



SKEWEN FLOOD ALLEVATION SCHEME

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1. Introduction

This Green Infrastructure Statement (GIS) has been prepared by AtkinsRéalis on behalf of Neath Port Talbot County Borough Council (NPTCBC) in support of the planning application for the Skewen Flood Alleviation Scheme (FAS).

The Skewen Flood Alleviation Scheme (FAS) aims to deal with the flooding problems which occur at Caenant Terrace, Skewen and to ensure that the community is protected from flooding in the future including safeguarding against the effects of climate change.

1.1 What is Green Infrastructure?

Green infrastructure is the network of natural and semi-natural features, green spaces, rivers, and lakes that intersperse and connect places. Green infrastructure can function at different scales. It might relate to individual trees, green roofs, or roadside verges. It could include parks, ponds, gardens, fields, allotments, or cemeteries. At a larger, landscape scale it can relate to entire ecosystems such as wetlands, waterways, peatlands, and mountain ranges or be connected networks of different habitats.

Green infrastructure can provide several functions at the same time with benefits for social, economic, and cultural reasons as well as environmental resilience. Multifunctional green infrastructure can result in positive benefits to a range of 'ecosystem services' that benefit people, including flood management, water purification, improved air quality, reduced noise pollution climate change mitigation and food production.

1.2 What is a Green Infrastructure Statement?

Chapter 6 of Planning Policy Wales (PPW) Edition 12 (February 2024) sets out the requirement to submit a GIS with all planning applications. There is no specific guidance on how a GIS should be produced and what should be included; however, PPW says that it should:

- *Be proportionate to the scale of the development.*
- *Describe how green infrastructure has been incorporated into the proposal.*
- *demonstrating positive multi-functional outcomes that are appropriate to the site.*
- *show how the step-wise approach has been applied.*
- *highlight any baseline data considered, and surveys and assessments carried out.*

The proposal has been developed in a proportional way, which responds to the relevant national and local policies. Policy BE1 (Design) of Neath Port Talbot Local Development Plan (2011-2026) states “5. *Important local features (including buildings, amenity areas, green spaces, and green infrastructure, biodiversity, and ecological connectivity) are retained and enhanced as far as possible.*” Furthermore, Policy 9 (Resilient Ecological Networks and Green Infrastructure) of Future Wales seeks to ensure the enhancement of biodiversity, the resilience of ecosystems and the provision of green infrastructure, which must be demonstrated as part of development proposals through innovative, nature-based approaches to site planning and the design of the built environment. In addition, the National Plan 2040 (2021) introduced specific policies that safeguard areas for the purposes of improving the resilience of ecological networks and ecosystems services, to identify areas for the provision of green infrastructure, and to secure biodiversity enhancement, i.e. the plan introduced a requirement for development to deliver a net benefit for biodiversity (NBB). Planning Policy Wales (PPW) 12th edition,(Paragraph 6.4.11) advises that planning authorities



must follow a step-wise approach to maintain and enhance biodiversity, build resilient ecological networks and deliver net benefits for biodiversity by ensuring that any adverse environmental effects are firstly avoided, then minimised, mitigated, and as a last resort compensated for.

Pre-application engagement has been undertaken with NPTCBC Officers throughout 2024 to develop a proportionate approach to green infrastructure improvements. The proposed approach to biodiversity, ecology and landscaping at the application site is detailed in full within the planning application documents. Refer to the Planning, Design and Access Statement Ref NE04_001-ATK-EAC-SWMWREC-RP-LP-000001) which contains a full list of the planning application documents.



2. Proposed Development

The upstream section of the proposed works starts in Caenant Terrace. Caenant Terrace is located just off New Road in Skewen, postcode SA10 6UP. Historic flooding has been observed from the open channel section near to the former Skewen Snooker Club, parallel to the South Wales Main Line railway, which is on a raised embankment. The flooding has been attributed to the limited flow capacity of a culvert which runs beneath several of the properties in Caenant Terrace. The culvert has been inspected and has been found to be in a poor condition, which has exacerbated the problem.

To improve the hydraulic capacity of the culverted section of the watercourse, the proposed scheme entails the construction of a new 1050mm diameter culvert along Caenant Terrace. The existing inlet structure is proposed to be replaced by a new structure, designed to incorporate a suitably sized trash screen. The intention is for the existing culvert to be retained to permit existing drainage connections to continue. However, the upper section of the culvert that passes under the houses on the north side of Caenant Terrace will be abandoned.

