Table 5: Filter Strip

Filter Strip - Operation and maintenance requirements in accordance with CIRIA C753 - The SuDS Manual		
Maintenance Schedule	**Required Action**	**Frequency**
Regular maintenance	Remove litter and debris	Monthly, (or as required).
	Cut grass - to retain height within specified design range	Monthly (during growing season), or as required.
	Manage other vegetation and remove nuisance plants.	Monthly (at start, then as required).
	Inspect filter strip surface to identify evidence of erosion, poor vegetation growth, compaction, ponding, sedimentation and contamination (e.g. oils).	Monthly (at start, then half yearly).
	Check flow spreader and filter strip surface for evens gradients.	Monthly (at start, then half yearly).
	Inspect gravel flow spreader upstream of filter strip for clogging.	Monthly (at start, then half yearly).
	Inspect silt accumulation rate and establish appropriate removal frequencies.	Monthly (at start, then half yearly).
Occasional maintenance	Re-seed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required or if bare soil is exposed over > 10% of the filter strip area.
Remedial actions	Repair erosion or other damage by re-turfing or reseeding.	As required.
	Relevel uneven surfaces and reinstate design levels	As required.
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface.	As required.
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip.	As required.
	Remove and dispose of oils or petrol residues using safe standard practices.	As required.

Table 6; Bioretention System/ Raingarden

Bioretention System/ Raingarden - Operation and maintenance requirements in accordance with CIRIA C753 - The SuDS Manual		
Maintenance Schedule	**Required Action**	**Frequency**
Regular Inspections	Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and access standing water levels in underdrain (if appropriate) to determine if maintenance is necessary.	Quarterly
	Check operation of underdrains by inspection of flows after rain.	Annually
	Assess plants for disease infection, poor growth, invasive species etc and replace as necessary.	Quarterly
	Inspect inlets and outlets for blockage	Quarterly
Regular maintenance	Remove litter and surface debris and weeds.	Quarterly (or more frequently for tidiness or aesthetic reasons)
	Replace any plants, to maintain planting density.	As required
	Remove sediment, litter and debris build-up from around inlets or from forebays.	Quarterly to biannually
Occasional maintenance	Infill any holes of scour in the filter medium, improve erosion protection if required.	As required
	Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch,	As required
Remedial actions	Remove and replace filter medium and vegetation above.	As required but likely to be > 20 years

Appendix H – Phosphate Mitigation Strategy

TECHNICAL DESIGN NOTE

Hydrock

Project name	West Bradley House, Glastonbury		
Design note title	Phosphates neutrality assessment and Strategy		
Document reference	28421-HYD-TN-C-001		
Author	Gareth Jones		
Revision	P01		
Date	24 August 2023	Approved	✓

1. INTRODUCTION

This report summarises the nutrient neutrality calculation for the redevelopment of at the private residential estate at West Bradley House, Glastonbury, BA6 8LT.

The review of phosphates neutrality for this site is to comply with the Council's statutory Development Plan in accordance with: -

- Mendip District Local Plan Part I: Strategy and Policies (December 2014)

- Somerset Waste Core Strategy (2013)

The works include refurbishment and alterations to Grade II* listed building and adjoining structures, demolition of storage buildings and replacement with new ancillary residential buildings, refurbishment and conversion of storage barn/farm office to residential use, alterations to landscape and access. A new internal swimming pool will also form part of these works.

The proposed accommodation will include a total of 10 No suites against the 5No. existing suites. In addition to the above new external paving areas are proposed along the development, including also landscaping areas.

Figure 1: Existing aerial from the South-East (extract from RPA Architects Report)

2. EXISTING SITE AND DRAINAGE

The site comprises an area of land of approximately 4.00 Ha in size. The primary site entrance is from Bradley Lane with a second entrance through the Orchard to the West. The topographical survey indicates that the existing ground level within the existing site goes from 28.00m to 35.00 from West to East and from 32.00 to 30.00 from North to South relating to Ordnance Survey National Grid levels. The residential dwelling accommodate 5 suites and the following outbuildings: -

- Reb Brick barn. Open space masonry barn.
- Apple Barn.
- The Cart shed.
- Tractor Sheds.

The are three existing ponds one at high level (+32.00m) a middle pond at +29.90 and the low pond at +27.00m approximately. The Bardley Brook runs to the North of the premises. A ditch runs along the southern boundary from the upper pond towards the adjoining Church gardens. This is used predominantly for over flow from the upper ponds. During a site visit in the summer months this ditch was in constant flow. A secondary ditch/culvert arrangement caters predominantly for over flow from the middle pond discharging to the lower pond. See arrangement below on Figure 2.

