

Drainage Maintenance Manual



The Civil Engineering Practice
11 Tungsten Building
George Street
Fishersgate
Sussex
BN41 1RA



Project	Bonhams Field, Yapton
Project Number	23018

By Martin Kempshall C Eng MICE

Date 26 June 2020

1 Schedule of Maintenance

- 1.1 Upon completion of the development the management of the shared drainage facilities will be passed on to a Management Company who will be appointed by the developer on behalf of the new Residents.
- 1.2 The regular and corrective maintenance of all shared elements of the drainage system beneath the road, including the lined voided subbase will be managed by the Management Company on behalf of the Residents.
- 1.3 Regular maintenance of all private drainage, channels, gutters, rainwater pipes, driveways and connections will be the responsibility of the individual homeowner and should be undertaken every 3 months.
- 1.4 Driveways and connections will be the responsibility of the individual homeowner and should be undertaken on an annual basis. Driveways which form part of the wider infiltration system include a legal covenant to ensure these remain part of the wider drainage system in perpetuity.
- 1.5 With adequate maintenance the working design life of permeable paving system is approximately 25 years. The extent of the permeable paving is shown on Drawing 1210 a copy of which is attached as part of this Drainage Maintenance Manual.
- 1.6 At a minimum interval of 25 years the permeable paving blocks shall be lifted and inspection undertaken as follows:
 - ¿ 3-6mm gravel bedding to be removed and the voided subbase stone inspected.
 - ¿ The subbase shall be replaced as required where blocked or blinded.
 - ¿ The permeable geotextile shall be inspected using a series of hand dug trial holes to assess its general condition, where damaged it should be replaced or repaired.
 - ¿ Upon completion of the inspection the voided stone subbase shall be replaced to the original specification and level.
 - ¿ The 3-6mm bedding shall be replaced with the permeable blocks reinstated after cleaning or where required replaced with new.



2. Following block reinstatement 3-6mm grit shall be swept into the joints between the permeable blocks.

1.7 Provisions will be made to replace any infrastructure that has reached the end of its serviceable design life and will be replaced on a like for like basis as far as reasonably practicable.

1.8 Drawing 2001 shows the drainage ownership responsibilities.

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Remove sediment and debris from silt trap chambers, channel drains and inlet chambers	Monthly or as required
	Litter and debris removal - catch pits	Monthly or as required
	Surface and foul water pipework - jetting / rodding	Every 2 years or as required
	Visual inspection of permeable paving for defects and settlement	Annually, or after leaf fall
	Sweeping / brushing / vacuuming of permeable paving	Annually, or after leaf fall
Corrective Maintenance	Repairs to access chambers / manhole covers	As required
	Replace any broken permeable blocks / surface, remedial works to any depressions or rutting	As required
	Inspect inlet, outlet from downpipe and gullies for blockages, standing water and clear	As required
	Full inspection and service of permeable paving system	Minimum of every 25 years

Table 1: Schedule of Regular and Corrective Maintenance

2 Financing

2.1 The regular maintenance of all private drainage, channels, gutters, rainwater pipes, driveways and connections will be the responsibility of the individual homeowner.

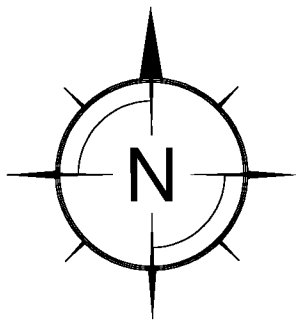
2.2 The regular and corrective maintenance of all shared elements of the drainage system will be managed and funded through the Management Company on behalf of the Residents.

2.3 In the event that the estate's Management Company becomes unable to discharge its duties within 2 years of first appointment the developer will endeavour to appoint an alternative on behalf of the Residents.

3 Maintenance Summary

Inspection / Action Required	Gullies, Channels and Gutters	Silt Traps, Channel Drainage and Inlet Chambers	Catchpit	Permeable Paving / Surfaces	Surface Water Pipework
Monthly		V	V		
3 Months	V		V	V	
1 Year				V	
After leaf fall in Autumn	V		V	V	
2 Years					V
5 Years					
25 Years				V	

Table 2: Drainage System Maintenance Summary



GENERAL NOTES:

1. 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.
2. This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and specification.
3. The main Contractor is responsible for ensuring the stability of the structure whilst the works are in progress.
4. 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:

1. All adoptable pipes, bends and junctions shall be vitrified clay to BS EN 295-1, with flexible joints and kitemark certified.
2. All Adoptable sewers shall be in strict accordance with the 7th edition of Sewers For Adoption. 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 2 bedding.
3. All private building drainage shall be constructed in strict accordance with BS EN 752:2008. 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.
4. 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.
5. 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.
6. 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.
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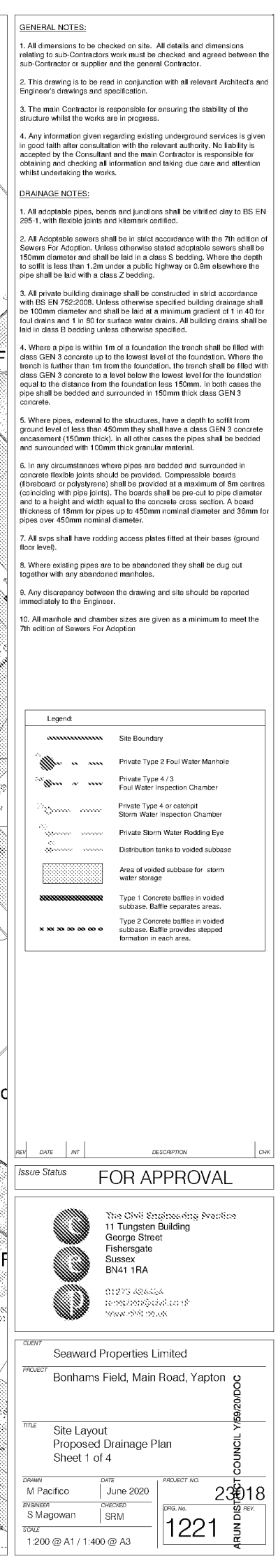
Legend:	
	Site Boundary
	Private Type 2 Foul Water Manhole
	Private Type 4 / 3 Foul Water Inspection Chamber
	Private Type 4 or catchpit Storm Water Inspection Chamber
	Private Storm Water Rodding Eye
	Distribution tanks to voided subbase
	Area of voided subbase for storm water storage
	Type 1 Concrete baffles in voided subbase. Baffle separates areas.
	Type 2 Concrete baffles in voided subbase. Baffle provides stepped formation in each area.

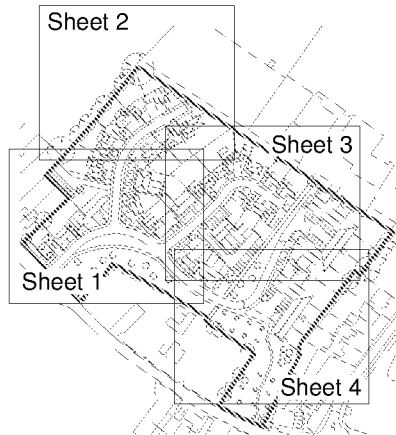
D	26.06.20	PJR	Voided subbase formation levels added. Cover and invert levels added. Drainage revised.	MK
C	20.04.20	MJP	Gullies removed from roads	MK
B	17.06.19	AJD	Site layout updated	SRM
A	06.06.19	MJP	Plots 26 and 27 updated	SRM
REV	DATE	BY	DESCRIPTION	CHK

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	Seaward Properties Limited				
PROJECT	Bonhams Field, Main Road, Yapton				
TITLE	Site Layout Proposed Drainage Plan				
DRAWN	M Pacifico		DATE	May 2019	
ENGINEER	S Magowan		CHECKED	SRM	
SCALE	1:500 @ A1 / :1000 @ A3				
			PROJECT NO.	23018	
			DWG No.	1210	REV. D





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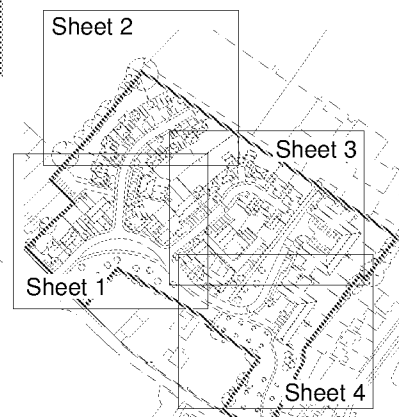
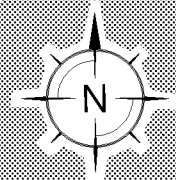
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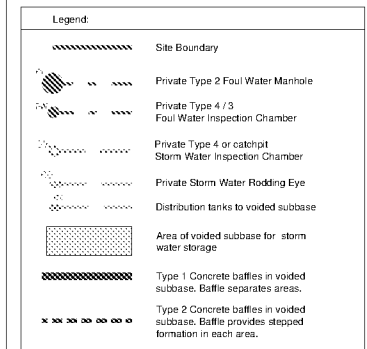


The Civil Engineering Profession
11 Tungsten Building
George Street
Fishergate
Sussex
BN41 1RA
01273 626454
01992 595195
www.civil.org.uk

CLIENT Seaward Properties Limited	
PROJECT Bonhams Field, Main Road, Yapton	
TITLE Site Layout Proposed Drainage Plan Sheet 2 of 4	
DRAWN M Pacifico	DATE June 2020
ENGINEER S Magowan	CHECKED SRM
SCALE 1:200 @ A1 / 1:400 @ A3	PROJECT NO. 23018
	DWG NO. 1222
	REV ARUN DISTRICT COUNCIL Y5920DOC