As a result of the improvements to the Caenant Terrace culvert, as well as addressing historic flooding downstream, a series of other network improvements are proposed. The proposed works downstream will involve installation of a new culvert in the highway, through green spaces and beneath existing railway lines. New inlet structures and trash screens will be required on the new and improved culverts. The new culvert will re-connect to the existing watercourse further downstream before discharging into the Tennant Canal and then into the River Clydach via a new overflow weir. This will allow excess surface water flows to gravitate from the upper reaches of Skewen and to the Tennant Canal, thereby reducing the risk of flooding to properties and the highway to the south east of Caenant Terrace.

The scheme does not involve any areas of permanent land take with works predominantly underground. Temporary access to land will be required for construction vehicles as well as for the site compound and storage areas.

The proposed Skewen Flood Alleviation Scheme involves a series of works aimed at reducing flooding risks in Skewen specifically to properties along the Caenant Terrace. The scheme includes the following key elements:

2.1 Inlet Structure

Drawing 000220 (Inlet Structure General Arrangement), Drawing 000221 (Inlet Structure Sections and Details), Drawing 000810 (Trash Screen Details Sheet 1 of 2), Drawings 000811 (Trash Screen Details Sheet 2 of 2)

1. The existing inlet structure is to be demolished and rebuilt. A new arrangement of galvanised steel screens, mesh platforms and kee klamp handrailing is to be provided.
2. The following details will be included in the construction of the inlet structure; trash screens, pedestrian gates and access gates, brick retaining wall, topsoiling and seeding, kerb raising, grasscrete permeable paving, pipe protection for the existing foul sewer and security fencing.
3. Flow from the structure will connect to a new 1050mm dia culvert, through proposed manhole MH1, towards Caenant Terrace.
4. Demolition and removal of the existing surface water sewer 450mm diameter pipe from underneath the footprint of the new inlet structure, up to MH1A.
5. The existing 225mm diameter foul sewer is to be protected by 1m wide concrete pipe protection for the 15m under the inlet structure footprint.



2.2 Caenant Terrace

Drawing 000200 (Caenant Terrace existing culvert overview), Drawings 000210, 000211, 000212, 000213 (Caenant Terrace plan and long section sheet 1, 2, 3, 4)

Existing:

1. From the proposed MH1A the existing 450mm diameter concrete pipe culvert will be plugged through to the existing MHA and between manhole A, EX-MH A, and proposed manhole MH5, the existing culvert will be sleeved with 300 diameter pipe and grouted in place.
2. The existing culvert between proposed MH5 and proposed MH6 will be removed.
3. Downstream of the proposed MH6 the culvert is to be Plugged with expanding concrete as far as the buried MH X between existing MH C and MH D.
4. The existing 225mm diameter combined sewer overflow (CSO), will be connected to the new culvert of Caenant Terrace through the proposed manhole MH7. Following MH7 to MHB the rest of the pipe will be abandoned by filling with foamed concrete (subject to CCTV).
5. The existing surface water sewer between MH8 and MH9 to be removed during surface water culvert construction.
6. The existing MHF is to be demolished and incorporated into new MH9.
7. The existing sewer downstream of the proposed MH9 will be lined with structural cure in place lining.
8. Between MH13 and MH14 the existing 375mm diameter surface water sewer to be removed.

Proposed:

1. Along Caenant Terrace a 1050mm diameter culvert will be installed from the intake at proposed manhole MH1 to MH14.
2. At the proposed manhole MH2, the existing 225mm surface water sewer will be connected to the proposed 1050mm diameter culvert.
3. The outlet from the inlet structure will connect with the proposed 1050mm diameter culvert at through the proposed manhole MH3.
4. A number of existing gullies are to be connected to proposed manholes. These include:
 - EX-G1 and EX-G2 to be connected to proposed MH4.
 - EX-G3 and EX-G4 to be connected to proposed MH6.
 - EX-G5 and EX-G6 to be connected to proposed MH8.
 - EX-G7 to be connected to proposed MH11.
 - EX-G8 and EX-G9 to be connected to proposed MH12.
 - EX-G10 to be connected to proposed MH14.
5. There are a number of service diversions needed in order to complete construction. These are noted below in section 3.11.

