

Water Neutrality & Nitrate Statement (Building Regulations Part G)

Atlas Planning

Proposed site at:

41 Beach Road,
Creek Cottage,
Emsworth,
PO10 7HR



Version	Revision	Date	Author	Reviewer	Project Manager
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2	A	02.06.2023	Malcolm Maclean	Malcolm Maclean	Nikos Protogeros
2	B	28.07.2023	Malcolm Maclean	Malcolm Maclean	Nikos Protogeros

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1.0 Water Neutrality

1.1 Introduction

This Water Neutrality & Nitrate Statement has been written by SRE for Atlas Planning on behalf of the end client (the client) to demonstrate how the new residential development at Creek Cottage, 41 Beach Road, Emsworth, PO10 7HR (Proposed Development) will meet the requirements of Natural England's Position Statement for Minimising Water Use¹ as well as Part G of Building Regulations 2013 (as applicable) and identifying Nitrate Neutrality and local planning policy.

*"The developments that take place for which the use of water in the supply area before the development is the same or lower than after the development takes place"*².

Water neutrality is a concept whereby the total demand for potable mains water supply within a planning area after development has taken place is the same (or less) than it was before development took place. If this can be achieved, the overall balance for water demand is 'neutral', and there is considered to be no net increase in demand as a result of development. To accomplish this, it is necessary for new development to be subject to appropriate planning policy, which aims to ensure that homes and businesses are built to high standards of water efficiency through the use of water-efficient fixtures and fittings, and in some cases, rainwater harvesting and greywater recycling.

1.2 Proposed Development

The Proposed Development is a new replacement 5-bed detached 2 storey house with garage, onsite parking and retained soft landscaping. The current 6 bed detached house is being demolished as part of planning application. The site location is shown below, with further architectural plans included in Appendix A & Figure 1:



Figure 1 – Proposed site details (OB Architecture)

¹ Natural England's Position Statement for Applications within the Sussex North Water Supply Zone September 2021 – Interim Approach

² Natural England's Position Statement for Applications within the Sussex North Water Supply Zone September 2021

For a replacement 'new development' as is being proposed here, it is theoretically possible to achieve water neutrality within the site through the complete management of the water cycle within the development area.

1.2.1 Policy & Regulations

The Proposed Development is required to meet both local planning policy as well as The National Standards (Part G) requirements in relation to water specification and use on site. These are summarised in Table 1 below:

Regulations, Guidance & Planning Policy	Requirement
Building Regulations-Part G	<u>Part G2</u> The minimum Part G standard equates to 125l/person/day and enhanced standard 110l/person /day (both including 5l/p/d external water use) and apply to a dwelling formed by: • New construction, • Material change of use where the building is used as a dwelling where previously it was not, or, • Material change of use where the building contains a flat, where previously it did not. "The estimated consumption of wholesome water of a new dwelling should be no more than 125 litres/person/day or 110 litres/person/day where the optional requirement applies. This includes a fixed factor of water for outdoor use of 5 litres/person/day."³ Therefore, the proposed development is going to consider the maximum calculated consumption of potable water (125 l/p/d) as per regulation unless otherwise asked by local authority.
Natural England's Position Statement for Applications within the Hampshire	The aim of water neutrality is to minimise the impact on existing water resources, infrastructure, and the environment. Natural England's methodology which allows for a 10% precautionary buffer on top of the optional lower Building Regulations water use per person standard of 110 litres/person/day.⁴ The definition of water neutrality is the use of water in the supply area before the development is the same or lower after the development is in place. • Minimise water use of new buildings • Water offsetting is required • Reuse water
Nutrient Budget Calculator	For nutrient neutrality calculation the water usage l/p/d would be considered as 125l/p/d including 5l/p/d as outdoor use⁵.

³ Approved Document Part G 2015 edition +2016 amendments, Appendix A – Water efficiency calculator for new dwellings

⁴ Position statement and mitigation plan for Havant Borough_May2022

⁵ Position statement and mitigation plan for Havant Borough_May2022

Table 1 - Summary of Regulations, Guidance & Planning Policy Requirement

The Proposed Development sits within one of Natural England's 'water neutrality and Nitrate Neutral' areas impacting the Solent and therefore these issues are applicable to the application site and will be assessed in this report.

The Proposed Development will seek to mitigate additional water use and nitrate impact compared to the present building on the site.

1.2.2 Natural England - Water Neutrality

Natural England have defined the overall area of interest which includes the North Sussex Water Resource Zone as per Table 2 below:

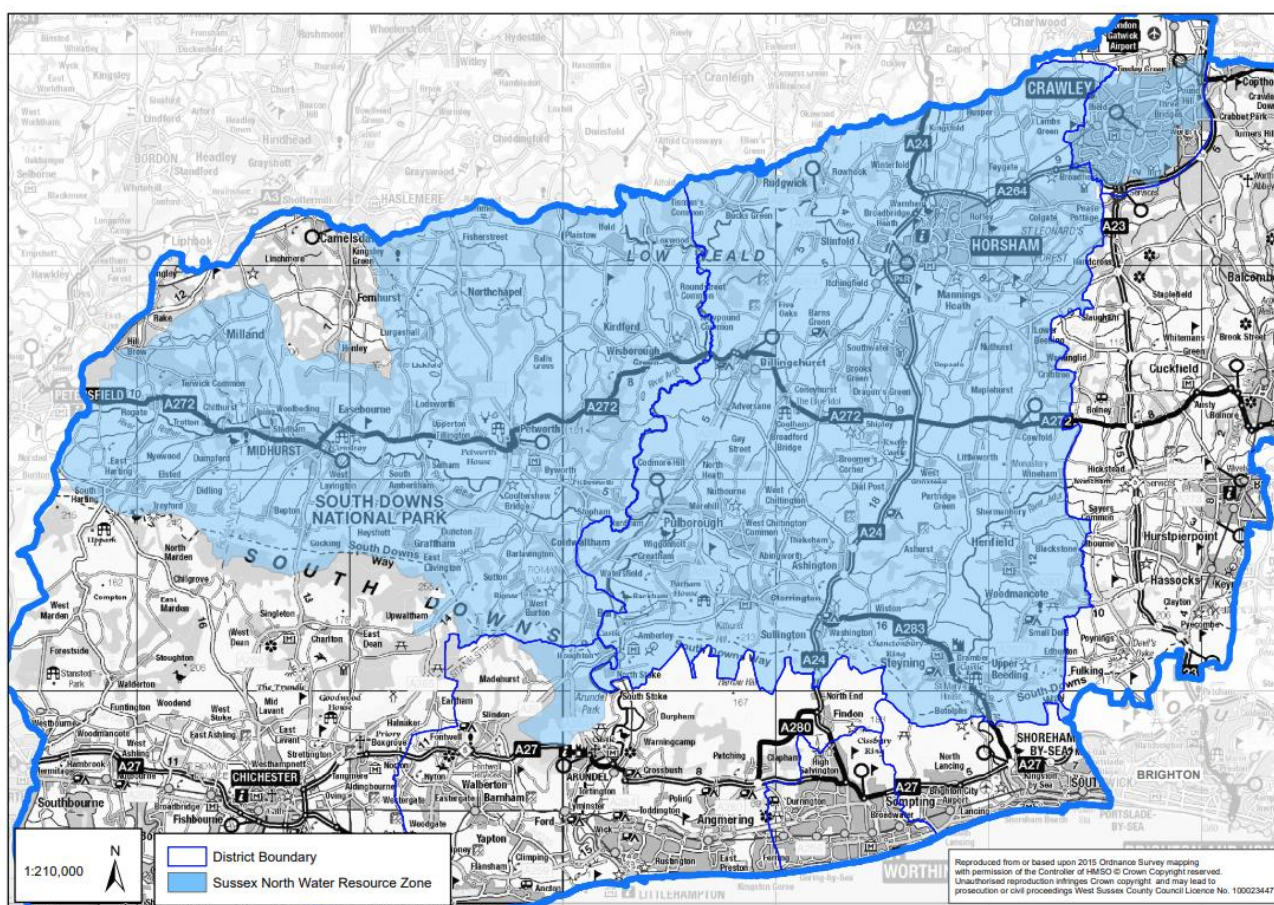


Figure 2 – District Boundary for water neutrality including the Sussex North Water Resource Zone⁶

⁶ https://www.westsussex.gov.uk/media/17039/map_sussexnorth_wrz.pdf

2.0 Water neutrality assessment

The proposed site is located on the shoreline of Chichester Harbour in Emsworth, a town in the Borough of Havant.