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01273 626454
01902 395133 ext 4018
www.the-civil-engineering.com

CLIENT	Seaward Properties Limited	PROJECT NO.	23018
PROJECT	Bonhams Field, Main Road, Yapton	DWG NO.	1223
TITLE	Site Layout Proposed Drainage Plan Sheet 3 of 4	DATE	June 2020
DRAWN	M Pacifico	CHECKED	SRM
ENGINEER	S Magowan	DATE	June 2020
SCALE	1:200 @ A1 / 1:400 @ A3	REV	

ARUN DISTRICT COUNCIL Y5920DOC



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Legend:

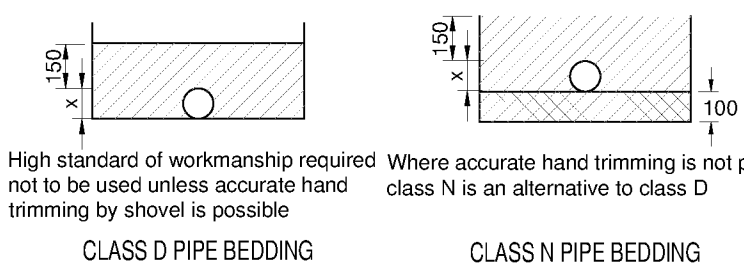
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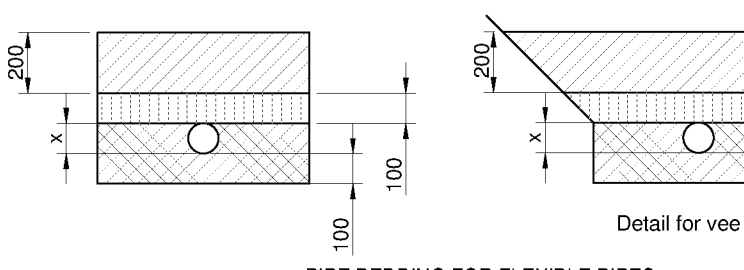
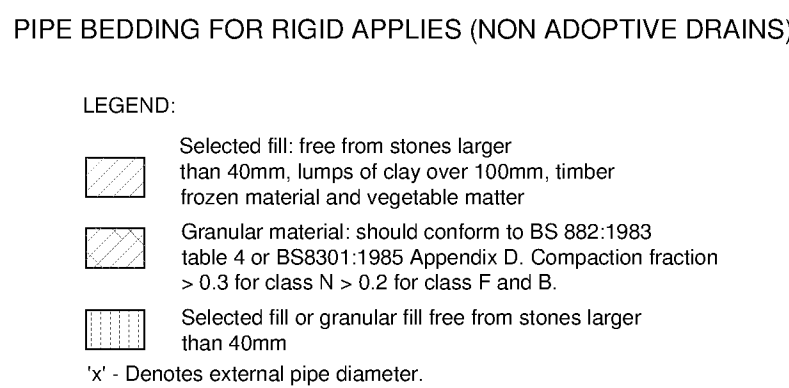
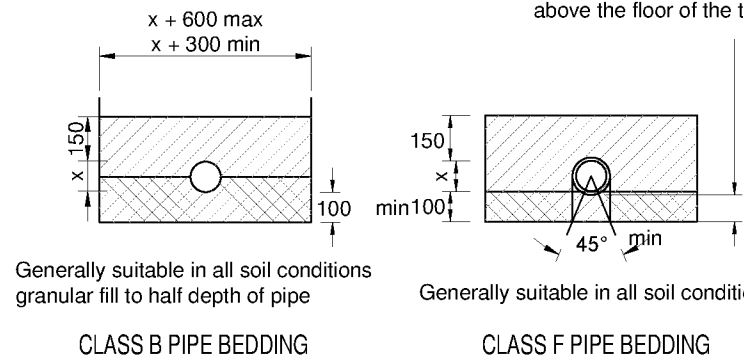
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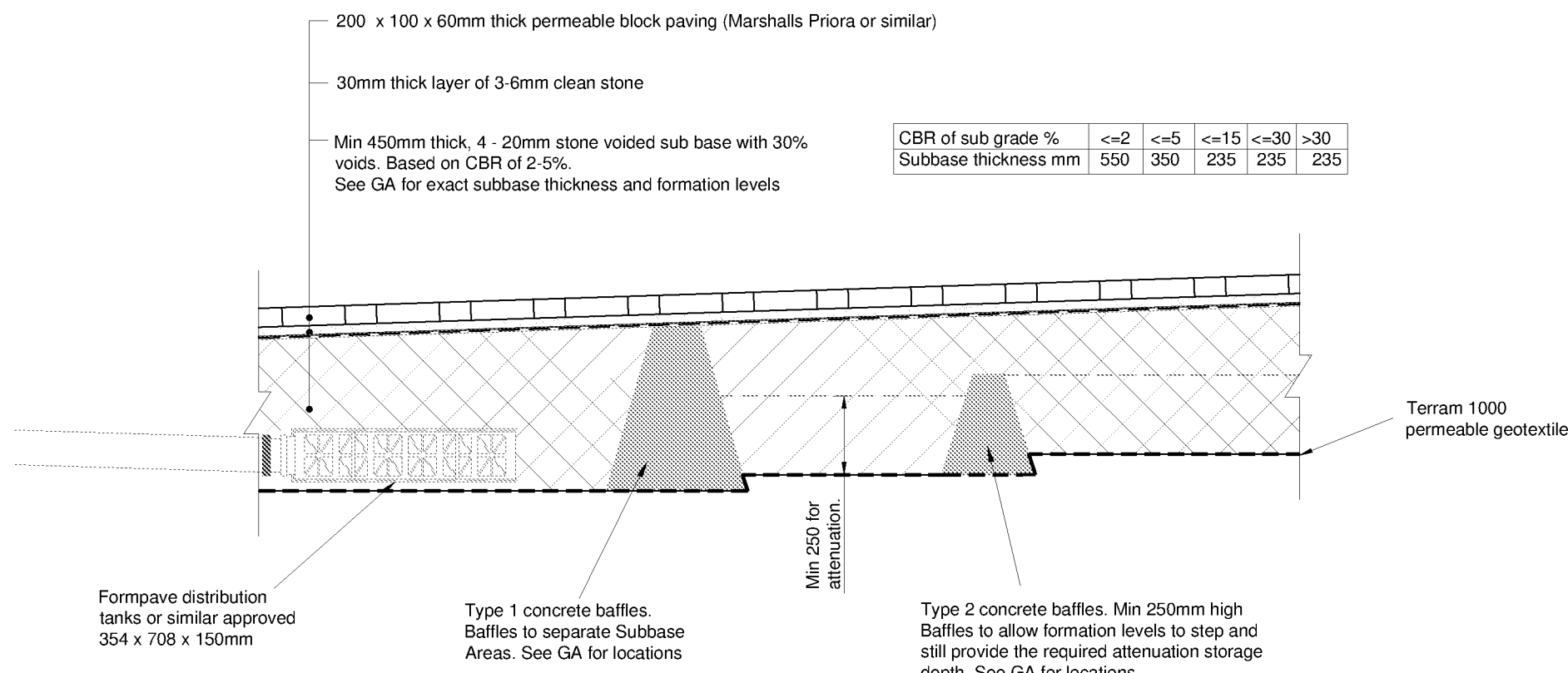
CLIENT Seaward Properties Limited		PROJECT NO. 23018
PROJECT Bonhams Field, Main Road, Yapton		
TITLE Site Layout Proposed Drainage Plan Sheet 4 of 4		
DESIGN M Pacifico	DATE June 2020	
ENGINEER S Magowan	CHECKED SRM	PROJ. No. 1224
SCALE 1:200 @ A1 / 1:400 @ A3		ARUN DISTRICT COUNCIL Y5920DOC



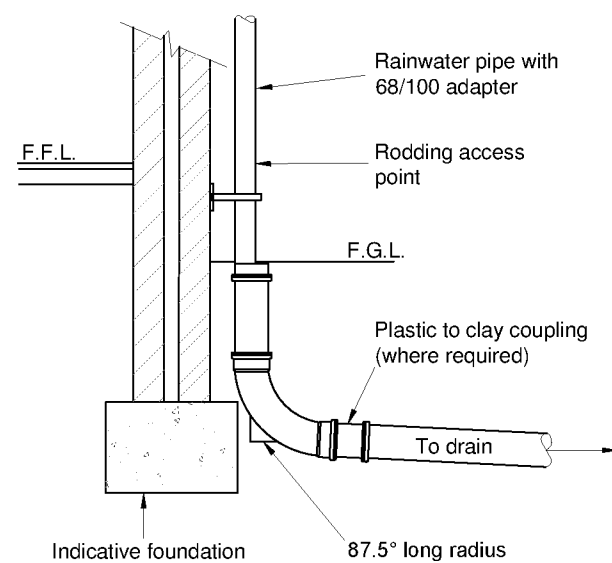
100mm	D or N F B	0.4 0.3 0.3	4.2 5.8 7.4	0.7 0.5 0.4	4.1 5.8 7.4	0.7 0.5 0.4	3.7 5.5 7.2
150mm	D or N F B	0.6 0.6 0.6	2.7 3.9 5.0	1.1 0.7 0.6	2.5 3.8 5.0	-- 0.7 0.6	-- 3.3 4.6
225mm	D or N F B	-- 0.6 0.6	-- 2.5 3.3	-- 1.2 0.8	2.1 3.2	-- 0.9	-- 2.4



