Surface Water Drainage Strategy for Planning

January 2026

Prepared for:

Stag Construction Services Ltd

Location:

9 Station Parade
Tarring Road
West Sussex
BN11 4SS

Our reference:

95586-Boys-StationRd_SWDS

Unda

unda.co.uk

Document Issue Record

Project Details	
Project:	Surface Water Drainage Strategy for Planning
Prepared for:	Stag Construction Services Ltd
Application:	Construction of a new single residential unit
Location:	9 Station Parade, Tarring Road, West Sussex, BN11 4SS
Our reference:	95586-Boys-StationRd_SWDS
Issue no.:	v1.0
Issue date:	26th January 2026

Project Consultants	
Lead Consultant:	Mr Antony Rousou, BSc (Hons)
Document Check:	Miss Ellen Webb, BSc (Hons)
Authorisation:	Mr Antony Rousou, BSc (Hons)

Contents

1. Introduction

1.1. This Surface Water Drainage Strategy has been prepared by Unda Consulting Limited on behalf of Stag Construction Services Ltd, in support of a planning application for the construction of a new single residential unit. The proposed development is being undertaken at 9 Station Parade, Tarring Road, West Sussex, BN11 4SS. This report sets out the surface water drainage arrangements for the proposed development.

1.2. The proposed planning application is for the construction of a new single residential unit. Post development the area draining into the Tanked Permeable Paving gravel sub-base will amount to approximately 83m².

1.3. In order to mitigate flood risk posed by post development runoff, adequate control measures will be required within the site. This will ensure that surface water runoff is dealt with at source and the flood risk off site is not increased.

Figure 1: Aerial view of the site and surrounding area (Source: Google Earth)

2. Existing Site

2.1. The site comprises of a two storey building. The ground floor is a commercial entity. A residential unit is situated on the first floor. The site also has an associated parking area towards the rear.

2.2. The surrounding area is characterised by residential properties and commercial buildings.

2.3. Existing plans are provided in the report Appendix.

Figure 2: Existing ground floor plan and elevations (Source: BPM Architectural Services)

Site Topography:

2.4. Environment Agency LiDAR has been used to assess the topography across the site and wider area. Light Detection and Ranging (LiDAR) is an airborne mapping technique, which uses a laser to measure the distance between the aircraft and the ground surface. Up to 100,000 measurements per second are made of the ground, allowing highly detailed terrain models to be generated at high spatial resolutions. The EA's LiDAR data archive contains digital elevation data derived from surveys carried out by the EA's specialist remote sensing team. Accurate elevation data is available for over 70% of England. The LiDAR technique records an elevation accurate to +/-5cm to 15cm with spatial resolutions ranging from 25cm to 2 metres. This dataset is derived from a combination of the full dataset which has been merged and re-sampled to give the best possible coverage. The dataset can be supplied as a Digital Surface Model (DSM) produced from the signal returned to the LiDAR (which includes heights of objects, such as vehicles, buildings and vegetation, as well as the terrain surface) or as a Digital Terrain Model (DTM) produced by removing objects from the Digital Surface Model. 1.0m horizontal resolution DTM LiDAR data has been used for the purposes of this study.

2.5. LiDAR remotely sensed digital elevation data suggests that the ground topography on site ranges from approximately 7.60mAOD to 7.90mAOD.

