

Drainage Technical Note

Proposed Residential Development at

Land adjacent to 52 The Crossways, Chandlers Ford, Eastleigh

On behalf of

Mr Duke Readings

August 2026

Document History and Status

Project Number 23803

Date	Version	Prepared By	Reviewed By	Approved By
28 April 2023	1.0	Kyanna Hodge MEng GMICE	Stuart Magowan IEng MICE	Stuart Magowan IEng MICE
10 Aug 2023	1.1	Kyanna Hodge MEng GMICE	Stuart Magowan IEng MICE	Stuart Magowan IEng MICE
27 Aug 2026	2.0	Steve Doughty Director	Stuart Magowan IEng MICE	Stuart Magowan IEng MICE

This document has been prepared in accordance with the scope of services for The Civil Engineering Practice's appointment with its client and is subject to the terms of the appointment. It is addressed to and for the sole use and reliance of The Civil Engineering Practice's client. The Civil Engineering Practice accepts no liability for any use of this document other than by its client and only for the purposes stated in the document, for which it was prepared and provided. No person other than the client may copy (in whole or in part) use or rely on the contents of this document, without the prior written permission of The Civil Engineering Practice.

Any advice, opinions, or recommendations within this document should be read and relied upon only in the context of the document as a whole. In preparing this document, information and advice may have been sought from third parties. The Civil Engineering Practice cannot be held liable for the accuracy of third party information.

The information contained within this document takes precedence over that contained within any previous version.



CONTENTS

1	Non Technical Summary	1
2	Planning Policy Context	2
2.1	Planning Permission	2
2.2	Planning Condition	2
3	Drainage Technical Note 1.1	3
3.1	Surface Water Drainage	3
3.2	Foul Drainage	3
4	Discharge of Condition Drainage Proposals	4
4.1	Detailed Surface water Drainage Design	4
4.2	Detailed Foul Water Drainage Design	4
4.3	Water Quality	4
5	Conclusions	6
6	List of Appendices, Images and Tables	7

1 Non Technical Summary

- 1.1 This Drainage Technical Note has been undertaken on behalf of Mr Readings to discharge planning condition 4 of planning permission F/23/95155 for the construction of one residential dwelling with associated car parking and landscaping on Land adjacent to 52 The Crossways, Chandlers Ford, Eastleigh, Hampshire.
- 1.2 The proposed development will incorporate a sustainable drainage system which will discharge at a suitably restricted rate to the public surface water sewer located beneath The Crossways and provide storage for all storm return periods up to and including the 1:100 year rainfall event with an allowance for climate change.
- 1.3 Foul water will be discharged to the existing public foul sewer located beneath The Crossways.
- 1.4 This report concludes that a suitable surface water and foul water drainage system has been designed to accommodate the anticipated flows from the proposed development.

2 Planning Policy Context

2.1 Planning Permission

2.1.1 Planning permission for the proposed development was granted on 5 October 2023 under planning reference F/23/95155.

2.2 Planning Condition

2.2.1 Planning condition 4 states that *'Prior to the commencement of development, details of the proposed means of foul sewerage and surface water disposal shall be submitted to, and approved in writing by, the Local Planning Authority, in consultation with Southern Water. This shall be in broad accordance with the submitted Drainage Technical Note (V1.1)'*

3 Drainage Technical Note 1.1

3.1 Surface Water Drainage

- 3.1.1 Drainage Technical Note 1.1 proposed a restricted surface water discharge to the public surface water sewer located beneath The Crossways at a restricted rate of 2 l/s
- 3.1.2 An additional 10% of roof area was included within the calculations to account for potential future urban creep amounting to a total potential impermeable site area of 176.m².
- 3.1.3 The driveway as proposed as a permeable paving drainage system. Sufficient storage was proposed for all storm return periods up to and including the future year 1:100 year rainfall event with a 45% additional allowance for climate change.

3.2 Foul Drainage

- 3.2.1 Drainage Technical Note 1.1 proposed that foul water would be discharged to the existing public foul sewer located beneath The Crossways.

4 Discharge of Condition Drainage Proposals

4.1 Detailed Surface Water Drainage Design

- 4.1.1 Rainwater collected from the roof will discharge via rainwater pipes located at the southern end of the building into filter trenches which will connect to a system of 95% voided crates located at the southern end of the proposed driveway.
- 4.1.2 The driveway will be constructed as a permeable paving system of 80mm block paving over 30mm gritstone over 150mm of 30% voided stone subbase.
- 4.1.3 Water collected within that permeable paving will discharge via the filter trenches to the crate storage system.
- 4.1.4 Surface water from the storage crates will be discharged via a hydrobrake at a peak rate of 2l/s to the existing public surface water sewer located beneath The Crossways.

4.2 Detailed Foul Water Drainage Design

- 4.2.1 Foul water will be discharged by gravity to the existing public foul sewer located beneath The Crossways.
- 4.2.2 Detailed drainage design drawings together with surface water storage calculations are located in Appendix 1 at the rear of this report.

4.3 Water Quality

- 4.3.1 The proposed development is for residential use. In accordance with CIRIA SuDS Manual 2015 (Report C753), the pollution hazard level for this type of development is classified as between very low and low depending on the use / area of the site.
- 4.3.2 The surface water scheme will include mitigation to ensure that surface water is suitably treated and any pollution risk adequately managed prior to discharge.
- 4.3.3 Table 26.2 in Chapter 26 of CIRIA report C753 The SuDS Manual provides Pollution Hazard Indices for varying land types. Those of relevance to the development proposals are as follows:

Land Use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very Low	0.2	0.2	0.05
Individual property driveways	Low	0.5	0.4	0.4

Table 1: Pollution Hazard Indices

4.3.4 The use of permeable paving will meet the target treatment level required as follows:

Private Areas	Total suspended solids (TSS)	Metals	Hydrocarbons
Filter drain (roofs)	0.4	0.4	0.4
Permeable pavement (Driveway)	0.7	0.6	0.7

Table 2: Pollution Mitigation Provision

5 Conclusions

- 5.1 Detailed surface water and foul water drainage systems have been design which are in broad accordance with the submitted Drainage Technical Note (V1.1).
- 5.2 The surface water drainage system has been designed to meet the performance, attention, storage and water quality parameters.
- 5.3 The foul water drainage system has also been designed in broad accordance with the submitted Drainage Technical Note (V1.1)
- 5.4 A suitable surface water and foul water drainage system has been designed to accommodate the anticipated flows from the proposed development.

