Land at Brook House Farm, Yarpole
Surface Water Drainage Strategy

Contract Ref: CWC167 Rev 1

Client: Border Oak Design & Construction Ltd

Corner Water
CONSULTING

CONTENTS

QUALITY ASSURANCE RECORD

Contributors for Corner Water Consulting:

Name	Role
Alan Corner	Project Director

Document Status and Revision History:

Revision	Date	Project Contact	Status / Comment
1	12/01/2024	Alan Corner	First Issue

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1. INTRODUCTION

1.1 PURPOSE

1.1.1 This surface water drainage strategy report has been prepared to accompany the planning application for a new residential scheme of 6 No. residential dwellings at Brook House Farm, Yarpole, Leominster, HR6 0BB.

1.1.2 Corner Water Consulting was commissioned by Border Oak & Construction Design Ltd to design the surface water drainage solution for the new residential development to include sustainable drainage (SuDS).

1.2 SOURCES OF INFORMATION

1.2.1 The following data was utilised:

- National Planning Policy Framework plus Guidance;
- The SuDS Manual plus National and Local SuDS standards and guidance;
- Sustainable Drainage Systems (SuDS) Handbook, June 2018, by Herefordshire Council;
- The Building Regulations;
- Drawing Proposed Development at Brook House Farm, Yarpole, drawing number D1744.1 Rev L dated 16 May 2022 by Border Oak);
- Soil investigations report by H+H Drainage, 7 December 2018;
- Topographical Survey, January 2018, by A D Horner Ltd (drawing ref. 5306-31JAN18-01).

1.3 DESIGN CRITERIA AND INPUT DATA

1.3.1 Both the surface and foul water drainage networks have been designed in accordance with the best practices outlined in the Design and Construction Guidance. This includes ensuring the self-cleansing criteria is achieved for the full capacity of pipes. Plus seeking to achieve a minimum cover depth of between 900mm to 1.2m. Due to the general flat gradients across the site, this later criteria cannot be met, meaning that adequate protection or enhanced structural integrity of the pipes is required.

1.3.2 The design of the surface water drainage network and respective storage features takes in account a climate change allowance of 45%.

1.3.3 As the scheme is below 10 units, there is no requirement to account for urban creep allowance in the surface water drainage design – in accordance with paragraph 8.11 of Herefordshire Council's SuDS Handbook.

1.3.4 Surface water attenuation features have been designed to cope with rainfall events up to, and including, the 1%AEP – hereafter referred to as the design event. These features have been tested with an additional climate change allowance of 45%, ensuring that the maximum water level for the 1%AEP45CC are compatible with a 300mm freeboard in the basin.

1.3.5 The correct operation of the proposed drainage systems is subject to a maintenance schedule being followed, see detail within Section 2.4.

1.3.6 In the design of the surface water attenuation/infiltration open features, a slope of 1 in 3 has been deemed suitable for excavation purposes. However, this assumption should be assessed through site-specific geo-technical assessment prior to construction.

1.3.7 This detailed design has not been informed by a site-specific utilities survey. However, in accordance with the best H&S practices, it is recommended that the location of the proposed drainage apparatus is checked against a site-specific utilities survey prior to construction.

1.3.8 A groundwater assessment was undertaken and located groundwater at 1.9m below the surface, with an unsaturated zone down to 1.7m deep. Percolation testing was undertaken by 'H+H Drainage' in December 2018. The report included in Appendix A shows saturated soils below a depth of 1.7m BGL and an average percolation value of 45.9 sec/mm, which corresponds to an infiltration rate of 0.02.6 m/hr. This design infiltration value has been used throughout the drainage strategy.

1.3.9 In terms of safety factors for infiltration features, a standard value of 2.0 has been adopted for permeable pavement at individual plots, whilst the design of infiltration basin included a safety factor of 6.0.

1.3.10 At the site there are twin 225mm pipes discharging into an existing farm ditch that will be under Plot 4. To ensure these pipes can still discharge the twin pipes will be connected into a new 300mm pipe laid in the gap between Plots 3 and 4 and discharging into the SuDS basin. As this is an offsite drainage system, with unknown flows, it has not been assessed in sizing the SuDS basin - which is designed to deal with the site runoff and flows. Any additional offsite flow will initially fill the 333mm of basin freeboard to the overflow channel. If site investigations and evidence show that there are no live connections to the twin 225mm pipes, it will be possible to make them redundant.

2 SURFACE WATER DRAINAGE STRATEGY

2.1 OVERALL PHILOSOPHY

2.1.1 The surface water drainage strategy follows the first priority of the gov.uk guidance i.e. infiltration of surface water runoff into the ground. The site SuDS strategy was designed to manage runoff up to the 1%AEP45CC rainfall event. The strategy is presented in drawing ref. CWC0167-DR-501, in Appendix C.

2.1.2 As part of the strategy source control SuDS are designed at a plot scale, by implementing permeable pavement within the private driveways. The aim of is to use these areas to promote infiltration of roof runoff and runoff generated within the footprint of the driveways.

2.1.3 The source control permeable paving may be insufficient to cope with all rainfall events, especially exceedance storms, therefore an overflow mechanism was designed for each plot to convey any exceedance flows into the main surface water drain along the internal access road to the SuDS infiltration basin.

2.1.4 The design of the main surface water carrier drain assumes an impermeable internal access road, with a traditional drainage arrangement of gullies draining into the main carrier. The main carrier drain conveys runoff generated within the road into an infiltration basin, located in the fields to the south of the development.

2.1.5 The minimum finished floor levels of the dwellings are also indicated in drawing CWC167-DR-501 and were set to 300mm above the local 1%AEP45CC flood levels associated with the adjacent watercourse. The flood levels have been informed by the detailed hydraulic modelling of the watercourse as described in report Flood Risk Assessment and Hydraulic Modelling Study by Corner Water Consulting, reference CWC167-TN-01 Rev 1 dated 13 November 2023, and these are summarised in drawing CWC167-DR-504 (Appendix B).

2.2 STORAGE REQUIREMENTS

2.2.1 The impermeable areas of the development have been assessed as 2,920 m^2. This area corresponds to the footprint of the main internal access road, together with the impermeable areas that comprise the curtilage of each dwelling and also roofs.

2.2.2 The permeable pavement was designed to comprise a first set of layers of blocks, bedding sand and granular sub-base of 150mm, which is to be underlain by a sub-base replacement of modular geo-cellular units of 150mm depth – which assumes a void ratio of 95%. An alternative arrangement would be a 30% voided stone sub-base of 450mm depth.

2.2.3 The design has shown that the 150mm deep modular units underneath the permeable pavement on each plot is able to manage runoff on its own up to the 1%AEP rainfall event, with no overflow into the carrier drain. Overflow from the permeable pavement is only seen for the 1%AEP45CC, with exceedance flows being directed into the carrier drain and ultimately into the open infiltration basin. This design utilises a factor of safety of 2.0 for infiltration rates at the permeable paving.