It is identified within the Natural England District Boundary for water neutrality, the following principles are to be applied to the Proposed Development and are discussed in this section:

- Provide a water budget showing details of the baseline and proposed water consumption, any mitigation measures proposed and mechanisms to secure them in advance of occupation/use
- Achieve a net portable water use of <110 litres/person/day⁷⁸
- Minimise water consumption through some/all of the following measures:
 - Incorporating low water usage for fittings
 - Incorporating rainwater harvesting
 - Off-set the remainder of any water

Water neutrality is achieved by reducing water use, reusing, and recycling water onsite, and then offsetting any remaining water demand in the existing local community, as demonstrated in Figure 3

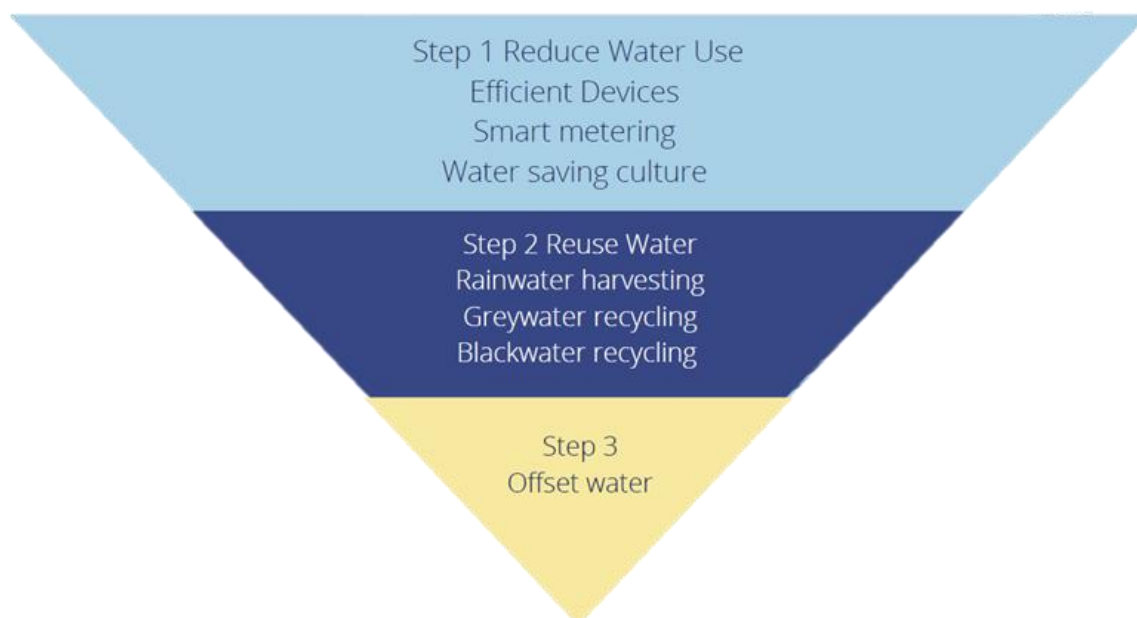


Figure 3 – Water Neutrality Hierarchy

⁷ Approved Document Part G 2015 edition with 2016 amendments, Appendix A – Water efficiency calculator for new dwellings

⁸ Position statement and mitigation plan for Havant Borough_May2022

2.1 Occupancy – Total litres per day

When calculating water use and rainwater harvesting (as well as any water offset), each building's 'occupancy' must be taken into consideration as part of the overall calculations so an accurate 'Total litres per day' can be produced.

2.1.1 Existing Dwelling

The water consumption of the existing development, based on the assumptions made about the water fittings prior to demolition, is shown in the table below. This figure is significantly higher than that of the Proposed Development baseline of 110l/p/d.

	l/p/d	Improvement %	Occupancy	Total l/d
Part G - Enhanced	110.00		6.00	660
Reduce Water Use	151.20	-37.5%	6.00	907.2

Table 2 - Water Efficiency — Existing Development

In fact, the figure that will be used within the calculations will be limited to 125l/p/d – in line with Building Regulations minimum standards.

2.1.2 RWH Occupancy Calculation

When sizing RWH systems the standard approach is to allocate 2 people to the master bedroom and 1 person for each other bedroom⁹. Based on the size of the proposed dwelling and the known end user the water calculations for Proposed Development are based on an occupancy rate of 6 people for 5 bedrooms.

2.2 Step 1 - Reduce water use

In order to accurately calculate the water neutrality for the Proposed Development, SRE have utilised Part G Domestic Water Calculator¹⁰ to accurately reflect predicted water use within the Proposed Development and the existing building it is replacing.

The first step of water neutrality is reducing water usage across the Proposed Development compared to Part G and local planning policy. This includes water efficient devices, smart metering, as well as promoting a water saving culture.

The following baseline in litres per day (l/d) has been calculated using the proposed occupancy rates and litres/person/day (l/p/d) from the water efficiency measures highlighted in this section.

	l/p/d	Improvement %	Occupancy	Total l/d
Part G - Enhanced	110.00		6.00	660
Reduce Water Use	92	16.8%	6.00	549

Table 3 – Water Efficiency – Reduce for Proposed Development

⁹ Approved Document Part G 2015 edition with 2016 amendments, Appendix A – Water efficiency calculator for new dwellings

¹⁰ CSH Wat01 Tool – The Water Efficiency Calculator for new dwellings (DCLG 2009)

2.2.1 Water efficient devices

Water efficient devices will be installed to the toilet, kitchen sink taps, showers and other household appliances to reduce water use.

Water appliances would be specified as products that are certified with a high rating from the European Water Label to ensure water efficiency. It's also important to regularly check toilets and taps for leaks, as these can waste between 200-400 litres/day¹¹.

Further details of the proposed fitting and flow rates are provided in Section 3.0 (Water fittings specification)

2.2.2 Smart Meters

The Proposed Development will use Smart Meters which will allow the consumer to monitor how much water they are using and how this affects their water bill. This can help consumers to reduce water usage, identify leaks and meet water saving targets recommended by water companies, with the incentive of reduced bills.

2.2.3 Water saving culture

This site can implement good water saving culture and behaviours to reduce water use and ensure that other measures put in place are effective. Education and self-awareness are therefore important components of achieving water neutrality. The contractor and local water authority can help encourage water saving behaviour by providing a water saving information pack for the owner upon completion of the Proposed Development. This would include information about the new installed technologies and how the overall water consumption can be reduced to encourage water saving behaviour.

2.3 Step 2 - Reuse water

Once internal water use is reduced to an ambitious level, water reuse should be considered for the site. Water reuse systems provide an alternative water supply for non-potable uses (e.g. flushing toilets, outdoor use, irrigation and laundry facilities). There are different options available including rainwater (and surface water) harvesting, greywater recycling and black water recycling.

