



Proposed New Artificial Pitches Centre for Outdoor Sport Burgess Hill

Surface Water Verification Report

R - 00178 – 001 – SVR – 0
October 2025

Report Originator(s)

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Revision Record

Revision	Date	Description	Written	Approved
0	27.10.25	First Issue	WRA	WRA

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Surface Water Calculations



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Client

S+ C Slatter

Project

Centre for Outdoor Sport, Burgess Hill

Title

Surface Water Verification Report

Page no. 3

Project ref 00178

Date Oct 2025

1.0 Introduction

1.1 Brief

- 1.1.1 The client, S+C Slatter Ltd. requires a surface water verification report to satisfy condition 24 of the sites planning approval.
- 1.1.2 The objective of this report is to provide an overview of the installed storm water drainage to ensure that it meets the requirements of the strategy set out as part of the planning approval.
- 1.1.3 This report has been prepared by SEA Consulting Engineers Ltd. With the benefit limited to our instructing Client, S+C Slatter Ltd. The author has 18 years' experience in infrastructure design for similar types of developments, therefore has the required experience in providing this verification report.

1.2 Site Location

- 1.2.1 The site is located to the north west of Burgess Hill and is part of the Northern Arc development. The site sits within a wider development area that is bound by the A2300 to the north, the A273 to the east, Gatehouse Lane to the south and Southern Counties Fencing Services to the west. The site itself is located to the west of the new access route through Northern Arc. The approximate national grid reference is E529265 N120090.

1.3 Proposed Development

- 1.3.1 The Centre for Outdoor Sport includes two 3G turf pitches, clubhouse and car park within the northern part of the site, whilst the southern part of the site will comprise four grass pitches overlapped by a cricket pitch. The proposed development layout is shown on the plans enclosed in Appendix A

2.0 Surface Water Drainage

2.1 Strategy

- 2.1.1 The surface water drainage design follows the principles set out originally during the planning application by JPP Consulting and then developed by SEA Consulting Engineers to satisfy planning condition 22.
- 2.1.2 The surface water from the development has been split into 3 catchments (football Pitch, Rugby Pitch and Pavillion and Car Park), with each area being restricted to greenfield runoff rates as follows
- Football Pitch – 4.5l/s
 - Rugby Pitch – 4.8l/s
 - Pavilion and Car Park – 3.3l/s
 - Total flow rate off-site = 12.6l/s
- 2.1.3 The football and rugby pitch are formed with a porous carpet on top of a porous macadam layer over a 175 mm-thick permeable subbase. Each pitch is split into 4 compartments with orifice flow control chambers provided to each compartment to make better use of the attenuation available within the pitch subbase. Additional geo-modular tanks are provided in each compartment. Flows are then conveyed to the outfall at the access road.
- 2.1.4 The pavilion and car park are provided with permeable handstanding areas at low points, which will allow water to infiltrate through into perforated pipework and then outfall to a flow control chamber. Attenuation is provided within a permeable subbase, geo-modular tanks and an online detention basin.

2.2 As Built Records

- 2.2.1 During the build, photographic records of progress were undertaken by the contractor. A copy of the photographs is provided in Appendix B, which shows installed drainage runs, flow control chamber, subbase and tanks
- 2.2.2 They have confirmed that the surface water has been installed as per the latest SEA drawing. Appendix C presents a copy of the as-built drainage layout.

2.3 Design Alterations

- 2.3.1 During the construction works, minor amendments were made to the arrangements of the football and rugby pitch attenuation; these are detailed below. These amendments were checked by SEA Consulting, and updated calculations are presented in Appendix D.
- Pitch subbase depths amended to 175mm throughout.
 - Pitch attenuation tanks depth amended from 1m to 0.8m to suit the preferred supplier's details. Plan areas increased to ensure no loss in attenuation volumes.
 - Rugby pitch flow control chamber amended to an Orifice chamber rather than a Hydrobrake due to lack of space for the Hydrobrake chamber to be installed.

2.4 Maintenance

2.4.1 All new surface water will remain private and maintenance will be the responsibility of the landowner/user. The following maintenance plan shall be implemented for the new AGP.

