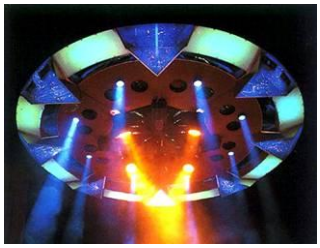


williamsaunders

architecture : engineering : building consultancy

PROPOSED RESIDENTIAL DEVELOPMENT,
SITE OFF POSTLAND ROAD, CROWLAND, PETERBOROUGH

SEAGATE HOMES (UK) LTD

DRAINAGE STATEMENT

12899-WMS-ZZ-XX-T-C-39201-S8-P4

MARCH 2025

DOCUMENT CONTROL

williamsaunders
architecture : engineering : building consultancy

The Kiln
Mather Road
Newark on Trent
Nottinghamshire NG24 1FB

Tel: 01636 704361
W: wm-saunders.co.uk

Contract: Proposed Residential Development, Site off Postland Road, Crowland, Peterborough

Document Title: Drainage Statement

Our Ref: 12899-WMS-ZZ-XX-T-C-39201-S8-P4-DRAINAGE_STATEMENT

Prepared by: Jake Ward BEng (Hons) GMICE **Date:** March 2025

RECORD OF AMENDMENTS TO DOCUMENT

Ref	Description	Date
P1	Planning Issue	31/03/2025
P2	Updated to suit revised site plan	09/05/2025
P3	Arch's site plan updated – Plot 6	07/11/2025
P4	3.6 - FFL's raised to 2.6m AOD, drawing updated	16/12/2025

Verified by: P.A.Eagles **Date:** 16/12/2025

C O N T E N T S

APPENDICES

williamsaunders

1.0 INTRODUCTION

William Saunders have been commissioned by Seagate Homes (UK) Ltd to prepare a Drainage Statement for the proposed residential development at land off Postland Road, Crowland. The document is to support a planning application for the development.

2.0 PROPOSED DEVELOPMENT

2.1 SITE LOCATION AND DESCRIPTION

The site is situated in Crowland, which is a town in the South Holland district of Lincolnshire. The National Grid Reference for the site is 524756E, 310887N. The centre of Crowland is approx. 1km from the site. The centre of Peterborough is approx. 14km from the site.

Access to the site is gained from a private road off Postland Road, south of the site. A location plan is shown at Figure 1.

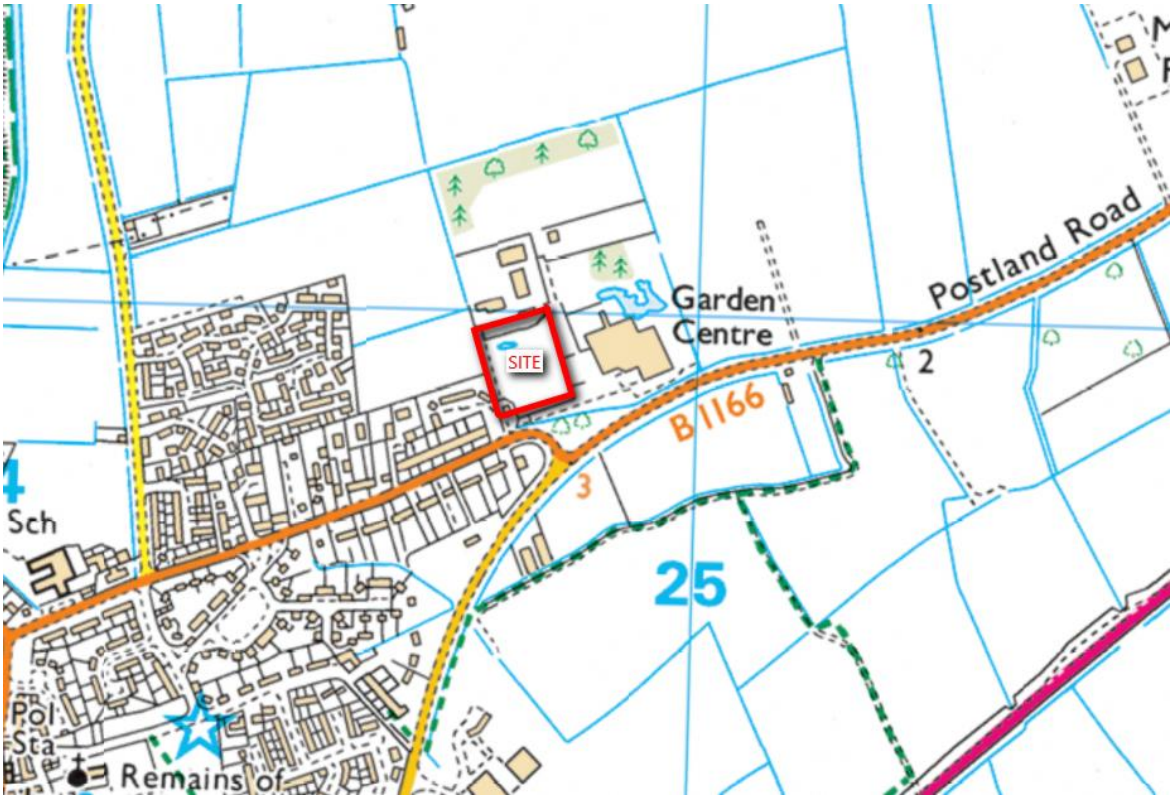


Figure 1

The site comprising, of greenfield land is situated northeast of the centre of Crowland and to the north of Postland Road.

The site lies at a level of approximately 0.65m – 2.3m AOD, is generally level and has an approximate area of 1.226 hectares. There is an existing stockpile of material within the site approximately 2.0m in height. A topographical survey drawing is included in Appendix A.

The site lies within the North Level IDB catchment area.

An existing riparian owned watercourse is located to the south of the site. The existing North Level IDB watercourse known as Brickfield Drain is located approximately 250m north of the site.

The proposed development is located within EA Flood Zone 3 identified as having a high probability of flooding from rivers and sea. A detailed Flood Risk Assessment has been undertaken by others. A copy of the EA Flood Risk Maps are included in Appendix B.

2.2 DEVELOPMENT PROPOSALS

The proposed scheme consists of a development of 9 residential dwellings with an access road and associated infrastructure. A proposed site layout can be seen in Appendix C.

3.0 DRAINAGE STRATEGY

3.1 FOUL DRAINAGE

An existing Anglian Water foul sewer is located to the south of the site, within Postland Road. A connection will be made to the sewer subject to a S106 connection approval. A copy of the AW sewer records is included at Appendix D.

It is proposed to provide a gravity private foul drainage system with a connection via a new manhole to the existing Anglian Water foul sewer. Due to the shallow depth of the existing sewer a private package pumping station will be required. The connection will be subject to Anglian Water approval.

3.2 SURFACE WATER DRAINAGE

In accordance with requirement H3 of the Building Regulations 2000 all possible options for disposal of surface water have been considered using the preferred hierarchy i.e.

- Soakaways
- Infiltration
- Watercourse
- Sewer

3.3 DISCHARGE TO SOAKAWAYS/INFILTRATION

Although ground investigation works have not been undertaken to determine ground conditions, evidence found from information available on the British Geological Survey GeoIndex mapping system indicates conditions being unsuitable for infiltration techniques. Bedrock geology is described as mudstone of the Oxford Clay Formation and superficial deposits being Tidal Flat Deposits consisting of clay and silt.

Due to the clay type ground conditions infiltration rates are assumed to be unsuitable for soakaways and other infiltration techniques for disposing of surface water.

3.4 DISCHARGE TO WATERCOURSE

An existing watercourse is located to the south of the site. An existing North Level IDB watercourse known as Brickfield Drain is located 250m north of the site. A copy of the IDB records is included in Appendix E.

The HR Wallingford online Greenfield Runoff Rate Estimation tool calculates the greenfield run off rates for the 1.22 ha site as follows:

- Q_{BAR} – 1.69 l/s
- 1 in 1 yr – 1.47 l/s
- 1 in 30 yr – 4.14 l/s
- 1 in 100 yr – 6.02 l/s
- 1 in 200 yr – 7.12 l/s

Where QBAR is less than 2.0l/s/ha then the limiting discharge rates are recommended to be set set at 2.0l/s/ha which results in a restricted discharge of 2.4 l/s.

The final agreed restricted discharge rate will be subject to IDB approval through a Land Drainage Consent application.

The calculated attenuation volumes (utilising Site 3D Quick Storage Estimate) for the proposed 2.4 l/s restricted discharge rate are:

30-year return period => 137m^3
100-year return period (+40% climate change) => 330m^3

A copy of the Quick Storage Estimate calculations and Greenfield Runoff calculations are included within Appendix F.

It is proposed to provide attenuation using permeable paving within the main access road and private parking areas. This will provide sufficient attenuation volumes to accommodate the 1 in year 30 year storm events, and the 100-year (+40% climate change) storm events.

The permeable paving will assist in improving water quality by removing pollutants from urban run-off at source.

The final discharge to the IDB watercourse will be restricted to agreed rate using a vortex control device located in the final downstream manhole of the surface water drainage system.