2.2.4 Aa shown in drawing ref. CWC167-DR-501 – Appendix C, any overflows generated within the curtilage of the plots will be intercepted by an overflow channel positioned at the interface between the plot and the main access road. The hydraulic model set up in *flow causeway* represents these overflow channels as 50mm/75mm pipes laid just below ground levels.

2.2.5 In terms of the infiltration basin, this feature was designed to manage runoff from the access road, as well as any exceedance runoff generated within the curtilage of the plots. The basin was designed at 1:3 side slopes with a maximum depth of 1.0m and a factor of safety of 6.0, which is deemed a precautionary approach.

2.2.6 The design of the infiltration basin comprises an overflow channel at 100mm below ground level to direct any exceedance flows directly into the watercourse. There is over 300mm freeboard to this overflow channel. This feature is elevated above the 1%AEP45CC flood extents from the watercourse, in accordance with the best practices and to prevent ingress of fluvial flows from the watercourse.

2.2.7 Detailed surface water drainage modelling has been undertaken using FEH-22 rainfall data within the hydraulic modelling software Flow (by Causeway), with results showing no flooding up to the 1%AEP45CC rainfall event– refer to Appendix D. A summary of the water levels in the infiltration basin is shown in Table 1 for the various critical rainfall events. The table below shows the design is able to achieve a minimum freeboard of 433mm, which is deemed a precautionary approach toward potential high groundwater levels.

2.3 WATER QUALITY

2.3.1 Further mitigation measures were implemented to improve surface water runoff treatment generated within the internal access road using trapped gullies to retain silt and bound pollutants, which is to be intercepted by traditional drainage arrangements. These measures include an impermeable section of the infiltration basin that will also act as a silt forebay – lined with impermeable membrane or puddle clay – to force the contact with grass along the first 7m to 8m of the basin. Following this, the basin natural strata will be replaced by a 300mm layer of soil with good contaminant potential to further polish surface water runoff.

2.3.2 The approach taken (i.e. use of shallow permeable SuDS systems and layers of granular material with good contaminant potential) is deemed to be adequate to address the treatment requirements set out in Table 26.4 of the CIRIA SuDS manual.

Table 1 – *Summary of the maximum outflow rates, water levels and available freeboard in the infiltration basin – ground level at 92.00mAOD and overflow at 91.9mAOD.*

Storm event	Overflow rate into watercourse (l/s)	Max. water level (m AOD)	Available freeboard (mm)
3.3%AEP40CC	0.0	91.368	532
1% AEP	0.0	91.336	570
1%AEP45CC	0.0	91.514	386

2.4 MAINTENANCE REQUIREMENTS

2.4.1 Regular maintenance will be required and the activities plus the frequency of occurrence are detailed in Table 2 and Table 3.

Table 2 – Operation and maintenance requirements for detentions basins. Extracted from Table 13.2 of the CIRIA SuDS Manual.

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter, debris and trash	Monthly
	Cut grass – for landscaped areas and access routes	Monthly (during growing season) or as required
	Cut grass – meadow grass in and around basin	Half yearly: spring (before nesting season) and autumn
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
Occasional maintenance	Reseed areas of poor vegetation growth	Annually, or as required
	Prune and trim trees and remove cuttings	As required
	Remove sediment from pre-treatment system when 50% full	As required
Remedial actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realign the rip-rap	As required
	Repair or rehabilitate inlets, outlets and overflows	As required
	Rehabilitate infiltration surface using scarifying and spiking techniques if performance deteriorates	As required
	Relevel uneven surfaces and reinstate design levels	As required
Monitoring	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and pre-treatment systems for silt accumulation; establish appropriate silt removal frequencies	Half yearly
	Inspect infiltration surfaces for compaction and ponding	Monthly

Table 3 – Operation and maintenance requirements for permeable pavements. Extracted from Table 20.15 of the CIRIA SuDS Manual.

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

3 CONCLUSIONS

3.1.1 This Technical Note provides information covering the SuDS and surface water strategy for the residential development at Brook House Farm.

3.1.2 The surface water drainage network, including infiltration SuDS were designed in accordance with current NPPF requirements plus the design criteria set out in the Herefordshire Council's SuDS Guidance.

APPENDIX A: H+H DRAINAGE REPORT SUMMARISING PERCOLATION TESTING

H+H Drainage

Tremayne, Mortimer's Cross, Herefordshire HR6 9TG
Phone: 0845 2008421. Mobile: 07837 628764

7th December 2018.

For the Attention of Mr Ben Albright

Border Oak Design & Construction Ltd
Kingsland
Herefordshire
HR

Dear Sir,

Ref; BS.6297 Percolation test results relating to the proposed development at Brook House Farm, Yarpole.

Many thanks for your instruction to complete the necessary percolation tests at the above-mentioned property. The test holes have recently been completed and we have, from these results, calculated the percolation value for the tested areas.

Percolation Value (Vp)= 45.90

The proposed drainage field is to serve the two 4-bedroom dwellings. These dwellings have a design population of 6-persons per dwelling, in accordance with British Water Flows & Loads 4, and therefore the drainage field should be designed for a population equivalence of 12-persons in accordance with PPG4 and BS.6297. This means that the necessary drainage field to serve a septic tank would need to be **at least 138m^2.**

While completing our on-site investigations, a groundwater assessment trial hole was excavated to a depth of 2000mm deep in accordance with Environment Agency Guidelines.

This excavation showed that the local top soil is a dry till down to a depth of 1700mm below ground level.

At 1700mm deep, the till was found to be saturated with ground water and free-flowing ground water was found at a depth of 1900mm deep.

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The Environment Agency specify that there must be at least 1000mm of unsaturated ground beneath a drainage field. At this site, the unsaturated zone extends to a depth of 1700mm. Therefore, the proposed drainage field must not be installed at an invert depth greater that 700mm below ground level.

The test holes were completed in the positions shown on the associated plan. These test holes are more than 10m away from the local seasonal watercourse. It should be noted that the proposed drainage field should be installed more than 10m away from any watercourse.

In addition to percolation trial holes A, B and C, a trial hole was dug in position X. However, an existing soak-away was uncovered.

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Further trial holes were not excavated in the area of position X as there is insufficient room to install a new drainage field. A drainage field serving a septic tank must be at least 15m away from a dwelling and 2m from a boundary. Further, a drainage field cannot be installed in the same position as an existing soak-away.

This percolation test has been completed in accordance with Building Regulations H3, BS.6297-1983, and The Environment Agency PPG4.

We hope that the above information is more than sufficient for your needs. If you have any further questions regarding this site or any other drainage system, please do not hesitate to contact the undersigned at your convenience.

