

Ref: C3104_P1
05 November 2024

Mr Steven King
Planning Applications Team Leader
Development Management
Mid Sussex District Council
Oaklands Road
Haywards Heath
West Sussex
RH16 1SS

By email only.

Re: LLFA COMMENTS ON PLANNING APPLICATION REF; DM_23_3133- LAND AT GRID REFERENCE 526665 125250, BRIGHTON ROAD, WARNINGLID (ALSO KNOWS AS LAND ADJ HIGHFIELDS)

Dear Sirs

I refer to the email from the Lead Local Flood Authority (LLFA) dated **25th April 2024** with regards to the above planning application.

In response to LLFA queries we have the following comments:

Thank you for providing the updated drainage information submitted in support of this application. Following review I can advise that in principles the applicant has shown that foul and surface water drainage be provided for the proposed site. We would advise the applicant that at detail drainage design stage the following additional information will need to be provided:

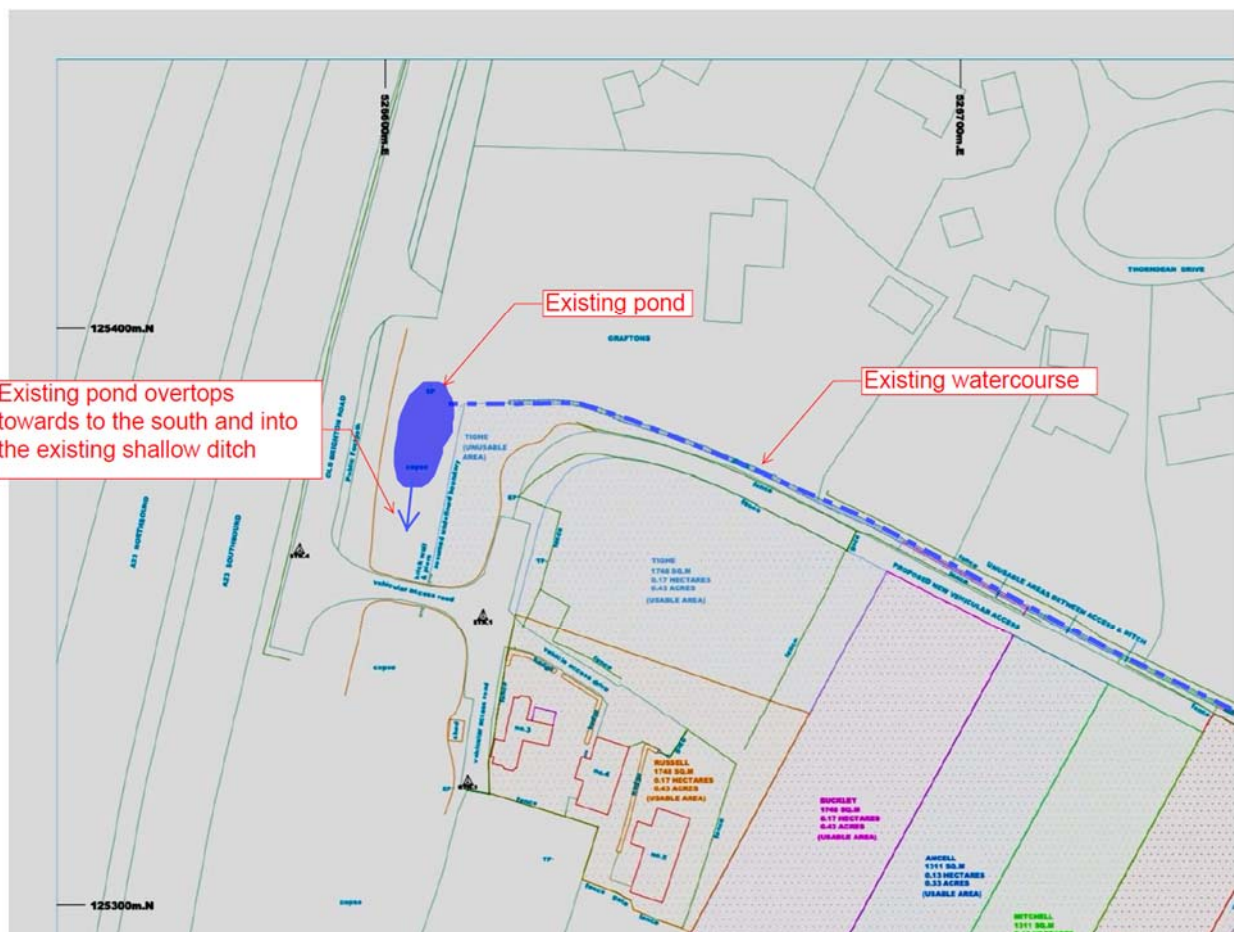
- *In site infiltration testing, to confirm the surface water infiltration rate*
- *Evidence that the existing ditch exist, has a wider connection to the surrounding area and it's inverts support the proposed drainage system.*
- *Evidence that the Environment Agency's General Building Rules have been considered with regards to the foul package treatment plant.*
 - o *We would advise that new rules have recently been added to the General Binding Rules, one of these rules prohibits new outfalls within 50m of an existing exempt small sewage discharge.*
 - o *If the drainage design would not meet with the Binding Rules, then an Environmental Permit will be required prior to the system being put into use. This is a separate process to planning but we would advise this is considered as part of the detailed design.*