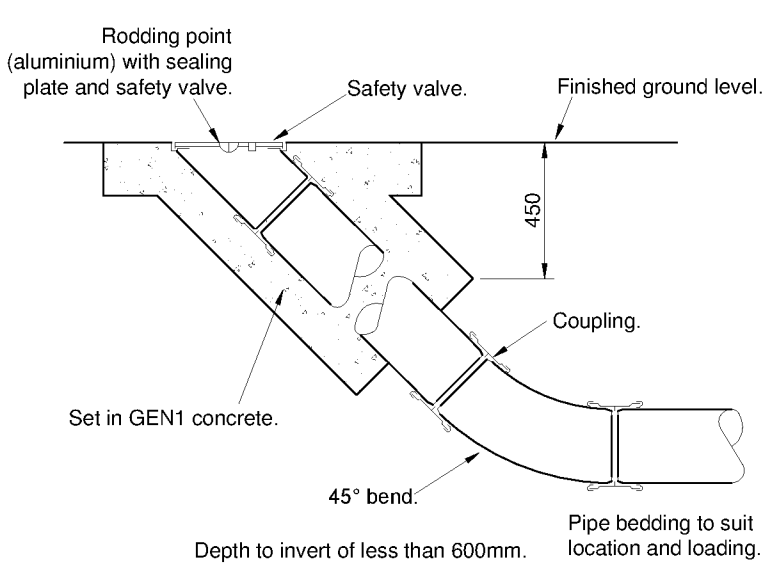
PIPE BEDDING DETAILS
(NON ADOPTABLE DRAINS)
(Not To Scale)



PERMEABLE CONCRETE BLOCK PAVING
DRIVE CONSTRUCTION DETAIL
Scale 1:20



TYPICAL RAINWATER PIPE DETAIL
(Scale 1:25)



DETAIL OF RODDING EYE
(Scale 1:25)

FIGURE B.21
TYPICAL INSPECTION CHAMBER DETAIL - TYPE 4 (Flexible material detail)
Maximum depth from cover level to soffit of pipe 2 m, non-entry

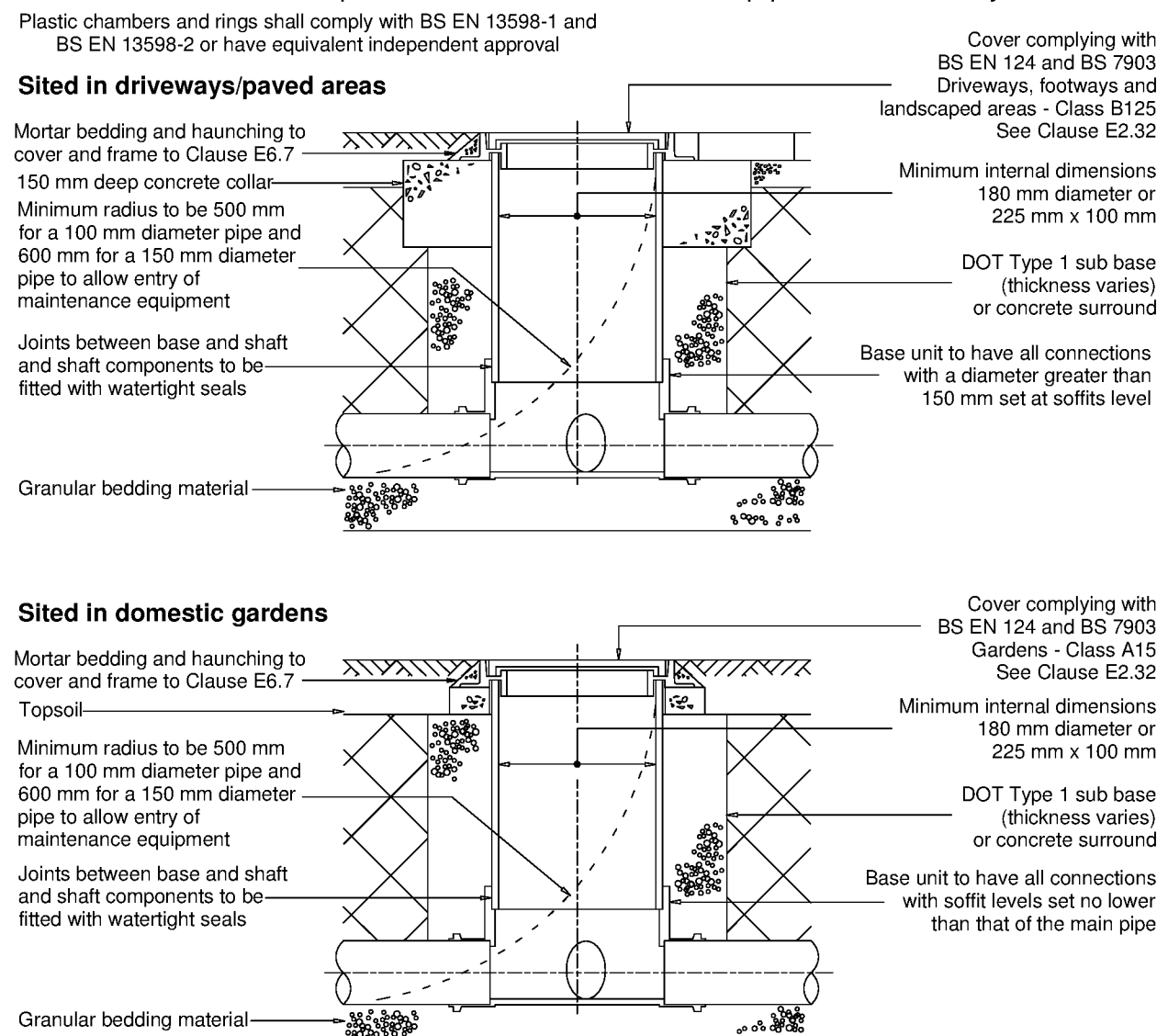
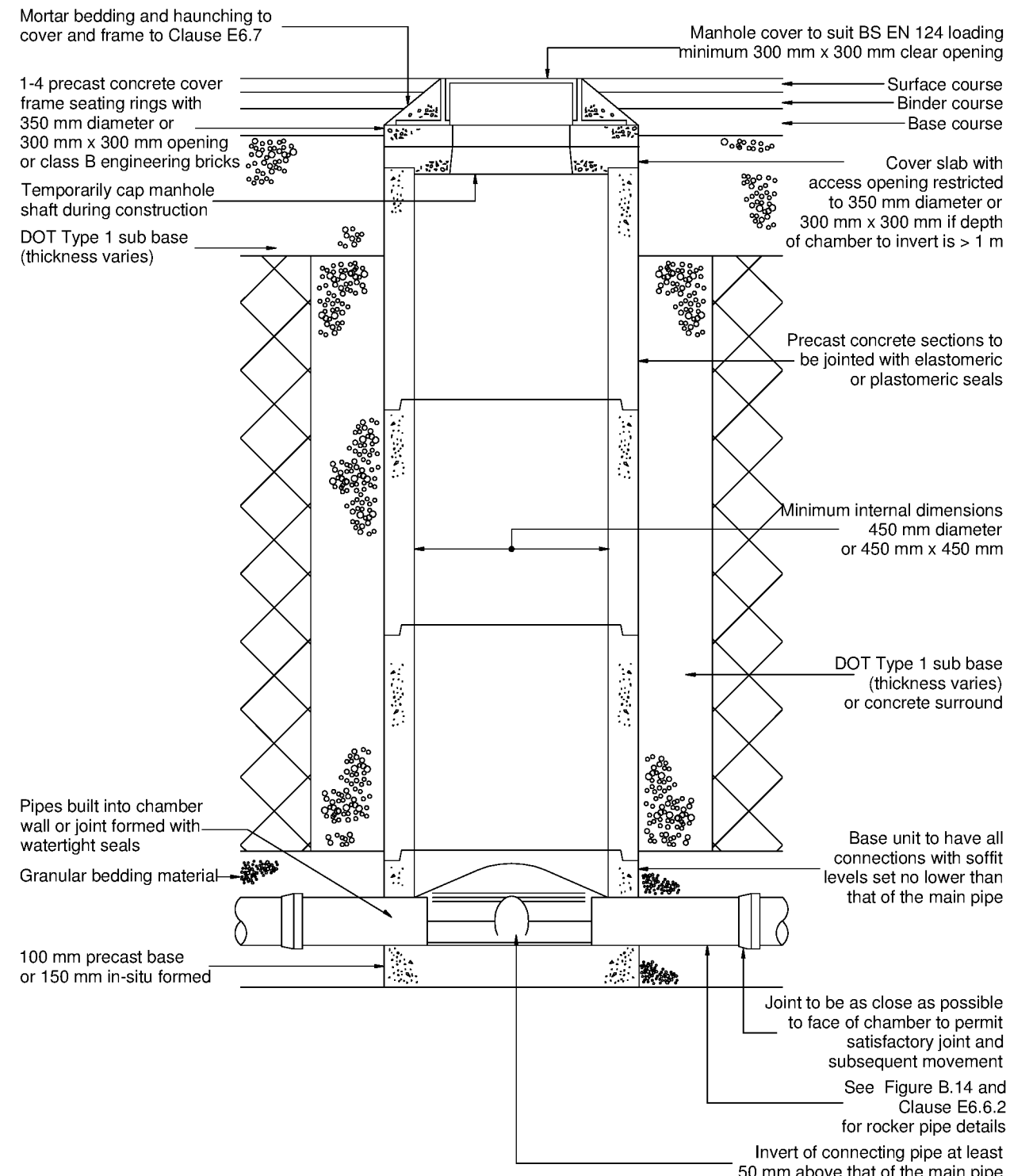