Yours Faithfully, [redacted]

[redacted]

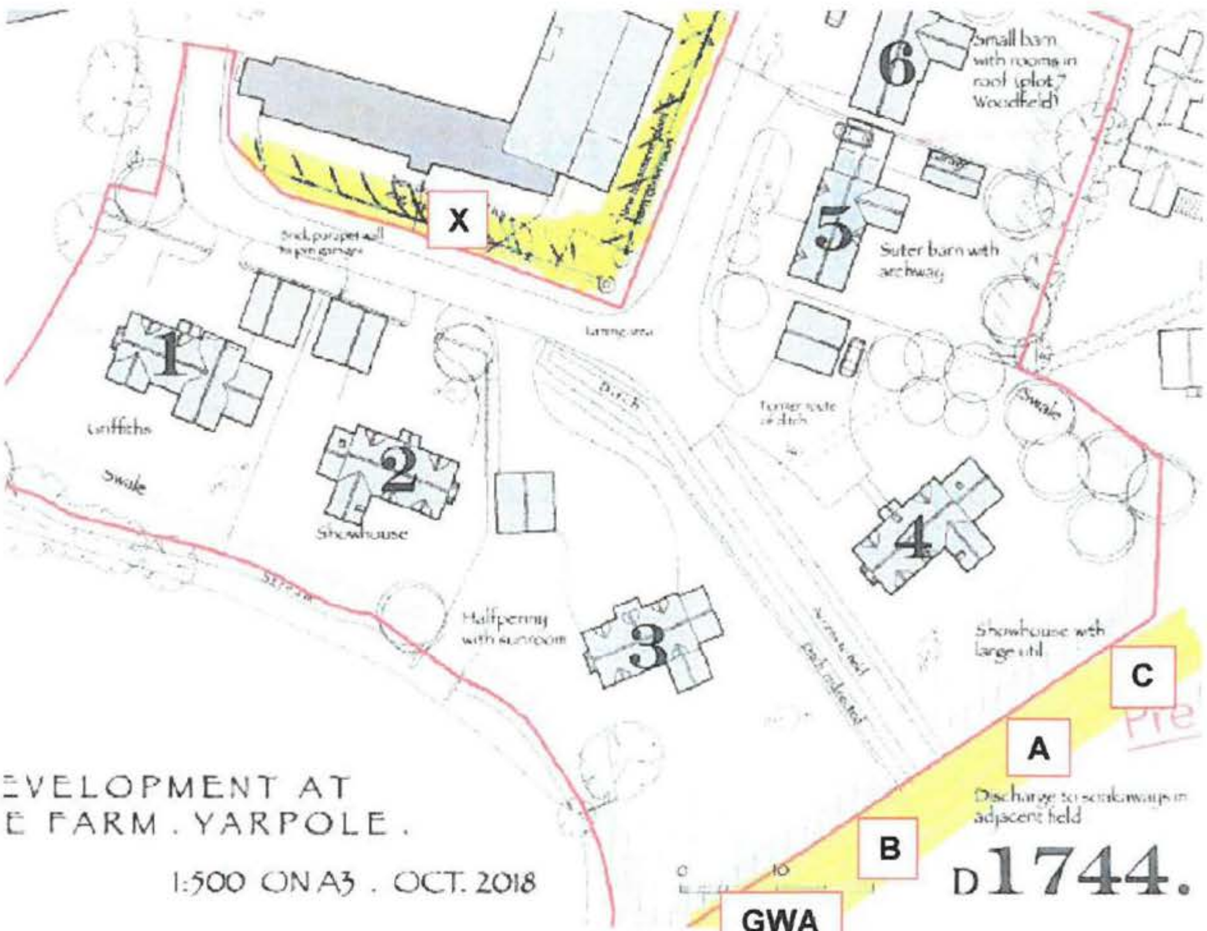
Alex Taysum-Hunter.
British Water Accredited

Trial Hole A

H+H Drainage

Tremayne, Mortimer's Cross, Herefordshire HR6 9TG
Phone: 0845 2008421. Mobile: 07837 628764

<u>Position of trial hole excavations.</u>



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Phone: 0845 2008421. Mobile: 07837 628764

Site Name: Brook House Farm, Yarpole

Date: 7th December 2018

Weather conditions: Overcast/Dry

Hole reference	Hole Depth	Water Drop	Time (secs)	Av. Drop
A				
Test 1	500mm	250	6900	27.6
Test 2	500mm	200	9900	49.5
Test 3	500mm	200	11400	57
			Hole Average:	44.7

Hole reference	Hole Depth	Water Drop	Time (secs)	Av. Drop
B				
Test 1	500mm	200	10200	51
Test 2	500mm	200	10800	54
Test 3	500mm	250	12000	60
			Hole Average:	55

Hole reference	Hole Depth	Water Drop	Time (secs)	Av. Drop
C				
Test 1	700mm	250	8400	33.6
Test 2	700mm	250	10200	40.8
Test 3	700mm	250	9900	39.6
			Hole Average:	38

H+H Drainage is the trading name of Taysum-Hunter Ltd.
Registered in England & Wales, Registration number 7357577

H+H Drainage

Tremayne, Mortimer's Cross, Herefordshire HR6 9TG
Phone: 0845 2008421. Mobile: 07837 628764

Calculation of soak-away (Summary & Calculation sheet)

Site Name: Brook House Farm, Yarpole

Date: 7th December 2018

Weather conditions: Overcast/Dry

Average calculation

Hole reference	Depth below ground		Average time
A	500mm		44.7
B	500mm		55
C	700mm		38
D			
E			
F			
G			
H			
		Vp:	45.9

Assumed maximum population: 12
Method of treatment: Septic tank
Standard of treatment: Settlement
GBR factor: 0.25