The proposed drainage layout is included within Appendix G and Site3D Simulation Calculations for the proposed surface water drainage network are included within Appendix H.

3.5 DISCHARGE TO SEWER

This option has not been considered.

3.6 DRAINAGE STRATEGY REQUIREMENTS

To reduce the runoff from the developed site to greenfield runoff rates and accommodate future climate change, the detailed design of the surface water drainage system will need to include the following: -

- Drain/Sewer Networks
  - Suitably sized drains to convey surface water flows to the point of discharge into the adjacent watercourse.
- Attenuation
  - Suitably sized attenuation in the form of permeable paving, designed to provide the required storage volume necessary with an allowance for climate change to prevent flooding at the surface.

- Flood Flow Routes
  - To address the residual risks of surface water flows and potential infrastructure failure, flow routes for such waters should be analysed and demonstrated to not present a hazard to the development or adjacent properties.

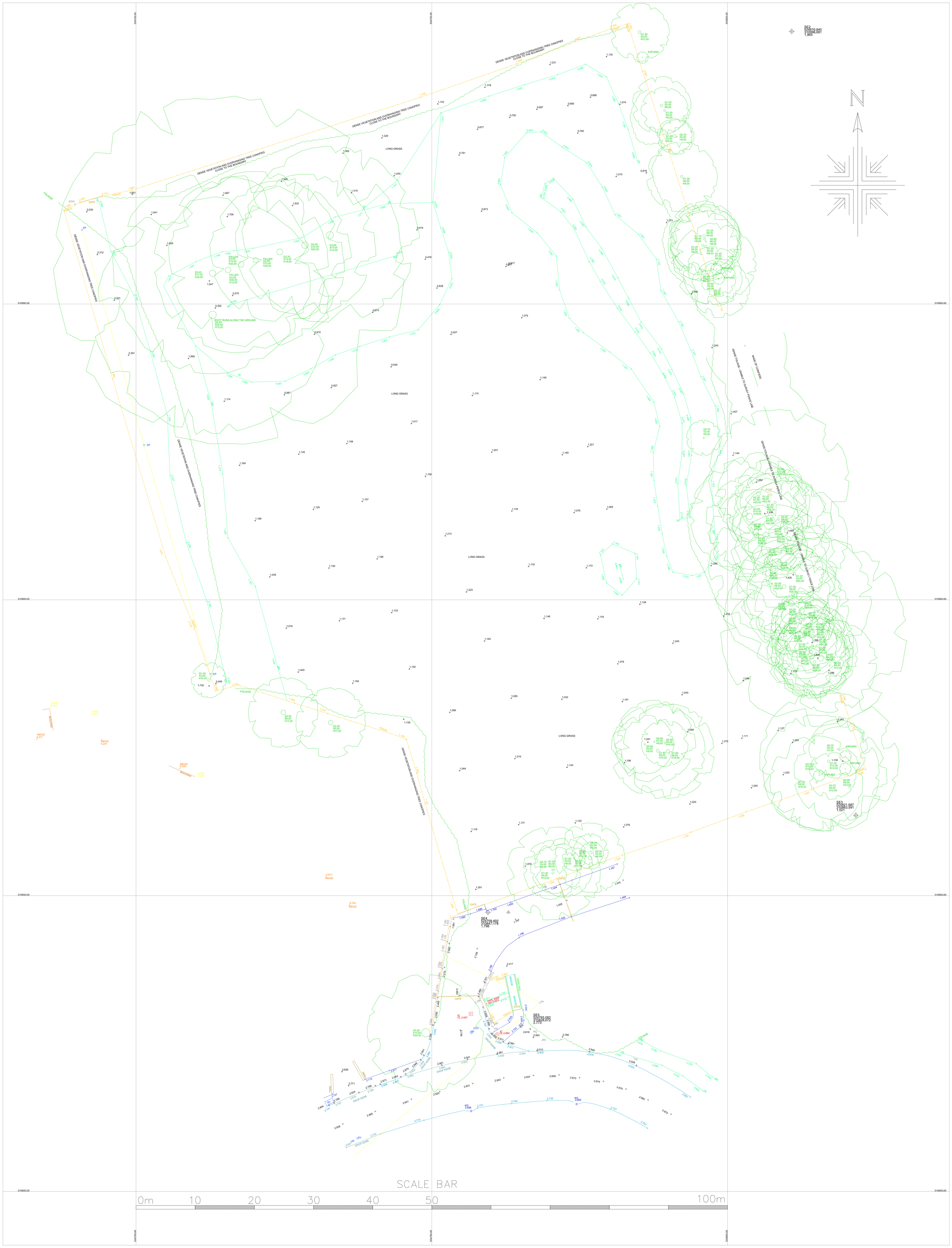
- Floor Levels
  - Adjacent to flood flow routes and open surface drainage features, floor levels should be set to minimise the flood risk. The Flood Risk Assessment requires FFL's to be a minimum of 1.5m above existing ground levels (equivalent to 2.6m AOD). However, it should be noted that the final foul and surface water drainage design will require levels higher than this to achieve a gravity discharge and sufficient cover to the piped systems.

4.0 CONCLUSIONS

- Areas of the proposed development are at risk of flooding from rivers and sea. Refer to separate Flood Risk Assessment by others.
- The development will generate quantities of surface water runoff which could pose flood risk to the development itself or to its neighbours unless appropriate design and management measures are taken.
- The surface water runoff generated by the proposed development will be managed in a manner which will ensure no risk of flooding or increased risk to surrounding properties, at present and considering allowances for future climate change.
- The residual risks from surface water and infrastructure failure will be addressed by consideration of flood flow routes through the development.
- Existing ground conditions are not considered suitable for infiltration techniques for the disposal of surface water.
- Surface water drainage shall be discharged to the existing watercourse south of the site at a restricted discharge rate to be agreed with the IDB.
- Attenuation will be provided in the form of permeable paving which will also assist in improving water quality.
- Foul water drainage will be discharged to the Anglian Water foul sewer system to the south of the site.

APPENDIX A

Topographical Survey



JOB TITLE **TOPOGRAPHIC SURVEY OF THE LAND OFF JAMES ROAD, CROWLAND**	**SE REF** SE1401-1	**DRAWN BY** AR
CLIENT **SEAGATE HOMES**	**SHEET SIZE & SCALE** A0 @ 1:200	**DATE OF SURVEY** JUNE 2024
	LATEST REVISIONS AND DETAILS	

SE Surveys LIMITED

SURVEYED EXTENTS SUCH AS FENCELINES, WALLS AND HEDGES ETC DO NOT REPRESENT A LEGAL BOUNDARY OR LEGAL OWNERSHIP AND FURTHER ADVICE SHOULD BE SOUGHT IN THIS MATTER.

SURVEYED DATA IS A RESULT OF MEASUREMENTS TO EXISTING FEATURES AT THE TIME OF THE SURVEY. SURVEY DATA SHOWN IS ALSO DEPENDANT ON THE CLIENTS SPECIFICATION.

AREAS OF VEGETATION OR HEAVY TRAFFIC MAY CAUSE DETAIL TO BE MISSED.

MANHOLE CHAMBERS WILL NOT BE INSPECTED IF THERE IS A RISK TO PUBLIC OR ANY STAFF MEMBERS. CRACKED COVERS AND THOSE THAT DO NOT LIFT WITH REASONABLE FORCE WILL NOT BE LIFTED. CHAMBERS, PIPES AND FLOWS ARE MEASURED ABOVE GROUND ANSD SHOULD BE CHECKED PRIOR TO ANY CONSTRUCTION/ALTERATIONS.

DRAWING UNITS, LEVELS AND DIMENSIONS ARE SHOWN IN METRES.

THE DATA USED FOR THE HORIZONTAL AND VERTICAL CONTROL FOR THIS SURVEY HAS BEEN RECORDED USING OUR SURVEY GRADE GNSS RECIEVERS. THIS DATA WAS PROVIDED BY TRIMBLE VRS CORRECTION SERVICE AND PRIMARY SURVEY CONTROL IS BASED ON OSGB36(15)

THIS SURVEY HAS A SCALE FACTOR OF 1 APPLIED AND HAS BEEN BASED ON SE1 AND REFERENCED TO SE2. THEREFORE THIS GRID SHOULD BE TREATED AS ARBITRARY.

PLOTTING ON PAPER MAY LEAD TO ERRORS AND SCALING RISKS. PLEASE DO NOT SCALE FROM THIS DRAWING.

ALL DIMENSIONS SHOULD BE CHECKED ON SITE PRIOR TO CONSTRUCTION.

THIS DRAWING IS TO BE USED FOR IT'S ORIGINAL PURPOSE ONLY, NO RESPONSIBILITY WILL BE ACCEPTED IF THIS IS SUPPLIED TO ANY OTHER PARTY OTHER THAN THE ORIGINAL CLIENT.

ANY DISCREPENCIES NOTICED ON SITE, SHOULD BE REPORTED IMMEDIATELY AND WORK SHOULD BE PAUSED ON SITE.

APPENDIX B

EA Flood Risk Maps

Flood map for planning

Your reference	Location (easting/northing)	Created
<Unspecified>	**524759/310926**	**5 Mar 2025 9:44**

Your selected location is in flood zone 3
– an area with a high probability of flooding.