6 List of Appendices, Images and Tables

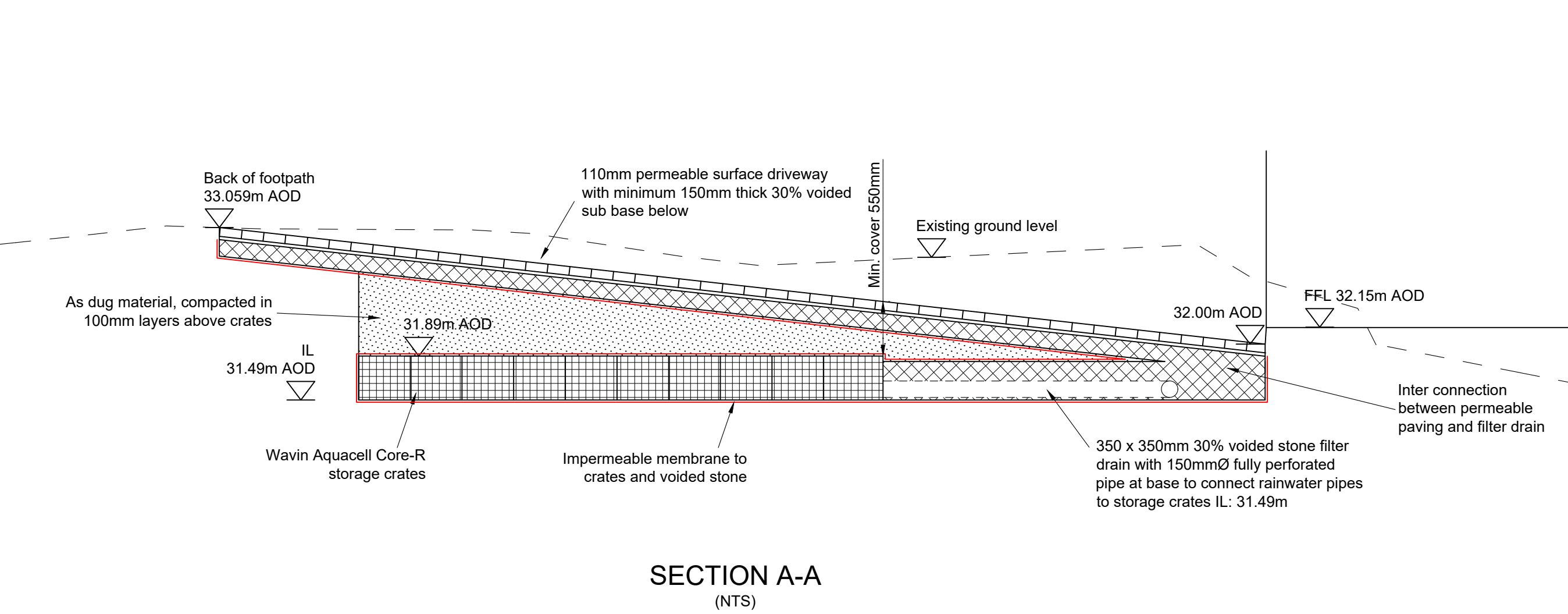
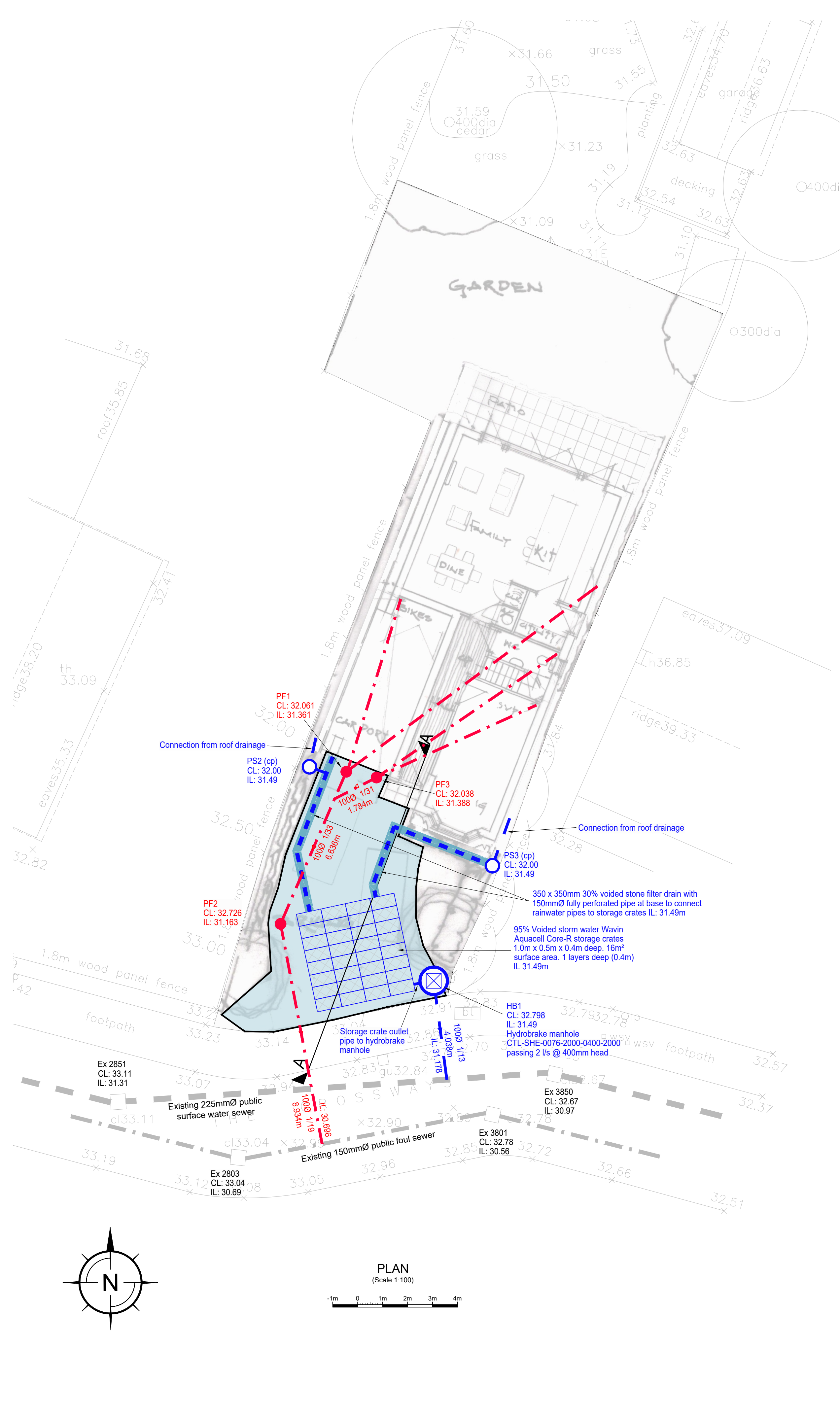
Appendix 1 Detailed Drainage Design Drawings and Surface Water Storage Calculations