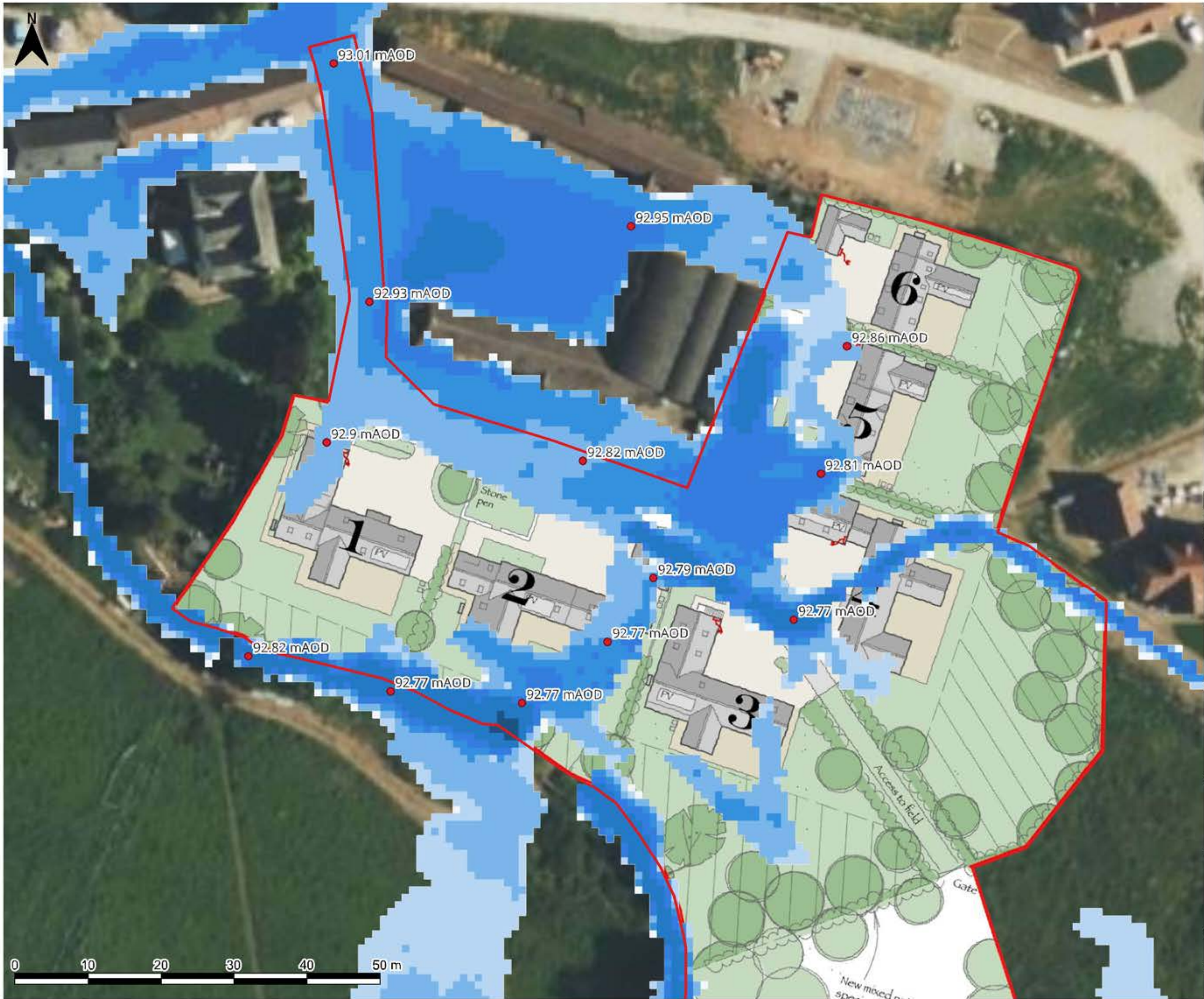
ASSUMED POPULATION X AVERAGE TIME X FACTOR A =

12 x 45.9 x 0.25 =	137.7

Minimum Drainage Field area required:	**138m²**

Completed by: Alex Taysum_Hunter

APPENDIX B: WATERCOURSE FLOOD LEVEL PLAN



KEY:

- APPLICATION SITE
- FLOOD LEVEL (1%AEP45CC)

SURFACE WATER FLOOD DEPTHS:

- <= 0.01
- 0.01 - 0.05
- 0.05 - 0.10
- 0.10 - 0.20
- 0.20 - 0.30
- 0.30 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- > 3.00

REV	DATE	DRW	DESCRIPTION	CHK	APP
01	24/03/22	AM	FIRST ISSUE	AC	AC

STATUS:
FOR INFORMATION ONLY

CWC

Corner Water Consulting
1 Cricklade Court,Cricklade Street
Swindon SN1 3EY
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CLIENT:
BORDER OAK DESIGN & CONSTRUCTION LTD

PROJECT:
CWC167
YARPOLE

TITLE:
PLUVIAL HYDRAULIC MODELLING
INDICATIVE FLOOD LEVELS
'BASELINE' 1%AEP45CC

DRAWN:	CHECKED:	APPROVED:
JG	AC	AC
QGIS FILE: CWC167.qgz	SCALE @A3: 1:500	DATE: 27/10/23
PROJECT No: CWC167	DRAWING No: CWC167-DR-004	REV: P01

APPENDIX C: SURFACE WATER DRAINAGE LAYOUT PLAN

DO NOT SCALE

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES (mm) AND ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM (mAOD) UNLESS STATED OTHERWISE.
2. THIS DRAINAGE LAYOUT PLAN IS SUBJECT TO AN INTER-DISCIPLINE STANDARD REVIEW.
3. THIS DRAFT VERSION OF THE DRAINAGE LAYOUT PLAN SHOULD ONLY BE USED FOR COMMENT BETWEEN THE CLIENT AND THE DESIGNER. NO LIABILITY AS A RESULT OF THE USE OF THIS DRAWING FOR OTHER PURPOSES IS ACCEPTED.
4. STRUCTURAL FEATURES ASSOCIATED WITH DRAINAGE APPARATUS ARE SUBJECT TO A STRUCTURAL AND GEO-TECHNICAL DESIGN AT THE DETAILED DESIGN STAGE.
5. DESIGN SUBJECT TO SITE-SPECIFIC ASSESSMENT OF PEAK SEASONAL GROUNDWATER LEVELS TO CONFIRM SUFFICIENT CLEARANCE TO BOTTOM OF INFILTRATION FEATURES.
6. INFILTRATION FEATURES DESIGNED ON THE BASIS OF A GENERIC INFILTRATION RATE OF 2.6x10⁻²m/hr. INFILTRATION RATES DERIVED FROM A PERCOLATION TESTING Vp VALUE OF 45.9 s/mm, AS SHOWN IN 'H+H DRAINAGE' LETTER DATED FROM 07/12/2018. INFILTRATION RATES TO BE CONFIRMED WITH SITE-SPECIFIC BRE365 TESTING AT THE LOCATION OF EACH INFILTRATION FEATURE, PRIOR TO CONSTRUCTION.
7. MINIMUM FINISHED FLOOR LEVELS (FFL) SET ON THE BASIS OF 2D PLUVIAL MODELLING EXERCISE, FOR THE 1%AEP45CC FLOOD EVENT. FOR MORE INFORMATION REFER TO DRAWING REF. CWC167-DR-004 REV P01.
8. DRAINAGE PROPOSALS SHOW SURFACE WATER DRAINS WITH COVER DEPTHS BELOW 1200mm. STRUCTURAL PROTECTION REQUIRED IN ACCORDANCE WITH THE BEST PRACTICES OF THE DESIGN AND CONSTRUCTION GUIDANCE.

