

MD1809 Palin Drive

Drainage Statement - Appendix

MD1809(A)Drainage Statement Appendix_

Anglian Water Asset Plan
UK SUDS Preliminary Site Report
Greenfield run off rates (HR Wallingford tool)
Attenuation storage estimate (HR Wallingford tool)
JRW 'Oriflo' single dwelling flow control device (trade literature)

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Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
2304	C	3.58	1.966	1.614
2310	C	3.22	2.256	0.964
0100	F	-	-	-
0101	F	-	-	-
0102	F	-	-	-
0103	F	-	-	-
0105	F	-	-	-
0201	F	-	-	-
0202	F	3.193	1.852	1.341
1101	F	3.28	2.48	0.8
1102	F	-	-	-
1103	F	-	-	-
1104	F	-	-	-
1105	F	-	-	-
1200	F	-	-	-
1201	F	-	-	-
1202	F	-	-	-
1203	F	-	-	-
1301	F	3.382	2.312	1.07
1302	F	10.4	9	1.4
1303	F	4.29	3.434	0.856
1304	F	4.4	3.324	1.076
2101	F	3.18	2.46	0.72
2102	F	3	2.2	0.8
2103	F	3.05	2.07	0.98
2106	F	3.15	2.25	0.9
2107	F	-	-	-
2204	F	3.2	2.4	0.8
2205	F	-	-	-
2206	F	-	-	-
2308	F	3.96	3.069	0.891
2309	F	4.42	3.172	1.248
0152	S	-	-	-
0153	S	-	-	-
0154	S	-	-	-
0251	S	3.17	1.42	1.75
0352	S	-	-	-
0353	S	-	-	-
0354	S	-	-	-
0355	S	-	-	-
0356	S	-	-	-
1151	S	-	-	-
1152	S	-	-	-
1153	S	-	-	-
1154	S	-	-	-
1251	S	-	-	-
1252	S	-	-	-
1253	S	-	-	-

Site Drainage Evaluation

Site name: MD1809 Palin Drive
Site location: Spalding, Lincolnshire

Report Reference: 1609497325344
Date: 1/1/2021

1. INTRODUCTION

This is a bespoke report providing initial guidance on potential implementation of SuDS for the development site in line with current best practice.

The use of this tool should be supplemented by more detailed guidance on SuDS best practice provided in a [number of sources](#), principally the CIRIA SUDS Manual (2007), other CIRIA documents; the Use of SUDS in High Density Developments, HR Wallingford, (2005) and other HR Wallingford documents.

The objective is to provide some early guidance on the numbers and types of components that might be suitable for consideration within the site design. This may facilitate pre-application discussions with planners and other relevant authorities.

This guidance has been provided prior to the completion of the SUDS standards and the supporting guidance. However the principles of this tool are unlikely to be very different to the aims of the SUDS standards. HR Wallingford is not liable for the use of any output from the use of this tool and the performance of the drainage system. It is recommended that detailed design using appropriately experienced engineers professionals and tools is undertaken before finalising any drainage scheme arrangement for a site.

THE CONTENT OF THE REPORT

This report is split into 8 sections as follows:

2. Generic SuDS Best Practice Principles
3. Runoff Destination
4. Hydraulic Design Criteria
5. Water Quality Design Criteria
6. Site-Specific Drainage Design Considerations
7. SuDS Construction
8. SuDS Components Performance
9. Guidance on The Use of Individual Components

2. GENERIC SuDS BEST PRACTICE PRINCIPLES

To comply with current best practice, the drainage system should:

- (i) manage runoff at or close to its source;
- (ii) manage runoff at the surface;
- (iii) be integrated with public open space areas and contribute towards meeting the objectives of the urban plan;
- (iv) be cost-effective to operate and maintain.