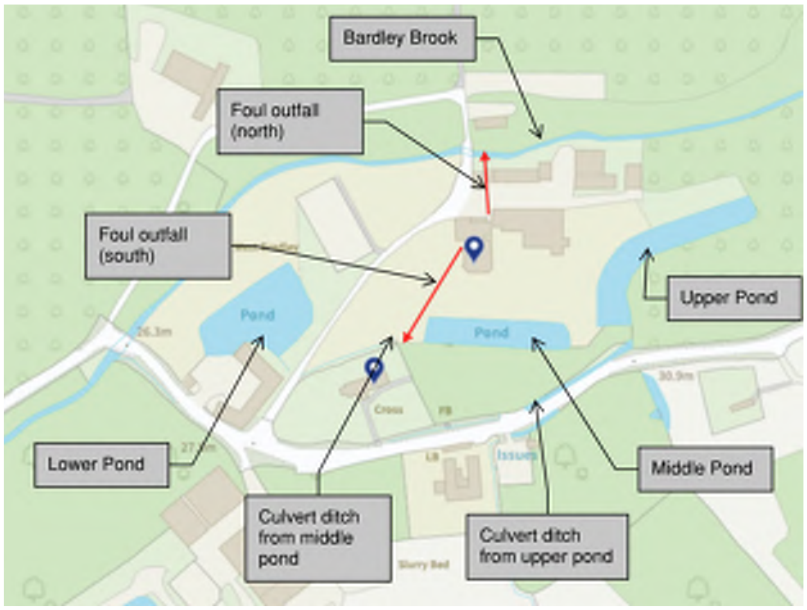


Figure 2: Listed Buildings (extract from Historic England)

A drainage survey has been carried out by Solum Surveying Ltd in July 20223 at the premises to determine the foul water arrangement and outfall from site. The following was concluded: -

1. There are no foul sewers within the site or local area
2. There are no treatment plants, septic tanks or cesspits on the premises
3. Foul water from the main house discharges to 2.no outfalls.
    a. To the north of the property, the foul drain outfalls directly to the brook
    b. To the east of the property the foul drainage discharges to the culvert from the overflow drain of the middle pond.

The historical barns and out buildings also have drains and above ground foul drains discharging to Bradley Brook. Refer to Appendix B for the drainage survey.

3. GROUND CONDITIONS

A geological report has been carried out by Hydrock. The ground conditions are reported as Langport Member, Blue Lias & Charmouth Mudstone Formation Langport Member, slightly sandy silty clay / silty clay of varying consistency. Between depths of 1.30m - 2.70m, this transitioned into extremely weak grey / dark grey mottled brown mudstone (excluding TP04 at which mudstone was encountered at 0.10m bgl).

Groundwater was encountered at depths between 0.80m below ground level (bgl) and 2.70m bgl during the investigation. Water levels recorded post-fieldwork ranged from 1.40m bgl to 1.99m bgl

The ground conditions are not suitable for the use of a foul water drainage field due to poor porosity and subsequent inadequate infiltration rates and also ground water levels.

4. FOUL DRAINAGE

4.1 Phosphates

In accordance with Mendip District Local Plan Part I: Strategy and Policies, the site location falls within the Somerset Levels and Moors Ramstar **Brue** Catchment area. A Ramsar site is a wetland site designated to be of international importance under the Ramsar Convention, also known as the 'The Convention on Wetlands', an intergovernmental environmental treaty established in 1971 by UNESCO. This is an area of risk

There to the requirement to protect this area from phosphate pollution, it is required to demonstrate that the proposed development has no adverse impact on the phosphate levels within the sub-catchment which it discharges into.

This is proven using the phosphate calculator, accessed from Mendip District and Somerset Council website. This calculator compares the proposed development land area usage and population figures with the site baseline to confirm no increase in phosphate loading occurs.

4.2 Baseline

The current site consists of an occupancy with 5-bedroom suites for 6 persons and historical agricultural barns for commercial orchard and arable farming. Refer to Appendix C for existing topographical arrangement.

4.3 Site proposals

The proposed renovation includes a newly installed swimming pool in the existing barn and the house and outbuildings will provide the following accommodation: -

Main house = 4 bedrooms, sleeps 5

Guest barn = 5 bedrooms, sleeps 10

Farmyard cottage = 2 bedrooms, sleeps 4

Total = 11 bedrooms, sleeps 19 : this is 14 additional persons than existing use

Due to the absence of foul sewers in the vicinity and ground conditions unsuitable for drainage fields; it is proposed to discharge foul water through biological treatment plant and outfall treated water to Bradley Brook.

The proposed works will use a Graf One2Clean package treatment plant (PTP), which has a phosphate reduction efficiency of 80.2%. It is a biological treatment plant with no requirement for chemical dosing. Refer to the enclosed certificate at the end of this form in Appendix D.

Note pool backwash will be dealt with separately. This will be collated in a cesspit, sized appropriately, and be emptied as and when required.

4.4 Proposed Phosphate Calculation

The Mendip District Phosphorous Budget online calculator is a tool designed to quantify the phosphorous loading of an area of land subject to a change of land use and population, in order to identify is proposed developments will be 'Phosphorous neutral'. Where the proposed development will create additional phosphorous into the system, solutions in how to offset this excess phosphorous and achieve phosphorous neutrality are presented.

The tool is only necessary for proposed developments that have the potential to increase phosphorous loading to rivers that flow into the Somerset Levels and Moors Ramsar site. The tool consists of seven worksheets covering the items below. Refer to Appendix E.

