Development & Planning Authority

Guernsey Technical Standard

Drainage and waste disposal

The Building (Guernsey) Regulations, 2012

H

H1 Foul Water Drainage
H2 Cesspools, septic tanks, settlement tanks and effluent tanks
H3 Rainwater drainage
H4 Building over sewers
H5 Separate systems of drainage
H6 Solid waste storage
H7 Overflow drainage
H8 Farm Drainage
H9 Disused drains, cesspools, septic tanks, settlement tanks or effluent tanks

2012 edition
With May 2016 amendments

MAIN CHANGES MADE BY THE MAY 2016 AMENDMENTS

1. Text changes made to reflect the new structure of government post May 1st 2016. All references to Departments have been removed.

MAIN CHANGES MADE BY THE FEB 2013 AMENDMENTS

2. The general guidance on materials and workmanship and the Construction Products Directive has been edited to reflect the new EU Construction Products Regulation.

3. Confirmation on the capacity required for cesspools has been included.

MAIN CHANGES IN THE 2012 EDITION

4. This Guernsey Technical Standard which takes effect on 1st July 2012, and is issued under the Building (Guernsey) Regulations, 2012. From this date all previous editions of documents approved under the Building Regulations, 1992 i.e. (the UK Approved Document H and sections H1 - H6 of the Guernsey Approved Documents 1993) will no longer be valid except in relation to building work carried out in accordance with full plans deposited with the States of Guernsey Building Control before that date.

How this Guernsey Technical Standard H differs from the UK Approved Document H

5. In addition to the different legislative references reflecting Guernsey legislation, the main differences a non resident based applicant should note are:

   a) Septic tanks are not generally accepted on the Island and therefore no guidance is provided within this document,

   b) Sections H7, H8 and H9 are in addition to the requirements of the UK mainly due to anti pollution measures protecting the Islands water resource.

6. The UK Building (Approved Inspectors, etc.) Regulations 2010 are not in force in Guernsey. Therefore approved inspectors are not recognised on the Island and all references have been removed.

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Introduction

What is a Guernsey Technical Standard?

This document has been approved and issued Development and Planning Authority to provide practical guidance on ways of complying with requirements H1 to H9 and regulation 11 of the Building (Guernsey) Regulations, 2012 (GSI, 2012 No.11). The Building (Guernsey) Regulations, 2012 are referred to throughout the remainder of this document as 'the Building Regulations'.

The intention of issuing Guernsey Technical Standards is to provide guidance about compliance with specific aspects of the Building Regulations in some of the more common building situations. They include examples of what, in ordinary circumstances, may be reasonable provision for compliance with the relevant requirement(s) of the Building Regulations to which they refer.

If guidance in a Guernsey Technical Standard is followed this may be relied upon as tending to show compliance with the requirement(s) covered by the guidance. Similarly a contravention of the standard may be relied upon as tending to establish a breach of the requirements. However, this is not conclusive, so simply following guidance does not guarantee compliance in an individual case or a failure to follow it meaning that there is necessarily a breach. It is also important to note that there may well be other ways of achieving compliance with the requirements. There is therefore no obligation to adopt any particular solution contained in this Guernsey Technical Standard if you would prefer to meet the relevant requirement in some other way. However, persons intending to carry out building work should always check with Building Control, that their proposals comply with Building Regulations.

The guidance contained in this Guernsey Technical Standard relates only to the particular requirements of the Building Regulations that the document addresses, (see 'Requirements' below). However, building work may be subject to more than one requirement of the Building Regulations and there may be an obligation to carry out work on a material change of use. In such cases the work will also have to comply with any other applicable requirements of the Building Regulations and work may need to be carried out which applies where a material change of use occurs.

This document is one of a series that has been approved and issued for the purpose of providing practical guidance with respect to the requirements of the Building Regulations in particular of regulations 6, 8 and 11 and Schedule 1.

At the back of this document is a list of all the documents that have been approved and issued for this purpose.

How to use this Guernsey Technical Standard

In this document the following conventions have been adopted to assist understanding and interpretation:

a. Texts shown against a yellow background are extracts from the Building Regulations, and set out the legal requirements that relate to compliance with the **drainage and waste disposal** requirements of the Building Regulations. It should be remembered however that, as noted above, building works must comply with all the other applicable provisions of the Building Regulations.

b. Details of technical publications referred to in the text of this document will be presented in italics and repeated in standards referred to as an annex at the rear of this document. A reference to a publication is likely to be made for one of two main reasons. The publication may contain additional or more comprehensive technical detail, which it would be impractical to include in full in this Document but which is needed to fully explain ways of meeting the requirements; or it is a source of more general information. The reason for the reference will be indicated in each case. The reference will be to a specified edition of the document. The Guernsey Technical Standard may be amended from time to time to include new references or to refer to revised editions where this aids compliance.

Where you can get further help

If you require clarification on any of the technical guidance or other information set out in this Guernsey Technical Standard and the additional detailed technical references to which it directs you, there are a number of routes through which you can seek further assistance:

- The States of Guernsey website: **www.gov.gg/planning**
- If you are the person undertaking the building work you can seek advice from Building Control Surveyors to help ensure that, when carried out, your work will meet the requirements of the Building Regulations.
- Businesses registered with a competent person self-certification scheme may be able to get technical advice from their scheme operator. A full list of competent persons schemes are included as Schedule 3 of the Building Regulations.
- If your query is of a highly technical nature you may wish to seek the advice of a specialist, or industry technical body, in the area of concern.

Responsibility for compliance

It is important to remember that if you are the person (e.g. designer, builder, installer) carrying out building work to which any requirement of Building Regulations applies you have a responsibility to ensure that the work complies with any such requirement. The building owner or occupier will also have a responsibility for ensuring compliance with Building Regulation requirements and could be served with a compliance notice in cases of non-compliance or with a challenge notice in cases of suspected non-compliance.

General Guidance

Types of work covered by this Guernsey Technical Standard

Building work

Building work, as defined in regulation 5 of the Building (Guernsey) Regulations, 2012, includes the erection or extension of a building, the provision or extension of a controlled service or fitting, and the material alteration of a building or a controlled service or fitting. In addition, the Building Regulations may apply in cases where the purposes for which or the manner or circumstances in which, a building or part of a building is used change in a way that constitutes a material change of use.

Under regulation 6 of the Building Regulations, building work must be carried out in such a way that, on completion of work,

i. the work complies with the applicable Parts of Schedule 1 of the Building Regulations,

ii. in the case of an extension or material alteration of a building, or the provision, extension or material alteration of a controlled service or fitting, it complies with the applicable Parts of Schedule 1 to the Building Regulations and also does so as satisfactorily as it did before the work was carried out.

Work described in Part H concerns the Drainage and waste disposal. Work associated with Drainage and waste disposal covered in these sections may be subject to other relevant Parts of the Building Regulations.

Material change of use

A material change of use occurs in specified circumstances in which a building, or part of a building that was previously used for one purpose will be used in future for another, or is converted to a building of another kind. Where there is a material change of use the Building Regulations set requirements that must be met before the building can be used for its new purpose.

Regulation 7 of the Building (Guernsey) Regulations, 2012 specifies the following circumstances as material changes of use:

– a building is used as a dwelling where previously it was not,

– a building contains a flat where previously it did not,

– a building is used as an institution where previously it was not,

– a building is used as a public building where previously it was not,

– a building is not described in Classes I to V or VI of Schedule 2, where previously it was,

– a building contains a room for residential purposes where previously it did not,

– a building contains an office where previously it did not,

– a building is used as an hotel or guest house, where previously it was not,

– a building is an industrial building, where previously it was not,

– a building contains a shop, where previously it did not,

– a building is used for the sale of food or drink, to the public in the course of a business and for consumption in that building and where there is a maximum capacity of 15 or more persons seated or standing, where previously it was not so used,

– the building, which contains at least one room for residential purposes, contains a greater or lesser number of such rooms than it did previously,

– the building, which contains at least one dwelling, contains a greater or lesser number of dwellings than it did previously.

Parts H1 - H9 apply to all of the change of use categories listed above..

Protected Buildings and Monuments

The types of building works covered by this Guernsey Technical Standard may include work on historic buildings. Historic buildings include:

a. a building appearing on the protected buildings listing

b. a building or other structure appearing on the protected monument listing

When exercising its functions under The Land Planning and Development Law, the States has duties under s30(1), 34, 35 and 38(1) of that Law, to secure so far as possible that monuments are protected and preserved, that the special characteristics of protected buildings are preserved and to pay special attention to the desirability of preserving and enhancing the character and appearance of a conservation area. Building Control will need to comply with these duties when considering any decisions in relation to such buildings or buildings in such areas.

Special considerations may apply if the building on which the work is to be carried out has special historic, architectural, traditional or other interest, and compliance with the **drainage and waste disposal** requirements would unacceptably alter the fabric, character or appearance of the building or parts of it.

When undertaking work on or in connection with buildings with special historic, architectural, traditional or other interest, the aim should be to improve the **drainage and waste disposal** where and to the extent that it is possible provided that the work does not prejudice the fabric, character or appearance of the host building or increase the long-term deterioration to the building's fabric or fittings.

In arriving at a balance between historic building conservation and the **drainage and waste disposal** requirements advice should be sought from the historic building adviser.

Note: Any building which is a protected monument listed under Section 29 of The Land Planning and Development (Guernsey) Law 2005 is exempt from most Building Regulations requirements including those in Part H, (See regulation 13 and class V of Schedule 2 to the Building Regulations) unless the proposed works constitute a material change of use.

Notification of work

In almost all cases of new building work it will be necessary to notify Building Control in advance of any work starting. The exception to this: where work is carried out under a self-certification scheme listed in Schedule 3 or where works consist of emergency repairs.

Competent person self-certification schemes under Schedule 3

Under regulations 14(4), 17(4) and 19 of the Building Regulations it is not necessary to deposit plans or notify Building Control in advance of work which is covered by this Guernsey Technical Standard if that work is of a type set out in column 1 of Schedule 3 to the Regulations and is carried out by a person registered with a relevant self-certification (competent persons) scheme as set out in column 2 of that Schedule. In order to join such a scheme a person must demonstrate competence to carry out the type of work the scheme covers, and also the ability to comply with all relevant requirements in the Building Regulations. These schemes may change from time to time, or schemes may change name, or new schemes may be authorised under Schedule 3; the current list on the States website should always be consulted. Full details of the schemes can be found on the individual scheme websites.

Where work is carried out by a person registered with a competent person scheme, regulation 19 of the Building Regulations requires that the occupier of the building be given, within 30 days of the completion of the work, a certificate confirming that the work complies with all applicable Building Regulation requirements. There is also a requirement that Building Control be given a notice that this has been done, or the certificate, again within 30 days of the completion of the work. These certificates and notices are usually made available through the scheme operator.

Building Control is authorised to accept these certificates as evidence of compliance with the requirements of the Building Regulations. However, inspection and enforcement powers remain unaffected, although they are normally used only in response to a complaint that work may not comply.

Exemptions

Schedule 2 to the Building Regulations sets out a number of classes of buildings which are exempt from the majority of Building Regulations requirements including Parts H1, H2 and H4-H9.

Note: some classes of Schedule 2 retain the requirements to meet the requirements of Part H3.

Materials and workmanship

Any building work within the meaning of the Building Regulations should, in accordance with regulation 11, be carried out with proper materials and in a workmanlike manner.

You may show that you have complied with regulation 11 in a number of ways. These include the appropriate use of a product bearing CE marking in accordance with the Construction Products Regulation (305/2011/EU-CPR) as or a product complying with an appropriate technical specification (as defined in those Regulations), a British Standard or an alternative national technical specification of any state which is a contracting party to the European Economic Area which in use is equivalent, or a product covered by a national or European certificate issued by a European Technical Approval issuing body, and the conditions of use are in accordance with the terms of the certificate.

You will find further guidance in the Guernsey Technical Standard on materials and workmanship that provides practical guidance on regulation 11 on materials and workmanship.

Supplementary guidance

Building Control occasionally issues additional material to aid interpretation of the guidance in Guernsey Technical Standards. This material may be conveyed in official letters to relevant agents and/or posted on the States website accessed through: **www.gov.gg/planning**

Technical specifications

When a Guernsey Technical Standard makes reference to specific standards or documents, the relevant version of the standard is the one listed at the end of the publication. However, if this version of the standard has been revised or updated by the issuing standards body, the new version may be used as a source of guidance provided that it continues to address the relevant requirements of the Building Regulations.

Where it is proposed to work to an updated version of the standard instead of the version listed at the end of the publication, this should be discussed with Building Control in advance of any work starting on site.

The appropriate use of any product, which complies with a European Technical Approval as defined in the Construction Products Regulation, (305/2011/EU-CPR) as amended, repealed or replaced will meet the relevant requirements.

Independent schemes of certification and accreditation

Much of the guidance throughout this document is given in terms of performance.

Since the performance of a system, product, component or structure is dependent upon satisfactory site installation, testing and maintenance, independent schemes of certification and accreditation of installers and maintenance firms will provide confidence in the appropriate standard of workmanship being provided.

Confidence that the required level of performance can be achieved will be demonstrated by the use of a system, material, product or structure which is provided under the arrangements of a product conformity certification scheme and an accreditation of installer scheme.

Third party accredited product conformity certification schemes not only provide a means of identifying materials and designs of systems, products and structures which have demonstrated that they reach the requisite performance, but additionally provide confidence that the systems, materials, products and structures are actually provided to the same specification or design as that tested or assessed.

Third party accreditation of installers of systems, materials, products and structures provides a means of ensuring that installations have been conducted by knowledgeable contractors to appropriate standards, thereby increasing the reliability of the anticipated performance.

Many certification bodies that approve such schemes are accredited by the **United Kingdom Accreditation Service.**

Certification of products, components, materials or structures under such schemes may be accepted as evidence of compliance with the relevant standard. Similarly the certification of installation or maintenance of products, components, materials and structures under such schemes as evidence of compliance with the relevant standard may be acceptable. Nonetheless Building Control will wish to establish in advance of the work, that any such scheme is adequate for the purpose of the Building Regulations.

Interaction with other legislation

This Guernsey Technical Standard makes reference to other legislation, including those listed below, the requirements of which may be applicable when carrying out building work. All references are to legislation as amended or repealed and replaced.

Note: All Laws, Ordinances and Statutory instruments can be accessed at;

www.guernseylegalresources.gg/

The Health and Safety at Work (General) (Guernsey) Ordinance, 1987 made under the Health and Safety at Work etc. (Guernsey) Law, 1979 and the Health, Safety and Welfare of Employees Law, 1950 applies to any workplace or part of a workplace. It applies to the common parts of flats and similar buildings if people such as cleaners, wardens and caretakers are employed to work in these common parts.

The Sewerage (Guernsey) Law, 1974.

The Water Byelaws (Guernsey) Ordinance, 2003.

Food and Drugs (Food Hygiene) Order, 1976.

Mixed use development

In mixed use developments part of a building may be used as a dwelling while another part has a non-domestic use. In such cases, if the requirements of this Part of the Regulations for dwellings and non-domestic use differ, the requirements for non-domestic use should apply in any shared parts of the building.

H1 FOUL WATER DRAINAGE

The Requirement H1

This Guernsey Technical Standard deals with the following requirements from Part H of Schedule 1 to the Building Regulations

Requirement	*Limits on application*
Foul water drainage **H1.** (1) An adequate system of drainage must be provided to carry foul water from appliances within the building to one of the following, listed in order of priority- (a) a public sewer, or, where that is not reasonably practicable, (b) a private sewer communicating with a public sewer, or, where that is not reasonably practicable, (c) a cesspool, or, where that is not reasonably practicable, (d) either a septic tank which has an appropriate form of secondary treatment or another wastewater treatment system. (2) In this Part 'foul water' means waste water which comprises or includes- (a) waste from a sanitary convenience, bidet or appliance used for washing receptacles for foul waste, or (b) water which has been used for food preparation, cooking or washing.	

Guidance

Performance

The requirement of H1 will be met if a foul water drainage system:

a. conveys the flow of foul water to a foul water outfall (a foul or combined sewer, a cesspool, effluent tank, septic tank or settlement tank),

b. minimises the risk of blockage or leakage,

c. prevents foul air from the drainage system from entering the building under working conditions,

d. is ventilated,

e. is accessible for clearing blockages, and

f. does not increase the vulnerability of the building to flooding.

Introduction to provisions

H1.1 The capacity of the system should be large enough to carry the expected flow at any point.

H1.2 The capacity depends on the size and gradient of the pipes. Minimum sizes and gradient limits are given in the text.

H1.3 The pipe sizes quoted in this document are nominal sizes used as a numerical designation in convenient round numbers approximately equal to a manufacturer's size. Equivalent pipe sizes for individual pipe standards will be found in the standards listed in Tables 4, 7 and 14.

Section 1 - Above ground

Sanitary Pipework

1.1 The provisions in this section are applicable to domestic buildings and small non-domestic buildings. Complex systems in larger buildings should be designed in accordance with *BS EN 12056* (see paragraph 1.39).

1.2 The guidance in these provisions is applicable for WCs with major flush volumes of 5 litres or more. Where WCs with major flush volumes less than 5 litres are used, consideration should be given to the increased risk of blockages. Guidance on the design of sanitary pipework suitable for use with WCs with major flush volumes as low as 4 litres can be found in *BS EN 12056* (see paragraph 1.39).

Traps

1.3 All points of discharge into the system should be fitted with a trap (e.g. a water seal trap) to prevent foul air from the system entering the building. Under working and test conditions traps should retain a minimum seal of 25mm of water or equivalent.