The drainage system should endeavour to ensure that, for any particular site:

- (i) natural hydrological processes are protected through maintaining Interception of an initial depth of rainfall and prioritising infiltration, where appropriate;
- (ii) flood risk is managed through the control of runoff peak flow rates and volumes discharged from the site;
- (iii) stormwater runoff is treated to prevent detrimental impacts to the receiving water body as a result of urban contaminants.

In addition, it is desirable to maximise the amenity and ecological benefits associated with the drainage system where there are appropriate opportunities. SuDS are green infrastructure components and can provide health benefits, and reduce the vulnerability of developments to the impacts of climate change.

3. RUNOFF DESTINATION

Introduction

Infiltration should be prioritised as the method of controlling surface water runoff from the development site, unless it can be demonstrated that the use of infiltration would have a detrimental environmental impact.

Groundwater (via Infiltration)

Infiltration may not be appropriate for managing runoff from this site. Robust studies are required to confirm the significance of the following constraints to infiltration:

(1) The subsurface geology is primarily impermeable and the use of infiltration is unlikely to be suitable. Where infiltration rates are confirmed via testing to be $< 1 \times 10^{-7}$ m/s, infiltration will be very limited. Where infiltration rates are between 1×10^{-7} and 1×10^{-5} m/s, then soils can still provide Interception and partial infiltration. If rates are confirmed to be $> 1 \times 10^{-5}$ m/s, full infiltration can be considered in the design.

The groundwater beneath the site is designated as , and this designation will define the treatment requirement for any infiltrated water (See Water Quality Design Criteria).

Surface water body

It has been determined that surface water runoff from the site (that cannot be discharged to groundwater via infiltration) cannot practicably be discharged to a surface water body. The results of robust studies to confirm the significance of the following constraints should be presented as evidence:

(1) The distance from the point of discharge from the site to the surface water body is significantly greater than to the proposed alternative receiving waterbody, and this constraint outweighs any negative impacts resulting from discharging to the alternative location.

Surface water sewer /local highway drain

All surface water runoff that cannot be discharged to groundwater via infiltration will be managed on site and discharged to a surface water sewer or local highway drain.

The surface sewer reference is: and the asset owner is: *Anglian Water*.

4. HYDRAULIC DESIGN CRITERIA**Introduction**

Best practice criteria for hydraulic control require Interception, runoff and volume control.

Interception

To fulfill the requirements for Interception, there should normally be no runoff from the site for an initial depth of rainfall - usually 5mm. This is achieved through the use of infiltration, evapotranspiration, or rainwater harvesting.

Flow and Volume Control

The site is a greenfield development, therefore runoff from the site needs to be constrained to the equivalent greenfield rates and volumes.

Attenuation and hydraulic controls will be used to manage flow rates.

Rainwater harvesting, or the use of Long Term Storage can be used to achieve greenfield runoff volume control. Where volume control is not practicable, flows discharged from the site will be constrained to Q_{bar} or 2 l/s/ha (whichever is the greater).

5. WATER QUALITY DESIGN CRITERIA**Introduction**

Current best practice takes a risk-based approach to managing discharges of surface runoff to the receiving environment. The following text provides guidance on the extent of water quality management likely to be appropriate for the site.

Hazard Classification

Runoff from clean roof surfaces (ie not metal roofs, roofs close to polluted atmospheric discharges, or roofs close to populations of flocking birds) is classified as Low in terms of hazard status.

Runoff from roads, parking and other areas of residential, commercial and industrial sites (that are not contaminated with waste, high levels of hydrocarbons, or other chemicals) is classified as Medium in terms of hazard status.

Treatment requirements for disposal to surface water systems

Roof runoff will not require treatment prior to discharge.

Runoff from other parts of this site such as roads, parking and other areas will require at least 2 treatment stages prior to discharge.

6. SITE-SPECIFIC DRAINAGE DESIGN CONSIDERATIONS

The design of SuDS with access to temporary or permanent water should consider public health and safety as well as issues associated with construction and operational management of the structures. Health and safety issues and risk mitigation features are presented in the [CIRIA SuDS Manual](#).