Pitch and Permeable subbase

Maintenance Schedule		
Maintenance Category	Required Action	Frequency
Regular Maintenance	Brushing (Standard cosmetic sweep over all areas)	Once a year, after the autumn leaf fall, or reduced frequency as required, based on site specific observations of clogging or manufacturers recommendations. Particular attention to be paid to areas where water into pervious areas from adjacent impermeable areas as this area is most likely to collect sediment
Occasional maintenance	Stabilise and mow adjacent contributing areas	As required
	Removal of weeds or management an appropriate weed killer applied directly into the weeds by an applicator rather than spraying	As required
Remedial Actions	Remediate any landscaping which, through vegetation maintenance strip, has been raised to within 50mm of the finished surface	As required
	Remedial work to any depressions, rutting and cracked surfacing considered detrimental to the performance or hazard to users	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10-15 years, or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for 3 month after installation
	Inspect for areas of poor operation and/or weed growth – if required take remedial action	3-monthly, 48hrs after large storms for the first 6 months
	Establish slit accumulation rates and establish appropriate brushing frequencies.	Annually
	Monitor Inspection chambers	Annually

Pipe systems, Inspection chambers, manholes and Hydrobrake

Maintenance Schedule		
Maintenance Category	Required Action	Frequency
Regular Maintenance	Inspect and identify area that are not operating correctly, if required, take remedial action	Monthly (for the first 3 months) then six monthly
	Debris removal from catchment surface (where may cause risks to performance)	Monthly
Remedial Actions	Remove Blockages	As required
	Cleaning/Jetting	As required
	Repair/rehabilitation of system	As required
Monitoring	Inspect/check all parts of the piped system and inspection chambers to ensure that they are in good condition and operating as required.	Annually and after large storm

Permeable Paving

Maintenance Schedule		
Maintenance Category	Required Action	Frequency
Regular Maintenance	Brushing (Standard cosmetic sweep over all areas)	Once a year, after the autumn leaf fall, or reduced frequency as required, based on site specific observations of clogging or manufacturers recommendations. Particular attention to be paid to areas where water into pervious areas from adjacent impermeable areas as this area is most likely to collect sediment
Occasional maintenance	Stabilise and mow adjacent contributing areas	As required
	Removal of weeds or management using an appropriate weed killer applied directly into the weeds by an applicator rather than spraying	As required
Remedial Actions	Remediate any landscaping which, through vegetation maintenance strip, has been raised to within 50mm of the finished surface	As required
	Remedial work to any depressions, rutting and cracked surfacing considered detrimental to the performance or hazard to users	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10-15 years, or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for 3 month after installation
	Inspect for areas of poor operation and/or weed growth – if required take remedial action	3-monthly, 48hrs after large storms for the first 6 months
	Establish slit accumulation rates and establish appropriate brushing frequencies.	Annually
	Monitor Inspection chambers	Annually