1.4 Table 1 gives minimum trap sizes and seal depths for the appliances which are most used.

1.5 **Pressure fluctuation** – To prevent the water seal from being broken by the pressures which can develop in the system the branch discharge pipes should be designed as described in paragraphs 1.7 to 1.25.

1.6 **Access for clearing blockages** – If a trap forms part of an appliance the appliance should be removable. All other traps should be fitted directly after the appliance and should be removable or be fitted with a cleaning eye.

Branch discharge pipes

1.7 Branch pipes should discharge into another branch pipe or a discharge stack unless the appliances discharge to a gully. Gullies are generally at ground floor level, but may be at basement level. Branch pipes should not discharge into open hoppers.

Table 1 **Minimum trap sizes and seal depths**

Appliance	Diameter of trap (mm)	Depth of seal (mm of water or equivalent)
Washbasin [1] Bidet	32	75
Bath [2] Shower [2]	40	50
Food waste disposal unit Urinal bowl Sink Washing machine [2] Dishwashing machine [2]	40	75
WC pan – outlet <80mm	75	50
WC pan – outlet >80mm	100	50

[1] The depth of seal may be reduced to 50mm only with flush grated wastes without plugs on spray tap basins.

[2] Where these appliances discharge directly to a gully the depth of seal may be reduced to not less than 38mm.

[3] Traps used on appliances with flat bottom (trailing waste discharge) and discharging to a gully with a grating may have a reduced water seal of not less than 38mm.

1.8 If the appliances are on the ground floor the pipe(s) may discharge to a stub stack or discharge stack, directly to a drain or (if the pipe carries only wastewater) to a gully. (See paragraphs 1.11 and 1.30.)

1.9 A branch pipe from a ground floor closet should only discharge directly to a drain if the depth from the floor to the drain is 1.3m or less (see Diagram 1).

Diagram 1 **Direct connection of ground floor WC to a drain**

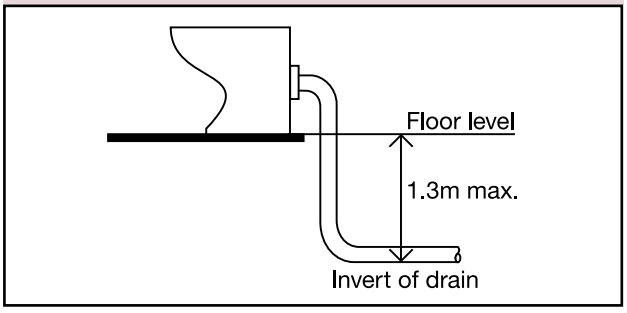
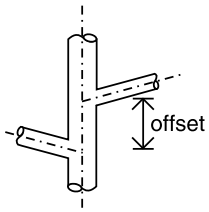
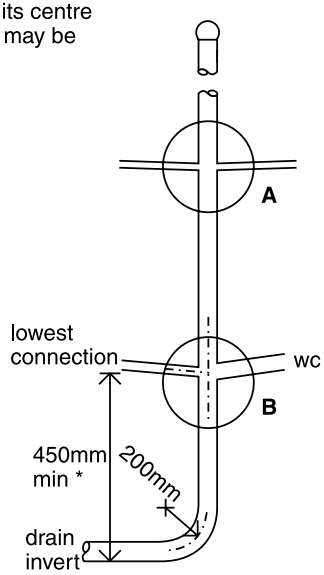


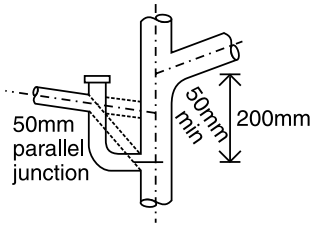
Diagram 2 **Branch connection to stacks – crossflow prevention**

A branch creates a no connection zone on a stack
No other branch may be fitted such that its centre line falls inside a zone but its centre line may be on the boundary of the zone





Opposed branch connection in the horizontal plane should be avoided



Key

A opposed connections without swept entries not exceeding 65mm should be offset
110mm on a 100mm diameter stack
250mm on a 150mm diameter stack

Opposed connections larger than 65mm (without swept entries) should be offset at least 200mm irrespective of stack diameter
Unopposed connections may be at any position

B Angled connection or 50mm diameter parallel junction where a branch discharge pipe would enter the WC no connection zone

NB A waste (branch discharge pipe) manifold may be a suitable alternative

* This should be increased in buildings over 3 storeys

1.10 A branch pipe should not discharge into a stack in a way which could cause crossflow into any other branch pipe. (See Diagram 2.)

1.11 A branch discharge pipe should not discharge into a stack lower than 450mm above the invert of the tail of the bend at the foot of the stack in single dwellings of up to 3 storeys (see Diagram 2).

1.12 Branch pipes may discharge into a stub stack. (See paragraph 1.30.)

1.13 A branch pipe discharging to a gully should terminate between the grating or sealing plate and the top of the water seal.

1.14 Condensate drainage from boilers may be connected to sanitary pipework. The connection should be made using pipework of minimum diameter 22mm through a 75mm condensate trap. If an additional trap is provided externally to the boiler to provide the 75mm seal, an air gap should be provided between the boiler and the trap.

a. The connection should preferably be made to an internal stack with a 75mm condensate trap.

b. If the connection is made to a branch pipe, the connection should be made downstream of any sink waste connection.

c. All sanitary pipework receiving condensate should be made from materials resistant to a pH value of 6.5 and lower. The installation should be in accordance with *BS 6798*.

1.15 Sizes of branch pipes – Pipes serving a single appliance should have at least the same diameter as the appliance trap (see Table 1). If a pipe serves more than one appliance, and is unventilated, the diameter should be at least the size shown in Table 2.

1.16 Bends in branch pipes should be avoided if possible. Where they cannot they should have as large a radius as possible.

1.17 Junctions on branch pipes of about the same diameter should be made with a sweep of 25mm radius or at 45°. Connection of branch pipes of 75mm diameter or more to a stack of equal diameter should be made with a sweep of 50mm minimum radius or at 45°.

1.18 Branch pipes up to 40mm diameter joining branch pipes 100mm diameter or greater should, if practicable, connect to the upper part of the pipe wall of the larger branch.

Table 2 **Common branch discharge pipes (unventilated)**

Appliance	Max. no. to be connected	Max. length of branch pipe (m)	Min. size of pipe (mm)	Gradient limits (mm fall per metre)
WC outlet > 80mm	8	15	100	18 [2] to 90
WC outlet < 80mm	1	15	75 [3]	18 to 90
Urinal – bowl		3 [1]	50	
Urinal – trough		3 [1]	65	18 to 90
Urinal – slab		3 [1]		
Washbasin or bidet	3	1.7	30	18 to 22
		1.1	30	18 to 44
		0.7	30	18 to 87
		3.0	40	18 to 44
	4	4.0	50	18 to 44

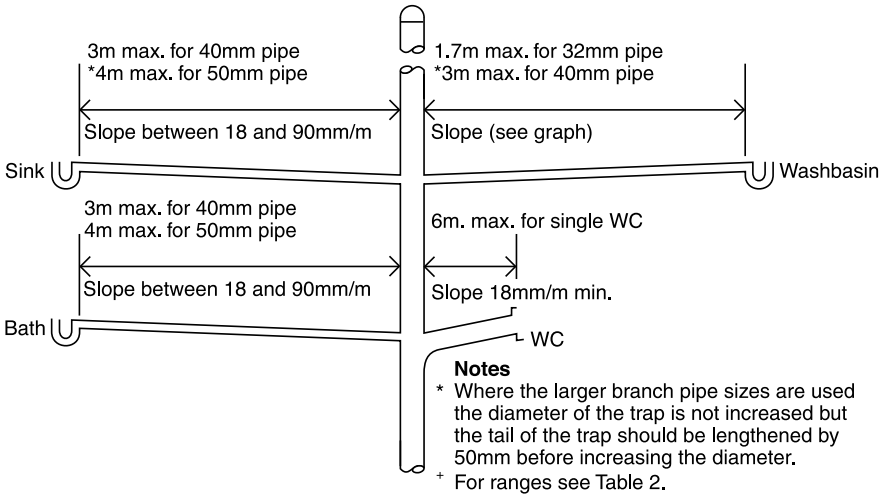
[1] Should be as short as possible to prevent deposition.

[2] May be reduced to 9mm on long drain runs where space is restricted, but only if more than one WC is connected.

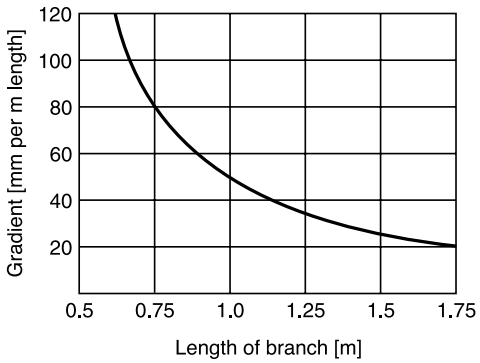
[3] Not recommended where disposal of sanitary towels may take place via the WC, as there is an increased risk of blockages.

[4] Slab urinals longer than seven persons should have more than one outlet.

Diagram 3 **Branch connections**



(a) Unvented branch connections to stacks



(b) Design curve for 32mm washbasin waste pipes

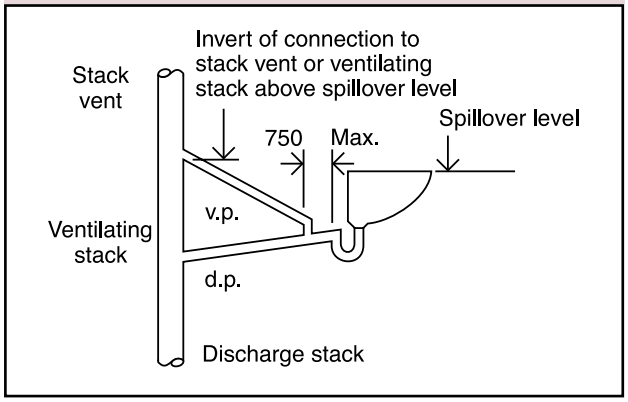
1.19 Ventilation of branch pipes – separate ventilation will not be needed to prevent the water seals in traps from being lost by pressures which can develop in the system if the length and slope of the branch discharge pipes do not exceed those shown in Table 2 or Diagram 3.

1.20 If the figures in Table 2 and Diagram 3 are exceeded the branch pipe should be ventilated by a branch ventilating pipe to external air, to a ventilating stack (ventilated branch system) or internally by use of an air admittance valve.

1.21 A separate ventilating stack is only likely to be preferred where the numbers of sanitary appliances and their distance to a discharge stack are large.

1.22 **Branch ventilating pipes** – should be connected to the discharge pipe within 750mm of the trap and should connect to the ventilating stack or the stack vent, above the highest 'spillover' level of the appliances served (see Diagram 4). The ventilating pipe should have a continuous incline from the discharge pipe to the point of connection to the ventilating stack or stack vent.

Diagram 4 **Branch ventilation pipes**



1.23 Branch ventilating pipes which run direct to outside air should finish at least 900mm above any opening into the building nearer than 3m (see Diagram 6 and paragraph 1.31).

1.24 Branch ventilating pipes to branch pipes serving one appliance should be at least 25mm diameter or where the branch is longer than 15m or has more than 5 bends, should be at least 32mm.

1.25 Rodding points should be provided to give access to any lengths of discharge pipe which cannot be reached by removing traps or appliances with internal traps (see paragraph 1.6).

Discharge stacks

1.26 All stacks should discharge to a drain. The bend at the foot of the stack should have as large a radius as possible and at least 200mm at the centre line.

1.27 Offsets in the 'wet' portion of a discharge stack should be avoided. If they are unavoidable then in a building of not more than 3 storeys there should be no branch connection within 750mm of the offset. In a building over 3 storeys a ventilation stack may be needed with connections above and below the offset. In buildings over 3 storeys discharge stacks should be located inside the building.

1.28 **Sizes of stacks** – Stacks should have at least the diameter shown in Table 3 and should not reduce in the direction of flow. Stacks serving urinals should be not less than 50mm, stacks serving closets with outlets less than 80mm should be not less than 75mm and stacks serving closets with outlets greater than 80mm should be not less than 100mm. The internal diameter of the stack should be not less than that of the largest trap or branch discharge pipe. For larger buildings the maximum flow should be checked. (See paragraphs 2.70 to 2.72.)

Table 3 **Minimum diameters for discharge stacks**

Stack size (mm)	Max. capacity (litres/sec)
50*	1.2
65*	2.1
75†	3.4
90	5.3
100	7.2

Notes:

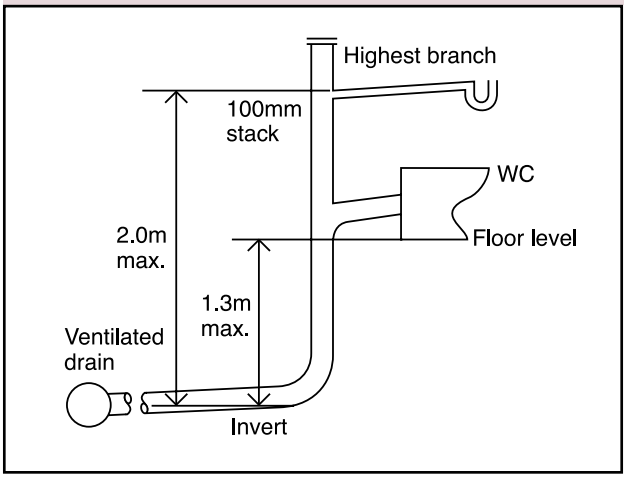
* No WCs.

† Not more than 1 WC with outlet size <80mm.

1.29 Ventilation of discharge stacks – To prevent water seals in the traps from being lost by pressures which can develop in the system, discharge stacks should be ventilated. Discharge stacks connected to drains liable to surcharging or near an intercepting trap require ventilating pipes of not less than 50mm diameter connected to the base of the stack above the likely flood level.

1.30 Stub stacks – A stub stack may be used if it connects into a ventilated discharge stack or into a ventilated drain. This is on condition that the drain is not subject to surcharging and no connected water closet has a floor level more than 1.3m and no other branch into the stub stack has a centreline more than 2m to the centre line above the invert of the connection or drain (see Diagram 5).

Diagram 5 **Stub stack**

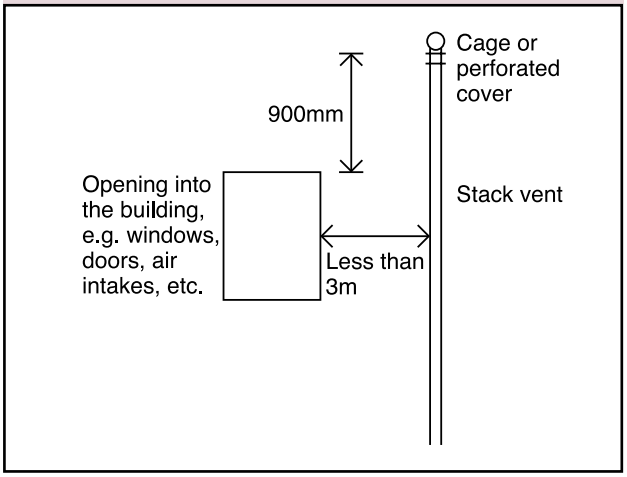


1.31 Ventilating pipes open to outside air should finish at least 900mm above any opening into the building within 3m and should be finished with a wire cage or other perforated cover, fixed to the end of the ventilating pipe, which does not restrict the flow of air (see Diagram 6). In areas where rodent control is a problem (see paragraph 2.22) these should be metallic.

1.32 Sizes of stack ventilation pipes – stack ventilation pipes (the dry part above the highest branch) may be reduced in size in one and two storey houses, but should be not less than 75mm.

1.33 Ventilated discharge stacks may be terminated inside a building when fitted with air admittance valves complying with *BS EN 12380:2002.* Where these valves are used they should not adversely affect the amount of ventilation necessary for the below ground system which is normally provided by open stacks of the sanitary pipework. Air admittance valves should be located in areas which have adequate ventilation, should be accessible for maintenance and should be removable to give access for clearance of blockages. Air admittance valves should not be used outside buildings or in dust laden atmospheres. Where there is no open ventilation on a drainage system or through connected drains, alternative arrangements to relieve positive pressures should be considered.

Diagram 6 **Termination of ventilation stacks or ventilation part of discharge**



1.34 Access for clearing blockages – rodding points should be provided in discharge stacks to give access to any lengths of pipe which cannot be reached from any other part of the system. All pipes should be reasonably accessible for repair. Rodding points in stacks should be above the spillover level of appliances.

Materials for pipes, fittings and joints

1.35 Any of the materials shown in Table 4 may be used (the references are to British Standard or European Standard Specifications). Where necessary different metals should be separated by non-metallic material to prevent electrolytic corrosion. Care should be taken to ensure continuity of any electrical earth bonding requirements. Pipes should be firmly supported without restricting thermal movement. Attention is also drawn to the requirement of Part B of the Building Regulations and guidance in the Guernsey Technical Standard B relating to penetration of fire separating elements and fire stopping provisions.

Table 4 **Materials for sanitary pipework**

Material	British Standard
Pipes	
Cast iron	BS 416, BS EN 877
Copper	BS EN 1254, BS EN 1057
Galvanised steel	BS 3868
PVC-U	BS EN 1329
Polypropylene (PP)	BS EN 1451
ABS	BS EN 1455
Polyethylene (PE)	BS EN 1519
Styrene copolymer blends (PVC + SAN)	BS EN 1565
PVC-C	BS EN 1566
Traps	BS EN 274, BS 3943

Note: Some of these materials may not be suitable for carrying trade effluent or condensate from boilers.