Stage 1 - Identifies the additional phosphorous as a result of changes in the population
Stage 2 - Calculates the phosphorous load from current land use
Stage 3 - Calculates the phosphorous load from future land uses
Stage 4 - Calculates the total change in phosphorous loading as a result of the proposed development
Stage 5 - Calculates the required solutions to achieve phosphorous neutrality under current wastewater permit limits
Stage 6 - Calculates the required solutions to achieve phosphorous neutrality under AMP7 wastewater permit limits
Stage 7 - Calculates the difference in mitigation solutions between current wastewater permit limits and AMP7 permit limits

4.5 Comparison of baseline and proposed

See below for a summary table showing the population values and land usage areas below. Refer to Appendix F & Appendix G for land usage area layouts. Note the house and guest accommodation will be used infrequently, likely 25% of the year, how ever a more conservative value has been used for a 'worst case scenario'.

		Baseline (pre-development)	Proposed (post-development)
Population		5 bedrooms	11 bedrooms
Land Usage	Urban	5,290m^2 (0.529ha)	5,378 m^2 (0.538ha)
	Open space/greenfield	15,659m^2 (1.566ha)	15,704 m^2 (1.570ha)
	Watercourse / pond area	5,680 m^2 (0.568ha)	5,680 m^2 (0.568ha)
	Horticulture	3,705 m^2 (0.371ha)	3,572 m^2 (0.357ha)
	Total	30,334 m^2 (3.034ha)	30,334 m^2 (3.034ha)

Online Calculator Output

Due to the limitations of the online calculator, the calculation has had to be split up to ensure the correct phosphate levels are calculated. Stage 1 and stage 2 have been completed twice to capture the baseline/proposed phosphate levels correctly, refer to Appendix H and I for the online calculator output pages.

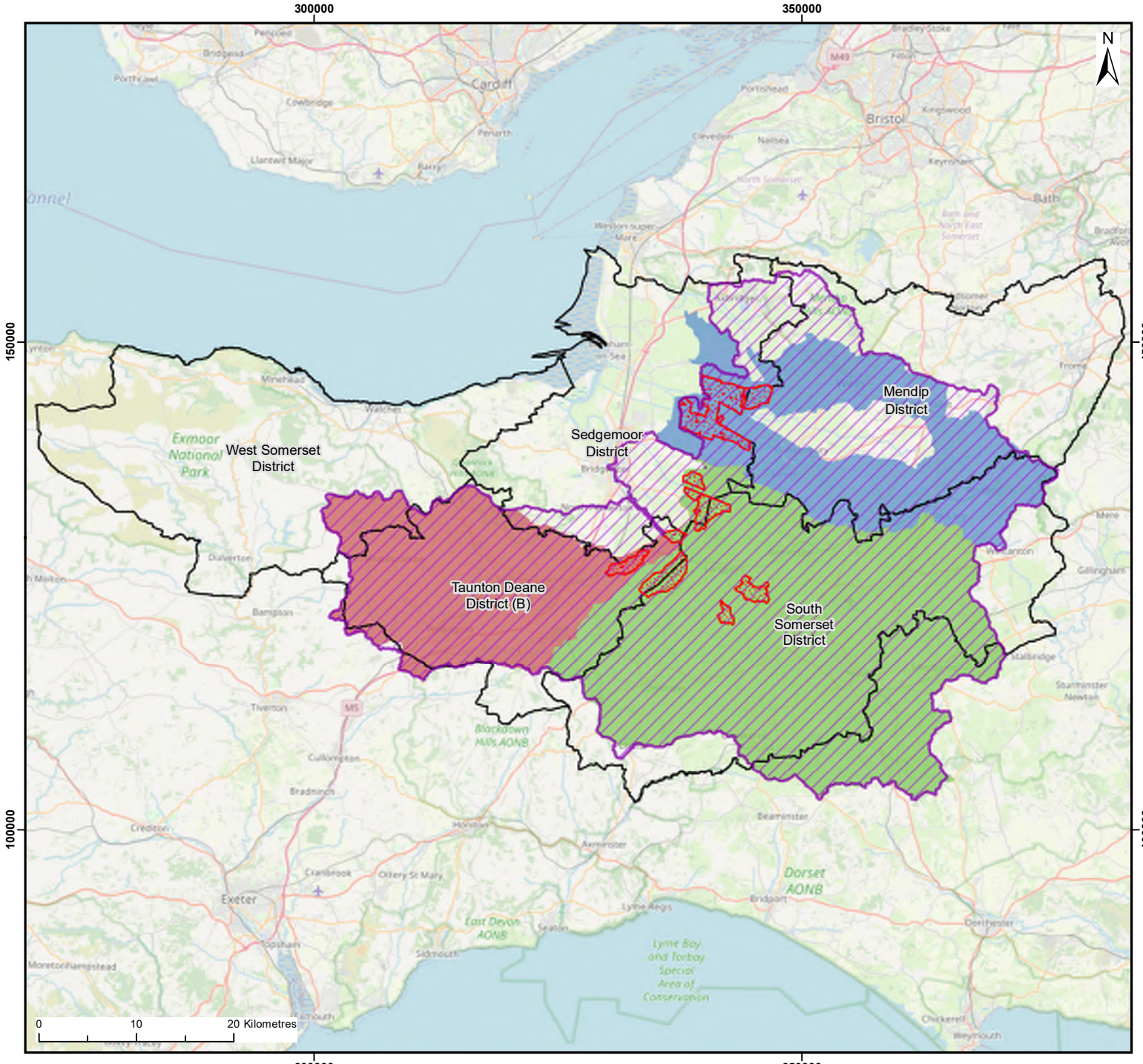
	Baseline (kg/yr)	Proposed (kg/yr)	Difference (kg/yr)
Population	4.75 (Calculation A)	4.58 (Calculation B)	- 0.17
Land Usage	0.84 (Calculation C)	0.84 (Calculation D)	- 0.00

