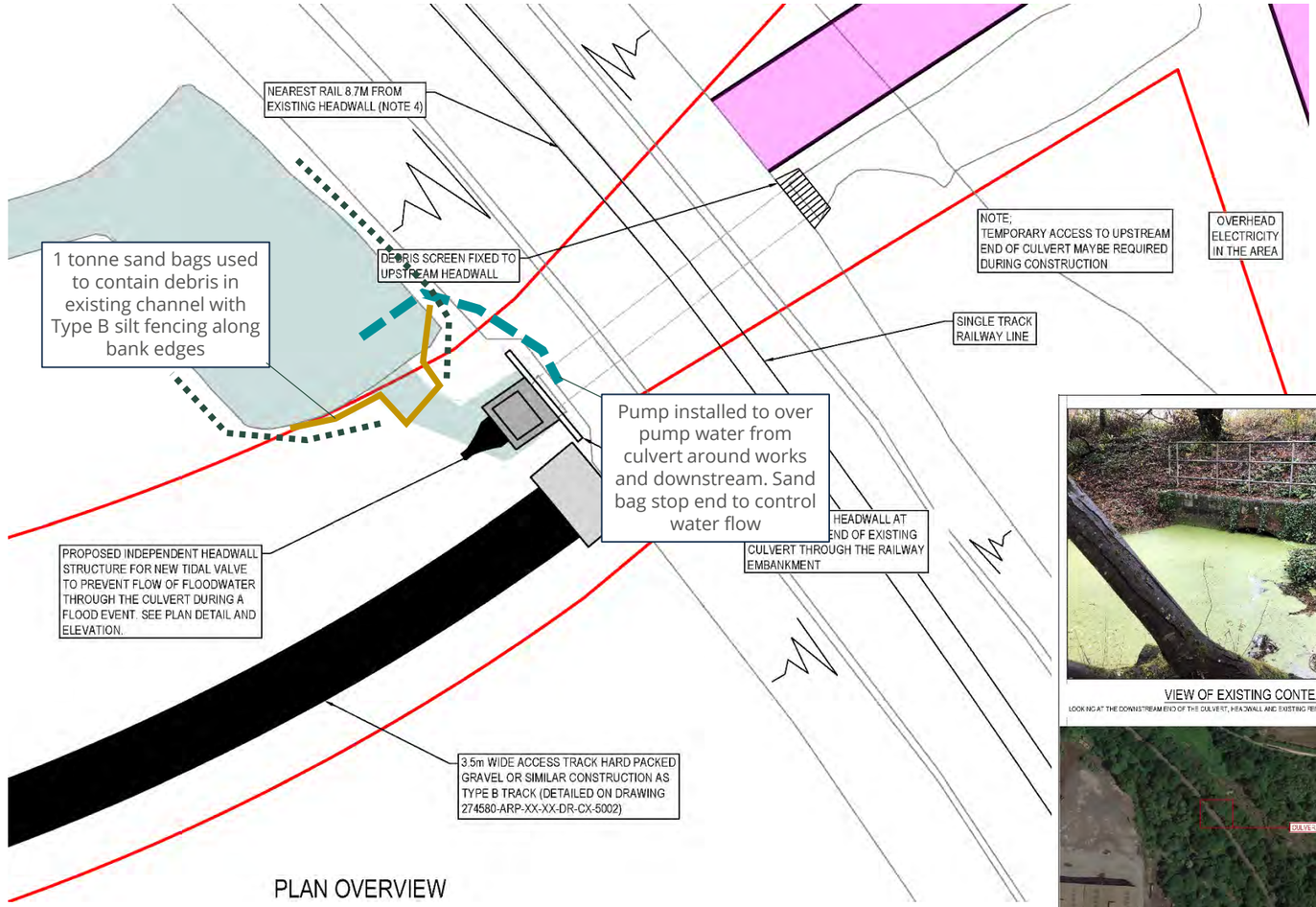
LOOKING AT THE DOWNSTREAM END OF THE CULVERT, HEADWALL AND EXISTING FENCE. PHOTO TAKEN FROM NETWORK RAIL INSPECTION REPORT

AERIAL VIEW OF CULVERT

IMAGERY(C)2021 AERODATA INTERNATIONAL SURVEYS, BLUESKY, INFOTERRA LTD & COWI A/S, GETMAPPING PLC, INFOTERRA LTD & BLUESKY, MAXAR TECHNOLOGIES, THE GEOINFORMATION GROUP, MAP DATA (C) 2021