Table 1 Pollution Hazard Indices

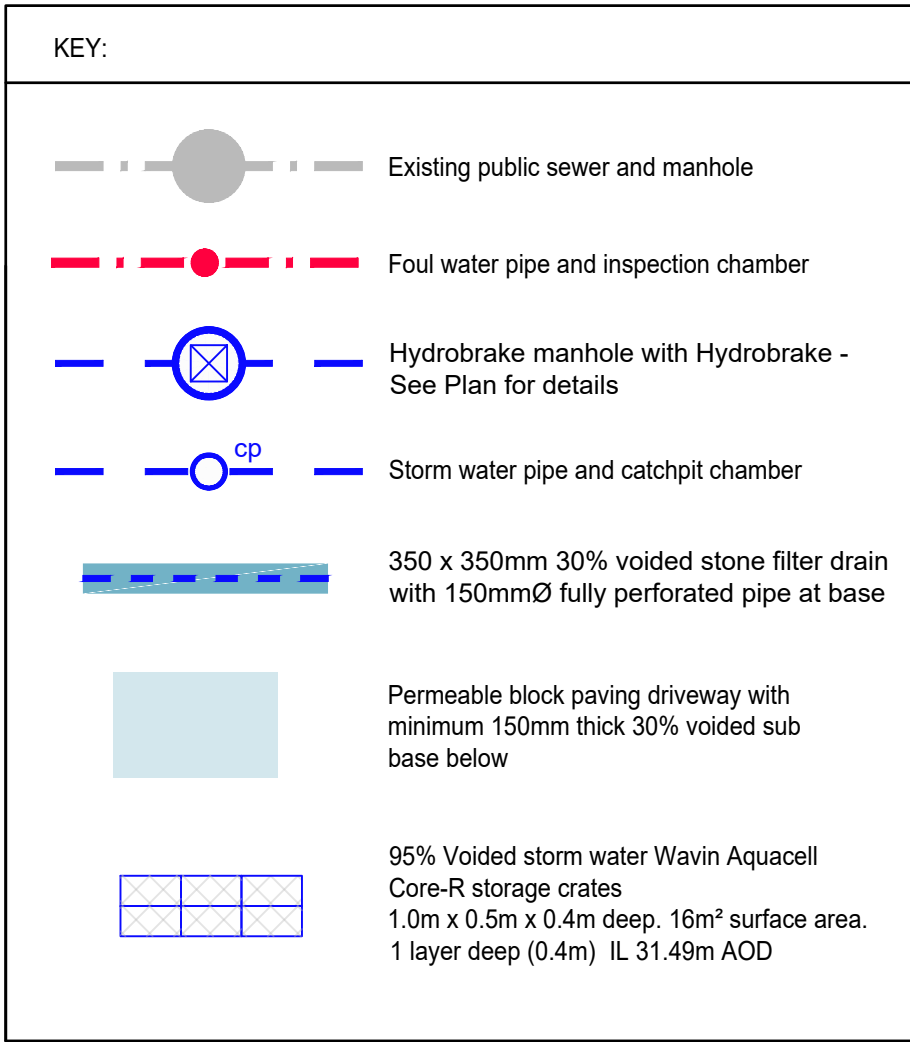
Table 2 Pollution Mitigation Provision

Appendix 1

**Detailed Drainage Design Drawings
and Surface Water Storage Calculations**



PHASE: 0 (PRIVATE)								
MH No.	MANHOLE DIMENSION (mm)	MANHOLE TYPE	COVER TYPE	COVER LEVEL (m)	INVERT LEVEL (m)	DEPTH TO SOFFIT (m)	EASTING (m)	NORTHING (m)
PS2	450Ø	CATCHPIT	B125	32.000	31.490	0.410	443303.568	119903.767
PS3	450Ø	CATCHPIT	B125	32.000	31.490	0.410	443310.897	119899.803
PF1	450Ø	Type E	B125	32.061	31.361	0.600	443305.042	119903.566
PF2	315Ø	Type E	B125	32.726	31.163	1.463	443302.411	119897.474
PF3	450Ø	Type E	B125	32.038	31.388	0.550	443306.255	119903.337



- GENERAL NOTES:**
- All dimensions to be checked on site. All details and dimensions relating to sub-Contractors work must be checked and agreed between the sub-Contractor or supplier and the general Contractor.
 - This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and specification.
 - The main Contractor is responsible for ensuring the stability of the structure whilst the works are in progress.
 - Any information given regarding existing underground services is given in good faith after consultation with the relevant authority. No liability is accepted by the Consultant and the main Contractor is responsible for obtaining and checking all information and taking due care and attention whilst undertaking the works.
- DRAINAGE NOTES:**
- All adoptable pipes, bends and junctions shall be vitrified clay in accordance with the current version of BS EN 295-1, with flexible joints and kitemark certified.
 - All Adoptable sewers shall be in strict accordance with the SSG Appendix C - Design and Construction Guidance. Unless otherwise stated adoptable sewers shall be 150mm diameter and shall be laid in a class S bedding. Where the depth to soffit is less than 1.2m under a public highway or 0.9m elsewhere the pipe shall be laid with a class Z bedding.
 - All private building drainage shall be constructed in strict accordance with the current version of BS EN 752:2017. Unless otherwise specified building drainage shall be 100mm diameter and shall be laid at a minimum gradient of 1 in 40 for foul drains and 1 in 80 for surface water drains. All building drains shall be laid in class B bedding unless otherwise specified.
 - Where a pipe is within 1m of a foundation the trench shall be filled with class GEN 3 concrete up to the lowest level of the foundation. Where the trench is further than 1m from the foundation, the trench shall be filled with class GEN 3 concrete to a level below the lowest level for the foundation equal to the distance from the foundation less 150mm. In both cases the pipe shall be bedded and surrounded in 150mm thick class GEN 3 concrete.
 - Where pipes, external to the structures, have a depth to soffit from ground level of less than 450mm they shall have a class GEN 3 concrete encasement (150mm thick). In all other cases the pipes shall be bedded and surrounded with 100mm thick granular material.
 - In any circumstances where pipes are bedded and surrounded in concrete flexible joints should be provided. Compressible boards (fibreglass or polystyrene) shall be provided at a maximum of 8m centres (coinciding with pipe joints). The boards shall be pre-cut to pipe diameter and to a height and width equal to the concrete cross section. A board thickness of 18mm for pipes up to 450mm nominal diameter and 36mm for pipes over 450mm nominal diameter.
 - All svps shall have rodding access plates fitted at their bases (ground floor level).
 - Impermeable membranes to be sealed around any incoming pipes
 - Where existing pipes are to be abandoned they shall be dug out together with any abandoned manholes.
 - Any discrepancy between the drawing and site should be reported immediately to the Engineer.
 - All manhole and chamber sizes are given as a minimum to meet the SSG Appendix C-Design and Construction Guidance