After inserting 'dummy' figures in stage 1-3 on the online calculator to generate the above differences, calculation summary in Appendix J and K (and the above table) shows that there is a net betterment of **0.17kg/year.**

5. CONCLUSION

The proposed development will provide a betterment in total phosphorous load despite the increase in population with the introduction of a treatment plant. No further mitigation measures are required. This is to be agreed with Mendip District Council Local Planning Authority.

6. APPENDIX A – SOMERSET LEVELS AND MOORS SURFACE WATER CATCHMENT



Legend:

- Area of risk - Brue Catchment
- Area of risk - Parrett Catchment
- Area of risk - Tone Catchment
- Previous Natural England catchment map for information (now superseded)
- Local Planning Authorities Boundaries
- Somerset Levels & Moors Ramsar

Data Sources: Environment Agency, Natural England © HaskoningDHV UK Ltd, 2022.
Base map: © OpenStreetMap (and) contributors, CC-BY-SA. Sources: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community. Local Planning Authorities boundaries sourced from OS open data.

Client:	Project:
Somerset combined authorities	Phosphate Budget Calculator

Title: Somerset Levels and Moors Surface Water Catchment

Figure:	Drawing No:
1	PC1961-RHD-ZZ-XX-DR-Z-0010

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	09/03/2022	GC	OB	A4	1:575,000

Co-ordinate system: British National Grid

Royal HaskoningDHV
Enhancing Society Together

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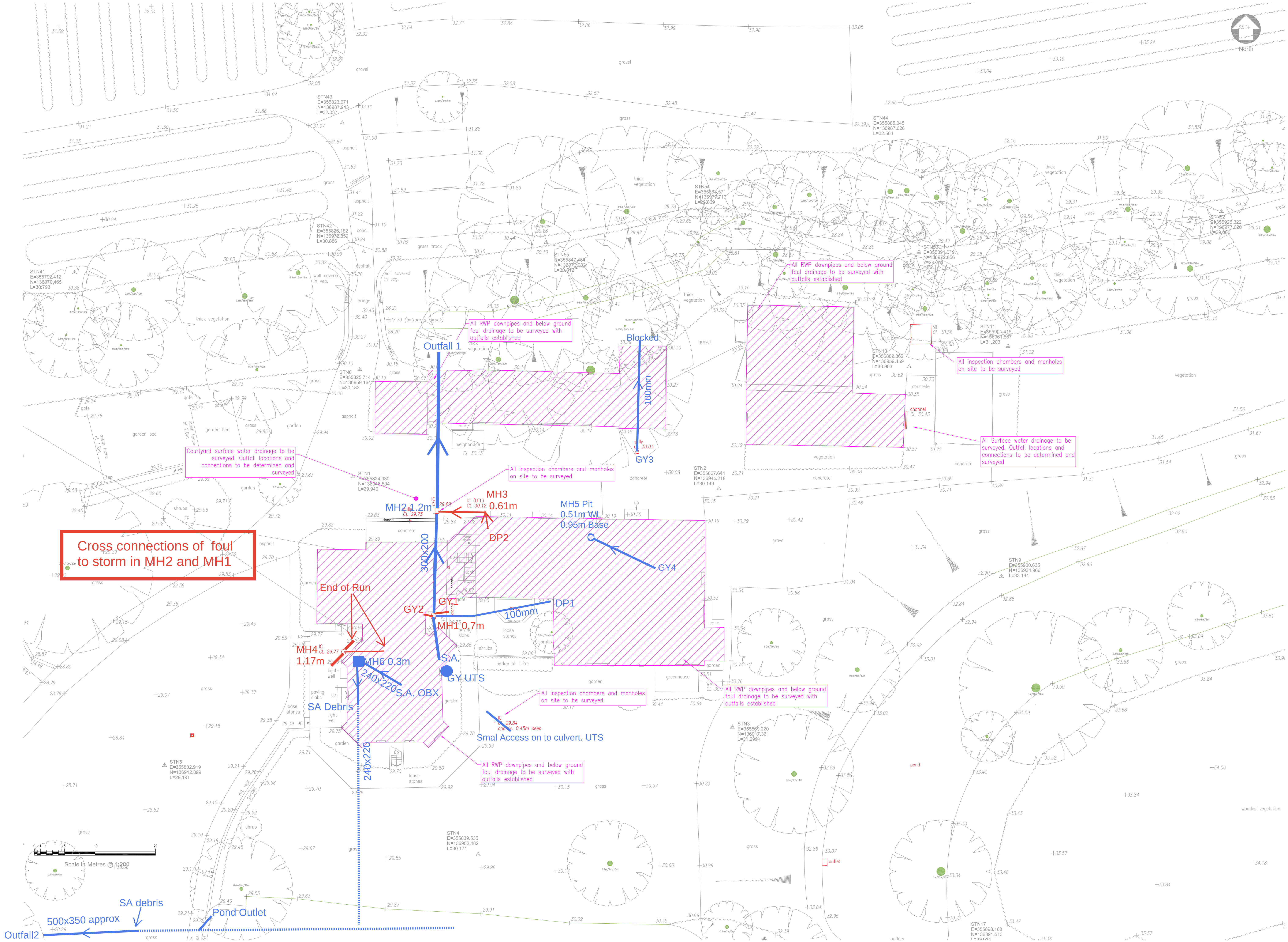
www.royalhaskoning.co.uk