The proposed development is only considering rainwater harvesting for garden irrigation due to the site layout and type of property ownership.

	l/p/d	Improvement %	Occupancy	Total l/d
Reduce Water Use	92		6.00	549.00
Reuse Water	87.00	5.4%	6.00	522.00

Table 4 – Water Efficiency – Reuse for Proposed Development

Various systems can be applied to the Proposed Development however, the selection of a particular system depends on the requirements and characteristics of the development and is discussed and assessed further in this section of the report.

2.3.1 Rainwater Harvesting

Rainwater harvesting (RWH) systems capture and reuse the rainfall collected from surfaces such as roofs. They can in certain instances include the capture of surface water runoff (stormwater/surface water harvesting), but

¹¹ www.ewaterwise.org.uk/save-water/

particularly for community scale systems rather than individual dwellings. RWH can range from simple gravity fed systems, serving a single household with an above ground tank used for watering gardens, through to more complex systems which may treat and pump water to multiple homes or buildings for non-potable uses.

As the roof (surface) water drainage design can be modified as part of the installation of the development, rainwater harvesting to capture water will be installed for the Proposed Development to supply water for irrigating (by hand) the soft landscaping.

However, if after ground investigation a full RWH system is not a technically viable option, a simpler alternative is to have secure rainwater butts, which can be used for local ground irrigation and offset some of the outside tap use of 5l/p/d allocation in Part G, and an alternate method of delivering Water Neutrality will need to be sought.

The Proposed Development will make use of the main house flat roofs which can have their surface water drainage connected into a single underground rainwater harvesting tank. Tank sizing information is detailed later in this section.

Average rainfall data had initially been taken from historical mapping but has now been calculated using the latest MET office data. The MET office provides a regional figure of 803mm/yr for Southern England but taking the average from three local weather stations a robust figure of 768mm/yr has been calculated and used for the Rainwater Harvesting calculations as shown in Table 5. The mapping and regional data can be found in Appendix B

	Thorney Island (14 miles)	Martyr Worthy (17miles)	Odiham (19 Miles)	Average for Site
mm/annum	767.67	753.63	783.27	768.19

Table 5 – Average Annual Rainfall for the site

	Details	Comments
Rainwater collection Area	~196m ²	Roof catchment area
Yield co-efficient (Flat roof)	0.50	Although there are flat roof areas (single ply/lead finish) these will drain off via flat roof
Hydraulic Filter Efficiency	0.90	Default figure – filter efficiency
Average Rainfall	780mm	Based on EA mapping

Table 6 – Rainwater Harvesting Inputs

The above figures take into account system efficiencies from the collection process through the Yield co-efficient and the Hydraulic Filter Efficiencies. To avoid rainwater being unnecessarily discharged into the surface water drain (soakaway), the sizing of the RWH Tank will accommodate capacity for a 35 day 'drought' period¹².

¹² RWH sizing provides capacity for minimum 18, standard 21, 'drought' days as per BS EN 16941-1:2018. SRE have proposed 35 days to accommodate local planning application challenges.

Based on rainwater being used for external water use only the following water reuse calculations are achieved on site based on BS8515:2009 and Environment Agency guidance¹³: Please see Appendix C for detailed calculations.

	l/p/d
Rainwater Collected	30.93
Non-potable Consumption (offset)	5.0
<i>Excess Rainwater not currently used (if negative mains water tops up the system)</i>	25.93

Table 7 – Water Reuse calculations – Rain Water Harvesting

To determine the RWH tank capacity for proposed site the annual collected rainwater is calculated, and the tank then sized:

Unit	Building Footprint (roof area) m ²	Yield Co-eff	Hydraulic Filter	Average Rainfall M/yr	Collected Rain Water m ³ /yr
Main Roof	196.00	0.50	0.90	0.768	67.74
Secondary	0.00	0.50	0.90	0.768	0.00
Total	196.00				67.74

Table 8 – Collected Rain Water per year for proposed development

Unit	Rainwater Collection (m ³ /yr)	Rainwater Collection (l/yr)	Water Demand (l/p/d)	Drought days coverage (l/p)	Drought Days Total (l)	RWH Minimum Tank Size (m ³)
Main Roof	67.74	67,738	5.00	175	1,050	1.05
Total	67.74	67,738	5.00	175	1,050	1.05

Table 9 – RWH Tank Capacity for proposed development

From above tables the Proposed Development will install one RWH Tank of min 1.5m³ capacity – most likely to be 3m³ for the dwelling's external water use.

2.3.2 Greywater recycling

Greywater recycling (GWR) systems capture and recycle the used wastewater from showers, baths and basins. The plumbing services in most buildings direct all wastewater services to the below ground sewage system.

¹³ Environment Agency Harvesting rainwater for domestic uses: an information guide (October 2010)

However, GWR systems require separate plumbing services and connections for the greywater so it can be captured, treated and recycled, instead of distributing directly into the wastewater system.

As this is a redevelopment the infrastructure for the new mechanical services to connect to a GWR system can be easily integrated. These systems are normally suited for large commercial buildings, where there is both a high volume of greywater produced as well as a high demand for non-potable water sources for the recycled water to be utilised on. However, the proposed development is not considering the greywater recycling due to the dispersed site layout and space implications of including the additional plant equipment on site. meaning this will not be a cost-effective option compared to other water recycling systems available.

2.3.3 Blackwater recycling

Blackwater is any wastewater that is contaminated with water discharged from a toilet, so this can and usually does contain greywater. Blackwater recycling requires treatment before it can be reused. This usually involves aerobic screening, biological treatment, ultrafiltration, ultraviolet disinfection, TDS (total dissolved solids) and nutrient removal and chlorination. Blackwater recycling systems are typically much more complex and a larger scale than other water reuse and recycling systems.

Water reuse technologies have the potential to save significant amounts of water. For example, ~24% of water in the home is used for flushing the toilet and ~4% externally in the garden meaning a water reuse system could save at least a quarter of demand if it was installed for these purposes. Depending on its quality and the system installed it could also be used for an additional 12% of water for washing clothes.

This option is not a feasible option due to the capital and management expense and technical challenges involved for an ancillary building to the main house. Generally, the process is only adopted on larger commercial sites, or for multi-home developments.

2.4 Step 3 - Offset water

The final step to achieving water neutrality (if required) is offsetting any residual demand by making savings in the existing local community. Importantly, these savings must be made within the same water resource zone as managed by the local water authority.

Options for offsetting schemes are as follows:

- Water efficiency audits and retrofits for existing homes
- Offsetting by fixing leaks over and above planned work by water companies
- Retrofitting properties to improve water efficiency.
- Retrofitting water reuse schemes.
- In addition to these, offsetting activities should also be supported by awareness campaigns and promoting water saving behaviours.
- The installation of smart meters can also help encourage water saving behaviours and provide information on how much water is being used.
- Leak detection system

The inclusion of water meters is being proposed, however, further offset is not required at this stage.

2.4.1 On-site Offset

The existing building is assumed to have a water use of 125 l/p/d and will be replaced by the Proposed Development. Therefore, a further reduction of 15l/p/d (difference between 125l/p/d and the Local Authority planning requirement of 110l/p/d for new development).

By removing the water usage within the existing building on-site, the overall water usage for the Proposed Development can be reduced further.

2.4.2 Off-site Offset

There is not a requirement to provide further off-site offset for the Proposed Development.

2.5 Water Neutrality Summary

Therefore, considering the water reduction measures and the site-wide rainwater harvesting the Proposed Development water use can be mitigated by measures undertaken on site for the house to <110l/p/d in line with Natural England's Position Statement & Water Neutrality Study

	l/p/d	Improvement %	Occupancy	Total l/d (Site)
Proposed Development	92	16.4%	6	15.05
Existing Site	151.2	-37.5%	6	-56.63

Table 10 – Comparison of Total Water Offset Required to achieve Water Neutrality

	Part G Compliance	Havant Borough Requirement	Reduced water usage after RWH	Difference	Water Saving Total l/p/d
Proposed Development		110	87	15	72
Existing Site	125		151.2		-26.2

Table 11 - Comparison of Total water saving on site l/p/d

The total site offset requirement equates to an equivalent average of 15.05l/p/d.