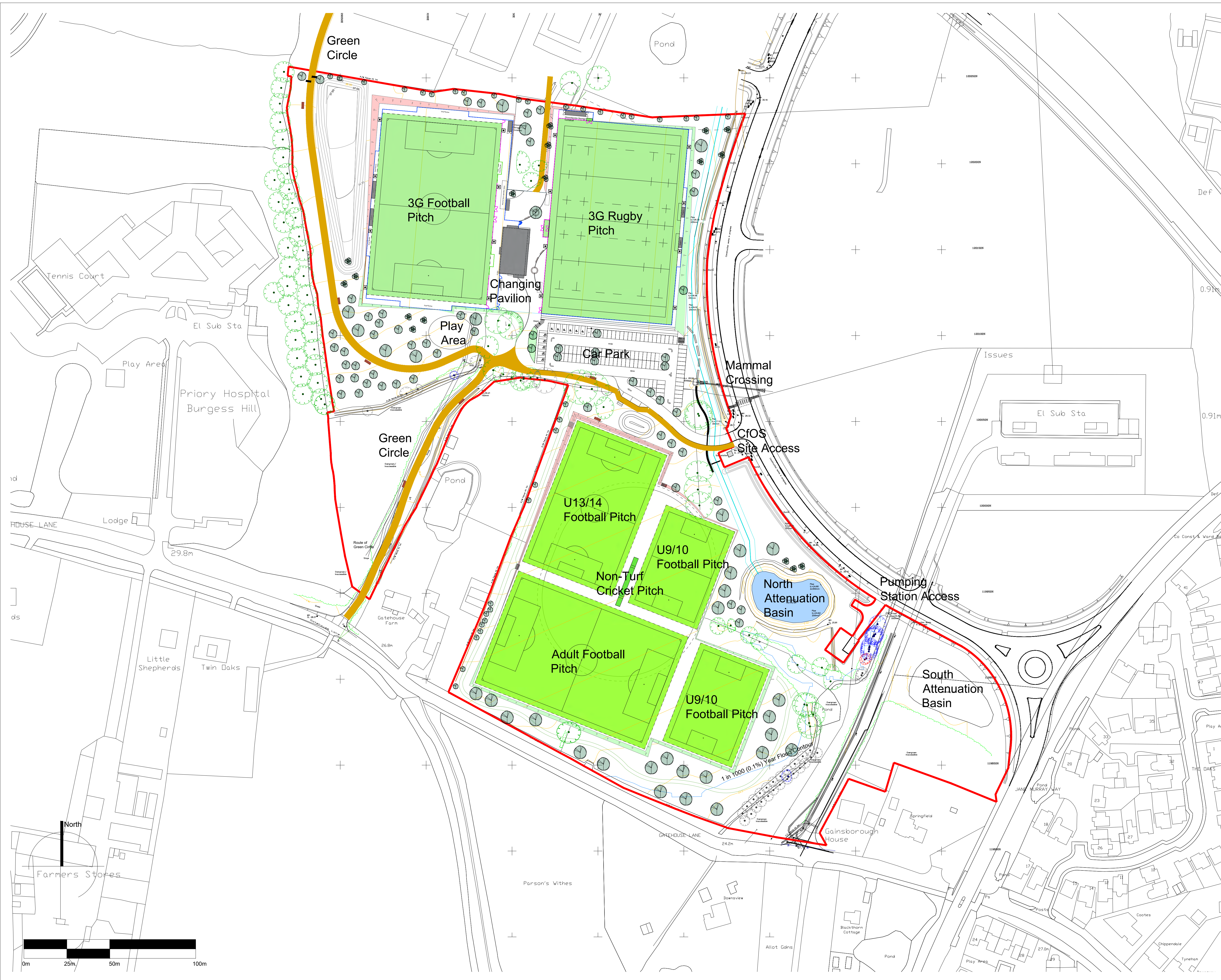
Detention Basin

Maintenance Schedule		
Maintenance Category	Required Action	Frequency
Regular Maintenance	Remove litter and debris	Monthly
	Cut Grass – for access routes	Monthly (during growing season) or as required
	Cut Grass – Meadow grass and around basin	Half yearly (spring – before nesting season and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets, outlets and overflows for blockages and clear if required	Monthly
	Inspect inlets and facility surface for slit accumulation. Establish appropriate slit removal frequencies	Monthly (for first year, then as required)
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets, outlet and forebay	Annually, or as required
	Manage wetland plants in outlet pool – where provided	Annually
Occasional maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim trees and remove cuttings	Every 2 years, or as required
	Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 year, or as required
Remedial Actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required

Client	S+ C Slatter
Project	Centre for Outdoor Sport, Burgess Hill
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Appendix A

Proposed Site Plan



- KEY:**
- Site Boundary
 - Proposed route of Bridleway (forming part of Green Circle)
 - Proposed route of shared pedestrian/cycle path (hoggins)
 - Proposed route of shared pedestrian/cycle path (paved)
 - Proposed route of Employment Zone surface water drainage corridor
 - Cutting
 - Embankment
 - 4.5m Fencing
 - 2.5m Fencing
 - 2.0m Fencing
 - 1.2m Spectator Barrier
 - Existing Tree
 - Proposed Tree

REV.	DATE	DESCRIPTION	BY
A	24.02.23	Football pitch dims notes amended. South mini soccer pitch move to avoid flood zone.	MT
B	01.06.23	Updated in line with dwg nos. 022 & 023.	MT
C	19.06.23	Parking spaces increased, pavilion update as TGE info.	MT
D	23.06.23	Parking drop off added.	MT
E	28.06.23	Gabion retaining wall shown between car park & rugby.	MT
F	30.06.23	Topo updated, Green Circle alignment revised.	MT
G	07.07.23	Running straight omitted.	MT
H	20.09.23	Green Circle amended, LEAP relocated, parent parking added, cycle parking added, swale added, zebra crossing added, lighting columns amended, spot bund added.	MT
J	09.11.23	Topsoil heap added, car park revised, retained trees revised, cycle parking revised.	MT
K	20.11.23	Line of Green Circle revised, plaza, car park & steps revised, bin store relocated, line of employment zone drain revised, existing trees added back.	MT
L	04.12.23	Landscape features added.	MT
M	24.12.23	Car park revised, footpath widths revised.	MT
N	26.12.23	Orchard omitted, trees added.	MT
P	08.02.24	Swale, acoustic barrier and proposed trees revised.	MT



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STATUS: Concept - Stage 2			
CLIENT: Mid Sussex District Council			
PROJECT: Burgess Hill Centre for Outdoor Sport			
DRAWING: Proposed Site Plan			
SCALE 1:1000	SHEET A1	DRAWN MT	DATE 13.02.23
PROJECT NO. 1003	DRAWING NO. (03) 021	REVISION P	
This drawing must not be reproduced in whole or part without written consent. Do not scale this drawing. All dimensions in millimetres unless stated otherwise. All dimensions to be checked on site. ©2023 Mark Thomas. All Rights Reserved. NOT FOR CONSTRUCTION			