7. APPENDIX B – DRAINAGE SURVEY



North
Outfall 1
Blocked
100mm
GY3
All RWP downpipes and below ground foul drainage to be surveyed with outfalls established
All inspection chambers and manholes on site to be surveyed
All Surface water drainage to be surveyed. Outfall locations and connections to be determined and surveyed
Courtyard surface water drainage to be surveyed. Outfall locations and connections to be determined and surveyed
MH2 1.2m
MH3
0.61m
DP2
MH5 Pit
0.51m WL
0.95m Base
GY4
Cross connections of foul to storm in MH2 and MH1
300x200
End of Run
GY1
GY2
DP1
100mm
MH1 0.7m
MH4
1.17m
MH6 0.3m
S.A.
GY UTS
240x220
S.A. OBX
SA Debris
Smal Access on to culvert. UTS
240x220
SA debris
500x350 approx
Pond Outlet
Outfall2
Scale in Metres @ 1:200

8. APPENDIX C – EXISTING SITE LAYOUT

Please note that the grid shown on this drawing is as follows;

- ☐ Arbitrary
- ☐ Arbitrary but related to building line
- ☐ Arbitrary but approx. related to North
- ☐ Best fit to an Ordnance Survey Digital Sheet
- ☒ Related to the Ordnance Survey National Grid

Please note that the levels shown on this drawing are as follows;

- ☐ Arbitrary and related to a temporary bench mark
- ☐ Related to an Ordnance Survey Bench Mark
- ☒ Related to the Ordnance Survey National GPS Network

Level positions are indicated by a cross or the decimal point

Type Ordnance Survey
Position N/A
Value N/A

All trees sizes are approximate and should be checked on site before using information. Where guaranteed tree species become important the services of a tree expert should be employed

Notation : diameter of trunk / Height / Spread

Where drainage covers have been lifted data has been recorded for each individual manhole from the surface and connections to other manholes, pipes or gullys are assumed. Where information is required by accessing the manhole or tracing to other manholes then a services trace will be needed.

13727-01

CADPLAN
PRECISION MEASUREMENTS
Land Surveys . Measured Building Surveys . 3D Laser Scanning
Utility Surveys . Lease Plans . 3D Models . Rights of Light Surveys
Cob Tree House Oldbury Lane Ightham Kent TN15 9DA
Tel : 01732 469100 Fax : 01732 469101 E : post@cadplan.co.uk

Client
Richard Parr Associates

Project
West Bradley House
West Bradley
Somerset BA6 8LT

Drawing Title
Topographic Survey

Sheet/Scale	Date	Drawn	Checked
A0@1:200	11/08/22	B.J.V.	C.S.D.
Project No.	Drawing No.	Preliminary	Revision
13727	01		

9. APPENDIX D – FOUL WATER TREATMENT PLANT

Prüfinstitut für Abwassertechnik GmbH

PERFORMANCE RESULTS

Otto Graf GmbH
Carl-Zeiss-Str. 2 - 6, 79331 Teningen, Germany

EN 12566-3
Small wastewater treatment systems for up to 50 PT

Small wastewater treatment system one2clean
SBR plant in one two-zone polypropylene tank

Test report PIA2014-216B14.01.e

Nominal organic daily load*	0.27	kg/d	
Nominal hydraulic daily load	0.75	m³/d	
Material	polypropylene		
Treatment efficiency (nominal sequences)		Efficiency	Effluent
	COD	94.2 %	43 mg/l
	BOD_5	98.0 %	7 mg/l
	SS	96.3 %	14 mg/l
	NH_4-N**	98.3 %	0.5 mg/l
	N_{tot}**	87.0 %	7.9 mg/l
	P_{tot}	80.2 %	1.6 mg/l
Electrical consumption	0.63	kWh/d	

**at a test influent of ≥ 300 mg/l BOD_5 (mean)*
***determined for temperatures ≥ 12°C in the bioreactor*

Performance tested by:

PIA – Prüfinstitut für Abwassertechnik GmbH
(PIA GmbH)
Hergenrather Weg 30
52074 Aachen, Germany

This document replaces neither the declaration of performance nor the CE marking.

