Shadow Habitats Regulation Assessment

Former Warminster Police Station

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1 Introduction

1.1 Crossman Planning Consultancy (CPC) has been appointed by the Gainsborough Group to undertake a shadow habitats regulation assessment (sHRA) in respect of proposals for residential development at the former Warminster Police Station, Station Road, Wiltshire, Warminster, BA12 9BR. This sHRA has been produced in compliance with the Conservation of Habitats and Species Regulations 2017 (as amended); hereafter referred to as the 'Habitats Regulations'.

1.2 This document has been prepared to assist the assessment of the potential for effects from nutrient changes caused by the proposed development on the Somerset Levels and Moors Ramsar Site as required by Regulation 63 of the Habitats Regulations.

1.3 The Somerset Levels and Moors Ramsar Site is vulnerable to nutrient loading and is protected by the Habitats Regulations and any proposals that could affect it requires an habitats regulation assessment (HRA).

1.4 This document is to be submitted to Natural England (NE) as the statutory advisor for designated nature conservation sites in England to formally request their views on the assessment under Regulation 76 of the Habitats Regulations, and specifically whether they can concur with the conclusions.

2 The HRA Process

2.1 Regulation 63 of the Habitats Regulations requires a competent authority to make an 'Appropriate Assessment' of the implications of the plan or project for that site in view of its conservation objectives, before deciding to undertake or give consent for a plan or project which (a) is likely to have a significant effect on a European Site (either alone or in-combination with other plans or project), and (b) is not directly connected with or necessary to the management of that site. In light of the conclusions of the assessment, the competent authority may proceed with or consent to the plan or project only after having ascertained that it will not adversely affect the integrity of the European Site.

2.2 All plans and projects should identify any possible effects early in the process and then either alter the plan or project to avoid them or introduce mitigation measures to the point where no adverse effects remain. The 'competent authority' shall agree to the plan or project only after

having ascertained that it will not adversely affect the integrity of the site concerned, and if appropriate, having obtained the opinion of the general public.

2.3 The assessment of a project under the Habitats Regulations can be split into four stages as shown in **Table 1** below.

Stage	Description
Screening (Stage 1)	Assessment of the likelihood of a plan or project, alone or in-combination, having a significant effect on a European Site or its features. If a significant effect is likely, an Appropriate Assessment is required as set out in Regulation 63(1).
Appropriate Assessment (Stage 2)	A detailed consideration of the potential effects of the plan or project in relation to the Conservation Objectives for the European Site(s) to determine if there is likely to be an adverse effect on the integrity of the site (i.e. an effect that would compromise the site meeting its Conservation Objectives). If it can be demonstrated that with appropriate mitigation measures the plan or project would not give rise to an adverse effect on the integrity of a European Site, the plan or project can proceed.
Assessment of Alternative Solutions (Stage 3)	Where it cannot be demonstrated that there is no adverse effect, or there is uncertainty, the assessment would then need to consider if there were any other alternatives to the plan or project that would not give rise to adverse effects on the integrity of the European Site.
Assessment where no alternative solutions exist and where adverse impacts remain (Stage 4)	If adverse effects are still likely then the competent authority would then consider if there are any Imperative Reasons of Overriding Public Interest (IROPI), only at this stage can Compensatory Measures be considered. It is very unusual for plans or projects to be considered in Stages 3 or 4.

Table 1: *Stages of the HRA process.*

3 Guidance and Policy

3.1 The following guidance and policy must be followed when assessing the potential effects of the plan or project:

- The Habitats Regulations Assessment Handbook, DTA Publications Ltd[1]; which includes analysis of relevant recent caselaw, and
- Gov.uk website[2].

3.2 Professional advice should be sought when required in order to ensure a thorough and scientific assessment of the plan or project and its potential effects on a European Site.

3.3 In addition to the guidance noted above, a number of websites can be used to gather information on the European Sites in order to inform the assessment, in particular, the Management Plans for European Sites and Regulation 37 information. This is not an exhaustive list, however commonly used websites used include:

- Natural England (NE) website[3];
- MAGIC (Multi-Agency Geographic Information for the Countryside) website[4]; and
- Joint Nature Conservation Committee (JNCC) website[5].

4 Relevant Case Law

4.1 With regards to recent case law (Coillte vs People Over Wind[6]) the inclusion of plainly established and uncontroversial mitigation during Stage 1 is no longer considered appropriate. Mitigation, as considered by the Centre Européen de Coopération Juridique (CECJ) in regard to the case law, is interpreted to mean measures that are intended to avoid or reduce the harmful effects of the envisaged plan or project on the site concerned.

4.2 Consequently, any plan or project which identifies an impact on a European Site and where avoidance and mitigation is applicable will need to address these measures during Stage 2 Appropriate Assessment.

[1] Tyldesley, D. and Chapman, C. (2013) The Habitats Regulations Assessment Handbook. Nov 2019 edition. UK, DTA Publications Ltd https://www.dtapublications.co.uk/

[2] https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site

[3] Natural England Access to Evidence http:/publications.naturalengland.org.uk/

[4] MAGIC. Magic interactive Mapping Application. http:/www.magic.gov.uk/MagicMap.aspx

[5] JNCC Website https://jncc.gov.uk/

[6] People over Wind, Case C323/17 European Court of Justice, 12th April 2018.

5 Details of the Project

Project Details

5.1 The site is located within an urban area to the north of Warminster (OS grid reference 87648 45167) It comprises an area of hardstanding with some buildings and small, former amenity grassland areas. To the north of the site is Station Road which runs around the eastern boundary. To the west there is a carpark and to the south there is a building, separated from the site by a wall.

Environmental Baseline

5.2 The site has been assessed as providing low suitability to support protected species with no evidence of protected species having been identified following ecological surveys. In respect of flora and fauna identified, three small trees are located around the site's south-western boundary and which could provide habitat for passerine bird species, although no evidence of their presence was identified during surveys. Furthermore, there are two existing structures on the site (former social club and garage rank). These buildings could provide habitat for nesting birds, such as house martin and swallow, although no evidence of these species was found during surveys.

5.3 Details of the environmental baseline can be found in the preliminary ecological assessment at **Appendix 1**. Details of phosphorous baseline can be found in the nutrient neutrality assessment at **Appendix 2**.

6 Project Description

6.1 Full planning permission is sought for the following:

'Erection of 21 flats with landscaping and associated works'

6.2 The development is provided in four separate blocks of accommodation with a maximum height of 3.5 storeys. The buildings are positioned in a courtyard arrangement, with the latter providing car parking and amenity space.

6.3 Details of the proposed development can be found at **Appendix 3**.

7 Construction Methodology and Programme

7.1 Given that the proposed development comprises traditional housing it is expected that standard construction methods will be utilised.

7.2 Development is anticipated to commence in late 2025.

8 European Sites

8.1 European Sites that are located close to the project and which could be linked by pathways such as hydrological or visitor catchments must be identified. This exercise has been done below.

River Avon Special Area of Conservation (SAC)

Category	Details
Name of European Site and EU Code	River Avon Special Area of Conservation (SAC)
European Site Size	Approx. 475.9 hectares
Description of European Site	The River Avon SAC encompasses stretches of the River Avon and its tributaries in Hampshire and Wiltshire. The catchment area spans about 1,750 square kilometres, with 205 kilometres of the river designated as Sites of Special Scientific Interest (SSSI). It is predominantly a chalk stream, supporting a high biodiversity of aquatic plants and fish species. The site also supports a range of wetland habitats, providing rich fauna, including birds, mammals, and aquatic invertebrates.
Qualifying Features of the European Site	- **Habitats:** River habitat characterised by water crowfoot and starwort. - **Species:** - *Atlantic salmon (Salmo salar)* - *Bullhead (Cottus gobio)* - *Brook lamprey (Lampetra planeri)* - *Sea lamprey (Petromyzon marinus)* - *Desmoulin's whorl snail (Vertigo moulinsiana)*

Site-Specific Conservation Objectives	- Ensure the integrity of the site is maintained or restored. - Maintain or restore the extent and distribution of qualifying habitats and species.- Preserve the structure and function of these habitats and populations.- Protect the supporting processes on which the habitats and species rely.- Prevent deterioration and disturbance to the qualifying species.
Vulnerability of the European Site	- Sensitive to increased nutrient loading, particularly phosphorus and nitrogen.- Nutrient loading can cause eutrophication, leading to algal blooms, reduced oxygen levels, and harm to aquatic ecosystems.- Main sources of nutrient pollution include agricultural runoff, sewage discharges, and industrial pollution.- To protect the SAC's integrity, developments must achieve nutrient neutrality by offsetting any increased nutrient load.
Identified Ways in Which Qualifying Features Could Be Affected	- **Water Quality Degradation:** Increased nutrients cause eutrophication, impacting aquatic habitats and species.- **Hydrological Changes:** Alterations to water flow due to abstraction, land drainage, or development can impact the river's physical structure and habitats.- **Habitat Loss/Degradation:** Development within the catchment can lead to habitat loss or degradation.- **Disturbance to Species:** Increased human activity (e.g., recreation, development) may disturb breeding and feeding behaviour.

Salisbury Plain Special Protection Area (SPA)

Category	Details
Name of European Site and EU Code	Salisbury Plain Special Protection Area (SPA) (UK9011102)
European Site Size	Approximately 20,000 hectares
Description of European Site	Salisbury Plain is a vast chalk plateau in central southern England, renowned for its rich archaeology, including Stonehenge. It is the largest remaining area of calcareous grassland in north-west Europe, supporting a diverse range of habitats such as unimproved chalk downland, scrub, woodland, and wetlands. The area is of national and international importance for breeding and wintering birds, notably the stone-curlew and quail. Additionally, it hosts nationally rare and scarce plants and invertebrates. (en.wikipedia.org)
Qualifying Features of the European Site	- **Species:** - *Stone-curlew (Burhinus oedicnemus) - Quail (Coturnix coturnix) - Hen harrier (Circus cyaneus) - Merlin (Falco columbarius) - Short-eared owl (Asio flammeus) - Barn owl (Tyto alba) - Long-eared owl (Asio otus) - Nightingale (Luscinia megarhynchos) - Whinchat (Saxicola rubetra) - Wheatear (Oenanthe oenanthe) - Corn bunting (Emberiza calandra) - Montagu's harrier (Circus pygargus) - Hobby (Falco subbuteo) - Great bustard (Otis*

	tarda) - Chalkhill blue butterfly (Polyommatus coridon) - Adonis blue butterfly (Polyommatus bellargus) - Duke of Burgundy butterfly (Hamearis lucina) - Grizzled skipper butterfly (Pyrgus malvae) - Dark green fritillary butterfly (Speyeria aglaja) - Small blue butterfly (Cupido minimus) - Great crested newt (Triturus cristatus) - Smooth newt (Lissotriton vulgaris) - Common frog (Rana temporaria) - Common toad (Bufo bufo) - Barred grass snake (Natrix helvetica) - Common lizard (Zootoca vivipara) - Slowworm (Anguis fragilis) - Adder (Vipera berus)
Site-Specific Conservation Objectives	- Maintain or restore the integrity of the SPA by ensuring that the populations of qualifying species are maintained at or above their current levels. (publications.naturalengland.org.uk)- Ensure that the distribution and quality of habitats supporting these species are preserved.
Vulnerability of the European Site	- **Disturbance:** Human activities, especially during the breeding season, can disrupt nesting birds. (wiltshire.gov.uk)- **Habitat Loss:** Development and land-use changes may lead to the loss of critical habitats.- **Predation:** Increased predation by introduced species can threaten ground-nesting birds.- **Climate Change:** Alterations in temperature and precipitation patterns can affect food availability and breeding success.

Identified Ways in Which Qualifying Features Could Be Affected	- **Recreational Disturbance:** Increased public access can lead to disturbances, especially to breeding stone-curlews. (wiltshire.gov.uk)- **Development Pressures:** Construction and infrastructure projects may encroach upon vital habitats, leading to fragmentation.- **Agricultural Practices:** Intensification can degrade habitats through increased use of fertilizers and pesticides.- **Military Training:** While some military activities are compatible with conservation, certain practices may cause habitat degradation or disturbance to wildlife.

9 Stage 1: Screening of the Project

Likelihood of Alone Significant Effects

9.1 Stage 1 of the HRA, the screening, is a test of Likely Significant Effect (LSE) to determine whether an Appropriate Assessment is required against all impact pathways identified. The screening is done considering the proposal in isolation and therefore not in-combination with any other plans or projects. It is also done in the absence of avoidance or other mitigation measures. Note that the assessment is made with awareness of the conservation objectives for the features of the European Site, however the actual assessment of the plan or project against the conservation objectives is not required until the Appropriate Assessment (Stage 2).

Potential Impact Pathways

9.2 River Avon Special Area of Conservation (SAC) – the proposed development will result in an increase in phosphate loading within the hydrological catchment of the SAC through the production of wastewater during the operation of the development.

9.3 Salisbury Plain Special Protection Area (SPA) – the proposed development will result in an increased population that will increase recreational pressure on the SPA.

Qualifying Feature	Relevant Conservation Objectives	Potential Impact Pathway	Likely Significant Effect Alone
River Avon Special Area of Conservation (SAC)			
Atlantic salmon (Salmo salar)	- Ensure the integrity of the SAC is maintained or restored. - Maintain or restore the extent and distribution of qualifying habitats and species. - Preserve the structure and function of qualifying habitats. - Protect the supporting processes on which these habitats and species rely. - Prevent deterioration or disturbance to qualifying species.	- Increased phosphate loading within the hydrological.	- Likely significant impact due to water quality degradation, particularly from nutrient enrichment.
Salisbury Plain Special Protection Area (SPA)			
Stone-curlew (Burhinus oedicnemus)	- Ensure the integrity of the SPA by maintaining the population of Stone curlew.	- Disturbance from human activity (e.g., recreation, military training).	Likely significant effects from human disturbance during breeding season, especially from

	- Protect their nesting habitats and prevent disturbance.	- Loss of breeding habitat due to land-use change.	increased recreational pressure.