REV	DATE	INT	DESCRIPTION	CHK
-----	------	-----	-------------	-----

Issue Status **FOR APPROVAL**

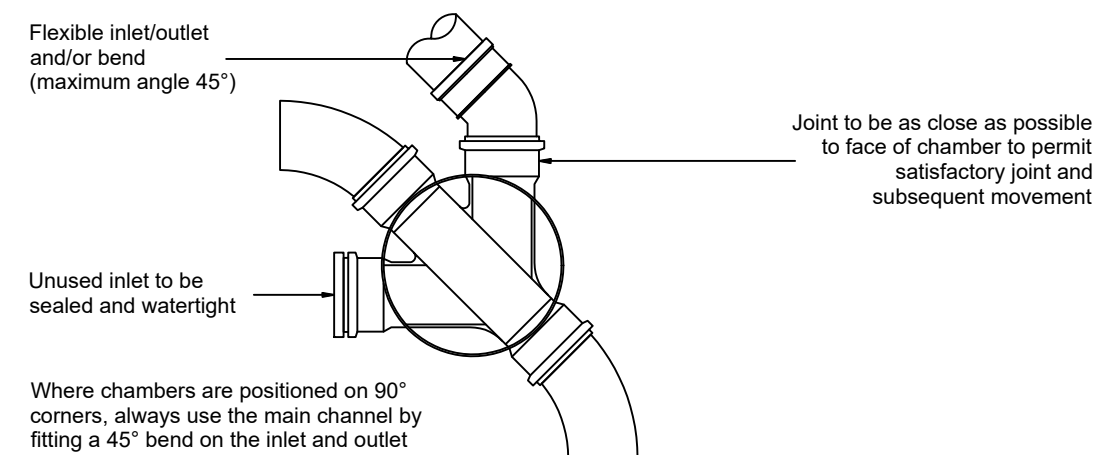
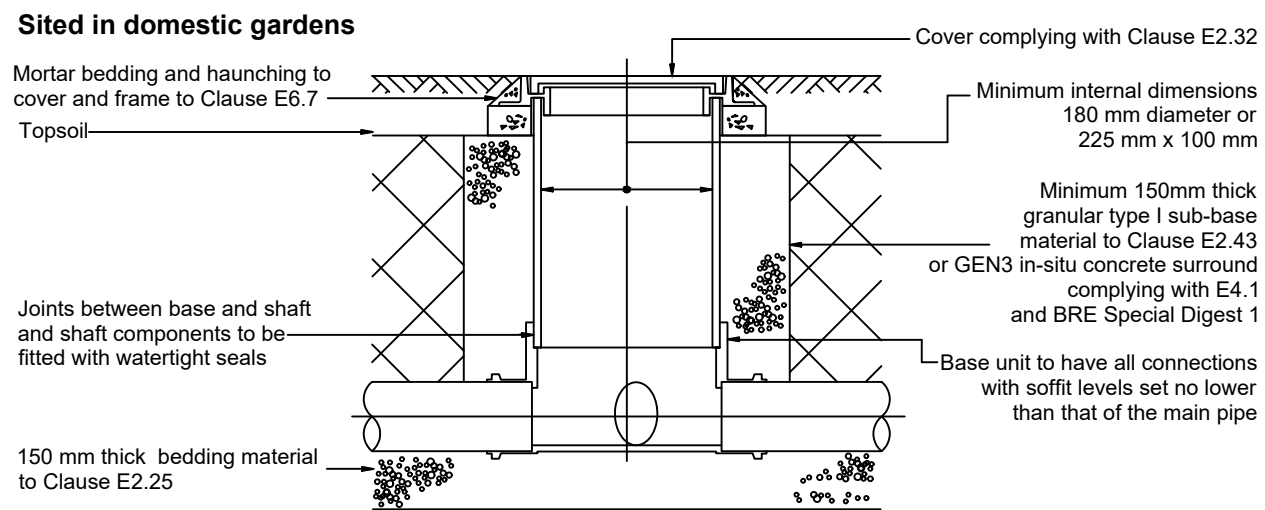
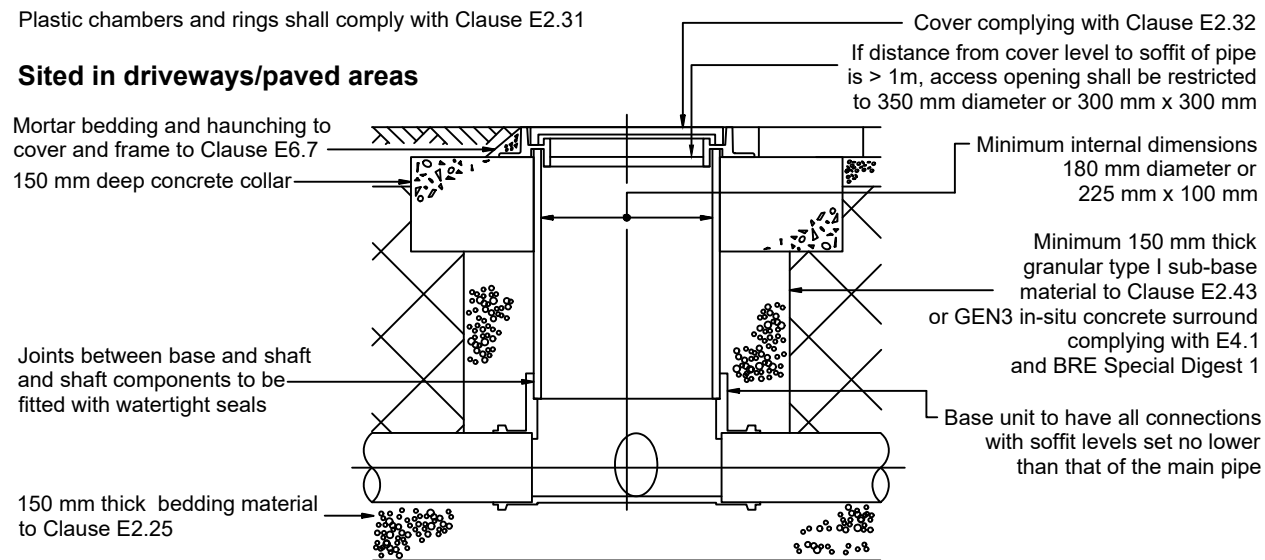