Notified Body No.: 1739

Certified according to ISO 9001:2008

DAkkS Deutsche Akkreditierungsstelle D-PL-17712-01-00

Prüfinstitut für Abwassertechnik GmbH
geprüft - tested - testé

Elmar Lancé November 2014

10. APPENDIX E – PHOSPHOROUS BUDGET CALCULATOR PROCESS

Phosphorous Budget Calculator
v3.1

Introduction

Following the Dutch Nitrogen Case which ruled that where a site is failing to achieve condition due to pollution, the potential for a new development to add to the nutrient load is "necessarily limited". Ramsar sites are classified as 'European Sites' under the National Planning Policy Framework (NPPF) Paragraph 176. As such, Natural England's view is that any development proposal that adds phosphorous into the catchment of Ramsar sites, such as the Somerset Levels and Moors, is likely to have a significant effect. Proposed developments likely to affect European Sites should be subject to Habitats Regulations Assessment to assess the Likely Significant Affect on the Ramsar. Application with a Likely Effect will require an Appropriate Assessment to assess the implications of the proposal on the designated site.

This tool is designed to quantify the phosphorous loading of an area of land subject to a change of land use and population, in order to identify is proposed developments will be 'Phosphorous neutral'. Where the proposed development will create additional phosphorous into the system, solutions in how to offset this excess phosphorous and achieve phosphorous neutrality are presented.

This tool is only necessary for proposed developments that have the potential to increase phosphorous loading to rivers that flow into the Somerset Levels and Moors Ramsar site. Developments that are located outside of the hydrological catchment but will connect to a Wastewater Treatment Works (WwTW) that drains to a river within the catchment should not complete Stages 2 and 3.

The methodology employed within this tool was, in part, guided by Natural England's advice on nutrient neutrality in relation to the Stodmarsh designated sites, published in November 2020.

This tool consists of seven main worksheets:

Stage 1 - Identifies the additional phosphorous as a result of changes in the population
Stage 2 - Calculates the phosphorous load from current land use
Stage 3 - Calculates the phosphorous load from future land uses
Stage 4 - Calculates the total change in phosphorous loading as a result of the proposed development
Stage 5 - Calculates the required solutions to achieve phosphorous neutrality under current wastewater permit limits
Stage 6 - Calculates the required solutions to achieve phosphorous neutrality under AMP7 wastewater permit limits
Stage 7 - Calculates the difference in mitigation solutions between current wastewater permit limits and AMP7 permit limits

About

This Phosphorous budget calculator is designed to allow the user to:
- Calculate the phosphorous budget for a proposed development and if, in its current form, the proposed development is phosphorous neutral; and
- Assess the various mitigation options if the proposed development is not phosphorous neutral.

The tool has been designed so that the user is able to update the data and methods in light of any new research or understanding

The information supplied in this tool is for guidance purposes only and is not intended to provide an exact budget calculation due to the limitations and assumptions of the model. The user is responsible for ensuring the accuracy and completeness of all data entered, be it manually or automatically, and used by this tool. The user is also responsible for any commercial decisions taken on any of the outputs of this tool.

Royal HaskoningDHV will not be liable for any of the following arising from the use of this tool (including from any negligence on the part of Royal HaskoningDHV):
(i) loss of anticipated profits or expected future business;
(ii) damage to reputation or goodwill;
(iii) damages, costs or expenses payable by the user to any third party;
(iv) loss of any order or contract; or
(v) indirect or consequential loss of any kind.

This Phosphorous budget calculator has been developed by Royal HaskoningDHV on behalf on Somerset West and Taunton District Council.

Phosphorous budget calculator, v3.1 (released March 2021)

General help

The Tool uses the following colour coding to indicate the functionality to the user. These colours are:

The user needs to input a value here
This contains fixed or calculated values and the user does not need to input a value

Stage 1

This stage calculates the change in phosphorous loading as a result of changes in the population of a site.

Step 1: The user should input the additional number of units that are proposed by the development. This is then multiplied by the occupancy rate per dwelling.

Step 2: The user has the option to select whether sewage from the proposed development will be handled by Wastewater treatment works or by Package treatment plants. The user must select one or the other, both options cannot be used.

Step 2a: If the proposed development is to use **Wastewater Treatment Works** (**WwTW)**, then the user should select 'Yes' from the drop down box. Following this, the user should select the WwTW that the development will connect to.

Step 2b: If the proposed development is to use **Package Treatment Plants (PTPs)**, then the user should select 'Yes' from the drop down box. Following this, the user should input the reduction efficiency of the package treatment plant. If the efficiency is unknown then the user should input a precautionary efficiency of 90%.

Stage 2

This stage calculates the phosphorous load from the current land use. Step 2: The user should input the area (hectares) of the current land uses that make up the total area of the development site. A GIS viewer can be used to identify the land uses on a coarse scale (https://gridreferencefinder.com/). However, if more detail is known about the site land uses then this should be manually inputted by the user.