Screening Decision

9.4 The risk of Likely Significant Effects on the European Sites from the project alone cannot be ruled out, and therefore an Appropriate Assessment (Stage 2) is required.

10 Stage 2: Appropriate Assessment

Assessment of Potentially Adverse Effects Without Mitigation

Qualifying Feature	Impact Pathway	Description of Impacts and Adverse Effects	Can adverse effect on Somerset Levels and Moors Ramsar Site integrity be ruled out?
River Avon Special Area of Conservation (SAC)			
Atlantic salmon (Salmo salar), Bullhead (Cottus gobio), Brook lamprey (Lampetra planeri), Desmoulin's whorl snail (Vertigo moulinsiana)	Without mitigation, there is an impact pathway, and significant effects cannot be ruled out.	The wastewater from the new development will lead to an increase in nutrient (phosphorus) loading in the river's catchment area of **0.41kg TP/yr.** This could result in the deterioration of water quality, negatively impacting the habitat for these species, particularly affecting juvenile salmon growth, bullhead populations, and the habitats for brook lamprey and Desmoulin's whorl snail.	No.

		Increased nutrient levels may also lead to algal blooms, reducing oxygen levels and potentially resulting in habitat loss or degradation for these species.	
Salisbury Plain Special Protection Area (SPA)			
Stone-curlew (Burhinus oedicnemus), *Quail (Coturnix coturnix)*, *Hen harrier (Circus cyaneus)*, *Merlin (Falco columbarius)*, *Short-eared owl (Asio flammeus)*, *Barn owl (Tyto alba)*, *Long-eared owl (Asio otus)*, *Nightingale (Luscinia megarhynchos)*, *Whinchat (Saxicola rubetra)*, *Wheatear (Oenanthe*	Increased population from development leading to recreational pressure, with potential disturbance to breeding and foraging birds.	The development will generate an increased population of **37 people.** This may lead to higher levels of recreational activities such as walking, cycling, and off-road vehicles, which could disturb nesting and foraging birds, particularly during critical breeding seasons. This disturbance may reduce the availability of food, increase stress levels in the birds, and potentially lead to abandonment of nesting sites. Additionally, recreational pressure could cause habitat degradation through trampling and littering.	No.

oenanthe), Corn bunting (Emberiza calandra), Montagu's harrier (Circus pygargus), Hobby (Falco subbuteo), Great bustard (Otis tarda)			

Assessment of Potentially Adverse Effects with Mitigation

Qualifying Feature	Description of Impacts and Adverse Effects	Can adverse effects be mitigated?	Description of mitigation	Can adverse effect on site integrity be ruled out?
Atlantic salmon (Salmo salar), Bullhead (Cottus gobio), Brook lamprey (Lampetra planeri), Desmoulin's whorl snail (Vertigo moulinsiana)	The wastewater from the new development will lead to an increase in nutrient (phosphorus) loading in the river's catchment area of **0.41kg TP/yr.** This could result in the deterioration of water quality, negatively impacting the habitat for these species, particularly affecting	Yes.	A reduction in phosphorous levels of **0.41kg TP/yr** will be achieved by: - Diverting surface water flows into onsite sustainable urban drainage systems and associated gravel traps. - Grey water recycling.	Yes.

	juvenile salmon growth, bullhead populations, and the habitats for brook lamprey and Desmoulin's whorl snail. Increased nutrient levels may also lead to algal blooms, reducing oxygen levels and potentially resulting in habitat loss or degradation for these species.			
Salisbury Plain Special Protection Area (SPA)				
Stone-curlew (Burhinus oedicnemus), *Quail (Coturnix coturnix)*, *Hen harrier (Circus cyaneus)*, *Merlin (Falco columbarius)*, *Short-eared owl (Asio flammeus)*, *Barn owl (Tyto alba)*, *Long-eared owl (Asio otus)*,	The development will generate an increased population of **37 people.** This may lead to higher levels of recreational activities such as walking, cycling, and off-road vehicles, which could disturb nesting and foraging birds, particularly during critical breeding seasons. This disturbance may reduce the availability	Yes.	Ongoing monitoring and management advice at the SPA to be undertaken. This is in accordance with the implemented recommendations of the HRA Mitigation and Management Strategy for Salisbury Plain SPA (June 2024).	Yes.

Nightingale (Luscinia megarhynchos), *Whinchat (Saxicola rubetra)*, *Wheatear (Oenanthe oenanthe)*, *Corn bunting (Emberiza calandra)*, *Montagu's harrier (Circus pygargus)*, *Hobby (Falco subbuteo)*, *Great bustard (Otis tarda)*	of food, increase stress levels in the birds, and potentially lead to abandonment of nesting sites. Additionally, recreational pressure could cause habitat degradation through trampling and littering.			

11 Likelihood of In Combination Adverse Effects on Site Integrity

11.1 Nutrient neutrality has been demonstrated for the project alone with mitigation in place and therefore there will be no adverse effect on integrity of the Ramsar Site due to nutrients. Therefore, no in-combination assessment is required.

11.2 Housing delivery and in-turn population growth across Wiltshire is below the levels assessed to be acceptable by the HRA Mitigation and Management Strategy for Salisbury Plain SPA (June 2024). Therefore, subject to the on-going implementation of mitigation measures in combination Adverse Effects will be avoided.

12 Conclusion

12.1 It is concluded that the project will not adversely affect the integrity of the River Avon Special Area of Conservation (SAC) or the Salisbury Plain Special Protection Area (SPA).

Appendix 1 – Preliminary Ecological Appraisal

ELLENDALE
ENVIRONMENTAL

Warminster Police Station
Preliminary Ecological Assessment (PEA)

For Apex Planning Design

22nd May 2024

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Version

VERSION	DATE	AUTHOR	REVIEWED	APPROVED
CIC v1.0	20/05/24	Stewart Parsons	Emma Parsons	22/05/24

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Ellendale Environmental Limited accepts no responsibility for any use of or reliance on the contents of this report by any third party.

The report, and the information contained in it, is intended to be valid for a maximum of 12 months from the date of the survey, providing no significant alterations to the site have occurred.

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Executive Summary

Ellendale Environmental Limited was commissioned by Apex Planning Design to undertake a Preliminary Ecological Assessment (PEA) at Warminster Police Station, Warminster, Wiltshire, BA12 9BR ('the site'). It is proposed to redevelop the site to provide accommodation ('the proposed development').

Surveys undertaken at the site as part of the PEA included a Phase 1 Habitat survey and a protected species walkover. The Phase 1 Habitat survey was undertaken following a Phase 1 survey methodology to list the plant species associated with each habitat, and the preliminary protected species walkover was conducted for the site and the surrounding area.

The site is located within an urban area to the north of Warminster and comprises an area of hardstanding with some buildings and small, former amenity grassland areas. To the north of the site there is Station Road which runs around the eastern boundary. To the west there is a carpark and to the south there is a building, separated from the site by a wall. There are seven Phase 1 habitat types recorded on the site, including boundary features.

There are two structures on the site, namely, a social club to the north and a suite of garages to the west. Most of the rest of the site comprises sealed surfaces (primarily tarmac), stores of earth and construction debris, shallow but extensive excavations, and an area of remnant lawn in the south. Parked vehicles and ad hoc stores of building materials were frequent.

Three small trees around the south-western boundary wall provide the most suitable habitat for protected species, namely nesting birds. The trees provide habitat for common passerine bird species; however, no evidence of these were found during the survey.

In addition, the buildings present provide habitat for nesting birds, including house martin and swallow; however, no evidence of these was found during the survey.

Overall, the site is assessed as providing low suitability to support protected species and no evidence of protected species was detected during the survey.

A loft void is present within the social club; however, this could not be accessed due to the potential presence of asbestos. There are numerous holes in the structure of the roof which may provide access for bats to the internal loft space of the building; therefore, it has been assessed as providing Low bat roost potential due to these features. A further dusk activity survey for bats is recommended.

Recommendations have been made for modest post-construction ecological enhancements at the site that are proportionate with the low level of environmental impact from the proposed development.

1. Introduction

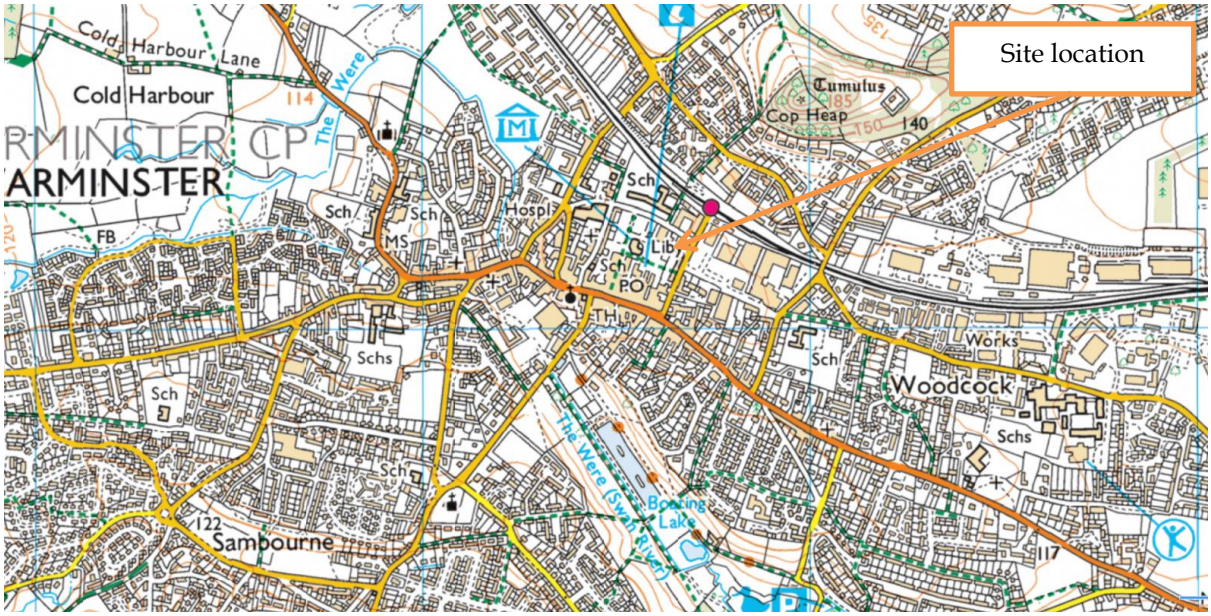
1.1 Commission

Ellendale Environmental Limited was commissioned by Apex Planning Design to undertake a Preliminary Ecological Assessment (PEA) at Warminster Police Station, Warminster, Wiltshire, BA12 9BR ('the site'). It is proposed to redevelop the site to provide accommodation ('the proposed development').

1.2 Site Details

The site is located to the north of Warminster, a historic market town and civil parish in south-west Wiltshire, on the western edge of Salisbury Plain, at OS grid reference ST 87648 45167.

Figure 1: Site location



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1.3 Survey Objectives

On the basis of the brief provided by the client, Ellendale Environmental conducted an ecological survey of the site and a 50m buffer (where accessible and appropriate) to fulfil the following needs:

- Obtain baseline information on the current habitats and ecological features in and around the site;

- Identify any further specialist surveys that may be required;
- Identify the presence (or potential presence) of any protected species whose disturbance may require consent under The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) or the Wildlife and Countryside Act, 1981 (as amended); and
- Identify any species or habitats which may require special mitigation during the development of the site.

2. Methodology

2.1 Data Search

Publicly available databases, including MAGIC and the NBN Atlas, were consulted for historical evidence of:

- Statutory land-based designations;
- Non-statutory land-based designations; and
- Protected and notable species.

The data search was conducted within a 2km (5km for bats) radius of the site boundaries.

2.2 Phase 1 Habitat Survey

A Phase 1 Habitat survey of the site area was undertaken, and the habitats present on the site were mapped following the Phase 1 survey methodology (JNCC, 2010), listing the plant species associated with each habitat. This methodology was a Phase 1 habitat survey, whereby all habitats were surveyed and recorded onto a base plan, and any habitats that were considered to be of potential interest to nature conservation were recorded through the use of target notes to annotate a Phase 1 habitat map.

2.3 Preliminary Protected Species Walkover

The site and surrounding areas were examined for signs of protected species. The presence/potential presence of protected or notable species of conservation concern was recorded using target notes, following the Chartered Institute of Ecological and Environmental Management guidance (CIEEM, 2012).

2.4 Preliminary Roost Assessment

An inspection of the buildings within the site was undertaken, looking for evidence of bats, bat roosting sites and possible bat access/egress points.

In examining the buildings for bats, particular attention was given to any crevice in which bats may roost. These were inspected for bat droppings, bat urine, feeding remains, oil staining from the fur of bats (indication of frequent use of a particular site), and wear of substrates caused by the movement of bats in and out over a long period of time.

In addition, trees within the site were inspected for their suitability to support bats.

2.5 Survey Area

The survey covered the entire site and areas within 50m (where accessible and appropriate).

2.6 Survey Limitations

The aim of this survey was not to record every species present on the site, as one survey acts as a snapshot, recording only those species which are present at the time or whose presence can be indicated through the occurrence of field signs, such as feeding remains, droppings or places used for shelter or foraging.

