

**OAK VIEW NURSING HOME, HAYLING ISLAND,
HAMPSHIRE**

NITROGEN BUDGET

Final Document (Revision 2)

December 2020

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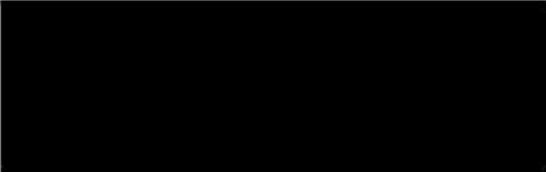
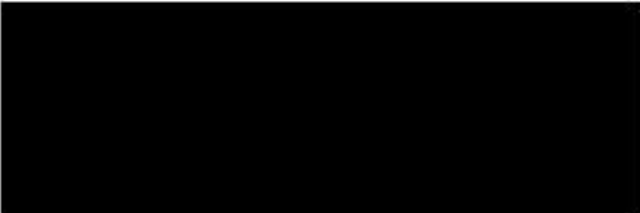
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HAMPSHIRE**

NITROGEN BUDGET

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1.0 INTRODUCTION

1.1 Introduction

Ecological Survey & Assessment Limited (ECOSA) have been appointed by English Oak Care Homes to provide a Technical Note in respect of Nutrient Neutrality to determine if the proposed development at Oak View Nursing Home, 47-49 Beech Road, West Town, Hayling Island, Hampshire, PO11 0JB can achieve “nutrient neutrality”. The proposals comprise a first floor extension of a care home to provide an additional 14 rooms for residents (5.0).

1.2 Background

As part of a planning application, the client must demonstrate that the development can achieve nutrient neutrality with regard to nitrogen inputs into Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites within the, either alone or in-combination with other plans or projects.

The proposed development will generate wastewater as a result of new building occupancy, and this will be treated at Budd’s Farm Waste Water Treatment Works (WwTW), and will eventually feed into the Solent.

The Site Improvement Plan for the Solent (Natural England, 2014) identifies that *“...water pollution affects a range of habitat and bird species at the site through eutrophication and toxicity. Sources include both point source discharges (including flood alleviation / storm discharges) and diffuse water pollution from agriculture / road runoff. Environment Agency flood event discharge consents allow untreated waters to be discharged which end up in the SAC and are likely to have a negative impact.”*

As the development will likely have an impact on designated sites within the Solent, any significant effects as a result of the proposals will need to be addressed in line with Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (as amended).

Natural England have advised that any new residential development that lies within the catchment of the Solent should achieve ‘nutrient neutrality’ in order to demonstrate that there is capacity to accommodate growth.

2.0 METHODOLOGY

2.1 Introduction

The methodology for assessing if the proposed development will achieve nutrient neutrality is divided into four stages (Natural England, 2020):

2.2 Stage 1 – Calculate the total nitrogen output in kilograms per year derived from the development that would exit the Wastewater Treatment Works into Solent catchments after treatment

This stage calculates the net increase in nitrogen output as a result of wastewater generation for all additional residential units proposed, taking into account treatment of wastewater at Budd's Farm Wastewater Treatment Works. The nitrogen output as a result of wastewater generation is calculated through the following steps:

- Calculate the additional population;
- Confirm water use;
- Confirm WwTW permit level; and
- Calculate Total Nitrogen (TN) in kilograms per annum that would exit the WwTW after treatment derived from the proposed development.

Natural England advise that it is appropriate to discount an amount of nitrogen that would be present in groundwater and river water if they were in a more natural condition and state that for the purposes of this methodology, a river and groundwater nitrogen concentration of 2.0 milligrams per litre is used to reflect the amount of nitrogen that would otherwise be present in river and groundwater. This is termed the 'acceptable nitrogen load'.

2.3 Stage 2 – Calculate existing (pre-development) nitrogen output as a result of leaching from current land use of the development site

This stage calculates the likely average nitrogen output as a result of nitrogen leaching from current land use. Different land uses will result in different rates of nitrogen leaching into the Solent catchment. The average nitrogen output rates of different uses are provided in the guidance provided by Natural England (Natural England, 2020).