Stage 3

This stage calculates the phosphorous load from the current land use.

Step 2: The user should input the proposed land uses that make up the total area of the development site. Any pre-determined on-site mitigation should also be inputted here.

Bespoke banking coefficients should be inputted for constructed wetland that can be evidenced

Stage 4

This stage provides a summary of the phosphorous loads calculated in stages 1-3 and presents the phosphorous budget for the proposed development.

A 20% precautionary buffer is included to account for uncertainties in the runoff coefficients used. The User has the option to change this buffer should this be appropriate.

Stage 5

This stage calculates the area and land uses of the mitigation site required for the proposed development to be phosphorous neutral, under current WwTW permit limits.

Step 4: The user has the option to select the amount of phosphorous load to be offset by the various land uses, which will then calculate the relevant area of land (Hectares) that needs to be changed.

Step 5: The user has the option to input the required area of land (hectares) to be mitigated until the project is phosphorous neutral, which will then calculate the equivalent phosphorous load for each land use.

The banking coefficients for wetlands uses a value of 8 kg/ha/yr for guidance purposes only. A site bespoke site-specific value will need to be calculated

Stage 6

This stage calculates the area and land uses of the mitigation site required for the proposed development to be phosphorous neutral, under AMP7 WwTW permit limits.

Step 4: The user has the option to select the amount of phosphorous load to be offset by the various land uses, which will then calculate the relevant area of land (Hectares) that needs to be changed.

Step 5: The user has the option to input the required area of land (hectares) to be mitigated until the project is phosphorous neutral, which will then calculate the equivalent phosphorous load for each land use.

Stage 7

This stage provides a summary in the differences in mitigation land use area between the current WwTW permit limits and the AMP7 WwTW permit limits

Land Use Definitions

The land uses presented in this tool followed the CORINE 2018 land use data. Definitions of key land uses are presented below:

Land Use	Description
Urban	Development which encompasses the built form, gardens, pathing, roads, hardstanding's, parks and small areas of open space, ponds and SuDS. The phosphorous load results from sewer overflows and from drainage that picks up phosphorous on the urban land. Agricultural barns used for storage of materials, farming supplies and temporary livestock can be classified as Urban. However, barns used for a specific farming type (e.g. piggeries and chicken farms) should be classified under the relevant farming land use.
Mineral Workings and Quarries	An open or surface mineral working, usually for the extraction of building stone, as slate, limestone, etc.
Allotment and City farms	Wholly or mainly cultivated for the production of vegetable or fruit crops for consumption by the tenant or local community. In some cases the land will also be used for ornamental plants and the keeping of hens or bees.
Sports and Leisure facilities	Facilities used for recreational purposes such as managed sports pitches, athletic fields, gymnasiums, swimming pools etc.
Transport tracks and ways	Encompasses large infrastructure such as motorways and significant rail infrastructure. Small scale roads and tracks are covered under the Urban land use
Transport terminals	A large scale facility where passengers and freight are assembled or dispersed
Cereals	Holdings on which cereals, combinable crops and set-aside account for more than two thirds of the total standard output.
Dairy	Holdings on which dairy cows account for more than two thirds of their total standard output.
Cropping	Holdings on which arable crops (including field scale vegetables) account for more than two thirds of the total standard output, excluding holdings classified as cereals; holdings on which a mixture of arable and horticultural crops account for more than two thirds of their total SO excluding holdings classified as horticulture and holdings on which arable crops account for more than one third of their total standard output and no other grouping accounts for more than one third.
Horticulture	Holdings on which fruit (including vineyards), hardy nursery stock, glasshouse flowers and vegetables, market garden scale vegetables, outdoor blubs and flowers and mushrooms account for more than two thirds of their total standard output.
Pig Farming	Holdings on which pigs account for more than two thirds of their total standard output.
Lowland grazing / Paddock	Holdings on which cattle, sheep and other grazing livestock account for more than two thirds of their total standard output except holdings classified as diary. A holding is classified as lowland if less than 50% of its total area is in the Less Favoured Area (LFA). A paddock is classified as a small enclosures used for grazing horses.
Mixed livestock	Holdings for which none of the other categories account for more than two thirds of total standard output. This category includes mixed pigs and poultry farms as wells as farms with a mixture of crops and livestock (which neither accounts for more than two thirds of standard output.
Poultry farming	Holdings on which poultry account for more than two thirds of their total standard output.
General Arable	Use this option if unsure of the breakdown of arable land.

Improved grass	Land used for grazing (other than arable land) where over one third of the sward comprises, singly or in a mixture, ryegrass, cocksfoot or timothy, or land that has been improved by management practices such as liming and top dressing, where there is not a significant presence of sensitive plants species indicative of native unimproved grassland.
Unimproved grass	Land used for grazing or mowing which is not normally treated with mineral fertiliser or lime and contains a significant presence of sensitive plant species indicative of native unimproved grassland.
Open Space / Greenfield	Greenfield areas that have not been in agricultural use for at least 10 years and are not subject to unmanaged recreational use.
Woodland	Tree-covered areas which either arose naturally or as a result of plantations. This includes conifer woodland, mixed woodlands and broad-leaved woodlands etc.
shrub / heathland / bracken / bog	Land that contains extensive areas of either shrubs, heath or bracken A bog refers to land that is a wetland area of muddy ground that can accumulate peat.
Freshwater marsh	Non-tidal, non-forested marsh wetland that contains fresh water, and is continuously or frequently flooded.
Meadow / semi natural grassland	A meadow is a field habitat vegetated by grass and other non-woody plant that has an open character and is not grazed by livestock
Wetland	Land use specific to constructed wetland only and does not include ponds or SuDS.