The Civil Engineering Practice
11 Tungsten Building
George Street
Fishergate
Sussex
BN41 1RA
01273 424424
reception@civil.co.uk
www.civil.co.uk

CLIENT		Wessex Planning	
PROJECT		Land Adjacent To 52 The Crossways, Chandlers Ford	
TITLE		Site Layout - Proposed Drainage	
DRAWN	DATE	PROJECT NO.	
A Davies	Aug 2026	23803	
ENGINEER	CHECKED	DWG. NO.	REV.
S Doughty	SRD	101	-
SCALE		1:100 @ A1, 1:200 @ A3	

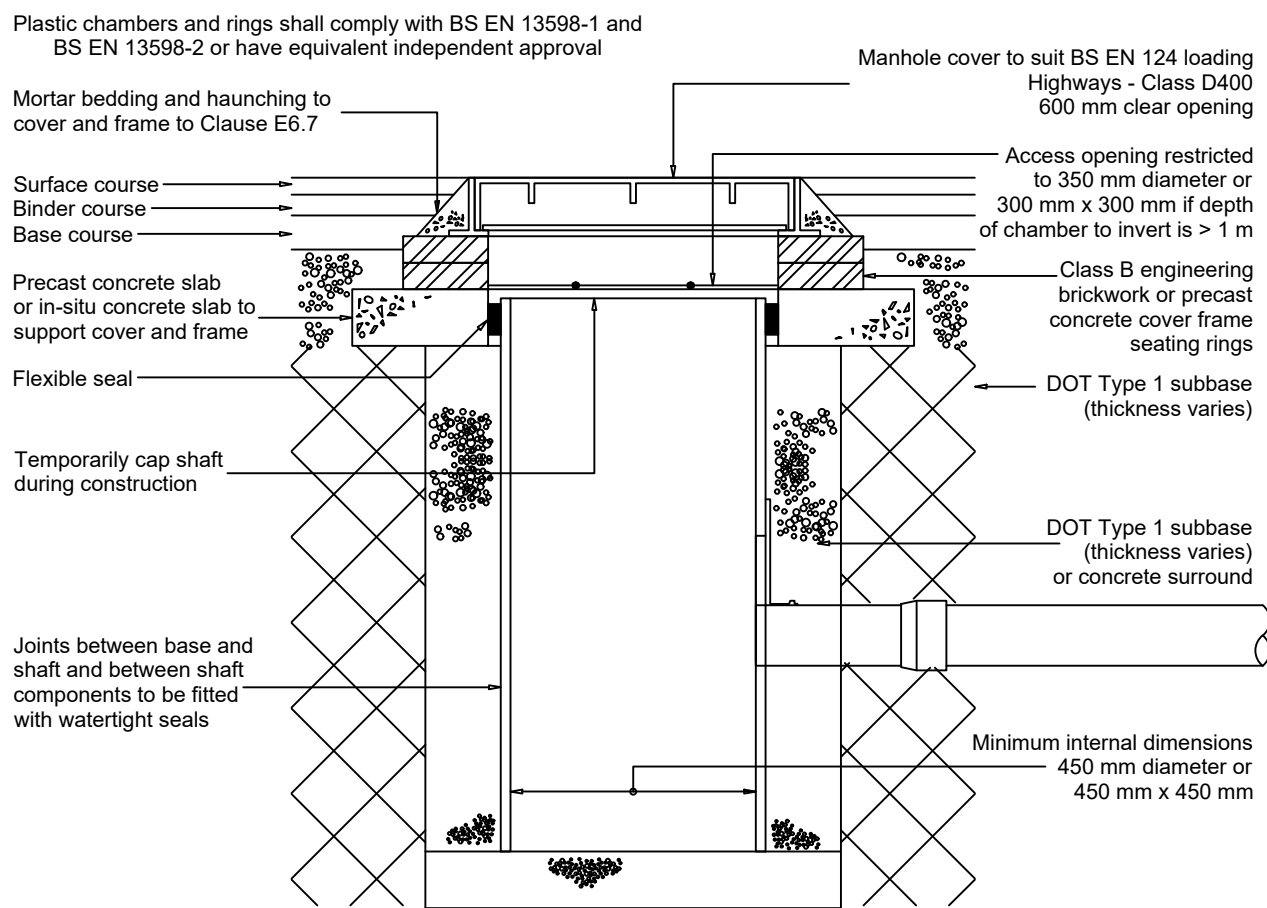
FIGURE B.23
TYPICAL INSPECTION CHAMBER DETAIL - TYPE E

Depth from cover level to soffit of pipe up to 2 m
Flexible material construction



Note: Where the access chamber is in the highway (including any footway), the highway authority can have specific requirements.
Not to scale