Marshalls Railway Embankment Culvert



PLAN OVERVIEW

VIEW OF EXISTING CONTEXT

LOOKING AT THE DOWNSTREAM END OF THE CULVERT, HEADWALL AND EXISTING FENCE PHOTO TAKEN ON SITE VISIT 2020

AERIAL VIEW OF CULVERT LOCATION

IMAGERY(C)2021 AERODATA INTERNATIONAL SURVEYS, BLUESKY, INFOTERRA LTD & COWI A/S, GETMAPPING PLC, INFOTERRA LTD & BLUESKY, MAXAR TECHNOLOGIES, THE GEOINFORMATION GROUP, MAP DATA (C) 2021

Liberty Steel Railway Embankment Culvert

Project Title: Stephenson Street FAS ECI		
Drawing Name: Silt Control Measures 4 of 7, Culvert Works		
Client: Natural Resources Wales		
Drawn: DT	**Checked:** OC	**Date:** 14/05/2021
Approved: OC	**Scale:** NTS	**DWG Ref:** C1394.SK04

Full details of surface water management to be provided within Construction Environmental Management Plan once detailed design is completed.

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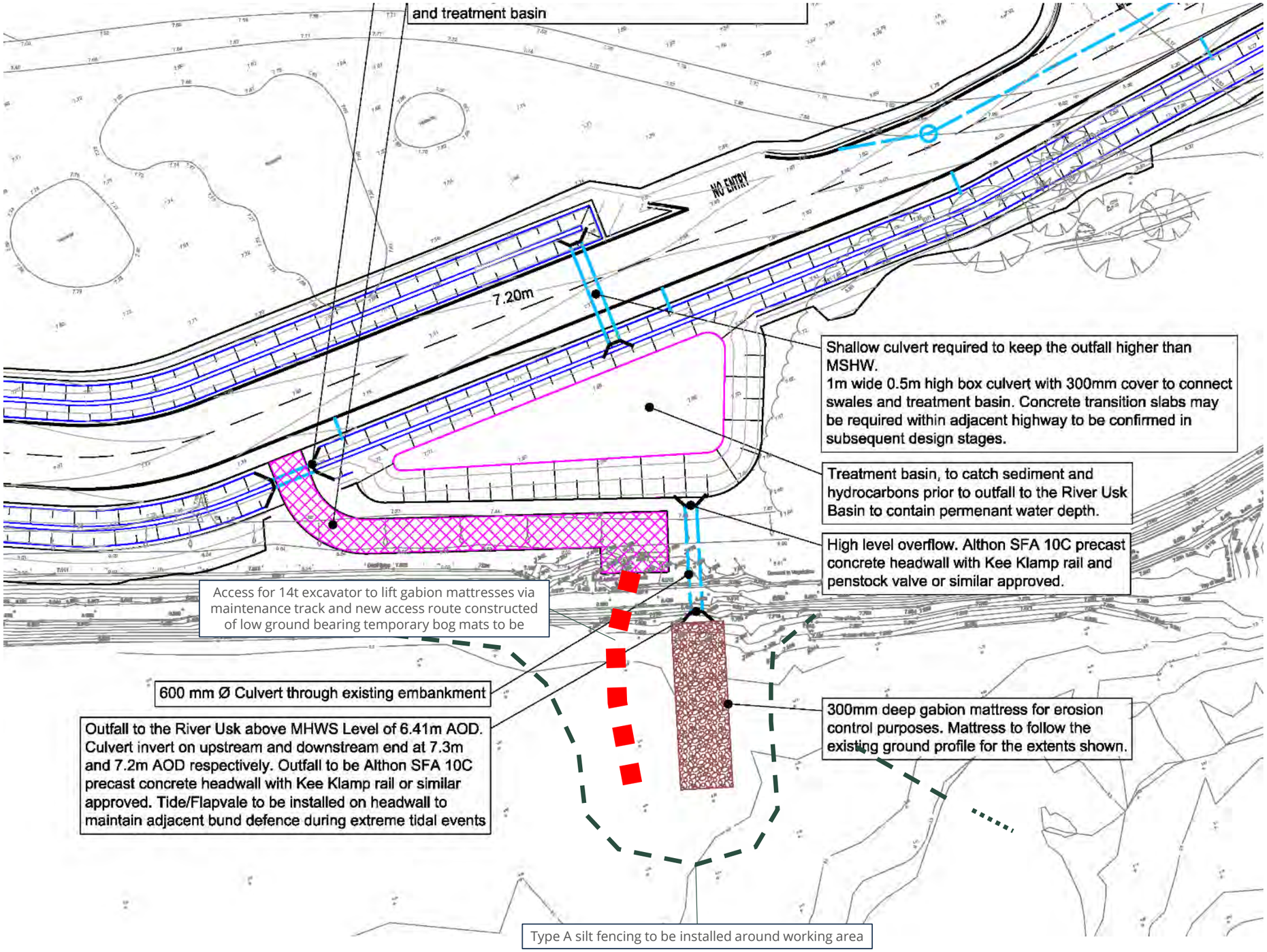

