



The Town House
St George's Square
Bishops Waltham
Southampton SO32 1AF

CALCULATIONS

RUSHBY BREWSTER

CONSULTING CIVIL AND STRUCTURAL ENGINEERS

Job Title	Job No.	Sht. No.
43/45 BARNHAM ROAD BARNHAM.	PBB 146	F-1
Element	Prepared	Date
Foul DRAINAGE	SB	FEB 12

Foul

ACCOMMODATION - $2 \times 2B + 5 \times 2B + 4 \times 1B$

USING SITS 2/3

$$7 \times 4P = 28P$$

$$4 \times 3P = 12P$$

$$\underline{40} \times 0.8 = 32P$$

$$\therefore \text{Flow} = 32 \times 180 \text{ L/DAY} = 5760 \text{ L/TRES/DAY}$$
$$(\equiv 0.066 \text{ L/SEC FLOW})$$

26B146-F-2

Table of Loadings for Sewage Treatment Systems

Per person / activity / day (unless otherwise specified)

	FLOW (Litres)	BOD (Grams)	Ammonia as N (Grams)
DOMESTIC DWELLINGS			
Standard residential	180	60	8
Mobile home type caravans with full services	180	75	6
INDUSTRIAL			
Office / Factory without canteen	50	25	5
Office / Factory with canteen	100	38	5
Open industrial site, e.g. construction, quarry, without canteen	60	25	5
*Full-time Day Staff	90	38	5
*Part-time Staff (4 hr shift)	45	25	3
SCHOOLS			
Non-residential with canteen cooking on site	90	38	5
Non-residential without a canteen	50	25	5
Boarding school (i) residents	200	75	10
(ii) day staff (inc. mid-day meal)	90	38	5
HOTELS, PUBS & CLUBS			
Hotel Guests (Prestige hotels)	300	105	12
Hotel Guests (3* & 4* hotels)	250	94	10
Guests (Bedroom only - no meals)	80	60	6
Residential Training/Conference Guest (inclusive all meals)	350	150	15
Non residential Conference Guest	60	25	2.5
Drinkers	12	15	5
Holiday camp chalet resident	227	94	10
Resident Staff	180	75	10
Restaurants - Full Meals - luxury catering	30	38	4
- pre-prepared catering	25	30	2.5
- Snack Bars & bar meals	15	19	2.5
- Function Rooms including buffets	15	19	2.5
- Fast Food i.e. (roadside restaurants)	12	12	2.5
- Fast Food Meal (burger chain and similar)	12	15	4
Students (Accommodation only)	100	66	5
AMENITY SITES			
Toilet Blocks (per use)	10	12	2.5
Toilet (W/C) (per use)	10	12	2.5
Toilet (Urinal) (per use)	5	12	2.5
Toilet Blocks in long stay car parks/lorry parks (per use)	10	19	4
Shower (per use)	40	19	2
Golf Club	20	19	5
Local community sports club, e.g. squash, rugby & football	40	25	8
Swimming (where a separate pool exists without an associated sports centre)	10	12	2.5
Health Club/Sports Centre	50	19	4
Tent sites	75	44	8
Caravan Sites - (i) Touring not serviced	100	44	8
(ii) Static not serviced	100	44	8
(iii) Static fully serviced	180	75	8
HOSPITALS & RESIDENTIAL CARE HOMES			
Residential old people / nursing	350	110	13
Small hospitals	450	140	Assess
Large hospitals		Assess individually	

*Staff figures also apply to other applications

- After installation, if the system is overloaded, due to activities that were not previously identified by the owner/purchaser of the system, then the manufacturer may not be able to assist with meeting the legal obligations of the permit provided by the regulator. The regulator has the right to review permits and change them if necessary.
- All sewage treatment system should be maintained according to the manufacturer's instructions by a certified engineer trained in accordance with the British Water Maintenance and Service Code of Practice.

