Southview Road, Southwick

Hydraulic Modelling Report

January 2026

Assessment | Modelling | Design

Scheme Information	
Scheme:	Southview Road, Southwick
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Client:	GTA Civils and Transport Ltd
Instruction:	The instruction to undertake this modelling was received from Florence Van Vaerenbergh of GTA Civils and Transport Ltd.
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Approval Record	
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Revision	Date	Comment
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This report will remain valid for a period of twelve months (from the date of last issue) after which the source data should be reviewed in order to reassess the findings and conclusions on the basis of latest available information

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Glossary and Modelling Short Codes

Table 1: Glossary of Technical Terms

Term / Acronym	Definition
1D (model)	One dimensional – A type of model typically built using watercourse cross-section survey data to represent the watercourse and adjacent floodplain
2D (model)	Two dimensional – A type of hydraulic model typically built using LiDAR and site-specific topographic data to represent the wider floodplain
1D-2D (model)	A combination of 1D and 2D modelling (i.e. typically a representation of the watercourse and floodplain respectively)
AEP	Annual Exceedance Probability – the probability that a storm event will occur in any given year
Defra	Department for Environment, Food and Rural Affairs
DfI	Department for Infrastructure – one of nine departments in Northern Ireland responsible for regional strategic planning and development policy
EA	Environment Agency – non-departmental public body responsible for the protection and enhancement of the environment in England
ESTRY	Industry standard flood modelling software (1D engine built into TUFLOW)
FCA	Flood Consequence Assessment
FRA	Flood Risk Assessment
FFL	Finished Floor Level
Flood risk	The product of the frequency or likelihood of a flood event and the consequences (such as loss, damage, harm, distress and disruption)
FMP	Flood Modeller Pro – industry standard flood modelling software
HMR	Hydraulic Modelling Report
IDB	Internal Drainage Board
LA	Local authority
LiDAR	Light Detection and Ranging (i.e. Ground elevation data)
LLFA	Lead Local Flood Authority
Main river	A watercourse on which the relevant regulatory body (e.g. EA/NRW/SEPA/DfI) has permissive powers, but not a duty, to carry out maintenance, improvement, or construction work.
MIKE (11/21/FLOOD)	Industry standard flood modelling software
NGR	National Grid Reference
NRW	Natural Resources Wales – Welsh Government sponsored body responsible for managing the environment and natural resources of Wales
Ordinary watercourse	A river, stream, ditch, cut, sluice, dyke or non-public sewer that is not a designated main river, and for which the LA has flood risk management responsibilities and powers.

Term / Acronym	Definition
SEPA	Scottish Environment Protection Agency – non-departmental public body responsible for the protection and enhancement of the environment in Scotland
TN	Technical Note
TUFLOW	Industry standard flood modelling software

Short codes are used in the naming and referencing of model files, events and scenarios to ensure a consistent, high-quality naming convention is followed and to simplify communication of model results.

Table 2: Modelling Short Codes

Model Short Code	Definition
ABC	Model identifier
BL[*x*]-[*y*]	A *y*% blockage at location *x* (e.g. BL1-67 – 67% blockage at location "1")
BR[*x*]-[*y*]	A *y* metre wide breach scenario at location *x* (e.g. BR2-50 – 50m wide breach at location "2")
CC	Climate change
DEV	Post-development site layout
EXG	Existing (pre-development) site layout
MIT	Flood mitigation option
NC	"Normal conditions" A model setup representative of present channel and floodplain conditions throughout the study area – no additional structure blockages, defence breaches or pump failures
OPT	Development option
Q[*x*]	1 / *x* % AEP fluvial event
R[*x*]	1 / *x* % AEP pluvial event
ST[*x*]	Sensitivity test *x* (e.g. ST1 – channel and floodplain roughness +20%)
T[*x*]	1 / *x* % AEP tidal event

Introduction

Waterco has been commissioned to undertake a detailed hydraulic modelling study in support of the FRA being prepared for a proposed residential development, on Southview Road in Southwick, by GTA Civils & Transport Ltd.

The main objective of this hydraulic modelling study is to quantify existing pluvial flood risk at the site and the change in flood risk elsewhere (if any) as a result of the development. To enable this, a linked 2D[1] rainfall-on-grid model has been constructed. This report considers pluvial flood risk only, other sources of flooding have not been considered. The purpose of this report is to summarise the hydraulic modelling works completed.

Site Description and Proposed Development

A full description of the existing site layout, flood risk and the proposed development site layout can be found within the associated FRA. Table 3 provides an overview of the existing site. A location plan and an aerial photograph of the site are included in Appendix A .

Table 3: Site Overview

Site Overview	
Site Address	Southview Road Southwick Brighton BN42 4TS
NGR (located at centre of site)	524152, 105888
Current Site Use	Greenfield
Regulatory body	LLFA – West Sussex County Council

The proposed development comprises of two residential dwellings with associated hard and soft landscaping, with a proposed access road. A proposed development plan is included in Appendix B.

The outputs of this hydraulic modelling study provide a detailed, up-to-date assessment of the existing pluvial flood risk at the site and quantify the change in flood risk elsewhere (if any) as a result of the proposed development.

[1] A 2-Dimensional (2D) Digital Terrain Model (DTM) of the potential floodplain (created from LiDAR).

Flood Risk & History

Table 4 provides a brief overview of the flood risk pertaining to the site.

Table 4: Site Flood Risk

Site Flood Risk	
Type of Flood Risk	Pluvial
Primary Source of Flood Risk	Surface water overland flow
EA Flood Map for Planning Surface Water (March 2025)	1 in 30 – 3.3% chance of flooding each year. 1 in 100 – 1% chance of flooding each year. 1 in 1000 – 0.1% chance of flooding each year. The flood map is included in Appendix C.
Adur and Worthing Strategic Flood Risk Assessment (SFRA) 2024	The SFRA surface water flood risk mapping shows the site to experience flooding up to and during the 0.1% AEP + Upper End climate change event.
Available Model Data	The SFRA surface water flood risk mapping has been taken from the Risk of Flooding from Surface Water (RoFSW) dataset published by the EA. JBA carried out additional modelling to account for the impact of climate change. This generalised modelling approach is not suitable for site-specific assessment, therefore, a site-specific model has been constructed.
Historical Flooding	There is no evidence of historical flooding at the site. The EA Historical Flood Map shows that flooding occurred in November 1960 to the gardens and properties north-west of the site along Somerly Gardens and Underdown Road, and in the area of Hill View Allotment and south-east of the site along Roman Way. The source of the flooding is noted as drainage. The flood map is included in Appendix C.

Hydraulic Model Build

The information provided in this section details the modelling works carried out as part of this scheme. The model log[2] provided with the model files should be consulted if further details are required. An explanation of the file, event and scenario naming convention used is provided in the model log.

Model Approach

Table 5 provides a general overview of the model itself. The 2D model extent is provided in Appendix D.

Table 5: General model overview

General Model Overview	
Brief Summary:	A new 2D pluvial only hydraulic model of the study area has been developed using the latest available LiDAR data to assess the existing flood risk to the site and quantify the change in flood risk elsewhere as a result of the proposed development (if any).
Model Type:	2D
Software Builds:	TUFLOW 2025-2-1 HPC Single Precision (Latest build available at the start of the project)
Simulation Type:	Pluvial
Waterco Model Reference & Version:	17247-33530-004

[2] Doc ref: 17247-33530-Model_Log.xlsx

Data Sources

Table 6 details the data sources used within the model build process.

Table 6: Data sources

Data Source	Doc Ref	Provider	Date/Age	Comments
Topographic Data				
Existing site topographical survey	X_12383_survey_m.dwg 17247-Existing_Site_Levels_001.2dm	Acad Mapping Ltd Land Surveyors	April 2017	The LiDAR data levels at the site have been compared to the topographical survey of the site and found to be within +/- 150mm. Included in Appendix E.
EA LiDAR DTM (1m)	17247-1m_DTM_2022.tif	EA	2022	Full model extent coverage
Post-develop-ment site layout plan	Proposed Surface_0.5.asc x_12383_3D strings.dwg x_12383_3D triangulations.dwg X_12383_site plan_m.dwg	GTA Civils & Transport	December 2025	Full coverage of site
Other Data				
OS MasterMap	213725-1_OSM_1_Shape_Areas.shp	Bluesky International Limited	2025	Covers the site and immediate vicinity
OS Open Zoomstack	OS Open Zoomstack	Ordnance Survey	June 2025	Contain OS Data ©Crown Copyright (2025)

Hydrology

To investigate the surface water flood risk, a range of rainfall events have been simulated; 50% (R2), 3.33% (R30), 1% (R100) and 0.1% (R1000) AEP events. The impact of future climate change has also been investigated during the 3.33% and 1% AEP events, by increasing rainfall by 40% and 45% respectively (R30CC40, R100CC45). A 45% climate change uplift has also been applied to the 0.1% AEP event (R1000CC45) as per the Adur and Worthing Level 1 Strategic Flood Risk Assessment (2024).