Individual SuDS components should not be treated in isolation, but should be seen together as providing a suite of drainage features which are appropriate in different combinations for varying scales. It is always desirable to have a mix of SuDS components across the site as different components have different capacities for treatment of individual pollutants.

7. SuDS CONSTRUCTION

SuDS are a combination of civil engineering structures and landscaping practice. Due to the limited experience of building SuDS in the water industry, there are a number of key issues which need to be particularly considered as their construction requires a change in approach to some standard construction practices.

- SuDS components should be constructed in line with either the manufacturer's guidelines or best practice methods.
- The construction of SuDS usually only requires the use of fairly standard civil engineering construction and landscaping operations, such as excavation, filling, grading, top-soiling, seeding, planting etc. These operations are specified in various standard construction documents, such as the Civil Engineering Specification for the Water Industry (CESWI).
- Construction of soakaways is regulated by the Buildings Regulations part H (Drainage and waste disposal) which sets out the requirements for drainage of rainwater from the roofs of buildings.
- During construction, any surfaces which are intended to enable infiltration must be protected from compaction. This includes protecting from heavy traffic or storage of materials.
- Water contaminated with silt must not be allowed to enter a watercourse or drain as it can cause pollution. All parts of the drainage system must be protected from construction runoff to prevent silt clogging the system and causing pollution downstream. Measures to prevent this include soil stabilisation, early construction of sediment management basins, channelling run-off away from watercourses and surface water drains, and erosion prevention measures.
- After the end of the construction period and prior to handover to the site owner/operator:
 - Subsoil that has been compacted during construction activities should be broken up prior to the re-application of topsoil to garden areas and other areas of public open space to reinstate the natural infiltration performance of the ground;
 - Any areas of the SuDs that have been compacted during construction but are intended to permit infiltration must be completely refurbished;
 - Checks must be made for blockages or partial blockages of orifices or pipe systems;
 - Any silt deposited during the construction must be completely removed;
 - Soils must be stabilised and protected from erosion whilst planting becomes established.

Detailed guidance on the construction related issues for SuDS is available in the SuDS Manual and the associated [Construction Site handbook](#) (CIRIA, 2007).

8. SuDS COMPONENTS PERFORMANCE

	Interception	Peak flow control: Low	Peak flow control: High	Volume reduction	Volume control	Gross sediments	Fine sediments	Hydrocarbons/PAHs	Metals	Nutrients
Rainwater Harvesting	Y	Y	S	Y	N	N	N	N	N	N
Pervious Pavement	Y	Y	Y	Y	Y	Y	Y	Y	Y	Var
Filter Strips	Y	N	N	N	N	Y	N	Y	Y	Var
Swales	Y	Y	S	Y(*)	N	Y	Y(+)	Y	Y	Y(-)
Trenches	Y	Y	S	Y(*)	N	N	N	Y	Y	Y(-)
Detention Basins	Y	Y	Y	N	Y	Y	Y(+)	Y	Y	Var
Ponds	N	Y	Y	N	Y	N(~)	Y	Limited	Y	Var
Wetlands	N	Y	S	N	Y	N(~)	Y	Limited	Y	Y
Green Roofs	Y	Y	N	N	N	N	N	Y	N	N
Bioretention Systems	Y	Y	S	Y(*)	N	N(~)	Y	Y	Y	Y
Proprietary Treatment Systems	N	N	N	N	N	Y	Y	Y(!)	Y(!)	Y(!)
Subsurface Storage	N	Y	Y	N	Y	N(~)	N	N	N	N
Subsurface Conveyance	N	N	N	N	Y	N(~)	N	N	N	N

S: Not normally with standard designs, but possible where space is available and designs mitigate impact of high flow rates.

Y(*): Where infiltration is facilitated by the design.

N(∞): Gross sediment retention is possible, but not recommended due to negative maintenance and performance implications.

Y(+): Where designs minimise the risk of fine sediment mobilisation during larger events.

Y(!): Where designs specifically promote the trapping and breakdown of oils and PAH based constituents.