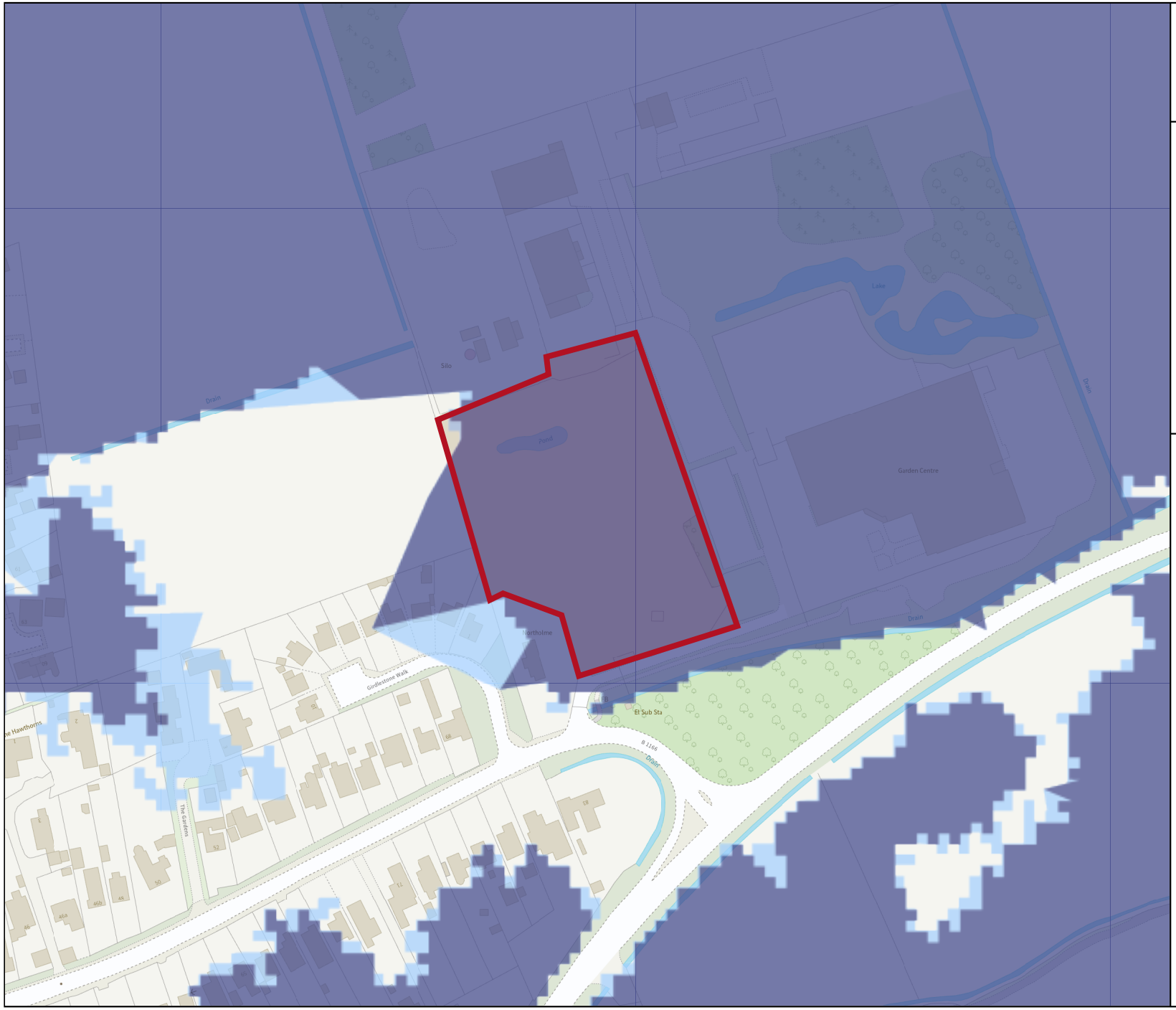
This means:

- you may need to complete a flood risk assessment for development in this area
- you should ask the Environment Agency about the level of flood protection at your location and request a Flood Defence Breach Hazard Map (You can email the Environment Agency at: enquiries@environment-agency.gov.uk)
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (find out more at www.gov.uk/guidance/flood-risk-assessment-standing-advice)

Notes

The flood map for planning shows river and sea flooding data only. It doesn’t include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.



Environment Agency

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
524759/310926

Scale
1:2500

Created
5 Mar 2025 9:44

- Selected area
- Flood zone 3
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Water storage area

0 20 40 60m

APPENDIX C

Proposed Site Layout

POSTLAND ROAD, CROWLAND

N

NOTES:

All dimensions to be checked on site prior to construction or off-site fabrication by the Contractor, his Sub-contractor or Supplier.

Do not scale plans - use figure or grid dimensions where given. Any deviation from the drawing is to be reported to the originator immediately.

IF IN DOUBT ASK !

Key

- Boundary
- Proposed Housing
- Existing Surrounding Buildings
- Private Rear/Front Garden Areas
- Principal Highway / Road
- Private Drives & Car Parking Spaces
- Footpaths
- Housetypes - Point of Access
- Primary Site Access
- Existing Retained Trees & Hedges
- Proposed Tree & Hedge Planting

AS Housetype plotted as per design sheets

OPP Housetype plotted opposite handing to design sheets

BCP Bin Collection Point

Rev	Notes	Date	By
B	- Bin Collection Points updated - Landscaping amended - Plot 6 position amended	05.11.25	DL
A	- AS & OPP handings added to dwellings - Bin Collection Points added - Footpath link added to site entrance	12.08.25	DL

SEAGATE HOMES

Project:
PROPOSED RESIDENTIAL DEVELOPMENT
AT POSTLAND ROAD, CROWLAND

Drawing:
SITE LAYOUT

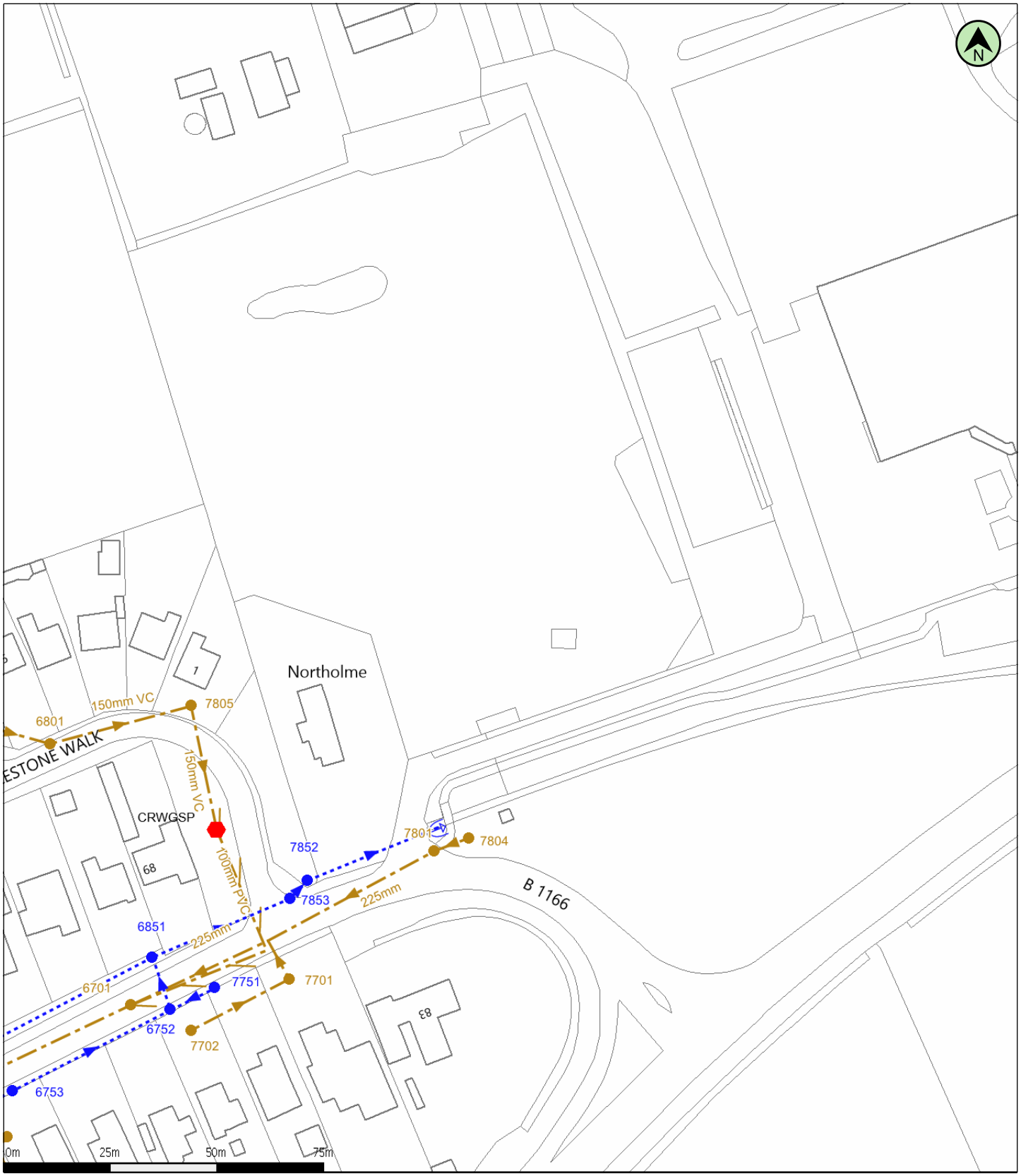
Drawn: DL
Date: 16.04.25

Status: PLANNING
Scale: 1:500 @ A2

Drawing Number: PRC-SH-SL-AR-1001
Revision: B

APPENDIX D

Anglian Water Records and Correspondence



Scale: 1:1250

Date: 20/11/24

Wastewater Plan A4

Data updated: 31/10/24

Map Centre: 524779,310887

Our Ref: 1624344 - 2

Powered by digdat

Foul Sewer
Surface Sewer
Combined Sewer
Final Effluent
Rising Main*
Private Sewer*
Decommissioned Sewer*