Client	S+ C Slatter
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Appendix B

Site Progress Photographic Record























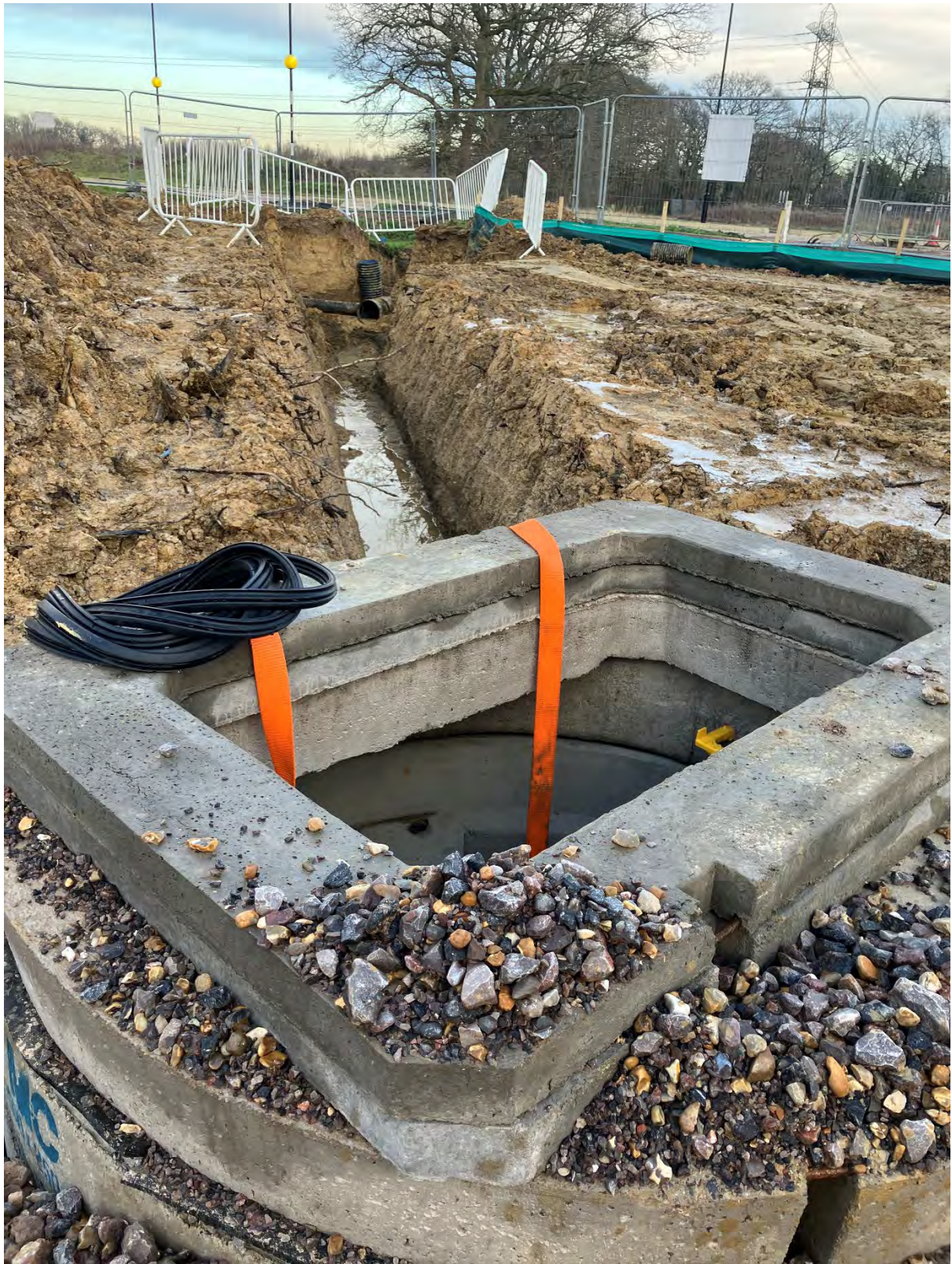




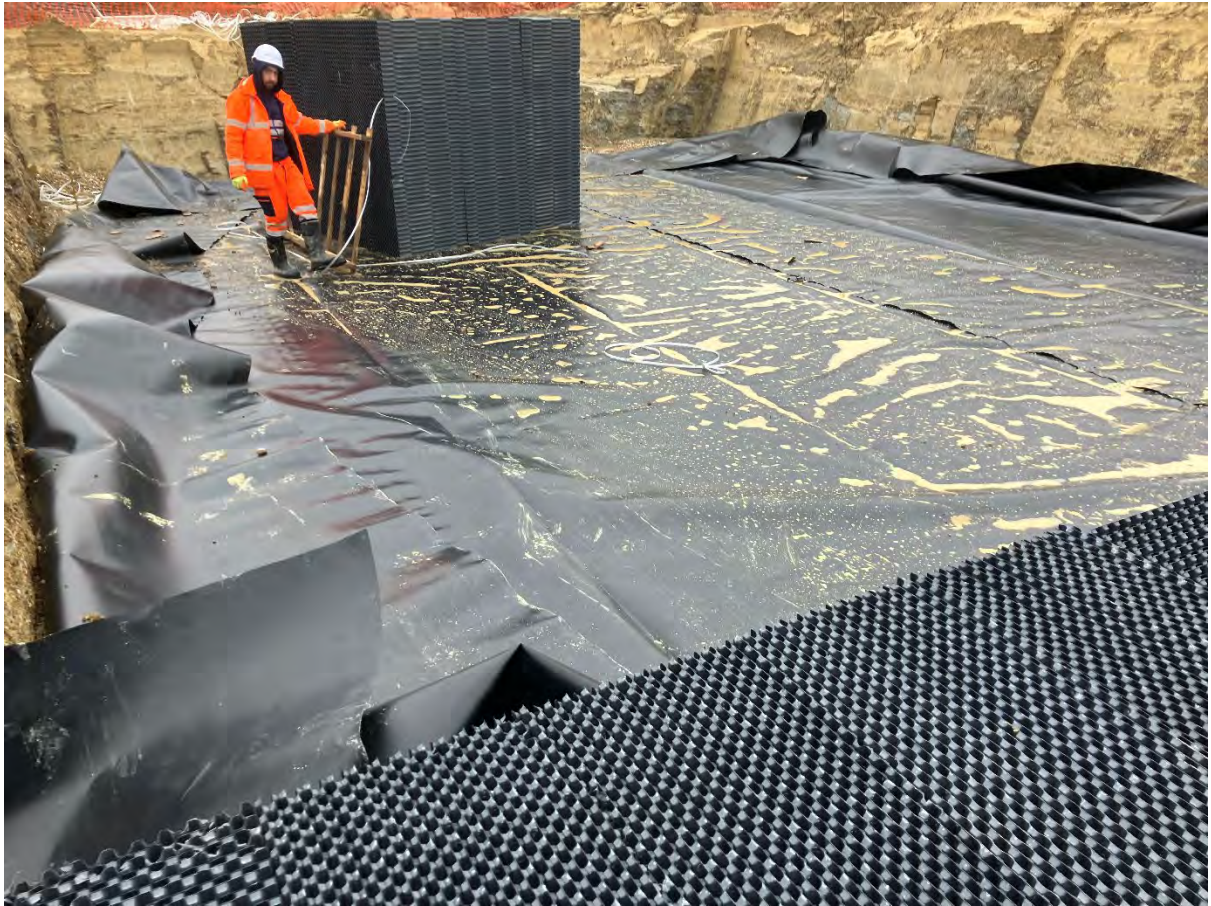














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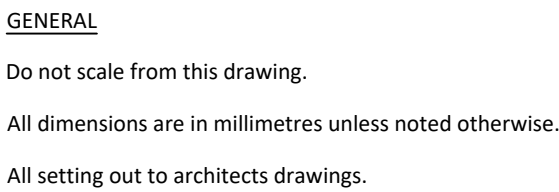
Title

Surface Water Verification Report

Appendix C

Drainage Layout – As Built

SEA Drawing 00178/E01/M



GENERAL

Do not scale from this drawing.

All dimensions are in millimetres unless noted otherwise.

All setting out to architects drawings.

Drawing to be read in conjunction with all other SEA drawings and architects drawings

This scheme has been designed using the survey information provided by others. It shall be the responsibility of the contractor to verify levels, boundaries etc prior to commencing any works on site. SEA Structural Engineers Ltd. shall not accept any responsibility for errors resulting from the survey.

All setting to be in accordance with the Architect's drawings, the Contractor is to check all dimensions and levels prior to commencement of work and report any discrepancies to the Engineer, including any encountered during construction works.

All dimensions should be checked on site prior to construction. Please notify the Engineer of any discrepancies before commencing or continuing any work.

HEALTH, SAFETY & THE ENVIRONMENT

In accordance with the Health and Safety at Work etc Act 1973 and the Construction (Design and Management) Regulations 2015, designs and details on this drawing have been the subject of a Designers Risk Assessment, to identify risks in construction, use, or demolition of the scheme.