Design hyetographs based on an optimum storm duration are required as input to the hydraulic model. To provide the required rainfall hyetographs, the ReFH2 method has been undertaken.

The subject catchment is 1.04km^2 and was purchased from the FEH Web Service at NGR 524100, 105550. A watershed analysis was carried out in GIS software based on 1m resolution LiDAR data. The results of the

watershed analysis showed some discrepancies between the FEH catchment and GIS watershed catchment boundaries. The catchment boundary was based on the higher resolution watershed analysis. A comparison of the FEH catchment boundary and the adopted catchment boundary is shown in Appendix F. The remaining catchment descriptors for the subject site, which are included in the net rainfall calculations in ReFH2 have been checked and where necessary, updated in accordance with the FEH Handbook and Flood Estimation Guidelines. The catchment descriptors DPLBAR and URBEXT2000 have been updated. The original and updated catchment descriptors are included in Appendix F.

The adopted storm duration is 3.25 hours, and the summer profile has been adopted by default given the urban nature of the catchment.

The net rainfall (hyetographs) has been calculated using the ReFH2 calculation method. The net rainfall is used as this will account for the losses from infiltration in the catchment which the model does not account for. The peak net rainfall results are summarised in Table 7. The full ReFH2 reports are included in Appendix F.

There are uncertainties associated with the urban element of the catchment, the ReFH2 calculations undertaken do not account for sewers.

The ReFH2 reports show there is a large reduction in rainfall depth between the total rain and net rainfall values. A reason for the reduction, is the high BFIHOST19 of the catchment (0.903), which is underlain by chalk bedrock and superficial deposits of clay, silt, sand and gravel. Given this, the ReFH2 outputs are considered suitable for this assessment.

Table 7: Peak net rainfall

Pluvial Design Event (AEP)	Peak Net Rainfall (mm)
50%	1.23
3.33%	2.75
3.33% + 40% CC	3.84
1%	3.49
1% + 45% CC	5.06
0.1%	5.48
0.1%+ 45% CC	7.94

2D Model Information

Table 8 summarises the details of the 2D model, including the various parameters within the model.

Table 8: 2D model details

<table>
<tr><th colspan="2">2D Model Details</th></tr>
<tr><td>Number of Domains and Extent:</td><td>1 domain. The model extent is shown in Appendix D.</td></tr>
<tr><td>DTM Data Sources:</td><td>The 2D TUFLOW model has been constructed from EA LiDAR DTM (1m). The LiDAR data levels at the site have been compared to the topographical survey of the site and found to be within +/- 150mm. As the LiDAR offers a higher resolution, this dataset has been utilised in the model.</td></tr>
<tr><td>Cell Size:</td><td>2m – this resolution is adequate to represent the flow paths on site and within the wider floodplain whilst maintaining a reasonable run time.</td></tr>
<tr><td>Building Representation:</td><td>High roughness – 0.5s/m$^{1/3}$</td></tr>
<tr><td>Existing Flood Defences:</td><td>None.</td></tr>
<tr><td>General Bank Levels (Non-Defence):</td><td>None.</td></tr>
<tr><td>Roughness Approach and Values (s/m$^{1/3}$):</td><td>Manning’s n based on Chow (1959), survey, photographs, and aerial imagery.
Land use at the site and areas that are shown to drain to the site has been based on OS MasterMap data. Elsewhere, in the wider model extent land use has been assigned based on OS Open Zoomstack mapping and a material value applied.
A 2D roughness fix has been applied to the car park at St Theresa’s Roman Catholic Church to update the roughness from 0.035 (land/grass) to 0.02 (road/pavements).

<table>
<tr><td>Buildings</td><td>0.500</td></tr>
<tr><td>Gardens, driveways, steps, land, grass, slopes, cliffs</td><td>0.035</td></tr>
<tr><td>Water</td><td>0.030</td></tr>
<tr><td>Rough grassland</td><td>0.060</td></tr>
<tr><td>Rail</td><td>0.025</td></tr>
<tr><td>Road, path, pavements</td><td>0.020</td></tr>
<tr><td>Structures</td><td>0.020</td></tr>
<tr><td>Pylon</td><td>0.035</td></tr>
</table>
</td></tr>
<tr><td>Boundary Conditions:</td><td>Rainfall applied to the delineated surface water catchment which contributes to the 2D domain. Rainfall runoff method ReFH2 (version 2.3) has been used to provide design hyetographs for input into the hydraulic model. The net rainfall hyetographs, which include the losses through infiltration have been applied directly to the 2D domain using a TUFLOW 2d_rf rainfall polygon.

The downstream boundaries are represented using a 2D Head-Discharge (HQ) boundary. The HQ boundary slope has been estimated based on local ground slope.</td></tr>
</table>

Structures:	None.
Post-Development Layout:	An alternative 2D DEV2 model has been created using the proposed level data provided by the Client (Appendix B). A TUFLOW z-shape layer has been used to represent the proposed building finished floor levels (FFLs). The northern building has been set to 11.46m AOD and the southern building to 11.15m AOD. A TUFLOW 2d_mat layer has been applied within the site boundary, specifying Manning's n values that correspond to the proposed development layout.
Other DTM Adjustments:	Minor DTM filtering errors corrected using z-shape polygons to interpolate levels based on surrounding values.
Timestep:	1s
Initial Conditions:	None.
Non-Default Parameters:	Cell Wet/Dry Depth = 0.2mm (as recommended for rainfall modelling).
Further Comments:	See assumptions and notes tab in the model log. (Doc Ref: 17247-33530-Model_Log.xlsx)

Model Simulation Setup

The list of simulations modelled for this study are detailed in this section.

Primary Simulations

Primary simulations have been modelled for a range of pluvial design events for the existing site scenario and proposed development scenario. A 'no rain on building' scenario has been simulated for the proposed development scenario to differentiate between surface water flow paths and rain falling on the proposed buildings that would be captured by the property drains.

Table 9: Primary simulations under normal conditions (NC)

Pluvial Design Event (AEP)	Climate Change Allowance	Site Layout
50%	-	Existing (EXG)
3.33%	-	
3.33%	40	
1%	-	
1%	45	
0.1%	-	
0.1%	45	
50%	-	Proposed Development (DEV2) / Proposed Development No Rain on Building (DEV2_NC_NR_BUILD)
3.33%	-	
3.33%	40	
1%	-	
1%	45	
0.1%	-	
0.1%	45	

Model Limitations

This section presents the steps taken throughout the modelling process to reduce uncertainty and improve confidence in the model outputs. Efforts have been made to assess and reduce the levels of uncertainty at each stage of the modelling process. The most appropriate available information has been used to construct the model to represent flooding mechanisms. The assumptions made are generally conservative for modelled water levels at the proposed scheme location and are therefore appropriate for the assessment of flood risk.

In the absence of available calibration data, sensitivity testing of four identified sources of uncertainty has been carried out along with model validation against a known flood event (if available) and a review of the model's performance rating. Table 10 lists and ranks identified sources of uncertainty and the assumptions made as part of the model build process.

Limitations and Assumptions

Table 10: Sources of uncertainty and assumptions

Rank	Source	Selected method	Assumptions
1	Friction parameters	Manning's n roughness coefficient based on available guidance (Chow 1959)	Floodplain roughness has been assigned using the best available information (and aerial photographs, OSMM, OS Open Zoomstack). The floodplain roughness values may vary over the year and the sensitivity tests have been carried out to quantify the impact.
2	Boundary conditions	2D HQ Boundary	The HQ boundary slopes have been estimated from LiDAR levels local to the boundary. Sensitivity testing of the specified slope value has been carried out to assess any potential impact to the water levels at the site.
3	Rainfall hyetographs	ReFH2 approach	See hydrology section above for detail. Sensitivity tests have been carried out to quantify the impact.
4	TUFLOW "control number"	Default	TUFLOW HPC constantly assesses and adjusts its "control number" to ensure stability criteria are met. Under or overlocking this value can affect simulation speed and stability. The default value of "1.0" has been used. Sensitivity testing of the control number has been carried out.
5	Topography	DTM and survey data	Latest available 1m resolution LiDAR data has been used to represent the floodplain topography. Comparison between site-specific topographical survey data and LiDAR data at the site show that generally levels are within 150mm. Therefore, LiDAR was used due to higher resolution. For the proposed scheme, the existing ground levels were modified within the proposed scheme footprint using polygons such as z shapes.
6	Grid size	2m cell size	This is suitable to represent most of the floodplain features across the model extents to an appropriate level of detail.