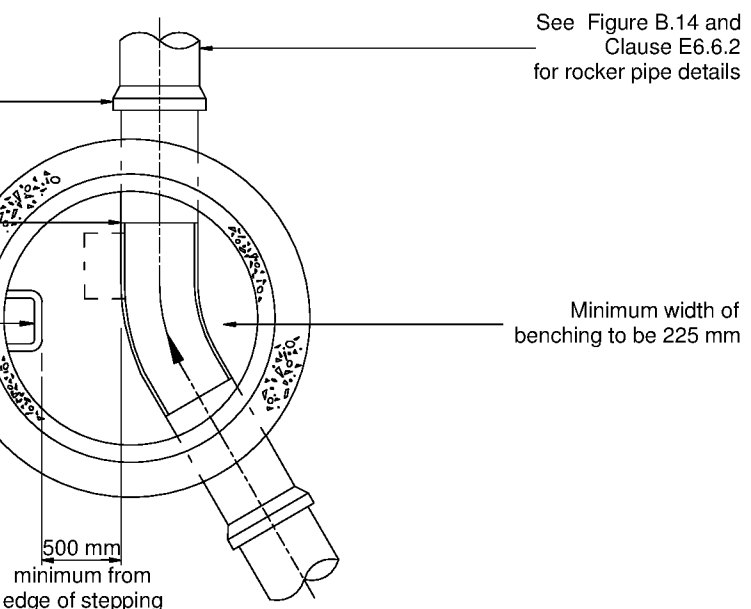
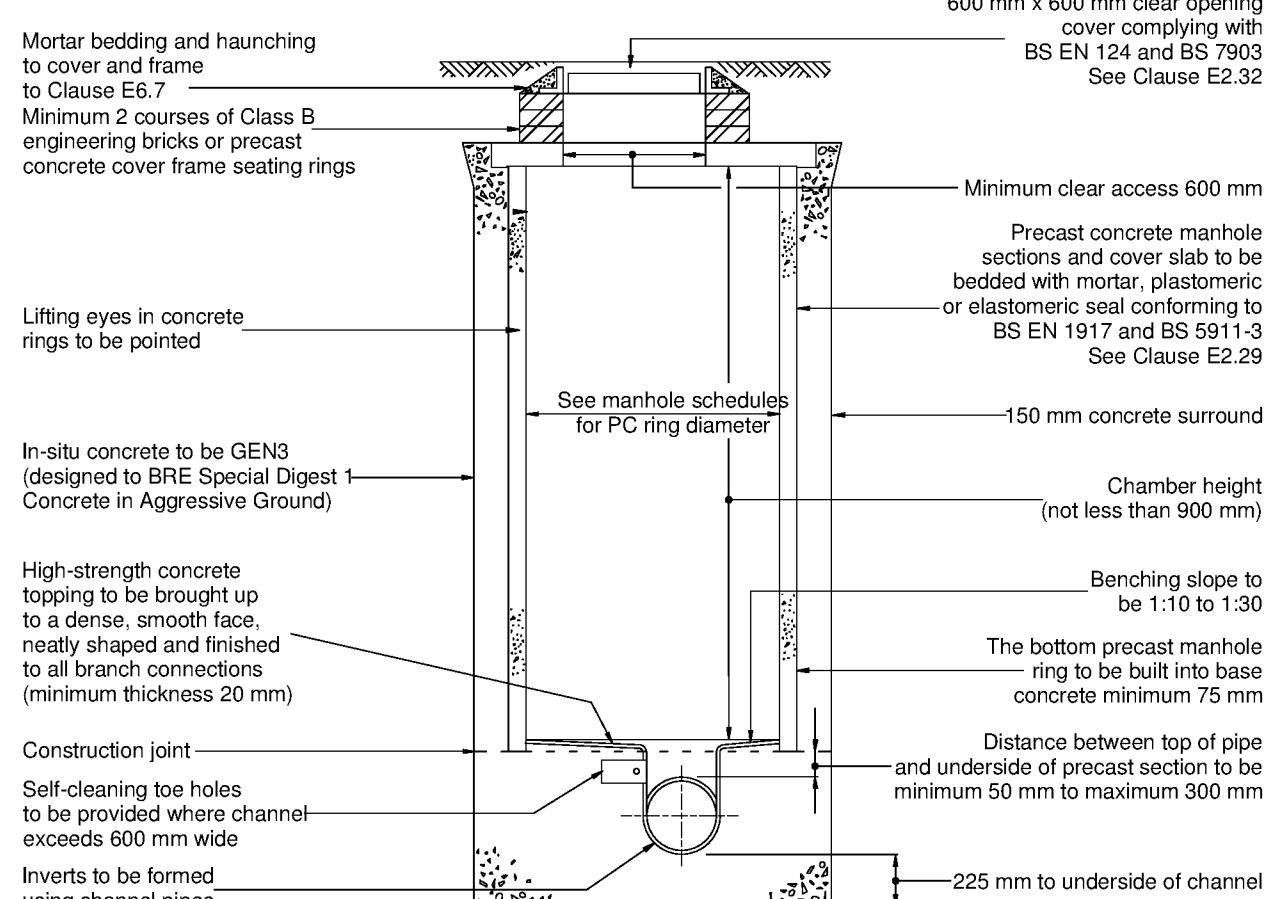
FIGURE B.18
TYPICAL INSPECTION CHAMBER DETAIL - TYPE 3 (Rigid material detail)
Maximum depth from cover level to soffit of pipe in areas subject to vehicle loading 3 m, non-entry



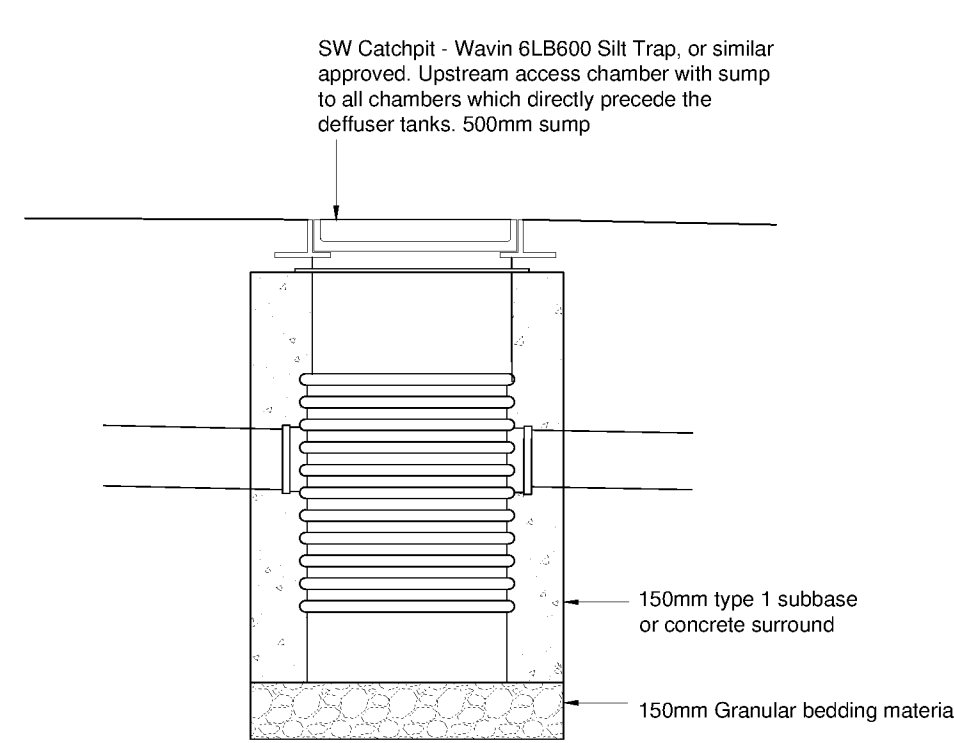
Note: Where the access chamber is in the highway the Highway Authority can have specific requirements

Not to scale

FIGURE B.12
TYPICAL MANHOLE DETAIL - TYPE 2
Maximum depth from cover level to soffit of pipe 3.0 m



Not to scale



CATCHPIT CHAMBER
(Scale 1:20)

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A 26.06.20 PUR Details updated.

REV DATE INT DESCRIPTION MK

Issue Status FOR APPROVAL

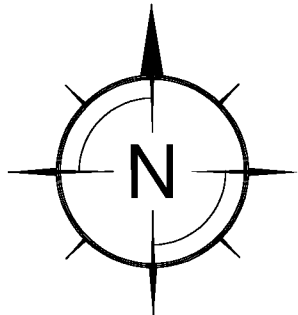
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CLIENT Seaward Properties Limited

PROJECT Bonhams Field, Main Road, Yapton

TITLE Construction Details

DRAWN M Pacifico DATE May 2019 PROJECT NO 23018
ENGINEER S Magowan CHECKED SRM
SCALE 1:500 @ A1



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3. The main Contractor is responsible for ensuring the stability of the structure whilst the works are in progress.
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DRAINAGE NOTES:

1. All adoptable pipes, bends and junctions shall be vitrified clay to BS EN 295-1, with flexible joints and kitemark certified.
2. All Adoptable sewers shall be in strict accordance with the 7th edition of Sewers For Adoption. 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.
3. All private building drainage shall be constructed in strict accordance with BS EN 752:2008. 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.
4. 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.
5. 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.
6. 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.
7. All svps shall have rodding access plates fitted at their bases (ground floor level).
8. Where existing pipes are to be abandoned they shall be dug out together with any abandoned manholes.
9. Any discrepancy between the drawing and site should be reported immediately to the Engineer.
10. All manhole and chamber sizes are given as a minimum to meet the 7th edition of Sewers For Adoption

Storm Drainage Maintenance Legend:

To be maintained by the homeowner

- Private Type 4 Storm Water Inspection Chamber
- Private Storm Water Rodding Eye

To be maintained by estates management Company

- Type 4 Storm Water Inspection Chamber
- Property boundary
- Distribution Tanks to Subbase