Evidence collected has been used to draw conclusions about the flora and fauna within the boundary of the site and to provide an assessment of their ecological and nature conservation value.

Weather was not a limiting factor to the survey. The prevailing conditions at the time of the survey are summarised in Table 1.

Table 1: Survey weather conditions

SURVEY DATE	TEMPERATURE (˚C)	WIND SPEED (MPH)	CLOUD COVER / PRECIPITATION
15/05/24	17.4	Avg. 1.2 Max 2.0	50% cloud cover, dry with an occasional light breeze.

2.7 Surveyor

The survey was undertaken by Phil Quinn, a field ecologist and associate of Ellendale Environmental, who is a full member of CIEEM. Phil has over 35 years' professional experience of undertaking ecological surveys across the UK.

3. Results

3.1 Data Search

A 2km data search for existing designated sites and biological records was undertaken from MAGIC[1] and the NBN Atlas[2].

Statutory designated sites

The following statutory designated sites were identified within 2km of the site boundary by the data search:

- Cranborne Chase & West Wiltshire Downs Area of Outstanding Natural Beauty (AONB) is located approximately 1.7km south of the site;
- River Avon System Site of Special Scientific Interest (SSSI) is located approximately 1.1 km south-east of the site;
- Salisbury Plain SSSI, Special Area of Conservation (SAC) and Special Protection Area (SPA) is located approximately 1.8km north-east of the site; and
- River Avon SAC is located approximately 1.1 km south-east of the site.

These designated sites and their qualifying features are not considered to be at risk from the proposed development.

Non-statutory designated sites

There are no non-statutory designated sites located within 2km of the site.

Protected and notable species

The following terrestrial protected and notable species were identified within 2km of the site boundaries by the data search:

- Grass snake *Natrix Helvetica* (12 records, the closest of which is located 0.5km north-east of the site, and the most recent recorded in 2023);

[1] Magic database. http://www.magic.gov.uk/MagicMap.aspx Accessed on 08/04/24.
[2] NBN Atlas database. NBN Atlas - UK's largest collection of biodiversity information Accessed on 08/04/24.

- Common lizard *Zootoca vivipara* (three records, the closest of which is located 1km north-east of the site, and the most recent recorded in 2021);
- Slow-worm *Anguis fragilis* (two records, the closest of which is located 0.3km north-west of the site, and the most recent recorded in 2020);
- West European hedgehog *Erinaceus europaeus* (196 records, the closest of which is located 0.1km east of the site, and the most recent recorded in 2023);
- Eurasian badger *Meles meles* (87 records, the closest of which is located 0.9 km south of the site, and the most recent recorded in 2023);
- European water vole (three records, the closest of which is located 0.7km south-west of the site, and the most recent recorded in 2022);
- Eurasian otter *Lutra lutra* (10 records, the closest of which is located 1km south of the site, and the most recent recorded in 2023);
- Beaver *Castor fiber* (one record, located 1km south of the site and recorded in 2020); and
- Brown hare *Lepus europaeus* (one record, located 2km north-east of the site and recorded in 2020).

The following bat species were identified within 5km of the site boundaries by the data search:

- Serotine bat *Eptesicus serotinus* (one record, located 4km north-west of the site and recorded in 1984);
- Daubenton's bat *Myotis daubentonii* (one record, located 4.8km north-west of the site and recorded in 2019); and
- Noctule bat *Nyctalus noctula* (one record, located 3km west of the site and recorded in 1974).

Bird species

Approximately 116 bird species have been recorded within 2km of the site and are shown on the NBN Atlas with records of Rock dove *Columba livia* present within the site (recorded in 2022).

3.2 Phase 1 Habitat Survey

The site is located within an urban area to the north of Warminster and comprises an area of hardstanding with some buildings and small, former amenity grassland areas. To the north of the site the is Station Road which runs around the eastern boundary. To the west there is a carpark and to the south there is a building, separated from the site by a wall.

There are seven Phase 1 habitat types recorded on the site, including boundary features, namely:

- J.4 Bare ground;
- J.3.6 Buildings;
- J.2.3.5 Wall;
- J.2.3.4 Fence;
- J.1.2 Amenity grassland;
- J.1.3 Ephemeral/short perennial; and
- A.3.1 Parkland/scattered trees (Broad-leaved).

J.4 Bare ground

The majority of the site comprises sealed hard surfaces (tarmac and concrete) or areas of shallow excavation where building rubble and soil predominate. Parked vehicles and stored building materials are common here and there are sections of Heras fencing around some of the excavations.

J.3.6 Buildings

Buildings are present within the site including a social club which is located within the north of site on a south-east to north-west axis and is a single storey rectangular-shaped structure. A caravan and an old bicycle shelter are present to the south-east of the social club.

A range of seven small contiguous single void garages constructed are located on the western side of the site and directly abut the site's western boundary. The garages have a flat roof comprising an aluminium-type corrugated material.

These buildings are further discussed in Section 3.4.

Photograph 1: showing a view of the site entrance and social club



J.2.3.5 Wall

Along the site's northern and western external boundary there is a 2m high concrete blockwork wall and there is a 3m wide entrance gateway in this boundary immediately west of the social club. The south-western boundary is a heavily-mortared mix of stone rubble and brick, whilst the southern boundary is a 2m high brick wall. South-east of the social club there is also a small section mortared stone wall boundary.

J.2.3.4 Fence

To the east there are wooden panel fences forming the boundary of occupied dwellings but south of these dwellings – and adjacent to the former police station – active construction work was commencing, and no physical boundary was observed.

J.1.2 Amenity grassland

In the south of the site there is a remnant area of established lawn (amenity grassland) but this was mostly covered by spoil and building materials. What was visible demonstrated that common grass species such as Yorkshire fog *Holcus lanatus*, fescues *Festuca spp*, bromes *Bromus spp.*, and meadow-grasses *Poa spp.*, predominated. Here there was also much germander speedwell *Veronica chamaedrys* and yarrow *Achillea millefolium*, with some meadow buttercup *Ranunculus repens*.

Photograph 2: showing a view of the amenity grassland to the south of the site



Another, smaller and less species diverse area of grassland is present in the centre of the site and another strip of this habitat occurs along the site's south-western boundary wall, but this is mostly covered with building debris and materials.

J.1.3 Ephemeral/short perennial

Ephemeral/short perennial vegetation is present around the northern side of the social club in an unmanaged area where young specimens of buddleia *Buddleia davidii* are common and a small amount of bramble *Rubus fruticosus agg* also present along with some spear thistle *Cirsium vulgare*, a non-native species of poppy *Papaver sp.*, herb Robert *Geranium robertianum* and ivy *Hedera helix*, amongst other common species.

Photograph 3: showing a view of the ephemeral/short perennial vegetation



Further areas of ephemeral/short perennial vegetation are also present scattered around the site in areas of disturbed ground where species such as groundsel *Senecio vulgaris*, annual meadow-grass *Poa annua*, procumbent pearlwort *Sagina procumbens*, lesser trefoil *Trifolium dubium*, common mouse-ear *Cerastium fontanum*, dandelion *Taraxacum officinale* agg., and fool's parsley *Aethusa cynapium* are present (broad-leaved). Knotted hedge parsley *Torilis nodosa* was also noted and, although not rare, is uncommon in such an inner urban environment and is occasional in the centre of the site.

A.3.1 Parkland/scattered trees (Broad-leaved)

There are three small trees within the site, namely a part-espaliered apple *Malus domestica* and two multi-stem hollies *Ilex aquifolium* which are present along the south-western boundary wall. Part of a non-native conifer, growing on an adjacent property, hangs over the site's southern boundary.

Photograph 4: showing the trees along the survey site's south-western boundary wall



3.3 Preliminary Protected Species Walkover

The site and surrounding habitats were examined for signs of protected and notable species and the following assessment has been made for the potential for these species to be present.

Overall, the site is assessed as providing low suitability to support protected species and no evidence of protected species was detected during the survey.

3.3.1 Protected Species

Birds

The three small trees around the south-western boundary wall provide the most suitable habitat for protected species, namely nesting birds. The trees provide habitat for common passerine bird species; however, no evidence of these were found during the survey.

In addition, the buildings present on site provide habitat for nesting birds including house martin *Delichon urbicum* and swallow *Hirundo rustica;* however, no evidence of these was found during the survey.

Otter

There is no habitat present on site suitable to support this species.

Water vole

There is no habitat present on site suitable to support this species.

Badger

The site does not provide suitable habitat to support this species. Regular disturbance of the habitats present will deter this species, and roads and hardstanding will restrict access to the site. No evidence of badger, such as runs, latrines or scratching, was found.

Great Crested Newt

There are no waterbodies present on site that could support breeding great crested newts (GCN) *Triturus cristatus*. Much of the site is hardstanding which is considered to be unsuitable to support terrestrial GCN. Small patches of amenity grassland are considered to be suboptimal to support terrestrial GCN and are heavily disturbed. Hardstanding around the site will restrict the movement of this species into and out of the site and therefore GCN are not considered to be present.

3.3.2 Notable Species

Common reptiles and amphibians

There are no waterbodies present on site that could support breeding amphibians. Much of the site is hardstanding which is considered to be unsuitable to support terrestrial amphibians and common reptile species. Small patches of amenity grassland are considered to be suboptimal to support terrestrial amphibians and common reptile species and are heavily disturbed. Hardstanding around the site will restrict the movement of these species into and out of the site and therefore amphibians and common reptile species are not considered to be present.

3.4 Preliminary Roost Assessment

There are two structures on the site, namely, a former social club in the north and a suite of garages in the west, which were inspected for their suitability to support roosting bats.

The social club is a single storey rectangular-shaped structure located within the north of the site on a south-east to north-west axis. Its external surface is of a textured reformed stone blockwork and there is a small wooden porch on its eastern elevation. There are windows in the southern, eastern and western elevations which have smooth reformed stonework surrounds. All the windows are intact and are kept closed. The southern elevation has five larger windows and three smaller windows, whilst the western elevation has one larger window and a large glass doorway, although the latter is sealed with a large plywood board on its external surface. The eastern elevation has two large windows.

There is small chimney in the middle of the southern elevation which is also constructed from reformed stone blockwork. On the northern elevation there are neither doors nor windows. The main entrance to the social club is via a door in the eastern elevator and this leads into a short section of corridor.

Internally the majority of the social club comprises a large single void with part of the floor covered by thin carpet and the other part by a Lino-type material. The ceiling comprises thin reformed wood square panels over narrow wood strips.

In the east of the social club there are two toilet areas either side of the corridor adjacent to the main door; both these toilet areas have the same ceiling as the main area of the social club.

To the west of the southern toilet area there is a small storeroom with a curtain forming its western wall. To the west of the northern toilet area there is a small kitchen and to the west of that there is a small wood-effect bar. An access hatch to the roof void is present in the ceiling of the northern toilet area; however, this area could not be fully searched due to the likely presence of asbestos within the building.

Photograph 5: showing the social club, southern and eastern elevations



The roof of the social club is double-pitched and its outer surface appears to be asbestos, or asbestos-like corrugated sheeting which is in good condition. Asbestos-style ridge tiles runs along the apex of the roof. There are boxed soffits around the interface of the roof and the walls on the northern and southern elevations and these too are largely in good condition.

There are numerous holes into the structure of the roof where the roof panels overtop the soffits as well as at the gable ends where the ridge tiles are loose and where the ends of the soffit boxes have slipped away from the walls. These gaps may provide

access for bats to the internal loft space of the building and therefore the social club has been assessed as providing Low bat roost potential due to these features.

Photograph 6: showing loose ridge tiles in the gable of the eastern elevation of the social club



A range of seven small contiguous single void garages constructed from vertical concrete blocks are located on the western side of the site and directly abut the site's western boundary. The garages have a flat roof comprising an aluminium-type corrugated material.

At the time of survey two of the garage doors were open and those garages were being used to store low-value building equipment. The three southern-most garages had their doors shut and were also blocked by a large mound of earth and debris which had been placed in that area. Another of the garages has its door replaced with plywood whilst the northern-most garage had its door shut.

Photograph 7: showing a view of the garages (looking south-west)



No evidence of bat activity was found on the external surfaces of the garages and they are not assessed as providing suitable habitat for bat species. No further surveys for bats are therefore recommended.

The trees present on site are not considered to be suitable to support roosting bats and no suitable features such as cracks or crevices were found where bats could roost.

4. Conclusions

4.1 Conclusion

The site is located within an urban area to the north of Warminster and comprises an area of hardstanding with some buildings and small, former amenity grassland areas. There are seven Phase 1 habitat types recorded on the site, including boundary features.

There are two structures on the site, namely, the social club in the north and a suite of garages in the west. Most of the rest of the site comprises sealed surfaces (primarily tarmac), stores of earth and construction debris, shallow but extensive excavations, and an area of remnant lawn in the south of the site. Parked vehicles and ad hoc stores of building materials were frequent.

The three small trees around the south-western boundary wall provide the most suitable habitat for protected species, namely nesting birds. The trees provide habitat for common passerine bird species; however, no evidence of these were found during the survey. In addition, the buildings present on site provide habitat for nesting birds including house martin and swallow; however, no evidence of these was found during the survey.

Overall, the site is assessed as providing low suitability to support protected species and no evidence of protected species was detected during the survey.

A loft void is present within the social club; however, this could not be accessed due to potential presence of asbestos. There are numerous holes into the structure of the roof which may provide access for bats to the internal loft space of the building and therefore the social club has been assessed as providing Low bat roost potential due to these features. A further dusk activity survey for bats is recommended.