Outfall*
Inlet*
Manhole*

Sewage Treatment Works

Public Pumping Station

Decomissioned Pumping Station

*(Colour denotes effluent type)

lee.russell01@btinternet.com

postland road

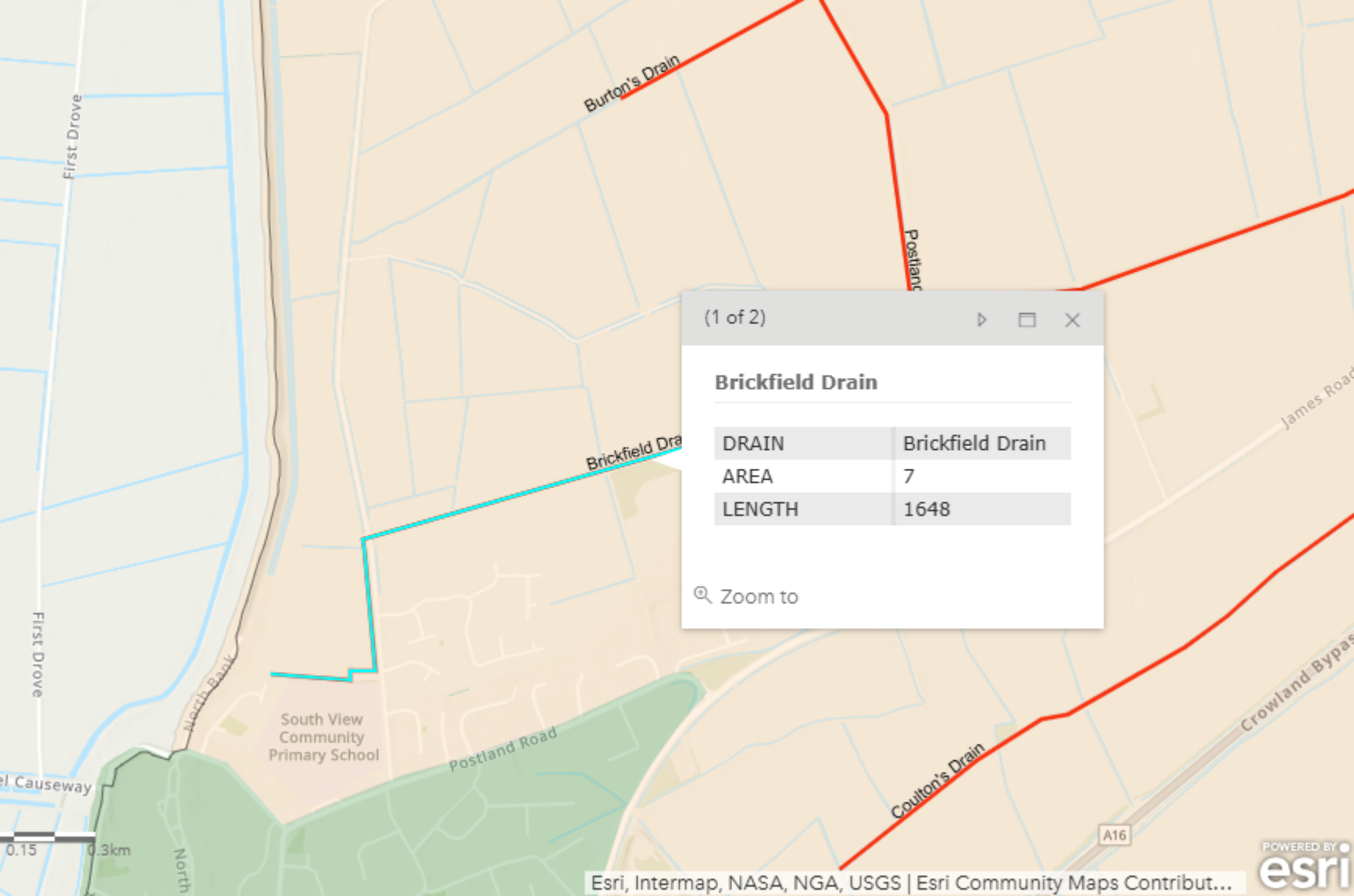
postland road

love every drop anglianwater

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
6701	F	2.753	0.673	2.08
6703	F	-	-	-
6801	F	2.021	0.661	1.36
7701	F	-	-	-
7702	F	-	-	-
7801	F	2.778	1.078	1.7
7804	F	-	-	-
7805	F	1.994	0.454	1.54
6752	S	2.781	1.27	1.511
6753	S	2.778	1.37	1.408
6851	S	2.865	0.94	1.925
7751	S	-	-	-
7852	S	2.744	0.82	1.924
7853	S	2.698	0.93	1.768

APPENDIX E

IDB Records and Correspondence


Burton's Drain
First Drove
Brickfield Drain
(1 of 2)
Brickfield Drain
DRAIN Brickfield Drain
AREA 7
LENGTH 1648
Zoom to
James Road
Crowland Bypass
Coulton's Drain
A16
South View Community Primary School
Postland Road
North Bank
First Drove
Causeway
0.15
0.3km
Esri, Intermap, NASA, NGA, USGS | Esri Community Maps Contribut...
POWERED BY esri

Paul Eagles

From: Huw Sharman <hs@northlevelidb.org>
Sent: 09 May 2025 11:36
To: Paul Eagles
Subject: Re: Site off Postland Road, Crowland - 12899

Good Morning Paul,

Apologies for the delay.

The discharge rate would appear to be acceptable, but we would need to check the connectivity and current state of the riparian water leading to the Boards System.

As mentioned, any discharge would require consent for the board and be subject to a development levy.

Kind regards

Huw Sharman

Technical Engineer

North Level District Internal Drainage Board

Drainage Office, Station Road, Thorney, Peterborough, PE6 0QE

Tel 01733 270333 | Fax 01733 270231

website | email | twitter

From: Paul Eagles <paul.eagles@wm-saunders.co.uk>
Sent: 09 May 2025 09:31
To: Enquiries <enquiries@northlevelidb.org>
Subject: FW: Site off Postland Road, Crowland - 12899

williamsaunders **architecture : engineering : building consultancy**

Further to below it would appear the email address was incorrect on the original email. I would be grateful if you could advise on the original request.

Regards,

Paul Eagles BEng MCIHT
Associate

William Saunders
The Kiln,
Mather Road,
Newark,
Notts.
NG24 1FB

Tel. 01636 704361
Mobile 07921 924 010

Web site. www.wm-saunders.co.uk

Follow us on

Consider the environment. Please don't print this e-mail unless you really need to.

From: Paul Eagles
Sent: 28 March 2025 17:33
To: 'enq@northlevelidb.org' <enq@northlevelidb.org>
Cc: Lee Russell <Lee.Russell@seagatehomes.co.uk>; Mark.Dennis@seagatehomes.co.uk; Jake Ward <Jake.Ward@wm-saunders.co.uk>
Subject: Site off Postland Road, Crowland - 12899

Dear Sirs,

Our Client is soon to submit a planning application to the LPA for a proposed residential development of 9 plots.

We are preparing a drainage strategy to be submitted to the LPA which proposes to discharge surface water from the site to an existing watercourse south of the site at a rate of 2.4 l/s (2.0 l/s/ha). Although this is not an IDB watercourse I believe it connects to the Brickfield Drain.

I would be grateful if you could confirm that this is an acceptable discharge rate although I appreciate that this will be subject to a land drainage consent application in the future as and when planning permission is granted and the development progresses.