2.3 Caenant Terrace Lane

Drawings 000230 (Caenant Terrace lane culvert general arrangement, 000231 (Caenant Lane culvert sections)

Proposed:

- Construction of proposed manhole MH14 and MH15.
- Construction of proposed 1200mm culvert by tunnelling techniques.
- Demolition and disposal of the existing 950mm x 750mm box culvert.



- Existing 375mm dia combined sewer to remain.
- Existing surface water sewer to remain.

2.4 New Road

Drawing 000300 (New Road existing overflow), Drawing 000301 (New Road overflow plan and long section sheet 1), Drawing 000302 (New Road existing overflow plan and long section sheet 2)

Existing:

1. Following the proposed bifurcation manhole NRO MH1/ MH16, the existing gullies along the culvert are to be replaced with new and discharged into the new 1200 dia. overflow culvert.
2. Existing manhole SWMH01 is to be demolished.
3. Following SWMH01 the existing 100mm diameter surface water sewer is to be abandoned and removed.

Proposed:

1. Following the exit from Caenant Terrace there is a proposed bifurcation manhole NRO MH1/MH16.
2. Construction of a proposed 1200mm diameter overflow pipe following proposed NRO MH1 to NRO MH5 (MH16-MH20).

2.5 Drummau Road

Drawings 000401 (Drummau Road existing overview), 000410 (White Gates General Arrangement), 000420 (White Gates Inlet Structure General Arrangement), 000430 (Drummau Road In Situ Concrete Channel General Arrangement), 000431 (Drummau Road General Arrangement Sheet 2 of 2), 000440 (Drummau Road Inlet Structure Sections and Details).

Proposed:

1. At the north of Drummau Road, there will be construction of a new concrete flow monitoring chamber for the Mining Remediation Authority (Coal Authority). This is in partnership with NPTCBC.
2. Construct a new below ground culvert underneath the existing bridge abutments to pick up overland and watercourse flows at Drummau Road. This will discharge flows into a new block stone open channel to connect to the existing line of watercourse. The existing culvert crossing beneath the network rail track will remain as Network Rail's asset.
3. Construct metal trash screen structure above ground on the watercourse located upstream of the access to the care home on Drummau Road.
4. Replace the existing buried concrete culverts at the access point to the care home on Drummau Road with new buried concrete culverts.
5. Replace the existing below ground concrete U Channels with new concrete U channels.
6. Replace the existing buried surface water culverts with a precast 1200mm dia concrete box culvert where Drummau Road meets New Road.

Existing:

1. The existing 600mm diameter mine water transfer pipe to be abandoned.
2. Existing block stone channel to remain and existing block stone to be reused in proposed open channel at tie in position.



2.6 Whitegates

Drawings 000400 (Whitegates Existing Overview)

1. Following the open channel, the existing inlet structure with trash screen will be removed and replaced.
2. Existing manhole SW-MH03 to be demolished and replaced with new manhole MH21.
3. Construction of proposed MH22.
4. Following proposed MH22 construct twin 1200mm dia. pipes to proposed MH23.
5. Replace existing 1200mm dia. corrugated steel/ ductile iron pipe culvert with a proposed 1800 dia. Culvert, flowing through proposed 1800 dia. culvert to the existing open watercourse.
6. Existing SW-MH04 to be demolished and replaced with new manhole MH23.
7. Existing 1600 x 1600 masonry arch to be demolished and replaced with new 1800 dia pipe. (existing headwall to be modified to suit).
8. Scour protection to be existing watercourse bed.

2.7 Old Road

Drawings 000500 (Old Road Inlet Structure General Arrangement), 000501 (Old Road Inlet Structure Sections and Details), Drawing 000502 (Old Road Inlet Structure Sections and Details)

1. Existing ground levels to be locally regraded to direct overland flows into the proposed sump, which will discharge flows into the proposed inlet structure. A speed hump will be constructed to ensure flows stop continuing along road.
2. Demolition of existing inlet structure, retaining walls and metal trash screen.
3. Existing 900mm dia culvert to be removed.
4. Construction of new reinforced concrete inlet structure, walls, and metal trash screen at the same location as existing.
5. Proposed inlet structure retaining wall is to be extended to widen the approach channel.
6. Existing 1800 x 100 concrete culvert at the outfall is to be retained.