Domestic housing

- A treatment system for a single house with up to and including 3 bedrooms shall be designed for a minimum population (P) of 5 people.
- The size of a treatment system for a single house with more than 3 bedrooms shall be designed by adding 1 P for each additional bedroom to the minimum single house value of 5 P, eg:
 - house with 3 bedrooms = minimum 5 P system
 - house with 4 bedrooms = minimum 6 P system (5+1)
 - house with 6 bedrooms = minimum 8 P system (5+3).
- For groups of small 1 and 2 bedroom houses or flats
 - flat with 1 bedroom = allow 3 P
 - flat with 2 bedrooms = allow 4 P
- A treatment system serving a group of houses shall be designed by adding together the P values for each house calculated independently, eg:
 - for a group of two houses (3 and 4 bedrooms, respectively) the system shall be for a minimum of 11 P (5+6)
- If the calculated total P for a group of houses exceeds 12 P then some reduction may be made to allow for the balancing effects on daily flow of a group of houses (round UP not down)
 - Where the total is 13-25 P multiply the total by 0.9 to give an adjusted P value, e.g. if there are four four-bedroom houses the total P will be 24 P (4 x 6) and the adjusted P will be 22 P (24 x 0.9 = 21.6)
 - Where the total is 26-30 P multiply the total by 0.8 to give an adjusted P value, e.g. if there are four three-bedroom houses and three four-bedroom houses the total P will be 38 P (4 x 5 and 3 x 6) and the adjusted P will be 31 P (38 x 0.8 = 30.4)
- Where there are larger groups of houses, the P should be estimated using both the expected total load and the flow, considering both peak and total flow
- These are minimum recommended population (P) loads, they should not be modified downwards, upward modification may be necessary because of particular characteristics of each property or groups of properties.
- The above assessments of population (P) should be used for both existing and new properties.
- Larger luxurious houses tend to have greater loads and increased water consumption with variability.
- Holiday homes tend to have higher occupancies, with perhaps, lounges also acting as bedrooms. Holiday lets and second homes may be used intermittently
- Check for unusual water uses such as spa baths, home brewing or home photo processing.
- Waste disposal units increase biological load.
- Laundry chemicals and toxic substances will affect the performance. (See below) It is assumed that laundry is not brought in, i.e. Tumbler strips.

REBING F3

Commercial premises

- Identify ALL the sources of waste.
- Identify final maximum site usage/business expectations.
- The individual values provided for each function within the table assume that 100% of every application and load is quantified. DO NOT reduce values based on reduced expectations.
- All catering applications require the installation of adequately sized grease separators, removal or retention systems up-stream of the biological treatment equipment.

Catering premises

- Establish maximum (and minimum) daily load based on a 24 hour cycle.
- Check period of operation.
- Identify dates of maximum loads, e.g. Mothering Sunday, Easter, Bank holidays, Fridays etc.
- Identify load peaks, usually at lunch or evening.
- Flow balancing may provide an appropriate solution.
- Where WDU and potato peelers are to be used calculate/ document the load.
- Identify the nature(s) of the catering in order to select the correct loading, eg

Bar snacks	- ploughmans, sandwiches, basket meals, etc.
Pre-prepared catering	- frozen and chilled meals (not prepared on site).
Home cooked meals	- fresh soups, fresh vegetables, casseroles, etc.
Luxury catering	- fully prepared on site with cream sauces, home made desserts.
Takeaways	- Indian, Chinese, fish and chips, etc.
Fast food	- roadside restaurants, burger chains, etc.
Function room catering	- Establish "normal" style, may be sandwiches, or full buffet, home cooked meals, conference, wedding banquets, etc.