As shown above in order to deliver Water Neutrality additional off-site water offset needs to be identified and agreed by the Client and the Local Authority. The overall result is the Proposed Development would be water neutral with all the measures above being undertaken, with a large water offset being provided across the wider site. All supporting water calculations are provided in the Appendix C.

3.0 Water fittings specification

Where known, the flow rates and capacities have been selected in order to achieve the requirements for reducing water use and specifying water efficient devices in line with natural England's water neutrality requirements.

Where fittings and appliances have not yet been specified, the flow rates and capacities listed in the Water Efficiency Calculation are the maximum allowable flow rates and capacities and should be used to inform the specification and purchasing of the fittings. These are summarised below:

3.1 Building Specification

The Water Efficiency Calculation has been undertaken on the basis of the following specification for delivering in excess of the baseline water use prior to onsite reuse and offsetting.

The manufactures and fitting types detailed in the following table provide a performance specification in support of the calculations to achieve the desired flow rates.

The main contractor/sub-contractor shall select similar/equivalent performing products in order to achieve the water reduction targets.

Fitting	Measure	Capacity / flow rate	Manufacturer's Details (make & model)
Kitchenette Tap	Flow rate (litres/minute)	3	CP961 Inline Flow Regulator
Shower	Flow rate (litres/minute)	6	EcoVand Style Air 6 l/min shower head
Bath	Flow rate (litres)	140	Twyford Celtic
WC (dual flush)	Flush volume (litres)	4	PRESIDENT/SENATOR II CLOSE COUPLED WC
	Part flush volume (litres)	2.6	PRESIDENT/SENATOR II CLOSE COUPLED WC
Washing machine	Litres/kg dry load	8.17	Default
Wash hand basin taps	Flow rate (litres/minute)	3.5	CP961 Inline Flow Regulator
Dishwasher	Litres/place setting	1.25	Default
Waste disposal unit	Litres/use	n/a	-
Water softener	Litres/person/day	-	Harvey water Softener (HVX)

Table 12– Water fittings specification – Proposed Development

4.0 Water Neutrality Summary

Water neutrality has the potential to deliver large scale water and carbon saving across the Proposed Development

In order to reduce, reuse and offset the sites water use across the development SRE propose:

- Reduce water use
 - Provide Water efficient devices, In line with the recommendation in Section 7.0
 - Install Smart meters, to help the owners monitor ongoing water consumption
 - Provide water saving information pack to influence owner's behaviour.
- Reuse Water
 - Inclusion of Rainwater Harvesting (for external irrigation only) as per recommendations in Section 2.3.1

The Proposed Development could meet the relevant Natural England's Water Neutrality requirements as per the specification outlined in Appendix C.

41 Beach Road	l/p/d	Total l/d	Improvement %
Baseline	110	660	
Proposed Development Reduced Water Use	92.00	552	16.4%
Proposed Development Reuse Water	87.00	522.00	5.4%
Proposed Development Water Neutrality		522.00	20.9%

Table 13:Summary Water Neutrality Calculations for 41 Beach Road

Therefore, the Proposed Development satisfies the Natural England and local Planning Policy requirement for water use within the building and is therefore technically 'Water Neutral'.

5.0 Nutrient Neutrality Assessment

The following section assesses the impact of the Proposed Development on the level of nitrates being discharged into the waste water system and how the scheme can achieve nitrate neutrality.

5.1 Introduction

“Eutrophication is now recognised to be one of the important factors contributing to habitat change” Glibert et al 2005¹⁴

UK’s coastal ecosystem becomes more eutrophicated as a result of the rising nutrient levels. Eutrophication¹⁵ is a process which increases plant growth, increased plant growth reduces the oxygen present in water. This process makes it difficult for aquatic insects and fish to survive, limiting or eliminating a food source from the food cycle and harming a variety of animals. These nutrients can be found in sewage, fertilisers used on agricultural land, and animal faeces. Excess nutrients, particularly nitrogen and phosphorus, from a variety of sources can have an impact on water quality along the UK coast.

Parts of the Solent are already in unfavourable condition because excess nutrients cause eutrophication, it was not appropriate to allow new schemes that would result in extra nutrients, no matter how small. To be permitted, development schemes must be 'nutrient neutral,' meaning that the amount of nutrients entering the harbours must not increase as a result of development.

According to a 2018 Integrated Water Management Study for the south Hampshire region, it is questionable how to accommodate increased housing demand (as mandated by the federal government) without nutrients having a detrimental effect on the coastline. Therefore, Natural England met the challenge¹⁶. It gave explicit instructions on its reasoning and a course for the future. As a result, Nutrient budgets are now necessary, and all development plans must be nutrient neutral.

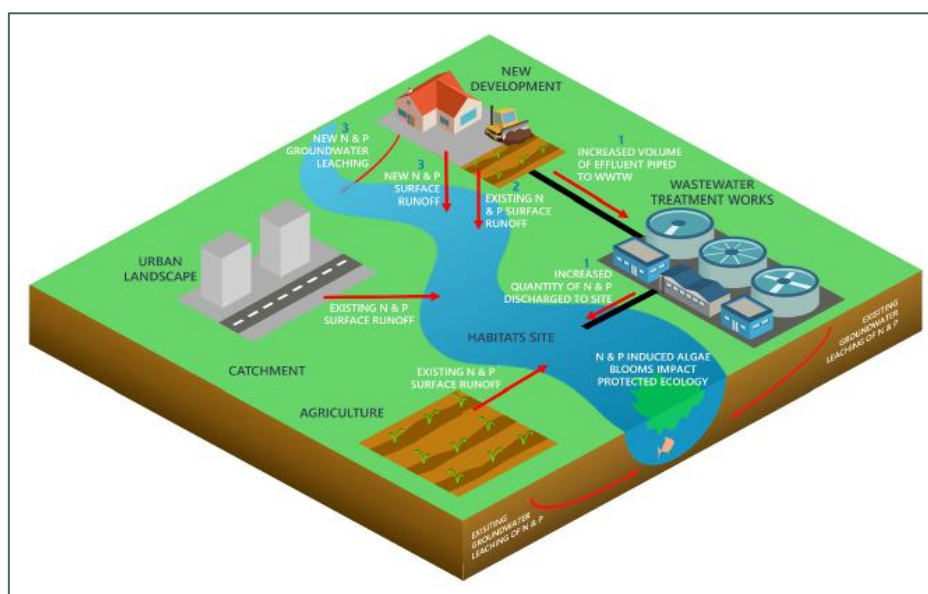


Figure 4: Diagram demonstrating the potential nutrient impact pathways from a new development to a Habitat's site.¹⁷

¹⁴ <http://chnep.wateratlas.usf.edu/upload/documents/EutrophicationAndHABs.pdf>

¹⁵ <https://www.eea.europa.eu/publications/signals-2000/page014.html>

¹⁶ <https://www.push.gov.uk/wp-content/uploads/2020/03/Adviceon-Achieving-Nutrient-Neutrality-for-New-development-in-the-Solent-Region-March-2020.pdf>

¹⁷ Nutrient Budget Calculator Guidance

5.2 Overview

This report demonstrates the Nutrient Budget of a development site 41 Beach Road, Creek Cottage, Emsworth, PO10 7HR impacting the Solent Marine sites. The Nutrient Neutrality calculation includes key inputs and assumptions based on the best available scientific evidence and research. However, there is some uncertainty for each input. For example, there is uncertainty in predicting occupancy levels and water use for each household in perpetuity. Identifying current land type and the associated nutrient inputs is also based on best available evidence, research, and professional judgement, and is subject to some uncertainty¹⁸.