Project Title: Stephenson Street FAS ECI		
Drawing Name: Silt Control Measures 5 of 7, SW Outfall		
Client: Natural Resources Wales		
Drawn: DT	**Checked:** OC	**Date:** 14/05/2021
Approved: OC	**Scale:** NTS	**DWG Ref:** C1394.SK05

Full details of surface water management to be provided within Construction Environmental Management Plan once detailed design is completed.

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Natural Resources Wales

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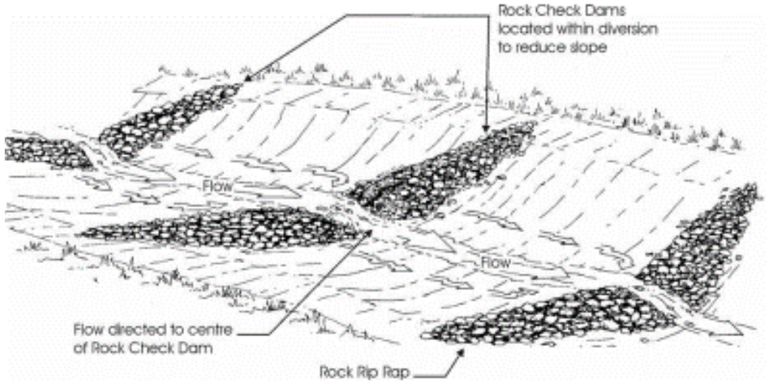
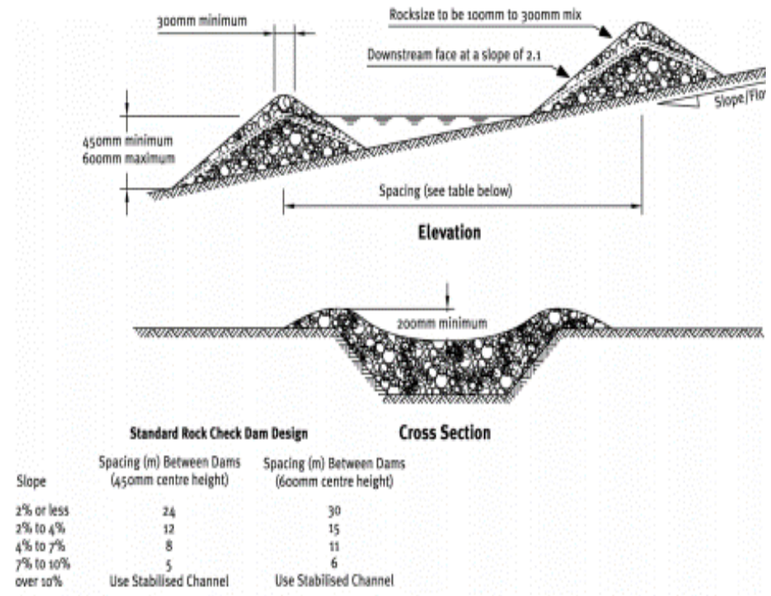
To supplement sediment retention ponds (or Siltbusters where space is more constrained) check dams will be used - in preference to straw bales - to reduce the velocity of concentrated flows and reduce erosion on swale or channel constructions. These will be limited to temporary swales or small channels.

