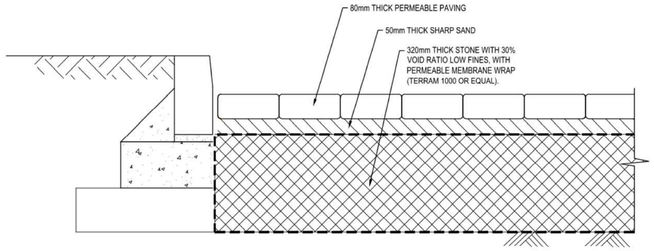
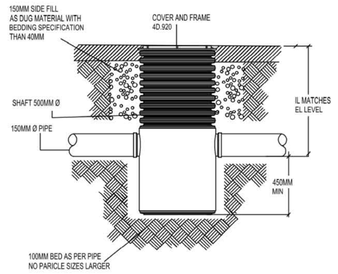
CDM - RESIDUAL RISKS

THERE ARE CONSIDERED TO BE RESIDUAL RISKS ASSOCIATED WITH THE STRUCTURAL ASPECTS OF THIS PROJECT

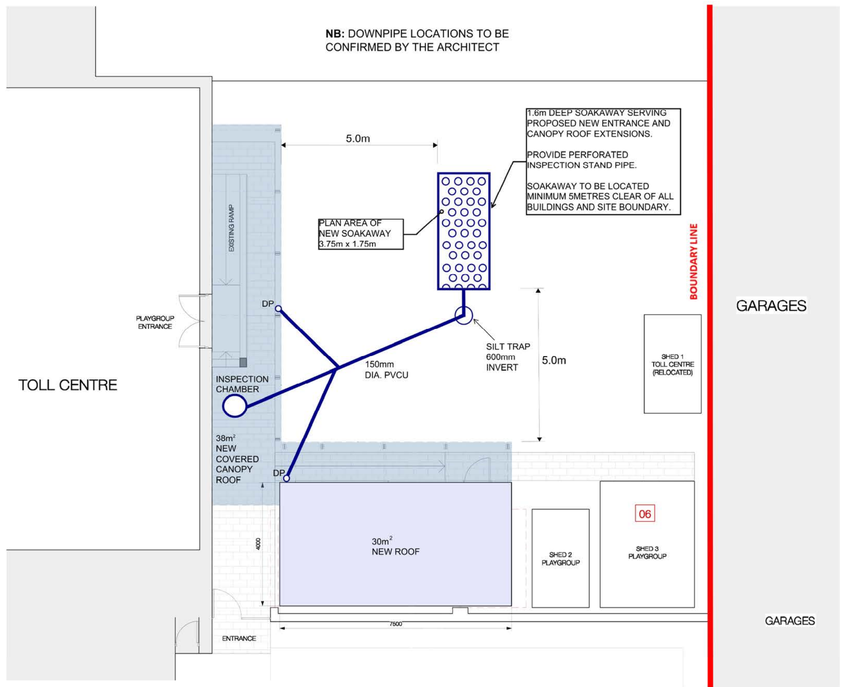


PERMEABLE PAVING CONSTRUCTION
SCALE 1:10



WAVIN 500Ø SILT TRAP BASE
INSPECTION CHAMBER
NTS SCALE

NB: DOWNPIPE LOCATIONS TO BE CONFIRMED BY THE ARCHITECT



PROPOSED SUDS LAYOUT
SCALE 1:100

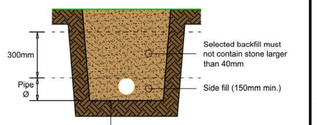
0 1 2 3 4 5M

LEGEND

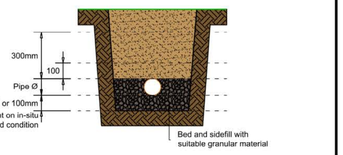
GENERAL SPECIFICATION NOTES

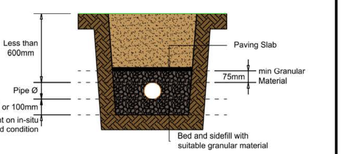
1. THIS DRAWINGS IS TO BE READ IN CONJUNCTION WITH ALL OTHER PROJECT DOCUMENTS, INCLUDING ALL ENGINEERING AND ARCHITECTURAL DRAWINGS AND IN PARTICULAR THE FIXINGS SCHEDULE AND STRUCTURAL SPECIFICATIONS PROVIDED. ANY AMBIGUITIES OR DISCREPANCIES BETWEEN THIS SPECIFICATION AND ANY OTHER PROJECT DOCUMENTS SHALL BE REFERRED TO THE STRUCTURAL ENGINEER FOR CLARIFICATION.
2. WHERE PROPRIETARY PRODUCTS ARE SPECIFIED, ALTERNATIVE MANUFACTURERS' PRODUCTS MAY BE USED SUBJECT TO DEMONSTRATION OF EQUAL PERFORMANCE AND DURABILITY.
3. DO NOT SCALE FROM THIS DRAWING.
4. ALL SIZES/DIMENSIONS TO BE CONFIRMED ON SITE PRIOR TO CONSTRUCTION.
5. THIS DRAWING HAS BEEN PREPARED FOR THE PURPOSE OF OBTAINING A BUILDING WARRANT. THE DRAWING MAY BE SUITABLE FOR CONSTRUCTION PURPOSES, HOWEVER IT MAY BE NECESSARY TO AUGMENT OR AMEND THE INFORMATION FOR CONSTRUCTION PURPOSES. NO LIABILITY WILL BE ACCEPTED FOR ANY CONSTRUCTION WITHOUT REFERRAL TO CHRISTIE GILLESPIE CONSULTING ENGINEERS LTD.