OUR RESPONSE:

A site infiltration test was conducted in accordance with the BRE 365 method, and results indicate slightly higher infiltration rates compared to the adjacent site, ranging from 2.28×10^{-5} m/s to 1.69×10^{-5} m/s. For design purposes, we have applied the worst-case infiltration rate of 1.69×10^{-5} m/s to the proposed soakaway and shallow permeable paving layout. Please refer to the attached updated drainage plan, calculations, and report for detailed information.

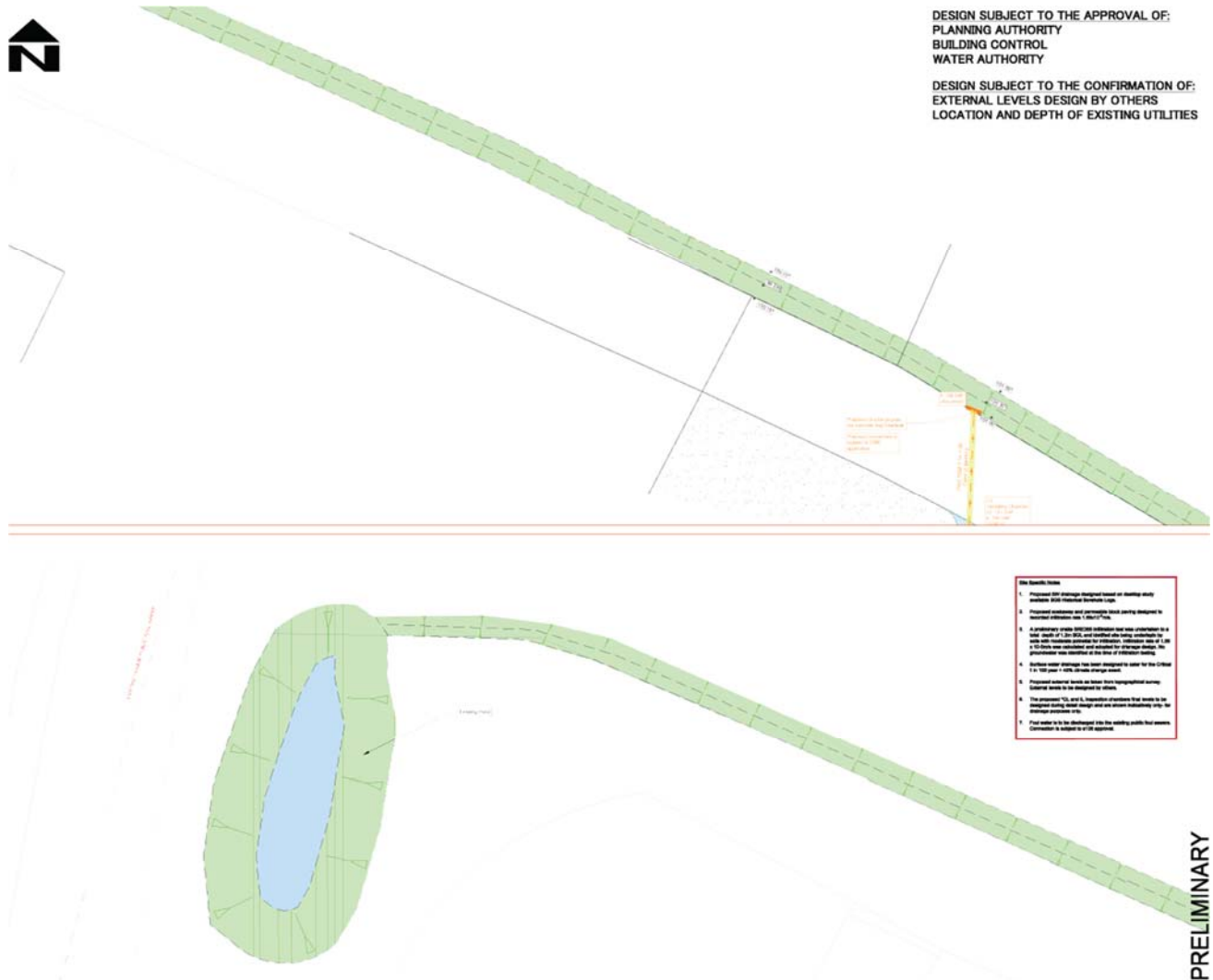
During the site walkover, it was observed that the existing ditch depth varies between 0.6m and 0.9m below ground level and is heavily overgrown.