- Hard paved areas including no dig area at site boundary

REV	DATE	WT	DESCRIPTION	CHK
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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		Seaward Properties Limited	
PROJECT		Bonhams Field, Main Road, Yapton	
TITLE		Site Layout Proposed Drainage Ownership Plan	
DRAWN	DATE	PROJECT NO.	
P Reynolds	May 2020	23018	
ENGINEER	CHECKED	DWG. No.	REV.
S Magowan	SRM	2001	
SCALE			
1:500 @ A1 / :1000 @ A3			

The Civil Engineering Practice					Page 1																																																																																																																																																																																																																			
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The Civil Engineering Practice				Page 2	
11 Tungsten Building George Street Fishersgate BN41 1RA		23018 Bonham's Field, Yapton Catchment A			
Date 25/06/2020 File Catchment A.SRCX		Designed by MEK Checked by			
Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (mE)	Status
30 min Winter	4.401	0.141	0.2	4.1	OK
60 min Winter	4.433	0.173	0.2	5.0	OK
120 min Winter	4.449	0.189	0.2	5.4	OK
180 min Winter	4.453	0.193	0.2	5.5	OK
240 min Winter	4.448	0.188	0.2	5.4	OK
360 min Winter	4.436	0.176	0.2	5.1	OK
480 min Winter	4.423	0.163	0.2	4.7	OK
600 min Winter	4.409	0.149	0.2	4.3	OK
720 min Winter	4.396	0.136	0.2	3.9	OK
960 min Winter	4.370	0.110	0.2	3.2	OK
1440 min Winter	4.330	0.070	0.2	2.0	OK
2160 min Winter	4.305	0.045	0.2	1.3	OK
2880 min Winter	4.297	0.037	0.2	1.1	OK
4320 min Winter	4.288	0.028	0.1	0.8	OK
5760 min Winter	4.283	0.023	0.1	0.7	OK
7200 min Winter	4.280	0.020	0.1	0.6	OK
8640 min Winter	4.278	0.018	0.1	0.5	OK
10080 min Winter	4.276	0.016	0.1	0.5	OK
Storm Event	Rain (mm/hr)	Flooded Volume (mE)	Time-Peak (mins)		
30 min Winter	94.920	0.0	35		
60 min Winter	60.760	0.0	64		
120 min Winter	36.120	0.0	120		
180 min Winter	26.488	0.0	174		
240 min Winter	21.140	0.0	224		
360 min Winter	15.213	0.0	278		
480 min Winter	12.015	0.0	352		
600 min Winter	9.992	0.0	426		
720 min Winter	8.587	0.0	496		
960 min Winter	6.748	0.0	628		
1440 min Winter	4.812	0.0	866		
2160 min Winter	3.452	0.0	1172		
2880 min Winter	2.745	0.0	1532		
4320 min Winter	2.017	0.0	2252		
5760 min Winter	1.642	0.0	2992		
7200 min Winter	1.413	0.0	3680		
8640 min Winter	1.259	0.0	4416		
10080 min Winter	1.148	0.0	5112		
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The Civil Engineering Practice		Page 3																																	
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Date 25/06/2020 File Catchment A.SRCX	Designed by MEK Checked by																																		
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ø1982- 2020 Innovyze																		

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Summer</td><td>4.699</td><td>0.039</td><td>0.3</td><td>1.9</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>4.696</td><td>0.036</td><td>0.3</td><td>1.7</td><td>O K</td></tr><tr><td>15 min Winter</td><td>4.838</td><td>0.178</td><td>0.4</td><td>8.5</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (mE)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>141.120</td><td>0.0</td><td>22</td></tr><tr><td>30 min Summer</td><td>94.920</td><td>0.0</td><td>36</td></tr><tr><td>60 min Summer</td><td>60.760</td><td>0.0</td><td>66</td></tr><tr><td>120 min Summer</td><td>36.120</td><td>0.0</td><td>124</td></tr><tr><td>180 min Summer</td><td>26.488</td><td>0.0</td><td>182</td></tr><tr><td>240 min Summer</td><td>21.140</td><td>0.0</td><td>240</td></tr><tr><td>360 min Summer</td><td>15.213</td><td>0.0</td><td>310</td></tr><tr><td>480 min Summer</td><td>12.015</td><td>0.0</td><td>370</td></tr><tr><td>600 min Summer</td><td>9.992</td><td>0.0</td><td>432</td></tr><tr><td>720 min Summer</td><td>8.587</td><td>0.0</td><td>498</td></tr><tr><td>960 min Summer</td><td>6.748</td><td>0.0</td><td>632</td></tr><tr><td>1440 min Summer</td><td>4.812</td><td>0.0</td><td>898</td></tr><tr><td>2160 min Summer</td><td>3.452</td><td>0.0</td><td>1280</td></tr><tr><td>2880 min Summer</td><td>2.745</td><td>0.0</td><td>1644</td></tr><tr><td>4320 min Summer</td><td>2.017</td><td>0.0</td><td>2296</td></tr><tr><td>5760 min Summer</td><td>1.642</td><td>0.0</td><td>2944</td></tr><tr><td>7200 min Summer</td><td>1.413</td><td>0.0</td><td>3672</td></tr><tr><td>8640 min Summer</td><td>1.259</td><td>0.0</td><td>4408</td></tr><tr><td>10080 min Summer</td><td>1.148</td><td>0.0</td><td>5144</td></tr><tr><td>15 min Winter</td><td>141.120</td><td>0.0</td><td>22</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (mE)	Status	15 min Summer	4.818	0.158	0.4	7.6	O K	30 min Summer	4.870	0.210	0.4	10.1	O K	60 min Summer	4.921	0.261	0.4	12.5	Flood Risk	120 min Summer	4.952	0.292	0.4	14.0	Flood Risk	180 min Summer	4.963	0.303	0.4	14.5	Flood Risk	240 min Summer	4.963	0.303	0.4	14.6	Flood Risk	360 min Summer	4.953	0.293	0.4	14.0	Flood Risk	480 min Summer	4.941	0.281	0.4	13.5	Flood Risk	600 min Summer	4.929	0.269	0.4	12.9	Flood Risk	720 min Summer	4.918	0.258	0.4	12.4	Flood Risk	960 min Summer	4.895	0.235	0.4	11.3	O K	1440 min Summer	4.856	0.196	0.4	9.4	O K	2160 min Summer	4.808	0.148	0.4	7.1	O K	2880 min Summer	4.772	0.112	0.4	5.4	O K	4320 min Summer	4.727	0.067	0.4	3.2	O K	5760 min Summer	4.709	0.049	0.4	2.4	O K	7200 min Summer	4.703	0.043	0.3	2.1	O K	8640 min Summer	4.699	0.039	0.3	1.9	O K	10080 min Summer	4.696	0.036	0.3	1.7	O K	15 min Winter	4.838	0.178	0.4	8.5	O K	Storm Event	Rain (mm/hr)	Flooded Volume (mE)	Time-Peak (mins)	15 min Summer	141.120	0.0	22	30 min Summer	94.920	0.0	36	60 min Summer	60.760	0.0	66	120 min Summer	36.120	0.0	124	180 min Summer	26.488	0.0	182	240 min Summer	21.140	0.0	240	360 min Summer	15.213	0.0	310	480 min Summer	12.015	0.0	370	600 min Summer	9.992	0.0	432	720 min Summer	8.587	0.0	498	960 min Summer	6.748	0.0	632	1440 min Summer	4.812	0.0	898	2160 min Summer	3.452	0.0	1280	2880 min Summer	2.745	0.0	1644	4320 min Summer	2.017	0.0	2296	5760 min Summer	1.642	0.0	2944	7200 min Summer	1.413	0.0	3672	8640 min Summer	1.259	0.0	4408	10080 min Summer	1.148	0.0	5144	15 min Winter	141.120	0.0	22
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ø1982- 2020 Innovyze																																																																																																																																																																																																																							

The Civil Engineering Practice					Page 2
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Date 25/06/2020 File Catchment B.SRCX		Designed by MEK Checked by			
Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (mE)	Status
30 min Winter	4.896	0.236	0.4	11.3	O K
60 min Winter	4.955	0.295	0.4	14.2	Flood Risk
120 min Winter	4.992	0.332	0.4	15.9	Flood Risk
180 min Winter	5.007	0.347	0.4	16.7	Flood Risk
240 min Winter	5.011	0.351	0.4	16.8	Flood Risk
360 min Winter	5.001	0.341	0.4	16.4	Flood Risk
480 min Winter	4.985	0.325	0.4	15.6	Flood Risk
600 min Winter	4.970	0.310	0.4	14.9	Flood Risk
720 min Winter	4.955	0.295	0.4	14.1	Flood Risk
960 min Winter	4.923	0.263	0.4	12.6	Flood Risk
1440 min Winter	4.864	0.204	0.4	9.8	O K
2160 min Winter	4.793	0.133	0.4	6.4	O K
2880 min Winter	4.742	0.082	0.4	4.0	O K
4320 min Winter	4.705	0.045	0.3	2.2	O K
5760 min Winter	4.697	0.037	0.3	1.8	O K
7200 min Winter	4.692	0.032	0.2	1.5	O K
8640 min Winter	4.689	0.029	0.2	1.4	O K
10080 min Winter	4.686	0.026	0.2	1.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (mE)	Time-Peak (mins)		
30 min Winter	94.920	0.0	36		
60 min Winter	60.760	0.0	64		
120 min Winter	36.120	0.0	122		
180 min Winter	26.488	0.0	180		
240 min Winter	21.140	0.0	236		
360 min Winter	15.213	0.0	344		
480 min Winter	12.015	0.0	398		
600 min Winter	9.992	0.0	466		
720 min Winter	8.587	0.0	542		
960 min Winter	6.748	0.0	690		
1440 min Winter	4.812	0.0	970		
2160 min Winter	3.452	0.0	1348		
2880 min Winter	2.745	0.0	1676		
4320 min Winter	2.017	0.0	2252		
5760 min Winter	1.642	0.0	2992		
7200 min Winter	1.413	0.0	3680		
8640 min Winter	1.259	0.0	4416		
10080 min Winter	1.148	0.0	5144		
ø1982- 2020 Innovyze					