1.36 Sanitary pipework connected to WCs should not allow light to be visible through the pipe wall, as this is believed to encourage damage by rodents.

Workmanship

1.37 Good workmanship is essential. Workmanship should be in accordance with *BS 8000 Workmanship on Building Sites Part 13: Code of practice for above ground drainage.*

Air tightness

1.38 The pipes, fittings and joints should be capable of withstanding an air test of positive pressure of at least 38mm water gauge for at least 3 minutes. Every trap should maintain a water seal of at least 25mm. Smoke testing may be used to identify defects where a water test has failed. Smoke testing is not recommended for PVC-U pipes.

Alternative approach

1.39 The requirement can also be met by following the relevant recommendations of *BS EN 12056 Gravity drainage systems inside buildings*. Relevant clauses are in Part 1: General and performance requirements, Clauses 3–6; Part 2 Sanitary pipework, layout and calculation, Clauses 3 to 6 and National Annexes NA to NG (System III is traditionally in use in the UK); Part 5 Installation and testing, instructions for operation, maintenance and use, Clauses 4–6, 8, 9 and 11. *BS EN 12109 Vacuum Drainage Systems Inside Buildings.*

Section 2 - Below ground

2.1 This section gives guidance on the construction of underground drains and sewers from buildings to the point of connection to an existing sewer or a cesspool or wastewater treatment system and includes any drains or sewers outside the curtilage of the building. Disused and defective pipework is known to harbour rats.

2.2 Some public sewers may carry foul water and rainwater in the same pipes. If the drainage system is also to carry rainwater to such a sewer, the following provisions still apply but the pipe sizes may need to be increased to carry the combined flows (see paragraph 2.35). In some circumstances, separate drainage should still be provided (see requirement H5). Combined systems must not discharge to a cesspool or septic tank.

Outlets

2.3 Foul drainage should be connected to a public foul or combined sewer wherever this is reasonably practicable. For small developments connection should be made to a public sewer where this is within 30m provided that the developer has the right to construct the drainage over any intervening private land. Where levels do not permit drainage by gravity a pumping installation should be provided (see paragraphs 2.36 to 2.39).

2.4 For larger developments it may be economic to connect to a public sewer even where the sewer is some distance away. Developers are advised to consult Guernsey Waste Water to determine what, if any proposals for public sewer extension exist.

2.5 Guernsey Waste Water should be notified a before it is intended to connect to the public sewer.

2.6 Where it is not reasonably practicable to connect to a public sewer, it may be possible to connect to an existing private sewer that connects with a public sewer. The permission of the owner or owners of the sewer will be required. The sewer should be in satisfactory condition and have sufficient capacity to take the additional flows.

2.7 Where none of these options is reasonably practicable, cesspool should be provided (see requirement H2)

Surcharging of drains

2.8 Combined and rainwater sewers are designed to surcharge (i.e. the water level in the manhole rises above the top of the pipe) in heavy rainfall. Some foul sewers also receive rainwater and therefore surcharge. For low-lying sites (where the ground level of the site or the level of a basement is below the ground level at the point where the drainage connects to the public sewer) care should be taken to ensure that the property is not at increased risk of flooding. In all such cases Guernsey Waste Water should be consulted to determine the extent and possible frequency of the likely surcharge.

2.9 For basements containing sanitary appliances, where the risk of flooding due to surcharge of the sewer is considered by Guernsey Waste Water to be high, the drainage from the basement should be pumped (see paragraphs 2.36 to 2.39). Where the risk is considered to be low an anti-flooding valve should be installed on the drainage from the basement.

2.10 For other low-lying sites (i.e. not basements) where risk is considered low, sufficient protection for the building may be possible by provision of a gully outside the building at least 75mm below the floor level. This should be positioned so that any flooding from the gully will not damage any buildings. In higher risk areas an anti-flooding valve should be provided, or the drainage system pumped (see paragraph 2.36 to 2.39).

2.11 Anti-flooding valves should preferably be of the double valve type, and should be suitable for foul water and have a manual closure device. They should comply with the requirements of *prEN 13564*. A single valve should not normally serve more than one building. A notice should be provided inside the building to indicate that the system is drained through such a valve. This notice should also indicate the location of any manual override, and include advice on necessary maintenance.

2.12 All drainage unaffected by surcharge should by-pass the protective measures and discharge by gravity.

Layout

2.13 The layout of the drainage system should be kept simple. Changes of direction and gradient should be minimised and as easy as practicable. Access points should be provided only if blockages could not be cleared without them.

2.14 Connection of drains to other drains or private or public sewers, and of private sewers to public sewers, should be made obliquely, or in the direction of flow.

2.15 Connections should be made using prefabricated components. Where holes are cut in pipes a drilling device should be used to avoid damaging the pipe.

2.16 Where connections made to existing drains or sewers involve removal of pipes and insertion of a junction, repair couplings should be used to ensure a watertight joint and the junction should be carefully packed to avoid differential settlement with adjacent pipes.

2.17 Sewers (serving more than one property) should be kept as far as is practicable away from the point on a building where a future extension is likely (e.g. rear of a house, or side of house where there is room for a side extension).

2.18 The system should be ventilated by a flow of air. A ventilating pipe should be provided at or near the head of each main drain. An open ventilating pipe (without an air admittance valve) should be provided on any drain fitted with an intercepting trap (particularly on a sealed system), and on any drain subject to surcharge. Ventilated discharge stacks may be used (see paragraphs 1.27 and 1.29). Ventilating pipes should not finish near openings in buildings (see paragraph 1.31).

2.19 Pipes should be laid to even gradients and any change of gradient should be combined with an access point (see paragraph 2.49).

2.20 Pipes should also be laid in straight lines where practicable but may be laid to slight curves if these can still be cleared of blockages. Any bends should be limited to positions in or close to inspection chambers or manholes (see paragraph 2.49) and to the foot of discharge and ventilating stacks. Bends should have as large a radius as practicable.

2.21 Drainage serving kitchens in commercial hot food premises should be fitted with a grease separator complying with *BS EN 1825-1:2004* and designed in accordance with *BS EN 1825-2:2002* or other effective means of grease removal.

Special protection – rodent control

2.22 Where the site has been previously developed Building Control should be consulted to determine whether any special measures are necessary for control of rodents. Special measures which may be taken include the following.

a. Sealed drainage – drainage having access covers to the pipework in the inspection chamber instead of an open channel. These should only be used in inspection chambers, where maintenance can be carried out from the surface without personnel entry.

b. Intercepting traps – These are susceptible to blockage and require frequent maintenance. Intercepting trap stoppers should be of the locking type that can be easily removed from the chamber surface and securely replaced after blockage clearance. It is important that stoppers are replaced after maintenance. These should only be used in inspection chambers where maintenance can be carried out from the surface without personnel entry.

c. Rodent barriers – a number of rodent barrier devices are used in other countries; these include: enlarged sections on discharge stacks to prevent rats climbing, flexible downward facing fins in the discharge stack, or one way valves in underground drainage.

d. Metal cages on ventilator stack terminals should also be used to discourage rats from leaving the drainage system (see paragraph 1.31).

e. Covers and gratings to gullies may be displaced or attacked by rats. Solid plastic covers or metal gratings which can be fixed in place should be used to discourage rats from leaving the system.

Protection from settlement

2.23 A drain may run under a building if at least 100mm of granular or other flexible filling is provided round the pipe. On sites where excessive subsidence is possible additional flexible joints may be advisable or other solutions such as suspended drainage, particularly where the pipe is adjacent to structures or where soil conditions change in the course of the pipe run. Where the crown of the pipe is within 300mm of the underside of the slab, special protection should be provided (see paragraph 2.44).

2.24 At any points where pipes are built into a structure, including an inspection chamber, manhole, footing, ground beam or wall, suitable measures should be taken to prevent damage or misalignment. This may be achieved by either:

a. building in a length of pipe (as short as possible) with its joints as close as possible to the wall faces (within at most 150mm) and connected on each side of rocker pipes by a length of at most 600mm and flexible joints (see Diagram 7(a)); or

b. forming an opening to give at least 50mm clearance all round the pipe and the opening masked with rigid sheet material to prevent ingress of fill or vermin. It is important that the void is also filled with a compressible sealant to prevent ingress of gas (see Diagram 7(b)).

2.25 A drain trench should not be excavated lower than the foundations of any building nearby (see Diagram 8) unless either:

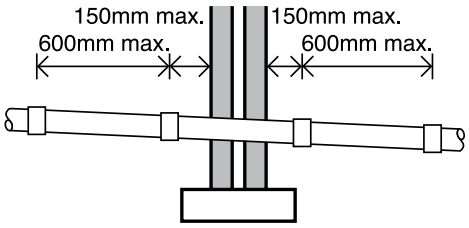
a. where the trench is within 1m of the foundation the trench is filled with concrete up to the lowest level of the foundation; or

b. where the trench is further than 1m from the building, the trench is filled with concrete to a level below the lowest level for the building equal to the distance from the building, less 150mm.

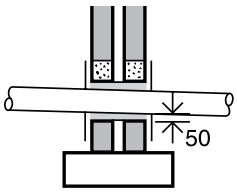
2.26 Where pipes are to be laid on piles or beams or in a common trench, or where the ground may prove unstable particularly where there is a high water table, advice may be found in *TRL A guide to the design loadings for buried rigid pipes.* Building Control may be able to provide information regarding the site.

Diagram 7 **Pipes penetrating walls**

(a) Short length of pipe bedded in wall, joints formed within 150mm of either wallface. Adjacent rocker pipes of max. length 600mm with flexible joints



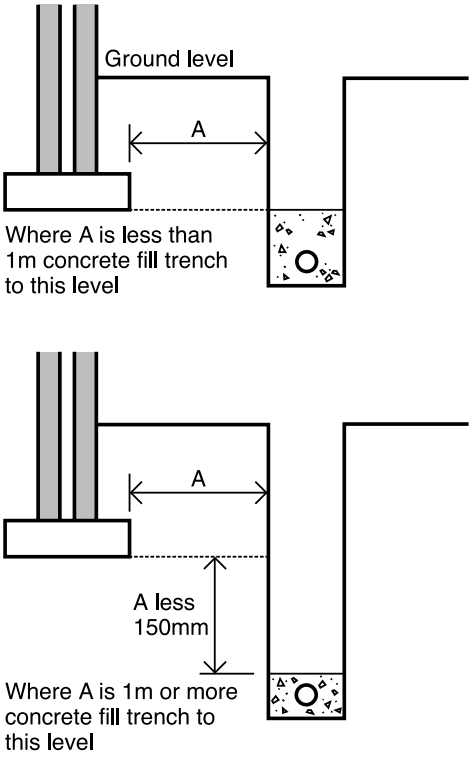
(b) Arch or lintelled opening to give 50mm space all round the pipe



Mask opening both sides with rigid sheet material to prevent entry of fill or vermin

Important Fill void with compressible sealant to prevent entry of gas

Diagram 8 **Pipe runs near buildings**



Depth of pipe cover

2.27 The depth of cover will usually depend on the levels of the connections to the system, the gradients at which the pipes should be laid and the ground levels.

2.28 Pipes also need to be protected from damage and if the limits of cover are not attainable it may be possible to choose another pipe strength and pipe bedding class combination (Guidance is given in *BS EN 1295-1 National Annex NA)*. Alternatively special protection can be provided (see paragraphs 2.41 to 2.45).

Pipe gradients and sizes

2.29 Drains should have enough capacity to carry the flow. The flow depends on the appliances connected (see paragraphs 0.1–0.3 and Table 5) and the capacity depends on the size and gradient of the pipes (see Diagram 9).

2.30 Sewers (i.e. a drain serving more than one property) should normally have a minimum diameter of 100mm when serving no more than 6 dwellings. Sewers serving more than 6 dwellings should normally have a minimum diameter of 150mm.

Diagram 9 **Discharge capacities of foul drains running 0.75 proportional depth**

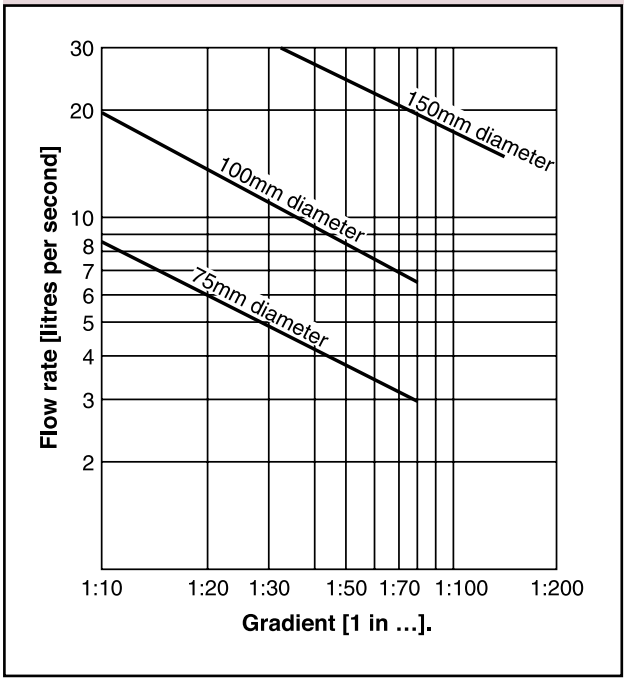


Table 5 **Flow rates from dwellings**

Number of dwellings	Flow rate (litres/sec)
1	2.5
5	3.5
10	4.1
15	4.6
20	5.1
25	5.4
30	5.8

2.31 The flow depends on the type, number and grouping of appliances.

2.32 Appliances are seldom in use simultaneously and the minimum drain sizes in normal use are capable of carrying the flow from quite large numbers of appliances. Table 5 shows approximate flow rates resulting from the typical household group of 1 WC, 1 bath, 1 or 2 washbasins, 1 sink and 1 washing machine used for design purposes in *BS EN 12056.*

2.33 A drain carrying foul water should have an internal diameter of at least 75mm. A drain carrying effluent from a WC or trade effluent should have an internal diameter of at least 100mm.

2.34 Table 6 shows the flattest gradients at which drains should be laid (depending on the flow and the appliances connected to them) and the capacity they will then have (see also paragraphs H.1–H.3).

Table 6 **Recommended minimum gradients for foul drains**

Peak flow (litres/sec)	Pipe size (mm)	Minimum gradient (1 in ...)	Maximum capacity (litres/sec)
< 1	75	1:40	4.1
	100	1:40	9.2
> 1	75	1:80	2.8
	100	1:80*	6.3
	150	1:150†	15.0

Notes:

* Minimum of 1 WC

† Minimum of 5 WCs

2.35 Combined systems – the capacity of systems carrying foul water and rainwater should take account of the combined peak flow (see paragraph 4.44).

Pumping installations

2.36 Where gravity drainage is impracticable, or protection against flooding due to surcharge in downstream sewers is required, a pumping installation will be needed.

2.37 Package pumping installations are available which are suitable for installation within buildings. Floor mounted units may be particularly suited for installation in basements. These should conform to *BS EN 12050.* Pumping installations for use inside buildings should be designed in accordance with *BS EN 12056-4*.

2.38 Package pumping installations suitable for installation outside buildings are also available. Guidance on the design of pumping installations for use outside buildings may be found in *BS EN 752-6*.

2.39 Where foul water drainage from a building is to be pumped, the effluent receiving chamber should be sized to contain 24-hour inflow to allow for disruption in service. The minimum daily discharge of foul drainage should be taken as 150 litres per head per day for domestic use. For other types of building, the capacity of the receiving chamber should be based on the calculated daily demand of the water intake for the building. Where only a proportion of the foul sewage is to be pumped, then the capacity should be based pro-rata. In all pumped systems the controls should be so arranged to optimise pump operation.

Materials for pipes and jointing

2.40 Any of the materials shown in Table 7 may be used (the references are to British Standard Specifications). Joints should be appropriate to the material of the pipes. To minimise the effects of any differential settlement pipes should have flexible joints. All joints should remain watertight under working and test conditions and nothing in the pipes, joints or fittings should project into the pipe line or cause an obstruction. Different metals should be separated by non-metallic materials to prevent electrolytic corrosion.

Table 7 **Materials for below ground gravity drainage**

Material	British Standard
Rigid pipes	
Vitrified clay	BS 65, BS EN 295
Concrete	BS 5911
Grey iron	BS 437
Ductile iron	BS EN 598
Flexible pipes	
UPVC	BS EN 1401+
PP	BS EN 1852+
Structure walled plastic pipes	BS EN 13476

+ Application area code UD should normally be specified

Note: Some of these materials may not be suitable for conveying trade effluent

Bedding and backfilling

2.41 The choice of bedding and backfilling depends on the depth at which the pipes are to be laid and the size and strength of the pipes.

2.42 **Rigid pipes** – The types of bedding and backfilling which should be used for rigid pipes of standard strength laid in a trench of any width are shown in Diagram 10 and Tables 8 and 9. Minimum and maximum depths of cover are also shown for each type.