2.8 Mineral Line Railway Crossing

Drawings 000600 (Railway Crossing Existing Overview), Drawings 000601 (Railway Crossing Existing Overview), Drawings 000602 (Railway Crossing Sections and Details). [1]

1. Construction of a 1200mm diameter concrete buried culvert and connecting it to the existing culvert north of the freight railway line.
2. Construction of a new buried concrete culvert offline of the existing structure and laid under the freight railway line by, micro tunnel / thrust bore / open cut techniques. A new buried concrete manhole will be built on the existing culvert to connect to the new culvert to act as an overflow to the canal.
7. Construction of a new surface water culvert at the railway, including:
8. Demolish and rebuild existing MH24, to accommodate additional outfall.
9. Construct 1200m dia. culvert from MH24 to MH27.
10. Construct MH25.
11. Construct sheet pile cofferdams for the tunnelling surrounding MH26 and MH27.
12. Thrust bore 1200mm dia. concrete culvert from MH26 to MH27, below the railway line.
13. Construct twin 900mm dia culverts from MH27 to outfall.



14. Construct proposed reinforced concrete outfall structure including new headwall to discharge into the Tennant Canal.
15. These works will also include reprofiling the existing channel and embankment near the canal.

2.9 Tenant Canal Overflow Weir

Drawings 000700 (Canal Overview General Arrangement).

1. Construction of a new proposed overflow weir structure to draw water off the Tennant Canal and discharge into the River Clydach. Works for this include the following:
 - a. Installation of proposed steel way and concrete u channel.
 - b. Breaking out and replacing an existing concrete slab/ wall.
 - c. Installation of proposed block stone retaining wall.
 - d. Installation of proposed turf reinforcement mat, rock roll and rip rap.
 - e. Installation of proposed guardrails.

Landscaping and Reinstatement

Reinstatement of disturbed areas along the construction route, particularly where the culverts cross highways. Any trees removed on the project will be replaced in a 3:1 replanting ratio in line with NPTCBC policy with the mitigation planting planned off the line of the new culvert.

2.10 Development site context

The site covers approximately 1.3km of the residential area of Skewen, which begins at Caenant Terrace to the west at the grid reference SS72689752 and culminates to the east to the east of Neath Abbey, at the confluence of the Tennant Canal and River Clydach. The site is approximately 8.4km northeast of Swansea and 2.6km West of Neath in South Wales. The site is located entirely within the administrative boundary of Neath Port Talbot County Borough Council (NPTCBC).

Skewen is located west of the River Neath, which flows in a north-east to south-west direction within the Neath Valley, bound by steep slopes within the upper sections of the valley, with the north and south slopes exceeding 100m Above Ordnance Datum (AOD). The general topography of Skewen is such that it slopes down from west to east, with an average elevation of 38m (AOD) towards the west end at the screen in Caenant Terrace and down to 5m AOD towards the eastern side at the Tennant Canal [2].

The site is located within a densely populated housing area and the existing culverts and watercourses gravitate in a west to east direction. These watercourses eventually discharge into both the Tennant Canal during nominal flow and the River Clydach, during peak flows. There is an existing overflow weir on the Tennant Canal that overflows into the River Clydach which is a tributary of the River Neath.

Directly north of the site is the Network Rail passenger railway line, which crosses Drummau Road and backs onto the residential properties along the north of Caenant Terrace. A mineral railway line is also present to the North of Monastery Road.

It is a highly populated as a housing area. In and around the site there are a mixture of land uses including residential properties, Cwrt-Clwydi-Gwyn Care Home and commercial properties such as motor repair establishments across the scheme.



The site incorporates transport infrastructure including the A4230 New Road and the B4290 Old Road.

The residential area of Skewen, particularly Caenant Terrace and Old Road have been subject to historic flooding. The proposals include a flood alleviation scheme to mitigate flooding to Caenant Terrace and Old Road and the wider Skewen area.

Fluvial and surface water in the urban area of Skewen is routed via a number of drainage channels comprising of culverts, watercourses and/or open channels. The capacity of the culverts and channels are insufficient to accommodate surface water flows to the necessary standards leaving properties at risk of frequent flooding. The fluvial and surface water currently discharges into both the Tennant Canal and the River Clydach.