The Civil Engineering Practice		Page 3
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Date 25/06/2020 File Catchment B.SRCX	Designed by MEK Checked by	
Innovyze Source Control 2020.1		

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 498100 101500 SU 98100 01500
Data Type	Catchment
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.030

Time (mins)	Area (ha)	Time (mins)	Area (ha)
From	To	From	To
0	4	4	8
	0.015		0.015

ø1982-2020 Innovyze

The Civil Engineering Practice		Page 4																
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<u>Model Details</u> Storage is Online Cover Level (m) 5.200 <u>Infiltration Blanket Structure</u> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.01296</td> <td>Diameter/Width (m)</td> <td>10.0</td> </tr> <tr> <td>Safety Factor</td> <td>1.5</td> <td>Length (m)</td> <td>16.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume</td> <td>Depth (m) 0.450</td> </tr> <tr> <td>Invert Level (m)</td> <td>4.660</td> <td></td> <td></td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.01296	Diameter/Width (m)	10.0	Safety Factor	1.5	Length (m)	16.0	Porosity	0.30	Cap Volume	Depth (m) 0.450	Invert Level (m)	4.660		
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Summer</td><td>5.525</td><td>0.265</td><td>0.6</td><td>19.1</td><td>Flood Risk</td></tr><tr><td>600 min Summer</td><td>5.513</td><td>0.253</td><td>0.6</td><td>18.2</td><td>Flood Risk</td></tr><tr><td>720 min Summer</td><td>5.502</td><td>0.242</td><td>0.6</td><td>17.4</td><td>Flood Risk</td></tr><tr><td>960 min Summer</td><td>5.480</td><td>0.220</td><td>0.6</td><td>15.8</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>5.441</td><td>0.181</td><td>0.6</td><td>13.1</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>5.395</td><td>0.135</td><td>0.6</td><td>9.8</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>5.361</td><td>0.101</td><td>0.6</td><td>7.3</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>5.321</td><td>0.061</td><td>0.6</td><td>4.4</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>5.307</td><td>0.047</td><td>0.5</td><td>3.4</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>5.301</td><td>0.041</td><td>0.5</td><td>3.0</td><td>O K</td></tr><tr><td>8640 min 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Summer	5.460	0.200	0.6	14.4	O K	60 min Summer	5.508	0.248	0.6	17.9	Flood Risk	120 min Summer	5.537	0.277	0.6	20.0	Flood Risk	180 min Summer	5.547	0.287	0.6	20.6	Flood Risk	240 min Summer	5.547	0.287	0.6	20.7	Flood Risk	360 min Summer	5.536	0.276	0.6	19.9	Flood Risk	480 min Summer	5.525	0.265	0.6	19.1	Flood Risk	600 min Summer	5.513	0.253	0.6	18.2	Flood Risk	720 min Summer	5.502	0.242	0.6	17.4	Flood Risk	960 min Summer	5.480	0.220	0.6	15.8	O K	1440 min Summer	5.441	0.181	0.6	13.1	O K	2160 min Summer	5.395	0.135	0.6	9.8	O K	2880 min Summer	5.361	0.101	0.6	7.3	O K	4320 min Summer	5.321	0.061	0.6	4.4	O K	5760 min Summer	5.307	0.047	0.5	3.4	O K	7200 min Summer	5.301	0.041	0.5	3.0	O K	8640 min Summer	5.297	0.037	0.4	2.7	O K	10080 min Summer	5.294	0.034	0.4	2.5	O K	15 min Winter	5.430	0.170	0.6	12.2	O K	Storm Event	Rain (mm/hr)	Flooded Volume (mE)	Time-Peak (mins)	15 min Summer	141.120	0.0	22	30 min Summer	94.920	0.0	36	60 min Summer	60.760	0.0	66	120 min Summer	36.120	0.0	124	180 min Summer	26.488	0.0	182	240 min Summer	21.140	0.0	240	360 min Summer	15.213	0.0	304	480 min Summer	12.015	0.0	362	600 min Summer	9.992	0.0	426	720 min Summer	8.587	0.0	494	960 min Summer	6.748	0.0	628	1440 min Summer	4.812	0.0	894	2160 min Summer	3.452	0.0	1272	2880 min Summer	2.745	0.0	1620	4320 min Summer	2.017	0.0	2292	5760 min Summer	1.642	0.0	2944	7200 min Summer	1.413	0.0	3672	8640 min Summer	1.259	0.0	4408	10080 min Summer	1.148	0.0	5144	15 min Winter	141.120	0.0	22
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The Civil Engineering Practice					Page 2
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Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (mE)	Status
30 min Winter	5.485	0.225	0.6	16.2	O K
60 min Winter	5.541	0.281	0.6	20.2	Flood Risk
120 min Winter	5.576	0.316	0.6	22.7	Flood Risk
180 min Winter	5.589	0.329	0.6	23.7	Flood Risk
240 min Winter	5.592	0.332	0.6	23.9	Flood Risk
360 min Winter	5.581	0.321	0.6	23.1	Flood Risk
480 min Winter	5.565	0.305	0.6	22.0	Flood Risk
600 min Winter	5.551	0.291	0.6	20.9	Flood Risk
720 min Winter	5.535	0.275	0.6	19.8	Flood Risk
960 min Winter	5.504	0.244	0.6	17.6	Flood Risk
1440 min Winter	5.447	0.187	0.6	13.4	O K
2160 min Winter	5.378	0.118	0.6	8.5	O K
2880 min Winter	5.332	0.072	0.6	5.2	O K
4320 min Winter	5.303	0.043	0.5	3.1	O K
5760 min Winter	5.296	0.036	0.4	2.6	O K
7200 min Winter	5.291	0.031	0.4	2.2	O K
8640 min Winter	5.288	0.028	0.3	2.0	O K
10080 min Winter	5.285	0.025	0.3	1.8	O K
Storm Event	Rain (mm/hr)	Flooded Volume (mE)	Time-Peak (mins)		
30 min Winter	94.920	0.0	36		
60 min Winter	60.760	0.0	64		
120 min Winter	36.120	0.0	122		
180 min Winter	26.488	0.0	178		
240 min Winter	21.140	0.0	236		
360 min Winter	15.213	0.0	342		
480 min Winter	12.015	0.0	388		
600 min Winter	9.992	0.0	462		
720 min Winter	8.587	0.0	538		
960 min Winter	6.748	0.0	686		
1440 min Winter	4.812	0.0	966		
2160 min Winter	3.452	0.0	1340		
2880 min Winter	2.745	0.0	1648		
4320 min Winter	2.017	0.0	2252		
5760 min Winter	1.642	0.0	2944		
7200 min Winter	1.413	0.0	3680		
8640 min Winter	1.259	0.0	4368		
10080 min Winter	1.148	0.0	5136		
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The Civil Engineering Practice		Page 3																																								
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The Civil Engineering Practice		Page 4																
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<u>Model Details</u> Storage is Online Cover Level (m) 5.800 <u>Infiltration Blanket Structure</u> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.01296</td> <td>Diameter/Width (m)</td> <td>15.0</td> </tr> <tr> <td>Safety Factor</td> <td>1.5</td> <td>Length (m)</td> <td>16.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume</td> <td>Depth (m) 0.450</td> </tr> <tr> <td>Invert Level (m)</td> <td>5.260</td> <td></td> <td></td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.01296	Diameter/Width (m)	15.0	Safety Factor	1.5	Length (m)	16.0	Porosity	0.30	Cap Volume	Depth (m) 0.450	Invert Level (m)	5.260		
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Summer	141.120	0.0	23	30 min Summer	94.920	0.0	37	60 min Summer	60.760	0.0	66	120 min Summer	36.120	0.0	126	180 min Summer	26.488	0.0	186	240 min Summer	21.140	0.0	246	360 min Summer	15.213	0.0	364	480 min Summer	12.015	0.0	482	600 min Summer	9.992	0.0	602	720 min Summer	8.587	0.0	720	960 min Summer	6.748	0.0	858	1440 min Summer	4.812	0.0	1086	2160 min Summer	3.452	0.0	1476	2880 min Summer	2.745	0.0	1880	4320 min Summer	2.017	0.0	2684	5760 min Summer	1.642	0.0	3464	7200 min Summer	1.413	0.0	4248	8640 min Summer	1.259	0.0	5016	10080 min Summer	1.148	0.0	5744	15 min Winter	141.120	0.0	22
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The Civil Engineering Practice					Page 2
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Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (mE)	Status
30 min Winter	5.628	0.328	2.1	157.4	O K
60 min Winter	5.715	0.415	2.1	199.3	Flood Risk
120 min Winter	5.783	0.483	2.1	231.8	Flood Risk
180 min Winter	5.820	0.520	2.1	249.7	Flood Risk
240 min Winter	5.842	0.542	2.1	260.4	Flood Risk
360 min Winter	5.862	0.562	2.1	270.0	Flood Risk
480 min Winter	5.869	0.569	2.1	273.3	Flood Risk
600 min Winter	5.869	0.569	2.1	273.2	Flood Risk
720 min Winter	5.864	0.564	2.1	270.9	Flood Risk
960 min Winter	5.847	0.547	2.1	262.5	Flood Risk
1440 min Winter	5.804	0.504	2.1	241.9	Flood Risk
2160 min Winter	5.753	0.453	2.1	217.2	Flood Risk
2880 min Winter	5.706	0.406	2.1	194.9	Flood Risk
4320 min Winter	5.627	0.327	2.1	157.2	O K
5760 min Winter	5.562	0.262	2.1	125.8	O K
7200 min Winter	5.508	0.208	2.1	99.8	O K
8640 min Winter	5.463	0.163	2.1	78.3	O K
10080 min Winter	5.426	0.126	2.1	60.6	O K
Storm Event	Rain (mm/hr)	Flooded Volume (mE)	Time-Peak (mins)		
30 min Winter	94.920	0.0	37		
60 min Winter	60.760	0.0	66		
120 min Winter	36.120	0.0	124		
180 min Winter	26.488	0.0	182		
240 min Winter	21.140	0.0	242		
360 min Winter	15.213	0.0	358		
480 min Winter	12.015	0.0	472		
600 min Winter	9.992	0.0	588		
720 min Winter	8.587	0.0	700		
960 min Winter	6.748	0.0	918		
1440 min Winter	4.812	0.0	1168		
2160 min Winter	3.452	0.0	1608		
2880 min Winter	2.745	0.0	2052		
4320 min Winter	2.017	0.0	2904		
5760 min Winter	1.642	0.0	3744		
7200 min Winter	1.413	0.0	4472		
8640 min Winter	1.259	0.0	5192		
10080 min Winter	1.148	0.0	5944		
ø1982-2020 Innovyze					