It is not considered necessary for Designers to highlight obvious and/or common risks (such as deep excavations, manual handling and working around heavy plant) which Contractors should be familiar with.

So as far as is reasonably practicable, risks inherent in the design have been eliminated. Where it has been considered that elimination of a risk (or part of a risk) is not reasonably practicable, it has been reduced.

Significant unusual residual risks are identified below, beside the measures which have been adopted to eliminate and/or reduce them:

- N/A

DRAINAGE NOTES

All pipe lengths and gradients are based on centre of manhole to centre of manhole

The exact position, level, size and use of existing sewers to be confirmed on site and reported to the Engineer prior to the commencement of works.

All pipes are to be laid with level soffit's or as indicated

All private drainage works to accord with the requirements of Building Regulations 2000, Part H (drainage and waste disposal).

The invert of each horizontal drain at the base of a stack shall be at least 450mm below the center line of the lowest branch pipe. Set the level to ensure at least 50mm clearance to footings.

All pipes to be bedded and backfilled in accordance with Part H, diagram 10. Shallow pipes shall be protected in accordance with Part H, diagram 11.

Unless otherwise stated, all private drainage to be 100mm diameter. Gradients have been shown where there are pipe capacity issues, however minimum gradients are as below:

Surface water 150mm diameter pipes shall not be laid flatter than 1 in 150

Foul water 150mm diameter pipes shall not be laid flatter than 1 in 150 providing there are minimum of 5 WC's connected.

Pipes which run adjacent to buildings shall be installed in strict accordance with Part h, causes 2.23 to 2.25 and diagram 9.

All private manholes and inspection chambers subject to vehicular loading must have class D400 covers and frames in accordance with BS EN 124:2015. All private manholes and inspection chambers not subject to vehicular loading must have class B125 covers and frames in accordance with BS EN 124:2015.

All drains near existing or proposed trees shall be constructed in accordance with the requirements of NHBC's practice note 3 'building near trees'.

Excavation of drain trenches must not be lower than the foundation of any nearby buildings. If the trench is within 1m of foundations, the trench needs to be filled with concrete up to the lowest level of the foundation. If the trench is further than 1m away from the foundations, the trench needs to be filled with concrete to a level below the lowest level for the building, equal to the distance from the building, less than 150mm.

An opening needs to be formed where a pipe passes through a wall, with a minimum 50mm clearance. A lintel must support the brickwork above and each side of the opening masked with rigid sheet material.

Where a pipe requires a concrete surround C20 concrete mix should be used with vertical joints formed at the face of each flexible joint using 18mm thick compressible board.

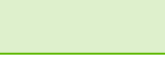
All UPVC pipes with less than 600mm cover need concrete protection. Where two pipes cross with less than 300mm separation, surround each with a C20 concrete mix. Where centered on the crossing point, extend the concrete surrounds as necessary to within 150mm of the next nearest flexible joint.

Adequate surface water drainage systems shall be provided to prevent unregulated discharge of water from a private drive onto the highway. These measures shall be implemented before the development is brought into use.

Perforated pipework to be used for distributor runs within permeable block paved areas.

DRAWING KEY:

— — — — —

- | | |
|---|---|
|  | Proposed four drainage |
|  | Existing storm drainage |
|  | Proposed storm drainage - Solid Pipe |
|  | Proposed storm drainage - Perforated pipe |
|  | Proposed extent of proprietary combined trench drainage. Bessey Block or similar. To be designed and specified by supplier and installed in strict accordance with their details. |
|  | Proposed storm proprietary geo-modular attenuation tanks. To be designed by supplier and installed in strict accordance with their details. |
|  | Proposed permeable subbase extends beneath pitches. Depth as indicated. |
|  | Proposed check dam beneath pitches |
|  | Proposed permeable subbase extends beneath handstandings. Depth as indicated. |
|  | Root protection extents |

[illegible]

**BURGESS HILL
CENTRE FOR OUTDOOR SPORTS**

DRAWING
PROPOSED DRAINAGE LAYOUT

SCALE: 1/350 @ 60	DATE: 28.04.2024
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DRAWN BY: WRA	REV: M
STATUS: AS BUILT	

DWG No: 00178/E01	M
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Appendix D

Surface Water Calculations

Football Pitch

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	8.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	5.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
1		8.00	33.266	450	0.750
2	0.210	8.00	33.085	450	1.500
3	0.210	8.00	32.910	450	1.500
4	0.210	8.00	32.735	450	1.500
5	0.210	8.00	32.560	1200	1.505
6			32.350	450	1.350

Links (Input)