Rank	Source	Selected method	Assumptions
7	Change in climate condition	Predictions of anticipated change to rainfall	Climate change events selected based on NPPF guidance.

Sensitivity Tests

Sensitivity testing of the top four ranked sources of uncertainty (see Table 10) has been carried out. A total of eight sensitivity tests have been carried out (ST1-8) with respect to the 1% AEP +45% CC pluvial event. Details of these sensitivity tests can be found in Table 11.

Table 11: Sensitivity test details

Sensitivity Test Short Code	Varied Parameter	Adjustment	Pluvial Event (AEP)	Site Layout
ST1	Roughness coefficients	+20%	1% AEP +45% CC	EXG
ST2	Roughness coefficients	-20%	1% AEP +45% CC	EXG
ST3	Downstream boundary slope	+20%	1% AEP +45% CC	EXG
ST4	Downstream boundary slope	-20%	1% AEP +45% CC	EXG
ST5	Rainfall intensity	+20%	1% AEP +45% CC	EXG
ST6	Rainfall intensity	-20%	1% AEP +45% CC	EXG
ST7	HPC Control Number Factor	+0.2	1% AEP +45% CC	EXG
ST8	HPC Control Number Factor	-0.2	1% AEP +45% CC	EXG

The results of sensitivity tests ST1 and ST2 show that a significant variation (+/-20%) in the Manning's 'n' coefficients used within the floodplain does not increase/decrease the maximum water levels by more than 30mm. Changes to the flood extent across the site during this event are negligible.

The results of sensitivity tests ST3 and ST4 show that significantly varying the slope value used at the downstream boundary by +/-20% does not have any effect on the maximum water level in the floodplain. The assessment of flood risk at the site remains unaffected.

The results of sensitivity tests ST5 and ST6 show that significantly varying the rainfall intensity used by +/-20% respectively causes an increase/decrease in maximum water levels and flood extents throughout the model as can be expected. The results show that the maximum flood depths on site for the 1% AEP +45% CC pluvial event return period varies by approximately +/- 8mm.

The results of sensitivity tests ST7 and ST8 show that varying the Control Number Factor by +/-20% respectively does not affect the assessment of flood risk at the site.

Model Validation

Comparison of model results against historical data was not possible as there are no available maps, flood extents or gauge data of past historical flooding at the site. The EA historical flood map shows that instances of flooding have occurred within the wider model extent in November 1960. There is no additional

information on the event to analyse or validate the model against and the flooding source is stated as drainage which is not considered in this study. Increased significance has therefore been placed on sensitivity testing to understand confidence in the model outputs.

Model Performance

Run performance has been monitored throughout the model build process and then during each simulation carried out, to ensure a suitable model convergence was achieved.

2D Stability

A review of the 2D log files shows that there are no comments, warnings or errors warranting attention.

Mass balance error statistics show that during the 50% AEP event, there is a single instability timestep correction along Sandown Road due to change in ground levels. During ST7 there are four instability timestep corrections at Cross Road Garden and at the junction of Lower Drive with Old Shoreham Road, which are associated with an increase in the HPC Control Number Factor. These are not expected to have a significant impact on the assessment of flood risk at the site and are therefore deemed acceptable.

Mass error is within the acceptable ±1% threshold and efficiency is above 87% in all simulated events.

Model Results

This section of the report documents the results obtained from the primary simulations.

Maximum flood depth, velocity and hazard mapping has been provided for each primary simulation in Appendix G. Flood hazard ratings have been calculated in accordance with DEFRA document 'FD2320: Flood Risks to People' and EA guidance document 'Supplementary Note on Flood Hazard Ratings and Thresholds'.

Maximum water level mapping for the 1% AEP +45% CC and 0.1% AEP +45% CC events is included in Appendix G.

Existing Site Layout Simulations

The results of the hydraulic modelling show the site experiences flooding during all simulated events. During the simulated flood events, flooding on site is caused by rainfall on site and an overland flow from elsewhere entering the site via the northern site boundary. The overland flow exits the site along the southern site boundary. During all simulated events, there is also an overland flow entering the site at the north-east boundary.

DEV2 Simulations - Post-Development Site Layout

When the development levels are considered, the proposed buildings are flood free during all simulated events. During the simulated flood events, surface water enters the site via the northern site boundary and flows west of the proposed buildings and exits the site along the southern boundary. During all simulated events, there is also an overland flow entering the site at the north-east boundary.

The surface water extents shown around the perimeter of the building on the flood mapping is due to the rainfall on grid modelling approach, with rainfall being applied directly to the buildings which would be captured by the property drains. A 'no rain on building' scenario has been simulated where no rainfall is applied to the proposed buildings to represent this, which show the buildings are flood free. The 'no rain on building' flood maps are included in Appendix G.

Flood Risk Impact Off Site

The potential impact of the proposed development on flood risk elsewhere has been quantified by comparing the equivalent EXG and DEV2 simulation results. To provide a detailed assessment of the relative changes in flood depths throughout the floodplain, a series of maximum flood depth difference maps have been created and are included in Appendix G. The maps show that the proposed development has no significant impact on offsite flood risk.

Conclusions

Waterco has been commissioned to undertake a detailed hydraulic modelling study in support of the FRA being prepared for the proposed residential development along Southview Road, Southwick, Brighton, BN42 4TS.

A new 2D pluvial hydraulic model of the study area has been developed to assess the existing pluvial flood risk to the site and quantify the change in flood risk elsewhere as a result of the proposed development (if any).

The results of the hydraulic modelling show that during the existing scenario the site experiences flooding during all simulated events.

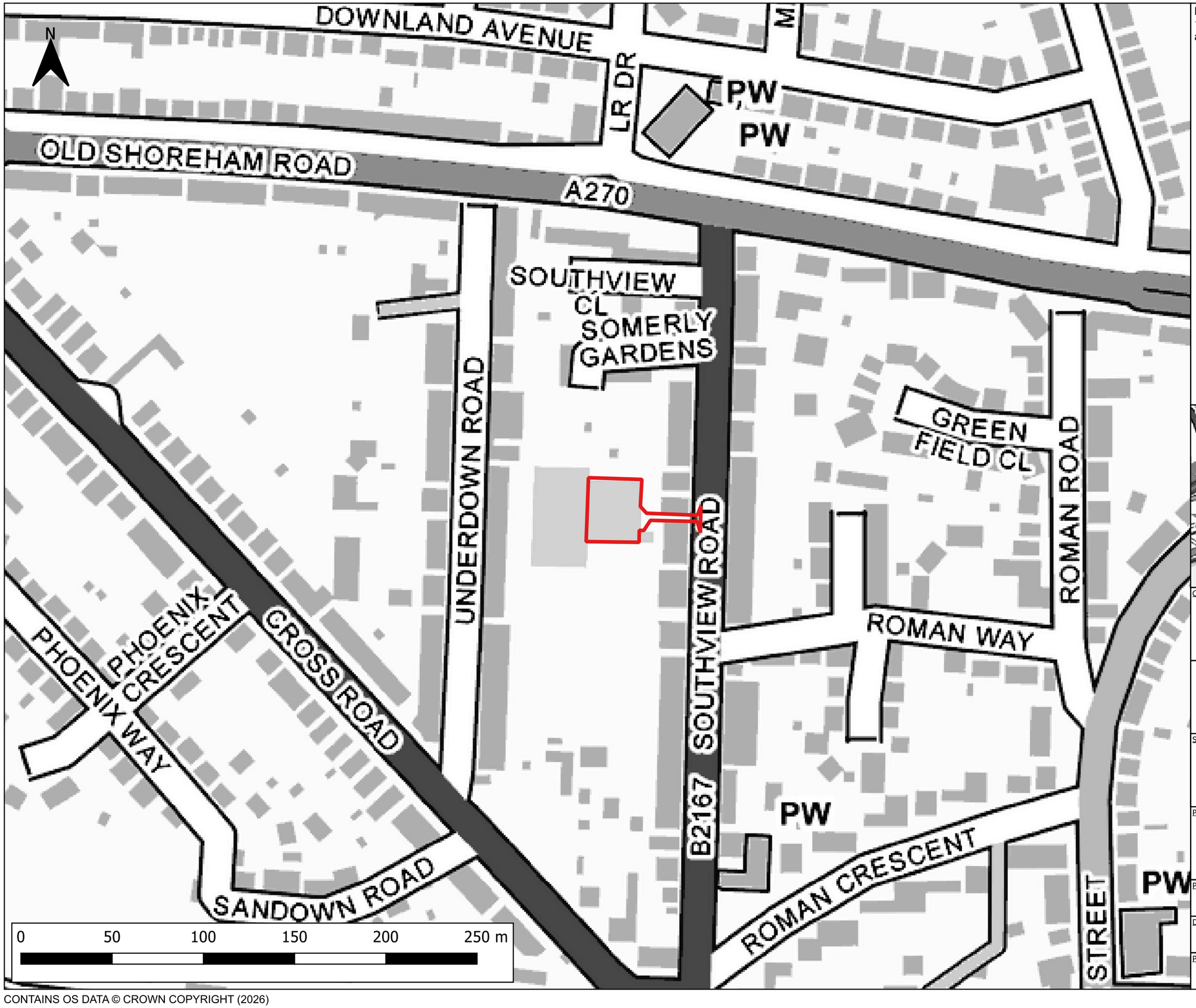
When the development levels are considered, the proposed buildings are flood free during all simulated events.