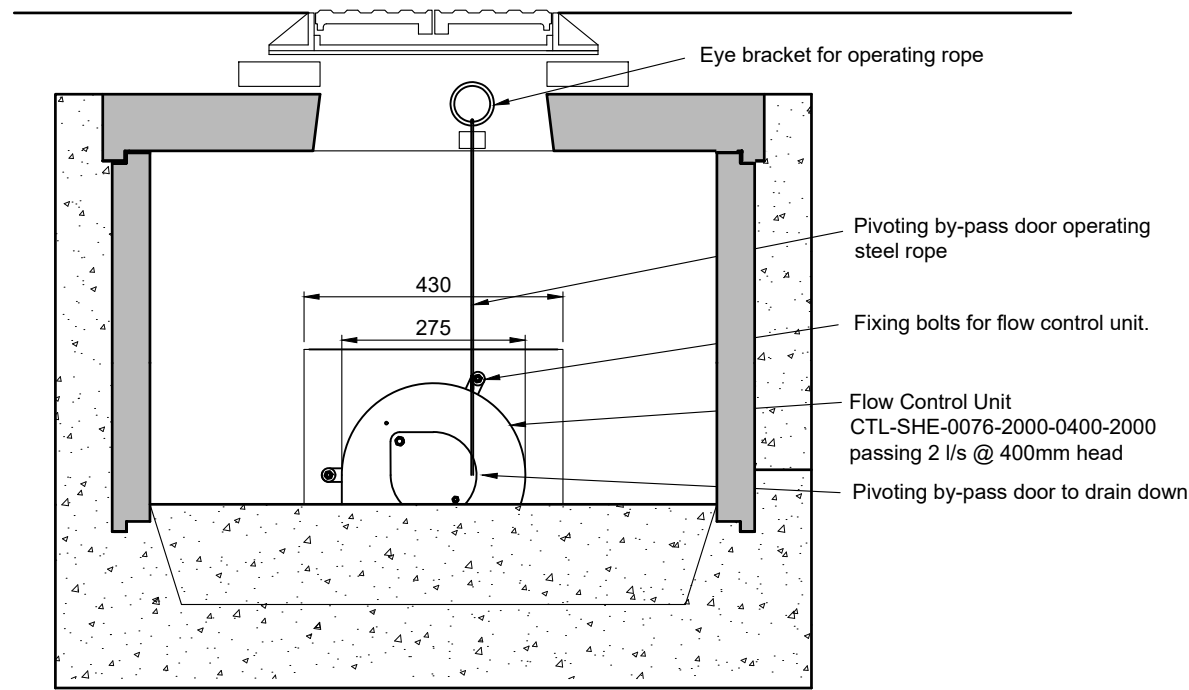
Maximum depth from cover level to soffit of pipe in areas subject to vehicle loading 3 m, non-entry



Not to scale

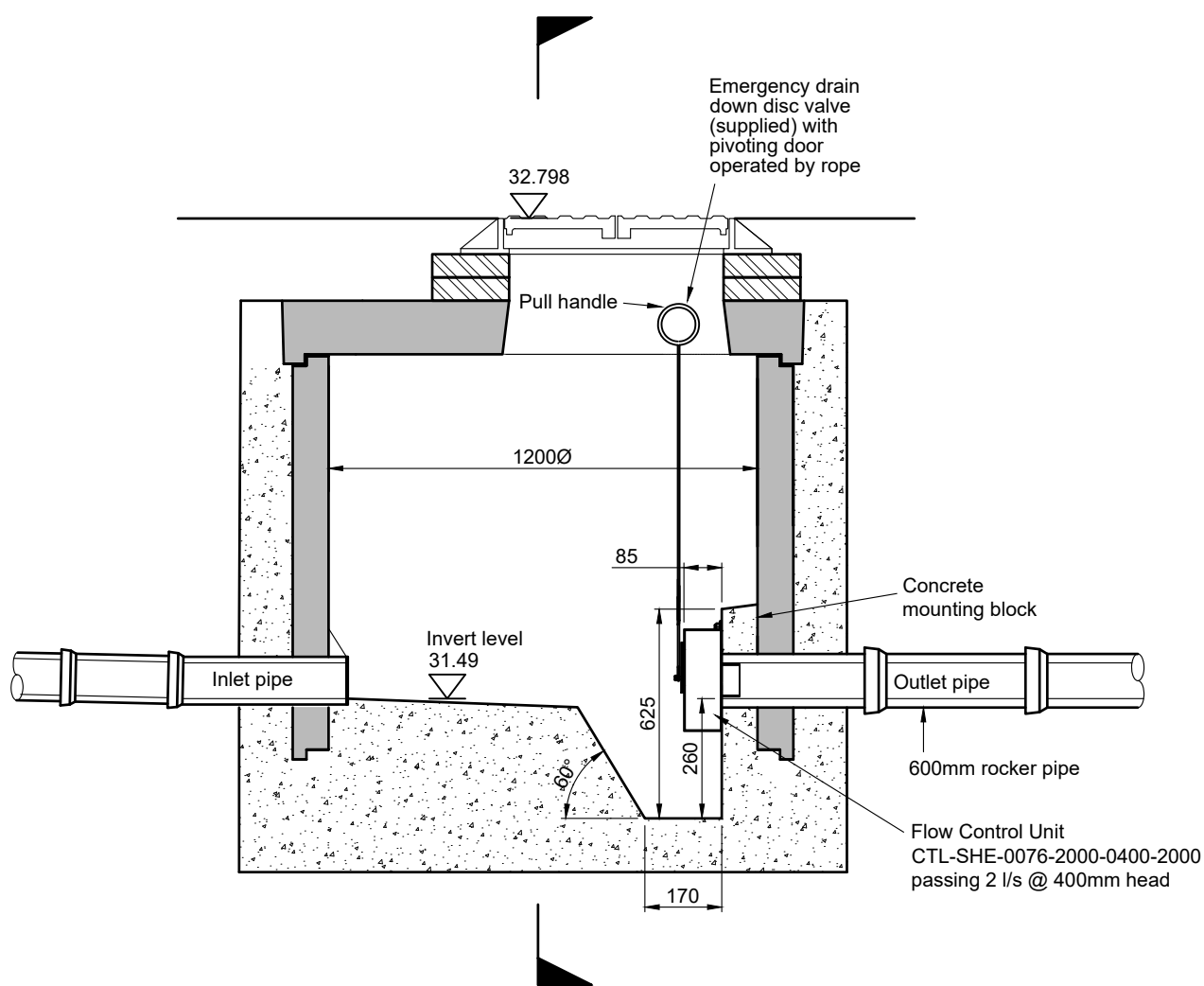
CATCHPIT CHAMBER
500mm SUMP

(Scale 1:20)



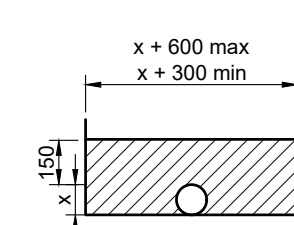
SECTION

(Scale 1:20)



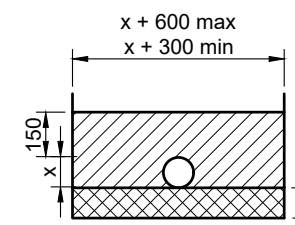
HYDROBRAKE MANHOLE DETAIL

(Scale 1:20)



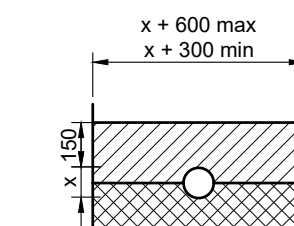
High standard of workmanship required not to be used unless accurate hand trimming by shovel is possible