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	1	2	18.127	0.600	32.516	31.585	0.931	19.5	150	8.13	5.0
1.001	2	3	17.524	0.600	31.585	31.410	0.175	100.1	150	8.42	5.0
1.002	3	4	17.524	0.600	31.410	31.235	0.175	100.1	150	8.71	5.0
1.003	4	5	17.524	0.600	31.235	31.055	0.180	97.4	150	9.00	5.0
1.004	5	6	2.416	0.600	31.055	31.000	0.055	43.9	150	9.03	5.0

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	18.127	19.5	150	Circular	33.266	32.516	0.600	33.085	31.585	1.350
1.001	17.524	100.1	150	Circular	33.085	31.585	1.350	32.910	31.410	1.350
1.002	17.524	100.1	150	Circular	32.910	31.410	1.350	32.735	31.235	1.350
1.003	17.524	97.4	150	Circular	32.735	31.235	1.350	32.560	31.055	1.355
1.004	2.416	43.9	150	Circular	32.560	31.055	1.355	32.350	31.000	1.200

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	450	Manhole	Adoptable	2	450	Manhole	Adoptable
1.001	2	450	Manhole	Adoptable	3	450	Manhole	Adoptable
1.002	3	450	Manhole	Adoptable	4	450	Manhole	Adoptable
1.003	4	450	Manhole	Adoptable	5	1200	Manhole	Adoptable
1.004	5	1200	Manhole	Adoptable	6	450	Manhole	Adoptable

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	0.750	Drain Down Time (mins)	240	Check Discharge Volume	x
Winter CV	0.840	Additional Storage (m³/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 %)
2	0	0	0
30	0	0	0
100	45	0	0

Node 2 Online Orifice Control

Flap Valve	x	Invert Level (m)	31.585	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.039		

Node 3 Online Orifice Control

Flap Valve	x	Invert Level (m)	31.410	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.056		

Node 4 Online Orifice Control

Flap Valve	x	Invert Level (m)	31.235	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.059		

Node 5 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	31.055	Product Number	CTL-SHE-0094-4500-1440-4500
Design Depth (m)	1.440	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	4.5	Min Node Diameter (mm)	1200

Node 2 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	32.805	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.175
Safety Factor	2.0	Width (m)	106.000	Inf Depth (m)	
Porosity	0.30	Length (m)	17.525		

Node 3 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	32.630	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.175
Safety Factor	2.0	Width (m)	106.000	Inf Depth (m)	
Porosity	0.30	Length (m)	17.525		

Node 4 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	32.455	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.175
Safety Factor	2.0	Width (m)	106.000	Inf Depth (m)	
Porosity	0.30	Length (m)	17.525		

Node 5 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	32.280	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.175
Safety Factor	2.0	Width (m)	106.000	Inf Depth (m)	
Porosity	0.30	Length (m)	17.525		

Node 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	31.710
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	100.0	0.0	0.800	100.0	0.0	0.801	0.0	0.0

Node 3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	31.635
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	100.0	0.0	0.800	100.0	0.0	0.801	0.0	0.0

Node 4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	31.460
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	100.0	0.0	0.800	100.0	0.0	0.801	0.0	0.0

Node 5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	31.280
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	100.0	0.0	0.800	100.0	0.0	0.801	0.0	0.0

RUGBY PITCH

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	8.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	5.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
9		8.00	32.230	450	0.750
10	0.227	8.00	32.045	450	1.515
11	0.227	8.00	31.855	450	1.515
12	0.227	8.00	31.665	450	1.515
13	0.227	8.00	31.475	1200	1.520
14			31.450	450	1.525

Links (Input)

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)
2.000	9	10	18.129	0.600	31.480	30.530	0.950	19.1	150	8.13	5.0
2.001	10	11	19.000	0.600	30.530	30.340	0.190	100.0	150	8.45	5.0
2.002	11	12	19.000	0.600	30.340	30.150	0.190	100.0	150	8.76	5.0
2.003	12	13	19.000	0.600	30.150	29.955	0.195	97.4	150	9.07	5.0
2.004	13	14	2.597	0.600	29.955	29.925	0.030	86.6	150	9.11	5.0

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)
2.000	18.129	19.1	150	Circular	32.230	31.480	0.600	32.045	30.530	1.365
2.001	19.000	100.0	150	Circular	32.045	30.530	1.365	31.855	30.340	1.365
2.002	19.000	100.0	150	Circular	31.855	30.340	1.365	31.665	30.150	1.365
2.003	19.000	97.4	150	Circular	31.665	30.150	1.365	31.475	29.955	1.370
2.004	2.597	86.6	150	Circular	31.475	29.955	1.370	31.450	29.925	1.375