ABBREVIATIONS:

CL	COVER LEVEL
IL	INVERT LEVEL
FFL	FINISHED FLOOR LEVEL

KEY:

- SITE BOUNDARY
- SURFACE WATER NETWORK
- DIVERSION OF DITCH
- PERMEABLE PAVING UNDERLAIN BY 150mm PERMAVOID SUB-BASE
- OVERFLOW GRATED CHANNEL
- GROUND SLOPE
- WATERCOURSE FLOW DIRECTION
- WATERCOURSE
- 1%AEP45CC SURFACE WATER FLOOD EXTENTS
- IMPERMEABLE LINER/PUDDLE CLAY
- FILTER MATERIAL (TYPE B SHW505)
- RAINWATER DIFFUSER
- PROPOSED GROUND FALL

REV	DATE	BY	DESCRIPTION	CHK	APP
P01	03/01/2024	JG	ISSUE FOR COMMENT ONLY	AC	AC

CLIENT: BORDER OAK DESIGN & CONSTRUCTION LTD

PROJECT: CWC167 YARPOLE RESIDENTIAL DEVELOPMENT

TITLE: SURFACE WATER DRAINAGE LAYOUT PLAN

SCALE	DRAWN	CHECKED
1:400	JG	AC

STATUS: FOR COMMENT ONLY — DATE: January 24

DRAWING No: CWC0167-DR-501 — REV: P01

CORNER WATER CONSULTING

APPENDIX D: FLOW CAUSEWAY MODELLING OUTPUTS

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Inverts
Additional Flow (%)	45	Minimum Backdrop Height (m)	1.200
CV	0.750	Preferred Cover Depth (m)	0.500
Time of Entry (mins)	6.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	200.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
MH S0101	0.012	6.00	92.620	1200	346877.981	264682.860	0.870
MH S0102	0.021	6.00	92.700	1200	346880.582	264666.939	1.157
MH S0201	0.014	6.00	92.410	1200	346935.370	264680.232	0.907
MH S0103	0.007	6.00	92.450	1350	346925.715	264652.116	1.066
MH S0104			92.050	1350	346957.419	264604.371	0.856
MH S0105			92.400	1350	346932.543	264589.900	1.302
BASIN			92.000		346929.500	264576.933	0.946
permpav_plot01	0.047	6.00	92.750		346877.704	264658.896	0.075
permpav_plot02	0.046	6.00	92.700		346908.744	264648.117	0.100
permpav_plot03	0.038	6.00	92.400		346928.490	264636.776	0.050
permpav_plot04	0.049	6.00	92.500		346936.867	264648.544	0.075
permpav_plot05	0.026	6.00	92.650		346941.066	264672.473	0.075
permpav_plot06	0.032	6.00	92.780		346941.120	264685.849	0.050

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	MH S0101	MH S0102	16.132	0.600	91.750	91.642	0.108	149.4	150	6.33	197.0
1.001	MH S0102	MH S0103	47.505	0.600	91.543	91.385	0.158	300.7	300	7.21	187.0
3.001	MH S0201	MH S0103	29.728	0.600	91.503	91.384	0.119	249.8	225	6.76	192.0
1.002	MH S0103	MH S0104	57.313	0.600	91.385	91.194	0.191	300.1	300	8.27	177.1
1.003	MH S0104	MH S0105	28.779	0.600	91.194	91.098	0.096	299.8	300	8.80	172.4
1.004	MH S0105	BASIN	13.319	0.600	91.098	91.054	0.044	302.7	300	9.04	170.3
2.000_overflowchan	permpav_plot01	MH S0102	8.542	0.600	92.675	92.625	0.050	170.8	75	6.30	197.4
5.000_overflowchan	permpav_plot02	MH S0103	17.436	0.600	92.600	92.283	0.317	55.0	75	6.34	196.9
6.000_overflowchan	permpav_plot03	MH S0103	15.589	0.600	92.350	92.298	0.052	299.8	50	6.95	189.8
7.000_overflowchan	permpav_plot04	MH S0103	11.710	0.600	92.425	92.308	0.117	100.1	75	6.31	197.2

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	0.820	14.5	9.3	0.720	0.908	0.012	0.0	88	0.870
1.001	0.901	63.7	58.7	0.857	0.765	0.080	0.0	228	1.018
3.001	0.823	32.7	54.9	0.682	0.841	0.073	0.0	225	0.838
1.002	0.902	63.8	203.3	0.765	0.556	0.292	0.0	300	0.914
1.003	0.903	63.8	197.9	0.556	1.002	0.292	0.0	300	0.914
1.004	0.898	63.5	195.5	1.002	0.646	0.292	0.0	300	0.910
2.000_overflowchan	0.482	2.1	36.7	0.000	0.000	0.047	0.0	75	0.495
5.000_overflowchan	0.859	3.8	35.2	0.025	0.092	0.046	0.0	75	0.882
6.000_overflowchan	0.273	0.5	28.4	0.000	0.102	0.038	0.0	50	0.284
7.000_overflowchan	0.633	2.8	37.9	0.000	0.067	0.049	0.0	75	0.651

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
3.000_overflowchan	permpav_plot05	MH S0201	9.625	0.600	92.575	92.334	0.241	39.9	75	6.16	198.9
4.000_overflowchan	permpav_plot06	MH S0201	8.038	0.600	92.730	92.328	0.402	20.0	50	6.12	199.3

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
3.000_overflowchan	1.010	4.5	20.6	0.000	0.001	0.026	0.0	75	1.038
4.000_overflowchan	1.089	2.1	25.2	0.000	0.032	0.032	0.0	50	1.132

Pipeline Schedule

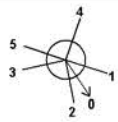
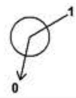
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	16.132	149.4	150	Circular	92.620	91.750	0.720	92.700	91.642	0.908
1.001	47.505	300.7	300	Circular	92.700	91.543	0.857	92.450	91.385	0.765
3.001	29.728	249.8	225	Circular	92.410	91.503	0.682	92.450	91.384	0.841
1.002	57.313	300.1	300	Circular	92.450	91.385	0.765	92.050	91.194	0.556
1.003	28.779	299.8	300	Circular	92.050	91.194	0.556	92.400	91.098	1.002
1.004	13.319	302.7	300	Circular	92.400	91.098	1.002	92.000	91.054	0.646
2.000_overflowchan	8.542	170.8	75	Circular	92.750	92.675	0.000	92.700	92.625	0.000
5.000_overflowchan	17.436	55.0	75	Circular	92.700	92.600	0.025	92.450	92.283	0.092
6.000_overflowchan	15.589	299.8	50	Circular	92.400	92.350	0.000	92.450	92.298	0.102
7.000_overflowchan	11.710	100.1	75	Circular	92.500	92.425	0.000	92.450	92.308	0.067
3.000_overflowchan	9.625	39.9	75	Circular	92.650	92.575	0.000	92.410	92.334	0.001
4.000_overflowchan	8.038	20.0	50	Circular	92.780	92.730	0.000	92.410	92.328	0.032