6. ONLY MATERIALS OR PRODUCTS WITH A CE MARK SHALL BE INCORPORATED INTO THE CONSTRUCTION. CHRISTIE GILLESPIE CONSULTING ENGINEERS TO BE INFORMED IF NO HARMONISED STANDARD EXISTS FOR ANY PROPOSED MATERIAL OR PRODUCT.
7. REFER TO ARCHITECTS DRAWINGS FOR SETTING OUT, ALL INTERNAL AND EXTERNAL FINISHES TO ARCHITECT'S SPECIFICATION.
8. ALL STRUCTURAL ELEMENTS TO BE PROVIDED WITH MINIMUM 60 MINUTES FIRE PROTECTION IN ACCORDANCE WITH ARCHITECT'S DETAILS & SPECIFICATIONS.

Bedding & Backfill

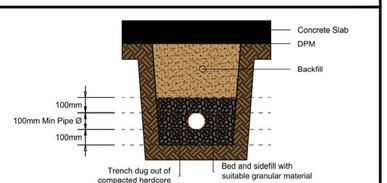


Shallow Drains

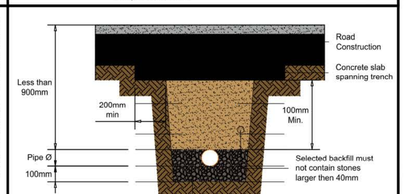


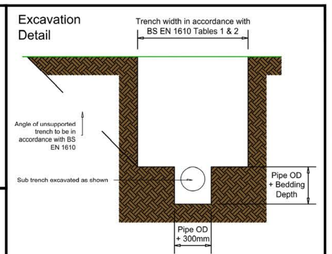


Drains Under Solid Floors



Drains Under Private Roads





Trenches should not be open for extended periods in advance of pipe laying and should be backfilled as soon as possible. It is essential that the sides of the trench are adequately supported during pipe laying. Trench widths should be as narrow as is practicable but not less than the pipe diameter plus 300mm to allow adequate sidefill to be placed. Deeper excavations should ideally incorporate a sub-trench in accordance with the diagram above.

Granular Material For Bed & Surround Of Pipes And Sewers	Nominal Pipe Size	Granular Material Size
	100 / 110mm	10mm nominal single-size
		14 to 5 mm course graded
	150 / 160mm	10 or 14mm nominal single-sized
		14 to 5 mm course graded
	150/225mm (and over)	10, 14 or 20mm niminal single-sized
		14 or 20 to 5mm course graded
	Grading complying with the requirements of BS EN 1610. Granular material also includes aggregates for concrete to BS EN 12620.	