4.2 Site-Specific Mitigation

Site personnel should be made aware of protected species and if any are recorded on site, all works should stop, and a suitably qualified ecologist contacted.

Nesting birds

Should any vegetation of the site require removing, this should be undertaken out with the breeding bird season (March – August, inclusive), as all nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended).

If works are undertaken within this period, a nesting bird survey would be required no more than 24 hours prior to the works. If nesting birds were found, these areas of the site would need to be protected from disturbance until the young have fledged naturally.

Bats

As the social club has been identified as having Low bat roost potential, this structure will require additional survey effort to determine whether bats utilise it as a roost. Where the nature of the social club's roofing material can be determined and, should it not be hazardous, it is recommended that a suitably qualified bat surveyor should access the roof void to determine whether there is any evidence of roosting bats.

A minimum of one emergence (dusk) survey should be undertaken in the bat activity season between May and August inclusive. A minimum of two suitably experienced bat surveyors will be required, with one positioned at the south-eastern edge of the building and the other at the north-western edge. Should evidence of bats be found further surveys will be required to fulfil the requirements of the BCT guidelines (4th edition).

4.3 Suggested Biodiversity Enhancements

The following recommendations are made for modest post-construction ecological enhancements at the site which are proportionate with the low level of environmental impact from the proposed development:

- Bird nesting boxes (both small-hole and open-fronted) should be placed within the site to create nesting opportunities for small bird species as part of the overall design; and
- Bat boxes should be placed on or around the site boundaries or incorporated within the buildings, if possible, to create roosting opportunities for bat species as part of the overall design.

It is important that, where possible, opportunities to create new ecological features or enhance existing ones are fully explored. The following measure would benefit the development by introducing ecological enhancements and should be encouraged:

- Planting of native shrubs in appropriate areas of the site will bolster the existing habitat and provide connectivity between existing habitats. Species beneficial to wildlife include hawthorn *Crataegus monogyna*, hazel *Corylus avellana,* holly *Ilex aquifolium* and cherry *Prunus avium*.

It is recommended that an ecologist contributes to any detailed landscape designs, planting lists and post-construction management to ensure a biodiversity net gain for the site.

5. Target Notes

5.1 Botanical Target Notes (TN)

TN1 – The social club.

TN2 – Hardstanding at the entrance to the site.

TN3 – The garages.

TN4 – An area of amenity grassland.

TN5 – Hardstanding within the site.

TN6 – An area of amenity grassland.

TN7 – Hardstanding within the site.

TN8 – An area of amenity grassland.

5.2 Animal Target Notes (AN)

AN1 – The social club building is assessed as providing low roost suitability as gaps were found around the building providing access to the internal loft space.

AN2 – The garage building do not provide habitat for bats and no evidence was found during the survey. The open garages could provide habitat for nesting birds; however, no old or active nests were found.

AN3 – Trees around the amenity grassland provide some suitable habitat for nesting birds; however, no old or active nests were found.

6. Extended Phase 1 Habitat Map



ELLENDALE ENVIRONMENTAL

Drawing Title;
Warminster Police Station
Extended Phase 1 Map

Client;
Apex Planning Design

Date;	**Drawn By;**
21/05/24	**SP**
Project Number;	**Version Number;**
EEL800	**v1.0**

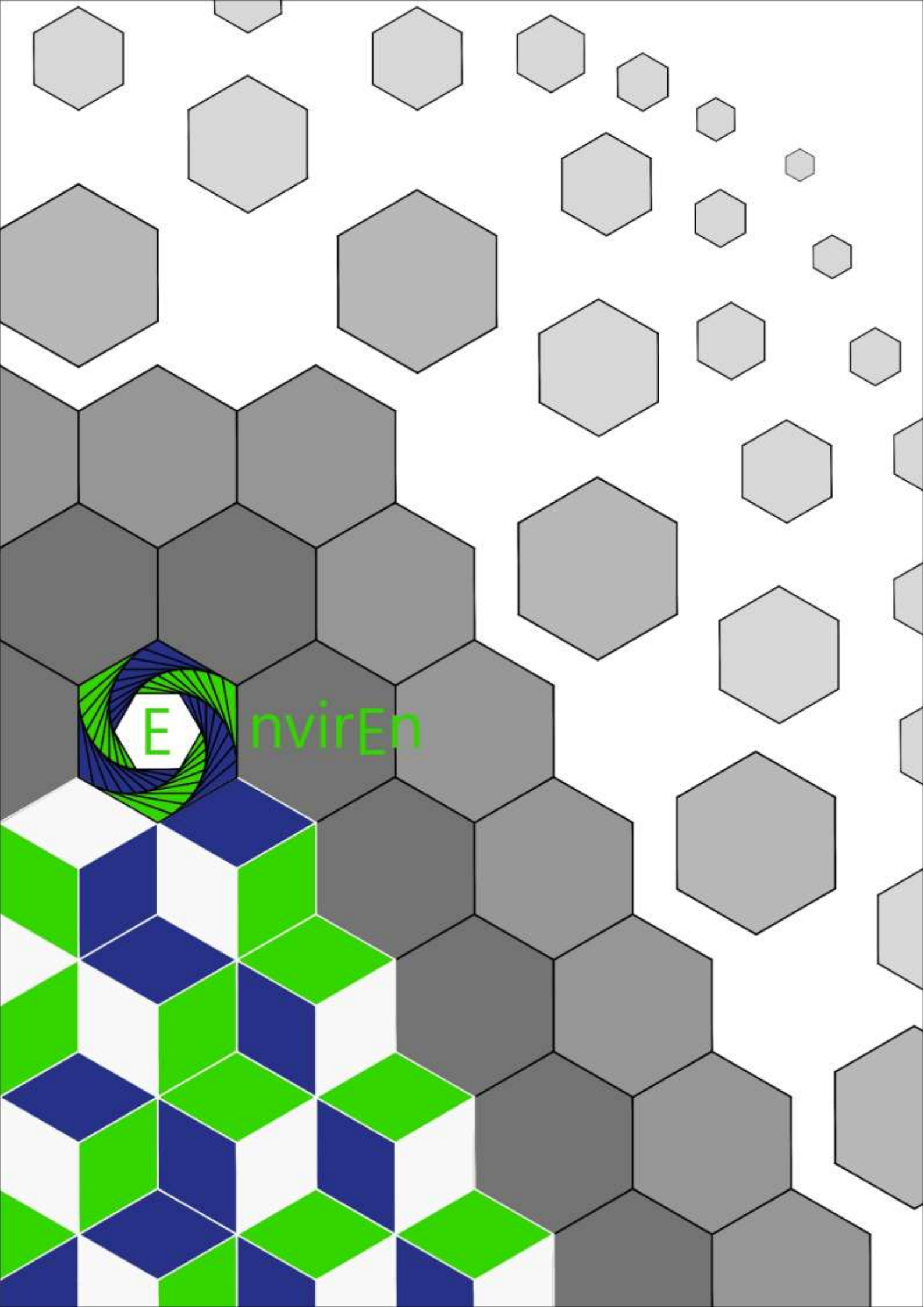
Target Note
- TN

Animal Note
- AN

Woodland and Scrub
- Broad-leaved Tree

Miscaleaneous
- Wall
- Building
- Hard Stanidng
- Amenity Grassland

Appendix 2 – Nutrient Neutrality Assessment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Nutrient Neutrality Assessment and Mitigation Strategy (NNAMS)

Warminster Police Station, Warminster

B. Townsend BEng

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Executive Summary

This report has been compiled for the support of the construction of twenty one flats at Warminster Police Station, Warminster (Grid reference ST 87640 45174.) The application is for the construction of the dwellings along with associated drives, gardens and infrastructure.

This report demonstrates that the development will achieve Nutrient Neutrality through directing surface water from the existing hardstanding out of the foul sewer and into soakaways and filter drains serving the proposed dwellings, additionally the applicant will install greywater recycling systems within the proposed flats. The proposals would result in an increase in nutrient loads from foul and surface water discharge if onsite controls were not to be implemented.

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1. Introduction

1.1. This report has been prepared to support a planning application for the construction of twenty one flats at Warminster Police Station, Warminster. The report demonstrates that by removing surface water from the foul water sewer, through the installation of soakaways and filter drains, alongside installation of greywater recycling systems, the development will achieve Nutrient Neutrality. The site itself is 0.232Ha (2320m^2) and previously constituted commercial urban land area consisting of buildings, garages and parking area being part of Warminster Police Station. The creation of the flats would result in an increase in nutrients discharging into the surrounding water network due to foul water discharge from the proposed properties if onsite controls were not to be implemented (see **Appendix A**)
(Note: although being separate entities phosphorus and phosphates have been used interchangeably throughout this report and to suit the specific usage in background information and reports)

2. Background Information

Site Location

2.1. The site is located in central Warminster to south of Warminster train station. The site is located close to local amenities/landmarks such as the train station to the north and a supermarket to the east. The exact location can be found in **Figure 2.1**:



Figure 2.1 – Site Location

2.2. The proposed development sits within the hydrological catchment of the River Avon SAC, as indicated in **Figure 2.2**.



Figure 2.2 – Hydrological Catchment Plan

Brief Site Hydrology

2.3. Overland flows from the development are transported to the north east and then into the combined sewer in Station Road. The combined flows are transported to the Warminster WRC which subsequently discharges to the River Wylye. The River Wylye flows south and discharges into the River Nadder at Wilton. The River Nadder flows south before discharging into the River Avon in Salisbury. The River Avon flows south and discharges into the Christchurch Harbour.

Site Description

2.4. The proposed development is roughly 0.232 hectares in size when considering supplied site information. The site currently consists of buildings, hardstanding and grassed areas as displayed on the mapping in **Figure 2.3**.



Figure 2.3 – Aerial Reconnaissance Photography

Regional Background and Underlying Science

2.5. The regional background and context for nutrient neutrality within the River Avon SAC can be found in **Appendix G**. The underlying science that underpins the requirement to achieve nutrient neutrality is presented in **Appendix H**.

3. Development Proposals

3.1. The development proposals consist of the construction of twenty one flats, alongside associated gardens, drives and ancillaries. Currently surface water from the development site is drained to the combined/foul water network that passes along Station Road (see **Appendix B**).

3.2. To mitigate the nutrient arisings from the development the surface water shall be rerouted out of the foul sewer network, providing a significant volumetric reduction in water generated. As per Natural England guidance and the conclusions of other Royal Haskoning DHV[1] reports once water enters the foul sewer network it mixes with sewage from the surrounding catchment, when this reaches the WwTW it is discharged at a permitted concentration in mg/l, therefore by removing this surface water runoff from the foul sewer network the development shall achieve a significant reduction in nutrients discharged. This is the same methodology that allows water reduction measures to be used and why Package Treatment Plants (PTPs) cannot be connected to the sewer network to reduce nutrient loads.

3.3. A design infiltration rate of $4.2x10^{-5}$m/s has been calculated based on onsite percolation testing (see report ref: J-2865-Rev.02). Such an infiltration rate is adequate to enable the discharge of surface water to ground through permeable paving and to allow roof water from the site to be infiltrated to ground through soakaways. The development should be encased in gravel traps to ensure that overland flows do not exit the site. The provisions of

[1] Royal Haskoning DHV – Somerset Levels and Moors Phosphate Mitigation Solutions (Report reference: PC2250-RHD-ZZ-XX-RP-Z-0001)

this section should be conveyed to the appropriate engineer completing the drainage strategy for the development to be incorporated for submission.

3.4. As the surface water shall discharge to ground the post development phosphorus loads need not be considered, this is as per the methodology outline in CIRIA C808[2]:

"Where stormwater runoff from residential developments can be infiltrated to ground, and where soil conditions allow that infiltration to occur without risk of groundwater pollution, then it should be maximised across the development and used as the first step in phosphorus pollution control. ***For all flows that are effectively infiltrated, and where groundwater protection is provided by the soil, the phosphorus in that runoff is considered to be captured and removed from the water environment***"

3.5. The volumetric reduction in water from surface water runoff can be calculated by following the principles of the Wallingford Procedure[3] and the Modified Rational Method. Detailed calculations for the reduction achieved can be found in **Section 4**.

3.6. As the Warminster WRC currently benefits from a permitted discharge concentration the reduction can be immediately used to offset the development. Discharge of surface water to ground should not be seen as mitigation as development should follow the hierarchy in Approved Document H[4], which states that development should discharge to the following receptors in order of preference:

1) An adequate soakaway or some other adequate infiltration system; or, where that is not reasonably practicable,
2) A watercourse; or, where that is not reasonably practicable,
3) A sewer.

As can be seen the development shall promote the discharge of surface water up the hierarchy established in the Building Regulations and therefore the proposals shall not constitute mitigation, it is merely construction best practice that all new development should follow.

Greywater recycling system

3.7. Additionally, a greywater recycling system will be introduced into the proposed flats, to reduce the wastewater output. The greywater yield and demand are presented in **Table 3.1**.

Table 3.1 – Greywater Demand and Yield

Greywater Demand		
Component	**Greywater Demand (litres per person per day)**	**Greywater Demand (litres per flat per day [based on an occupancy of 1.75 persons per house])**
WC	13.54	23.70
Washing Machine	17.16	30.03
Irrigation	5.00	8.75
Total	35.7	62.48

[2] CIRIA C808 – Using SuDS to reduce phosphorus in surface water runoff
[3] The Wallingford Procedure – Design and analysis of urban storm drainage – Volume 4 The Modified Rational Method
[4] The Building Regulations 2010 – Approved Document H – Drainage and waste disposal

Greywater Yield		
Component	**Greywater Yield (litres per person per day)**	**Greywater Yield (litres per flat per day [based on an occupancy of 1.75 persons per house])**
Showers, Bath and Hand Basins	63.14	110.50

3.8. A can be seen in **Table 3.1**, the greywater yield far exceeds the greywater demand. The reduced water demand per person shall therefore be 85l/p/d (84.3l/p/d rounded up).