The proposed works are designed to provide additional capacity in the drainage system to alleviate fluvial and surface water flooding of properties throughout Skewen, but particularly at Caenant Terrace and along Drummau Road, Whitegates Court and Old Road. The implementation of an improved culvert system would reduce the frequency and severity of flooding in the area. Currently the threshold of flooding is below a 1 in 2-year flood (50% AEP). The proposed scheme is designed to ensure that there is no internal flooding to any properties in a 1 in 100year (1% AEP) flood event. The scheme would ensure no detriment to any third parties during any design events up to the 1 in 1000 (0.1% AEP). This reduction in local flood risk will remove the associated stress, worry and wider human health impacts and economic impacts associated with the current flooding issues.

Recent hydrological analysis and modelling suggests that the areas will flood more frequently if no works are implemented as a result of the impacts of climate change.

2.11 Environmental Context and Impact

Following a desk-based review the following potential sensitivities of the site and its surroundings have been identified [2]:

- The scheme is not located within an Area of Outstanding Natural Beauty (AONB).
- The scheme is approximately 375m from the River Neath at its nearest point, is directly adjacent to the River Clydach and required works in the Tennant Canal. All of these watercourses are designated as Sites of Interest for Nature Conservation (SINC);
- The proposed development site includes parts of Pentrefynnon and Gwlyptir Mynachlog Nedd which are designated as SINC adjacent to the Tennant Canal;
- The following 6 wildlife/ SINC sites within 1km of the site: Neath Estuary, Dyffryn Woods, Roman Way Reedbed, Neath Canal, Coed Bach a'r cwm and Square Pond;
- Under Policy BE 3 in the adopted local development plan the Tennant Canal is safeguarded from proposals which would prejudice its conservation, restoration and operation. The policy protects the setting of the canals and promotes the use of the canals for recreation, including encouraging walking and cycling, and for water supply; and
- Public right of way (PRoW) No. 12 9/1 (underpass) runs east of Caenant Terrace, PRoW No. 12 21/1 runs between St.Johns Terrace and Old Road, PROW 12/18/1 runs along Jenkins Road, PROW No. 44 25/4 runs along an unnamed road north of, and over, the Tennant Canal and PROW No. 44 25/1 is adjacent to the works proposed adjacent to the River Clydach.
- During construction there is the potential for some temporary adverse effects due to noise emissions, dust generation, disruption to vehicular and non-vehicular access and water pollution and soil pollution. However, subject to the contractor implementing mitigation measures regarded as good practice, such effects are unlikely to be significant.



2.12 Ecology

A Preliminary Ecological Appraisals (PEA) and Ecological Impact Assessment (EclA) have been carried out for the site. The findings from the TACP report are summarised below [3]:

- There is no internationally and nationally designated ecological sites within 1km of the proposed works area.
- Within 1km of the site, records of bat species were identified. However, the Phase 1 Habitat Survey noted, there were no visible potential roost features for bats present. The age of the trees and low density of climbing ivy stems limits the potential roosting bats. There is potential for bats to roost in some of the buildings within the industrial estate or have day roosts within the bridges over the canal. There is potential for the canal and the River Clydach to be important foraging and commuting habitat for a number of species.
- The desk survey confirmed that there were records of badgers within 1km of the site. However, there is no evidence on site that supports that there is badger activity. Therefore, the site is considered to have negligible ecological importance for badgers. There are a few foraging or resting sites within the residential areas precluding movement across the site. As such the site is considered to have negligible ecological importance for hedgehog. It should be noted however, whilst they are not anticipated, that excavations should not be left open overnight as these could result in trapped or injured animals.
- The isolated trees within the site and the large trees lining the southern side of the canal have potential to support nesting birds during the nesting season (late February to early September, inclusive weather dependent).
- The canal and river Clydach have potential to support European otters. The site is considered to have local ecological importance to otters along the canal and River Clydach.

Also, refer to the Skewen Arboricultural Impact Assessment (AIA) report by Grounded Trees and Ecology.