Where the as-dug material is suitable, the bottom of the trench may be trimmed to form the pipe bed and the as-dug soil used as sidefill and backfill in accordance with BS EN 1610 bedding construction type B.
Where the as-dug material is unsuitable as bed and surround installation should be carried out in accordance with BS EN 1610 bedding construction type 1, as shown opposite. Trenches should be excavated to allow for the depth of bedding material. Before any pipework is installed the bedding material should be laid evenly along the bottom of the trench. The sidefill material must be the same as the bedding material and extended to the crown of the pipe and be thoroughly compacted. Where the backfill above the pipe contains stones larger than 40mm or where the pipework is deeper than 2m in poor ground, the granular material must extend at least 100mm above the pipe crown. Alternatively, backfill material can be graded to eliminate stones exceeding 40mm and this selected material used for the first 300mm above the pipe. When the pipes are to be laid in rock, compacted sand or gravel, or in very soft or wet ground requiring mechanical means of trimming, the bedding should be a minimum of 100mm.
Pipes laid at depths less than 600mm and which are not under a road should, where necessary, be protected against damage by placing over them a layer of concrete, paving slabs or similar. A minimum 75mm cushioning layer of granular material must be laid between pipes and the slabs or concrete.
Where drains are laid in fields, additional protection may be required from heavy vehicles and equipment. It is recommended that the installation is carried out with a concrete slab spanning the trench as shown for drains under private roads.
Drains often have to be laid under buildings in order to connect sanitary pipework which has been positioned some distance from the outer walls. Where this occurs, deep hardcore within the foundation boundaries should be compacted first. The trench for the pipe should then be excavated and suitable material employed for the bedding and backfilling operation. If trenches are dug from original ground, pipes may be laid and surrounded as necessary before the top layer of hardcore is formed. Where a pipe passes through a wall or foundation of a building, a lintel or sleeve should be built-in to provide clearance around the pipe.
The flexible nature of PVCu pipes enables them to accommodate ground movement and other differential settlement that may occur under normal conditions. Therefore, the use of concrete bed and surround is not recommended and only under special circumstances, at very shallow cover depths or where it is necessary to safeguard foundations, should it be used. Where the use of concrete bed and surround is unavoidable, it is recommended that pipes are laid in 3 metre lengths and a compressible board is shaped to fit around each joint. Pipes should also be wrapped with polythene to prevent the ingress of cement slurry into ring seal joints.
If the depth of cover under a road or driveway is less than 0.9m, a concrete slab spanning the trench width is required.

Minimum Recommended Gradients For Foul Drains

Peak Flow l/s (a)	Pipe Size mm	Minimum Gradient (b) (c) (d)
< 1	75	1 in 40
	100	1 in 40
>1	75	1 in 80
	100	1 in 80 (e)
	150	1 in 150 (f) (g)

a Peak flows should be based on probability flow calculation methods.
b These gradients have been empirically demonstrated on the basis of 6 l WC flush volumes. Further research is necessary to evaluate the recommended gradients for use in systems with very low WC flush volumes.
c Exceptionally, where the length of drain or sewer serving a small number of properties is very long, steeper gradients can be required.
d Where ground settlement is expected, steeper gradients are recommended.
e Minimum of one WC connected.
f Minimum of five WCs connected.
g Exceptionally, where a 150 mm diameter pipe is used to carry flows from less than five WCs, the minimum gradient should be 1 in 60.

Recommended Maximum Spacing Of Access Provision (In Metres) For Manual Cleaning

Distance From	To Access Fitting Type 1	To Access Fitting Type 2	To Junction or Branch	To Inspection chamber - shallow	To Manhole & Inspection Chamber - Deep
Start of External Drain	12	12		22	45
Rodding Eye	22	22	22	45	45
Access Fitting Type 1 Min 150mm x 100mm			12	22	22
Access Fitting Type 2 Min 225mm x 100mm			22	45	45
Inspection Chamber - Shallow	22	45	22	45	45
Manhole & Inspection Chamber - Deep				45	90 (up to 200 for drains & sewers intended for entry by personnel not exceeding DN1800)

a) Stack or ground floor appliance

Recommended Dimensions For The Construction Of New Rodding Eyes, Access Fittings And Inspection Chambers (No Personnel Entry)

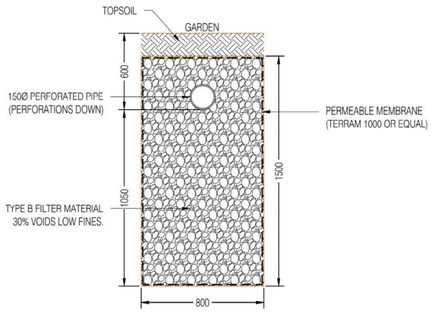
Type of Access	Depth to invert from cover level m	Minimum nominal internal dimensions (a) Rectangular Length & Width mm	Minimum nominal internal dimensions (a) Circular Ø mm	Clear Opening Size Rectangular length and width mm	Clear Opening Size Circular Ø mm	Remarks
Rodding Eye			Preferably same size as drain but not less than DN 100		Same size as pipework (b)	
Access fitting (c)	< 0,6, except where situated in chamber	150x100	150	Same size as access fitting (b)	Same size as access fitting (b)	The depth restriction is imposed because of the limited access afforded and is based on the ability to manipulate a stopper at arms length from the surface.
Access fitting (c)		225x100	225			
Inspection Chamber (d) - Shallow	≤ 0,6	225x100	190 for drains up to DN150		Min. 190	
	≤ 1,0	450x450	450	Min. 430x430	Min. 430	Restricted to inspection and remotely operated equipment - *no personnel entry*
Inspection Chamber (d) - Deep	> 1,0	450x450 (e)	450 (e)	Max. 300x300	Max. 350 (f)	Restricted to inspection and remotely operated equipment — *no personnel entry*. Max. size imposed to prevent personnel entry.

a These sizes apply to straight-through pipes; , larger sizes should be used at turning chambers or chambers with several side branches.
b The clear opening may be reduced by 20 mm in order to provide proper support for the cover and frame.
c Fitting with a removable cover that permits access into the pipe, either from surface level or from within a chamber
d Chamber with a removable cover constructed on a drain or sewer that provides access from surface level only, but does not permit entry of a pers on
e It is not always possible to gain access to side branches. The top of the chamber may be reduced to a minimum of 300 mm × 300 mm or 350 diameter.
f A larger clear opening cover may be used in conjunction with a restricted access.