Due to the existing watercourse being heavily overgrown no pipe outlet was identified, however it was confirmed that the existing watercourse continuous along the access road towards to the Brighton Road where it connects with the existing pond as per the sketch below. The existing pond overtops towards to the south into a shallow ditch.





The treated effluent is to be discharged through a treatment plant into the existing watercourse, see drainage plan extract below. An Environmental Permit (standard rules permit) will be arranged due to the proposed discharge location being within 50 meters of another exempt small sewage discharge.



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WATER AUTHORITY

DESIGN SUBJECT TO THE CONFIRMATION OF:
EXTERNAL LEVELS DESIGN BY OTHERS
LOCATION AND DEPTH OF EXISTING UTILITIES

Site Specific Notes

- Proposed SW drainage designed based on desktop study available BGS Historical Borehole Logs.
- Proposed soakaway and permeable block paving designed to recorded infiltration rate $1.69 \times 10^{-6} \text{ m/s}$.
- A preliminary onsite BRE365 infiltration test was undertaken to a total depth of 1.2m BGL and identified site being underlain by soils with moderate potential for infiltration. Infiltration rate of $1.69 \times 10^{-6} \text{ m/s}$ was calculated and adopted for drainage design. No groundwater was identified at the time of infiltration testing.
- Surface water drainage has been designed to cater for the Critical 1 in 100 year + 45% climate change event.
- Proposed external levels as taken from topographical survey. External levels to be designed by others.
- The proposed *CL and IL inspection chambers final levels to be designed during detail design and are shown indicatively only- for drainage purposes only.
- Foul water is to be discharged into the existing public foul sewers. Connection is subject to s106 approval.

Proposed Treatment Plant:
Marsh Ensign Ultra (Model 10) with pumped outlet
(max. population of 10)
Pumped discharge - 1.9l/s
D:2.6m x W:1.65m x H:1.935m
CL 100.73
Inlet IL 99.870
Outlet IL 99.795 subject to manufacturer specification

Treated effluent to be discharged into the existing watercourse. Final type and size to be confirmed by the manufacturer.

PP1
Permeable Paving with Porous Sub-base
Infiltration
• 50mm Gravel Filled EcoGrid reinforcement system
• 40mm Laying Course
• Geotextile
• 350mm 5/20mm Clean stone with min 30% void ratio
• Geotextile
Designed to recorded infiltration rate of $1.69 \times 10^{-6} \text{ m/s}$