Y("): Where subsurface soil structure facilitates the trapping and breakdown of oils and PAH based constituents.

Var: The nutrient removal performance is variable, and can be negative in some situations.

Y(-): Good nutrient removal performance where subsurface biofiltration systems with a permanently saturated zone included within the design.

Rainwater Harvesting

Rainwater harvesting systems can be used to effectively drain roofs and provide both water supply and stormwater management benefits.

Roof water can be drained into pervious pavement areas using diffusers to dissipate the point inflows. Detailed design of the pavement will need to take account of the additional impermeable roof area.

Pervious pavements provide effective drainage, storage and treatment of car park surfacing,

Filter strips can provide treatment for runoff from impermeable surfaces, upstream of swales or trench components. They can reduce the need for kerbing and runoff collection systems.

Swales can be used to convey roof water to other parts of the site.

Swales provide treatment and conveyance of runoff from impermeable areas. There are a range of swale types - standard grass channels, underdrained swales, and wetland swales - depending on drainage requirements.

Trenches can be used to convey roof water to other parts of the site.

Trenches can provide treatment and conveyance of runoff for impermeable areas.

Detention basins can be used to attenuate and treat runoff.

Detention basins can be used to attenuate and treat runoff.

Ponds

- *Roofs*

Ponds can be used to attenuate and treat roof runoff.

- *Car parks/other impermeable surfaces*

Ponds can be used to attenuate and treat runoff. However, they are best implemented at the lower end of the treatment train as a 'polishing' component. They should not be used as sediment management devices, as sediment and wet vegetation is relatively costly to extract and dispose of. If poor quality water remains in ponds for extended periods, nutrient concentrations can rise - particularly in the summer months, and the pond can become unattractive with poor amenity and biodiversity potential.

- *Other*

Ponds built in permeable soils will require lining to maintain the water level of the permanent pool. The lining may be finished 100 or 200 mm lower than the outlet invert to encourage some infiltration to take place to contribute to interception.

Wetlands

- *Roofs*

Wetlands can be used to attenuate and treat roof runoff.

- *Car parks/other impermeable surfaces*

Wetlands can be used to attenuate and treat runoff. However, they are best implemented at the lower end of the treatment train as a 'polishing' component. They should not be used as sediment management devices, as sediment and wet vegetation is relatively costly to extract and dispose of. If poor quality water remains in wetlands for extended periods, nutrient concentrations can rise - particularly in the summer months, and the wetland can become unattractive with poor amenity and biodiversity potential.

Green Roofs

- *Roofs*

Green roofs can be designed to provide interception, management and treatment of rainfall up to specified rainfall depths.

Bioretention Systems

- *Roofs*

Bioretention systems can be used to attenuate and treat roof runoff.

- *Car parks/other impermeable surfaces*

Bioretention systems can be used for car park drainage.

Proprietary Treatment Systems

- *Car parks/other impermeable surfaces*

Proprietary treatment systems could be used where surface vegetated systems are impracticable. However, regular monitoring needs to be ensured so that they are maintained so that they continue to function effectively.

Subsurface Storage

- *Roofs*

Subsurface storage can be used to attenuate roof runoff.

- *Car parks/other impermeable surfaces*

Subsurface storage can be used to attenuate car park runoff.

Subsurface Conveyance Pipes

[HR Wallingford Ltd](#), the Environment Agency and any local authority are not liable for the performance of a drainage scheme which is based upon the output of this report.