The proposed development has no significant impact on offsite flood risk.

Recommendations

The outputs of this modelling study should be used to support the Flood Risk Assessment.

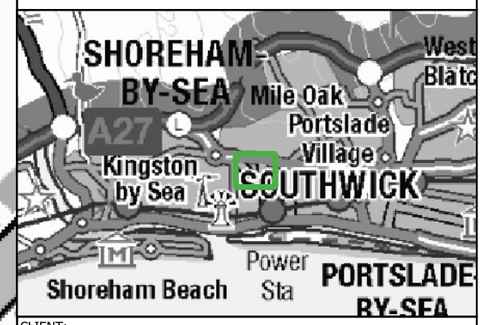
Appendix A Location Plan and Aerial Image



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

Site Boundary



CLIENT:

gta Civils & Transport

waterco
www.waterco.co.uk

SCHEME:

Southview Road, Southwick

PLOT TITLE:

Location Plan

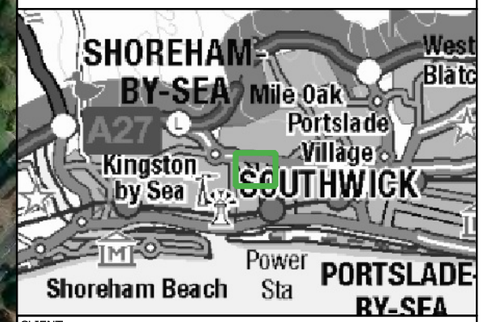
PLOT STATUS:			DATE:
FINAL			19-01-2026
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
MH	LP	AP	1:2000

PLOT NAME:	REVISION:
17247_Location_Plan	-

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

Site Boundary



CLIENT: gta Civils & Transport

waterco
www.waterco.co.uk

SCHEME: Southview Road, Southwick

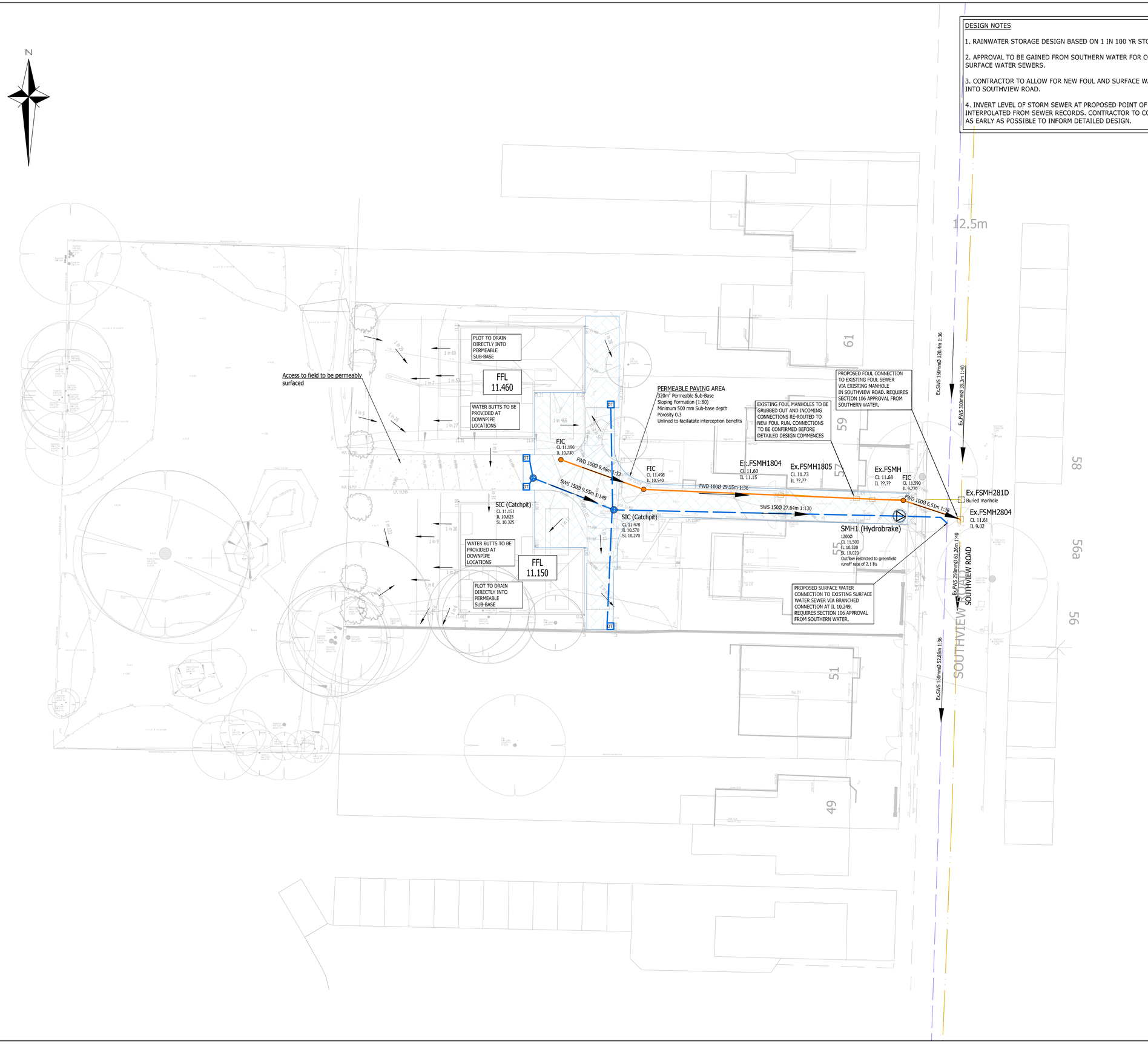
PLOT TITLE: Aerial Plan

PLOT STATUS:	DATE:
FINAL	19-01-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
MH	LP	AP	1:2000

PLOT NAME:	REVISION:
17247_Aerial_Plan	-

Appendix B Proposed Development Plan



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8. Your attention is also drawn to the fact that the information contained within this file may be subject to alteration at any time, pending technical approval from an approving authority or at the client's instruction. It is therefore strongly recommended that multiple and regular cross checks are made against the current contract drawings.
It is your responsibility to ensure that the correct issue or revision of the DWG data file is being used and requests for updated information made accordingly.

9. Should any apparent discrepancies between the data contained within the DWG file and the current contract drawings become evident, it must be reported back to GTA Civils & Transport as soon as reasonably practicable. Precedence should be given to the current contract drawings (PDF) unless advised otherwise.