Regards,

Paul Eagles BEng MCIHT
Associate

APPENDIX F

Greenfield Runoff Estimation and Quick Storage Estimate Calculations

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Paul Eagles
Site name:	Postland Road
Site location:	

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	52.68213° N
Longitude:	0.15557° W
Reference:	2927447849
Date:	Mar 05 2025 15:22

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):	1.22

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	2	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.3	0.3

Hydrological characteristics

	Default	Edited
SAAR (mm):	554	554
Hydrological region:	5	5
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	2.45	2.45
Growth curve factor 100 years:	3.56	3.56
Growth curve factor 200 years:	4.21	4.21

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

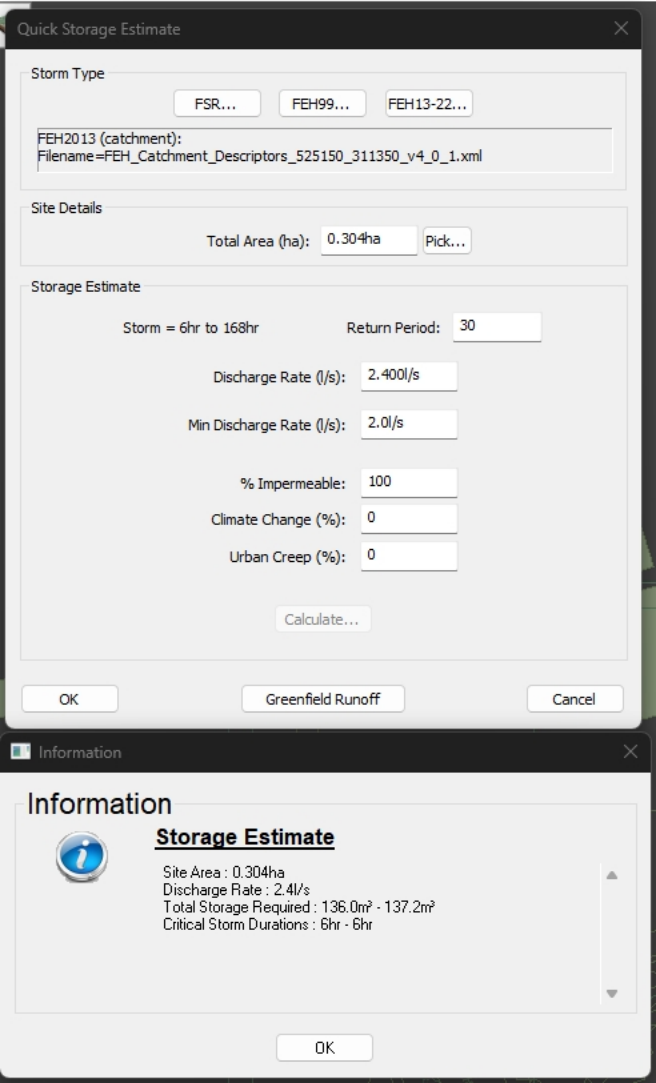
(3) Is SPR/SPRHOST ≤ 0.3?

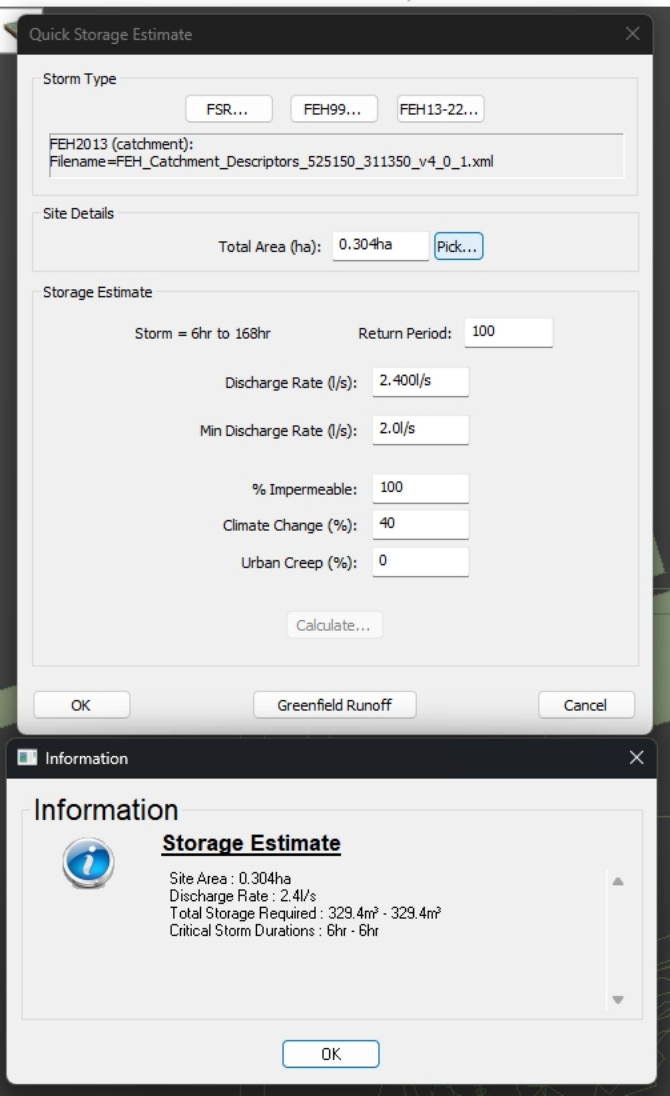
Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited

Q_{BAR} (l/s):	1.69	1.69
1 in 1 year (l/s):	1.47	1.47
1 in 30 years (l/s):	4.14	4.14
1 in 100 year (l/s):	6.02	6.02
1 in 200 years (l/s):	7.12	7.12


Quick Storage Estimate
Storm Type
FSR...
FEH99...
FEH13-22...
FEH2013 (catchment):
Filename=FEH_Catchment_Descriptors_525150_311350_v4_0_1.xml
Site Details
Total Area (ha):
0.304ha
Pick...
Storage Estimate
Storm = 6hr to 168hr
Return Period:
30
Discharge Rate (l/s):
2.400l/s
Min Discharge Rate (l/s):
2.0l/s
% Impermeable:
100
Climate Change (%):
0
Urban Creep (%):
0
Calculate...
OK
Greenfield Runoff
Cancel
Information
Information
Storage Estimate
Site Area : 0.304ha
Discharge Rate : 2.4l/s
Total Storage Required : 136.0m³ - 137.2m³
Critical Storm Durations : 6hr - 6hr
OK


Quick Storage Estimate
Storm Type
FSR...
FEH99...
FEH13-22...
FEH2013 (catchment):
Filename=FEH_Catchment_Descriptors_525150_311350_v4_0_1.xml
Site Details
Total Area (ha):
0.304ha
Pick...
Storage Estimate
Storm = 6hr to 168hr
Return Period:
100
Discharge Rate (l/s):
2.400l/s
Min Discharge Rate (l/s):
2.0l/s
% Impermeable:
100
Climate Change (%):
40
Urban Creep (%):
0
Calculate...
OK
Greenfield Runoff
Cancel
Information
Information
Storage Estimate
Site Area : 0.304ha
Discharge Rate : 2.4l/s
Total Storage Required : 329.4m³ - 329.4m³
Critical Storm Durations : 6hr - 6hr
OK

APPENDIX G

Drainage Layout

Key

- PS1 — Private Surface Water Drain
- PF1 — Private Foul Drain
- Proposed French Drain
- Existing Foul Sewer
- Existing Surface Water Sewer
- Proposed Channel Drain
- Proposed Permeable Paving

Drainage Strategy

Surface water is to discharge to an existing watercourse to the south of the site at a discharge rate of 2.4l/s (subject to IDB approval). Attenuation will be provided in the form of permeable paving, providing sufficient attenuation volumes for both 1 in 30 year storm events, and 1 in 100 year +40% climate change storm events.

Foul water is to discharge to an existing AW sewer in Postland Road. Due to the shallow depth of the existing AW sewer a pumping station will be required. The connection will be subject to AW S106 approval.

Proposed foul rising main

Proposed control chamber restricting discharge to 2.4l/s subject to IDB approval

Proposed ACO Channel Drain

Proposed private package pump station

Proposed restricted discharge of 2.4l/s subject to IDB approval

Foul connection via new manhole on existing AW sewer subject to S106 approval

Rev	Description	Drn	Vf'd	Date
P8	FFL's raised to 2.600m AOD - Flood Risk	PAE	~~Vf'd~~	16/12/25
P7	Architects layout revised - Plot 6	JW	PAE	07/11/25
P6	Foul sewage treatment plant omitted and private package pump station reinstated. French drains added to boundaries to collect any surface water run-off from raised site.	JW	PAE	29/10/25
P5	Foul sewage treatment plant added	JW	PAE	21/08/25
P4	ACO Channel drain relocated	JW	PAE	09/05/25
P3	Strategy revised to suit updated site plan	JW	PAE	06/05/25
P2	Strategy revised to suit updated site plan	JW	PAE	16/04/25
P1	Initial issue.	JW	PAE	28/03/25

As outlined in section 2.3 of the CITB Industry Guidance to Designers, insignificant risks can usually be ignored, as can risks arising from routine construction activities, unless the design compounds or significantly alters these risks. In accordance with CDM Regulations 8, 9 and 11, any significant risks relating to the design features shown on this drawing have been identified and are annotated thus: [!]

☒ No significant risks have been identified.

☐ Significant risks have been identified - refer to notes on drawing for information on residual risks and any control measures to be employed.

Refer to the current Designer's Risk Assessment sheets for further details.

Designer's Signature JW Date 03/25

Drawing Status: REGULATORY APPROVAL

williamsaunders
architecture: engineering: building consultancy
The Kiln,
Mather Road,
Newark-on-Trent,
Nottinghamshire. NG24 1FB.
Tel: 01636 704361
W: wm-saunders.co.uk

Also at Leeds and Lincoln.