STANDARD DRAINAGE NOTES

- DO NOT SCALE FROM THIS DRAWING, REFER TO FIGURED DIMENSIONS ONLY. THE CONTRACTOR SHOULD CHECK ALL DIMENSIONS ON SITE.
- ALL DIMENSIONS IN MILLIMETRES AND ALL LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECT AND ENGINEERING DETAILS, DRAWINGS AND SPECIFICATIONS.
- ANY DISCREPANCIES SHOULD BE REPORTED TO THE ARCHITECT AND/OR ENGINEER IMMEDIATELY, SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO THE COMMENCEMENT OF WORK.
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- COVER LEVELS SHOWN ARE APPROXIMATE. COVERS AND FRAMES SHALL BE SET TO FINISHED GROUND LEVELS AND FALLS.
- ALL UN-REFERENCED PIPES ARE TO BE 100mm DIA
- ALL PIPES TO BE ADOPTED, OR CONNECTING TO ADOPTED SEWERS, TO BE VITRIFIED CLAY TO BS EN 285 AND BS85 (SWS ONLY), OR CONCRETE PIPES TO BE EN 1916 AND BS5911-PART 1.
- ROAD GULLY OUTLET PIPES ARE TO BE 150mm DIA. WITH CONCRETE SURROUND AND FLEXIBLE JOINTS. ALL GULLIES SHALL BE FITTED WITH GRADE D400 GRATINGS AND FRAMES TO BS EN124, UNLESS OTHERWISE STATED.
- ALL ADOPTABLE SEWERS SHALL BE CONSTRUCTED TO THE STANDARDS AND SPECIFICATION LAID DOWN IN INSTRUCTIONS FOR ADOPTION 6th EDITION, WITH A VIEW TO ADOPTION UPON COMPLETION OF WORKS.
- ALL PRIVATE DRAINAGE TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS APPROVED DOCUMENT PART-H, AND TO THE SATISFACTION OF THE BUILDING CONTROL INSPECTOR.
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- NO PRIVATE AREAS ARE TO DRAIN ONTO ADOPTABLE AREAS AND VICE VERSA.
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- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONFIRM THE LOCATION AND DEPTH OF ALL EXISTING SERVICES AND UTILITIES THAT MAY BE PRESENT
- UPON COMPLETION BUT PRIOR TO HANDOVER, CONTRACTOR TO CARRY OUT FULL CCTV SURVEY OF DRAINAGE SYSTEM WHICH IS TO BE REVIEWED BY ENGINEER TO ENSURE SATISFACTORY INSTALLATION
- MANHOLE AND CHAMBER COVER GRADES:

- 'A15' IN ALL LANDSCAPED AREAS AND ON FOOTPATHS
- 'B125' IN ALL DRIVEWAYS
- 'C250' IN PRIVATE PARKING AREAS
- 'D400' IN CARRIAGEWAY/ACCESS ROAD

DRAINAGE LEGEND

PROPOSED FEATURES

- FWD Foul Drainage
- Foul Rising Main
- SWD Surface Water Drainage
- Rainwater pipe
- Storm water access chamber (3000)
- Storm water inspection chamber (4500)
- Storm water catchpit chamber (4500)
- Storm water rodding eye
- Extent of permeable paving with porous sub-base
- Soil stack (type TBC by architect/m&e engineer)
- Foul water access chamber (3000)
- Foul water inspection chamber (4500)
- Proposed Bio-Retention units
- Proposed FFL and external ground levels proposed based on the datum levels provided from site by others.
- Pipe info - diameter, length, gradient, bedding type

ABBREVIATIONS

- MH - MANHOLE
- IC - INSPECTION CHAMBER
- AC - ACCESS CHAMBER
- CP - CATCHPIT
- BC - BRAKE CHAMBER
- RE - RODDING EYE
- IL - INVERT LEVEL
- SL - SUMP LEVEL
- RA - RESTRICTED ACCESS COVER
- CL - COVER LEVEL
- TL - TOP OF CELLULAR SA
- BL - BASE OF CELLULAR SA
- FL - FORMATION LEVEL

Proposed surface level (Assumed)

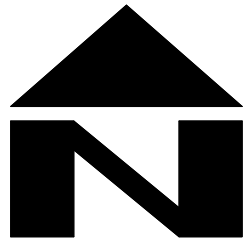
PRELIMINARY

Prefixed to drawing numbers shall signify the following:-

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P2	07.11.24	UPDATED TO CLIENT COMMENTS	KCK	TZ	CS
P1	16.10.24	UPDATED TO LLFA COMMENTS	KCK	TZ	CS
P.	09.04.24	PRELIMINARY ISSUE	KCK	TZ	CS
REV	DATE	DESCRIPTION	BY	CHK	APP

cgs civils Consulting Civil Engineers							
CLIENT	ISABELLA MEARS						
ARCHITECT	TDA						
JOB TITLE	HIGHFIELDS, WARNINGLID RH17 5SY						
DRAWING TITLE	PROPOSED DRAINAGE STRATEGY SHEET 1						
DRAWN	KCK	ENGINEER	TZ	CHECKED	CS	APPROVED	CS
DATE	APRIL 2024		SCALE @ A1	1:100			
JOB No.	C3104	STATUS	P	DRAWING No.	101	REV.	P2



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Based on the site walkover and information provided by the client, it has been confirmed that the existing watercourse follows its historical route, ultimately discharging into an existing pond located to the west of the site. The pond, when reaching capacity, overtops into a shallow ditch that subsequently flows southward.