KEY

- Private surface water drain
- Private Surface Water Manhole
- Private Foul water drain
- Private Foul Water Manhole
- SIC — Surface Water Plastic Inspection Chamber
- FIC — Foul Plastic Inspection Chamber
- Permeable Paving area

Rev	Amendments	Date	Dsn	Chk
P2	Updated to latest layout	14.01.26	NG	FVV
P1	INITIAL ISSUE	03.02.23	AF	JP

Status: PRELIMINARY

Client: S.D. HOLDINGS LTD

Architect: CIRCLE25 DESIGN

Project: LAND TO REAR OF 53-61 SOUTHVIEW ROAD, SOUTHWICK

Title: SITE DRAINAGE

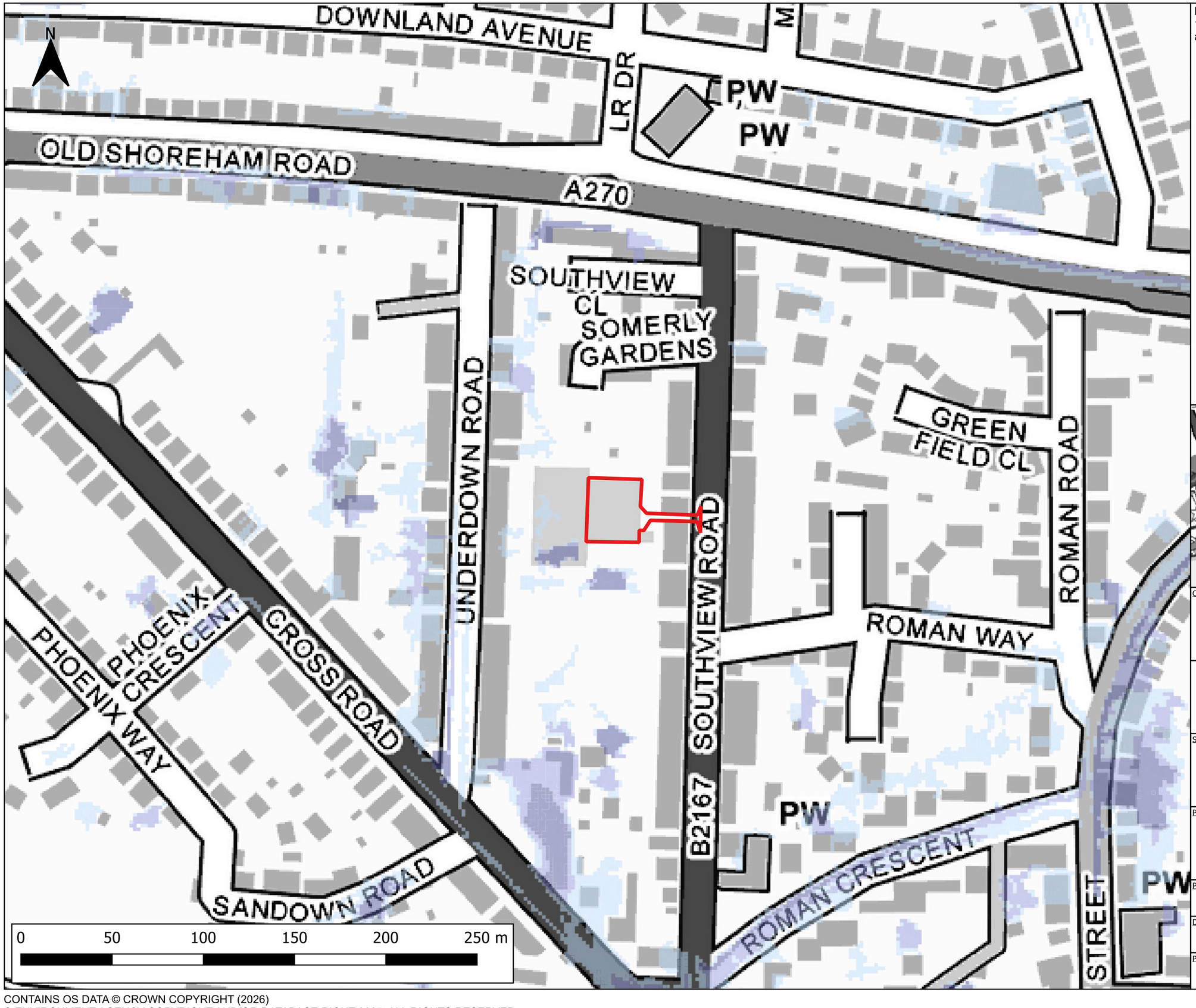
Date: FEBRUARY 2023 | Scale @ A1: 1:200

Clients Ref. | Project Ref.: 12383

gta Civils & Transport
Maple House, 192-198 London Road,
Burgess Hill, West Sussex, RH15 9RD
Tel.01444 871444 Web: www.gtacivils.co.uk

Drawing Number: 12383-100 | Rev.: P2

Appendix C EA Flood Maps



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary

Annual Likelihood of Flooding

- 1 in 30
- 1 in 100
- 1 in 1000

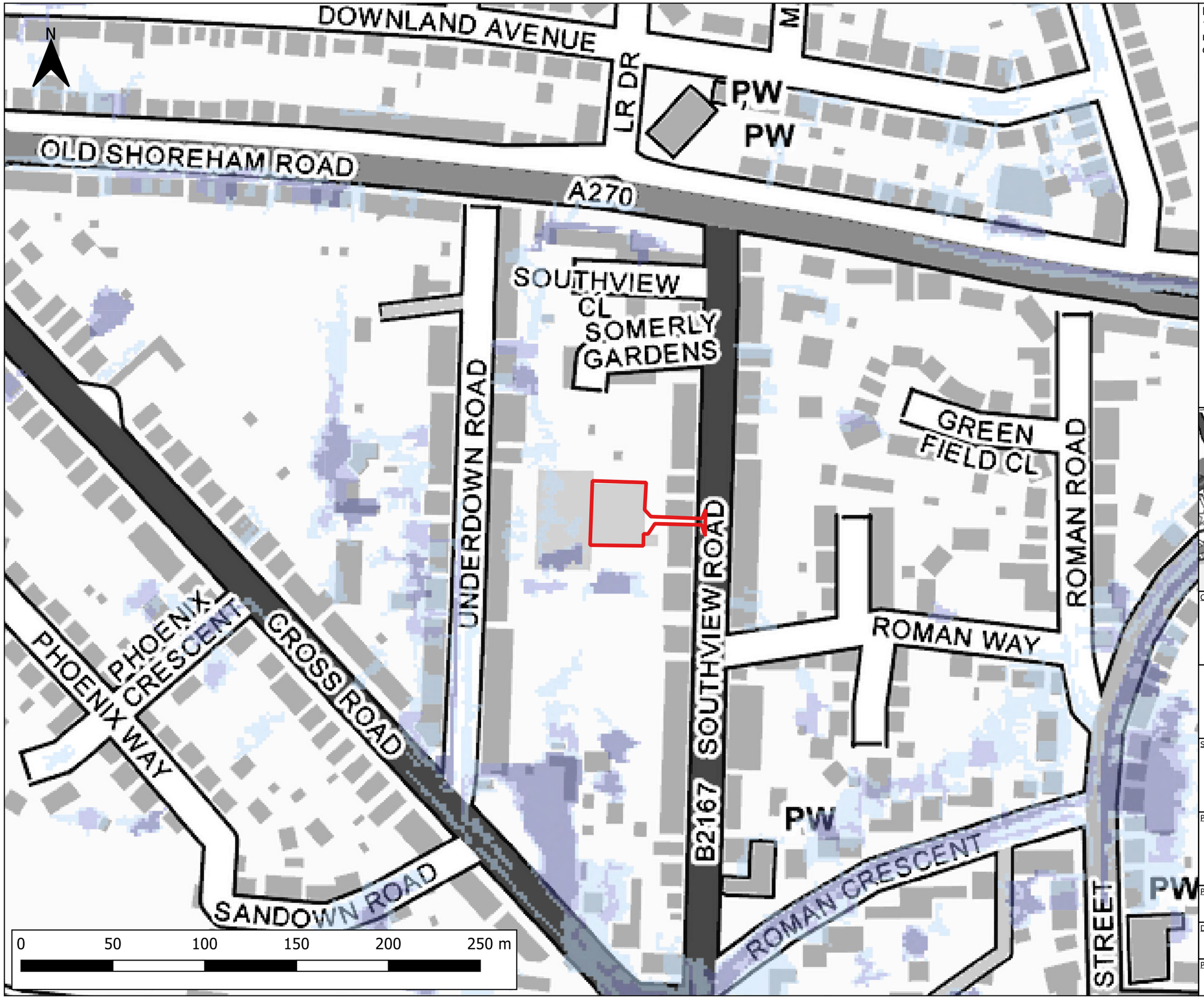
CLIENT: gta Civils & Transport

waterco
www.waterco.co.uk

SCHEME: Southview Road, Southwick

PLOT TITLE: EA Flood Map for Planning - Present Day Extents - Surface Water
Data published January 2025