Project: Residential Development, Postland Road, Crowland

Client: Seagate Homes (UK) Ltd

Title: Drainage Strategy

WmS Project Ref.	Drawn	Date	Scale
12899	JW	Mar 2025	1:250 @ A1

Drawing/Document Reference

Project	Originator	Zone	Level	Type	Role	Number	Status	Rev.
12899	WMS	ZZ	XX	D	C	39200	S8	P8

APPENDIX H

Hydraulic Calculations

Network Details

Manhole Schedule

Manhole	Catchment Area (ha)	Diameter (m)	Type	CL (m)	IL (m)	Depth To Soffit (m)	Easting (m)	Northing (m)
PP1	0.073	0.180	Type E	2.000	1.150	0.700	524759.017	310956.144
PP2	0.000	0.450	Type E	2.000	1.150	0.700	524755.372	310954.144
PP4	0.066	0.180	Type E	2.000	1.150	0.700	524747.784	310936.125
PP3	0.000	0.180	Type E	2.000	1.150	0.700	524748.938	310944.465
PP5	0.000	0.450	Type E	2.000	1.150	0.700	524751.795	310941.532
PP6	0.023	0.180	Type E	2.000	1.150	0.700	524761.781	310928.486
PP7	0.000	0.450	Type E	2.000	1.150	0.700	524759.760	310925.822
PP8	0.099	0.180	Type E	2.000	1.150	0.700	524767.873	310892.995
PP9	0.000	0.450	Type E	2.000	1.150	0.700	524771.354	310892.115
PP10	0.000	0.450	Type E	2.000	1.150	0.700	524771.867	310871.548
PP11	0.037	0.180	Type E	2.000	1.150	0.700	524764.421	310859.584
PS1	0.006	0.450	Type E	2.275	1.150	0.975	524761.727	310858.522
PS2	0.000	1.200	Type E	2.200	1.119	0.931	524761.544	310851.215
outfall	0.000	0.000	Type E	2.313	1.000	1.163	524767.061	310834.296

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (m)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
1.000	PP1	1.150	PP2	1.150	Circ	0.15mØ	4.158		0.600	0.700	0.700
1.001	PP2	1.150	PP5	1.150	Circ	0.15mØ	13.109		0.600	0.700	0.700
2.000	PP4	1.150	PP5	1.150	Circ	0.15mØ	6.732		0.600	0.700	0.700
3.000	PP3	1.150	PP5	1.150	Circ	0.15mØ	4.094		0.600	0.700	0.700
1.002	PP5	1.150	PP7	1.150	Circ	0.15mØ	17.614		0.600	0.700	0.700
4.000	PP6	1.150	PP7	1.150	Circ	0.15mØ	3.344		0.600	0.700	0.700
1.003	PP7	1.150	PP9	1.150	Circ	0.15mØ	35.646		0.600	0.700	0.700
5.000	PP8	1.150	PP9	1.150	Circ	0.15mØ	3.591		0.600	0.700	0.700
1.004	PP9	1.150	PP10	1.150	Circ	0.15mØ	20.573		0.600	0.700	0.700
1.005	PP10	1.150	PS1	1.150	Circ	0.15mØ	16.508		0.600	0.700	0.975
6.000	PP11	1.150	PS1	1.150	Circ	0.15mØ	2.896		0.600	0.700	0.975
1.006	PS1	1.150	PS2	1.119	Circ	0.225mØ	7.309	232.8	0.600	0.900	0.856
1.007	PS2	1.119	outfall	1.000	Circ	0.15mØ	17.795	150.0	0.600	0.931	1.163

Permeable Paving Schedule

Permeable Paving	Assigned Manhole	Effective Storage Volume (m3)	CL (m)	IL (m)	Storage Infil Rate (m/hr)	Safety Factor	Easting (m)	Northing (m)
Permeable Paving2	PP1	79.403	2.000	1.150	0.00000000	2.00	524758.117	310965.116
Permeable Paving1	PP4	87.935	2.000	1.150	0.00000000	2.00	524720.477	310931.646
Permeable Paving3	PP6	54.904	2.000	1.150	0.00000000	2.00	524761.294	310923.578
Permeable Paving4	PP8	94.760	2.000	1.150	0.00000000	2.00	524767.125	310900.400
Permeable Paving5	PP11	75.752	2.000	1.150	0.00000000	2.00	524774.144	310880.537

Outfall Details

Outfall Manhole outfall : Free Discharge

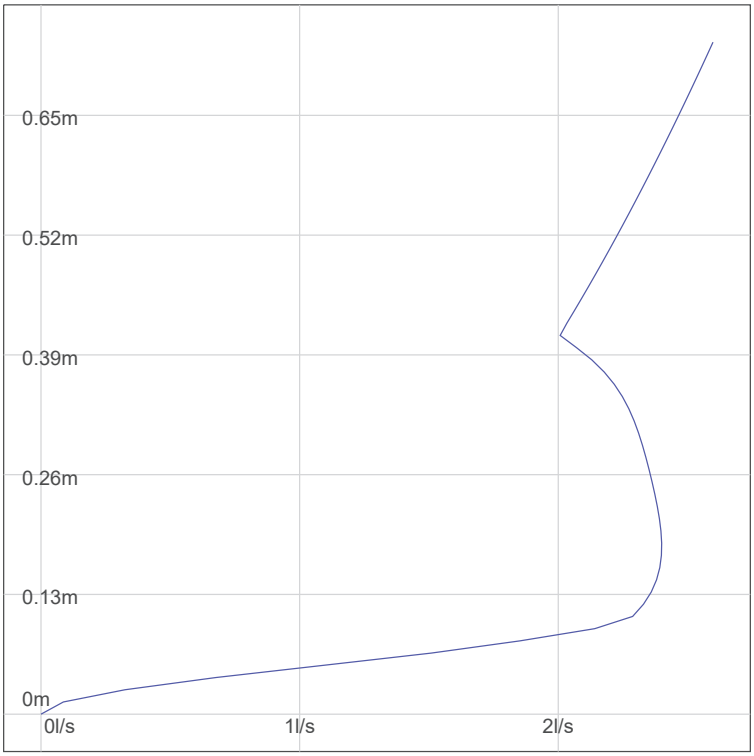
Flow Control Details

Controls within Manhole PS2

Hydro-Brake® Optimum Control at Manhole PS2

Model Ref	Design Depth (m)	Design Flow (l/s)	Depth Above Invert (m)	FF Head (m)	FF Flow (l/s)	KF Head (m)	KF Flow (l/s)
SHE-0079-2400-0614-2400	0.614	2.400	0.000	0.182	2.400	0.410	2.002

Hydro-Brake® Optimum Control at PS2



Simulation Settings

FEH2013 (catchment): Filename=FEH_Catchment_Descriptors_525150_311350_v4_0_1.xml

Summer (Cv: 0.75), Winter (Cv: 0.84)

Global Time of Entry: 5.0 mins

Durations (mins): 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080

Return Periods (yrs) + Climate Change: (1, +0%), (2, +0%), (30, +0%), (100, +40%)