CLASS D PIPE BEDDING



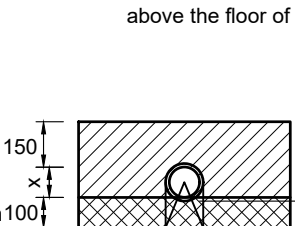
Where accurate hand trimming is not possible class N is an alternative to class D

CLASS N PIPE BEDDING



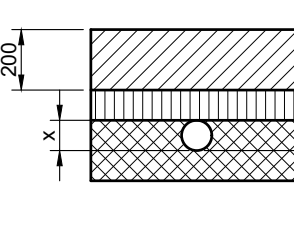
Generally suitable in all soil conditions granular fill to half depth of pipe

CLASS B PIPE BEDDING

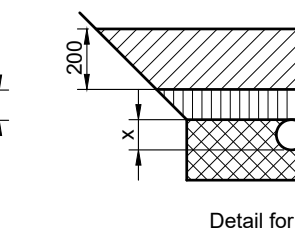


Generally suitable in all soil conditions

CLASS F PIPE BEDDING



PIPE BEDDING FOR FLEXIBLE PIPES



Detail for vee trench

PIPE BEDDING DETAILS
(NON ADOPTABLE DRAINS)

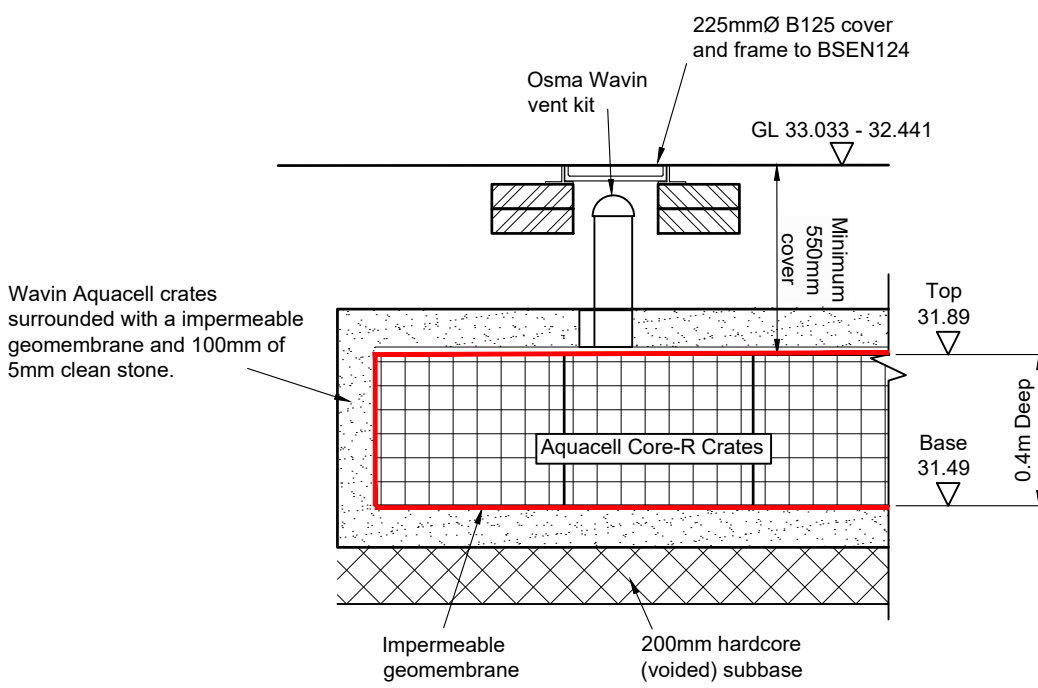
(Not To Scale)

PIPE BORE	BEDDING CLASS	Fields and gardens		Light traffic roads		Heavy traffic roads	
		MIN	MAX	MIN	MAX	MIN	MAX
100mm	D or N	0.4	4.2	0.7	4.1	0.7	3.7
	F	0.3	5.8	0.5	5.8	0.5	5.5
	B	0.3	7.4	0.4	7.4	0.4	7.2
150mm	D or N	0.6	2.7	1.1	2.5	--	--
	F	0.6	3.9	0.7	3.8	0.7	3.3
	B	0.6	5.0	0.6	5.0	0.6	4.6
225mm	D or N	--	--	--	--	--	--
	F	0.6	2.5	1.2	2.1	--	--
	B	0.6	3.3	0.8	3.2	0.9	2.4

PIPE BEDDING FOR RIGID APPLIES (NON ADOPTIVE DRAINS)

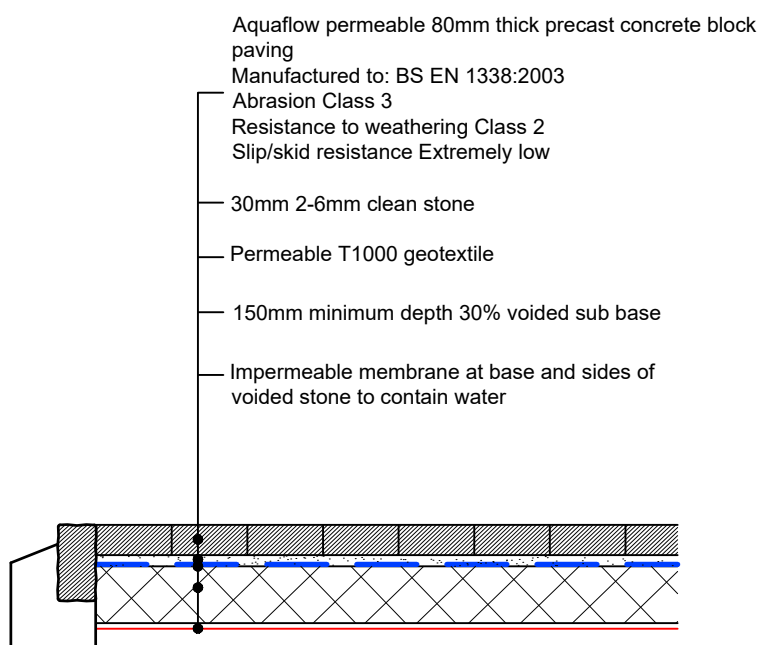
LEGEND:

- Selected fill: free from stones larger than 40mm, lumps of clay over 100mm, timber frozen material and vegetable matter
- Granular material: should conform to BS 882:1983 table 4 or BS8301:1985 Appendix D. Compaction fraction > 0.3 for class N > 0.2 for class F and B.
- Selected fill or granular fill free from stones larger than 40mm
- 'x' - Denotes external pipe diameter.