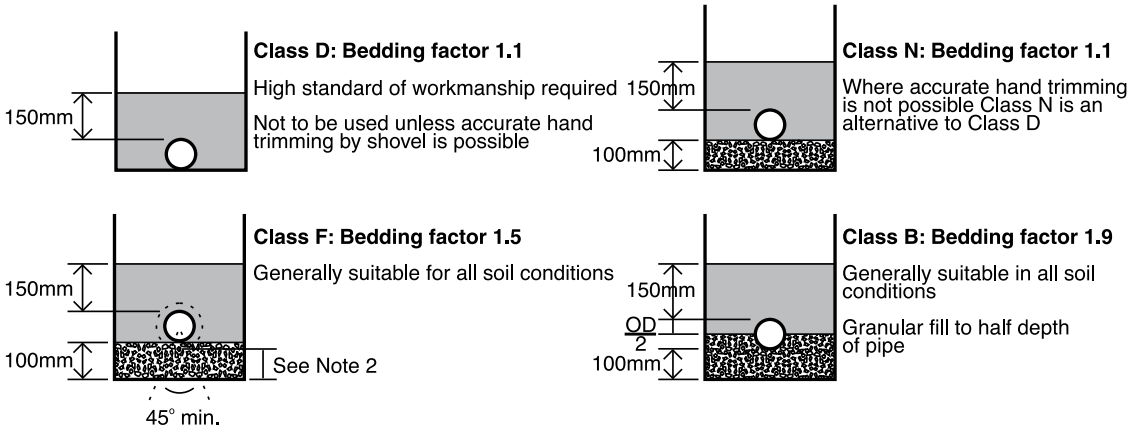
2.43 **Flexible pipes** – These will become deformed under load and require support to limit the deformation. The bedding and backfilling should be as shown in Diagram 10. Minimum and maximum depths of cover are also shown in Table 10.

2.44 Where pipes have less than the minimum recommended cover in Table 8, 9 or 10, the pipes should, where necessary, be protected from damage by a reinforced concrete cover slab with a flexible filler and at least 75mm of granular material between the top of the pipe and the underside of the flexible filler below the slabs (see Diagram 11 and paragraphs 2.28, 2.42 and 2.43).

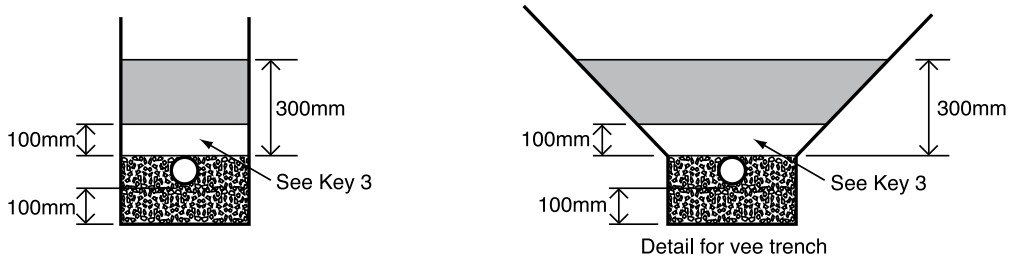
2.45 Where it is necessary to backfill the trench with concrete in order to protect nearby foundations (see paragraph 2.25) movement joints formed with compressible board should be provided at each socket or sleeve joint face (see Diagram 12).

Diagram 10 **Bedding for pipes**

a) Rigid pipes



b) Flexible pipes



Key

1 Selected fill: free from stones larger than 40mm, lumps of clay over 100mm, timber, frozen material, vegetable matter.

2 Granular material – For rigid pipes the granular material should conform to BS EN 1610 Annex B Table B.15 and should be single size material or graded material from 5mm up to a maximum size of 10mm for 100mm pipes, 14mm for 150mm pipes, 20mm for pipes from 150mm up to 600mm diameter and 40mm for pipes more than 600mm diameter. Compaction fraction maximum 0.3 for class N or B and 0.15 for class F.

3 Selected fill or granular fill free from stones larger than 40mm.

Notes:

1. Provision may be required to prevent groundwater flow in trenches with class N, F or B type bedding.
2. Where the pipe has sockets and Class D bedding is used, holes which should be as short as is practicable should be prepared in the trench bottom to give a clearance of 50mm beneath the socket.
3. Where the pipe has sockets and Class F or N bedding is used, the sockets should be not less than 50mm above the floor of the trench.
4. All dimensions are in mm.

Table 8 Limits of cover for class 120 clayware pipes in any width of trench

Nominal size	Laid in fields	Laid in light roads	Laid in main roads
100mm	0.6m – 8+m	1.2m – 8+m	1.2m – 8m
225mm	0.6m – 5m	1.2m – 5m	1.2m – 4.5m
400mm	0.6m – 4.5m	1.2m – 4.5m	1.2m – 4m
600mm	0.6m – 4.5m	1.2m – 4.5m	1.2m – 4m

Notes:

1. All pipes assumed to be Class 120 to BS EN 295; other strengths and sizes of pipe are available, consult manufacturers.
2. Bedding assumed to be Class B with bedding factor of 1.9; guidance is available on use of higher bedding factors with clayware pipes.
3. Alternative designs using different pipe strengths and/or bedding types may offer more appropriate or economic options using the procedures set out in BS EN 1295.
4. Minimum depth in roads set to 1.2m irrespective of pipe strength.

Table 9 Limits of cover for class M concrete pipes in any width of trench

Nominal size	Laid in fields	Laid in light roads	Laid in main roads
300mm	0.6m – 3m	1.2m – 3m	1.2m – 2.5m
450mm	0.6m – 3.5m	1.2m – 3.5m	1.2m – 2.5m
600mm	0.6m – 3.5m	1.2m – 3.5m	1.2m – 3m

Notes:

1. All pipes assumed to be Class M to BS 5911; other strengths and sizes of pipe are available, consult manufacturers.
2. Bedding assumed to be Class B with bedding factor of 1.9.
3. Alternative designs using different pipe strengths and/or bedding types may offer more appropriate or economic options using the procedures set out in BS EN 1295.
4. Minimum depth in roads set to 1.2m irrespective of pipe strength.

Table 10 Limits of cover for thermoplastics (nominal ring stiffness SN4) pipes in any width of trench

Nominal size	Laid in fields	Laid in light roads	Laid in main roads
100mm – 300mm	0.6m – 7m	0.9m – 7m	0.9m – 7m

Notes:

1. For drains and sewers less than 1.5m deep and there is a risk of excavation adjacent to the drain and depth, special calculation is necessary, see BS EN 1295.
2. All pipes assumed to be to in accordance with the relevant standard listed in Table 7 with nominal ring stiffness SN4; other strengths and sizes of pipe are available, consult manufacturers.
3. Bedding assumed to be Class S2 with 80% compaction and average soil conditions.
4. Alternative designs using different pipe strengths and/or bedding types may offer more appropriate or economic options using the procedures set out in BS EN 1295.
5. Minimum depth is set to 1.5m irrespective of pipe strength to cover loss of side support from parallel excavations.

Diagram 11 **Protection for pipes laid at shallow depths (minimum sizes)**

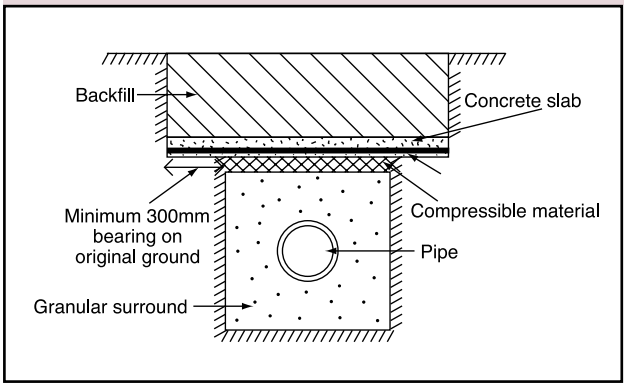
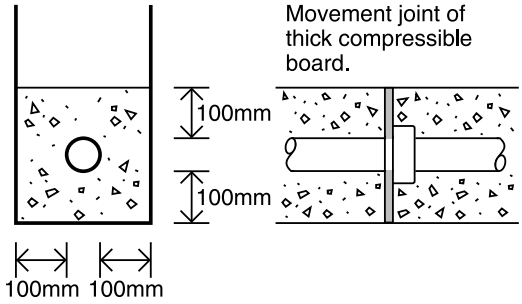


Diagram 12 **Joints for concrete encased pipes (minimum sizes)**



Clearance of blockages

2.46 Sufficient and suitable access points should be provided for clearing blockages from drain runs which cannot be reached by any other means. The siting, spacing and type of the access points will depend on the layout, depth and size of the runs.

2.47 The provisions described below are for normal methods of rodding (which need not be in the direction of flow) and not mechanical means of clearing.

2.48 Access points should be one of four types. Tables 11 and 12 show the depth at which each type should be used and the recommended dimensions it should have. The dimensions should be increased at junctions if they do not allow enough space for branches. The types are:

a. rodding eyes – capped extensions of the pipes;

b. access fittings – small chambers on (or an extension of) the pipes but not with an open channel;

c. inspection chambers – chambers with working space at ground level;

d. manholes – deep chambers with working space at drain level.

Table 11 **Minimum dimensions for access fittings and inspection chambers**

Type		Depth to invert from cover level (m)	Internal sizes		Cover sizes	
			Length x width (mm x mm)	Circular (mm)	Length x width (mm x mm)	Circular (mm)
Rodding eye			As drain but min. 100			Same size as pipework [1]
Access fitting						
small	150 diam.	0.6 or less,				
	150 x 100	except where	150 x 100	150	150 x 100 [1]	Same size as
large	225 x 100	situated in a	225 x 100	225	225 x 100 [1]	access fitting
		chamber				
Inspection chamber						
	shallow	0.6 or less	225 x 100	190 [2]	–	190 [1]
		1.2 or less	450 x 450	450	Min. 430 x 430	430
	deep	> 1.2	450 x 450	450	Max. 300 x 300 [3]	Access restricted to max. 350 [3]

Notes:

1. The clear opening may be reduced by 20mm in order to provide proper support for the cover and frame.
2. Drains up to 150mm.
3. A larger clear opening cover may be used in conjunction with a restricted access. The size is restricted for health and safety reasons to deter entry.

2.49 Siting of access points – access should be provided at the following points:

a. on or near the head of each drain run, and

b. at a bend and at a change of gradient, and

c. at a change of pipe size (but see below if it is at a junction), and

d. at a junction unless each run can be cleared from an access point (some junctions can only be rodded through from one direction).

2.50 Access should be provided to long runs. The distances between access points depend on the types of access used but should not be more than shown in Table 13 for drains up to and including 300mm.

2.51 Access points to sewers (serving more than one property) should be in places where they are accessible and apparent for use in an emergency. Examples of suitable locations include highways, public open space, unfenced front gardens and shared or unfenced driveways.

2.52 Construction of access points – these should contain the foul water under working and test conditions and resist the entry of groundwater and rainwater. Any of the materials shown in Table 14 may be used.

2.53 Where half round channels are used in inspection chambers and manholes the branches up to and including 150mm diameter should discharge into the channel in the direction of flow at or above the level of the horizontal diameter. A branch with a diameter >150mm should be set with the soffit level with that of the main drain. Where the angle of the branch is more than 45° a three quarter section branch should be used. Channels and branches should be benched up at least to the top of the outgoing pipe and at a slope of 1 in 12. The benching should be rounded at the channel with a radius of at least 25mm.

Table 12 **Minimum dimensions for manholes**

Type	Size of largest pipe (DN)	Min. internal dimensions [1] Rectangular length and width	Circular diameter	Min. clear opening size [1] Rectangular length and width	Circular diameter
Manhole					
< 1.5m deep to soffit	≤ 150 225 300 >300	750 x 675 [7] 1200 x 675 1200 x 750 1800 x (DN+450)	1000 [7] 1200 1200 The larger of 1800 or (DN+450)	750 x 675 [2] 1200 x 675 [2]	na [3]
>1.5m deep to soffit	≤ 225 300 375-450 >450	1200 x 1000 1200 x 1075 1350 x 1225 1800 x (DN+775)	1200 1200 1200 The larger of 1800 or (DN+775)	600 x 600	600
Manhole shaft [4]					
> 3.0m deep to soffit of pipe	Steps [5]	1050 x 800	1050	600 x 600	600
	Ladder [5]	1200 x 800	1200		
	Winch [6]	900 x 800	900	600 x 600	600

Notes:

1. Larger sizes may be required for manholes on bends or where there are junctions.
2. May be reduced to 600 by 600 where required by highway loading considerations, subject to a safe system of work being specified.
3. Not applicable due to working space needed.
4. Minimum height of chamber in shafted manhole 2m from benching to underside of reducing slab.
5. Min. clear space between ladder or steps and the opposite face of the shaft should be approximately 900mm.
6. Winch only – no steps or ladders, permanent or removable.
7. The minimum size of any manhole serving a sewer (i.e. any drain serving more than one property) should be 1200mm x 675mm rectangular or 1200mm diameter.

Table 13 **Maximum spacing of access points in metres**

From	To Access Fitting		To Junction	To Inspection chamber	To Manhole
	Small	Large			
Start of external drain [1]	12	12	–	22	45
Rodding eye	22	22	22	45	45
Access fitting: small 150 diam. and 150 x 100 large 225 x 100	 – –	 – –	 12 22	 22 45	 22 45
Inspection chamber shallow	22	45	22	45	45
Manhole and inspection chamber deep	–	–	–	45	90 [2]

Notes:

1. Stack or ground floor appliance
2. May be up to 200 for man-entry size drains and sewers

Table 14 **Materials for access points**

Material	British Standard
1. Inspection chambers and manholes	
Clay, bricks and blocks	BS 3921
Vitrified clay	BS EN 295, BS 65
Concrete – precast	BS 5911
Concrete – in situ	BS 8110
Plastics	BS 7158
2. Rodding eyes and access fittings (excluding frames and covers)	as pipes see Table 7 ETA Certificates

2.54 Inspection chambers and manholes should have removable non-ventilating covers of durable material (such as cast iron, cast or pressed steel, precast concrete or plastics) and be of suitable strength. Small lightweight access covers should be secured (for example with screws) to deter unauthorised access (for example by children). Inspection chambers and manholes in buildings should have mechanically fixed airtight covers unless the drain itself has watertight access covers. Manholes deeper than 1m should have metal step irons or fixed ladders.

Workmanship

2.55 Good workmanship is essential. Workmanship should be in accordance with *BS 8000 Workmanship on Building Sites Part 14: Code of practice for below ground drainage*.

2.56 During construction, drains and sewers which are left open should be covered when work is not in progress to prevent entry by rats.

2.57 Any drain or sewer should be protected from damage by construction traffic and heavy machinery. Protection may be provided by providing barriers to keep such traffic away from the line of the sewer. Heavy materials should not be stored over drains or sewers.

2.58 Where piling works are being carried out care should be taken to avoid damage to any drain or sewer. The position of the drain or sewer should be established by survey. If the drain or sewer is within 1m of the piling, trial holes should be excavated to establish the exact position of the sewer. The location of any connections should also be established. Piling should not be carried out where the distance from the outside of the sewer to the outside of the pile is less than two times the diameter of the pile.

Testing and inspection

2.59 Water tightness – after laying, including any necessary concrete or other haunching or surrounding and backfilling, gravity drains and private sewers should be tested for water tightness using either an air test or a water test. Information on test requirements is given in paragraphs 2.60 and 2.61 for pipe sizes up to 300mm. For further information and for larger sizes see *BS 8000 Part 14 or BS EN 1610.*

2.60 **Air test –** for pipes up to 300mm diameter, the pipe should be pressurised up to a pressure of 110mm water gauge and held for approximately 5 minutes prior to testing. Following this the pipe should be able to hold an initial 100mm pressure with a maximum loss of head on a manometer of 25mm in a period of 7 minutes.

2.61 **Water test** – For pipes up to 300mm diameter the system should be filled with water up to a depth of 5m above the lowest invert in the test section and a minimum depth of 1m measured at the highest invert in the test section. This may then be left for a period (one hour is generally sufficient) to condition the pipe. The test pressure should then be maintained for a period of 30 minutes, by topping up the water level as necessary so that it is within 100mm of the required level throughout the test. The losses per square metre of surface area should not exceed 0.15 litres for test lengths with only pipelines or 0.20 litres for test lengths including pipelines and manholes, or 0.40 litres for tests with only manholes and inspection chambers alone (i.e. no pipelines).

2.62 **Connectivity** – Where separate drainage systems are provided (see requirements H5), connections should be proven to ensure that they are connected to the correct system.

Sewers affected by septic gases

2.63 Generally public sewers are affected by gas from cesspit emptying. Therefore a gas interceptor must be fitted in the last access chamber before the public sewer and that chamber must have a fresh air inlet. Where a sealed interceptor is fitted, the fresh air inlet must be fitted within the drain run up flow of the trap (see diagram 13 for details of a gas interceptor)

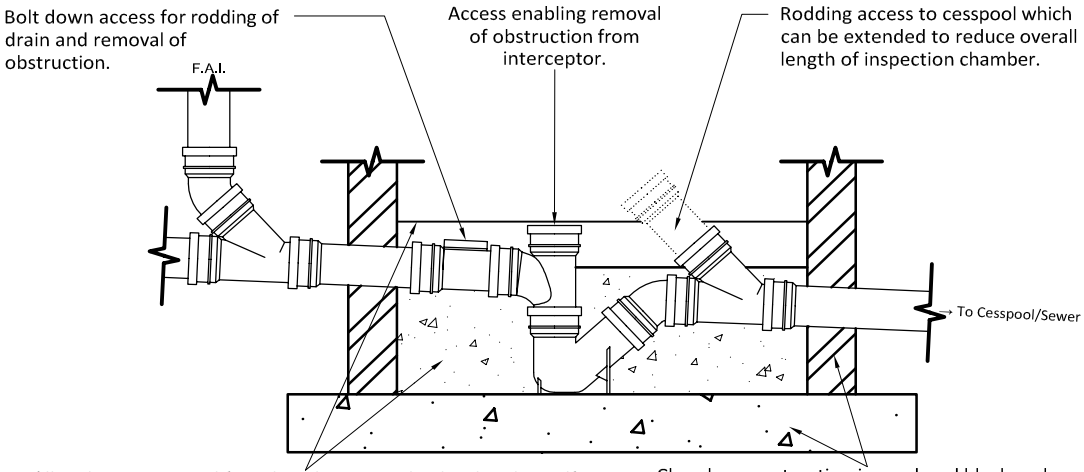
Anti Pollution

2.64 In very sensitive areas the drainage must be sealed i.e. open channels are not permitted within access chambers.

Alternative approach

2.65 The requirement can also be met by following the relevant recommendations of *BS EN 752.* The relevant clauses are in Part 3, Part 4 and Part 6. *BS EN 752*, together with *BS EN 1610* and *BS EN 1295*, contains additional information about design and construction. *BS EN 12056* describes the discharge unit method of calculating flows. Also by providing systems meeting the requirements of *BS EN 1091 Vacuum sewerage systems outside buildings, or BS EN 1671 Pressure sewerage systems outside buildings.*

Diagram 13 **UPVC Sealed interceptor detail**



Additional Guidance for Larger Buildings Capacity of pipes

(see paragraph 1.28)

2.70 The flow depends on the type, number and grouping of appliances.

2.71 Appliances are seldom in use simultaneously and the minimum stack sizes in normal use are capable of carrying the flow from quite large numbers of appliances. Table 15 shows approximate flow rates resulting from the typical household group of 1 WC, 1 bath, 1 or 2 washbasins, 1 sink and 1 washing machine used for design purposes in *BS EN 12056*.