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
1Yr 15Min Winter	13.200	0.00	0.40	30Yr 15Min Summer	92.732	0.00	0.41
1Yr 15Min Summer	13.200	0.00	0.39	30Yr 15Min Winter	92.732	0.00	0.41
1Yr 30Min Winter	8.343	0.00	0.45	30Yr 30Min Summer	59.841	0.00	0.40
1Yr 30Min Summer	8.343	0.00	0.44	30Yr 30Min Winter	59.841	0.00	0.40
1Yr 60Min Winter	5.143	0.00	0.46	30Yr 60Min Summer	36.650	0.00	0.41
1Yr 60Min Summer	5.143	0.00	0.46	30Yr 60Min Winter	36.650	0.00	0.42
1Yr 120Min Summer	4.357	0.00	0.44	30Yr 120Min Summer	23.416	0.00	0.42
1Yr 120Min Winter	4.357	0.00	0.43	30Yr 120Min Winter	23.416	0.00	0.47
1Yr 180Min Winter	3.760	0.00	0.37	30Yr 180Min Summer	17.874	0.00	0.40
1Yr 180Min Summer	3.760	0.00	0.38	30Yr 180Min Winter	17.874	0.00	0.45
1Yr 240Min Winter	3.121	0.00	0.33	30Yr 240Min Summer	14.442	0.00	0.34
1Yr 240Min Summer	3.121	0.00	0.34	30Yr 240Min Winter	14.442	0.00	0.39
1Yr 360Min Summer	2.429	0.00	0.28	30Yr 360Min Summer	10.614	0.00	0.23
1Yr 360Min Winter	2.429	0.00	0.27	30Yr 360Min Winter	10.614	0.00	0.26
1Yr 480Min Winter	2.011	0.00	0.22	30Yr 480Min Summer	8.457	0.00	0.17
1Yr 480Min Summer	2.011	0.00	0.23	30Yr 480Min Winter	8.457	0.00	0.18
1Yr 600Min Winter	1.706	0.00	0.20	30Yr 600Min Summer	7.022	0.00	0.12
1Yr 600Min Summer	1.706	0.00	0.20	30Yr 600Min Winter	7.022	0.00	0.13
1Yr 720Min Winter	1.479	0.00	0.17	30Yr 720Min Summer	5.999	0.00	0.09
1Yr 720Min Summer	1.479	0.00	0.18	30Yr 720Min Winter	5.999	0.00	0.09
1Yr 960Min Summer	1.191	0.00	0.15	30Yr 960Min Summer	4.668	0.00	0.06
1Yr 960Min Winter	1.191	0.00	0.14	30Yr 960Min Winter	4.668	0.00	0.06
1Yr 1440Min Summer	0.876	0.00	0.11	30Yr 1440Min Summer	3.248	0.00	0.04
1Yr 1440Min Winter	0.876	0.00	0.11	30Yr 1440Min Winter	3.248	0.00	0.04
1Yr 2160Min Summer	0.645	0.00	0.09	30Yr 2160Min Summer	2.249	0.00	0.03
1Yr 2160Min Winter	0.645	0.00	0.08	30Yr 2160Min Winter	2.249	0.00	0.02
1Yr 2880Min Winter	0.523	0.00	0.06	30Yr 2880Min Summer	1.734	0.00	0.02
1Yr 2880Min Summer	0.523	0.00	0.07	30Yr 2880Min Winter	1.734	0.00	0.02
1Yr 4320Min Summer	0.398	0.00	0.05	30Yr 4320Min Summer	1.207	0.00	0.02
1Yr 4320Min Winter	0.398	0.00	0.05	30Yr 4320Min Winter	1.207	0.00	0.01
1Yr 5760Min Summer	0.334	0.00	0.04	30Yr 5760Min Summer	0.938	0.00	0.01
1Yr 5760Min Winter	0.334	0.00	0.04	30Yr 5760Min Winter	0.938	0.00	0.01
1Yr 7200Min Winter	0.295	0.00	0.03	30Yr 7200Min Summer	0.776	0.00	0.01
1Yr 7200Min Summer	0.295	0.00	0.03	30Yr 7200Min Winter	0.776	0.00	0.01
1Yr 8640Min Summer	0.267	0.00	0.03	30Yr 8640Min Summer	0.669	0.00	0.01
1Yr 8640Min Winter	0.267	0.00	0.02	30Yr 8640Min Winter	0.669	0.00	0.01
1Yr 10080Min Summer	0.247	0.00	0.02	30Yr 10080Min Summer	0.593	0.00	0.01
1Yr 10080Min Winter	0.247	0.00	0.02	30Yr 10080Min Winter	0.593	0.00	0.01
2Yr 15Min Summer	30.800	0.00	0.47	100Yr+40% 15Min Summer	177.520	0.00	0.57
2Yr 15Min Winter	30.800	0.00	0.47	100Yr+40% 15Min Winter	177.520	0.00	0.60
2Yr 30Min Summer	19.600	0.00	0.45	100Yr+40% 30Min Summer	115.080	0.00	0.73
2Yr 30Min Winter	19.600	0.00	0.45	100Yr+40% 30Min Winter	115.080	0.00	0.76
2Yr 60Min Summer	12.000	0.00	0.43	100Yr+40% 60Min Summer	71.120	0.00	0.84
2Yr 60Min Winter	12.000	0.00	0.43	100Yr+40% 60Min Winter	71.120	0.00	0.87
2Yr 120Min Summer	8.400	0.00	0.36	100Yr+40% 120Min Summer	46.480	0.00	0.90
2Yr 120Min Winter	8.400	0.00	0.36	100Yr+40% 120Min Winter	46.480	0.00	0.93
2Yr 180Min Summer	6.683	0.00	0.31	100Yr+40% 180Min Summer	35.843	0.00	0.90
2Yr 180Min Winter	6.683	0.00	0.30	100Yr+40% 180Min Winter	35.843	0.00	0.92
2Yr 240Min Summer	5.425	0.00	0.26	100Yr+40% 240Min Summer	28.945	0.00	0.87
2Yr 240Min Winter	5.425	0.00	0.26	100Yr+40% 240Min Winter	28.945	0.00	0.89
2Yr 360Min Winter	4.067	0.00	0.20	100Yr+40% 360Min Summer	21.257	0.00	0.80
2Yr 360Min Summer	4.067	0.00	0.20	100Yr+40% 360Min Winter	21.257	0.00	0.82
2Yr 480Min Summer	3.293	0.00	0.16	100Yr+40% 480Min Summer	16.908	0.00	0.73
2Yr 480Min Winter	3.293	0.00	0.16	100Yr+40% 480Min Winter	16.908	0.00	0.75
2Yr 600Min Summer	2.761	0.00	0.14	100Yr+40% 600Min Summer	13.999	0.00	0.65

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
2Yr 600Min Winter	2.761	0.00	0.13	100Yr+40% 600Min Winter	13.999	0.00	0.67
2Yr 720Min Winter	2.375	0.00	0.12	100Yr+40% 720Min Summer	11.923	0.00	0.56
2Yr 720Min Summer	2.375	0.00	0.12	100Yr+40% 720Min Winter	11.923	0.00	0.60
2Yr 960Min Summer	1.877	0.00	0.10	100Yr+40% 960Min Summer	9.244	0.00	0.39
2Yr 960Min Winter	1.877	0.00	0.10	100Yr+40% 960Min Winter	9.244	0.00	0.43
2Yr 1440Min Summer	1.346	0.00	0.07	100Yr+40% 1440Min Summer	6.399	0.00	0.08
2Yr 1440Min Winter	1.346	0.00	0.07	100Yr+40% 1440Min Winter	6.399	0.00	0.10
2Yr 2160Min Summer	0.971	0.00	0.06	100Yr+40% 2160Min Summer	4.396	0.00	0.02
2Yr 2160Min Winter	0.971	0.00	0.05	100Yr+40% 2160Min Winter	4.396	0.00	0.02
2Yr 2880Min Summer	0.777	0.00	0.05	100Yr+40% 2880Min Summer	3.360	0.00	0.01
2Yr 2880Min Winter	0.777	0.00	0.04	100Yr+40% 2880Min Winter	3.360	0.00	0.01
2Yr 4320Min Summer	0.576	0.00	0.03	100Yr+40% 4320Min Summer	2.303	0.00	0.01
2Yr 4320Min Winter	0.576	0.00	0.03	100Yr+40% 4320Min Winter	2.303	0.00	0.01
2Yr 5760Min Summer	0.471	0.00	0.03	100Yr+40% 5760Min Summer	1.766	0.00	0.01
2Yr 5760Min Winter	0.471	0.00	0.03	100Yr+40% 5760Min Winter	1.766	0.00	0.01
2Yr 7200Min Summer	0.407	0.00	0.02	100Yr+40% 7200Min Summer	1.442	0.00	0.01
2Yr 7200Min Winter	0.407	0.00	0.02	100Yr+40% 7200Min Winter	1.442	0.00	0.01
2Yr 8640Min Winter	0.364	0.00	0.02	100Yr+40% 8640Min Summer	1.225	0.00	0.01
2Yr 8640Min Summer	0.364	0.00	0.02	100Yr+40% 8640Min Winter	1.225	0.00	0.01
2Yr 10080Min Summer	0.333	0.00	0.02	100Yr+40% 10080Min Winter	1.070	0.00	0.01
2Yr 10080Min Winter	0.333	0.00	0.01	100Yr+40% 10080Min Summer	1.070	0.00	0.01

Simulation Results

Return Period Yrs: 1.0
Climate Change %: 0

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
PP1	960 min Winter	671	1.209	0.059	0.214		OK
PP2	960 min Winter	673	1.209	0.059	0.214		OK
PP4	960 min Winter	672	1.209	0.059	0.190		OK
PP3	960 min Winter	676	1.209	0.059	0.007		OK
PP5	960 min Winter	672	1.209	0.059	0.402		OK
PP6	960 min Winter	687	1.208	0.058	0.002		OK
PP7	960 min Winter	679	1.208	0.058	0.482		OK
PP8	960 min Winter	667	1.205	0.055	0.305		OK
PP9	960 min Winter	668	1.205	0.055	0.778		OK
PP10	960 min Winter	678	1.199	0.049	0.774		OK
PP11	960 min Winter	704	1.189	0.039	0.069		OK
PS1	960 min Winter	698	1.189	0.039	0.864		OK
PS2	960 min Winter	709	1.189	0.070	0.866		OK
outfall	960 min Winter	701	1.025	0.025	0.863		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	960 min Winter	673	PP1	PP2	0.059	0.064	0.222		OK
1.001	960 min Winter	672	PP2	PP5	0.059	0.066	0.220		OK
2.000	960 min Winter	672	PP4	PP5	0.059	0.032	0.206		OK
3.000	960 min Winter	1066	PP3	PP5	0.059	0.013	0.035		OK
1.002	960 min Winter	672	PP5	PP7	0.058	0.067	0.410		OK
4.000	960 min Winter	759	PP6	PP7	0.058	0.019	0.097		OK
1.003	960 min Winter	699	PP7	PP9	0.056	0.080	0.481		OK
5.000	960 min Winter	667	PP8	PP9	0.055	0.126	0.382		OK
1.004	960 min Winter	671	PP9	PP10	0.052	0.145	0.780		OK
1.005	960 min Winter	691	PP10	PS1	0.044	0.192	0.779		OK
6.000	960 min Winter	829	PP11	PS1	0.039	0.091	0.134		OK
1.006	960 min Winter	709	PS1	PS2	0.055	0.123	0.866	0.026	OK
1.007	960 min Winter	701	PS2	outfall	0.025	0.454	0.863	0.060	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
Permeable Paving2	960 min Winter	671	1.209	0.059	0.215		OK
Permeable Paving1	960 min Winter	671	1.209	0.059	0.197		OK
Permeable Paving3	960 min Winter	673	1.208	0.058	0.071		OK
Permeable Paving4	960 min Winter	664	1.205	0.055	0.308		OK
Permeable Paving5	960 min Winter	702	1.189	0.039	0.091		OK