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	MH S0101	1200	Manhole	Adoptable	MH S0102	1200	Manhole	Adoptable
1.001	MH S0102	1200	Manhole	Adoptable	MH S0103	1350	Manhole	Adoptable
3.001	MH S0201	1200	Manhole	Adoptable	MH S0103	1350	Manhole	Adoptable
1.002	MH S0103	1350	Manhole	Adoptable	MH S0104	1350	Manhole	Adoptable
1.003	MH S0104	1350	Manhole	Adoptable	MH S0105	1350	Manhole	Adoptable
1.004	MH S0105	1350	Manhole	Adoptable	BASIN		Junction	
2.000_overflowchan	permpav_plot01		Junction		MH S0102	1200	Manhole	Adoptable
5.000_overflowchan	permpav_plot02		Junction		MH S0103	1350	Manhole	Adoptable
6.000_overflowchan	permpav_plot03		Junction		MH S0103	1350	Manhole	Adoptable
7.000_overflowchan	permpav_plot04		Junction		MH S0103	1350	Manhole	Adoptable
3.000_overflowchan	permpav_plot05		Junction		MH S0201	1200	Manhole	Adoptable
4.000_overflowchan	permpav_plot06		Junction		MH S0201	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
MH S0101	346877.981	264682.860	92.620	0.870	1200	 0	1.000	91.750	150
MH S0102	346880.582	264666.939	92.700	1.157	1200	 1	2.000_overflowchan	92.625	75
						2	1.000	91.642	150
						0	1.001	91.543	300

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections		Link	IL (m)	Dia (mm)
MH S0201	346935.370	264680.232	92.410	0.907	1200		1	4.000_overflowchan	92.328	50
							2	3.000_overflowchan	92.334	75
							0	3.001	91.503	225
MH S0103	346925.715	264652.116	92.450	1.066	1350		1	7.000_overflowchan	92.308	75
							2	6.000_overflowchan	92.298	50
							3	5.000_overflowchan	92.283	75
							4	3.001	91.384	225
							5	1.001	91.385	300
							0	1.002	91.385	300
MH S0104	346957.419	264604.371	92.050	0.856	1350		1	1.002	91.194	300
							0	1.003	91.194	300
MH S0105	346932.543	264589.900	92.400	1.302	1350		1	1.003	91.098	300
							0	1.004	91.098	300
BASIN	346929.500	264576.933	92.000	0.946			1	1.004	91.054	300
permpav_plot01	346877.704	264658.896	92.750	0.075			0	2.000_overflowchan	92.675	75
permpav_plot02	346908.744	264648.117	92.700	0.100			0	5.000_overflowchan	92.600	75
permpav_plot03	346928.490	264636.776	92.400	0.050			0	6.000_overflowchan	92.350	50
permpav_plot04	346936.867	264648.544	92.500	0.075			0	7.000_overflowchan	92.425	75
permpav_plot05	346941.066	264672.473	92.650	0.075			0	3.000_overflowchan	92.575	75
permpav_plot06	346941.120	264685.849	92.780	0.050			0	4.000_overflowchan	92.730	50

Simulation Settings

Rainfall Methodology	FEH-22	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	0.750	Drain Down Time (mins)	240	Check Discharge Volume	x
Analysis Speed	Normal	Additional Storage (m^3/ha)	20.0		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
5	0	0	0
30	0	0	0
30	40	0	0
100	0	0	0
100	45	0	0

Node permpav_plot01 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.02610	Invert Level (m)	92.450	Slope (1:X)	300.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.150
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	0.150
Porosity	0.95	Length (m)	18.300		

Node permpav_plot02 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.02610	Invert Level (m)	92.400	Slope (1:X)	300.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.150
Safety Factor	2.0	Width (m)	9.500	Inf Depth (m)	0.150
Porosity	0.95	Length (m)	16.700		

Node permpav_plot03 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.02610	Invert Level (m)	92.100	Slope (1:X)	300.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.150
Safety Factor	2.0	Width (m)	10.700	Inf Depth (m)	0.150
Porosity	1.00	Length (m)	12.300		

Node permpav_plot04 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.02610	Invert Level (m)	92.200	Slope (1:X)	300.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.150
Safety Factor	2.0	Width (m)	12.400	Inf Depth (m)	0.150
Porosity	0.95	Length (m)	12.700		

Node permpav_plot05 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.02610	Invert Level (m)	92.350	Slope (1:X)	300.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.150
Safety Factor	2.0	Width (m)	5.500	Inf Depth (m)	0.150
Porosity	0.95	Length (m)	13.200		

Node permpav_plot06 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.02610	Invert Level (m)	92.480	Slope (1:X)	300.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.150
Safety Factor	2.0	Width (m)	11.400	Inf Depth (m)	0.150
Porosity	0.95	Length (m)	12.400		

Node BASIN Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.02500	Safety Factor	6.0	Invert Level (m)	91.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	13137

Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)
0.000	45.0	43.3	1.000	238.9	153.3

Results for 5 year Critical Storm Duration. Lowest mass balance: 99.77%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	MH S0101	11	91.788	0.038	2.0	0.0538	0.0000	OK
15 minute summer	MH S0102	11	91.601	0.058	5.4	0.0859	0.0000	OK
15 minute summer	MH S0201	11	91.543	0.040	2.3	0.0579	0.0000	OK
15 minute summer	MH S0103	12	91.459	0.075	8.7	0.1165	0.0000	OK
15 minute summer	MH S0104	13	91.267	0.073	8.3	0.1047	0.0000	OK
600 minute summer	MH S0105	615	91.198	0.100	1.6	0.1432	0.0000	OK
600 minute summer	BASIN	615	91.198	0.144	1.6	12.7188	0.0000	OK
240 minute summer	permpav_plot01	160	92.513	-0.162	2.8	5.6287	0.0000	OK
180 minute summer	permpav_plot02	128	92.465	-0.135	3.1	5.5088	0.0000	OK
240 minute summer	permpav_plot03	164	92.156	-0.194	2.2	4.7146	0.0000	OK
240 minute summer	permpav_plot04	168	92.263	-0.162	2.8	6.2130	0.0000	OK
240 minute summer	permpav_plot05	172	92.422	-0.153	1.5	3.4510	0.0000	OK
240 minute summer	permpav_plot06	160	92.529	-0.201	1.9	3.7891	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
15 minute summer	MH S0101	1.000	MH S0102	2.0	0.571	0.137	0.0561
15 minute summer	MH S0102	1.001	MH S0103	5.3	0.491	0.083	0.5418
15 minute summer	MH S0201	3.001	MH S0103	2.3	0.332	0.070	0.2406
15 minute summer	MH S0103	1.002	MH S0104	8.3	0.636	0.131	0.7614
15 minute summer	MH S0104	1.003	MH S0105	8.1	0.620	0.127	0.3791
600 minute summer	MH S0105	1.004	BASIN	1.6	0.358	0.025	0.3597
600 minute summer	BASIN	Infiltration		0.1			
240 minute summer	permpav_plot01	2.000_overflowchan	MH S0102	0.0	0.000	0.000	0.0000
240 minute summer	permpav_plot01	Infiltration		0.7			
180 minute summer	permpav_plot02	5.000_overflowchan	MH S0103	0.0	0.000	0.000	0.0000
180 minute summer	permpav_plot02	Infiltration		0.6			
240 minute summer	permpav_plot03	6.000_overflowchan	MH S0103	0.0	0.000	0.000	0.0000
240 minute summer	permpav_plot03	Infiltration		0.5			
240 minute summer	permpav_plot04	7.000_overflowchan	MH S0103	0.0	0.000	0.000	0.0000
240 minute summer	permpav_plot04	Infiltration		0.6			
240 minute summer	permpav_plot05	3.000_overflowchan	MH S0201	0.0	0.000	0.000	0.0000
240 minute summer	permpav_plot05	Infiltration		0.3			
240 minute summer	permpav_plot06	4.000_overflowchan	MH S0201	0.0	0.000	0.000	0.0000
240 minute summer	permpav_plot06	Infiltration		0.5			