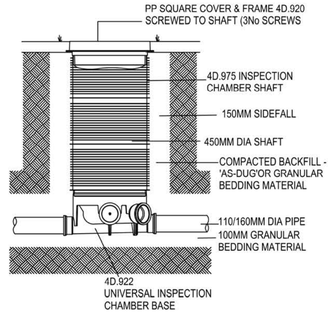
Recommended Dimensions For The Construction Of New Manholes And Manhole Shafts (With Personnel Entry)

Type of Access	Depth to pipe soffit from cover level m	DN largest pipe in manhole / means of descent into shaft	Min. internal dimensions (a) Rectangular Length & Width mm	Min. internal dimensions (a) Circular Ø mm	Min. clear opening size Rectangular length and width mm	Min. clear opening size Circular Ø mm	Remarks
Manhole (b)	< 1,5	≤ 150 225 300 375 – 450 500 – 700 750 – 900 > 900	750 × 675 (c) 1 200 × 675 1 200 × 750 1 350 × 900 1 500 × 1 150 1 800 × 1 350 1800 × (DN + 775)	1 000 (c) 1 200 1 200 1 350 1 500 1 800 The larger of 1800 or (DN + 900)	750 × 675 (d)(e) 1 200 × 675 (e) 1 200 × 675 1 200 × 675 1 200 × 675 1200 × 675	na(f)	Generally in accordance with Safe work in confined spaces – Health and Safety Commission [29]. Larger opening size is required for manholes at shallower depths to permit standing / crouching. Where a ladder is provided the minimum size should be increased
	≥1.5	≤ 225 300 375 – 450 500 – 700 750 – 900 > 900	1 200 × 1 000 1 200 × 1 075 1 350 × 1 225 1 500 × 1 475 1 800 × 1 675 1 800 × (DN + 775)	1 200 1 200 1 350 1 500 1 800 The larger of 1 800 or (DN + 900)	600 × 600	600	
Manhole shaft (g)	> 3,0	Steps	1050x800	1050	600x600	600	Min. clear space between the ladder/steps and the opposite face of the shaft should be approx. 900 mm.
		Ladder	1200x800	1200			
		Winch	900x800	900	600x600	600	Winch only – no steps or ladders (permanent or removable)

a These sizes apply to straight-through pipes: for turning chambers or chambers with several side branches or where specific maintenance requirements are necessary, e.g. disconnecting traps, the minimum sizes should be increased.
b Chamber with a removable cover constructed on a drain or sewer to permit entry by personnel [subclause 3.41]
c The minimum size of any manhole serving more than one property should be 1 200 mm diameter or 1 200 mm × 675 mm rectangular.
d May be reduced to 600 mm × 600 mm or 600 diameter where the configuration of the manhole chamber permits a safe system of work.
e May be reduced to 600 mm × 600 mm diameter where required by highway loading considerations, subject to a safe system of work being specified.
f Not applicable due to working space needed.
g Minimum height of chamber in shuffled manhole 2 m from benching to underside of reducing slab.



ROOF SOAKAWAY CONSTRUCTION
SCALE 1:20



WAVIN 450Ø ENTRY (IC)
INSPECTION CHAMBER
(USED UP TO 1.1M DEPTH)
NTS SCALE

STATUS: PLANNING

REV	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT
BURNTISLAND PLAYGROUP

PROJECT
BURNTISLAND PLAYGROUP
NEW BUILDING AND CANOPY
TOLL CENTRE, BURNTISLAND

DRAWING TITLE
SUDS SURFACE WATER DRAINAGE LAYOUT

DRG No	Rev	SCALE	DATE
2021-P098 -D001		As Noted	05 APR 21
DRAWN BY		CHECKED BY	APPROVED BY
RIG		RIG	RG

CHRISTIE GILLESPIE
CONSULTING ENGINEERS LTD.
Suite 11, Stuart House, Eskmills Business Park, Musselburgh, EH21 7PB
Telephone Number: 0131 273 4334
www.christiegillespie.com

A1 SHEET SIZE