6.0 Nutrient Neutrality calculations

To determine the nutrition budget for a new development, the nutrient budget calculator needs a set of inputs. Four steps are taken to finish the calculations:

6.1 Stage 1-Increase in nutrient loading per year

This step determines the increase in nutrient loading per year caused by proposed development's wastewater. The number of occupants used in the calculation is the same as that used in the water neutrality calculations. and the daily water usage is 120l/p/d excluding 5l/p/d outdoor water usage as per the requirement in Part G standard. Wastewater for the proposed development goes to Thornham Waste Water Treatment Works (WwTw).

6.2 Stage 2-Pre-existing nutrient load

Stage 2 calculates the pre-existing nutrient load from the development site's previous land use. The operational catchment area that the development is located within is east Hampshire River¹⁹ shown in Appendix D. The soil drainage type associated with the predominant soil type within the development site is Naturally Wet²⁰. The annual average rainfall that the development site will receive is 722mm as per the Itchen at Tanners Brook at Millbrook flow gauge catchment information page²¹ shown in Appendix E. Proposed development site falls under Nitrate Vulnerable Zone (NVZ)²². This stage also requires the pre-development land area, which we have taken as 278m² (Ground floor + Garage). The proposed development site is classified as Residential urban land. Refer Appendix H

6.3 Stage 3-Nutrient load from post-development

This stage calculates the annual nutrient load from new (post-development) land use on the development site. The proposed development site comes under the Residential urban land type²³ and the area considered is 278m² (Ground floor + Garage). Refer Appendix I

6.4 Stage 4-Final annual nutrient budget

Last stage of the Nutrient budget calculation automatically analyses the findings from Stages 1-3 to the equation to determine the nutrient budget by calculating the net change in nutrient loading for the site and the development site's final annual nutrient budget.

¹⁸ Nutrient Budget Calculator Guidance

¹⁹ <http://environment.data.gov.uk/catchment-planning/>

²⁰ <http://www.landis.org.uk/soilscapes/#>

²¹ <https://fehweb.ceh.ac.uk/GB/map>

²² <http://mapapps2.bgs.ac.uk/ukso/home.html?layers=NVZEng>

²³ Solent-Nutrient-Budget-Calculator-Version-2-21.04.22

The difference between the new sources of nitrogen from a development and the sources of nitrogen already present on the pre-development site is the balance at stage 4 of the nutrient budget calculations. This balance is multiplied by 1.2, or boosted by a 20 % "buffer," to ensure the final total is reliable and appropriately precautionary²⁴. Refer Appendix J

7.0 Summary

The Stage 4 output shows how much nutrient mitigation is needed in Kg per year to achieve nutrient neutrality. According to the calculations, the Proposed Development produces 1.72 kg of Total Nutrient load per year.

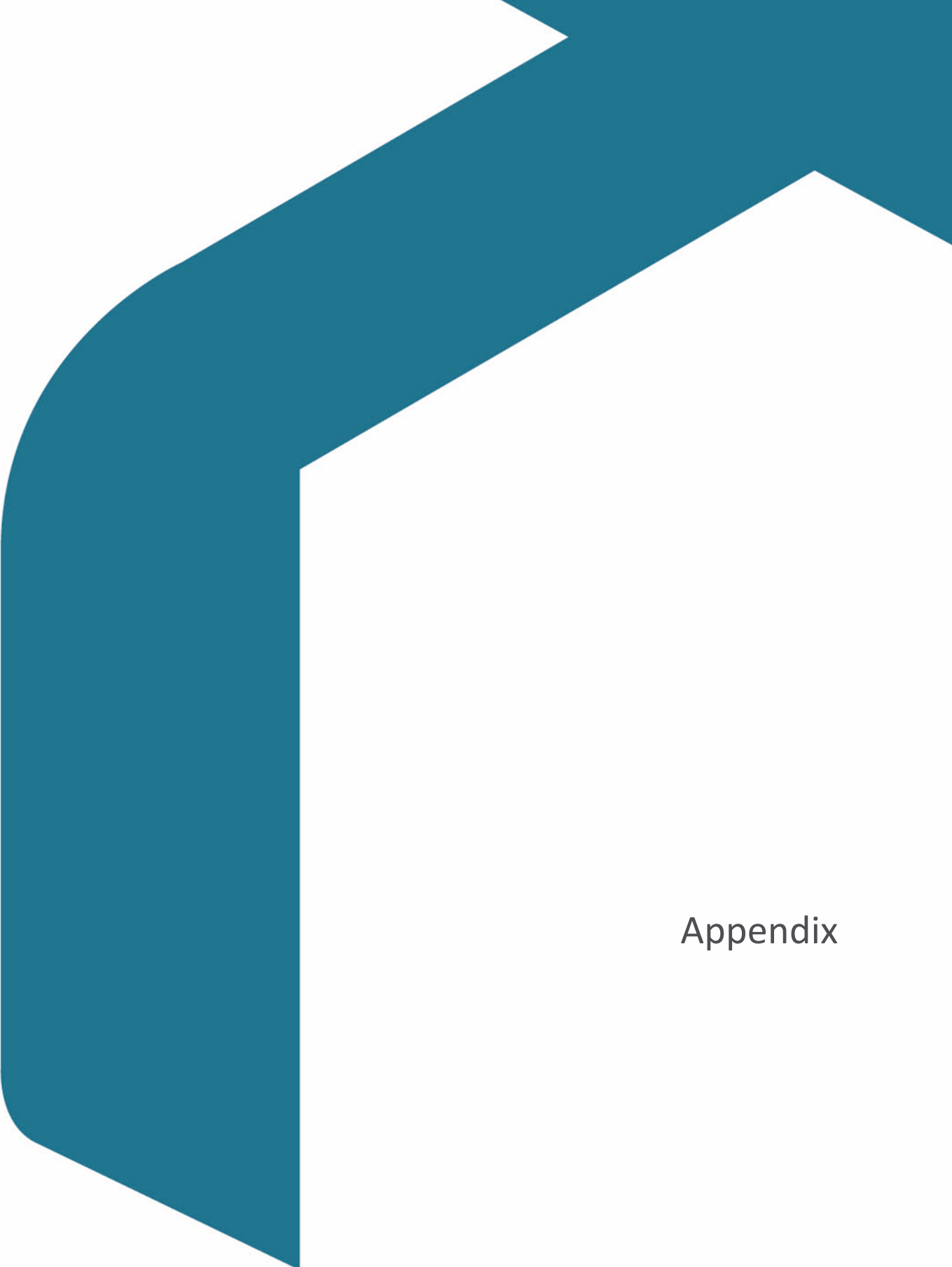
The existing site produced 2.87 Kg of Total Nutrient load per year.