Table 15 **Flow rates from dwellings**

Number of dwellings	Flow rate (litres/sec)
1	2.5
5	3.5
10	4.1
15	4.6
20	5.1
25	5.4
30	5.8

2.72 Flow rates for other commonly used appliances not covered in Table 15 are shown in Table 16.

Table 16 **Flow rates from appliances**

Appliance	Flow rate (litres/sec)
Spray tap basin	0.06
Washing machine	0.70
Dishwashing machine	0.25
Urinal (per person) 0.15	

Traps

(see paragraph 1.4)

2.73 Minimum trap sizes and seal depths for appliances not listed in Table 16 are shown in Table 17.

Table 17 **Minimum trap sizes and seal depths additional to Table 2**

Appliance	Diam. of trap (mm)	Depth of seal (mm)
Sanitary towel macerator	40	75
Food waste disposal unit (industrial type)	50	75
Urinal stall (1 to 6 person position)	65	50

Branch discharge pipes

(see paragraph 1.10)

2.74 A branch pipe should not discharge into a stack less than 750mm above the invert of the tail of the bend at the foot of the stack in a multi-storey building up to 5 storeys. Alternatively a branch pipe serving any ground floor appliance may discharge direct to a drain or into its own stack.

2.75 If the building has more than 5 storeys ground floor appliances, unless discharging to a gully or drain, should discharge into their own stack. If the building has more than 20 storeys ground floor appliances, unless discharging to a gully or drain, and first floor appliances should discharge into their own stack.

Ventilating stacks

(see paragraph 1.21)

2.76 A dry stack may provide ventilation for branch ventilation pipes as an alternative to carrying them to outside air or to a ventilated discharge stack (ventilated system).

2.77 Ventilation stacks serving buildings with not more than 10 storeys and containing only dwellings should be at least 32mm diameter (for all other buildings see paragraph 1.29).

2.78 The lower end of a stack may be connected directly to a ventilated discharge stack below the lowest branch discharge pipe connection and above the bend at the foot of the stack or to the crown of the lowest branch discharge pipe connection providing it is ≥75mm diameter.

Greywater recovery systems

2.79 Sanitary pipework and underground drainage used to collect greywater for recovery and re-use within the building should be designed and constructed in accordance with the guidance in this Approved Document.

2.80 All pipework carrying greywater for re-use should be clearly marked with the word 'GREYWATER' in accordance with *Water Regulations Advisory Scheme Information Guidance Note 09-02-05 Marking and Identification of Pipework for Reclaimed and Grey Water Systems*.

2.81 Guidance on external storage tanks is given in this Guernsey Technical Standard under H2.

2.82 Further guidance on greywater recovery systems can be found in the *Water Regulations Advisory Scheme leaflet No. 09-02-04 Reclaimed Water Systems.* Information about installing, modifying or maintaining reclaimed water systems.

The Requirement H2

This Guernsey Technical Standard deals with the following requirements from Part H of Schedule 1 to the Building Regulations

Requirement	*Limits on application*
Cesspools, septic tanks and effluent tanks. **H2.** (1) Any cesspool, septic tank and its form of secondary treatment, or other wastewater treatment system must be so sited and constructed that- (a) it is not prejudicial to the health of any person, (b) it will not contaminate any watercourse, underground water or water supply, (c) there are adequate means for emptying and maintenance, and (d) where relevant, it will function to a sufficient standard for the protection of health in the event of a power failure. (2) Any cesspool or holding tank which is part of a wastewater system or septic tank must be:- (a) of adequate capacity, (b) so constructed that it is impermeable to liquids, (c) adequately ventilated, and (d) adequately covered or fenced in. (3) Where a foul water drainage system from a building discharges to a cesspool, wastewater treatment system or septic tank, a durable notice must be affixed in a suitable place in the building containing information on any continuing maintenance required to avoid risks to health.	

H2 CESSPOOLS, SEPTIC TANKS, SETTLEMENT TANKS AND EFFLUENT TANKS

Guidance

Performance

The requirements of H2 will be met if:

a. cesspools and effluent tanks have sufficient capacity to store the foul water from the building or area until they are emptied,

b. septic tanks and settlement tanks have sufficient capacity to enable the breakdown and settlement of solid matter in the wastewater from the buildings and have adequate means of disposal of the effluent,

c. cesspools, septic tanks, settlement tanks and effluent tanks are sited and constructed so as to prevent leakage of the contents and ingress of subsoil water, and are provided with adequate ventilation,

d. cesspools, septic tanks, settlement tanks and effluent tanks are sited so as not to be prejudicial to health, not to contaminate any stream, surface water drain, pond or underground water or water supplies and so as to permit satisfactory access for emptying,

e. cesspools, septic tanks, settlement tanks and effluent tanks are so protected that accidental entry will be prevented.

Note: Septic tanks are not generally suitable for use on the Island and therefore no further guidance is given in this document. Guidance may be found in;

BS 6297: Code of practice for design and installation of small treatment works and cesspools.

BS EN 12566-1:2000, Small wastewater treatment systems for up to 50 PT. Prefabricated septic tanks

BS EN 12566-4:2007, Small wastewater treatment systems for up to 50 PT. Septic tanks assembled in situ from prefabricated kits

Introduction to provisions

H2.1 This document gives guidance only on the general principals relating to the capacity, siting, ventilation and protection of cesspools, settlement tanks and effluent tanks

Cesspools, settlement tanks and effluent tanks

Siting

3.1 The site of the cesspool should preferably be on ground sloping away from and sited lower than any existing building in the immediate vicinity.

3.2 Cesspools should be sited at least 4.5m from any habitable parts of buildings and preferably downslope. If this is not possible a lesser figure may be accepted providing the cesspool, settlement tank or effluent tank is fitted with a double seal cover and is ventilated at high level.

3.3 Cesspools should be sited within 22m of a vehicle access and at such levels that they can be emptied and cleaned without hazard to the building occupants or the contents being taken through a dwelling or place of work. Access may be through a covered space which may be lockable.

3.4 Emptying must be via a remote emptying point located adjacent to the vehicle access point.

3.5 Cesspools, settlement tanks and effluent tanks must be sited so that if they overflow they will not pollute any stream or water supply. If they are close to a stream the levels should be such that a gully, or similar, close to the property will overflow before the cesspit.

Design and construction

3.6 Cesspools should have a capacity below the level of the inlet of at least 7500 litres or equal to three days storage, whichever is the greater.

3.7 Cesspools and settlement tanks must be covered and ventilated. Effluent tanks must be covered or fenced in and, if they are covered, ventilated.

3.8 Cesspools and settlement tanks should have no openings except for the inlet, access for emptying and ventilation.

3.9 Cesspools, settlement tanks and effluent tanks should prevent leakage of the contents and ingress of subsoil water.

3.10 Cesspools and settlement tanks should be provided with access for desludging and cleaning. The access should have an opening of at least 600mm by 450mm and, have 100mm square mesh incorporated to prevent accidental entry. Access covers should be of durable quality having regard to the corrosive nature of the tank contents. The access should be lockable or otherwise engineered to prevent personnel entry.

3.11 Factory-made cesspools and settlement tanks are available in glass reinforced plastics, polyethylene or steel and should meet the relevant requirements of *BS EN 12566-1.* Particular care is necessary in ensuring stability of these tanks.

3.12 Cesspools and settlement tanks may be constructed in concrete, roofed with heavy concrete slabs. In situ concrete should be at least 150mm thick of C/25/P mix (s*ee BS 5328*).

3.13 The inlet of a cesspool or effluent tank and the inlet and outlet of a settlement tank should be provided with access for inspection (see guidance given earlier under H1).

3.14 The inlet of a cesspool, settlement tank or effluent tank must be provided with a gas interceptor to disconnect it from the last manhole. Refer to the earlier guidance given in paragraph 2.63 and diagram 13

3.15 All foul water from a building must be discharged into the cesspool. In areas remote from streams and water supplies, soakaways may be acceptable for the waste water from baths, bidets and hand wash basins providing the subsoil is sufficiently permeable to allow a soakaway to operate effectively. In this case permeability tests would normally be required and Building Control reserve the right to request the waste water to be taken to the cesspool is found necessary at a later date.

3.16 Only one dwelling will normally be allowed to connect to any cesspool. Communal cesspools are not generally acceptable.

Marking

3.17 A notice should be fixed within the building describing the necessary maintenance. An example of such wording is:

'The foul drainage system from this property is served by a cesspool. The system should be emptied approximately every <insert design emptying frequency> by a licensed contractor and inspected fortnightly for overflow. The owner is legally responsible to ensure that the system does not cause pollution, a health hazard or a nuisance.'

Greywater and rainwater storage tanks

3.18 Paragraphs 3.19 to 3.20 give guidance on tanks for the storage of greywater or rainwater for re-use within the building. It does not apply to water butts used for the storage of rainwater for garden use.

3.19 Greywater and rainwater tanks should:

a. prevent leakage of the contents and ingress of subsoil water, and should be ventilated;

b. have an anti-backflow device on any overflow connected to a drain or sewer to prevent contamination of the stored greywater or rainwater in the event of surcharge in the drain or sewer;

c. be provided with access for emptying and cleaning. Access covers should be of durable quality having regard to the corrosive nature of the tank contents. The access should be lockable or otherwise engineered to prevent personnel entry.

3.20 Further guidance on systems for greywater and rainwater re-use can be found in the Water Regulations Advisory Scheme leaflet No. 09-02-04. Reclaimed Water Systems. Information about installing, modifying or maintaining reclaimed water systems.

Alternative approach

3.21 The requirement can also be met by following the relevant recommendations of *BS 6297:1983 Code of practice for design and installation of small sewage treatment works and cesspools.* The relevant clauses are in Section 1, Section 2, Section 3 (Clauses 6–11), Section 4 and Appendices.

The Requirement H3

This Guernsey Technical Standard deals with the following requirements from Part H of Schedule 1 to the Building Regulations

Requirement	*Limits on application*
Rainwater drainage **H3.** (1) Adequate provision must be made for rainwater to be carried from the roof of the building.	
(2) Paved areas around the building must be so constructed as to be adequately drained.	Requirement H3(2) applies only to paved areas: (a) which provide access to the building pursuant to paragraph M1 (access and use) and M2 (access to extensions to buildings other than dwellings), (b) which provide access to or from a place of storage pursuant to paragraph H6(2) (solid waste storage), (c) in any passage giving access to the building, where this is intended to be used in common by the occupiers of one or more other buildings, or (d) forming the road providing access to buildings, and requirement H3(3) does not apply to the gathering of rainwater for reuse.
(3) Rainwater from a system provided pursuant to subparagraphs (1) or (2) must discharge to one of the following, listed in order of priority: (a) an adequate soakaway or some other adequate infiltration system, or, where that is not reasonably practicable, (b) a watercourse; or, where that is not reasonably practicable, (c) a sewer. and wherever practical the outfall must be situated within the catchment area.	
(4) In subparagraph (3), "catchment area" has the meaning in section 16 of the Prevention of Pollution (Guernsey) Law, 1989	

Guidance

Performance

The requirements of H3 will be met if:

a. rainwater from roofs and paved areas is carried away from the surface either by a drainage system or by other means,

b. a rainwater drainage system:

   i. carries the flow of rainwater from the roof to an outfall (a soakaway, a watercourse, a surface water or a combined sewer),

   ii. minimises the risk of blockage or leakage,

   iii. is accessible for clearing blockages,

c. rainwater soaking into the ground is distributed sufficiently so that it does not damage the foundations of the proposed building or any adjacent structure,

d. minimises the risk of blockage and leakage, and

e. is accessible for clearing blockages.

H3.1 The provisions in this document in relation to the drainage of paved areas apply only to paved areas:

a. within the curtilage of a building which are

   i. provided in accordance with requirement M2, to provide access to the principal entrance (see Guernsey Technical Standard M Section 1, for non-domestic buildings and Section 6 for domestic buildings),

   ii. provided in accordance with requirement H6 to give access from the building to the place for storing refuse, and from the place of storage to the collection point,

   b. which are yards or other forms of access intended to be used in common by more than one building.

The provisions of H3 only apply if these surfaces are paved.

H3.2 Methods of drainage other than connection to a public surface water sewer are encouraged where they are technically feasible.

H3.3 The capacity of the drainage system should be large enough to carry the expected flow at any point in the system.

H3.4 The flow depends on the area to be drained and the intensity of the rainfall.

H3.5 The capacity depends on the size and gradient of the gutters and pipes. Capacities and minimum sizes are given in the text.

H6.6 Rainwater or surface water should not be discharged to a cesspool or septic tank.

Introduction to provisions

Gutters and rainwater downpipes

Design rainfall intensities

4.1 For eaves, gutters the rainfall intensity for Guernsey should be taken as 0.02 litres per second per square metre.

4.2 Where the design incorporates valley gutters, parapet gutters, siphonic or drainage systems from flat roofs, and where over-topping of these systems would have particularly high consequences such as water entering the building, wetting of insulation or other dampness the design should be carried out in accordance with BS EN 12056 (see paragraph 1.17).

Gutters

4.3 The flow into a gutter depends on the area of surface being drained and whether the surface is flat or pitched (and, if it is pitched, on the angle of pitch). Table 18 shows a way of allowing for the pitch by working out an effective area.

Table 18 **Calculation of drained area**

	Type of surface	Effective design area
1	Flat roof	plan area of relevant portion
2	Pitched roof at 30º Pitched roof at 45º Pitched roof at 60º	plan area of portion x 1.29 plan area of portion x 1.50 plan area of portion x 1.87
3	Pitched roof over 70º or any wall	elevational area x 0.5

4.4 Table 19 shows the largest effective area which should be drained into the gutter sizes which are most often used. These sizes are for a gutter which is laid level, half round in section with a sharp edged outlet at only one end and where the distance from a stop end to the outlet is not more than 50 times the water depth. At greater distances the capacity of the gutter should be reduced. The Table shows the smallest size of outlet which should be used with the gutter.

4.5 Where the outlet is not at the end, the gutter should be of the size appropriate to the larger of the areas draining into it. Where there are two end outlets they may be up to 100 times the depth of flow apart.

Table 19 **Gutter sizes and outlet sizes**

Max. effective roof area (m^2)	Gutter size (mm diam.)	Outlet size (mm diam.)	Flow capacity (litres/sec)
6.0	–	–	–
18.0	75	50	0.38
37.0	100	63	0.78
53.0	115	63	1.11
65.0	125	75	1.37
103.0	150	89	2.16

Note: Refers to nominal half round eaves gutters laid level with outlets at one end sharp edged. Round edged outlets allow smaller downpipe sizes.

4.6 Gutters should be laid with any fall towards the nearest outlet. Where there is a fall or the gutter has a section which gives it larger capacity than a half-round gutter or the outlet is round edged it may be possible to reduce the size of the gutter and pipe.

Paragraph 4.17 gives a reference to some detailed recommendations which make reductions possible.

4.7 Gutters should also be laid so that any overflow in excess of the design capacity, caused by conditions such as above normal rainfall, will be discharged clear of the building, reducing the risk of overspilling of rainwater into the building or structural overload. On flat roofs, valley gutter, and parapet gutters, additional outlets may be necessary.

Rainwater pipes

4.8 Rainwater pipes should discharge into a drain or gully but may discharge to another gutter or onto another surface if it is drained. Any rainwater pipe which discharges into a combined system should do so through a trap (see requirements H1).

4.9 Where a rainwater pipe discharges onto a lower roof or paved area, a pipe shoe should be fitted to divert water away from the building. Where rainwater from a roof with an effective area greater than 25m^2 discharges through a single downpipe onto a lower roof, a distributor pipe should be fitted to the shoe to ensure that the flow width at the receiving gutter is sufficient so that it does not over-top the gutter.

4.10 The size of a rainwater pipe should be at least the size of the outlet from the gutter. A down pipe which serves more than one gutter should have an area at least as large as the largest of the contributing outlets and should be of sufficient size to take the flow from the whole contributing area.