PLOT STATUS:			DATE:
FINAL			20-01-2026
DRAWN: MH	CHECKED: LP	APPROVED: AP	PLOT SCALE AT A3: 1:2000
PLOT NAME: 17247_EA_FMfP_SW_PD			REVISION: -



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

Site Boundary

Annual Likelihood of Flooding

1 in 30

1 in 100

1 in 1000

CLIENT: gta Civils & Transport

waterco
www.waterco.co.uk

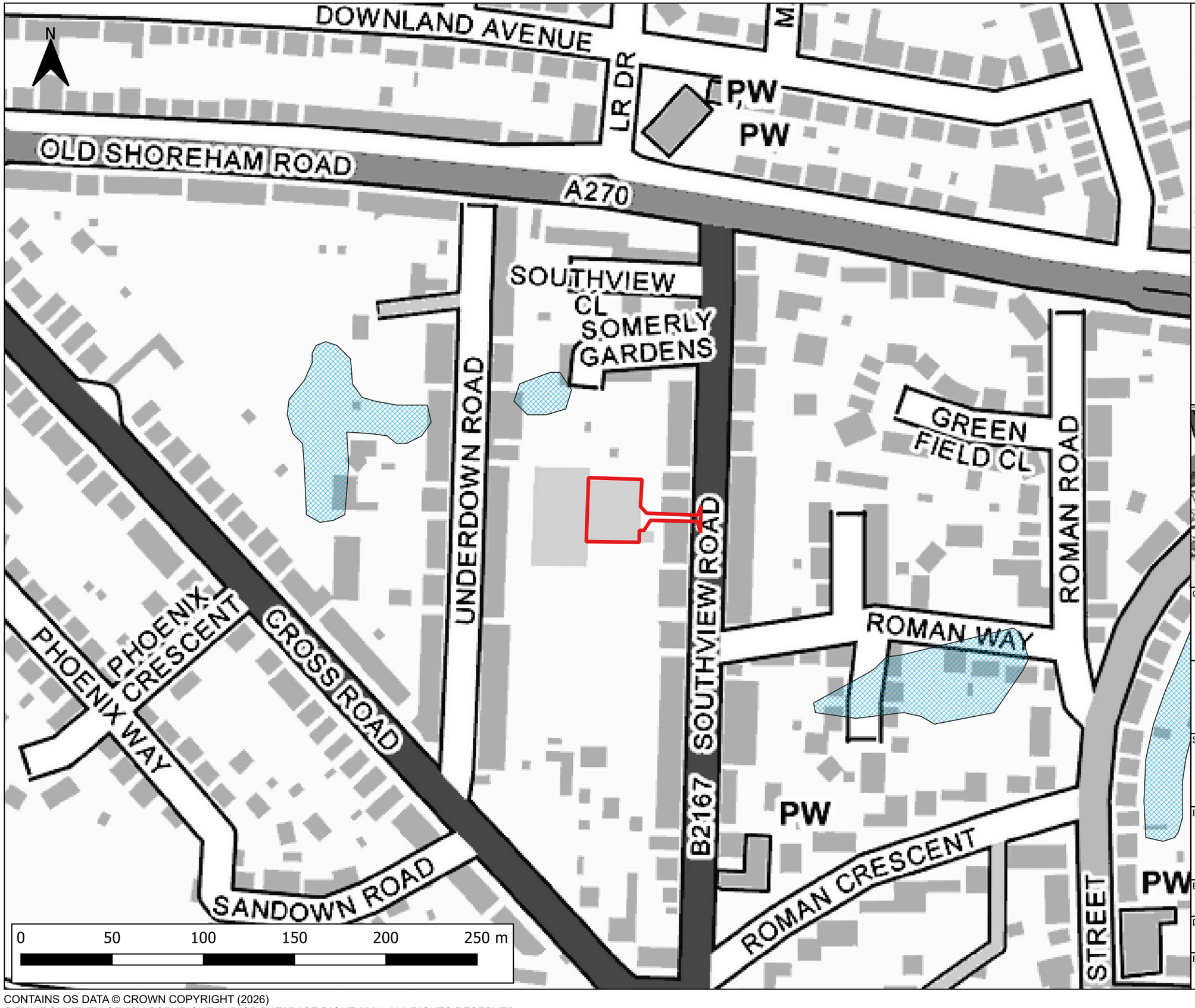
SCHEME: Southview Road, Southwick

PLOT TITLE: EA Flood Map for Planning - Climate Change Extents - Surface Water
Data published January 2025

PLOT STATUS:	DATE:
FINAL	20-01-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
MH	LP	AP	1:2000

PLOT NAME:	REVISION:
17247_EA_FMfP_SW_CC	-



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise
2) The Historic Flood Map is a GIS layer showing the maximum extent of individual Recorded Flood Outlines from river, the sea and groundwater springs that meet a set criteria. It shows areas of land that have previously been subject to flooding in England. This excludes flooding from surface water, except in areas where it is impossible to determine whether the source is fluvial or surface water but the dominant source is fluvial.
3) If an area is not covered by the Historic Flood Map it does not mean that the area has never flooded, only that the EA do not currently have records of flooding in this area that meet the criteria for inclusion.
4) The Historic Flood Map takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding. It will include flood extents that may have been affected by overtopping, breaches or blockages.

LEGEND

- Site Boundary
- Historic Flood Map

CLIENT: gta Civils & Transport

waterco
www.waterco.co.uk

SCHEME: Southview Road, Southwick

PLOT TITLE: EA Historic Flood Risk
Data revised August 2025

PLOT STATUS:	DATE:
FINAL	20-01-2026

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
MH	LP	AP	1:2000

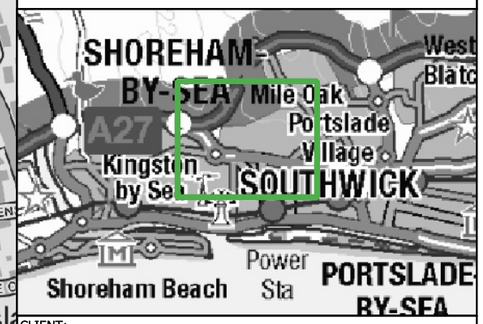
PLOT NAME:	REVISION:
17247_EA_Historic_Flood_Risk	-

Appendix D 2D Model Extent

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- 2D Model Extent
- Rainfall Boundary
- 2D Water Level (H) vs Flow Boundary (Q)



CLIENT: gta Civils & Transport

waterco
www.waterco.co.uk

SCHEME: Southview Road, Southwick

PLOT TITLE: Model Extent Plan

PLOT STATUS:			DATE:
FINAL			19-01-2026
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
MH	LP	AP	1:7000

PLOT NAME:	REVISION:
17247_Model_Extent_Plan	-

0 100 200 300 400 500 m

Appendix E Topographical Survey

Do Not Scale

CLIENT
Circle 25 Design

PROJECT
Land At Southview Road
Southwick

TITLE
SITE SURVEY

SCALE	DATE	BY
1:100	24/04/17	MG

NUMBER	SHEET	REVN
M1131	1	–

Acad Mapping Ltd
Land Surveyors
Frenches Farm House
Mark Cross
East Sussex TN6 3NS
Telephone (01892) 853663
Fax (01892) 853828
e-mail info@acadmapping.com

Survey carried out using GPS to establish control stations combined with Total Station methods for detail & levels
Grid relates to Ordnance Survey National Grid

Species of trees must be confirmed by a qualified arboriculturist before any design work takes place

Spreads of trees shown as average

N

1m 2m 3m 4m 5m

Scale 1:100 printed on A0

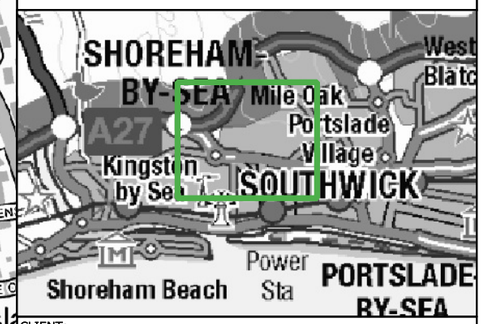
AutoCAD AVAILABLE IN DIGITAL FORMAT

Appendix F Hydrology

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- FEH Catchment Boundary
- Rainfall Watershed Analysis Catchment Boundary