The Civil Engineering Practice		Page 3																																						
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The Civil Engineering Practice		Page 4																
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K</td></tr><tr><td>600 min Summer</td><td>5.873</td><td>0.163</td><td>4.5</td><td>83.3</td><td>O K</td></tr><tr><td>720 min Summer</td><td>5.863</td><td>0.153</td><td>4.5</td><td>77.8</td><td>O K</td></tr><tr><td>960 min Summer</td><td>5.842</td><td>0.132</td><td>4.5</td><td>67.5</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>5.809</td><td>0.099</td><td>4.5</td><td>50.6</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>5.776</td><td>0.066</td><td>4.5</td><td>33.8</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>5.760</td><td>0.050</td><td>4.5</td><td>25.4</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>5.749</td><td>0.039</td><td>3.5</td><td>19.7</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>5.742</td><td>0.032</td><td>2.9</td><td>16.5</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>5.738</td><td>0.028</td><td>2.6</td><td>14.5</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>5.736</td><td>0.026</td><td>2.3</td><td>13.1</td><td>O 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Summer	5.907	0.197	4.5	100.5	O K	180 min Summer	5.908	0.198	4.5	101.1	O K	240 min Summer	5.905	0.195	4.5	99.6	O K	360 min Summer	5.895	0.185	4.5	94.5	O K	480 min Summer	5.884	0.174	4.5	89.0	O K	600 min Summer	5.873	0.163	4.5	83.3	O K	720 min Summer	5.863	0.153	4.5	77.8	O K	960 min Summer	5.842	0.132	4.5	67.5	O K	1440 min Summer	5.809	0.099	4.5	50.6	O K	2160 min Summer	5.776	0.066	4.5	33.8	O K	2880 min Summer	5.760	0.050	4.5	25.4	O K	4320 min Summer	5.749	0.039	3.5	19.7	O K	5760 min Summer	5.742	0.032	2.9	16.5	O K	7200 min Summer	5.738	0.028	2.6	14.5	O K	8640 min Summer	5.736	0.026	2.3	13.1	O K	10080 min Summer	5.734	0.024	2.2	12.0	O K	15 min Winter	5.836	0.126	4.5	64.5	O K	Storm Event	Rain (mm/hr)	Flooded Volume (mE)	Time-Peak (mins)	15 min Summer	141.120	0.0	21	30 min Summer	94.920	0.0	36	60 min Summer	60.760	0.0	64	120 min Summer	36.120	0.0	122	180 min Summer	26.488	0.0	172	240 min Summer	21.140	0.0	198	360 min Summer	15.213	0.0	260	480 min Summer	12.015	0.0	328	600 min Summer	9.992	0.0	394	720 min Summer	8.587	0.0	462	960 min Summer	6.748	0.0	592	1440 min Summer	4.812	0.0	840	2160 min Summer	3.452	0.0	1188	2880 min Summer	2.745	0.0	1500	4320 min Summer	2.017	0.0	2212	5760 min Summer	1.642	0.0	2944	7200 min Summer	1.413	0.0	3672	8640 min Summer	1.259	0.0	4408	10080 min Summer	1.148	0.0	5136	15 min Winter	141.120	0.0	21
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The Civil Engineering Practice					Page 2	
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Innovyze		Source Control 2020.1				
<u>Summary of Results for 100 year Return Period (+40%)</u>						
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (mE)	Status	
30 min Winter	5.877	0.167		4.5 85.3	O K	
60 min Winter	5.916	0.206		4.5 105.1	O K	
120 min Winter	5.936	0.226		4.5 115.2	O K	
180 min Winter	5.940	0.230		4.5 117.1	O K	
240 min Winter	5.936	0.226		4.5 115.1	O K	
360 min Winter	5.922	0.212		4.5 108.0	O K	
480 min Winter	5.907	0.197		4.5 100.3	O K	
600 min Winter	5.891	0.181		4.5 92.2	O K	
720 min Winter	5.875	0.165		4.5 84.1	O K	
960 min Winter	5.845	0.135		4.5 68.8	O K	
1440 min Winter	5.796	0.086		4.5 44.1	O K	
2160 min Winter	5.759	0.049		4.4 24.9	O K	
2880 min Winter	5.750	0.040		3.6 20.2	O K	
4320 min Winter	5.740	0.030		2.7 15.1	O K	
5760 min Winter	5.734	0.024		2.2 12.5	O K	
7200 min Winter	5.731	0.021		1.9 10.7	O K	
8640 min Winter	5.729	0.019		1.7 9.6	O K	
10080 min Winter	5.727	0.017		1.6 8.7	O K	
Storm Event	Rain (mm/hr)	Flooded Volume (mE)	Time-Peak (mins)			
30 min Winter	94.920	0.0	35			
60 min Winter	60.760	0.0	64			
120 min Winter	36.120	0.0	120			
180 min Winter	26.488	0.0	176			
240 min Winter	21.140	0.0	228			
360 min Winter	15.213	0.0	282			
480 min Winter	12.015	0.0	356			
600 min Winter	9.992	0.0	430			
720 min Winter	8.587	0.0	502			
960 min Winter	6.748	0.0	638			
1440 min Winter	4.812	0.0	880			
2160 min Winter	3.452	0.0	1168			
2880 min Winter	2.745	0.0	1528			
4320 min Winter	2.017	0.0	2248			
5760 min Winter	1.642	0.0	2992			
7200 min Winter	1.413	0.0	3672			
8640 min Winter	1.259	0.0	4416			
10080 min Winter	1.148	0.0	5216			
ø1982- 2020 Innovyze						

The Civil Engineering Practice		Page 3																																				
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The Civil Engineering Practice		Page 4																
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<u>Model Details</u> Storage is Online Cover Level (m) 6.250 <u>Infiltration Blanket Structure</u> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>Infiltration Coefficient Base (m/hr)</td> <td>0.01440</td> <td>Diameter/Width (m)</td> <td>50.0</td> </tr> <tr> <td>Safety Factor</td> <td>1.5</td> <td>Length (m)</td> <td>34.0</td> </tr> <tr> <td>Porosity</td> <td>0.30</td> <td>Cap Volume</td> <td>Depth (m) 0.450</td> </tr> <tr> <td>Invert Level (m)</td> <td>5.710</td> <td></td> <td></td> </tr> </table>			Infiltration Coefficient Base (m/hr)	0.01440	Diameter/Width (m)	50.0	Safety Factor	1.5	Length (m)	34.0	Porosity	0.30	Cap Volume	Depth (m) 0.450	Invert Level (m)	5.710		
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Summer	6.172	0.212	4.3	61.0	O K	60 min Summer	6.217	0.257	4.3	74.0	Flood Risk	120 min Summer	6.233	0.273	4.3	78.5	Flood Risk	180 min Summer	6.230	0.270	4.3	77.7	Flood Risk	240 min Summer	6.223	0.263	4.3	75.7	Flood Risk	360 min Summer	6.204	0.244	4.3	70.2	Flood Risk	480 min Summer	6.185	0.225	4.3	64.7	O K	600 min Summer	6.166	0.206	4.3	59.4	O K	720 min Summer	6.149	0.189	4.3	54.4	O K	960 min Summer	6.117	0.157	4.3	45.1	O K	1440 min Summer	6.067	0.107	4.3	30.7	O K	2160 min Summer	6.022	0.062	4.3	17.9	O K	2880 min Summer	6.006	0.046	3.9	13.4	O K	4320 min Summer	5.995	0.035	3.0	10.2	O K	5760 min Summer	5.989	0.029	2.5	8.4	O K	7200 min Summer	5.985	0.025	2.2	7.3	O K	8640 min Summer	5.983	0.023	1.9	6.5	O K	10080 min Summer	5.981	0.021	1.8	6.0	O K	15 min Winter	6.142	0.182	4.3	52.4	O K	Storm Event	Rain (mm/hr)	Flooded Volume (mE)	Time-Peak (mins)	15 min Summer	141.120	0.0	21	30 min Summer	94.920	0.0	35	60 min Summer	60.760	0.0	64	120 min Summer	36.120	0.0	120	180 min Summer	26.488	0.0	156	240 min Summer	21.140	0.0	188	360 min Summer	15.213	0.0	252	480 min Summer	12.015	0.0	320	600 min Summer	9.992	0.0	386	720 min Summer	8.587	0.0	452	960 min Summer	6.748	0.0	580	1440 min Summer	4.812	0.0	822	2160 min Summer	3.452	0.0	1148	2880 min Summer	2.745	0.0	1476	4320 min Summer	2.017	0.0	2208	5760 min Summer	1.642	0.0	2936	7200 min Summer	1.413	0.0	3672	8640 min Summer	1.259	0.0	4400	10080 min Summer	1.148	0.0	5136	15 min Winter	141.120	0.0	21
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The Civil Engineering Practice					Page 2
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<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Winter	6.200	0.240		4.3 69.0	O K
60 min Winter	6.253	0.293		4.3 84.3	Flood Risk
120 min Winter	6.275	0.315		4.3 90.7	Flood Risk
180 min Winter	6.274	0.314		4.3 90.4	Flood Risk
240 min Winter	6.263	0.303		4.3 87.4	Flood Risk
360 min Winter	6.239	0.279		4.3 80.2	Flood Risk
480 min Winter	6.211	0.251		4.3 72.4	Flood Risk
600 min Winter	6.184	0.224		4.3 64.6	O K
720 min Winter	6.158	0.198		4.3 57.0	O K
960 min Winter	6.110	0.150		4.3 43.3	O K
1440 min Winter	6.039	0.079		4.3 22.8	O K
2160 min Winter	6.004	0.044		3.8 12.7	O K
2880 min Winter	5.996	0.036		3.1 10.2	O K
4320 min Winter	5.986	0.026		2.2 7.6	O K
5760 min Winter	5.982	0.022		1.9 6.2	O K
7200 min Winter	5.979	0.019		1.6 5.3	O K
8640 min Winter	5.977	0.017		1.4 4.8	O K
10080 min Winter	5.975	0.015		1.3 4.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)		
30 min Winter	94.920	0.0	35		
60 min Winter	60.760	0.0	64		
120 min Winter	36.120	0.0	120		
180 min Winter	26.488	0.0	174		
240 min Winter	21.140	0.0	202		
360 min Winter	15.213	0.0	274		
480 min Winter	12.015	0.0	348		
600 min Winter	9.992	0.0	420		
720 min Winter	8.587	0.0	490		
960 min Winter	6.748	0.0	620		
1440 min Winter	4.812	0.0	842		
2160 min Winter	3.452	0.0	1128		
2880 min Winter	2.745	0.0	1496		
4320 min Winter	2.017	0.0	2208		
5760 min Winter	1.642	0.0	2992		
7200 min Winter	1.413	0.0	3696		
8640 min Winter	1.259	0.0	4328		
10080 min Winter	1.148	0.0	5128		
ø1982-2020 Innovyze					