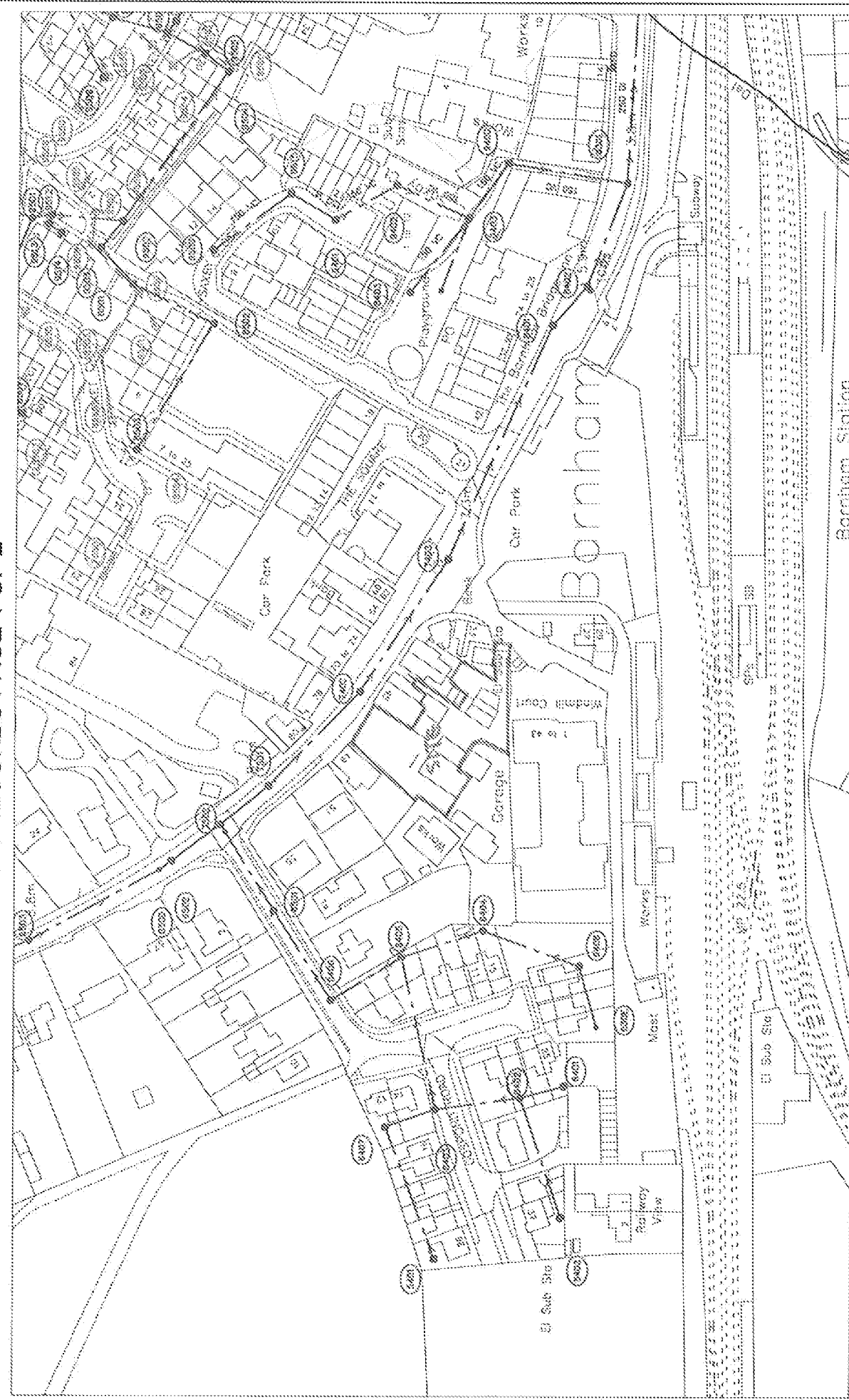
- The biological unit must be protected from grease and fats. Modern cooking uses light oils, which may not separate. The collection and containment of all forms of grease prior to the biological equipment is vital. Operate any grease system in full accordance with the manufacturer's instructions.
- Individual kitchen practices affect loads, i.e. leftovers on plates may be scraped into bin, or wet rinsed into system, the former is encouraged, the latter should be discouraged or factored into the treatment plant design.
- Premises serving beers may produce toxic caustic effluents due to the hygiene and cleaning regimes.
- The proportion of wastes from some sources can produce an effluent, which is difficult to treat, e.g. some Drive Through Fast Food establishments can have an effluent with a low organic content.