2.13 Baseline data, surveys, and assessments

The following surveys and assessment have informed this Green Infrastructure Statement:

1. An Ecology Impact Assessment (EcIA) and survey was carried out by TACP in January 2023. The findings are reported in an EcIA report (TACP: 60940C) which has been carried out to support the statutory PAC for the planning application for the Skewen FAS.
2. An EIA Screening opinion (DN P2023/0224) was sought in March 2023 which concludes that this is Not an EIA Development and there was no requirement to carry out an Environmental Impact Assessment (EIA) or supporting Environmental Statement.
3. The findings of the Flood Consequence Assessment (FCA), ref NE04_001-ATK-GEN-SWMWREC-RP-LW-000001, noting there are no detrimental impacts from flooding as a result of the scheme proposals.
4. The Water Framework Assessment (NE04_001-ATK-GEN-SWMWREC-RP-LE-000001) which advises there are no permanent impacts on any WFD quality elements at a waterbody scale and the scheme will not result in deterioration to any WFD quality elements. There may be some localised temporary impacts during construction, however these will be managed to an acceptable level in line with best practice working including compliance with Pollution Prevention Guidelines (PPG).
5. Also, refer to the Skewen Arboricultural Impact Assessment (AIA) report by Grounded Trees and Ecology.

An assessment of potential impacts on the ecosystems services resulting from the project's ecological effects was carried out with the EcIA report and it was reported that the site provides:

- **Supporting services** – soil formation, photosynthesis, primary production, nutrient cycling, and water cycling.
- **Regulating services** – air quality regulation, climate regulation, water regulation, erosion regulation, water purification, disease regulation, pest regulation, pollination, and natural hazard regulation.
- **Cultural services** – the site is open to formal public use and as such provides non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences thereby taking account of landscape values.
- **Provisioning services** – products obtained from ecosystems, including food, fibre, fuel, genetic resources, biochemical, natural medicines, pharmaceuticals, and fresh water.

For the operational phase, the project is anticipated to have a continued impact in terms of supporting services resulting from the overall impacts of flood alleviation. The magnitude of this impact would be slight positive at the Site level only and is therefore of a negligible magnitude and neutral significance.

No operation impacts are anticipated in relation to the cultural services and there is potential, depending on the design proposals for some benefits to these services. These are likely to be slight positive at the Site level only and of neutral significance.



3. Applying the step-wise approach

PPW 12, 6.4.15 sets out a 'step wise approach' and the **DECCA Framework** (Diversity, Extent, Condition, Connectivity, Adaptation) that is to be applied through the planning system:

- Diversity between and within ecosystems;
- The extent or scale of ecosystems;
- The condition of ecosystems including their structure and functioning;
- The connections between and within ecosystems; and
- Adaptability of ecosystems includes their ability to adapt to, resist and recover from a range of pressures likely to be placed on them through climate change for example.

Diversity, extent, condition, and connectivity are four attributes of ecosystems that can be used as proxies for resilience. Adaptability, recovery, and resistance are emergent properties of these four attributes. Together these contribute to overall ecosystem resilience.

3.1 Incorporating Green Infrastructure into the design

The table below shows how design decisions in the design area are assessed using the step-wise approach. Where it is possible to enhance biodiversity this has also been indicated.

Table 3-1 - Summary of key decisions during the development of the design as part of the step-wise approach

Decision	Step: Avoid/ Minimise / Mitigate/Restore / Compensation on site / compensation off site	Comment
Preferred route for the culvert	Avoid	Avoids ecologically valuable sites and ecosystems. There are no statutory designated sites or SINC's within the site area and none of those identified by the desk study would be affected by the current construction proposals. Avoids culverting of existing watercourses wherever possible to retain aquatic biodiversity.
Preferred route for the culvert	Minimise	Works are minimised in semi-natural areas with woodland. Instead, selection of culvert routing through areas of semi-cultivated/amenity grassland or hard surfaced areas (roads).
Surfacing for maintenance	Mitigate	Permeable surfaces are used complying with SuDS principles to reduce risks of creating additional impermeable areas which increase the risk of rainfall