Calculated by:	Boyd McAfee
Site name:	MD1809 Palin Drive
Site location:	Palin Drive, Spalding

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	52.78371° N
Longitude:	0.16078° W
Reference:	3601960681
Date:	Jan 01 2021 08:36

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):	0.4
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Methodology

Q _{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	2	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.3	0.3

Hydrological characteristics

	Default	Edited
SAAR (mm):	559	559
Hydrological region:	5	5
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	2.45	2.45
Growth curve factor 100 years:	3.56	3.56
Growth curve factor 200 years:	4.21	4.21

Notes**(1) Is $Q_{BAR} < 2.0$ l/s/ha?**

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is $SPR/SPRHOST \leq 0.3$?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q _{BAR} (l/s):	0.56	0.56
1 in 1 year (l/s):	0.49	0.49
1 in 30 years (l/s):	1.37	1.37
1 in 100 years (l/s):	1.99	1.99
1 in 200 years (l/s):	2.36	2.36

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.



Surface water storage requirements for sites

www.uksuds.com | Storage estimation tool

Calculated by:

Site name:

Site location:

Site Details

Latitude:

Longitude:

Reference:

Date:

This is an estimation of the storage volume requirements that are needed to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). It is not to be used for detailed design of drainage systems. It is recommended that hydraulic modelling software is used to calculate volume requirements and design details before finalising the design of the drainage scheme.

Site characteristics

Total site area (ha):	<input type="text" value="0.04"/>
Significant public open space (ha):	<input type="text" value="0"/>
Area positively drained (ha):	<input type="text" value="0.04"/>
Impermeable area (ha):	<input type="text" value="0.02"/>
Percentage of drained area that is impermeable (%):	<input type="text" value="50"/>
Impervious area drained via infiltration (ha):	<input type="text" value="0"/>
Return period for infiltration system design (year):	<input type="text" value="10"/>
Impervious area drained to rainwater harvesting (ha):	<input type="text" value="0"/>
Return period for rainwater harvesting system (year):	<input type="text" value="10"/>
Compliance factor for rainwater harvesting system (%):	<input type="text" value="66"/>
Net site area for storage volume design (ha):	<input type="text" value="0.04"/>
Net impermeable area for storage volume design (ha):	<input type="text" value="0.02"/>
Pervious area contribution to runoff (%):	<input type="text" value="30"/>

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Design criteria

Climate change allowance factor:

Urban creep allowance factor:

Volume control approach:

Interception rainfall depth (mm):

Minimum flow rate (l/s):

Methodology

esti:

Q_{BAR} estimation method:

SPR estimation method:

Soil characteristics

	Default	Edited
SOIL type:	<input type="text" value="2"/>	<input type="text" value="2"/>
SPR:	<input type="text" value="0.3"/>	<input type="text" value="0.3"/>

Hydrological characteristics

	Default	Edited
Rainfall 100 yrs 6 hrs:	<input type="text" value="--"/>	<input type="text" value="63"/>
Rainfall 100 yrs 12 hrs:	<input type="text" value="--"/>	<input type="text" value="97.79"/>
FEH / FSR conversion factor:	<input type="text" value="1.27"/>	<input type="text" value="1.27"/>
SAAR (mm):	<input type="text" value="559"/>	<input type="text" value="559"/>
M5-60 Rainfall Depth (mm):	<input type="text" value="20"/>	<input type="text" value="20"/>
'r' Ratio M5-60/M5-2 day:	<input type="text" value="0.4"/>	<input type="text" value="0.4"/>
Hydrological region:	<input type="text" value="5"/>	<input type="text" value="5"/>
Growth curve factor 1 year:	<input type="text" value="0.87"/>	<input type="text" value="0.87"/>
Growth curve factor 10 year:	<input type="text" value="1.65"/>	<input type="text" value="1.65"/>
Growth curve factor 30 year:	<input type="text" value="2.45"/>	<input type="text" value="2.45"/>
Growth curve factor 100 years:	<input type="text" value="3.56"/>	<input type="text" value="3.56"/>
Q_{BAR} for total site area (l/s):	<input type="text" value="0.06"/>	<input type="text" value="0.06"/>
Q_{BAR} for net site area (l/s):	<input type="text" value="0.06"/>	<input type="text" value="0.06"/>