Siphonic roof drainage systems

4.11 Siphonic roof drainage systems should be designed in accordance with *BS EN 12056-3* (see paragraph 4.17) and should take particular account of the following:

a. The need to take account of surcharge in the downstream drainage system as this can reduce the flow in the downpipe.

b. For long gutters the time taken for the system to prime the siphonic action may be excessive. Overflow arrangements should be provided to prevent gutters from over-topping.

4.12 Further information on the design of siphonic drainage systems can be found in *Hydraulics Research Ltd Report SR 463 Performance of Syphonic Drainage Systems for Roof Gutters.*

Eaves drop systems

4.13 Eaves drop systems allow rainwater from roofs to drop freely to the ground. Where these are used, they should be designed taking into account the following:

a. the protection of the fabric of the building from ingress of water, caused by water splashing on the external walls,

b. the need to prevent water from entering doorways and windows,

c. the need to protect persons using doorways, etc. from falling water,

d. the need to protect persons and the fabric of the building from rainwater as it hits the ground by splashing, for example by provision of a gravel layer or angled concrete apron deflecting the water away from the building,

e. the protection of foundations from concentrated discharges such as those from valleys or valley gutters or from excessive flows due to large roofs (i.e. where the area of roof per unit length of eaves is high).

Rainwater recovery systems

4.14 Rainwater drainage systems used to collect water for re-use within the building (rainwater recovery systems) should take account of the following:

a. storage tanks should comply with requirement H2 (see paragraphs 3.18 to 3.20),

b. pipework, washouts and valves should be clearly identified on marker plates (*see Water Regulations Advisory Scheme Information Guidance Note 09-02-05 Marking and Identification of Pipework for Reclaimed and Grey Water Systems).*

4.15 Further guidance on rainwater recovery systems can be found in the *UK's Water Regulations Advisory Scheme leaflet No. 09-02-04. Reclaimed Water Systems. Information about installing, modifying or maintaining reclaimed water systems*.

Materials for gutters, rainwater pipes and joints

4.16 The materials used should be of adequate strength and durability, and

a. all gutter joints should remain water tight under working conditions. Pipes inside a building should be capable of withstanding the air tightness test described in paragraph 1.32, and

b. pipework in siphonic roof drainage systems should be able to resist to negative pressures in accordance with the design, and

c. gutters and rainwater pipes should be firmly supported without restricting thermal movement, and

d. different metals should be separated by non-metallic material to prevent electrolytic corrosion.

Alternative approach

4.17 The performance can also be met by following the relevant recommendations of *BS EN 12056 Gravity drainage systems inside buildings.* The relevant clauses are in Part 3 Roof drainage layout and calculation, Clauses 3 to 7, annex A and National Annexes, and in Part 5 Installation, testing instructions for operation maintenance and use, Clauses 3, 4, 6 and 11. These standards contain additional detailed information about design and construction.

Drainage of paved areas

4.18 The following paragraphs give guidance on the design of paved areas for rainwater drainage systems. It is applicable to the drainage of paved areas around buildings and small car parks up to 4,000m². For the design of systems serving larger catchments, reference should be made to *BS EN 752-4* (see paragraph 4.36).

4.19 Surface gradients should direct water draining from a paved area away from buildings. Where the levels would otherwise cause water to concentrate along the wall of a building, a reverse gradient should be created, for at least 500mm from the wall of the building, to divert the water away from the wall.

4.20 Gradients on impervious surfaces should be designed to permit the water to drain quickly from the surface. A gradient of at least 1 in 60 is recommended. The gradient across a path should not exceed 1 in 40.

Design rainfall intensities

4.21 Design rainfall intensities of 0.014 litres/second/m² may be assumed for normal situations. Where ponding of rainfall is undesirable locally defined rainfall intensities should be obtained.

4.22 For very high risk areas, where ponding would lead to flooding of buildings, the drainage should be designed in accordance with *BS EN 752-4* (see paragraph 4.36).

Freedraining surfaces

4.23 Paths, driveways and other narrow areas of paving should be freedraining to a pervious area such as grassland, provided that:

a. the water is not discharged adjacent to buildings where it could damage foundations, and

b. the soakage capacity of the ground is not overloaded.

4.24 Where water is to be drained onto the adjacent ground the edge of the paving should be finished above or flush with the surrounding ground to allow the water to runoff.

4.25 Where the surrounding ground is not sufficiently permeable to accept the flow, filter drains may be provided (see paragraph 4.71).

Pervious paving

4.26 Pervious paving consists of a porous or permeable surface overlying a granular layer which acts as a storage reservoir, retaining peak flows while the water soaks into the underlying subsoil. They should be considered for larger paved areas where it is not possible to drain the rainwater to an adjacent pervious area. The design of the storage layer is undertaken on a similar basis to the design of the storage volume in soakaways (see paragraphs 4.60–4.64). Where infiltration is not possible (see paragraph 4.61), they may also be used with an impermeable barrier below the storage layer as a detention tank prior to flows discharging to a drainage system (see paragraph 4.73).

4.27 For steeply sloping surfaces, a check should be made to ensure that the water level can rise sufficiently in the granular storage layer to allow the storage capacity to be mobilised. A check should also be made to ensure that the stored water will not accumulate around the foundations of the building. Where infiltration is not possible (see paragraph 4.61), they may also be used with an impermeable barrier below the storage layer as a detention tank prior to flows discharging to a drainage system (see paragraph 4.73).

4.28 Pervious paving should not be used where excessive amounts of sediment are likely to enter the pavement and block the pores.

4.29 Pervious paving should not be used in oil storage areas, or where runoff may be contaminated with pollutants. Surface water should not be allowed to soak into the ground where ground conditions are not suitable (see paragraph 4.61).

4.30 Further information on pervious paving can be obtained from *CIRIA report C522 – Sustainable urban drainage systems – design manual for England and Wales.*

Drainage systems

4.31 Where it is not possible for surfaces to be freedraining, or to use pervious paving, impervious paving should be used with gullies or channels discharging to a drainage system.

4.32 Gullies should be provided at low points where water would otherwise pond. Intermediate gullies should be provided at intervals to ensure that gullies are not overloaded and the depth of flow in channels is not excessive.

4.33 Gully gratings should be set approximately 5mm below the level of the surrounding paved area in order to allow for settlement.

4.34 Provision should be made to prevent silt and grit entering the system, either by provision of gully pots of suitable size or by catchpits.

4.35 Drainage from large paved areas should be designed in accordance with *BS EN 752-4* (see 4.36).

Alternative approach

4.36 The performance can also be met by following the relevant recommendations of *BS EN 752-4:1998 Drain and sewer systems outside buildings, Part 4 Hydraulic design and environmental aspects*. The relevant clauses are Clause 11 and National Annexes ND and NE.

Surface water drainage

4.37 The following paragraphs give guidance on the design of surface water drainage systems. It is applicable to the drainage of small catchments with impervious areas up to 2 hectares. For the design of systems serving larger catchments, reference should be made to *BS EN 752-4* (see paragraph 4.74).

Outlets

4.38 Surface water drainage should discharge to a soakaway or other infiltration system where practicable.

4.39 Discharge to a watercourse may require a consent from Guernsey Water, who may limit the rate of discharge. Maximum flow rates can be limited by provision of detention basins (see paragraph 4.73).

4.40 Where other forms of outlet are not practicable, discharge should be made to a sewer.

Combined systems

4.41 No surface water should be discharged into a foul sewer unless Guernsey Waste Water agree. Where they can allow rainwater to discharge into the system if the sewer has enough capacity to take the added flow. Some private sewers also carry both foul and rainwater. If a sewer operated as a combined system does not have enough capacity, the rainwater should be run in a separate system with its own outfall.

4.42 In some circumstances, where a sewer is operated as a combined system and has sufficient capacity, separate drainage should still be provided.

4.43 Surface water drainage connected to combined sewers should have traps on all inlets.

Design rainfall intensities

4.44 Design rainfall intensities of 0.014 litres/second/m² may be assumed for normal situations. Alternatively the local rainfall intensity may be obtained.

4.45 Where low levels of surface flooding could cause flooding of buildings the rainfall intensities should be obtained from *BS EN 752-4* (see paragraph 4.74).

Design

4.46 Where there is evidence of a liability to surcharging from sewers, or levels in the building or on the site make gravity connection impracticable, surface water lifting equipment will be needed (see paragraphs 2.8 to 2.12).

Layout

4.47 Refer to paragraphs 2.13 to 2.21.

Depth of pipes

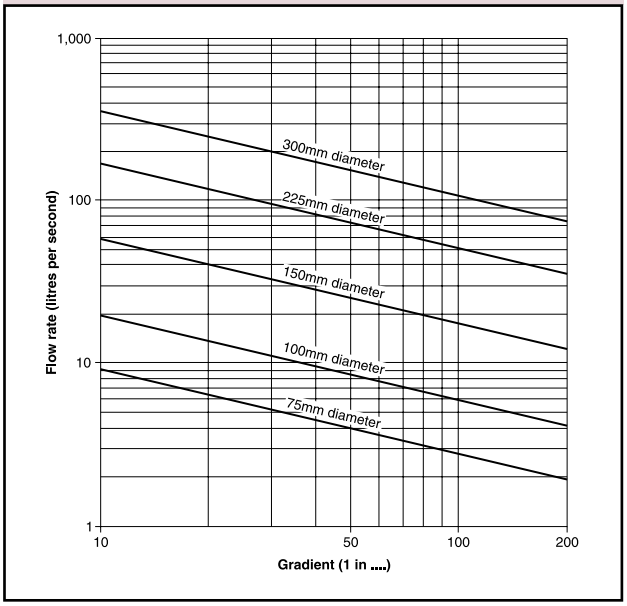
4.48 Refer to paragraphs 2.27 and 2.28 .

Pipe gradients and sizes

4.49 Drains should have enough capacity to carry the flow. The capacity depends on the size and gradients of the pipes.

4.50 Drains should be at least 75mm diameter. Surface water sewers (serving more than one building) should have a minimum size of 100mm. Diagram 13 shows the capacities of drains of various sizes at different gradients. However the capacity can be increased by increasing the gradient, or by using larger pipes.

Diagram 13 **Discharge capacities of rainwater drains running full**



4.51 75mm and 100mm rainwater drains should be laid at not less than 1:100. 150mm drains and sewers should be laid at gradients not less than 1:150 and 225mm drains should be laid at gradients not less than 1:225. For minimum gradients for larger pipes see *BS EN 752-4* (see paragraph 4.74.

Materials for pipes and jointing

4.52 See paragraph 2.40

Bedding and backfilling

4.53 See paragraphs 2.41 to 2.45

Clearance of blockages

4.54 See paragraphs 2.46 to 2.54

Workmanship

4.55 See paragraphs 2.55 to 2.58

Testing and inspection

4.56 See paragraphs 2.59 to 2.62

Contaminated runoff

4.57 Where any materials which could cause pollution are stored or used, separate drainage systems should be provided. This should include an appropriate form of separator or treatment system or the flow should be discharged into a system suitable for receiving polluted effluent.

4.58 On car parks, petrol filling stations or other areas where there is likely to be leakage or spillage of oil, drainage systems should be provided with oil interceptors (see paragraphs 4.75 to 4.81).

Soakaways and other infiltration drainage systems

4.59 Infiltration devices include soakaways, swales, infiltration basins and filter drains.

4.60 Further information on the design of infiltration drainage systems can be found in *CIRIA Report 156 – Infiltration drainage – Manual of good practice.*

4.61 Infiltration drainage is not always possible. Infiltration devices should not be built:

a. within 5m of a building or road or in areas of unstable land,

b. in ground where the water table reaches the bottom of the device at any time of the year,

c. where the presence of any contamination in the runoff could result in pollution of a groundwater source or resource.

4.62 Soakaways for areas less than 100m² are generally formed from square or circular pits, filled with rubble or lined with dry-jointed masonry or perforated ring units. Soakaways serving larger areas are generally lined pits or trench type soakaways.

4.63 Soakaways should be designed to a return period of once in ten years. The design should be carried out with storms of differing durations to determine the duration which gives the largest storage volume. For small soakaways serving 25m² or less a design rainfall of 10mm in 5 minutes may be assumed to give the worst case. For soakaways serving larger areas reference should be made to the sources listed in paragraph 4.66. Where the ground is marginal overflow drains can be acceptable.

4.64 Percolation tests should be carried out to determine the capacity of the soil (see paragraphs 4.67 to 4.70). Where the test is carried out in accordance with Guernsey Technical Standard H, (H2), the soil infiltration rate (f) is related to the value Vp derived from the test by the equation:

$$f = \frac{10^{-3}}{3V_p}$$

4.65 The storage volume should be calculated so that, over the duration the storm, it is sufficient to contain the difference between the inflow volume and the outflow volume. The inflow volume is calculated from the rainfall depth (see paragraph 4.62) and the area drained. The outflow volume (O) is calculated from the equation:

$$O = a_{s50} \times f \times D$$

Where a_{s50} is the area of the side of the storage volume when filled to 50% of its effective depth, and D is the duration of the storm in minutes.

4.66 Soakaways serving larger areas should be designed in accordance with *BS EN 752-4* (see paragraph 4.74), or *BRE Digest 365 Soakaway design.*

4.67 **Percolation test method** – A hole 300mm square should be excavated to a depth 300mm below the proposed invert level of the drainage pipe. Where deep drains are necessary the hole should conform to this shape at the bottom, but may be enlarged above the 300mm level to enable safe excavation to be carried out. Where deep excavations are necessary a modified test procedure may be adopted using a 300mm earth auger. Bore the test hole vertically to the appropriate depth taking care to remove all loose debris.

4.66 Fill the 300mm square section of the hole to a depth of at least 300mm with water and allow it to seep away overnight.

4.67 Next day, refill the test section with water to a depth of at least 300mm and observe the time, in seconds, for the water to seep away from 75% full to 25% full level (i.e. a depth of 150mm). Divide this time by 150. The answer gives the average time in seconds (V_p) required for the water to drop 1mm.

4.68 The test should be carried out at least three times with at least two trial holes. The average figure from the tests should be taken. The test should not be carried out during abnormal weather conditions such as heavy rain, severe frost or drought.

Other types of infiltration system

4.69 **Swales** are grass-lined channels which transport rainwater from a site as well as controlling flow and quality of surface runoff. Some of the flow infiltrates into the ground. There may be an overflow at the end into another form of infiltration device or a watercourse. They are particularly suitable for treatment of runoff from small residential developments, parking areas and roads.

4.70 **Infiltration basins** are dry grass-lined basins designed to promote infiltration of surface water to the ground.

4.71 **Filter drains** or french drains consist of the trench, lined with a geotextile membrane and filled with gravel. Much of the flow infiltrates into the ground. A perforated pipe is often laid through the gravel to assist drainage.

4.72 Flow enters the top of the filter drain directly from runoff, or is discharged into it through drains.

Detention ponds

4.73 Detention ponds are used to attenuate the flow from a drainage system, to limit the peak rate of flow into a sewer system or watercourse. Further information on design may be found in the references given in paragraph 4.74 and in *Sustainable Urban Drainage Systems – A Design Manual for England and Wales published by CIRIA*.

Alternative approach

4.74 The requirement can also be met by following the relevant recommendations of *BS EN 752-4 Drain and sewer systems outside buildings*. The relevant clauses are in Part 4 Hydraulic design and environmental considerations Clauses 3 to 12 and National Annexes NA, NB and ND to NI. BS EN 752, together with *BS EN 1295* and *BS EN 1610,* contains additional detailed information about design and construction.

Oil Separators

4.75 For most paved areas around buildings or car parks where a separator is required, a by-pass separator should be provided which has a nominal size (NSB) equal to 0.0018 times the contributing area. In addition it should have a silt storage volume in litres equal to 100 times NSB.

4.76 In fuel storage areas and other high risk areas full retention separators are required. These should have a nominal size (NS) equal to 0.018 times the contributing area. In addition it should have a silt storage volume in litres equal to 100 times NS.

4.77 Separators discharging to infiltration devices or surface water sewers should be Class I.

4.78 Separators should be leak tight. Inlet arrangements should not be direct to the water surface. Adequate ventilation should be provided.

4.79 Separators should comply with the requirements of the Guernsey Water and with *BS EN 858-2002 A1 2004 and BS EN 858-2:2003*.

4.80 Separators should be maintained regularly to ensure their continued effectiveness. Provision should be made for access for inspection and maintenance.

4.81 Further information on provision of separators is available in Use and design of oil separators in surface drainage systems, *Pollution Prevention Guideline No. 3*. This can be obtained from the Environment Agency.

The Requirement H4

This Guernsey Technical Standard deals with the following requirements from Part H of Schedule 1 to the Building Regulations

Requirement	*Limits on application*
Building over sewers	
H4. (1) The erection or extension of a building or work involving the underpinning of a building must be carried out in a way that is not detrimental to the building or building extension or to the continued maintenance of the drain, sewer. (2) In this paragraph and paragraph H5 "map of sewers" means the map of sewers kept at the Greffe as required by section 14(1) of the Sewerage Guernsey Law, 1974.	Requirement H4 applies only to work carried out- (a) over a drain, sewer or disposal main which is shown on any map of sewers, or (b) on any site or in such a manner as may result in interference with the use of, or obstruction of the access of any person to, any drain or sewer which is shown on any map of sewers.

Guidance

Performance

The requirements of H4 will be met if:

a. the building or extension or work involving underpinning;

   i. is constructed or carried out in a manner which will not overload or otherwise cause damage to the drain, sewer or disposal main either during or after the construction,

   ii. will not obstruct reasonable access to any manhole or inspection chamber on the drain, sewer or disposal main,

b. in the event of the drain, sewer or disposal main requiring replacement, there is a satisfactory diversionary route or the building or the extension will not unduly obstruct work to replace the drain, sewer or disposal main, on its present alignment,

c. the risk of damage to the building as a result of failure of the drain, sewer or disposal main is not excessive having regard to,

   i. the nature of the ground,

   ii. the condition, location or construction of the drain or sewer,

   iii. the nature, volume and pressure of the flow in the drain or sewer,

   iv. the design and construction of the foundations of the building.