		run-off
Tree removal	Mitigate + Enhance + Compensate on site	Where tree removal is unavoidable, replacement planting is considered in the ratio of 3:1 (to align with NPTCBC tree replacement policy) onsite, or immediately adjacent to the site. Areas have been identified and correlate to the area references in the Skewen Arboricultural Impact Assessment (AIA) report by Grounded Trees and Ecology. The following areas have been identified where tree removal is required:
	Minimise	- Area A - 3 sycamore trees (AT1C, AT2C and AT3) at the inlet structure at Caenant Terrace require removal = 3 in total in area D. - Area D - 1 sycamore (DT1) at Drummau Road, south of the railway viaduct and 6 Sycamore (DG1) at the open channel require removal = 7 in total in area D. - Area E - 1 ash tree (ET1) at inlet structure north of Old Road requires removal = 1 in total in area E. - Area G - 4 alder trees (GT4, 5, 6 and 7) at the canal towpath require removal = 4 in total in area G. The felling of 15 trees would require the planting of 45 trees to comply with the policy of planting 3 trees for every 1 lost. Therefore, areas have been identified which is suitable for tree planting and that are in the control of NPTCBC.
	Mitigate + Enhance	The viable land available for compensatory tree planting set out below: - Area F - Site near overflow to Tennant Canal can potential accommodate a very small number of trees due to size and topography of the site. This area is also covered with Japanese Knotweed which can be removed/treated and new tree planting undertaken. - Area D- Grassland north of railway viaduct off Drummau Rd which is part of the adopted highway, therefore offers some

		limited potential to accommodate tree planting. 3. A nearby public parks within NPTCBC ownership to take the majority of the compensatory planting. A reuse of any felled trees could be as a woody habitat by chopping and placing the wood in the Drummau scrubland for the blue ground beetles. Ground level tree assessments and bat surveys have been undertaken to assess likely impact and to place mitigation and enhancement measures in place. Enhancements could include installation of bat boxes and bird boxes on new and retained trees suitable for the appropriate species.
Above ground works	Minimise	Reduce the visual impact of any structures, by reducing the scale and screening with earthworks.
	Minimise	Selecting materials which blend in with the existing landscape and minimise hard construction wherever possible. For example, cladding concrete with masonry.
	Enhance	Undertake Wildflower planting in green areas such as Drummau Road or the site compound area off Burrows Road near the Skewen Park and BMX Track.
Designated sites	Mitigation / Minimise	No designated sites will be directly affected by the proposals and indirect impacts both through construction and operation would be managed through construction best practice and appropriate scheme design. Impacts in relation to mobile species associated with these sites would be mitigated through the best practice measures.
Construction Compounds	Mitigation	Careful placement of compounds, storage areas, with use of noise barrier fencing to reduce noise impacts within retained habitats.
Compound areas	Minimise /Mitigation	It is proposed that any required laydown areas (for storage, culvert construction, or for welfare units) will be confined to previously cleared areas/hard standing. For example, the car park adjacent to the culvert inlet at Caenant Terrace or areas within the site where there are few ecological constraints apparent.

Construction lighting	Minimise	Lights will not be aimed directly into the watercourse, nor will they be lit at nighttime. Night time working (more than 30 minutes either side of sunset / sunrise) will be avoided. This will minimise the impact to bats and other species. A bat survey has confirmed no bat roosts were identified.
Landscape design	Minimise	Hard landscaping features include reprofiling the existing channel near the Tennant Canal and River Clydach to tie in with natural surroundings.
Ecosystem Services	Avoid	The scheme will not impact on: ▪ Supporting services – soil formation, photosynthesis, primary production, nutrient cycling, and water cycling. ▪ Regulating services – air quality regulation, climate regulation, water regulation, erosion regulation, water purification, disease regulation, pest regulation, pollination, and natural hazard regulation. ▪ Cultural services – the site is open to formal public use and as such provides non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences thereby taking account of landscape values. ▪ Provisioning services – products obtained from ecosystems, including food, fibre, fuel, genetic resources, biochemical, natural medicines, pharmaceuticals, and fresh water.
Timing of the works	Avoid	Disturbance to birds to be minimised by reducing the duration and clearance of any scrubland and timed to avoid nesting/breeding season.
Removal of INNS	Avoid	The proposed works are likely to be within the vicinity of the extensive Japanese Knotweed along the Tennant Canal and River Clydach, as well as along Drummau and Old Road. An Invasive Non-Native Species Management Plan would be produced to cover the clearance works in areas where Knotweed and Himalayan Honeysuckle are noted, construction and post construction periods. This management plan would include appropriate methodologies for vegetation clearance, soil excavation and disposal, and ongoing management during and post construction. The INNS would then be replaced with a native wildflower mix to support biodiversity and to reduce invasive species impact.