2.4 Stage 3 – Calculate the likely nitrogen output as a result of leaching from future land use, and the net change in nitrogen output as a result of leaching

This stage calculates the likely average nitrogen output as a result of nitrogen leaching from the proposal land use post-development. This nitrogen output will not be received by the WwTW/proposed PTP and therefore will not be treated. As the proposed land use will replace the current land use, the nitrogen output calculated in Stage 2 (i.e. the output resulting from current land use) is subtracted from the nitrogen output calculated

for the proposed development, to give a net change in nitrogen output as a result of leaching post-development.

2.5 Stage 4 – Calculate the net change in the total nitrogen output that would result from the development

The final stage is to calculate the net change in nitrogen output into the Solent catchment as a result of the proposed development i.e. the total nitrogen output post-development as a result of increased wastewater generation and changes in land use (leaching), subtracting the current total nitrogen output at the site, based on the current land use. If there is a net increase in total nitrogen output post-development, then mitigation is required to achieve nutrient neutrality.

3.0 NUTRIENT BUDGET

3.1 Introduction

The nutrient budget calculation process is set out below, following the four stages as set out in the methodology (Section 2.0). The summary of this calculation is provided in **Appendix 2**.

3.2 Stage 1 – Calculate the total nitrogen output in kilograms per year derived from the development that would exit the Wastewater Treatment Works into Solent catchments after treatment

The proposals entail the development of 14 new residential units. Current guidance provided by Natural England (Natural England, 2020) indicates that an occupancy rate of 2.40 residents per dwelling should be utilised, however as the new bedrooms will be single occupancy only, a rate of one resident per dwelling will be used. Therefore, the new development is estimated to support 14 new residents.

In accordance with Natural England guidance a water consumption of 110 litres per person per day should be used to calculate current water use. This would indicate a water consumption of 1,540 litres per day.

The wastewater from the site is likely to be treated at Budd's Farm WwTW. The nitrogen permit limit for this WwTW is 9.70 milligrams per litre. The methodology indicates that it should be assumed that the WwTW works at 90% of its permit limited which would indicate an output of 8.73 milligrams per litre. Deducting the acceptable nitrogen loading of 2.00 milligrams per litre, which would be natural present within the water, this represents an anthropogenic output of 6.73 milligrams per litre. This represents 10,364.2 milligrams of nitrogen per day based on the 1,540 litres per day water use as a result of the proposals. This is equivalent to 0.0104 kilograms per day, or 3.78 kilograms per year.

3.3 Stage 2 – Calculate existing (pre-development) nitrogen output as a result of leaching from current land use of the development site

As there will be no change in land use, this stage of the calculation has not been undertaken.

3.4 Stage 3 – Calculate the likely nitrogen output as a result of leaching from future land use, and the net change in nitrogen output as a result of leaching

As there will be no change in land use, this stage of the calculation has not been undertaken.

3.5 Stage 4 – Calculate the net change in the total nitrogen output that would result from the development

The new development will result in an increased nitrogen output from wastewater discharge of 3.78 kilograms per year. As the land use of the site does not change post-development, there is no anticipated change in nitrogen output as a result of leaching. Natural England have indicated that a minimum 20% buffer should be applied to this figure (Natural England, 2020) and therefore, the budget is a net increased nitrogen output of 4.54 kilograms of nitrogen per year. The breakdown of this calculation is provided in **Appendix 2**.

4.0 CONCLUSION AND RECOMMENDATIONS

Natural England have proposed a number of potential types of mitigation including conversion of land, creation of wetlands, WwTW upgrades and strategic solutions with the Local Planning Authority (LPA). The mitigation measure considered most appropriate for this scheme is to consider a strategic solution with the LPA, Havant Borough Council.

Havant Borough Council offers to provide off-site mitigation at Warblington Farm for developments where the wastewater discharge is processed at Budd's Farm for financial contributions. The financial contributions required to offset the increase in nitrogen output is based on a rate of £1,235 per kilogram of nitrogen per year, plus an administration fee of £23. To offset the increase from the proposed extension a total of £5,629.90 will be required in financial contributions.

5.0 REFERENCES

CIEEM, 2017. Guidelines for Ecological Report Writing. 2nd ed. Winchester: Chartered Institute of Ecology and Environmental Management.