Introduction to provisions

H4.1 These provisions apply to the construction, extension or underpinning of a building over or within 3m of the centre line of an existing drain or sewer shown on the Guernsey Waste Water sewer records whether that sewer is a public sewer or not.

H4.2 Copies of the sewer record maps are held by Guernsey Waste Water. These are available for inspection during office hours.

H4.3 Where it is proposed to construct a building over or near a drain or sewer shown on any map of sewers, the developer should consult the owner of the drain or sewer, if the owner is not the developer himself. In the case of a public sewer Guernsey Waste Water is responsible and may be able to advise on the condition of the sewer or arrange an inspection.

H4.4 If repair or replacement of a public sewer is required it will be carried out by Guernsey Waste Water.

Undue risk in the event of failure of the drain or sewer

5.1 Some soils are easily eroded by groundwater leaking into the drain or sewer. Examples of such soils include fine sands, fine silty sands, saturated silts and peat. Buildings should not be constructed over or within 3m of drains or sewers in such soils unless special measures are taken in the design and construction of foundations to prevent undue risk to the building in the event of failure of the drain or sewer. Special measures will not be needed if the invert of the drain or sewer is:

a. above the level of the foundations, and

b. above the groundwater level, and

c. no more than 1m deep.

5.2 A building constructed over or within 3m of:

a. any rising main (except those used solely to drain the building),

b. any drain or sewer constructed from brick or masonry,

c. any drain or sewer in poor condition (e.g. the pipes are cracked, fractured, deformed more than 5% or misaligned)

would be exposed to a high level of risk in the event of failure of the drain or sewer. Buildings should not be constructed in such a position unless special measures are taken.

Maintaining access

5.3 Buildings or extensions should not be constructed over a manhole or inspection chamber or other access fitting on any sewer (serving more than one property). Paragraph 2.51 provides that access points to sewers (serving more than one property) should be in places where they are accessible and apparent for use in an emergency. Buildings and extensions should not be located where they would remove such a provision where this already exists, unless an alternative access point can be provided on the line of the sewer at a location acceptable to the owner.

5.4 A satisfactory diversionary route should be available so that the drain or sewer could be reconstructed without affecting the building. This route should not pass within 3m from the building. Where the drain or sewer is more than 1.5m deep and the drain or sewer is accessible to mechanical excavators the alternative route should also have such access.

5.5 The length of drain or sewer under a building should not exceed 6m except with the permission of the owners of the drain or sewer (i.e. the sewerage undertaker in case of a public sewer).

5.6 Buildings or extensions should not be constructed over or within 3m of any drain or sewer more than 3m deep, or greater than 225mm in diameter except with the permission of the owners of the drain or sewer.

Protection of the drain or sewer during construction

5.7 Any drain or sewer should be protected from damage by construction traffic and heavy machinery. Protection may be provided by providing barriers to keep such traffic away from the line of the sewer. Heavy materials should not be stored over drains or sewers.

5.8 Where piling works are being carried out care should be taken to avoid damage to any drain or sewer. The position of the drain or sewer should be established by survey. If the drain or sewer is within 1m of the piling, trial holes should be excavated to establish the exact position of the sewer. The location of any connections should also be established. Piling should not be carried out where the distance from the outside of the sewer to the outside of the pile is less than twice the diameter of the pile.

Protection from settlement

5.9 Where a drain or sewer runs under a building at least 100mm of granular or other suitable flexible filling should be provided round the pipe. On sites where excessive subsidence is possible additional flexible joints may be advisable or other solutions adopted such as suspended drainage. Where the crown of the pipe is within 300mm of the underside of the slab, special protection should be provided (see paragraph 2.44).

5.10 Where a drain or sewer running below a building is less than 2m deep, the foundation should be extended locally so that the drain or sewer passes through the wall (see paragraph 1.11).

5.11 Where a drain or sewer runs through a wall or foundation suitable measures should be taken to prevent damage or misalignment. For further guidance see paragraph 2.24.

5.12 Where the drain or sewer is more than 2m deep to invert and passes beneath the foundations, the foundations should be designed as a lintel spanning over the line of the drain or sewer. The span of the lintel should extend at least 1.5m either side of the pipe and should be designed so that no load is transmitted onto the drain or sewer.

5.13 A drain trench should not be excavated lower than the foundations of any building nearby. For further guidance see paragraph 2.25.

The Requirement H5

This Guernsey Technical Standard deals with the following requirements from Part H of Schedule 1 to the Building Regulations

Requirement	*Limits on application*
Separate systems of drainage **H5**. Any system for discharging water to a sewer which is provided pursuant to paragraph H3 must be separate from that provided for the conveyance of foul water from the building.	Requirement H5 applies only to a system provided in connection with the erection or extension of a building where it is reasonably practicable for the system to discharge directly or indirectly to a sewer for the separate conveyance of surface water which is- (a) shown on a map of sewers, or (b) under construction for and on behalf of the States of Guernsey.

Guidance

Performance

The requirements of H5 will be met if separate systems of drains and sewers are provided for foul water and rainwater where;

a. the rainwater is not contaminated, and

b. the drainage is to be connected either directly or indirectly to the public sewer system and either:

   i. the public sewer system in the area comprises separate systems for foul water and surface water, or

   ii. a system of sewers which provides for the separate conveyance of surface water is under construction either by the sewerage undertaker or by some other person.

Introduction to provisions

H5.1 These provisions are to help minimise the volume of rainwater entering the public foul sewer system as this can overload the capacity of the sewer and cause flooding.

Provision where separate sewer systems are provided

6.1 Where the buildings are to be drained to the public sewer system, and a separate system of public surface water sewers exist, separate drainage systems will be necessary.

Provision where separate sewer systems are proposed

6.2 Separate foul and rainwater drainage systems should also be provided where there is a combined sewer system at present but a system of sewers which provides for the separate conveyance of surface water is under construction on behalf of the States of Guernsey.

6.3 These separate drainage systems will both initially connect to the existing combined sewer system. However, when the separate sewer systems are completed, the drainage will be reconnected to the new sewers, minimising the disruption to the occupiers.

Contaminated runoff

6.4 Paragraph 4.57 deals with drainage from areas where materials are stored which could contaminate runoff. This could cause pollution if discharged to a surface water sewer. Where such flows are to be discharged into the foul sewer system, the consent of Guernsey Waste Water should first be obtained. Guernsey Waste Water should also be consulted where such flows are to be discharged into a foul drain which, though it would initially connect to a combined sewer, is intended would eventually be reconnected to a proposed foul sewer.

The Requirement H6

This Guernsey Technical Standard deals with the following requirements from Part H of Schedule 1 to the Building Regulations

Requirement	*Limits on application*
Solid waste storage **H6**. (1) Adequate provision must be made for storage of solid waste. (2) Adequate means of access must be provided- (a) for people in the building to the place of storage, and (b) from the place of storage to a collection point, or to a street (where there is no collection point).	

Guidance

Performance

The requirements of H6 will be met if the solid waste storage is;

a. designed and sited so as not to be prejudicial to health,

b. of sufficient area having regard to the requirements of the waste collection company for the number and size of receptacles,

c. sited so as to be accessible for use by people in the building and of ready access for removal to the collection point.

Introduction to provisions

H6.1 The efficacy of a refuse storage system is dependent on its capacity and the ease of removal in relation to the collection service provided by the parish.

H6.2 The Requirements of the Building Regulations do not cover the recycling of household and other waste. However H6 sets out general requirements for solid waste storage. Guidance is included in this section (H6) regarding arrangements for separate storage of waste for recycling should it be necessary.

Domestic developments

Capacity

7.1 For domestic developments space should be provided for storage of containers for separated waste (i.e. waste which can be recycled is stored separately from waste which cannot) with a combined capacity of 0.25m³ per dwelling. Where collections are less frequent than once per week, this allowance should be increased accordingly.

7.2 Low rise domestic developments – In low rise domestic developments (houses, bungalows and flats up to 4th floor) any dwelling should have, or have access to, a location where at least two movable individual or communal waste containers can be stored.

7.3 Where separate storage areas are provided for each dwelling, an area of 1.2m x 1.2m should be sufficient to provide for storage of waste containers and provide space for access.

7.4 High rise domestic developments – in multi-storey domestic developments dwellings up to the 4th floor may each have their own waste container or may share a waste container.

7.5 Dwellings above the 4th storey may share a single waste container for non-recyclable waste fed by chute, with separate storage for any waste which can be recycled. Alternatively storage compounds or rooms should be provided. In such a case a satisfactory management arrangement for conveying refuse to the storage area should be assured.

7.6 The use of 'Residents Only' recycling centres (areas where residents may bring their recyclable waste for storage in large containers, e.g. bottle banks) in large blocks has been found to be effective in some areas.

Siting

7.7 Storage areas for waste containers and chutes should be sited so that the distance householders are required to carry refuse does not usually exceed 30m (excluding any vertical distance). Containers should be within 25m of the waste collection point.

7.8 The location for storage of waste containers should be sited so that, unless it is completely unavoidable, the containers can be taken to the collection point without being taken through a building, unless it is a porch or garage, or a car port or other open covered space (this provision applies only to new buildings except that extensions or conversions should not remove such a facility where one already exists).

7.9 For waste containers up to 250 litres, steps should be avoided between the container store and collection point wherever possible and should not exceed 3 in number. Slopes should not exceed 1:12. Exceptionally this may be exceeded provided that the lengths are not excessive and it is not part of a series of slopes. (See also requirements K of schedule 1 of the Building Regulations) For storage areas where larger containers are to be used steps should be avoided. Where this is not otherwise possible, the storage area should be relocated.

7.10 The collection point should be reasonably accessible to the size of waste collection vehicles typically used by the waste collection authority.

7.11 External storage areas for waste containers should be away from windows and ventilators and preferably be in shade or under shelter. Storage areas should not interfere with pedestrian or vehicle access to buildings.

Design

7.12 Where enclosures, compounds or storage rooms are provided they should allow room for filling and emptying and provide a clear space of 150mm between and around the containers. Enclosures, compounds or storage rooms for communal containers should be a minimum of 2m high. Enclosures for individual containers should be sufficiently high to allow the lid to be opened for filling. The enclosure should be permanently ventilated at the top and bottom and should have a paved impervious floor.

7.13 Communal storage areas should have provision for washing down and draining the floor into a system suitable for receiving a polluted effluent. Gullies should incorporate a trap which maintains a seal even during prolonged periods of disuse.

7.14 Any room for the open storage of waste should be secure to prevent access by vermin. Any compound for the storage of waste should be secure to prevent access by vermin unless the waste is to be stored in secure containers with close fitting lids.

7.15 Where storage rooms are provided, separate rooms should be provided for the storage of waste which cannot be recycled, and waste which can be recycled.

7.16 Where the location for storage is in a publicly accessible area or in an open area around a building (e.g. a front garden) an enclosure or shelter should be considered.

7.17 High-rise domestic developments – where chutes are provided they should be at least 450mm diameter and should have a smooth non-absorbent surface and close fitting access doors at each storey which has a dwelling and be ventilated at the top and bottom.

Non-domestic developments

7.18 In other types of development, and particularly where special problems such as high density developments influence the provision of a system, it is essential that the parish constables are consulted for guidance on resolving the following points.

a. The volume and nature of the waste and the storage capacity required, based on the frequency of collection and the size and type of waste container.

b. Any requirements for segregation of waste which can be recycled.

c. The method of waste storage, including any on-site treatment proposed, related to the intended layout and building density.

d. The location of waste storage areas, waste treatment areas and waste collection points and the access to these locations for operatives and vehicles.

e. Hygiene arrangements in the waste storage and waste treatment areas.

f. Fire hazards and protection measures.

7.19 Waste storage areas should have an impervious floor and should have provision for washing down and draining the floor into a system suitable for receiving a polluted effluent. Gullies should incorporate a trap which maintains a seal even during prolonged periods of disuse.

7.20 Any room for the open storage of waste should be secure to prevent access by vermin. Any compound for the storage of waste should be secure to prevent access by vermin unless the waste is to be stored in secure containers with close fitting lids.

7.21 Waste storage areas should be marked and signs should be provided.

Alternative approach

7.22 Recommendations and data on these items can be found in *BS 5906:1980 Code of practice for storage and on-site treatment of solid waste from buildings*. The relevant clauses are Clauses 3 to 10, 12 to 15 and Appendix A.

Note: *BS 5906:1980* does not contain guidance on recycling. It is currently being updated and it is hoped that the revised edition will include guidance on this aspect.

The Requirement H7

This Guernsey Technical Standard deals with the following requirements from Part H of Schedule 1 to the Building Regulations

Requirement	*Limits on application*
Overflow Drainage	
H7. Any reservoir must be provided with adequate drainage to take off excess water	

Guidance

Performance

The requirements of H7 will be met if an overflow is provided to all reservoirs that will adequately convey any excess water to a suitable watercourse or infiltration system.

Introduction to provisions

H7.1 These provisions are to minimise the risk of flooding to adjacent premises and to reduce excess pressure on the retaining structure of the reservoir that may lead to failure.

Overflow

8.1 An overflow must be provided to all reservoirs, which may be piped to a stream, surface water drain or to a soakaway. The size of the overflow must be based on the combined maximum flow rate of all the inlets to the reservoir.

8.2 Before any connection can be made to a stream or drain, it will be necessary to ensure that there is adequate capacity to cope with the expected additional water run-off.

8.3 Any connection identified in 8.2 must be with the prior approval of the owner of the stream or drain. In the case of a public service water sewer of controlled stream/douit, Guernsey Waste Water must give their consent.

8.4 If the only solution is to discharge the overflow to a soakaway then this must be an engineered solution and be accompanied by the results of a percolation test. (See paragraphs 4.59 - 4.63 for soakaway guidance and 4.67 - 4.70 for percolation testing procedures)

H8 FARM DRAINAGE

The Requirement H8

This Guernsey Technical Standard deals with the following requirements from Part H of Schedule 1 to the Building Regulations

Requirement	*Limits on application*
Farm Drainage **H8**. (1) Any farm building or yard for use by animals (including a poultry run) must- (a) be sited and constructed so that it will not contaminate any stream, surface water drain, pond or underground water supply, by reason of the use of the building or yard, (b) have a floor, in the case of the building, or a surface, in the case of the yard, impermeable to liquids, and (c) have all drains, other than for rainwater, connected to an adequate watertight tank or other adequate watertight receptacle. (2) In this paragraph- (a) "farm building" means a building intended for use in connection with the keeping of any cattle, horses, goats, swine or poultry or any other animals, and (b) "poultry" means domestic fowl, turkey, geese, duck, guinea fowl, partridge, pheasant and pigeon.	

Guidance

Performance

The requirements of H8 will be met if any farm building or yard is sited and constructed so that any effluent will not pollute any source of water.

Introduction to provisions

H8.1 any farm building or yard is sited and constructed, taking into account the fall of the ground, the type of soil and the proximity of water courses or underground water supplies,

H8.2 any farm building or yard, where slurry, waste water or silage is produced, is covered with an impermeable surface that will prevent those pollutants from reaching the subsoil, and

H8.3 any farm building or yard where slurry, waste water or silage is produced, is laid at suitable falls to drainage channels or gullies connected to an effluent storage tank or other suitable watertight container.

Drainage

9.1 Guidance on drainage runs contained within section H1 of this document may be used in the provision of farm building or yard drainage.

9.2 Guidance on the provision of effluent tanks and cesspits contained within section H2 of this document may be referred to for farm drainage.

9.3 For all other guidance refer to the guidelines given in *CIRA Report number 126 Farm Waste Storage: guidelines for construction*.

H9 DISUSED DRAINS, CESSPOOLS, SEPTIC TANKS OR EFFLUENT TANKS

The Requirement H9

This Guernsey Technical Standard deals with the following requirements from Part H of Schedule 1 to the Building Regulations

Requirement	*Limits on application*
Disused drains, cesspools, septic tanks, or effluent tanks **H9**. (1) Any system which carried foul water from appliances within the building to a sewer, a cesspool, or an effluent, septic or settlement tank, and which has been disconnected from the appliances, must be capped off or otherwise sealed. (2) Any cesspool, septic tank, settlement tank or effluent tank which has become disused must be adequately cleansed and rendered innocuous.	

Guidance

Performance

The requirements of H9 will be met if-

a. Disused drainage runs are made so that there is no potential for pollution of the Islands water courses,

b. Disused cesspools, septic tanks, settlement tanks and effluent tanks are made so that there is no potential for the pollution of the Islands water courses,

c. No risk of the harbouring of disease will exist after the works have been completed.

Sealing or removal of disused drains or cesspools

10.1 Disused drains and cesspools offer a particular risk to pollution and harbouring of disease. They could also collapse causing subsidence.

10.2 Any works which result in any part of a drain or cesspool becoming permanently disused, they must seal any drain run at such points as Building Control may direct and render the drain or cesspool innocuous.

10.3 Drains less than 1.5m deep which are in open ground should as far as is practicable be removed. Other pipes should be sealed at both ends and at any point of connection, and grout filled to ensure that rats cannot gain access.

10.4 Larger pipes (225mm and above) should be grout filled to prevent subsidence or damage to buildings or services in the event of collapse.

Annex A - Standards referred to

H1

BS 65:1991
Specification for vitrified clay pipes, fittings and ducts, also flexible mechanical joints for use solely with surface water pipes and fittings.
AMD 8622 1995.