As a result of the Water Neutrality and Nitrate Neutrality assessments, the proposed site can save approximately 0.88 Kg TN per year (shown as a negative figure below), which is a significant reduction. Please refer to the details in Appendix J

	l/p/d	Annual wastewater Kg TN/yr	Annual Nitrogen nutrient Existing Kg TN/yr	Annual Nitrogen nutrient New Kg TN/yr	Annual Nutrient budget Kg TN/yr	Difference in Nutrient level TN/yr
Existing Dwelling	120.00	2.37	0.31	0.34	2.87	-0.88
Proposed Dwelling	87.00	1.72	0.31	0.34	2.09	

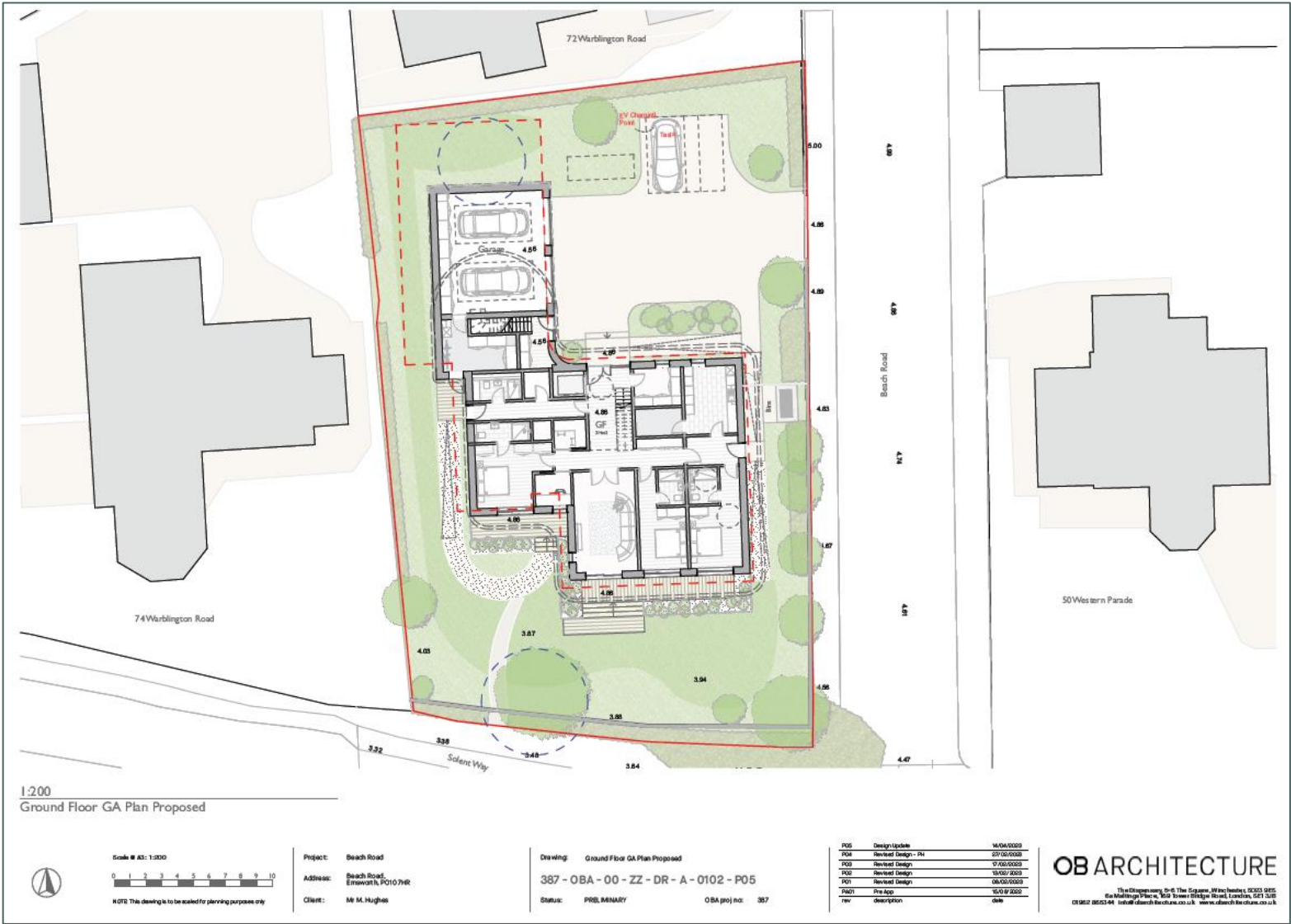
Table 14: Difference in Nutrient level by Existing and Proposed dwelling

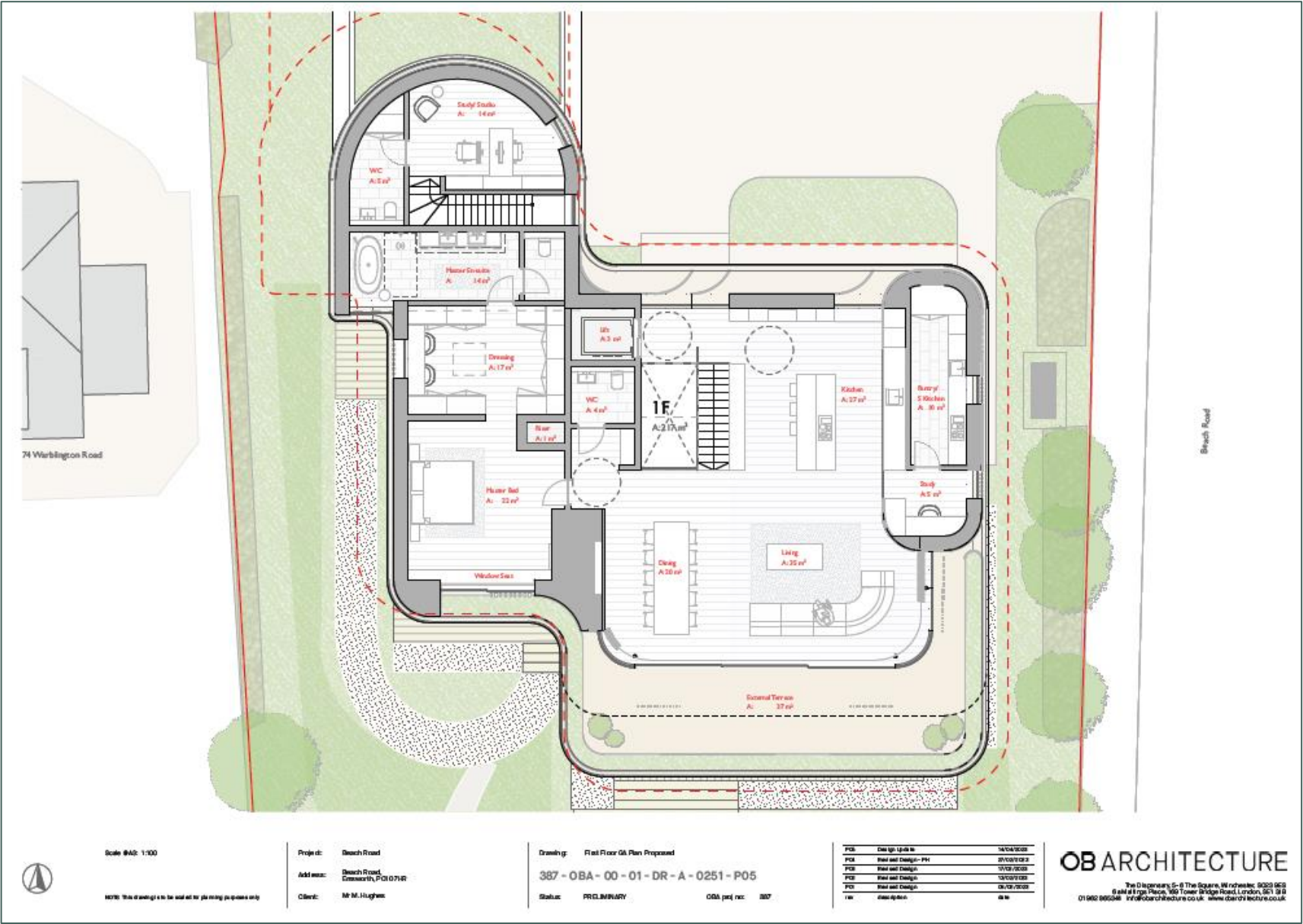
²⁴ Solent-Nutrient-Budget-Calculator-Version-2-21.04.22

A large, teal-colored abstract graphic on the left side of the page. It consists of a thick, curved line that starts from the top left, curves downwards and to the right, and then continues as a straight line towards the bottom right. The shape is reminiscent of a stylized letter 'L' or a corner of a page.