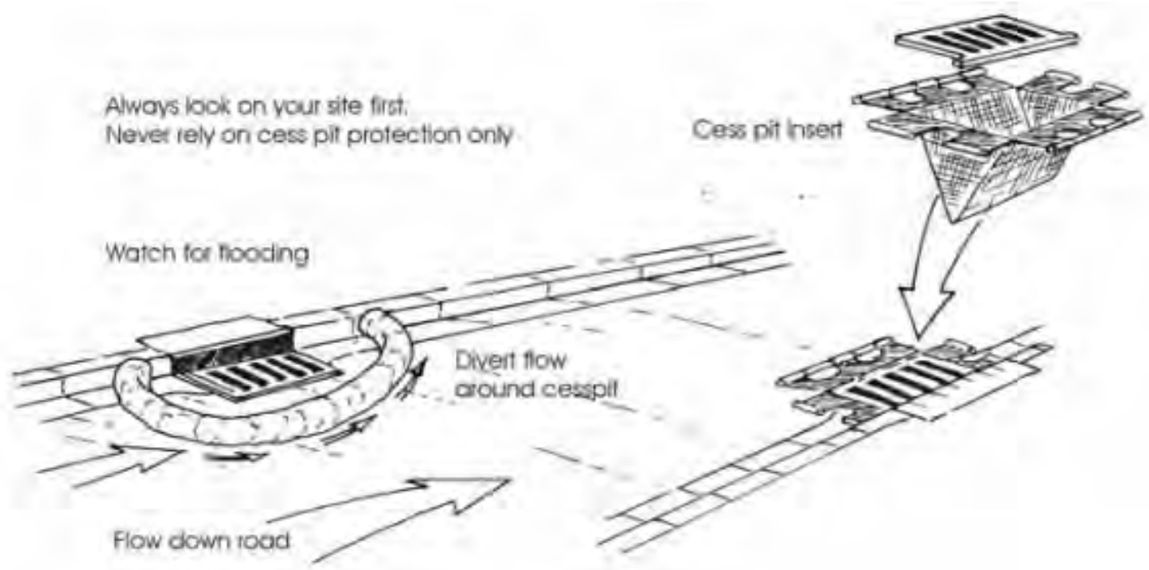




Slope	Spacing (m) Between Dams (450mm centre height)	Spacing (m) Between Dams (600mm centre height)
2% or less	24	30
2% to 4%	12	15
4% to 7%	8	11
7% to 10%	5	6
over 10%	Use Stabilised Channel	Use Stabilised Channel

Check Dam Watercourse Protection

Secondary sediment control and protection measures will be installed at existing highway drainage features on Coronation Road and East Bank Road. These will be designed to intercept and filter run-off before it enters the storm water system.



Existing Drainage Protection

Project Title: Stephenson Street FAS ECI		
Drawing Name: Silt Control Measures 6 of 7, General Projection Measures		
Client: Natural Resources Wales		
Drawn: DT	**Checked:** OC	**Date:** 14/05/2021
Approved: OC	**Scale:** NTS	**DWG Ref:** C1394.SK06

Full details of surface water management to be provided within Construction Environmental Management Plan once detailed design is completed.