3.9. The use of greywater recycling systems is considered industry best practice, as per Approved Document G, and therefore has not been included as mitigation. This is the same methodology justifying why the 110l/p/d optional planning requirement is not considered as mitigation. The greywater recycling to be used is a Hydraloop H300 (see **Appendix G**).

4. Nutrient Budget Calculator – Observations and Results

4.1. The direct print of the River Avon SAC Budget Calculator for the development is given in **Appendix A**. This section shall outline the observations made on the site, including proposed nutrient loads, previous and proposed land uses and volume of water generated as provided in the River Avon SAC Budget Calculator.

Proposed Volumetric Reductions as a Result of Removing Surface Water Runoff from the Combined Sewer System

4.2. As discussed in **Section 3**, by removing surface water discharge from a combined sewer network significant reductions in phosphorus discharge can be achieved. The volumetric reduction in water from surface water runoff can be calculated by following the principles of the Wallingford Procedure[5] and the Modified Rational Method, this simply means finding the average annual rainfall at the development site, multiplying this by the area of the site and applying a suitable annual volumetric runoff coefficient of 0.795 (being the average of the summer and winter volumetric runoff coefficients, being 0.75 and 0.84 respectively). The volumetric runoff coefficient looks at antecedent wetness conditions and makes an allowance for depressions, infiltration and other micro-storage mechanisms which would reduce the rate of runoff.

4.3. The calculations take an average annual rainfall value (SAAR value) of 913mm/year, as advised by the Source Control package of MicroDrainage[6]. The calculation for the amount of runoff generated is:

Criteria

Total Impermeable Area: 1718m^2
Average Runoff Coefficient: 0.795 (Average: (0.85 + 0.75)/2)
Total Annual Rainfall: 0.913m or 913mm

[5] The Wallingford Procedure – Design and analysis of urban storm drainage – Volume 4 The Modified Rational Method
[6] Innovyze – MicroDrainage – Source Control

Total Annual Volumetric Output

$$V_{Total} = Total\ Area\ \times Average\ Runoff\ Coefficient \times Total\ Annual\ Rainfall$$

$$V_{Total} = 1718\ \times 0.795\ \times 0.913$$

$$V_{Total} = 1247m^3$$

Therefore, the total average daily litres generated are:

$$L_{Daily} = \frac{V_{Total} \times 1000}{365}$$

$$\boldsymbol{L_{Daily} = \ 3416\ litres}$$

4.4. The difference between proposed volumetric loads from the dwellings and proposed volumetric savings from removing surface water from the combined sewer is presented in **Table 4.1**:

Table 4.1 – Water Generated vs Water Saved	
Unmitigated Wastewater Generated	3124 litres
Water Saved	3416 litres
Total	-292 litres

Table 4.2 – Final Comparison of Volume of Water Generated	
Prior to Mitigation	
Component	**Value**
Wastewater Generated by Development (Litres)	+3124 litres
Phosphorus Load from Wastewater Generated by Development (Pre-2030)	+0.51kg/year
Litres saved from Removing Surface Water Runoff from the Combined Sewer System	-3416 litres
Phosphorus Reduction from Removing Surface Water Runoff from the Combined Sewer System (Pre-2030)	-0.56kg/year
Pre-Mitigation Nutrient Budget	-0.05kg/year

5. Conclusion

5.1. As can be seen in this report, the nutrient arisings associated with the development have been extensively considered. The applicant will divert the surface water from the existing hardstanding/buildings out of the foul sewer system and thus provide the required nutrient reduction, as well as this the applicant shall install soakaways to take runoff from the proposed flats and gravel traps onsite to intercept overland flows. Additionally, the applicant will install greywater recycling systems in the proposed flats. The applicant shall achieve Nutrient Neutrality through the proposals and therefore nutrient arisings should not prevent planning permission being granted.

Table 5.1 – Pre and Post Nutrient Neutrality Assessment Risk Assessment

Pre NNAMS Risk				
Risk	**Description**	**Probability**	**Severity**	**Action to minimise risk**
Pollution of downstream water bodies.	Nutrients discharged from the development causing eutrophication downstream.	Looking at the hydraulic/ hydrological pathways, there is a medium likelihood of nutrient contamination.	Arisings from the development will be low/moderate.	Provide mitigation measures or control measures either through site controls or nutrient offsetting.
Post NNAMS Risk				
Risk	**Description**	**Probability**	**Severity**	**Action to minimise risk**
Pollution of downstream water bodies.	Nutrients discharged from the development causing eutrophication downstream.	Looking at the hydraulic/ hydrological pathways, there is a medium likelihood of nutrient contamination.	Arisings from the development will be offset through removing surface water from the combined sewer network and installing greywater recycling systems within the proposed flats.	No further action required.
High		Medium		Low

Appendix A Development Nutrient Calculator Direct Output

(Press Alt + Left Arrow to return if using Hyperlinks)

Nutrients from wastewater

This sheet contains 2 tables. The tables are separated by a heading, which describes the following table.
Note: You will need to fill in cells B5 to B9 in the first table 'Water infrastructure information'. Cells B10 is automatically calculated and will state '0.00' unless the user inputs have been entered. Cells A11 to A12 and B11 to B12 are automatically generated and will state 'Not applicable' depending on the inputs to cells B5 and B9. You may need to fill in cell C10 depending on the information you entered in cell B9. Cells C5 to C9 and cells C11 to C12 are intentionally blank cells.
You do not need to fill in any cells in the second table 'Final calculation of nutrient load from wastewater'. Cells B16 to B18 are automatically calculated and will state '0.00' unless the user inputs have been entered to the first table 'Water infrastructure information'. Cells A19 to A22, cells B20 and B22 are automatically generated and will state 'Not applicable' depending on the user inputs to the first table 'Water infrastructure information'. Cell B15, cell B19 and cell B21 are intentionally blank cells.
How to fill in the table 'Water infrastructure information'
Cell B5: Enter the date of first occupancy.
Cell B6: Enter the average occupancy rate of the development. The default rate is 2.4, this should not be edited without sufficient evidence.
Cell B7: Enter the water usage. This value should be kept at 120 unless other efficiency measures are used.
Cell B8: Enter the total number of dwellings or units that will be within the development site as of the project completion date.
Cell B9: Choose the receiving wastewater treatment works (WwTW) from the dropdown list.
If you select 'Package Treatment Plant user defined' or 'Septic Tank user defined', you must enter their certified value of total phosphorus (TP) in cell C10. Otherwise the default values will be used in the calculation of the nutrient load associated with wastewater.
Nutrient permits may be changing for the WwTW you select, from 01/01/2025, or 01/04/2030. If the date of first occupancy is in-between changing permit dates, multiple permit limits may be automatically generated in cells B10 to B12. If applicable, up to 3 values for the nutrient loading associated with wastewater will be presented in cell B18, B20 or B22.

Water infrastructure information

Description of required information	Data entry column - user inputs required	Additional data entry column - user inputs may be required
Date of first occupancy (dd/mm/yyyy):	20/05/2025	
Average occupancy rate (people/dwelling or people/unit):	1.75	
Water usage (litres/person/day):	85	
Development proposal (dwellings/units):	21	
Wastewater treatment works:	Warminster WwTW	
Current wastewater treatment works P permit (mg TP/litre):	**0.50**	

Not applicable	**Not applicable**	
Post 2030 WwTW P permit (mg TP/litre):	**0.25**	

Final calculation of nutrient load from wastewater

Description of values generated	**Values generated**
Post-2030 wastewater nutrient Loading	
Additional population (people):	**36.75**
Wastewater by development (litres/day):	**3123.75**
Annual wastewater TP load (kg TP/yr):	**0.26**
Pre-2030 wastewater nutrient loading	
Annual wastewater TP load (kg TP/yr):	**0.51**
Not applicable	
Not applicable	**Not applicable**

Nutrients from current land use

This sheet contains 2 tables. The tables are separated by a heading, which describes the following table.
Note: You will need to fill in cells B5 to B8 in the first table 'Current land use information'. You will need to fill in cells A11 to A27, and B11 to B27 in the second table 'Current land uses'. Cells B28, C11 to C28 are automatically calculated and will state '0.00' unless the user inputs have been entered. Cells D11 to D27 are automatically generated and will state 'Not applicable' depending on automatically generated data in cells C11 to C27. Row 28 is a Total Row. The Total Row states 'Totals:' in cell A28 and automatically calculates the total sum of cells B11 to B27 in cell B28 and C11 to C27 in cell C28. Cell D28 is intentionally blank.
How to fill in the table 'Current land use information'
Cell B5: Choose the operational catchment the site is located within from the dropdown list.
Cell B6: Choose the soil drainage type associated with the predominant soil type within the development site from the dropdown list.
Cell B7: Choose the annual average rainfall the development will receive from the dropdown list. If the rainfall volume is not on the list, select the nearest value.
Cell B8: Choose whether the development is in a nitrate vulnerable zone (NVZ) from the dropdown list.
How to fill in the table 'Current land uses'
Cell A11-A27: Choose the existing (pre-development) land use type(s) from the dropdown list.
Cells B11-B27: Enter the area in hectares of each land use type.
The nutrient load from current land uses is shown in cells C11-C27 for total phosphorus (TP).
The total nutrient load from current land uses is shown in cell C28 for TP.

Current land use information

Description of required information	Data entry column - user inputs required
Operational catchment:	Avon Hampshire
Soil drainage type:	Freely draining
Annual average rainfall (mm):	850.1 - 900
Within nitrate vulnerable zone (NVZ):	Yes

Current land uses

Existing land use type(s) - user inputs required	Area (ha) - user inputs required	Annual phosphorus export (kg TP/yr)
Commercial/industrial urban land	0.44	**0.56**
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00

		0.00
		0.00
Totals:	**0.44**	**0.56**

Nutrients from future land use

This sheet contains one table.

Note: You will need to fill in cells A5 to A21 and B5 to B21. Cells B22 and C5 to C22 are automatically generated calculations and will state '0.00' unless the user inputs have been entered. Row 22 is a Total Row. The Total Row states 'Totals:' in cell A22 and automatically calculates the total sum of cells B5 to B21 in cell B22 and C5 to C21 in cell C22.

How to fill in the table 'Future land uses'

Cells A5-A21: Choose the future (post-development) land use type(s) of landcover present on the new site from the dropdown list
Cells B5-B21: Enter the area in hectares of each land use type.

The nutrient load from future land uses is shown in cells C5 to C21 for total phosphorus (TP).

The total nutrient load from future land uses is shown in cell C22 for TP.

Future land uses

New land use type(s) - user inputs required	Area (ha) - user inputs required	Annual phosphorus export (kg TP/yr)
Residential urban land	0.23	**0.41**
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00

		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
Totals:	0.23	0.41

Nutrients from future land use after sustainable urban drainage system (SuDS) treatment

This sheet contains one table.
Note: You will need to fill in cells A5 to A29, cells B5 to B29, cells C5 to C29, cells E5 to E29 and cells F5 to F29 if you are including SuDS to remove nutrients from the surface runoff. Cells B30, D5 to D30 and cells G5 to G30 are automatically calculated and will state '0.00' unless the user inputs have been entered. Cells H5 to H29 are automatically generated and will state 'Not applicable' unless the total area of the landcover entered is larger than the total area of the landcover entered into the worksheet 'Nutrients_from_future_land_use'. Row 30 is a Total Row. The Total Row states 'Totals:' in cell A30 and automatically calculates the total sum of cells B5 to B29 in cell B30, cells D5 to D29 in cell D30 and cells G5 to G29 in cell G30. Cell C30, cell E30, cell F30 and cell H30 are intentionally blank.
How to fill in the table 'SuDS information'
Cells A5 to A29: Choose the future (post-development) land use type(s) of landcover present on the new site within the SuDS catchment area from the dropdown list. Only landcovers entered into the worksheet titled 'Nutrients_from_future_land_use' can be entered.
Cells B5 to B29: Enter the area in hectares of each new land use type within the SuDS catchment area.
Cells C5 to C29: Enter the percentage of the flow entering the SuDS feature. If all flow is being diverted to the SuDS feature then this value should be set to 100%.
The annual total phosphorus (TP) loads associated with the landcovers in the SuDS catchment area are automatically calculated in cells D5 to D29.
Cells E5 to E29: Enter the name of the SuDS features used to intercept surface flows can be entered in. Any text can be entered into these cells.
Cells F5 to F29: Enter the nutrient removal rates associated with the SuDS features for TP.
Values for column F must be identified by the user and must be specific to the SuDS features being implemented.
The annual TP load removed by the SuDS features are automatically calculated in cells G5 to G29. These values are subtracted from the nutrient budget.
You do not need to fill in column H 'Notes on data'. It will state "Not applicable" unless the total area of each landcover within the SuDS catchment area exceeds the area of the landcovers entered into the worksheet titled 'Nutrients_from_future_land_use'.
The total nutrient load removed through the SuDS features is shown in cell G30 for TP.