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.77%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	MH S0101	11	91.799	0.049	3.2	0.0691	0.0000	OK
15 minute summer	MH S0102	11	91.617	0.074	8.8	0.1102	0.0000	OK
15 minute summer	MH S0201	11	91.555	0.052	3.9	0.0751	0.0000	OK
15 minute summer	MH S0103	12	91.482	0.098	14.5	0.1522	0.0000	OK
15 minute summer	MH S0104	13	91.291	0.097	14.0	0.1391	0.0000	OK
720 minute summer	MH S0105	735	91.284	0.186	2.2	0.2668	0.0000	OK
720 minute summer	BASIN	735	91.284	0.230	2.0	20.6472	0.0000	OK
240 minute summer	permpav_plot01	176	92.539	-0.136	4.3	10.2580	0.0000	OK
240 minute summer	permpav_plot02	188	92.495	-0.105	4.2	10.1575	0.0000	OK
240 minute summer	permpav_plot03	188	92.186	-0.164	3.5	8.5589	0.0000	OK
240 minute summer	permpav_plot04	192	92.296	-0.129	4.5	11.1461	0.0000	OK
180 minute summer	permpav_plot05	180	92.463	-0.112	2.8	6.2927	0.0000	OK
240 minute summer	permpav_plot06	172	92.551	-0.179	3.0	6.7546	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
15 minute summer	MH S0101	1.000	MH S0102	3.2	0.651	0.221	0.0792
15 minute summer	MH S0102	1.001	MH S0103	8.7	0.561	0.137	0.7811
15 minute summer	MH S0201	3.001	MH S0103	3.9	0.377	0.119	0.3447
15 minute summer	MH S0103	1.002	MH S0104	14.0	0.727	0.219	1.1097
15 minute summer	MH S0104	1.003	MH S0105	13.7	0.712	0.215	0.5558
720 minute summer	MH S0105	1.004	BASIN	2.0	0.307	0.032	0.6933
720 minute summer	BASIN	Infiltration		0.1			
240 minute summer	permpav_plot01	2.000_overflowchan	MH S0102	0.0	0.000	0.000	0.0000
240 minute summer	permpav_plot01	Infiltration		0.7			
240 minute summer	permpav_plot02	5.000_overflowchan	MH S0103	0.0	0.000	0.000	0.0000
240 minute summer	permpav_plot02	Infiltration		0.6			
240 minute summer	permpav_plot03	6.000_overflowchan	MH S0103	0.0	0.000	0.000	0.0000
240 minute summer	permpav_plot03	Infiltration		0.5			
240 minute summer	permpav_plot04	7.000_overflowchan	MH S0103	0.0	0.000	0.000	0.0000
240 minute summer	permpav_plot04	Infiltration		0.6			
180 minute summer	permpav_plot05	3.000_overflowchan	MH S0201	0.0	0.000	0.000	0.0000
180 minute summer	permpav_plot05	Infiltration		0.3			
240 minute summer	permpav_plot06	4.000_overflowchan	MH S0201	0.0	0.000	0.000	0.0000
240 minute summer	permpav_plot06	Infiltration		0.5			

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.77%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	MH S0101	11	91.809	0.059	4.5	0.0832	0.0000	OK
15 minute summer	MH S0102	11	91.631	0.088	12.3	0.1308	0.0000	OK
15 minute summer	MH S0201	11	91.564	0.061	5.4	0.0885	0.0000	OK
15 minute summer	MH S0103	12	91.501	0.117	20.2	0.1825	0.0000	OK
960 minute summer	MH S0104	990	91.368	0.174	2.3	0.2496	0.0000	OK
960 minute summer	MH S0105	990	91.368	0.270	2.3	0.3870	0.0000	OK
960 minute summer	BASIN	990	91.368	0.314	2.1	29.7407	0.0000	OK
240 minute summer	permpav_plot01	208	92.572	-0.103	6.1	15.8977	0.0000	OK
240 minute summer	permpav_plot02	224	92.532	-0.068	5.9	15.7394	0.0000	OK
240 minute summer	permpav_plot03	228	92.222	-0.128	4.9	13.3140	0.0000	OK
360 minute summer	permpav_plot04	288	92.337	-0.088	4.8	17.2916	0.0000	OK
240 minute summer	permpav_plot05	172	92.590	0.015	3.4	8.9702	0.0000	OK
240 minute summer	permpav_plot06	192	92.579	-0.151	4.1	10.4751	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
15 minute summer	MH S0101	1.000	MH S0102	4.5	0.713	0.310	0.1017
15 minute summer	MH S0102	1.001	MH S0103	12.2	0.611	0.192	0.9984
15 minute summer	MH S0201	3.001	MH S0103	5.4	0.410	0.165	0.4365
15 minute summer	MH S0103	1.002	MH S0104	19.8	0.792	0.310	1.4352
960 minute summer	MH S0104	1.003	MH S0105	2.3	0.326	0.036	1.5737
960 minute summer	MH S0105	1.004	BASIN	2.1	0.254	0.033	0.9143
960 minute summer	BASIN	Infiltration		0.1			
240 minute summer	permpav_plot01	2.000_overflowchan	MH S0102	0.0	0.000	0.000	0.0000
240 minute summer	permpav_plot01	Infiltration		0.7			
240 minute summer	permpav_plot02	5.000_overflowchan	MH S0103	0.0	0.000	0.000	0.0000
240 minute summer	permpav_plot02	Infiltration		0.6			
240 minute summer	permpav_plot03	6.000_overflowchan	MH S0103	0.0	0.000	0.000	0.0000
240 minute summer	permpav_plot03	Infiltration		0.5			
360 minute summer	permpav_plot04	7.000_overflowchan	MH S0103	0.0	0.000	0.000	0.0000
360 minute summer	permpav_plot04	Infiltration		0.6			
240 minute summer	permpav_plot05	3.000_overflowchan	MH S0201	0.4	0.605	0.081	0.0057
240 minute summer	permpav_plot05	Infiltration		0.3			
240 minute summer	permpav_plot06	4.000_overflowchan	MH S0201	0.0	0.000	0.000	0.0000
240 minute summer	permpav_plot06	Infiltration		0.5			