Site discharge rates

	Default	Edited
1 in 1 year (l/s):	<input type="text" value="1.4"/>	<input type="text" value="1.4"/>
1 in 30 years (l/s):	<input type="text" value="1.4"/>	<input type="text" value="1.4"/>
1 in 100 year (l/s):	<input type="text" value="1.4"/>	<input type="text" value="1.4"/>

Estimated storage volumes

	Default	Edited
Attenuation storage 1/100 years (m³):	<input type="text" value="7"/>	<input type="text" value="7"/>
Long term storage 1/100 years (m³):	<input type="text" value="0"/>	<input type="text" value="0"/>
Total storage 1/100 years (m³):	<input type="text" value="7"/>	<input type="text" value="7"/>

This report was produced using the storage estimation tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at <http://uksuds.com/terms-and-conditions.htm>. The outputs from this tool have been used to estimate storage volume requirements. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.



CIVILS

Quality Plastic Solutions

OriChamber

Single Dwelling Orifice Control Chamber

The JFC OriChamber is a prefabricated unit which comprises a Ø600mm Twinwall Chamber with base, 110mm internal and outlet pipework and a pedestrian duty (bolt down) cover. The unit is available in two standard depths of 1.0m and 1.5m incorporating a 150mm sump. (Other depths available to order).



Features & Benefits:

- Prefabricated for ease of installation.
- Removable cover and frame to allow shaft to be trimmed on site to suit final levels
- Two inlet seals supplied along with a holesaw to allow them to be located at a suitable level and orientation.
- Overflow pipe which can be removed to allow the system to be drained if the orifice becomes blocked.



Fitted with a 110mm overflow pipe complete with debris cowl, the pipe and cowl can be removed if the orifice becomes blocked which allows the system to drain down and the blockage removed.

Two number 110mm inlet connection seals are supplied loose with a hole saw enabling them to be fitted easily to the required level and orientation on-site. This offers unique flexibility to the user.



The internal pipework is assembled from 110mm pipework and has an end cap which can be drilled with a certain diameter hole, based on the design flow and design head required (see table below). For specific head and flows contact JFC Civils Technical team.

		Flow (l/s)												
		0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00	2.00	3.00	4.00	5.00
Head (m)	0.150	15	19	21	24	26	28	30	32	34	48	59	68	76
	0.200	14	17	20	22	24	26	28	30	31	44	54	63	70
	0.250	13	16	19	21	23	25	27	28	30	42	52	59	67
	0.300	13	16	18	20	22	24	25	27	28	40	49	57	64
	0.350	12	15	17	19	21	23	24	26	27	39	47	55	61
	0.400	12	14	17	19	20	22	24	25	26	37	46	53	59
	0.450	11	14	16	18	20	21	23	24	26	36	44	51	57
	0.500	11	14	16	18	19	21	22	24	25	35	43	50	56
	0.550	11	13	15	17	19	20	22	23	24	35	42	49	55
	0.600	11	13	15	17	19	20	21	23	24	34	41	48	53
	0.650	10	13	15	17	18	20	21	22	23	33	41	47	52
	0.700	10	13	15	16	18	19	21	22	23	33	40	46	51
	0.750	10	12	14	16	18	19	20	21	23	32	39	45	51
	0.800	10	12	14	16	17	19	20	21	22	31	39	44	50
	0.850	10	12	14	15	17	18	20	21	22	31	38	44	49
	0.900	10	12	14	15	17	18	19	20	22	31	37	43	48
	0.950	10	12	13	15	17	18	19	20	21	30	37	43	48
	1.000		12	13	15	16	18	19	20	21	30	36	42	47
	1.050		11	13	15	16	17	19	20	21	29	36	42	46
	1.100		11	13	15	16	17	18	19	21	29	36	41	46
	1.150		11	13	14	16	17	18	19	20	29	35	41	45
	1.200		11	13	14	16	17	18	19	20	28	35	40	45
	1.250		11	13	14	15	17	18	19	20	28	34	40	44

The pedestrian duty cover and frame is removable to allow the chamber to be cut on-site to suit specific levels required.



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