SuDS information

New land use type(s) within SuDS catchment area - user inputs required	SuDS catchment area (ha) - user inputs required	Percentage of flow entering the SuDS (%) - user inputs required
Residential urban land	0.23	100.00

Totals:	**0.23**	

Annual phosphorus inputs to SuDS feature(s) (kg T/yr)	Name of SuDS feature(s) - user inputs required	TP removal rate for features - user specified (%) - user inputs required	Annual phosphorus load removed by SuDS (kg TP/yr)
0.41	Permeable Paving/Soakaways	100.00	**0.41**
0.00			**0.00**

0.00			0.00
0.00			0.00
0.00			0.00
0.41			0.41

Final nutrient budgets

This worksheet contains one table. This table is automatically populated using the outputs from the previous worksheets.

Note: You do not need to fill in any cells in the table.
Cells B5 to B8 and cells B10 are automatically calculated and will state '0.00' unless the user inputs have been entered to all of the required worksheets.
Cells A11 to A14, cell B12 and cell B14 are automatically generated and will state 'Not applicable' depending on the user inputs to the worksheet 'Nutrients_from_wastewater'.
Cell B9, B11 and B13 are intentionally blank.

This table presents calculations that underpin the final annual nutrient budget for the development site. Up to 3 values for the nutrient budget may be presented in cells B10, B12 and B24 for total phosphorus (TP).

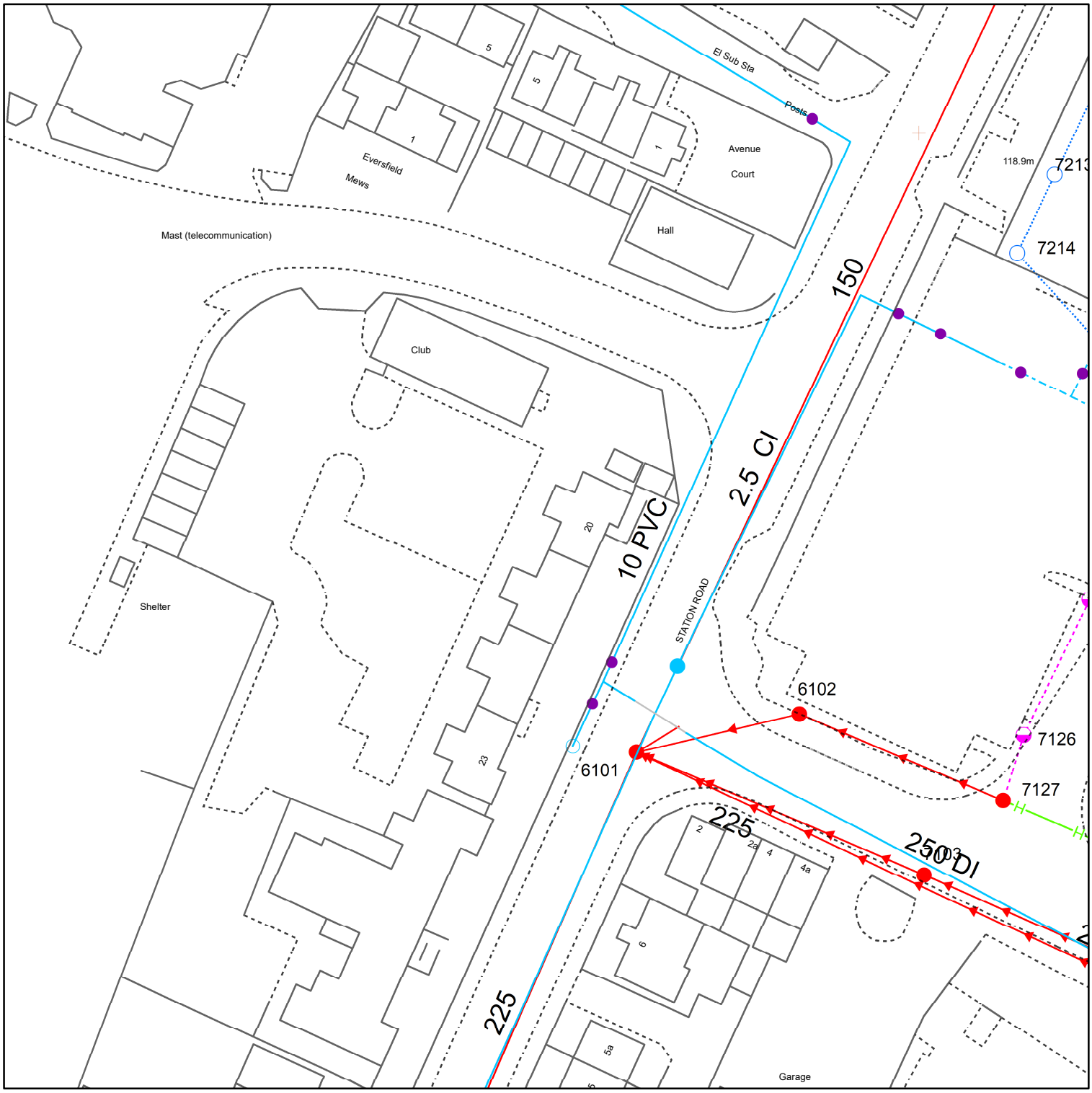
Total nutrient budget calculations

Description of values generated	Values generated
Wastewater TP load (kg TP/year):	**0.26**
Net land use TP change (kg TP/year):	**-0.56**
TP budget:	**-0.30**
TP budget + 20% buffer:	**-0.30**
Annual nutrient budget	
The total annual phosphorus load to mitigate is (kg TP/yr):	**0.00**
Pre-2030 nutrient budget	
The total annual phosphorus load to mitigate is (kg TP/yr):	**0.00**
Not applicable	
Not applicable	**Not applicable**

Appendix B Wessex Water Mapping

(Press Alt + Left Arrow to return if using Hyperlinks)

Wessex Water Network Map



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WATER MAINS
- Distribution
- Washout
- Raw Water
- Abandoned
- Private

FITTINGS
- Hydrant
- Other

SEWERS

	STRATEGIC	PUBLIC	PRIVATE	SECTION 104
Foul				
Surface				
Combined				
Abandoned				

Colours generally indicate the use of the sewer/drain (i.e Red - Foul, Dark Blue - Surface, Magenta - Combined/Dual Use, Light Green - Highway Drain, Mid Green - Overflow).
Some styles of line and symbol are shown on the key in sample/typical colours.

STRUCTURES
- Manhole - Foul
- Manhole - Surface
- Manhole - Combined
- Inlet
- Outfall
- Lamphole
- Bifurcation - Foul
- Bifurcation - Surface
- Bifurcation - Combined
- Combined Sewage Overflow
- Pumping Station - Surface
- Pumping Stn - Foul/Combined
- Gully
- Vent Column
- Rodding Eye
- Catchpit
- Flushing Chamber
- Soakaway
- Non Return Valve
- Air Valve
- Hatch Box
- X Washout

OTHER WESSEX PIPES
- Rising Mains
- Standby Rising Mains
- EDM Effluent Disposal
- Overflow
- S Syphon

NON-WESSEX / UNKNOWN
- Private Rising Mains
- CW Culverted Watercourse
- H Highway Drain
- ? Use Unknown
- SU Status Unknown

OTHER STRUCTURES
- Attenuation Tank
- Storage Tank
- Chamber
- Tunnel
- Interceptor

Wessex Water
YTL GROUP

Information in this map is provided for identification purposes only. No warranty as to accuracy is given or implied. The precise route of pipe work may not exactly match that shown. Wessex Water does not accept liability for inaccuracies. Sewers and lateral drains adopted by Wessex Water under the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011 are to be plotted over time and may not yet be shown. In carrying out any works, you accept liability for the cost of any repairs to Wessex Water apparatus damaged as a result of your works. You are advised to commence excavations using hand tools only. Mechanical digging equipment should not be used until pipe work has been precisely located. If you are considering any form of building works and pipe work is shown within the boundary of your property or a property to be purchased (or very close by) a surveyor should plot its exact position prior to commencing works or purchase. If you are proposing to build over or near Wessex Water's apparatus you should contact the Developer Services Team, tel: 01225 526333 or e-mail: developer.enquiries@wessexwater.co.uk to discuss your proposals. Details of assets within Wessex Water's land ownership are unavailable through this service.

Date: 16/05/2024
Centre: 387667, 145180
Scale: 1:625
(when printed at A4 size)

Appendix C Proposed Site Plan

(Press Alt + Left Arrow to return if using Hyperlinks)

Accommodation Schedule

Type/location	Apt. no	Floor	Beds	floor area m²
Apt/Block A	1	Ground	2	68
Apt/Block A	2	Ground	2	68
Apt/Block A	3	Ground	1	47
Apt/Block A	4	First	2+office	76
Apt/Block A	5	First	2	68
Apt/Block A	6	First	1	56
Apt/Block A	7	Second	2+office	76
Apt/Block A	8	Second	2	68
Apt/Block A	9	Third	1	55
Apt/Block B	1	Ground	2	68
Apt/Block B	2	Ground	2	68
Apt/Block B	3	First	2+office	76
Apt/Block B	4	First	2+office	88
Apt/Block B	5	Second	2+office	76
Apt/Block B	6	Second	1+office	54
Apt/Block B	7	Third	1	55
coach house Block C	1	First	1	50
coach house Block C	2	First	1	50
coach house Block C	3	First	1	50
Apt/Block D	1	Ground	2	64
Apt/Block D	2	First	2	90
Total	21			1371

Total Parking allocation spaces — 20+6 conversion

Legend

- Proposed Shrub/ornamental tree planting(scheme to be agreed)
- grass areas.
- permeable block paving finish (marshalls tegula priora blocks in grey or as agreed)
- permeable block paving finish (marshalls tegula priora blocks in traditional or as agreed)
- parking — permeable block paving to parking spaces with contrasting linear blocks as space demarcation, (marshalls tegula priora traditional with grey as demarcation) or as agreed
- refuge bin storage location
- cycle storage location
- buff colured paving slabs to form access paths
- permeable block paving finish (Marshalls tegula priora colour harvest or as agreed) to main entrances



Scales

1:200 Metric Scale Bar

0 2 4 6 8 10 12 14 16 18

Note:
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Client

Gainsborough Group Construction Ltd

Job

Proposed new development of former police station at
22 Station Road,
Warminster,
Wiltshire.
BA12 9BR

Title

Proposed revised site layout

Scale

1:200@A1

Date

March 2024

Drawn

Stewart Maxwell BSc. (Hons)

Drg Number

APD-03-24-04 A

Revisions

A 15-05-24 Layout revised in accordance with planning comments.

APEX PLANNING DESIGN

Email: adrian@apexpd.co.uk

Appendix D Drainage Plan

(Press Alt + Left Arrow to return if using Hyperlinks)

KEY

- PROPOSED PRIVATE SURFACE WATER SEWER 150mmØ AT 1:150 UNLESS SHOWN OTHERWISE TAKING RUNOFF FROM ROADS AND PARKING
- PROPOSED PRIVATE SURFACE WATER SEWER 150mmØ AT 1:150 UNLESS SHOWN OTHERWISE TAKING RUNOFF FROM ROOF AREAS
- PROPOSED PRIVATE FOUL SEWER/DRAIN 150mmØ 1:150 MIN UNLESS SHOWN OTHERWISE
- EXISTING FOUL WATER DRAINAGE PUBLIC
- PROPOSED PRIVATE SOAKAWAY CONSTRUCTED USING MODULAR INFILTRATION UNITS
- PROPOSED PRIVATE SURFACE WATER POLYPROPYLENE INSPECTION CHAMBER (475Ø/450Ø P.P.I.C.)
- PROPOSED PRIVATE SURFACE WATER MINI ACCESS CHAMBER (MAC) 600mm MAX DEPTH
- PERCOLATION TEST LOCATION
- CP PROPOSED SURFACE WATER CATCHPIT CHAMBER (1200Ø P.C.C.)
- PROPOSED PRIVATE FOUL WATER POLYPROPYLENE INSPECTION CHAMBER (475Ø/450Ø P.P.I.C.)
- FLOOD ROUTING

CAUTION !
UNDERGROUND UTILITY SERVICES NOT SHOWN ON DRAWING

LINEAR DRAIN TO BE PROVIDED AT ACCESS THRESHOLD TO PREVENT LOCALISED RUNOFF ONTO PUBIC HIGHWAY

SA1
PROPOSED SOAKAWAY CONSTRUCTED FROM MODULAR INFILTRATION UNITS OF 95% VOID CONTENT- WAVIN AQUACELL CORE R OR EQUIVALENT
SIZE 12m (L) x 2.5m (W) x 1.2m (D)
TO DRAIN IMPERMEABLE AREA OF ROOF 458m2 AND SELF AREA 30m2 = 490m2
GL 117.70 (approx)
BASE 115.50 (approx)

SOAKAWAY 1

TRIAL PIT SA1 Q=9.18 m/h

ACCESS ROAD , PARKING SPACES AND TURNING HEAD TO BE CONSTRUCTED IN PERMEABLE MATERIALS WITH 300mm DEEP POROUS SUB BASE OF MIN 30% VOID CONTENT SUBJECT TO MINIMUM STRUCTURAL REQUIREMENTS. FINISHED SURFACE GRADIENTS TO BE 1 IN 60 MAX

SA2
PROPOSED SOAKAWAY CONSTRUCTED FROM MODULAR INFILTRATION UNITS OF 95% VOID CONTENT- WAVIN AQUACELL CORE R OR EQUIVALENT
SIZE 5m (L) x 2.5m (W) x 1.2m (D)
TO DRAIN IMPERMEABLE AREA OF ROOF 202m2 AND SELF AREA 12.5m2 = 220m2
GL 117.90 (approx)
BASE 115.70 (approx)