Natural England, 2014. *Site Improvement Plan: Solent (SIP043)*, s.l.: Natural England.

Natural England, 2020. Advice on Achieving Nutrient Neutrality for New Development in the Solent Region - Version 5, s.l.: Natural England.

Appendix 1 Proposals Plan

The drawings, details and specifications are solely for the purpose of seeking Planning and Building Regulation approvals. They are not intended as a specification of works, and PMG Ltd accepts no liability should they be used in this manner.

Drawing to be read in conjunction with specification, details notes and any specialist design elements. Any works carried out prior to approval are done so at the clients/builders own risk.

The contractor is responsible for checking all scaled and stated dimensions prior to commencement on site. The length of all structural elements are to be checked on site prior to placing orders.

The builder is to expose any existing structural elements (foundations, walls, lintels, floors, beams, roofs etc) which are accepting additional loads for Building Control and client approval prior to commencement.

This drawing is the copyright of PMG Ltd and must not be copied, reproduced or replicated in any way without prior consent. These drawings and other documents are not transferrable by use by any other person.

Any boundaries shown on the plan are their assumed location/line and the client should check the precise line of any boundaries prior to commencement. No works to project over the boundary line.

Client is resolve all matters relating to the Party Wall etc Act 1996 prior to commencing building works

PMG Ltd will not be liable for the accuracy of any hidden details; such as wall constructions, lintels, existing beams, foundations, drainage, etc. It is the responsibility of the client and his appointed contractor to expose all hidden features prior to commencement of any building works. The client should arrange for all drainage to be surveyed and traced prior to commencement to ensure that the drainage layouts shown on the plans are correct. The client should arrange for a trial hole to be excavated, prior to commencement, and for Building Control inspection to allow the proposed foundation type and depth to be agreed.

All drainage layouts shown on the plans are indicative only. The client must appoint a drainage survey and tracing company to ascertain the exact layout, depth and condition of the existing drainage prior to the commencement of any building works.

Project Title

**Proposed Extensions & Alterations
Oak View Nursing Home
47-49 Beech Road
Hayling Island
Hampshire**

Drawing Title

Proposed First & Second Floor Plans

Client

Oak View Nursing Home

Date:

May 2019

Scale:

1:100 at A1

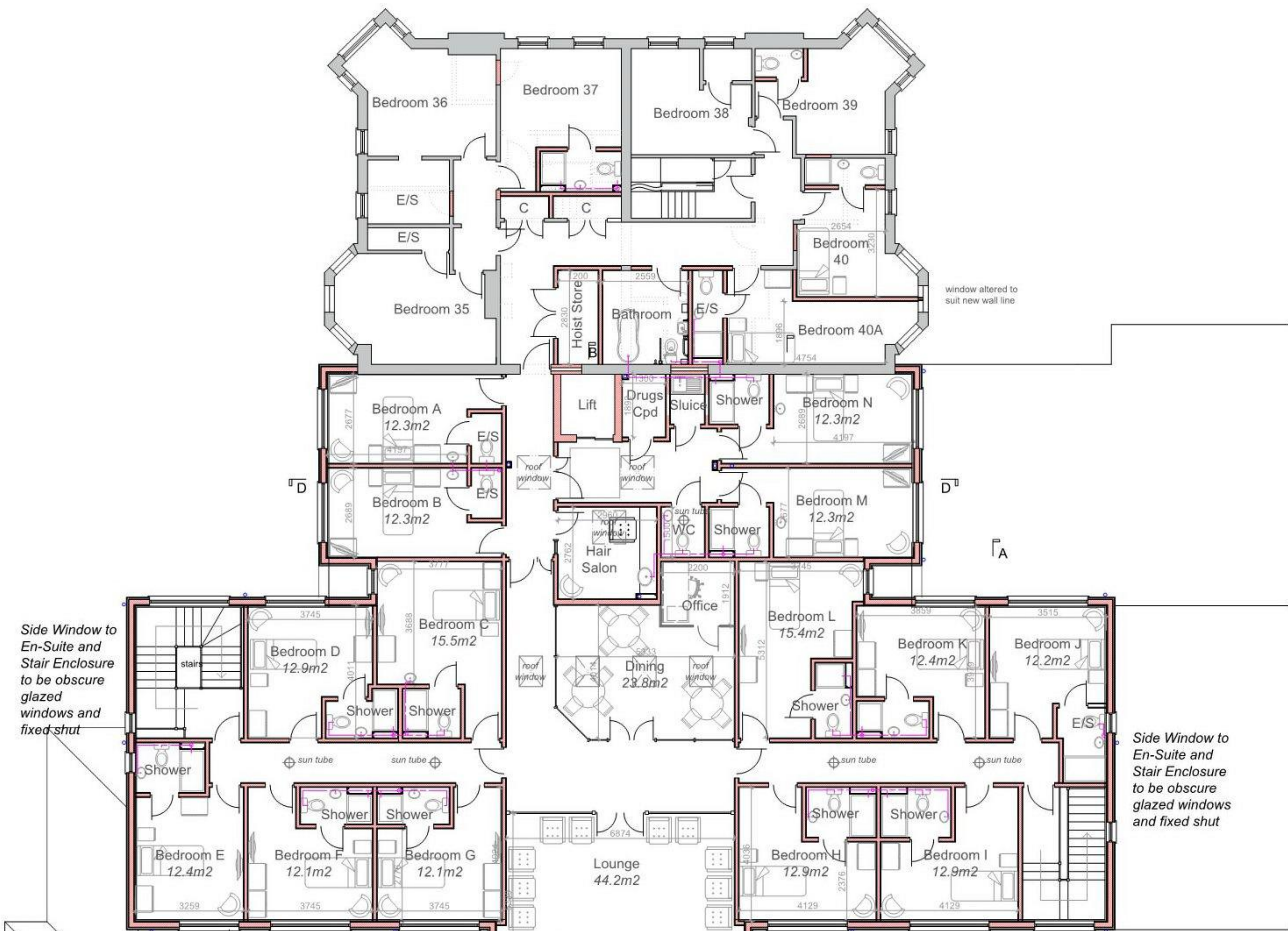
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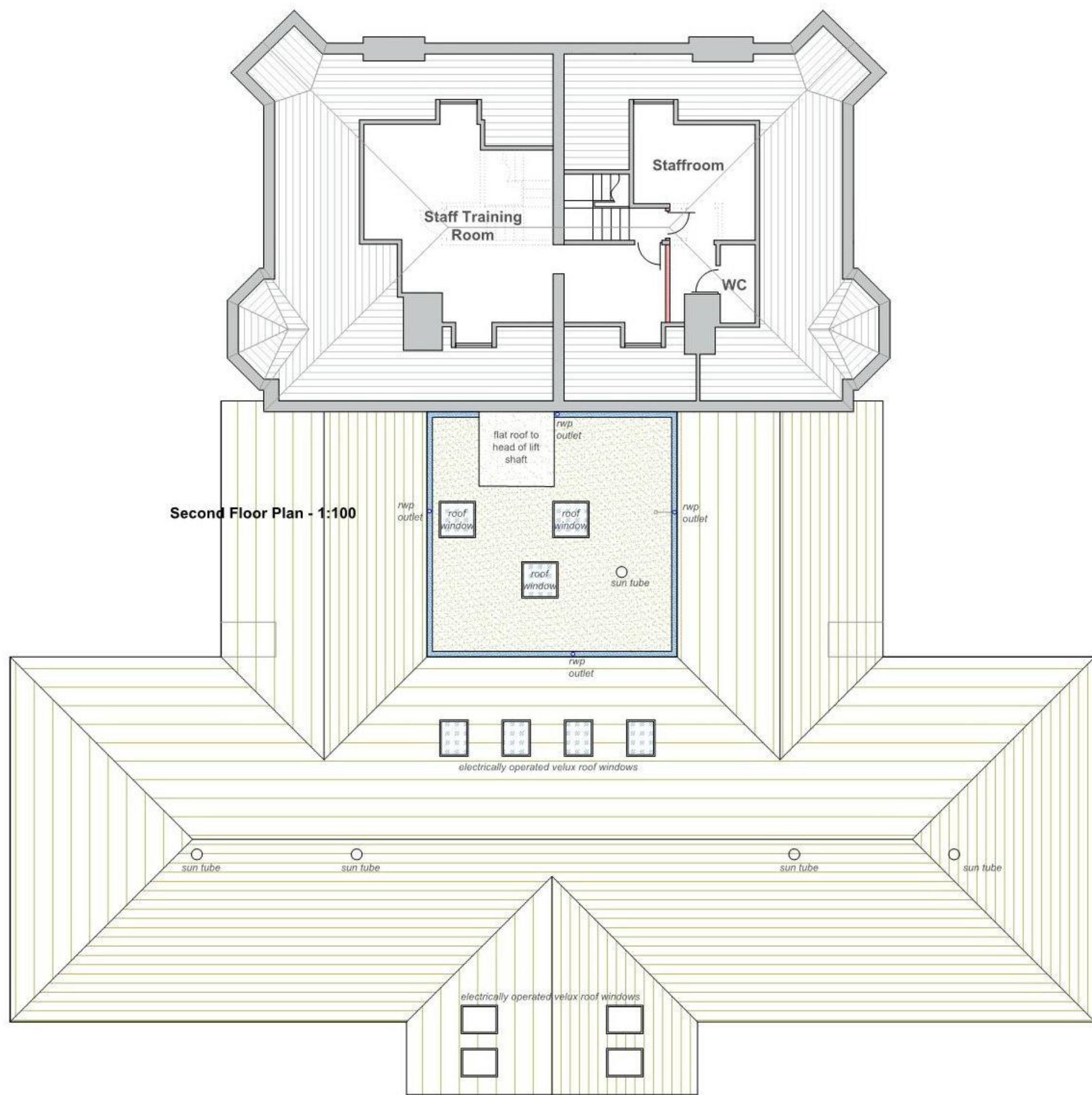
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Proposed First Floor Plan - 1:100