Wastewater Permit Limits

Current WwTW permit limits Vs AMP7 WwTW permit limits

The Water industry is looking to update and bring in new final effluent phosphorous consent which should come in before 2025, as part of the Water Industry National Environment Programme (WINEP). The enhancements are required to meet more onerous environmental permit requirements. Many WwTW in Somerset do not currently have a permit limit. However, following plans by Wessex Water, a large number will operate to a new permit level under AMP7. Further information regarding AMP7 permit limits can be found in the following documents:

0501C Atkins Phosphorus removal technology review

Representation C3 WINEP - Phosphorus removal

Soil Drainage Criteria

The drainage characteristics of soil has a control over the dominant flow pathways for pollutant losses and as such controls the loading of Phosphorous into surface water bodies. Therefore the runoff coefficients from various land uses are different in freely draining soil compared to impermeable soil. For impermeable soil under Arable land use, it is assumed that man made drainage systems would be in place, whereas rough grazing and woodland areas would not be drained. For free-draining soil, the majority of the flow would be to groundwater, and it is assumed that drainage would not be required. The user should use the Soilscapes tool (Cranfield soil and Agrifood insitute, 2020) to determine the dominant soil type on their site. Soilscapes can be found at http://www.landis.org.uk/soilscapes/index.cfm

The following table is used to identify the dominant drainage type of the proposed development from the soil type identified above. The drainage type should then inform Stage 2 of the calculator

Free draining		
Colour	ID	Name
	3	Shallow lime-rich soils over chalk or limestone
	4	Sand dune soils
	5	Freely draining lime-rich loamy soils
	6	Freely draining slightly acid loamy soils
	7	Freely draining slightly acid but base-rich soils
	10	Freely draining slightly acid sandy soils
	11	Freely draining sandy Breckland soils
	12	Freely draining floodplain soils
	13	Freely draining acid loamy soils over rock
	14	Freely draining very acid sandy and loamy soils

Impermeable		
Colour	ID	Name
	1	Saltmarsh soils
	2	Shallow very acid peaty soils over rock
	8	Slightly acid loamy and clayey soils with impeded drainage
	9	Lime-rich loamy and clayey soils with impeded drainage
	15	Naturally wet very acid sandy and loamy soils
	16	Very acid loamy upland soils with a wet peaty surface
	17	Slowly permeable seasonally wet acid loamy and clayey soils
	18	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils
	19	Slowly permeable wet very acid upland soils with a peaty surface
	20	Loamy and clayey floodplain soils with naturally high groundwater
	21	Loamy and clayey soils of coastal flats with naturally high groundwater
	22	Loamy soils with naturally high groundwater
	23	Loamy and sandy soils with naturally high groundwater and a peaty surface
	24	Restored soils mostly from quarry and opencast spoil
	25	Blanket bog peat soils
	26	Raised bog peat soils
	27	Fen peat soils

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11. APPENDIX F - PRE-DEVELOPMENT CATCHMENT AREA

LEGEND

Site Boundary		
Building area total	= 1,340m²	(0.134 ha)
Hardstanding area total	= 3,950m²	(0.395 ha)
TOTAL URBAN AREA	= 5,290m²	(0.529 ha)
Horticulture area total	= 3,705m²	(0.371 ha)
Open space / Greenfield area total	= 15,659m²	(1.566ha)
Watercourse / Pond area total	= 5,680 m²	(0.568ha)
TOTAL SITE AREA	= 30,334m²	(0.303 ha)

BRADLEY BROOK

KEY PLAN

NOTES

1. This drawing is to be read in conjunction with all relevant drawings, specifications and documentation.
2. The position, size and levels of all drains are to be confirmed on site prior to the commencement of the works and any discrepancies reported immediately to the Engineer.
3. Do not scale from this drawing, work to dimensions or co-ordinates provided. All levels are in metres and all dimensions are in millimeters, unless otherwise noted.

REVISIONS

REV	REVISION NOTES/COMMENTS	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
P01	First Issue	G.JONES	01.09.2023	GJ	01.09.2023	GJ	01.09.2023

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PROJECT
WEST BRADLEY HOUSE

TITLE
PRE-DEVELOPMENT LAND USAGE

HYDROCK PROJECT NO.	SCALE @ A1
C-28421	1:500

STATUS DESCRIPTION	STATUS
SUITABLE FOR INFORMATION	S2

DRAWING NO. (PROJECT CODE-ORGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)	REVISION
28421-HYD-00-XX-SK-C-0001	P01