CLIENT: gta Civils & Transport

waterco
www.waterco.co.uk

SCHEME: Southview Road, Southwick

PLOT TITLE: Catchment Boundary Plan

PLOT STATUS:			DATE:
FINAL			19-01-2026
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
MH	LP	AP	1:7000

PLOT NAME: 17247_Catchment_Boundary_Plan

REVISION: -

Catchment Descriptor	FEH Web Service	Revised
AREA	0.96	1.04
ALTBAR	41	41
ASPBAR	185	185
ASPVAR	0.83	0.83
BFIHOST	0.925	0.925
BFIHOST19	0.903	0.903
DPLBAR	1.01	1.06
DPSBAR	57.1	57.1
FARL	1	1
FPEXT	0.0443	0.0443
FPDBAR	0.172	0.172
FPLOC	0.169	0.169
LDP	1.97	1.97
PROPWET	0.34	0.34
RMED-1H	37.5	37.5
RMED-1D	11.1	11.1
RMED-2D	47.5	47.5
SAAR	772	772
SAAR4170	779	779
SPRHOST	8.8	8.8
URBCONC1990	0.91	0.91
URBEXT1990	0.3112	0.31
URBLOC1990	0.686	0.686
URBCONC2000	0.858	0.858
URBEXT2000	0.3008	0.3998
URBLOC2000	0.749	0.749
C	-0.026	-0.026
D1	0.39761	0.39761
D2	0.30566	0.30566
D3	0.36512	0.36512
E	0.30842	0.30842
F	2.45002	2.45002
C(1 km)	-0.026	-0.026
D1(1 km)	0.403	0.403
D2(1 km)	0.303	0.303
D3(1 km)	0.362	0.362
E(1 km)	0.309	0.309
F(1 km)	2.443	2.443

UK Design Flood Estimation

Generated on 14 November 2025 13:28:33 by martha.hughes
Printed from the ReFH2 Flood Modelling software package, version 4.2.9376.28705

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

Site details Checksum: 66DC-6177

Site name: Updated Rainfall Catchment Descriptors_524100_105550_v5_1_0

Easting: 524100

Northing: 105550

Country: England, Wales or Northern Ireland

Catchment Area (km²): 1.04

Using plot scale calculations: No

Model: 2.3

Site description: None

Model run: 2 year

Summary of results

Rainfall - FEH22 (mm):	23.16	Total runoff (ML):	4.64
Total Rainfall (mm):	22.08	Total flow (ML):	6.68
Peak Rainfall (mm):	6.08	Peak flow (m³/s):	0.45

Parameters

Where the user has overriden a system-generated value, this original value is shown in square brackets after the value used.
** Indicates that the user locked the duration/timestep*

Rainfall parameters (Rainfall - FEH22)

Name	Value	User-defined?
Duration (hh:mm:ss)	03:15:00	No
Timestep (hh:mm:ss)	00:15:00	No
SCF (Seasonal correction factor)	0.98	No
ARF (Areal reduction factor)	0.97	No
Seasonality	Summer	No

Loss model parameters

Name	Value	User-defined?
Cini (mm)	23.22	No
Cmax (mm)	1163.57	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

**The URBEXT2000 has been modified so that the 'Urban' proportion does not exceed 1.*

Name	Value	User-defined?
Tp (hr)	1.88	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m^3/s)	0	No
BL (hr)	48.35	No
BR	3.68	No

Urbanisation parameters

Name	Value	User-defined?
Sewer capacity (m^3/s)	0	No
Exporting drained area (km^2)	0	No
Urban area (km^2)	0.66 [0.65]	Yes
Effective URBEXT2000	0.41	n/a
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No

**The URBEXT2000 has been modified so that the 'Urban' proportion does not exceed 1.*

Time series data

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m^3/s)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
00:00:00	0.418	0.000	0.081	0.000	0.002	0.002
00:15:00	0.582	0.000	0.113	0.001	0.002	0.003
00:30:00	0.828	0.000	0.162	0.004	0.002	0.007
00:45:00	1.209	0.000	0.237	0.011	0.002	0.013
01:00:00	1.846	0.000	0.364	0.022	0.002	0.024
01:15:00	3.117	0.000	0.620	0.040	0.002	0.042
01:30:00	6.077	0.000	1.229	0.069	0.002	0.071
01:45:00	3.117	0.000	0.640	0.117	0.003	0.120
02:00:00	1.846	0.000	0.383	0.183	0.003	0.186
02:15:00	1.209	0.000	0.252	0.255	0.003	0.258
02:30:00	0.828	0.000	0.173	0.326	0.003	0.329
02:45:00	0.582	0.000	0.122	0.389	0.004	0.393
03:00:00	0.418	0.000	0.088	0.433	0.004	0.437
03:15:00	0.000	0.000	0.000	0.442	0.005	0.447
03:30:00	0.000	0.000	0.000	0.426	0.006	0.432
03:45:00	0.000	0.000	0.000	0.395	0.007	0.402
04:00:00	0.000	0.000	0.000	0.356	0.007	0.363
04:15:00	0.000	0.000	0.000	0.313	0.008	0.321
04:30:00	0.000	0.000	0.000	0.271	0.009	0.279
04:45:00	0.000	0.000	0.000	0.233	0.009	0.242
05:00:00	0.000	0.000	0.000	0.198	0.010	0.208
05:15:00	0.000	0.000	0.000	0.167	0.010	0.177
05:30:00	0.000	0.000	0.000	0.137	0.011	0.148
05:45:00	0.000	0.000	0.000	0.110	0.011	0.122
06:00:00	0.000	0.000	0.000	0.085	0.012	0.097
06:15:00	0.000	0.000	0.000	0.062	0.012	0.074
06:30:00	0.000	0.000	0.000	0.042	0.012	0.054
06:45:00	0.000	0.000	0.000	0.026	0.012	0.039
07:00:00	0.000	0.000	0.000	0.017	0.013	0.029
07:15:00	0.000	0.000	0.000	0.011	0.013	0.023
07:30:00	0.000	0.000	0.000	0.007	0.013	0.019
07:45:00	0.000	0.000	0.000	0.004	0.013	0.017
08:00:00	0.000	0.000	0.000	0.002	0.013	0.015
08:15:00	0.000	0.000	0.000	0.001	0.013	0.014

**The URBEXT2000 has been modified so that the 'Urban' proportion does not exceed 1.*

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m^3/s)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
08:30:00	0.000	0.000	0.000	0.001	0.013	0.013
08:45:00	0.000	0.000	0.000	0.000	0.013	0.013
09:00:00	0.000	0.000	0.000	0.000	0.013	0.013
09:15:00	0.000	0.000	0.000	0.000	0.013	0.013
09:30:00	0.000	0.000	0.000	0.000	0.013	0.013
09:45:00	0.000	0.000	0.000	0.000	0.013	0.013
10:00:00	0.000	0.000	0.000	0.000	0.012	0.012
10:15:00	0.000	0.000	0.000	0.000	0.012	0.012
10:30:00	0.000	0.000	0.000	0.000	0.012	0.012
10:45:00	0.000	0.000	0.000	0.000	0.012	0.012
11:00:00	0.000	0.000	0.000	0.000	0.012	0.012
11:15:00	0.000	0.000	0.000	0.000	0.012	0.012
11:30:00	0.000	0.000	0.000	0.000	0.012	0.012
11:45:00	0.000	0.000	0.000	0.000	0.012	0.012
12:00:00	0.000	0.000	0.000	0.000	0.012	0.012
12:15:00	0.000	0.000	0.000	0.000	0.012	0.012
12:30:00	0.000	0.000	0.000	0.000	0.012	0.012
12:45:00	0.000	0.000	0.000	0.000	0.012	0.012
13:00:00	0.000	0.000	0.000	0.000	0.012	0.012
13:15:00	0.000	0.000	0.000	0.000	0.012	0.012
13:30:00	0.000	0.000	0.000	0.000	0.012	0.012
13:45:00	0.000	0.000	0.000	0.000	0.012	0.012
14:00:00	0.000	0.000	0.000	0.000	0.011	0.011
14:15:00	0.000	0.000	0.000	0.000	0.011	0.011
14:30:00	0.000	0.000	0.000	0.000	0.011	0.011
14:45:00	0.000	0.000	0.000	0.000	0.011	0.011
15:00:00	0.000	0.000	0.000	0.000	0.011	0.011
15:15:00	0.000	0.000	0.000	0.000	0.011	0.011
15:30:00	0.000	0.000	0.000	0.000	0.011	0.011
15:45:00	0.000	0.000	0.000	0.000	0.011	0.011
16:00:00	0.000	0.000	0.000	0.000	0.011	0.011
16:15:00	0.000	0.000	0.000	0.000	0.011	0.011
16:30:00	0.000	0.000	0.000	0.000	0.011	0.011
16:45:00	0.000	0.000	0.000	0.000	0.011	0.011
17:00:00	0.000	0.000	0.000	0.000	0.011	0.011