Return Period Yrs: 2.0
Climate Change %: 0

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
PP1	480 min Winter	357	1.239	0.089	0.438		OK
PP2	480 min Winter	357	1.239	0.089	0.438		OK
PP4	480 min Winter	357	1.239	0.089	0.390		OK
PP3	480 min Winter	362	1.239	0.089	0.002		OK
PP5	480 min Winter	359	1.239	0.089	0.828		OK
PP6	480 min Winter	363	1.239	0.089	0.030		OK
PP7	480 min Winter	357	1.238	0.088	0.964		OK
PP8	480 min Winter	359	1.236	0.086	0.583		OK
PP9	480 min Winter	359	1.236	0.086	1.546		OK
PP10	480 min Winter	365	1.231	0.081	1.525		OK
PP11	600 min Winter	448	1.227	0.077	0.003		OK
PS1	480 min Winter	371	1.227	0.077	1.702		OK
PS2	480 min Winter	371	1.227	0.109	1.711		OK
outfall	480 min Winter	371	1.035	0.035	1.711		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	480 min Winter	357	PP1	PP2	0.089	0.090	0.503		OK
1.001	480 min Winter	359	PP2	PP5	0.089	0.091	0.497		OK
2.000	480 min Winter	359	PP4	PP5	0.089	0.037	0.400		OK
3.000	480 min Winter	362	PP3	PP5	0.089	0.007	0.036		OK
1.002	480 min Winter	359	PP5	PP7	0.089	0.090	0.865		OK
4.000	480 min Winter	491	PP6	PP7	0.089	0.022	0.207		OK
1.003	480 min Winter	357	PP7	PP9	0.087	0.091	0.964		OK
5.000	480 min Winter	359	PP8	PP9	0.086	0.175	0.954		OK
1.004	480 min Winter	362	PP9	PP10	0.084	0.184	1.656		OK
1.005	480 min Winter	368	PP10	PS1	0.079	0.219	1.644		OK
6.000	600 min Winter	515	PP11	PS1	0.077	0.090	0.275		OK
1.006	480 min Winter	388	PS1	PS2	0.093	0.127	1.726	0.051	OK
1.007	480 min Winter	371	PS2	outfall	0.035	0.555	1.711	0.119	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
Permeable Paving2	480 min Winter	357	1.240	0.090	0.423		OK
Permeable Paving1	480 min Winter	358	1.239	0.089	0.401		OK
Permeable Paving3	480 min Winter	359	1.238	0.088	0.166		OK
Permeable Paving4	480 min Winter	357	1.236	0.086	0.570		OK
Permeable Paving5	480 min Winter	374	1.228	0.078	0.186		OK

Return Period Yrs: 30.0
Climate Change %: 0

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
PP1	480 min Winter	426	1.404	0.254	0.559		Surcharged
PP2	480 min Winter	426	1.404	0.254	0.561		Surcharged
PP4	480 min Winter	426	1.403	0.253	0.511		Surcharged
PP3	480 min Winter	437	1.403	0.253	0.010		Surcharged
PP5	480 min Winter	427	1.403	0.253	1.099		Surcharged
PP6	480 min Winter	423	1.403	0.253	0.146		Surcharged
PP7	480 min Winter	426	1.403	0.253	1.362		Surcharged
PP8	480 min Winter	431	1.401	0.251	0.752		Surcharged
PP9	480 min Winter	428	1.401	0.251	2.043		Surcharged
PP10	480 min Winter	426	1.399	0.249	2.035		Surcharged
PP11	480 min Winter	411	1.397	0.247	0.184		Surcharged
PS1	480 min Winter	426	1.397	0.247	2.331		Surcharged
PS2	480 min Winter	429	1.397	0.278	2.401		Surcharged
outfall	180 min Winter	285	1.041	0.041	2.400		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	60 min Winter	51	PP1	PP2	0.150	0.184	2.482		Surcharged
1.001	60 min Winter	52	PP2	PP5	0.150	0.176	2.406		Surcharged
2.000	360 min Summer	192	PP4	PP5	0.150	0.055	0.854		Surcharged
3.000	600 min Winter	593	PP3	PP5	0.150	0.003	0.051		Surcharged
1.002	60 min Winter	55	PP5	PP7	0.150	0.193	3.029		Surcharged
4.000	240 min Winter	279	PP6	PP7	0.150	0.025	0.437		Surcharged
1.003	480 min Winter	548	PP7	PP9	0.150	0.081	1.393		Surcharged
5.000	120 min Summer	79	PP8	PP9	0.150	0.281	3.618		Surcharged
1.004	120 min Summer	83	PP9	PP10	0.150	0.235	3.932		Surcharged
1.005	120 min Winter	88	PP10	PS1	0.150	0.234	3.851		Surcharged
6.000	240 min Winter	271	PP11	PS1	0.150	0.046	0.810		Surcharged
1.006	480 min Winter	552	PS1	PS2	0.225	0.132	2.763	0.082	OK
1.007	960 min Winter	969	PS2	outfall	0.041	0.612	2.400	0.166	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
Permeable Paving2	480 min Winter	427	1.404	0.254	0.564		OK
Permeable Paving1	480 min Winter	427	1.404	0.254	0.517		OK
Permeable Paving3	480 min Winter	430	1.403	0.253	0.188		OK
Permeable Paving4	480 min Winter	423	1.402	0.252	0.777		OK
Permeable Paving5	480 min Winter	430	1.397	0.247	0.298		OK

Return Period Yrs: 100.0
Climate Change %: 40

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
PP1	600 min Winter	582	1.733	0.583	0.567		Flood Risk
PP2	600 min Winter	582	1.733	0.583	0.566		Flood Risk
PP4	600 min Winter	582	1.733	0.583	0.495		Flood Risk
PP3	600 min Winter	579	1.733	0.583	0.021		Flood Risk
PP5	600 min Winter	582	1.733	0.583	1.063		Flood Risk
PP6	600 min Winter	579	1.733	0.583	0.008		Flood Risk
PP7	600 min Winter	583	1.733	0.583	1.174		Flood Risk
PP8	600 min Winter	579	1.731	0.581	0.767		Flood Risk
PP9	600 min Winter	580	1.731	0.581	2.010		Flood Risk
PP10	600 min Winter	580	1.729	0.579	1.984		Flood Risk
PP11	600 min Winter	583	1.728	0.578	0.075		Flood Risk
PS1	600 min Winter	589	1.727	0.577	2.413		Surcharged
PS2	600 min Winter	581	1.727	0.608	2.433		Surcharged
outfall	5760 min Summer	3764	1.041	0.041	2.400		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	30 min Winter	45	PP1	PP2	0.150	0.213	3.757		Surcharged
1.001	30 min Winter	45	PP2	PP5	0.150	0.212	3.754		Surcharged
2.000	30 min Winter	36	PP4	PP5	0.150	0.200	2.262		Surcharged
3.000	720 min Winter	1373	PP3	PP5	0.150	0.004	0.069		Surcharged
1.002	30 min Winter	39	PP5	PP7	0.150	0.260	4.597		Surcharged
4.000	2160 min Summer	2208	PP6	PP7	0.150	0.029	0.519		Surcharged
1.003	2880 min Summer	2950	PP7	PP9	0.150	0.090	1.391		Surcharged
5.000	60 min Winter	66	PP8	PP9	0.150	0.314	5.548		Surcharged
1.004	30 min Winter	44	PP9	PP10	0.150	0.294	5.190		Surcharged
1.005	30 min Winter	44	PP10	PS1	0.150	0.291	5.150		Surcharged
6.000	15 min Winter	29	PP11	PS1	0.150	0.174	1.814		Surcharged
1.006	4320 min Summer	3225	PS1	PS2	0.225	0.121	2.806	0.083	OK
1.007	5760 min Summer	3764	PS2	outfall	0.041	0.612	2.400	0.166	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
Permeable Paving2	600 min Winter	581	1.734	0.584	0.568		OK
Permeable Paving1	600 min Winter	582	1.734	0.584	0.493		OK
Permeable Paving3	600 min Winter	583	1.733	0.583	0.177		OK
Permeable Paving4	600 min Winter	580	1.733	0.583	0.801		OK
Permeable Paving5	600 min Winter	582	1.727	0.577	0.283		OK

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