Open channel upstream of Caenant Terrace Inlet	Enhance	Open channel upstream of Caenant Terrace inlet structure to be cleared of debris to enhance the watercourse and to improve water quality and biodiversity.
Open channel Whitegates	Enhance	Open channel upstream of Whitegates inlet structure to be cleared of debris to enhance the watercourse and to improve water quality and biodiversity.
Open channel Drummau Road	Enhance	Open channel downstream of Drummau Road railway culvert to be cleared of debris to enhance the watercourse and to improve water quality and biodiversity.
Open channel New Road	Enhance	Open channel upstream of New Road inlet structure and trash screen to be cleared of debris to enhance the watercourse and to improve water quality and biodiversity.
Grassland area above Network Rail Viaduct	Enhance	Identified as suitable for habitat enhancement. Recommend reintroducing heather to restore native grassland and support local biodiversity.
Drummau Road Wasteland	Enhance	Wasteland south of the Network Rail Viaduct Identified as an area of low ecological value with potential for enhancement. Sightings of the rare Blue Ground Beetle around Drummau with potential to attract more to the area through measures. It is the UK's largest and rarest beetle so this could be an attraction for nature enthusiasts. Suggested replanting of oak and beech trees into scrub habitat to improve ecological habitat as the beetles favour woodland with deadwood on the forest floor. Introduce bilingual information boards for the community to learn more about the wildlife in the area such as the rare Blue Ground Beetle as Skewen in one of 2 sites in the UK where it is thriving. Grassland North of the Network Rail Viaduct: Area identified as suitable for habitat enhancement. Recommend reintroducing heather to restore native grassland and support local biodiversity. Add a rubbing post nature trail around the scrubland to engage local children in the wildlife and increase the social value of the scheme.
Surface water storage sump area near Old Road	Minimise	Location selected on perimeter of existing unused hard standing site to avoid impacts on areas of scrubland. The proposed construction using a sump buried below ground that blends with the surrounding environment. Some temporary disturbance would occur during construction.
	Mitigate	Reuse of excavated materials from other parts of the



		site to avoid importation or disposal quantities for soils. To minimise disturbance the CEMP will limit the hours of working to daylight hours.
	Enhance	Encourage wildflower establishment. Enhancements here could include bat boxes on retained trees and bird boxes suitable for both enhancement and to limit the use of bat boxes by these species.
Overflow works from Tennant Canal to River Clydach	Enhancement	Vegetated soft engineering bank protection measures will be used on river bank to blend in with existing banks and use of rock and coir rolls at the base of the embankment to provide erosion protection.
Whitegates	Mitigation / Minimise	Himalayan Honeysuckle presence confirmed on this section of the site. This will require appropriate treatment and management during construction to prevent further spread.
Installation of fence lines and hedgehog highways	Enhancements	Where fence lines are used to protect certain areas of the works, gaps will be provided at ground level to provide Hedgehog highways.
Designated sites	Mitigation / Minimise	No designated sites will be directly affected by the proposals and indirect impacts both through construction and operation would be managed through construction best practice and appropriate scheme design. Impacts in relation to mobile species associated with these sites would be mitigated through the best practice measures detailed in the section below.

3.2 Management and Monitoring

The enhanced habitats will be subject to annual monitoring for a minimum of 12 months from the start of operation to assess the extent to which plant populations are establishing in the green space and the effectiveness of bat and bird boxes.

3.3 Delivery and Responsibility

The detailed measures will be subject to a planning condition requiring implementation of all approved landscaping, community adaptations and biodiversity gain. The works will be delivered in a single phase of work, with a contractual period of maintenance of 12 months following completion of the works.



4. Conclusion

The scale and nature of the project provides its principal benefits to the community of Skewen by reducing the risk of flooding and safeguarding communities from the effects of climate change.

The project offers small scale opportunities to enhance green infrastructure on a proportionate basis. Net biodiversity benefit will be achieved through the proposal. This includes a holistic approach to maximising on-site green infrastructure through the careful coordination of drainage works, landscape, and ecology considerations.

Green infrastructure will be delivered on land owned and controlled by the Applicant (NPTCBC).

The works will have temporary impacts on habitats in the short term due to disturbance. These have been avoided, minimised, and mitigated as far as possible. The Applicant will conduct the long-term management and maintenance of all green infrastructure.



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