-51 Bedrooms (51 Residents)
-External Ground Floor Area =944.9m2 (internal floor area 893.8m2)
-External First Floor Area = 607m2 (internal floor area 572.4m2)
-Site Area = 2133m2

Footprint of first floor extension is
as approved under extant
planning approval 06/55601/011



Second Floor Plan - 1:100

Appendix 2 Nutrient Budget

Stage 1 - Nitrogen Load from Wastewater		
New Residents (A)	14.00	People
Waste Water Generation (B = A x 110 litres/day)	1540.00	l/day
Budd's Farm WWTW Environmental Permit Limit (C)	9.70	mg/l TN
Total Nitrogen (TN) Discharged After Treatment (D = B x (C x 90% - 2 mg))	10364.20	mg/TN/day
Total (E = D / 1000000 x 365 days)	3.78	kg/TN/year

Stage 2 - Nitrogen Load from Current Land Use		
Land to be Developed (F)	0.00	ha
Existing Use (G)	Urban Area	14.3 kg/ha/year
Total (H = F x G)	0.0	kg/TN/year

Stage 3 - Nitrogen Load from Future Land Use		
New Urban Area (I)	0.00	ha
Leaching from Urban Area (J = I x 14.3 kg/ha)	0.00	kg/TN/year
New Open Space (K)	0.00	ha
Leaching from Open Space (L = K x 5.0 kg/ha)	0.00	kg/TN/year
New Community Food Growing Provision (M)	0.00	ha
Leaching from Community Food Growing Provision (N = M x 26.9 kg/ha)	0.00	kg/TN/year
Total (O = J + L + N)	0.00	kg/TN/year

Budget		
Stage 1 - Nitrogen Load from Wastewater (E)	3.78	kg/TN/year
Stage 2 - Nitrogen Load from Current Land Use (H)	0.00	kg/TN/year
Stage 3 - Nitrogen Load from Future Land Use (O)	0.00	kg/TN/year
Total Future (P = E + O)	3.78	kg/TN/year
Total Change (P - H)	3.78	kg/TN/year
20% Buffer on Total Change ((P - H) x 20%)	0.76	kg/TN/year
Total Including Buffer (P - H + 20% Buffer)	4.54	kg/TN/year