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
2.000	9	450	Manhole	Adoptable	10	450	Manhole	Adoptable
2.001	10	450	Manhole	Adoptable	11	450	Manhole	Adoptable
2.002	11	450	Manhole	Adoptable	12	450	Manhole	Adoptable
2.003	12	450	Manhole	Adoptable	13	1200	Manhole	Adoptable
2.004	13	1200	Manhole	Adoptable	14	450	Manhole	Adoptable

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	0.750	Drain Down Time (mins)	240	Check Discharge Volume	x
Winter CV	0.840	Additional Storage (m³/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 %)
2	0	0	0
30	0	0	0
100	45	0	0

Node 10 Online Orifice Control

Flap Valve	x	Invert Level (m)	30.530	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.033		

Node 11 Online Orifice Control

Flap Valve	x	Invert Level (m)	30.340	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.047		

Node 12 Online Orifice Control

Flap Valve	x	Invert Level (m)	30.150	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.060		

Node 13 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.450	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	4.8		
Invert Level (m)	29.955	Diameter (m)	0.043		

Node 10 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	31.745	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	
Safety Factor	2.0	Width (m)	114.000	Inf Depth (m)	
Porosity	0.30	Length (m)	19.000		

Node 11 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	31.555	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	
Safety Factor	2.0	Width (m)	114.000	Inf Depth (m)	
Porosity	0.30	Length (m)	19.000		

Node 12 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	31.365	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	
Safety Factor	2.0	Width (m)	114.000	Inf Depth (m)	
Porosity	0.30	Length (m)	19.000		

Node 13 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	31.175	Slope (1:X)	100.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	
Safety Factor	2.0	Width (m)	114.000	Inf Depth (m)	
Porosity	0.30	Length (m)	19.000		

Node 10 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	30.755
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	93.8	0.0	0.800	93.8	0.0	0.801	0.0	0.0

Node 11 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	30.565
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	93.8	0.0	0.800	93.8	0.0	0.801	0.0	0.0

Node 12 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	30.375
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	93.8	0.0	0.800	93.8	0.0	0.801	0.0	0.0

Node 13 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	31.180
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	93.8	0.0	0.800	93.8	0.0	0.801	0.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	9	1	31.480	0.000	0.0	0.0000	0.0000	OK
480 minute winter	10	464	31.153	0.623	5.1	37.4532	0.0000	SURCHARGED
480 minute winter	11	456	31.084	0.744	6.0	48.6555	0.0000	SURCHARGED
480 minute winter	12	360	31.024	0.874	7.0	60.6059	0.0000	SURCHARGED
30 minute winter	13	26	31.205	1.250	22.9	8.9964	0.0000	FLOOD RISK
15 minute summer	14	1	29.925	0.000	4.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	9	2.000	10	0.0	0.000	0.000	0.1596	
480 minute winter	10	Orifice	11	1.0				
480 minute winter	11	Orifice	12	1.9				
480 minute winter	12	Orifice	13	3.3				
30 minute winter	13	Orifice	14	4.3				45.8

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.82%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	9	690	31.846	0.366	0.1	0.0583	0.0000	SURCHARGED
720 minute winter	10	690	31.846	1.316	7.5	93.1022	0.0000	FLOOD RISK
600 minute winter	11	585	31.678	1.338	10.6	101.2741	0.0000	FLOOD RISK
480 minute winter	12	464	31.501	1.351	12.2	107.3769	0.0000	FLOOD RISK
240 minute winter	13	236	31.316	1.361	18.6	51.6000	0.0000	FLOOD RISK
15 minute summer	14	1	29.925	0.000	4.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute winter	9	2.000	10	-0.1	-0.006	-0.002	0.3192	
720 minute winter	10	Orifice	11	1.0				
600 minute winter	11	Orifice	12	2.0				
480 minute winter	12	Orifice	13	3.3				
240 minute winter	13	Orifice	14	4.5				116.7

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	9	1380	32.029	0.549	1.0	0.0873	0.0000	FLOOD RISK
1440 minute winter	10	1380	32.029	1.499	7.8	199.0739	0.0000	FLOOD RISK
960 minute winter	11	930	31.848	1.508	11.5	204.5975	0.0000	FLOOD RISK
960 minute winter	12	915	31.654	1.504	12.5	202.0099	0.0000	FLOOD RISK
960 minute winter	13	930	31.448	1.493	13.9	145.7661	0.0000	FLOOD RISK
15 minute summer	14	1	29.925	0.000	4.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute winter	9	2.000	10	-1.0	-0.057	-0.025	0.3192	
1440 minute winter	10	Orifice	11	1.0				
960 minute winter	11	Orifice	12	2.1				
960 minute winter	12	Orifice	13	3.4				
960 minute winter	13	Orifice	14	4.7				292.8