**The URBEXT2000 has been modified so that the 'Urban' proportion does not exceed 1.*

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m^3/s)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
17:15:00	0.000	0.000	0.000	0.000	0.011	0.011
17:30:00	0.000	0.000	0.000	0.000	0.011	0.011
17:45:00	0.000	0.000	0.000	0.000	0.011	0.011
18:00:00	0.000	0.000	0.000	0.000	0.011	0.011
18:15:00	0.000	0.000	0.000	0.000	0.010	0.010
18:30:00	0.000	0.000	0.000	0.000	0.010	0.010
18:45:00	0.000	0.000	0.000	0.000	0.010	0.010
19:00:00	0.000	0.000	0.000	0.000	0.010	0.010
19:15:00	0.000	0.000	0.000	0.000	0.010	0.010
19:30:00	0.000	0.000	0.000	0.000	0.010	0.010
19:45:00	0.000	0.000	0.000	0.000	0.010	0.010
20:00:00	0.000	0.000	0.000	0.000	0.010	0.010
20:15:00	0.000	0.000	0.000	0.000	0.010	0.010
20:30:00	0.000	0.000	0.000	0.000	0.010	0.010
20:45:00	0.000	0.000	0.000	0.000	0.010	0.010
21:00:00	0.000	0.000	0.000	0.000	0.010	0.010
21:15:00	0.000	0.000	0.000	0.000	0.010	0.010
21:30:00	0.000	0.000	0.000	0.000	0.010	0.010
21:45:00	0.000	0.000	0.000	0.000	0.010	0.010
22:00:00	0.000	0.000	0.000	0.000	0.010	0.010
22:15:00	0.000	0.000	0.000	0.000	0.010	0.010
22:30:00	0.000	0.000	0.000	0.000	0.010	0.010
22:45:00	0.000	0.000	0.000	0.000	0.010	0.010
23:00:00	0.000	0.000	0.000	0.000	0.010	0.010
23:15:00	0.000	0.000	0.000	0.000	0.009	0.009
23:30:00	0.000	0.000	0.000	0.000	0.009	0.009
23:45:00	0.000	0.000	0.000	0.000	0.009	0.009
24:00:00	0.000	0.000	0.000	0.000	0.009	0.009
24:15:00	0.000	0.000	0.000	0.000	0.009	0.009
24:30:00	0.000	0.000	0.000	0.000	0.009	0.009
24:45:00	0.000	0.000	0.000	0.000	0.009	0.009
25:00:00	0.000	0.000	0.000	0.000	0.009	0.009
25:15:00	0.000	0.000	0.000	0.000	0.009	0.009
25:30:00	0.000	0.000	0.000	0.000	0.009	0.009
25:45:00	0.000	0.000	0.000	0.000	0.009	0.009

**The URBEXT2000 has been modified so that the 'Urban' proportion does not exceed 1.*

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m^3/s)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
26:00:00	0.000	0.000	0.000	0.000	0.009	0.009
26:15:00	0.000	0.000	0.000	0.000	0.009	0.009
26:30:00	0.000	0.000	0.000	0.000	0.009	0.009
26:45:00	0.000	0.000	0.000	0.000	0.009	0.009
27:00:00	0.000	0.000	0.000	0.000	0.009	0.009
27:15:00	0.000	0.000	0.000	0.000	0.009	0.009
27:30:00	0.000	0.000	0.000	0.000	0.009	0.009
27:45:00	0.000	0.000	0.000	0.000	0.009	0.009
28:00:00	0.000	0.000	0.000	0.000	0.009	0.009
28:15:00	0.000	0.000	0.000	0.000	0.009	0.009
28:30:00	0.000	0.000	0.000	0.000	0.008	0.008
28:45:00	0.000	0.000	0.000	0.000	0.008	0.008
29:00:00	0.000	0.000	0.000	0.000	0.008	0.008
29:15:00	0.000	0.000	0.000	0.000	0.008	0.008
29:30:00	0.000	0.000	0.000	0.000	0.008	0.008
29:45:00	0.000	0.000	0.000	0.000	0.008	0.008
30:00:00	0.000	0.000	0.000	0.000	0.008	0.008
30:15:00	0.000	0.000	0.000	0.000	0.008	0.008
30:30:00	0.000	0.000	0.000	0.000	0.008	0.008
30:45:00	0.000	0.000	0.000	0.000	0.008	0.008
31:00:00	0.000	0.000	0.000	0.000	0.008	0.008
31:15:00	0.000	0.000	0.000	0.000	0.008	0.008
31:30:00	0.000	0.000	0.000	0.000	0.008	0.008
31:45:00	0.000	0.000	0.000	0.000	0.008	0.008
32:00:00	0.000	0.000	0.000	0.000	0.008	0.008
32:15:00	0.000	0.000	0.000	0.000	0.008	0.008
32:30:00	0.000	0.000	0.000	0.000	0.008	0.008
32:45:00	0.000	0.000	0.000	0.000	0.008	0.008
33:00:00	0.000	0.000	0.000	0.000	0.008	0.008
33:15:00	0.000	0.000	0.000	0.000	0.008	0.008
33:30:00	0.000	0.000	0.000	0.000	0.008	0.008
33:45:00	0.000	0.000	0.000	0.000	0.008	0.008
34:00:00	0.000	0.000	0.000	0.000	0.008	0.008
34:15:00	0.000	0.000	0.000	0.000	0.008	0.008
34:30:00	0.000	0.000	0.000	0.000	0.007	0.007

**The URBEXT2000 has been modified so that the 'Urban' proportion does not exceed 1.*

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m^3/s)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
34:45:00	0.000	0.000	0.000	0.000	0.007	0.007
35:00:00	0.000	0.000	0.000	0.000	0.007	0.007
35:15:00	0.000	0.000	0.000	0.000	0.007	0.007
35:30:00	0.000	0.000	0.000	0.000	0.007	0.007
35:45:00	0.000	0.000	0.000	0.000	0.007	0.007
36:00:00	0.000	0.000	0.000	0.000	0.007	0.007
36:15:00	0.000	0.000	0.000	0.000	0.007	0.007
36:30:00	0.000	0.000	0.000	0.000	0.007	0.007
36:45:00	0.000	0.000	0.000	0.000	0.007	0.007
37:00:00	0.000	0.000	0.000	0.000	0.007	0.007
37:15:00	0.000	0.000	0.000	0.000	0.007	0.007
37:30:00	0.000	0.000	0.000	0.000	0.007	0.007
37:45:00	0.000	0.000	0.000	0.000	0.007	0.007
38:00:00	0.000	0.000	0.000	0.000	0.007	0.007
38:15:00	0.000	0.000	0.000	0.000	0.007	0.007
38:30:00	0.000	0.000	0.000	0.000	0.007	0.007
38:45:00	0.000	0.000	0.000	0.000	0.007	0.007
39:00:00	0.000	0.000	0.000	0.000	0.007	0.007
39:15:00	0.000	0.000	0.000	0.000	0.007	0.007
39:30:00	0.000	0.000	0.000	0.000	0.007	0.007
39:45:00	0.000	0.000	0.000	0.000	0.007	0.007
40:00:00	0.000	0.000	0.000	0.000	0.007	0.007
40:15:00	0.000	0.000	0.000	0.000	0.007	0.007
40:30:00	0.000	0.000	0.000	0.000	0.007	0.007
40:45:00	0.000	0.000	0.000	0.000	0.007	0.007
41:00:00	0.000	0.000	0.000	0.000	0.007	0.007
41:15:00	0.000	0.000	0.000	0.000	0.007	0.007
41:30:00	0.000	0.000	0.000	0.000	0.006	0.006
41:45:00	0.000	0.000	0.000	0.000	0.006	0.006
42:00:00	0.000	0.000	0.000	0.000	0.006	0.006
42:15:00	0.000	0.000	0.000	0.000	0.006	0.006
42:30:00	0.000	0.000	0.000	0.000	0.006	0.006
42:45:00	0.000	0.000	0.000	0.000	0.006	0.006
43:00:00	0.000	0.000	0.000	0.000	0.006	0.006
43:15:00	0.000	0.000	0.000	0.000	0.006	0.006

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