SA3
PROPOSED SOAKAWAY CONSTRUCTED FROM MODULAR INFILTRATION UNITS OF 95% VOID CONTENT- WAVIN AQUACELL CORE R OR EQUIVALENT
SIZE 3m (L) x 2.5m (W) x 1.2m (D)
TO DRAIN IMPERMEABLE AREA OF ROOF 93m2 AND SELF AREA 7.5m2 = 110m2
GL 117.70 (approx)
BASE 115.50 (approx)

TRIAL PIT SA3 Q=0.15m/h

PROPOSED FOUL DRAINAGE TO CONNECT INTO EXISTING CHAMBER
ASSUMED IL 116.90m AOD OR LOWER

ASSUMED ROUTE OF EXISTING FW PIPEWORK

PROPOSED FOUL DRAINAGE CONNECTION POINT FOR BLOCKS A AND B INTO NEW MANHOLE CONSTRUCTED ON EXISTING WW FOUL SEWER
ASSUMED IL 116.00m AOD OR LOWER FOR GRAVITY CONNECTION
S106 APPLICATION REQUIRED

PROPOSED FOUL DRAINAGE CONNECTION POINT FOR COACH HOUSE INTO EXISTING WW FOUL SEWER.
ASSUMED IL 116.40m AOD OR LOWER.
S106 APPLICATION REQUIRED

STATION ROAD

Garage

PLAN SHOWING PRELIMINARY FOUL AND SURFACE WATER DRAINAGE PROPOSALS
(Scale 1:200)

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NOTES

1. This drawing is copyright. Refer to details above.
2. This drawing is only to be used for the purposes described in the status box below.
   Work to figured dimensions only, do not scale for construction purposes.
3. This drawing is to be read in conjunction with all other drawings, details and specifications pertaining to the work described. It should only be used for the purpose marked in the status box below, and shall not be used for construction unless clearly marked CONSTRUCTION.
4. Materials and workmanship shall comply to the appropriate British Standards and Codes of Practice unless otherwise stated.
5. The activities required to construct the work, shown on drawings clearly marked CONSTRUCTION, may be subject to the provisions of the Construction (Design & Management) Regulations 2015. The Contractor and Client must ensure that they are adequately conversant with these regulations and that the appropriate procedures required under the regulations are observed at all times.
6. The contractor is responsible for locating services prior to excavation. Any services shown on the drawing should be considered 'indicative' only. Where no services are shown on the drawing it does not necessarily mean there are no services present, only that a services search has not been undertaken. Where in doubt refer to HSE booklet "avoiding danger from underground services"
7. Design Risk Assessment

   A risk assessment relating to potential hazards associated with the works described within this drawing, in so far as they have been designed by EDS Ltd, has been undertaken. Risks identified have been eliminated by design wherever practicable. The status with regard to residual risks is as follows:

   The work is at an early planning stage and is not sufficiently advanced to allow a meaningful assessment of risks to be undertaken at this time.

   Designer - EDS Drawing revision - A
   Date - 30.05.23

8. Pipe routing and chamber locations shown indicative only.

DATE.	DRWN.	CHKD.	REV.	NOTES.
15.05.24	TPS	LT	C	DRAINAGE PROPOSALS AMENDED TO SUIT REVISED DEVELOPMENT LAYOUT
31.05.23	TPS	LT	B	SOUTHERN FOUL DRAINAGE ROUTE AMENDED
30.05.23	TPS	LT	A	PRELIMINARY ISSUE

PROJECT MANAGER:-	TIM SULLIVAN
PROJECT ENGINEER:-	TIM SULLIVAN
DRAWN DATE:-	MAY 2023
SCALE & SHEET SIZE:-	1:200 @ A1

PRELIMINARY

EDS
Engineering & Development Solutions
- Flood Risk Assessment
- SuDS and Surface Water
- Foul and Sewage Treatment
- Highway Design
- Civil Engineering
- Statutory Approvals

EDS, Unit E4, Threemilestone Industrial Estate, Threemilestone, Truro, Cornwall TR4 9LD (01872) 306311 (Mob) 07973816457
Email: jan@eadsolutions.co.uk
www.eadsolutions.co.uk

CLIENT
GAINSBOROUGH GROUP CONSTRUCTION LTD.

PROJECT
REDEVELOPMENT OF LAND AT 22 STATION ROAD. WARMINSTER.BA12 9BR

DRAWING TITLE
PLAN SHOWING PRELIMINARY FOUL AND SURFACE WATER DRAINAGE PROPOSALS

PROJECT No.	DRAWING No.	REV.
J-2865	3001	C

Appendix E Infiltration Risk Scoring

(Press Alt + Left Arrow to return if using Hyperlinks)

Pollutant Risk Score

Is the development site located outside of flood zone 2 or 3? — Yes

Is the depth to the maximum ground water level greater than one metre below the base of the SuDS component? — Yes

Is the total pollution score less than or equal to 180? (See below)

Polution hazard traffic density

(●) Urban ( ) Other

Standard Average Annual Rainfall depth (SAAR depth)

( ) < 740 mm (●) 740 - 1060 mm ( ) > 1060 mm

Type of SuDS

( ) Continuous unlined linear collection and conveyance components (●) Shallow soakway (eg infiltration basin/trench permeable pavement)

Unsaturated zone depth

(●) > 15 m ( ) 5 - 15 m ( ) 1 - 5 m

Predominant flow type through soils between infiltration surface and groundwater

(●) Intergranular flow ( ) Mixed fracture and intergranular flow ( ) Fractured flow

Unsaturated zone material : Clay content

( ) > 15 % Clay (●) 1 - 15 % Clay ( ) < 1% Clay

Unsaturated zone organic carbon content : Soil Organic Matter (SOM) content

( ) > 15 % SOM (●) 1 - 15 % SOM ( ) < 1 % SOM

Unsturated zone material: soil pH

( ) > 8 (●) 5 - 8 ( ) < 5

	Risk Score (RS)	Weighting Factor (WF)
	1	15
	2	30
	2	30
	1	20
	1	20
	2	10
	2	10
	2	10
Total		145

Yes

Is the SuDS device further than 5 metres away from a surface water feature? — Yes

Infiltration possible

Appendix F Hydroloop H300 Product Data

(Press Alt + Left Arrow to return if using Hyperlinks)

H300 PRODUCT DATA SHEET

With a Hydraloop device, you can recycle up to 95% of shower & bath water and optionally 50% of washing machine water – which enables you to reuse up to 45% of the total in-house domestic water. Due to its innovative and breakthrough technology, Hydraloop reusable water is clean, clear, safe and certified and for toilet flushing, washing machine, garden irrigation and/or swimming pool top-up.

HYDRALOOP H300

H300	Input: Greywater from shower and bath Output: Two (2) valves for reusable water to the toilets and the washing machine Colour: Stone Front Plate: Stainless-steel front plate with white coloured logo and small status light
H300 Premium	Input: Greywater from shower and bath Output: Two (2) valves for reusable water to the toilets and the washing machine Choose from three colours: Dew, Chili and Stone Front Plate: Premium stainless-steel front plate with Hydraloop LED logo lights

ADD-ONS

Output Garden (auxiliary outlet)	One (1) extra valve for reusable water in the garden
Output Pool (auxiliary outlet)	One (1) extra valve for reusable water for the pool
Washing Machine Option (diverter valve)	Option to recycle 50% of greywater from washing machine, including sanitary lift pump
Lift pumps *	DAB Novabox 30/300. This lift pump is submerged underneath the floor DAB Genix VT 030. This lift pump is on the floor

*A lift pump is only necessary if Hydraloop device is positioned on same floor or a story higher as shower/bathtub

*Please note that the DAB pump listed is not certified to be sold into NA

HYDRALOOP H300 SPECIFICATIONS

Volume	300 liters / 80 gallons
Cleaning capacity	530 liters / 140 gallons per day
Dimensions	80 cm wide, 34 cm deep, 187 cm high 31.5” wide, 13.4” deep, 74” high
Voltage	100 / 240V, 24V internal
Usage	20 W during treatment. Average power consumption: 200kWh/year
WiFi	The Hydraloop device needs to be connected with an internal WiFi-network
Average reusable water quality	Non-potable water: CBOD5: 6ppm TSS: 3 ppm Turbidity: 2 NTU E. coli: <1 MPN/100mL pH: 7.1
Noise Level	± 44 dB.

LED LIGHT INDICATIONS

White	Hydraloop device provides reusable water.
Blue	Hydraloop device provides backup water (until reusable water becomes available).
Purple	The washing machine mode is active.
Green	In self-cleaning mode.
Orange + two (2) short sound signals per minute	The UV disinfection lamp is not functioning properly.
Red + three (3) short sound signals/minute	The water distribution pump has switched itself off. Which might happen when water is leaking somewhere in-house.

CONNECTION OVERVIEW

Input connections

Main greywater inlet into the top of the Hydraloop device: 40 mm| 1 ½" OD

- Bring all greywater sources into one dedicated line.
- Please ensure all greywater lines are separated from black water.
- If the greywater input is on a higher floor than the Hydraloop device, gravity will direct the flow.
- In other circumstances, install a lift pump.

Greywater inlet to the Hydraloop device from

1 H300 H600 Shower
Bath

2 H600* Tumble dryer
Air conditioning
Heat pump

3 H300 H600 Optional: Washing machine (only with inlet diverter)
You can connect only one (1) washing machine per Hydraloop device

Power/Network connections

4 **Permanent WiFi internet connection:**
Bandwidth of 2.4GHz or 5 GHz
Ethernet & Bluetooth (v 2.0)

5 **Power supply:** 100-120V (60Hz) or 200-240V
Outlet to be within 1.2 m of device

6 **Backup water inlet**
Tap water or other: 15 mm | ½" MNPT – flow of 12 LPM| 3.2 USGPM
If the flow rate is higher than 12LPM| 3.2 USGPM, floater cap and flow regulator.
If you use a rainwater pump, install an expansion vessel and 50-micron mesh pre-filter.

Output connections

7 **Wastewater outlet**
Connection to sewer: 40 mm| 1 ½" OD (min. of 50 mm| 2") with rubber sleeve
Wastewater from the Hydraloop device to sewer (gravity) operates on a timer for wastewater release every 7 days

8 **Toilet flushing** (pressurized):

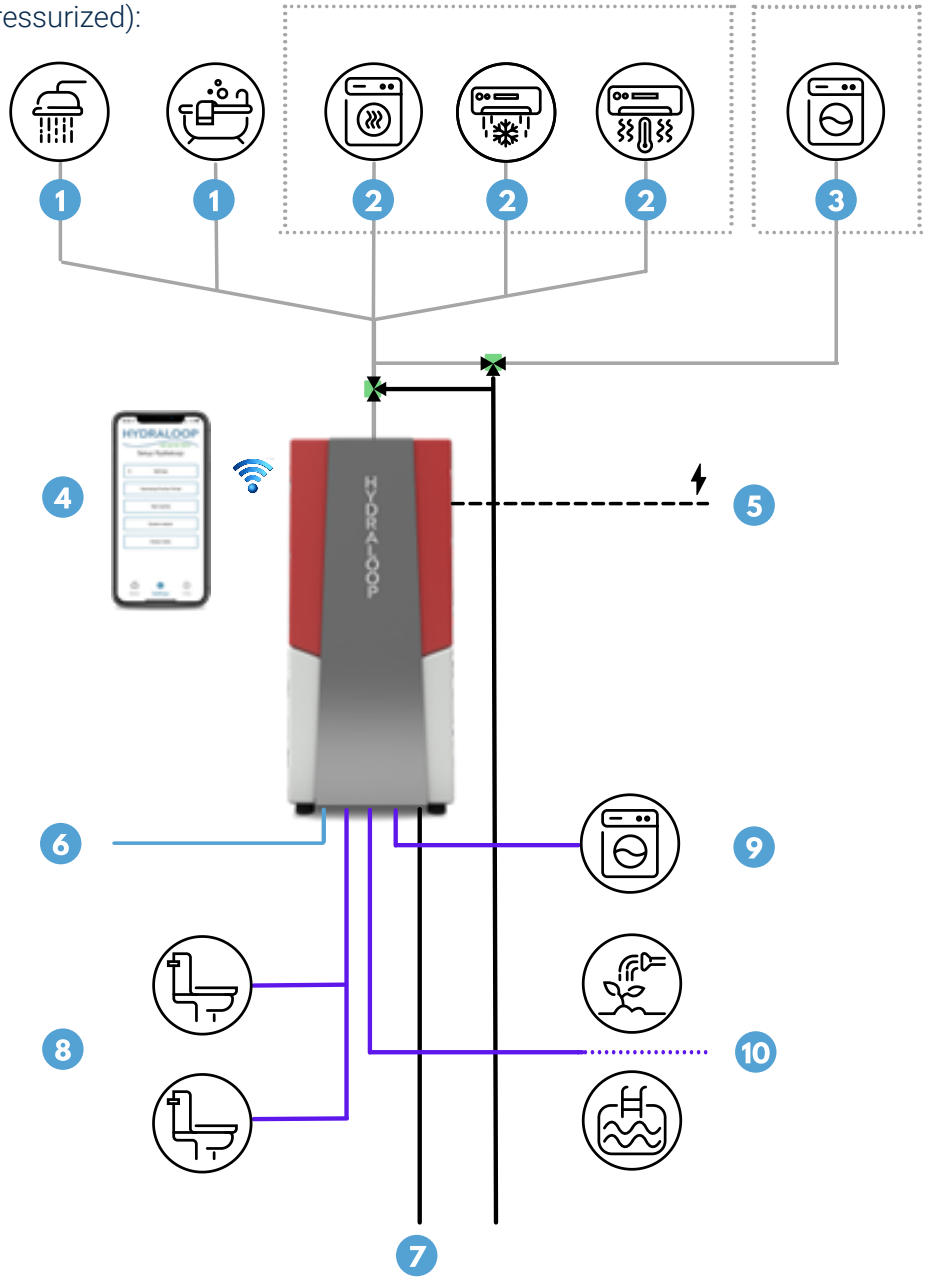
15 mm | ½" MNPT

9 **Washing machine** (pressurized):

15 mm | ½" MNPT

10 **Auxiliary outlet** (non-pressurized):

15 mm | ½" MNPT



Appendix G Regional Background and Context

(Press Alt + Left Arrow to return if using Hyperlinks)

Following the ruling on the "Dutch N" (Case C-293/17 and C-294/17)[7] in November 2018 through the Court of Justice of the European Union (CJEU), as well as several other lower profile cases in Ireland, Natural England wrote a letter[8] to a number of planning authorities in March 2022 identifying unacceptable phosphate levels within the waterways of the River Avon SAC and requested greater scrutiny of planning applications going forward which would increase nutrient loads into the water system[9], resulting in the Protected Area (SAC or SPA reaching a point where the ability to return the site to favourable conditions would be compromised or necessarily limit the conservation objectives of the area.