The Civil Engineering Practice		Page 3																																	
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The Civil Engineering Practice		Page 4																
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Summer	6.042	0.182	4.8	42.7	O K	60 min Summer	6.075	0.215	4.8	50.3	O K	120 min Summer	6.076	0.216	4.8	50.5	O K	180 min Summer	6.069	0.209	4.8	48.9	O K	240 min Summer	6.059	0.199	4.8	46.5	O K	360 min Summer	6.034	0.174	4.8	40.8	O K	480 min Summer	6.012	0.152	4.8	35.5	O K	600 min Summer	5.991	0.131	4.8	30.7	O K	720 min Summer	5.973	0.113	4.8	26.4	O K	960 min Summer	5.943	0.083	4.8	19.5	O K	1440 min Summer	5.911	0.051	4.8	11.9	O K	2160 min Summer	5.898	0.038	3.7	8.9	O K	2880 min Summer	5.891	0.031	3.0	7.3	O K	4320 min Summer	5.883	0.023	2.3	5.5	O K	5760 min Summer	5.879	0.019	1.9	4.5	O K	7200 min Summer	5.877	0.017	1.6	3.9	O K	8640 min Summer	5.875	0.015	1.4	3.5	O K	10080 min Summer	5.874	0.014	1.3	3.2	O K	15 min Winter	6.019	0.159	4.8	37.3	O K	Storm Event	Rain (mm/hr)	Flooded Volume (mE)	Time-Peak (mins)	15 min Summer	141.120	0.0	20	30 min Summer	94.920	0.0	34	60 min Summer	60.760	0.0	62	120 min Summer	36.120	0.0	100	180 min Summer	26.488	0.0	132	240 min Summer	21.140	0.0	166	360 min Summer	15.213	0.0	234	480 min Summer	12.015	0.0	298	600 min Summer	9.992	0.0	362	720 min Summer	8.587	0.0	424	960 min Summer	6.748	0.0	540	1440 min Summer	4.812	0.0	752	2160 min Summer	3.452	0.0	1108	2880 min Summer	2.745	0.0	1472	4320 min Summer	2.017	0.0	2204	5760 min Summer	1.642	0.0	2936	7200 min Summer	1.413	0.0	3616	8640 min Summer	1.259	0.0	4400	10080 min Summer	1.148	0.0	5096	15 min Winter	141.120	0.0	21
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The Civil Engineering Practice					Page 2
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<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (mE)	Status
30 min Winter	6.067	0.207		4.8	48.5 O K
60 min Winter	6.106	0.246		4.8	57.7 Flood Risk
120 min Winter	6.109	0.249		4.8	58.4 Flood Risk
180 min Winter	6.099	0.239		4.8	55.9 O K
240 min Winter	6.084	0.224		4.8	52.5 O K
360 min Winter	6.049	0.189		4.8	44.2 O K
480 min Winter	6.015	0.155		4.8	36.2 O K
600 min Winter	5.984	0.124		4.8	29.1 O K
720 min Winter	5.958	0.098		4.8	22.9 O K
960 min Winter	5.919	0.059		4.8	13.9 O K
1440 min Winter	5.900	0.040		3.8	9.3 O K
2160 min Winter	5.889	0.029		2.8	6.8 O K
2880 min Winter	5.883	0.023		2.3	5.4 O K
4320 min Winter	5.877	0.017		1.7	4.0 O K
5760 min Winter	5.874	0.014		1.4	3.3 O K
7200 min Winter	5.872	0.012		1.2	2.8 O K
8640 min Winter	5.871	0.011		1.0	2.5 O K
10080 min Winter	5.870	0.010		0.9	2.3 O K
Storm Event	Rain (mm/hr)	Flooded Volume (mE)	Time-Peak (mins)		
30 min Winter	94.920	0.0	34		
60 min Winter	60.760	0.0	62		
120 min Winter	36.120	0.0	114		
180 min Winter	26.488	0.0	142		
240 min Winter	21.140	0.0	180		
360 min Winter	15.213	0.0	254		
480 min Winter	12.015	0.0	322		
600 min Winter	9.992	0.0	384		
720 min Winter	8.587	0.0	444		
960 min Winter	6.748	0.0	542		
1440 min Winter	4.812	0.0	758		
2160 min Winter	3.452	0.0	1108		
2880 min Winter	2.745	0.0	1472		
4320 min Winter	2.017	0.0	2148		
5760 min Winter	1.642	0.0	2976		
7200 min Winter	1.413	0.0	3656		
8640 min Winter	1.259	0.0	4248		
10080 min Winter	1.148	0.0	5144		
ø1982-2020 Innovyze					

The Civil Engineering Practice		Page 3																																						
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ø1982- 2020 Innovyze																																																																																																																																																																																																																							

The Civil Engineering Practice					Page 2
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Innovyze		Source Control 2020.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Winter	6.307	0.247	1.7	73.5	Flood Risk
60 min Winter	6.371	0.311	1.7	92.4	Flood Risk
120 min Winter	6.417	0.357	1.7	106.0	Flood Risk
180 min Winter	6.440	0.380	1.7	112.7	Flood Risk
240 min Winter	6.451	0.391	1.7	116.0	Flood Risk
360 min Winter	6.455	0.395	1.7	117.2	Flood Risk
480 min Winter	6.449	0.389	1.7	115.5	Flood Risk
600 min Winter	6.438	0.378	1.7	112.4	Flood Risk
720 min Winter	6.425	0.365	1.7	108.5	Flood Risk
960 min Winter	6.402	0.342	1.7	101.6	Flood Risk
1440 min Winter	6.358	0.298	1.7	88.5	Flood Risk
2160 min Winter	6.298	0.238	1.7	70.7	O K
2880 min Winter	6.247	0.187	1.7	55.6	O K
4320 min Winter	6.171	0.111	1.7	32.8	O K
5760 min Winter	6.123	0.063	1.7	18.7	O K
7200 min Winter	6.107	0.047	1.6	14.1	O K
8640 min Winter	6.102	0.042	1.4	12.6	O K
10080 min Winter	6.099	0.039	1.3	11.5	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)		
30 min Winter	94.920	0.0	36		
60 min Winter	60.760	0.0	66		
120 min Winter	36.120	0.0	122		
180 min Winter	26.488	0.0	180		
240 min Winter	21.140	0.0	238		
360 min Winter	15.213	0.0	352		
480 min Winter	12.015	0.0	464		
600 min Winter	9.992	0.0	570		
720 min Winter	8.587	0.0	662		
960 min Winter	6.748	0.0	744		
1440 min Winter	4.812	0.0	1042		
2160 min Winter	3.452	0.0	1472		
2880 min Winter	2.745	0.0	1876		
4320 min Winter	2.017	0.0	2596		
5760 min Winter	1.642	0.0	3176		
7200 min Winter	1.413	0.0	3744		
8640 min Winter	1.259	0.0	4496		
10080 min Winter	1.148	0.0	5152		
ø1982- 2020 Innovyze					

The Civil Engineering Practice		Page 3																																						
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The Civil Engineering Practice		Page 4																
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