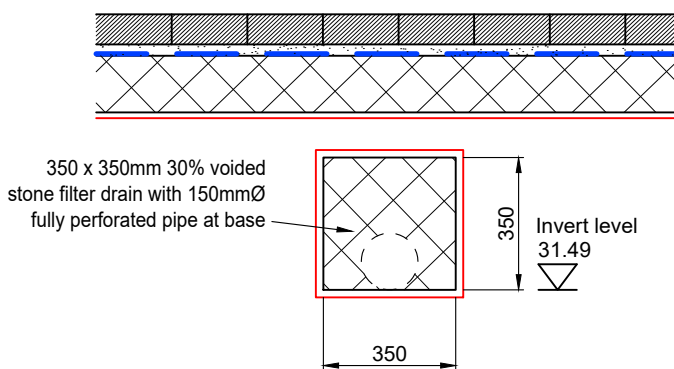
CRATE STORAGE CONSTRUCTION DETAIL

(Scale 1:20)



DRIVEWAY CONSTRUCTION DETAIL

(Scale 1:20)



TYPICAL FILTER DRAIN DETAIL
BENEATH PERMEABLE PAVING

(Scale 1:20)

GENERAL NOTES:

- All dimensions to be checked on site. All details and dimensions relating to sub-Contractors work must be checked and agreed between the sub-Contractor or supplier and the general Contractor.
- This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and specification.
- The main Contractor is responsible for ensuring the stability of the structure whilst the works are in progress.
- Any information given regarding existing underground services is given in good faith after consultation with the relevant authority. No liability is accepted by the Consultant and the main Contractor is responsible for obtaining and checking all information and taking due care and attention whilst undertaking the works.

DRAINAGE NOTES:

- All adoptable pipes, bends and junctions shall be vitrified clay in accordance with the current version of BS EN 295-1, with flexible joints and kitemark certified.
- All Adoptable sewers shall be in strict accordance with the SSG Appendix C - Design and Construction Guidance. Unless otherwise stated adoptable sewers shall be 150mm diameter and shall be laid in a class S bedding. Where the depth to soffit is less than 1.2m under a public highway or 0.9m elsewhere the pipe shall be laid with a class Z bedding. All building drains shall be laid in class B bedding unless otherwise specified.
- All private building drainage shall be constructed in strict in accordance with the current version of BS EN 752:2017. Unless otherwise specified building drainage shall be 100mm diameter and shall be laid at a minimum gradient of 1 in 40 for foul drains and 1 in 80 for surface water drains. All building drains shall be laid in class B bedding unless otherwise specified.
- Where a pipe is within 1m of a foundation the trench shall be filled with class GEN 3 concrete up to the lowest level of the foundation. Where the trench is further than 1m from the foundation, the trench shall be filled with class GEN 3 concrete to a level below the lowest level for the foundation equal to the distance from the foundation less 150mm. In both cases the pipe shall be bedded and surrounded in 150mm thick class GEN 3 concrete.
- Where pipes, external to the structures, have a depth to soffit from ground level of less than 450mm they shall have a class GEN 3 concrete encasement (150mm thick). In all other cases the pipes shall be bedded and surrounded with 100mm thick granular material.
- In any circumstances where pipes are bedded and surrounded in concrete flexible joints should be provided. Compressible boards (fibreboard or polystyrene) shall be provided at a maximum of 8m centres (coinciding with pipe joints). The boards shall be pre-cut to pipe diameter and to a height and width equal to the concrete cross section. A board thickness of 18mm for pipes up to 450mm nominal diameter and 36mm for pipes over 450mm nominal diameter.
- All svps shall have rodding access plates fitted at their bases (ground floor level).
- Impermeable membranes to be sealed around any incoming pipes
- Where existing pipes are to be abandoned they shall be dug out together with any abandoned manholes.
- Any discrepancy between the drawing and site should be reported immediately to the Engineer.
- All manhole and chamber sizes are given as a minimum to meet the SSG Appendix C-Design and Construction Guidance

REV DATE INT DESCRIPTION CHG

Issue Status FOR APPROVAL



The Civil Engineering Practice
11 Tungsten Building
George Street
Fishergate
Sussex
BN41 1RA
01273 424424
reception@civil.co.uk
www.civil.co.uk

CLIENT Wessex Planning

PROJECT Land Adjacent To 52 The Crossways, Chanders Ford

TITLE Construction Details

DRAWN A Davies DATE Aug 2026 PROJECT NO. 23803
ENGINEER S Doughty CHECKED SRD
SCALE As Shown @ A1

10 0 10 20 30 40mm



Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	1440	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m ³ /ha)	0.0		

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0	30	0	0	0
2	0	0	0	100	0	0	0
10	0	0	0	100	45	0	0
20	0	0	0				



Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	0.600
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	150.0		

Nodes

Name	Area (ha)	Cover Level (m)	Depth (m)	Invert Level (m)
Stoarge	0.018	32.000	0.510	31.490

Node Stoarge Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	31.490	Product Number	CTL-SHE-0076-2000-0400-2000
Design Depth (m)	0.400	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node Stoarge Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	1.5	Invert Level (m)	31.490
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	39

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	16.0	0.0	0.400	16.0	0.0	0.401	0.0	0.0



Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	Stoarge	22	31.540	0.050	2.1	0.7560	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
30 minute summer	Stoarge	Hydro-Brake®	0.9	1.3



Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	Stoarge	21	31.556	0.066	2.9	1.0085	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
30 minute summer	Stoarge	Hydro-Brake®	1.4	1.9



Results for 10 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	Stoarge	22	31.615	0.125	5.5	1.9073	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
30 minute summer	Stoarge	Hydro-Brake®	2.0	3.5



Results for 20 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	Stoarge	23	31.647	0.157	6.6	2.3914	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
30 minute summer	Stoarge	Hydro-Brake®	2.0	4.2



Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	Stoarge	23	31.665	0.175	7.2	2.6530	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
30 minute summer	Stoarge	Hydro-Brake®	2.0	4.5



Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	Stoarge	42	31.732	0.242	6.9	3.6801	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
60 minute summer	Stoarge	Hydro-Brake®	2.0	7.3



Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	Stoarge	45	31.890	0.400	10.0	6.0821	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
60 minute summer	Stoarge	Hydro-Brake®	2.0	10.6