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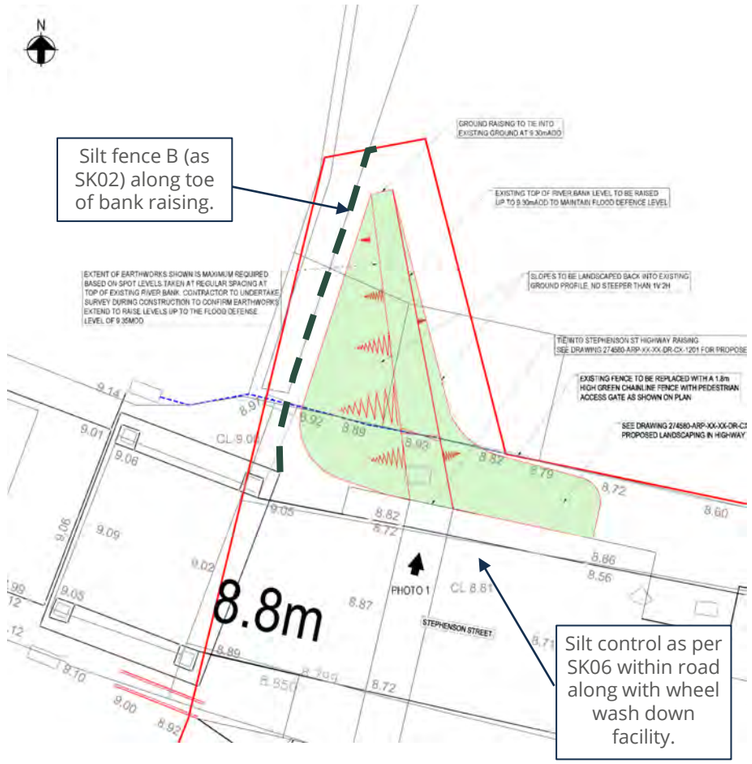
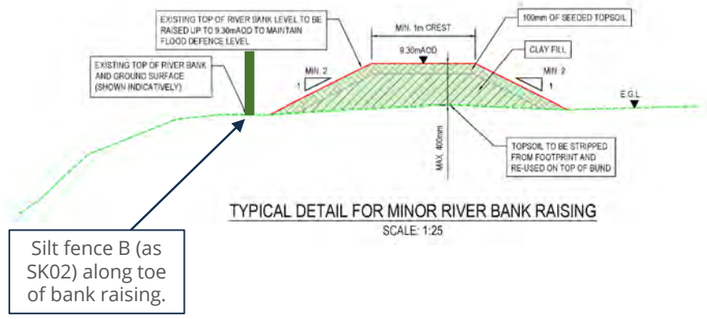
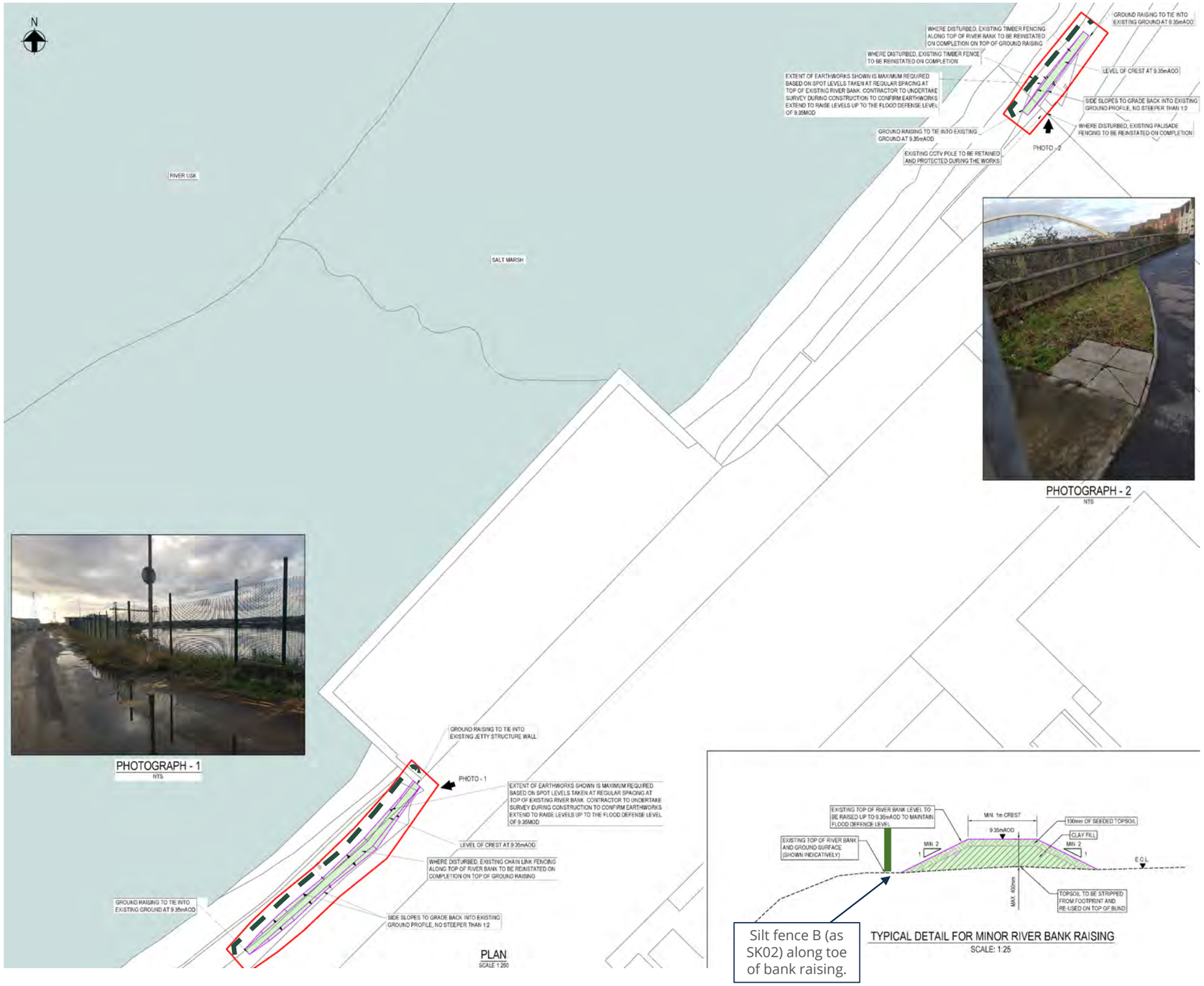




Stephenson Street River Bank Minor Ground Raising



Orb Works River Bank Minor Ground Raising

Project Title: Stephenson Street FAS ECI		
Drawing Name: Silt Control Measures 7 of 7, Ground Raising Works		
Client: Natural Resources Wales		
Drawn: DT	**Checked:** OC	**Date:** 14/05/2021
Approved: OC	**Scale:** NTS	**DWG Ref:** C1394.SK07

Full details of surface water management to be provided within Construction Environmental Management Plan once detailed design is completed.

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