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P2	07.11.24	UPDATED TO CLIENT COMMENTS	KCK	TZ	CS
P	31.10.24	PRELIMINARY ISSUE		TZ	CS CS
REV	DATE	DESCRIPTION	BY	CHK	APP

Consulting Civil Engineers

CLIENT

ISABELLA MEARS

ARCHITECT

TDA

JOB TITLE

HIGHFIELDS, WARNINGLID
RH17 5SY

DRAWING TITLE

PROPOSED DRAINAGE
STRATEGY SHEET 2

DRAWN

TZ

ENGINEER

TZ

CHECKED

CS

APPROVED

CS

DATE

OCTOBER 2024

SCALE @ A1

1:100

JOB No.

C3104

STATUS

PL

DRAWING No.

102

REV.

P1

PRELIMINARY



Job: Highfields, Warninglid - Test 1

Infiltration Calculator

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

V_{p75-25} = Effective storage volume between 75% and 25% effective depth

a_{p50} = Internal surface area of the trial pit up to 50% effective depth and including the base area

t_{p75-25} = The time for the water level to fall from 75% to 25% effective depth

f = Infiltration rate

Trial pit width	=	0.3
Trial pit depth	=	0.9
Trial pit length	=	1.2

a_{p50} =

1.71

 m/squared

t_{p75-25} =

4150

 seconds

V_{p75-25} =

0.162

 m/cubed

F =

2.28E-05



Job: Highfields, Warninglid - Test 2

Infiltration Calculator

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

V_{p75-25} = Effective storage volume between 75% and 25% effective depth

a_{p50} = Internal surface area of the trial pit up to 50% effective depth and including the base area

t_{p75-25} = The time for the water level to fall from 75% to 25% effective depth

f = Infiltration rate

Trial pit width	=	0.3
Trial pit depth	=	0.9
Trial pit length	=	1.2

a_{p50} =

1.71

 m/squared

t_{p75-25} =

4750

 seconds

V_{p75-25} =

0.162

 m/cubed

F =

1.99E-05



Job: Highfields, Warninglid - Test 3

Infiltration Calculator

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

V_{p75-25} = Effective storage volume between 75% and 25% effective depth

a_{p50} = Internal surface area of the trial pit up to 50% effective depth and including the base area

t_{p75-25} = The time for the water level to fall from 75% to 25% effective depth

f = Infiltration rate

Trial pit width	=	0.3
Trial pit depth	=	0.9
Trial pit length	=	1.2

a_{p50} =

1.71

 m/squared

t_{p75-25} =

5595

 seconds

V_{p75-25} =

0.162

 m/cubed

F =

1.69E-05

Design Settings

Rainfall Methodology	FEH-22	Maximum Time of Concentration (mins)	30.00	Preferred Cover Depth (m)	1.200
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0	Include Intermediate Ground	✓
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00	Enforce best practice design rules	✓
CV	1.000	Connection Type	Level Soffits		
Time of Entry (mins)	4.00	Minimum Backdrop Height (m)	0.200		

Nodes

Name	Area (ha)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
SA	0.012	9.800	450	1594.087	-1046.451	1.300

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Additional Storage (m³/ha)	0.0
Summer CV	1.000	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	1.000	Drain Down Time (mins)	240	Check Discharge Volume	x

Storm Durations

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

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
10	0	0	0	100	0	0	0
30	0	0	0	100	45	0	0
30	40	0	0				

Node SA Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00720	Porosity	0.95	Pit Width (m)	5.000	Inf Depth (m)	
Side Inf Coefficient (m/hr)	0.06084	Invert Level (m)	8.500	Pit Length (m)	3.000	Number Required	1
Safety Factor	1.5	Time to half empty (mins)	1031	Depth (m)	0.800		



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

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute summer	SA	690	8.842	0.342	0.5	4.9325	0.0000	OK
Link Event (Upstream Depth)		US Node	Link	Outflow (l/s)				
720 minute summer		SA	Infiltration	0.1				



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

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute summer	SA	720	8.907	0.407	0.7	5.8586	0.0000	OK
Link Event (Upstream Depth)		US Node	Link	Outflow (l/s)				
720 minute summer		SA	Infiltration	0.1				



Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	SA	960	9.099	0.599	0.6	8.6352	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)
1440 minute summer	SA	Infiltration	0.1



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

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute winter	SA	705	9.008	0.508	0.5	7.3239	0.0000	OK
Link Event (Upstream Depth)		US Node	Link	Outflow (l/s)				
960 minute winter		SA	Infiltration	0.1				



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

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute summer	SA	705	9.254	0.754	1.0	10.8656	0.0000	OK
Link Event (Upstream Depth)		US Node	Link	Outflow (l/s)				
960 minute summer		SA	Infiltration	0.2				