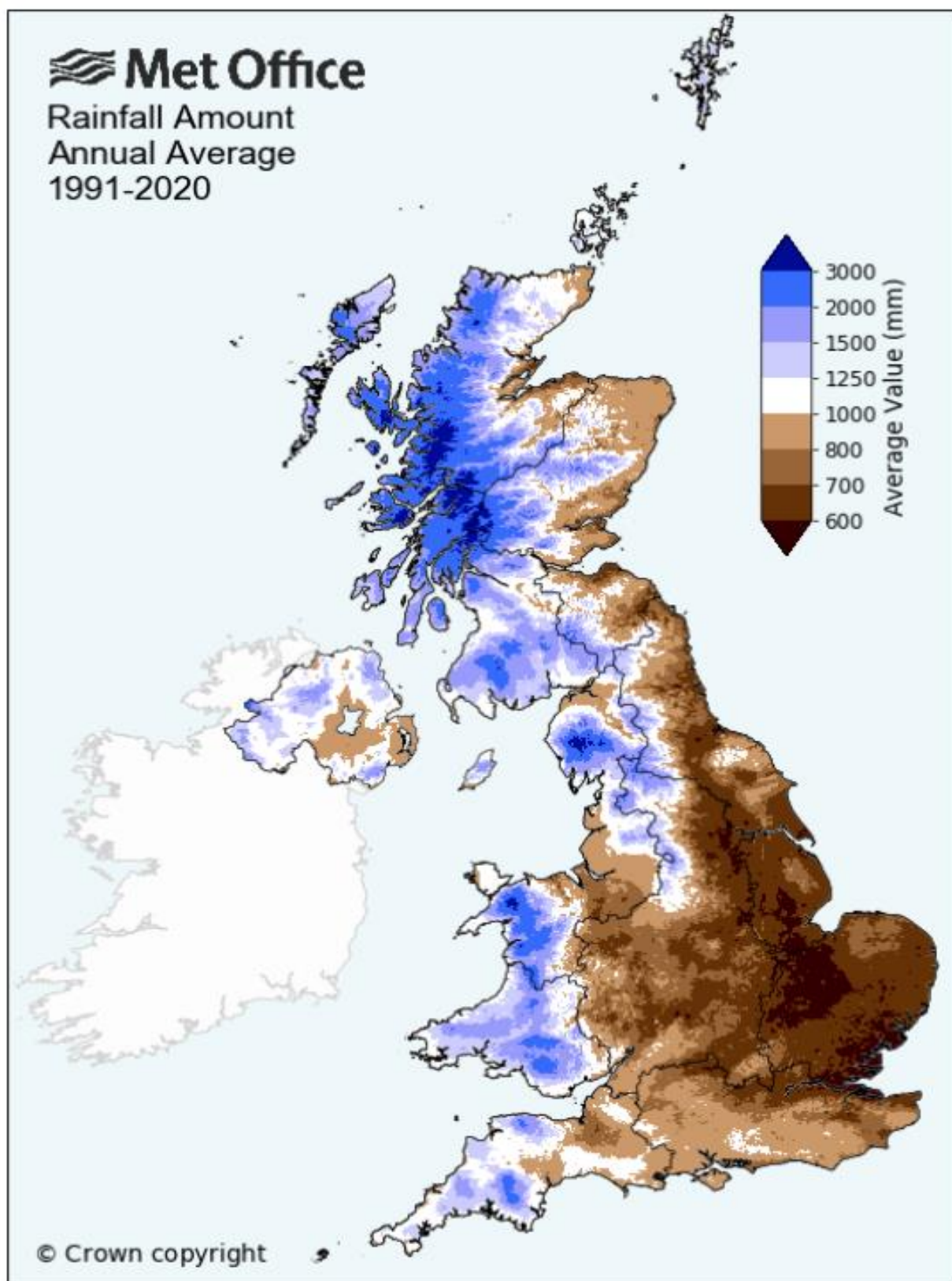
Appendix

Appendix A – Floor Plans (Proposed Development)





Appendix B – Rainfall Annual Average (MET Office)



Appendix C – Basic Water Calculations & Detailed Water Calculations (RWH Calculation)

Rainwater Calculation

RAINWATER CALCULATIONS		Go to Start
Part 1: Amount of rainwater collected		
Rainwater collection system in use?		Yes (Individual)
Which approach is being followed from BS8515:2009?		INTERMEDIATE APPROACH
Rainwater collection area	m ²	196.00
Yield co-efficient		0.50
Hydraulic filter efficiency		0.90
Average rainfall	mm/yr	768.00
Number of occupants served by the system		(Quantity) 6
Percentage collected	%	100.00%
Daily rainwater collection	litres	185.58
Daily rainwater	(litres/person)	30.93
Part 2: Where is the rainwater to be used?		
WC Consumption	(litres/person/day)	0.00
Washing Machine Consumption	(litres/person/day)	0.00
Daily non potable water demand:	(litres/person/day)	0.00
Part 3: Savings provided by rainwater		
Remaining demand requiring mains top-up/additional collection	(litres/person/day)	0.00
Excess rainwater not currently used:	(litres/person/day)	30.93
Water savings from rainwater use:	(litres/person/day)	0.00

RWH Specification

Job no:		MHAR-STOP-2788				
Date:		28.07.2023				
Assessor name:		Malcolm Maclean				
Registration no:		MM04				
Development name:		Stopham Road - Proposed Development				