As identified the site benefits from a pathway into the River Avon which encompasses/is hydraulically connected to the River Avon SAC, this area is protected as a European Site under the Habitat Regulations 2017, as well as comprising a SSSI (Sites of Special Scientific Interest) and an SPA (Special Protection Area) in the lower reaches of the Avon Valley. this is ratified by UK planning law under paragraph 176 of the NPPF[10]. The SAC and SPA form part of the UK's national site map with SACs constituting protected habitats and species that are considered of European interest. This is shared as a Designated Feature underpinning multiple SSSIs.



Figure G.1 – Protected sites in the River Avon catchment[11].

[7] C-293/17 - Coöperatie Mobilisation for the Environment and Vereniging Leefmilieu (Link-to-source)
[8] Natural England Letter to LPAs - Advice for development proposals with the potential to affect water quality resulting in adverse nutrient impacts on habitats sites.
[9] Reg. 63 of the Habitats Regulations 2017.
[10] NPPF – UK Government National Planning Policy Framework (Link-to-source)
[11] Protecting the Hampshire Avon – Essential Habitats Directive advice notes for developers



Figure G.2 – Species of River Avon SAC. From left to right: Sea lamprey, European bullhead, Desmoulin's whorl snail[12].

[12] JNCC – River Avon – Designated Special Area of Conservation (SAC)

Appendix H Nutrient Neutrality Underlying Science

(Press Alt + Left Arrow to return if using Hyperlinks)

Phosphorus is an essential nutrient for the continued and healthy growth of Flora, including crops, garden plants and flowers. Phosphates provide the sugar-phosphate backbone for DNA and RNA and therefore are essential for reproduction, they also are essential for photosynthesis and are required for energy transfer in cells, forming an integral part of ATP (Adenosine Triphosphate) and ADP (Adenosine Diphosphate).

Phosphorus is contained in large concentrations in NPK fertilisers used by farmers to ensure high crop yields and healthy plant growth, compensating for the loss of soil productivity associated with modern agricultural practises and the relative loss of the O-Horizon[13]. The relative lack of naturally occurring phosphorus and the disruption in the natural phosphorus cycle require phosphorus to be extracted from raw phosphate rock (a finite resource), this disturbs the natural balance of the region and often leads to nutrient pollution[14]. Beyond the cultivation of crops, phosphates are found further down the supply chain in commercial waste associated with food production and processing. They are also useful additives in household detergents as they chelate calcium and magnesium ions preventing the deposition of limescale[15], however the principal share of domestic phosphorus output comes from human waste as can be seen in **Figure H.1**.

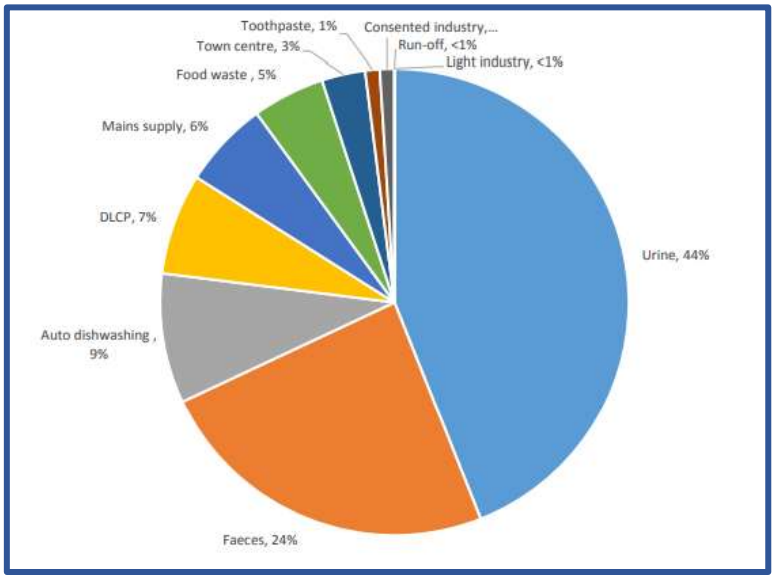


Figure H.1 – Breakdown of Phosphorus Arisings from Domestic Sources[16].

[13] O-Horizon – Britannica (Link-to-source)
[14] Environment Agency - Phosphorous and Freshwater Eutrophication Pressure Narrative (Link-to-source)
[15] European Commission - Phosphates and Alternative Detergent Builders (Link-to-source)
[16] Environment Agency - Phosphorous and Freshwater Eutrophication Pressure Narrative (Link-to-source)

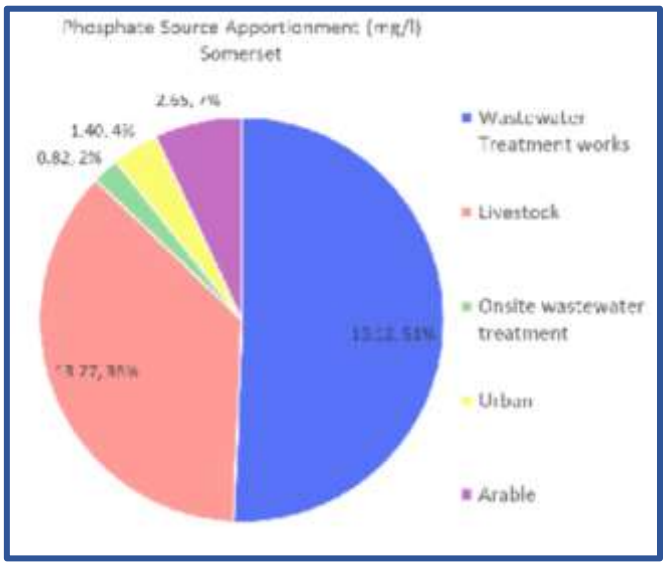


Figure H.2 – Phosphate Source Apportionment[17].

When nutrients are over sprayed due to variations in soil quality and the need to ensure proper nutrient spread, the excess is washed off the land by overland flows, these are either taken up by surface water sewer systems or discharged directly into local irrigation channels/open water courses[18]. Domestic nutrient arisings are usually taken away by foul/combined sewers into Wastewater Treatment Works (WwTWs), the treatment works employ Appropriate Treatment, Secondary Treatment or Advanced Treatment depending on the Population Equivalent of the Agglomeration they serve, the Downstream Receptor and depending on the quantity of Industrial Waste they are expected to accept. The treated water is then discharged into an appropriate receiving body, often rivers or watercourses[19]. Alternatively residential effluent is treated by a Package Treatment Plant and discharged into a watercourse directly or discharged to ground through a suitable Secondary Treatment Measure.

When nutrients enter the watercourse, they are taken up by aquatic plants which benefit in the same way as land based plants. However, high nutrient loads attract rapidly propagating plants such as Algae and Duckweed (*Genus Lemna*), which in the case of the former form dense monocultures called Algal Blooms (often called HABs – Harmful Algal Blooms)[20], this excessive plant/algal growth is called **Eutrophication**, the particular concern of Natural England is so called "Hyper Eutrophication".

[17] Collective Somerset Councils Letter to National Government.
[18] HR Wallingford – Greenfield Runoff Rate Estimation (Link-to-source)
[19] UK Government - Waste water treatment works: treatment monitoring and compliance limits (Link-to-source)
[20] UK Government – Algal Blooms (Link-to-source)



Figure H.3 – Example of at Surface Eutrophication.

Eutrophication is an excessive growth of filamentous Algae/Lemna which form in "mats" on the surface, these mats produce effects such as shading and smothering, which prevents sunlight reaching submerged oxygenating plants, which in turn die off and reduce the dissolved oxygen in the water body, additionally once the nutrient concentrations reduce there is a die-back of the Algal Blooms, which degrade at the bottom of the waterbody, this degradation is highly oxygen intensive and further removes dissolved oxygen. This lack of oxygen causes anoxia/hypoxia to species within the eco-system, which the environment can take years to recover from, if at all.

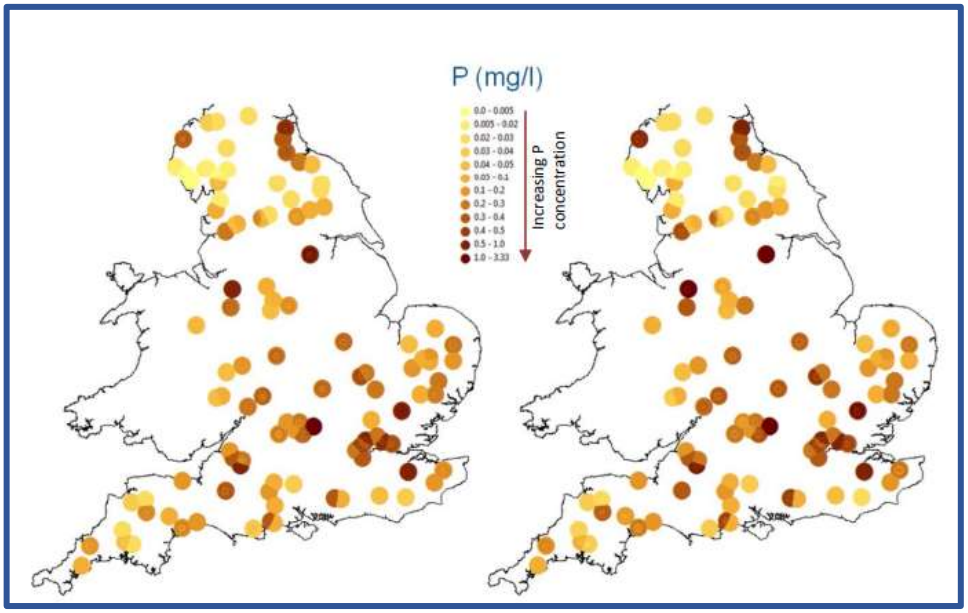


Figure H.4 – Estimated Phosphorus Concentrations for Study Sites as per Environment 2050s phosphorus concentrations Agency Report[21]

[21] Environment Agency - Climate change and eutrophication risk in English rivers (Link-to-source)

Appendix 3 – Proposed Development

Accommodation Schedule

Type/location	Apt. no	Floor	Beds	floor area m²
Apt/Block A	1	Ground	2	68
Apt/Block A	2	Ground	2	68
Apt/Block A	3	Ground	1	47
Apt/Block A	4	First	2+office	76
Apt/Block A	5	First	2	68
Apt/Block A	6	First	1	56
Apt/Block A	7	Second	2+office	76
Apt/Block A	8	Second	2	68
Apt/Block A	9	Third	1	55
Apt/Block B	1	Ground	2	68
Apt/Block B	2	Ground	2	68
Apt/Block B	3	First	2+office	76
Apt/Block B	4	First	2+office	88
Apt/Block B	5	Second	2+office	76
Apt/Block B	6	Second	1+office	54
Apt/Block B	7	Third	1	55
coach house Block C	1	First	1	50
coach house Block C	2	First	1	50
coach house Block C	3	First	1	50
Apt/Block D	1	Ground	2	64
Apt/Block D	2	First	2	90
Total	21			1371

Total Parking allocation spaces — 20+6 conversion

Legend

- Proposed Shrub/ornamental tree planting(scheme to be agreed)
- grass areas.
- permeable block paving finish (marshalls tegula priora blocks in grey or as agreed)
- permeable block paving finish (marshalls tegula priora blocks in traditional or as agreed)
- parking — permeable block paving to parking spaces with contrasting linear blocks as space demarcation, (marshalls tegula priora traditional with grey as demarcation) or as agreed
- refuge bin storage location
- cycle storage location
- buff colured paving slabs to form access paths
- permeable block paving finish (Marshalls tegula priora colour harvest or as agreed) to main entrances



Scales

1:200 Metric Scale Bar

0 2 4 6 8 10 12 14 16 18

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Client

Gainsborough Group Construction Ltd

Job

Proposed new development of former police station at
22 Station Road,
Warminster,
Wiltshire.
BA12 9BR

Title

Proposed revised site layout

Scale

1:200@A1

Date

March 2024

Drawn

Stewart Maxwell BSc. (Hons)

Drg Number

APD-03-24-04 A

Revisions

A 15-05-24 Layout revised in accordance with planning comments.

APEX PLANNING DESIGN

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