Hotels & Residential Centres

- Establish "style and type" of hotel e.g. Prestige (5*). Bedroom only accommodation, Conference Centres, Resort Hotels with Sports and Spas, Treatment Centres, etc.
- Calculate total loading based on occupancy of at least 2 people per room.
- Some hotels regularly have 4 occupants per room.

RM46-74

SEWER RECORDS PAGE 1 OF 2



O.S. REF. SU9504SE		Drawn by: Bhatia	Southern Water	
Title: 96371 Land to 43-45 Barnham Rd		Scale: 1:1250	N	
		Date: 18/03/2010	The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. This actual positions should be determined on site. (Copyright © 2005 Southern Water Services Ltd)	
		Based upon Ordnance Survey Digital Data with the permission of the controller of H.M.S.O. Crown Copyright Reserved Licence No. W1 328133.		

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SEWER RECORDS PAGE 2 OF 2

[illegible]

Drawn by: Shetlaur	
Title: 90371_Land to 43-45 Barnham Ro	
Date: 16/03/2010	

[illegible]

Mr John Bloomfield
Harrington Design & Bloomfield Ltd
6 The Old Flour Mill Queen Street
Emsworth
Hampshire
PO10 7BT

Our ref: HA/2010/110822/01-L01
Your ref: 09106
Date: 02 November 2010

Dear Mr Bloomfield

**DEVELOPMENT OF 16 NEW FLATS ON LAND CURRENTLY USED FOR
GARAGES AND MOTOR TRADE
LAND TO THE REAR OF 43/47 BARNHAM ROAD, BARNHAM, WEST SUSSEX
PO22 0ER**

Thank you for consulting us on your proposals. We are keen to help ensure that new development is as sustainable as possible and therefore appreciate the opportunity to comment on development proposals at this early stage. We have provided comments on two aspects which will need to be considered as part of any planning application.

1. Foul Drainage

As you may be aware, due to concern regarding the pollution of local watercourses and fields due to problems with the foul sewer network in the Barnham area, we have recently released a position statement to Arun District Council on wastewater treatment capacity constraints on new development in the Barnham Area.

Additional development within the area is likely to cause adverse environmental impacts. Therefore applicants will need to demonstrate that the development will not result in a significant increase in flows to the sewer network. We advise this is done through a comprehensive analysis of existing and proposed flows.

We recommend that figures found in the publication 'Flows and Loads 3 – Sizing Criteria, Treatment Capacity for Sewage Treatment Systems' available from are used to estimate household size and calculate wastewater flows. If there is any existing surface water flow to the sewer this could be offset against the proposed wastewater flows. Mitigation measures such as the incorporation of high water efficiency standards in new buildings should also be included.

Environment Agency
Guldbourne House Chatsworth Road, Worthing, West Sussex, BN11 1LD.
Customer services line: 0 [REDACTED]
Email: enquiries@environment-agency.gov.uk

Once this analysis is completed we would be happy to review it prior to the submission of any planning application.

Please note that although the 'Flows and Loads - 3' document was produced primarily to help calculate flows and loads for disposal by small wastewater treatment systems we only recommend it's use as a sensible means of calculating flows to sewer. We will object to developments proposing on-site treatment because we do not accept private treatment plants as a sustainable option in a sewered area.

2. Surface water drainage

Generally we would recommend infiltration rates for soakaways to be based on permeability tests undertaken over the winter period and not those done during the drier months. The design needs to be based upon BRE365 and cater for the 1 in 10 year storm between the invert of the entry pipe to the soakaway and the highest recorded water table. It must also have provision to ensure there is capacity in the system to contain below lowest ground level the 1 in 100 year event plus 20% on stored volumes. Therefore the local geological and hydrogeological characteristics of the site will dictate whether soakaways will be applicable and an investigation would be required.

The view expressed in this letter by the Environment Agency is a response to a pre application enquiry only and does not represent our final view in relation to any future planning application made in relation to this site. We reserve the right to change our position in relation to any such application.

You should seek your own expert advice in relation to technical matters relevant to any planning application before submission.

I hope this is of some use and please contact me if you have any questions on the above points.

Yours sincerely

pp. Mark Luker

Miss Catherine McLeod
Planning Liaison Officer

Sketches