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.77%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	MH S0101	11	91.806	0.056	4.1	0.0790	0.0000	OK
15 minute summer	MH S0102	11	91.627	0.084	11.2	0.1246	0.0000	OK
15 minute summer	MH S0201	11	91.561	0.058	4.9	0.0843	0.0000	OK
15 minute summer	MH S0103	12	91.495	0.111	18.4	0.1734	0.0000	OK
960 minute summer	MH S0104	975	91.336	0.142	2.2	0.2028	0.0000	OK
960 minute summer	MH S0105	975	91.336	0.238	2.2	0.3402	0.0000	OK
960 minute summer	BASIN	975	91.336	0.282	2.0	26.0385	0.0000	OK
240 minute summer	permpav_plot01	196	92.562	-0.113	5.6	14.1679	0.0000	OK
240 minute summer	permpav_plot02	212	92.522	-0.078	5.4	14.1100	0.0000	OK
240 minute summer	permpav_plot03	216	92.211	-0.139	4.5	11.8646	0.0000	OK
240 minute summer	permpav_plot04	224	92.325	-0.100	5.8	15.5226	0.0000	OK
360 minute summer	permpav_plot05	304	92.500	-0.075	2.4	8.8168	0.0000	OK
240 minute summer	permpav_plot06	184	92.570	-0.160	3.8	9.3323	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
15 minute summer	MH S0101	1.000	MH S0102	4.1	0.696	0.283	0.0949
15 minute summer	MH S0102	1.001	MH S0103	11.1	0.598	0.174	0.9329
15 minute summer	MH S0201	3.001	MH S0103	4.9	0.398	0.149	0.4082
15 minute summer	MH S0103	1.002	MH S0104	18.0	0.773	0.282	1.3345
960 minute summer	MH S0104	1.003	MH S0105	2.2	0.329	0.034	1.3329
960 minute summer	MH S0105	1.004	BASIN	2.0	0.255	0.032	0.8562
960 minute summer	BASIN	Infiltration		0.1			
240 minute summer	permpav_plot01	2.000_overflowchan	MH S0102	0.0	0.000	0.000	0.0000
240 minute summer	permpav_plot01	Infiltration		0.7			
240 minute summer	permpav_plot02	5.000_overflowchan	MH S0103	0.0	0.000	0.000	0.0000
240 minute summer	permpav_plot02	Infiltration		0.6			
240 minute summer	permpav_plot03	6.000_overflowchan	MH S0103	0.0	0.000	0.000	0.0000
240 minute summer	permpav_plot03	Infiltration		0.5			
240 minute summer	permpav_plot04	7.000_overflowchan	MH S0103	0.0	0.000	0.000	0.0000
240 minute summer	permpav_plot04	Infiltration		0.6			
360 minute summer	permpav_plot05	3.000_overflowchan	MH S0201	0.0	0.000	0.000	0.0000
360 minute summer	permpav_plot05	Infiltration		0.3			
240 minute summer	permpav_plot06	4.000_overflowchan	MH S0201	0.0	0.000	0.000	0.0000
240 minute summer	permpav_plot06	Infiltration		0.5			

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.77%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	MH S0101	11	91.820	0.070	6.0	0.0981	0.0000	OK
15 minute summer	MH S0102	11	91.645	0.102	16.3	0.1515	0.0000	OK
15 minute summer	MH S0201	11	91.574	0.071	7.2	0.1027	0.0000	OK
15 minute summer	MH S0103	12	91.521	0.137	26.8	0.2141	0.0000	OK
480 minute summer	MH S0104	496	91.514	0.320	7.4	0.4577	0.0000	SURCHARGED
480 minute summer	MH S0105	496	91.514	0.416	6.7	0.5951	0.0000	SURCHARGED
480 minute summer	BASIN	496	91.514	0.460	6.4	48.7237	0.0000	OK
240 minute summer	permpav_plot01	168	92.709	0.034	8.1	21.3034	0.0000	OK
240 minute summer	permpav_plot02	152	92.643	0.043	7.8	18.8616	0.0000	OK
360 minute summer	permpav_plot03	248	92.393	0.043	5.0	17.7783	0.0000	OK
240 minute summer	permpav_plot04	152	92.485	0.060	8.4	20.0723	0.0000	OK
120 minute summer	permpav_plot05	74	92.621	0.046	7.0	9.1882	0.0000	OK
240 minute summer	permpav_plot06	220	92.614	-0.116	5.5	15.2013	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
15 minute summer	MH S0101	1.000	MH S0102	6.0	0.768	0.414	0.1260
15 minute summer	MH S0102	1.001	MH S0103	16.2	0.656	0.255	1.2308
15 minute summer	MH S0201	3.001	MH S0103	7.2	0.435	0.220	0.5311
15 minute summer	MH S0103	1.002	MH S0104	26.4	0.848	0.414	1.7909
480 minute summer	MH S0104	1.003	MH S0105	6.7	0.413	0.105	2.0266
480 minute summer	MH S0105	1.004	BASIN	6.4	0.344	0.101	0.9379
480 minute summer	BASIN	Infiltration		0.1			
240 minute summer	permpav_plot01	2.000_overflowchan	MH S0102	0.9	0.472	0.420	0.0162
240 minute summer	permpav_plot01	Infiltration		0.7			
240 minute summer	permpav_plot02	5.000_overflowchan	MH S0103	2.3	0.901	0.618	0.0454
240 minute summer	permpav_plot02	Infiltration		0.6			
360 minute summer	permpav_plot03	6.000_overflowchan	MH S0103	0.5	0.353	0.978	0.0227
360 minute summer	permpav_plot03	Infiltration		0.5			
240 minute summer	permpav_plot04	7.000_overflowchan	MH S0103	2.7	0.724	0.957	0.0433
240 minute summer	permpav_plot04	Infiltration		0.6			
120 minute summer	permpav_plot05	3.000_overflowchan	MH S0201	3.0	1.065	0.661	0.0267
120 minute summer	permpav_plot05	Infiltration		0.3			
240 minute summer	permpav_plot06	4.000_overflowchan	MH S0201	0.0	0.000	0.000	0.0000
240 minute summer	permpav_plot06	Infiltration		0.5			

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