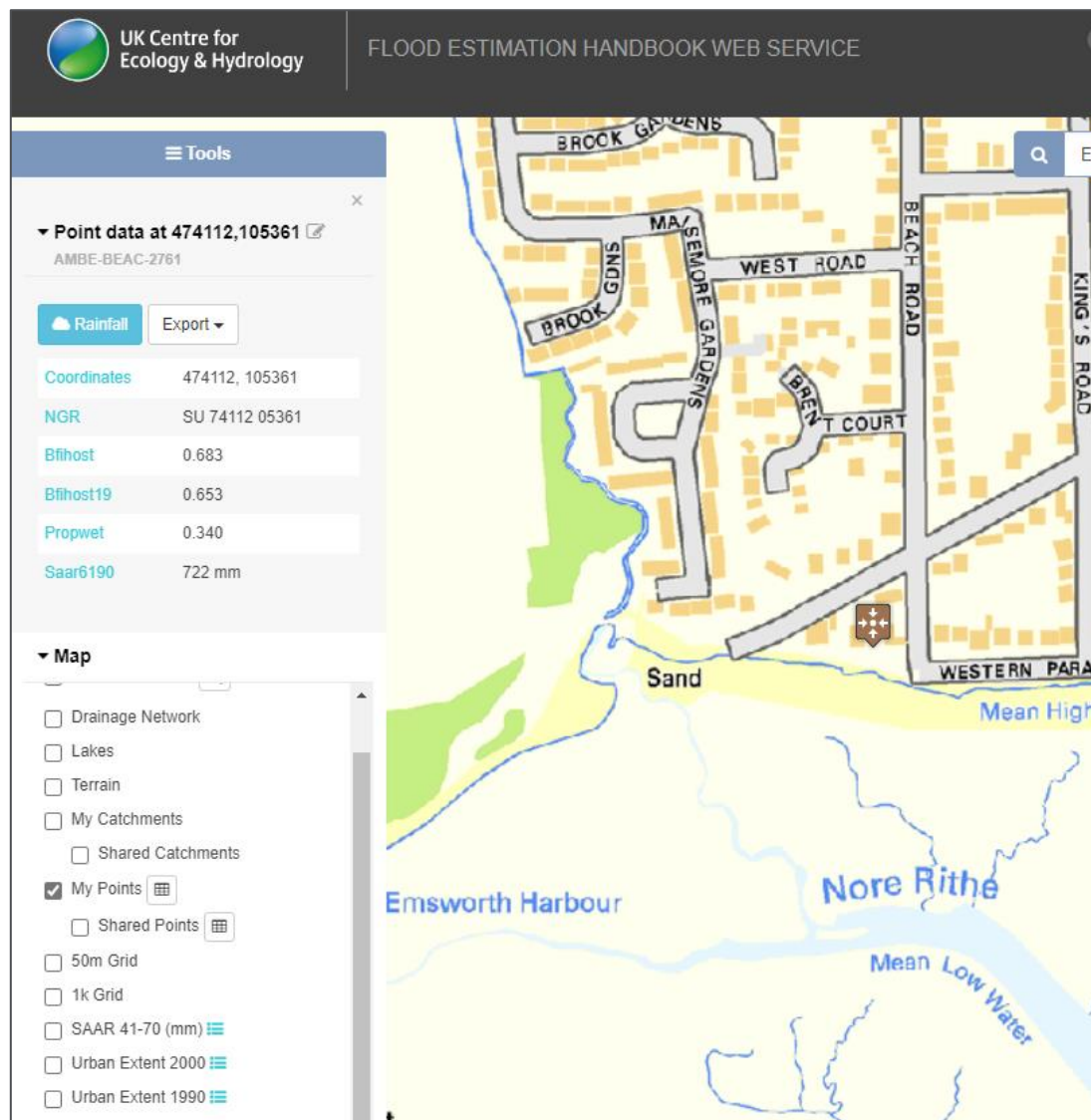
Dwelling Type:	1	2	3	4	5
Dwelling type description:	Proposed RWH	Existing No RWH			
WC	13.53	26.52	0.00	0.00	0.00
Taps (excluding kitchen taps)	7.11	11.06	0.00	0.00	0.00
Bath	15.40	22.00	0.00	0.00	0.00
Shower	26.22	65.55	0.00	0.00	0.00
Kitchen sink taps	11.68	13.88	0.00	0.00	0.00
Washing machine	17.16	17.16	0.00	0.00	0.00
Dishwasher	4.50	4.50	0.00	0.00	0.00
Waste Disposal Unit	0.00	0.00	0.00	0.00	0.00
Water Softener	0.00	0.00	0.00	0.00	0.00
Contribution from Greywater					
Contribution from Rainwater	0.00				
Contribution from Grey/Rainwater (combined system)					
Normalisation factor	0.91	0.91	0.91	0.91	0.91
Total Water Consumption	87.0	146.2	0.0	0.0	0.0
Code for Sustainable Homes - credits awarded	4	0	0	0	0
CSH Mandatory Level	Level 3/4	No level	-	-	-
External Water Use	5	5	5	5	5
17. K - Litres/person/day	92.0	151.2	0.0	0.0	0.0
17. K Compliance?	Yes	No	-	-	-

Appendix D – Solent Marine sites catchment²⁵



²⁵ <https://environment.data.gov.uk/catchment-planning/>

Appendix E –Annual average rainfall data²⁶



²⁶ <https://fehweb.ceh.ac.uk/GB/map>

Appendix F –Southern water supply areas²⁷



²⁷ <https://www.southernwater.co.uk/our-story/area-of-operation>

Appendix G Stage 1: Nutrient loading from additional wastewater (Comparison of Existing & Proposed site)

Stage 1

User Inputs

Date of first occupancy:	28/07/2023
Average occupancy rate:	6.00
Water usage (litres/person/day):	120
Development Proposal (dwellings/units):	1
Include deductible acceptable loading?	No
Wastewater treatment works:	Thornham WwTW
Wastewater treatment works N permit (mg TN/litre):	10

Stage 1 Calculated Loading

Stage 1 Nutrient Loading

Additional population	6	people
Wastewater by development	720	litres/day
Annual wastewater TN load	2.37	kg TN/yr

Stage 1

User Inputs

Date of first occupancy:	28/07/2023
Average occupancy rate:	6.00
Water usage (litres/person/day):	87
Development Proposal (dwellings/units):	1
Include deductible acceptable loading?	No
Wastewater treatment works:	Thornham WwTW
Wastewater treatment works N permit (mg TN/litre):	10

Stage 1 Calculated Loading

Stage 1 Nutrient Loading

Additional population	6	people
Wastewater by development	522	litres/day
Annual wastewater TN load	1.72	kg TN/yr

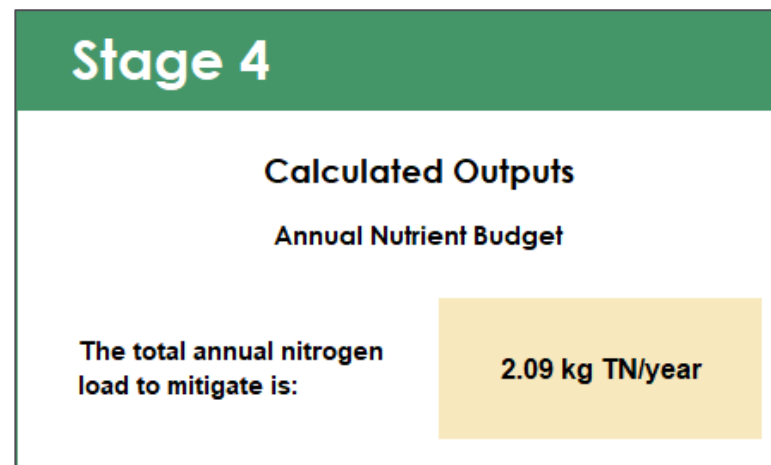
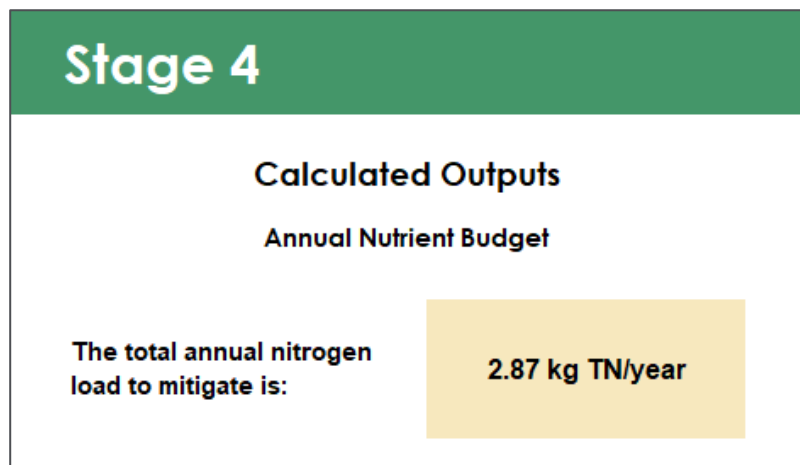
Appendix H Stage 2: Nutrient loading from pre-development land use

Stage 2		
User Inputs		
Catchment:	East Hampshire Rivers	
Soil drainage type:	Naturally wet	
Annual average rainfall (mm):	700.1 - 750	
Within Nitrate Vulnerable Zone (NVZ):	Yes	
Existing land use type(s)	Area (ha)	Annual nitrogen nutrient export (kg TN)
Residential urban land	0.02	0.31
Total:	0.023	0.31

Appendix I Stage 3 Nutrient loading from post-development land use

Stage 3		
User Inputs		
New land use type(s)	Area (ha)	Annual nitrogen nutrient export (kg TN)
Residential urban land	0.03	0.34
Total:	0.0251	0.34

Appendix J Stage 4 Nutrient budget calculation ((Comparison of Existing & Proposed site))





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