BS EN 274:1993
Sanitary tapware. Waste fittings for basins, bidets and baths. General technical specifications.
(Withdrawn and superseded by BS EN 274-1:2002 Waste fittings for sanitary appliances. Requirements. AMD 14959 2004. BS EN 274-2:2002 Waste fitting for sanitary appliances. Test methods. AMD 14957 2004. BS EN 274-3:2002 Waste fittings for sanitary appliances. Quality control. AMD 14958 2004.)

BS EN 295-1:1991
Vitrified clay pipes and fittings and pipe joints for drains and sewers. Test requirements. AMD 9290 1996, AMD 9429 1995, AMD 10621 1999.

BS EN 295-2:1991
Vitrified clay pipes and fittings and pipe joints for drains and sewers. Quality control and sampling. AMD 10620 1999.

BS EN 295-3:1991
Vitrified clay pipes and fittings and pipe joints for drains and sewers. Test methods. AMD 10357 1999.

BS EN 295-6:1996
Vitrified clay pipes and fittings and pipe joints for drains and sewers. Requirements for vitrified clay manholes. AMD 15279 2004.

BS 416-1:1990
Discharge and ventilating pipes and fittings, sand-cast or spun in cast iron. Specification for spigot and socket systems.

BS 437:1978
Specification for cast iron spigot and socket drain pipes and fittings. AMD 5877 1988.

BS EN 598:1995
Ductile iron pipes, fittings, accessories and their joints for sewerage applications. Requirements and test methods.

BS EN 752-1:1996
Drain and sewer systems outside buildings. Generalities and definitions.

BS EN 752-2:1997
Drain and sewer systems outside buildings. Performance requirements.

BS EN 752-3:1997
Drain and sewer systems outside buildings. Planning. AMD 10984 2000, AMD 13038 2001.

BS EN 752-4:1998
Drain and sewer systems outside buildings. Hydraulic design and environmental considerations. AMD 15442 2005.

BS EN 752-5:1998
Drain and sewer systems outside buildings. Rehabilitation.

BS EN 752-6:1998
Drain and sewer systems outside buildings. Pumping installations.

BS EN 752-7:1998
Drain and sewer systems outside buildings. Maintenance and operations. AMD 10440 1999.

BS EN 877:1999
Cast iron pipes and fittings, their joints and accessories for the evacuation of water from buildings. Requirements, test methods and quality assurance.

BS 882:1992
Specification for aggregates from natural sources for concrete. AMD 13579 2002.
(Withdrawn and superseded by BS EN 1260:2002 Aggregates for concrete. AMD 15333 2004.)

BS EN 1057:1996
Copper and copper alloys. Seamless, round copper tubes for water and gas in sanitary and heating applications.

BS EN 1091:1997
Vacuum sewerage systems outside buildings.

BS EN 1254-1:1998
Copper and copper alloys. Plumbing fittings. Fittings with ends for capillary soldering or capillary brazing to copper tubes. AMD 10099 1998.

BS EN 1254-2:1998
Copper and copper alloys. Plumbing fittings. Fittings with compression ends for use with copper tubes.

BS EN 1254-3:1998
Copper and copper alloys. Plumbing fittings. Fittings with compression ends for use with plastics pipes.

BS EN 1254-4:1998
Copper and copper alloys. Plumbing fittings. Fittings combining other end connections with capillary or compression ends. AMD 10750 1999.

BS EN 1254-5:1998
Copper and copper alloys. Plumbing fittings. Fittings with short ends for capillary brazing to copper tubes. AMD 10100 1998.

BS EN 1295-1:1998
Structural design of buried pipelines under various conditions of loading. General requirements.

BS EN 1329-1:2000
Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure. Unplasticized polyvinyl chloride (PVC-U). Specifications for pipes,
fittings and the system.

BS EN 1401-1:1998
Plastics piping systems for non-pressure underground drainage and sewerage. Unplasticized poly(vinylchloride) (PVC-U). Specifications for pipes, fittings and the system. AMD 13794 2002.

BS EN 1451-1:2000
Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure. Polypropylene (PP). Specifications for pipes, fittings and the system. AMD 13819 2002.

BS EN 1455-1:2000
Plastics piping systems for soil and waste
(low and high temperature) within the building structure. Acrylonitrile-butadienestyrene (ABS). Specifications for pipes, fittings and the system. AMD 13818 2002.

BS EN 1519-1:2000
Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure. Polyethylene (PE). Specifications for pipes, fittings and the system. AMD 13817 2002.

BS EN 1565-1:2000
Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure. Styrene copolymer blends (SAN + PVC). Specifications for pipes, fittings and the system. AMD 13816 2002.

BS EN 1566-1:2000
Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure. Chlorinated poly (vinyl chloride) (PVC-C). specification for pipes, fittings and the system. AMD 13815 2002.

BS EN 1610:1998
Construction and testing of drains and sewers.

BS EN 1671:1997
Pressure sewerage systems outside buildings.

BS EN 1825-1:2004
Installations for separation of grease. Principles of design, performance and testing, marking and quality control.

BS EN 1825-2:2002
Installations for separation of grease. Selection of nominal size, installation and maintenance.

BS EN 1852-1:1998
Plastics piping systems for non-pressure underground drainage and sewerage. Polypropylene (PP). Specifications for pipes, fittings and the system. AMD 14514 2003.

BS 3868:1995
Specification for prefabricated drainage stack units in galvanized steel.

BS 3921:1985
Specification for clay bricks. (Current but partially superseded by BS EN 772-3:1998 Method of test for masonry units. Determination of net volume and percentage of voids of clay masonry units by hydrostatic weighing. BS EN 772-7:1998 Method of test for masonry units. Determination of water absorption of clay masonry damp proof course units by boiling in water.)

BS 5255:1989
Specification for thermo-plastics waste pipe and fittings. (Current but partially superseded by BS EN 1329-1:2000 Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure. Unplasticized poly(vinyl chloride) (PVC-U). Specifications for pipes, fittings and the system. BS EN 1455-1:2000 Plastics piping systems for soil and waste (low and high temperature) within the building

structure. Acrylonitrile-butadiene-styrene (ABS). Specifications for pipes, fittings and the system. AMD 13818 2002. BS EN 1519-1:2000 Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure. Polyethylene (PE). Specifications for pipes, fittings and the system. AMD 13817 2002. BS EN 1565-1:2000 Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure. Styrene copolymer blends (SAN + PVC). Specifications for pipes, fittings and the system. AMD 13816 2002. BS EN 1566-1:2000 Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure. Chlorinated poly(vinyl chloride) (PVC-C). Specification for pipes, fittings and the system. AMD 13815 2002.)

BS 5911-2:1982
Precast concrete pipes, fittings and ancillary products. Specification for inspection chambers. AMD 5146 1986, AMD 8077 1994, AMD 11030 2001. (Withdrawn and superseded by BS 5911-4:2002 Concrete pipes and ancillary concrete products. Specification for unreinforced and reinforced concrete inspection chambers. AMD 15038 2004. BS EN 1917:2002 Concrete manholes and inspection chambers, unreinforced, steel fibre and reinforced. AMD 15289 2004.)

BS 5911-100:1988
Precast concrete pipes, fittings and ancillary products. Specification for unreinforced and reinforced pipes and fittings with flexible joints. AMD 6269 1989, AMD 7588 1993.
(Withdrawn and superseded by BS 5911-1:2002 Concrete pipes and ancillary concrete products. Specification for unreinforced and reinforced concrete pipes (including jacking pipes) and fittings with flexible joints. AMD 15040 2004.
BS EN 1916:2002 Concrete pipes and fittings, unreinforced, steel fibre and reinforced.
AMD 15288 2004.)

BS 5911-120:1989
Precast concrete pipes, fittings and ancillary products. Specification for reinforced jacking pipes with flexible joints. AMD 9020 1996.
(Withdrawn and superseded by BS 5911-1:2002 Concrete pipes and ancillary concrete products. Specification for unreinforced and reinforced concrete pipes (including jacking pipes) and fittings with flexible joints. AMD 15040 2004.
BS EN 1916:2002 Concrete pipes and fittings, unreinforced, steel fibre and reinforced.
AMD 15288 2004.)

BS 5911-200:1994
Precast concrete pipes, fittings and ancillary products. Specification for unreinforced and reinforced manholes and soakaways of circular cross section. AMD 11031 2001, AMD 13205 2001. (Withdrawn and superseded by BS 5911-3:2002 Concrete pipes and ancillary concrete products. Specification for unreinforced and reinforced concrete manholes and soakaways. AMD 15039 2004. BS EN 1917:2002 Concrete manholes and inspection chambers, unreinforced, steel fibre and reinforced. AMD 15289 2004.)

BS 6798:2000
Specification for installation of gas-fired hot water boilers of rated input not exceeding 70kW. AMD 14908 2005.

BS 7158:2001
Plastics inspection chambers for drains and sewers. Specification. (Current but superseded by BS EN 13598-1:2003 Plastics piping systems for non-pressure underground drainage and sewerage. Unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE). Specifications for ancillary fittings including shallow inspection chambers.)

BS 8000-13:1989
Workmanship on building sites. Code of practice for above ground drainage and sanitary appliances.

BS 8000-14:1989
Workmanship on building sites. Code of practice for below ground drainage.

BS 8110-1:1997
Structural use of concrete. Code of practice for design and construction. AMD 9882 1998, AMD 13468 2002, AMD 16016 2005.

BS EN 12050-1:2001
Wastewater lifting plants for buildings and sites. Principles of construction and testing. Lifting plants for wastewater containing faecal matter.

BS EN 12050-2:2001
Wastewater lifting plants for buildings and sites. Principles of construction and testing. Lifting plants for faecal-free wastewater.

BS EN 12050-3:2001
Wastewater lifting plants for buildings and sites. Principles of construction and testing. Lifting plants for wastewater containing faecal matter for limited applications.

BS EN 12056-1:2000
Gravity drainage systems inside buildings. General and performance requirements.

BS EN 12056-2:2000
Gravity drainage systems inside buildings. Sanitary pipework, layout and calculation.

BS EN 12056-3:2000
Gravity drainage systems inside buildings. Roof drainage, layout and calculation.

BS EN 12056-4:2000
Gravity drainage systems inside buildings. Wastewater lifting plants. Layout and calculation.

BS EN 12056-5:2000
Gravity drainage systems inside buildings. Installation and testing, instructions for operation, maintenance and use.

BS EN 12109:1999
Vacuum drainage systems inside buildings.

BS EN 12380:2002
Air admittance valves for drainage systems. Requirements, test methods and valuation of conformity.

BS EN 13564-1:2002
Anti-flooding devices for buildings. Quality assurance.

BS EN 13564-2:2002
Anti-flooding devices for buildings. Test methods.

BS EN 13564-3:2002
Anti-flooding devices for buildings. Quality assurance.

H2

BS 5328-1:1997
Concrete. Guide to specifying concrete. AMD 10364 1999, AMD 13876, AMD 14163 2002. (Withdrawn and superseded by BS 8500-1:2002 Concrete. Complementary British Standard to BS EN 206-1. Method of specifying and guidance for the specifier. AMD 14639 2003. BS 8500-2:2002 Concrete. Complementary British Standard to BS EN 206-1. Specification for constituent materials and concrete. AMD 14640 2003. BS EN 206-1:2000 Concrete. Specification, performance, production and conformity. AMD 13189 2001, AMD 14857 2004, AMD 15359 2004, AMD 15406 2004.)

BS 5328-2:1997
Concrete. Methods for specifying concrete mixes. AMD 9691 1997, AMD 10365 1999, AMD 10612 1999, AMD 13877. (Withdrawn and superseded by BS 8500-1:2002 Concrete. Complementary British Standard to BS EN 206-1. Method of specifying and guidance for the specifier. AMD 14639 2003. BS 8500-2:2002 Concrete. Complementary British Standard to BS EN 206-1. Specification for constituent materials and concrete. AMD 14640 2003. BS EN 206-1:2000 Concrete. Specification, performance, production and conformity. AMD 13189 2001, AMD 14857 2004, AMD 15359 2004, AMD 15406 2004.)

Concrete. Specification for the procedures to be used in producing and transporting concrete. AMD 6927 1991, AMD 7176 1992, AMD 9312, AMD 10366 1999, AMD 10708 1999, AMD 13878 2002. (Withdrawn and superseded by BS 8500-1:2002 Concrete. Complementary British Standard to BS EN 206-1. Method of specifying and guidance for the specifier. AMD 14639 2003. BS 8500-2:2002 Concrete. Complementary British Standard to BS EN 206-1. Specification for constituent materials and concrete. AMD 14640 2003. BS EN 206-1:2000 Concrete. Specification, performance, production and conformity. AMD 13189 2001, AMD 14857 2004, AMD 15359 2004, AMD 15406 2004.)

BS 5328-4:1990
Concrete. Specification for the procedures to be used in sampling, testing and assessing compliance of concrete. AMD 6928 1991, AMD 8760 1995, AMD 9313, AMD 10367 1999, AMD 10611 1999. (Withdrawn and superseded by BS 8500-1:2002 Concrete. Complementary British Standard to BS EN 206-1. Method of specifying and guidance for the specifier. AMD 14639 2003. BS 8500-2:2002 Concrete. Complementary British Standard to BS EN 206-1. Specification for constituent materials and concrete. AMD 14640 2003. BS EN 206-1:2000 Concrete. Specification, performance, production and conformity. AMD 13189 2001, AMD 14857 2004, AMD 15359 2004, AMD 15406 2004.)

BS 6297:1983
Code of practice for design and installation of small sewage treatment works and cesspools. AMD 1650 1990.

BS 7781:1994
Procedure for type testing of small biological domestic wastewater treatment plants.

BS EN 12566-1:2000
Small wastewater treatment plants less than 50 PE. Part Prefabricated septic tanks. AMD 14918 2004.

H3

BS EN 752-1:1996
Drain and sewer systems outside buildings. Generalities and definitions.

BS EN 752-2:1997
Drain and sewer systems outside buildings. Performance requirements.

BS EN 752-3:1997
Drain and sewer systems outside buildings. Planning. AMD 10984 2000, AMD 13038 2001.

BS EN 752-4:1998
Drain and sewer systems outside buildings. Hydraulic design and environmental considerations. AMD 15442 2005.

BS EN 752-5:1998
Drain and sewer systems outside buildings. Rehabilitation.

BS EN 752-6:1998
Drain and sewer systems outside buildings. Pumping installations.

BS EN 752-7:1998
Drain and sewer systems outside buildings. Maintenance and operations. AMD 10440 1999.

BS EN 858:2001
Separator systems for light liquids (e.g. oil and petrol). Principles of product design, performance and testing, making and quality control. AMD 15525 2005.

BS EN 858-2:2003
Separator systems for light liquids (e.g. oil and petrol). Selection of nominal size, installation, operation and maintenance.

BS EN 1295-1:1998
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Gravity drainage systems inside buildings. Roof drainage, layout and calculation.

BS EN 12056-4:2000
Gravity drainage systems inside buildings. Wastewater lifting plants. Layout and calculation.

BS EN 12056-5:2000
Gravity drainage systems inside buildings. Installation and testing, instructions for operation, maintenance and use.

H6

BS 5906:1980 (1987)
Code of practice for the storage and on-site treatment of solid waste from buildings.

GUERNSEY TECHNICAL STANDARDS

The following documents have been approved and issued Development and Planning Authority for the purpose of providing practical guidance with respect to the requirements of the Building Regulations

Guernsey Technical Standard A: Structure, 2012 edition with May 2016 amendments.

Guernsey Technical Standard B: Fire Safety - Volume 1 - Dwellinghouses, 2012 edition with May 2016 amendments.

Guernsey Technical Standard B: Fire Safety - Volume 2 - Buildings other than dwellinghouses, 2012 edition with May 2016 amendments.

Guernsey Technical Standard C: Site preparation and resistance to contaminants and moisture 2012 edition with May 2016 amendments.

Guernsey Technical Standard D: Toxic substances 2012 edition with May 2016 amendments.

Guernsey Technical Standard E: Resistance to the passage of sound, 2012 edition with May 2016 amendments.

Guernsey Technical Standard F: Ventilation, 2012 edition with May 2016 amendments.

Guernsey Technical Standard G: Health, hygiene and water efficiency, 2012 edition with May 2016 amendments.

Guernsey Technical Standard H: Drainage and waste disposal, 2012 edition with May 2016 amendments.

Guernsey Technical Standard J: Heat producing appliances and fuel storage systems, 2012 edition with May 2016 amendments.

Guernsey Technical Standard K: Safe means of access and egress, 2012 edition with May 2016 amendments.

Guernsey Technical Standard L1: Conservation of fuel and power – Dwellings, 2012 edition with May 2016 amendments.

Guernsey Technical Standard L2: Conservation of fuel and power – Buildings other than dwellings, 2012 edition with May 2016 amendments.

Guernsey Technical Standard M: Access to and use of buildings, 2012 edition with May 2016 amendments.

Guernsey Technical Standard N: Glazing - Materials and protection, 2012 edition with May 2016 amendments.

Guernsey Technical Standard P: Roads - Layout design and construction, 2012 edition with May 2016 amendments.

Guernsey Technical Standard Regulation 11: Materials and Workmanship, 2012 edition with May 2016 amendments.

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States of Guernsey - Building Control
Sir Charles Frossard House
La Charroterie
St Peter Port
Guernsey
GY1 1FH
Telephone +44 (0) 1481 717200
Facsimile +44 (0) 1481 717099
Email planning@gov.gg

States of Guernsey
Building Control