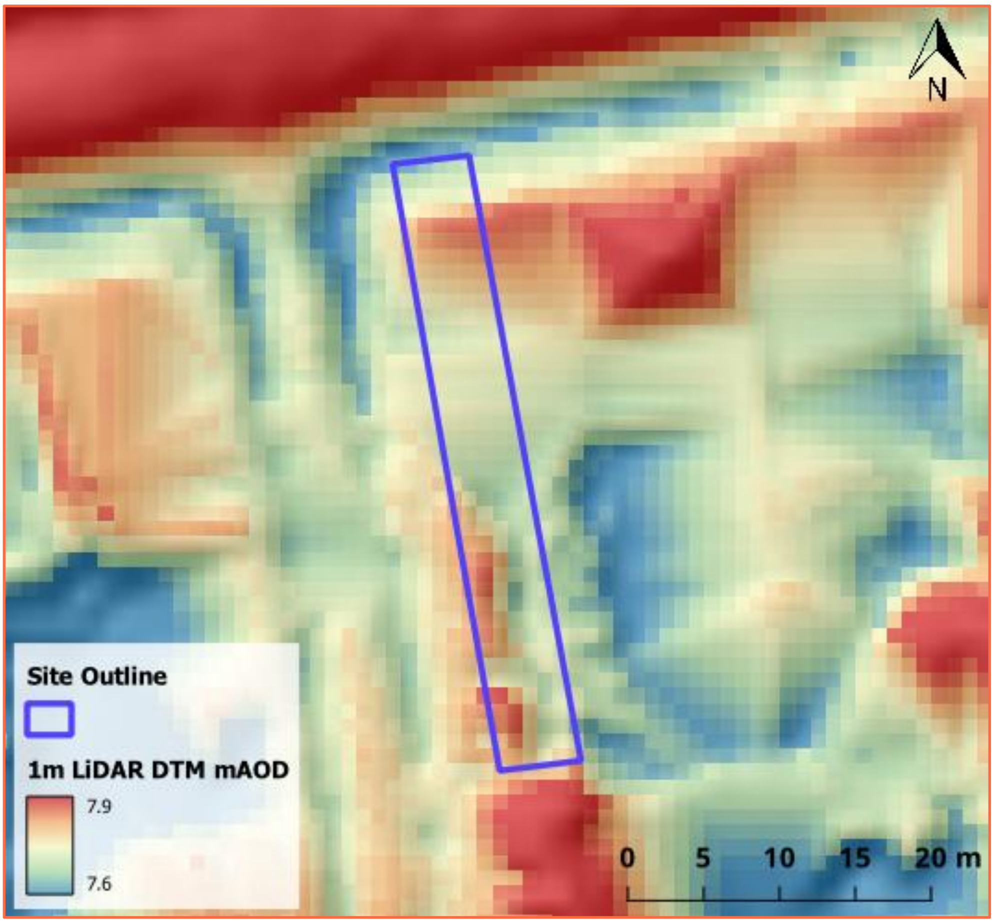


Figure 3: 1m LiDAR DTM (Source: EA, OS)

Existing Ground Conditions:

2.6. The 1:50,000 BGS map shows that the bedrock underlying the site is Seaford Chalk Formation – Chalk.

2.7. The BGS mapping shows superficial deposits of River Terrace deposits (Undifferentiated) – sand, silt, and clay underlying the site.

2.8. The soil type taken from the UKSO Soil Map Viewer, shows the site to located upon relatively deep soils of sand Loess parent material with a soil texture of silt to sand.

2.9. The published Environment Agency Groundwater Source Protection Zone map shows the site is not located within a Groundwater Source Protection Zone.

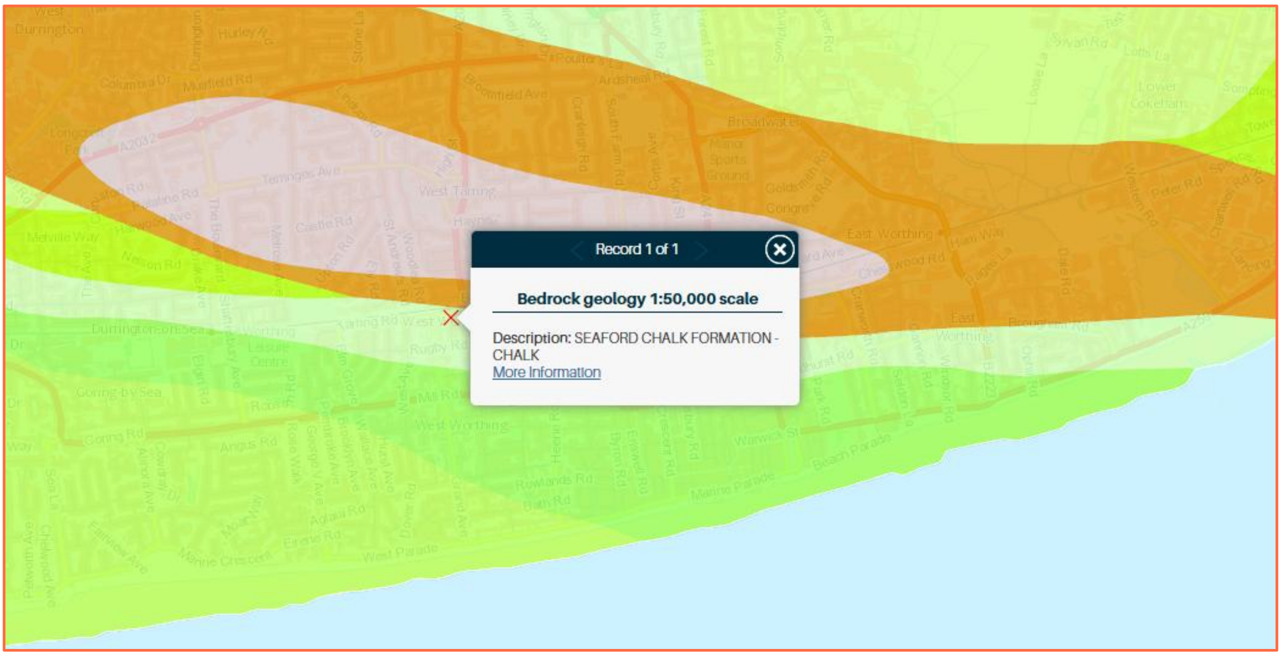


Figure 4: BGS Bedrock Geology (Source: BGS)

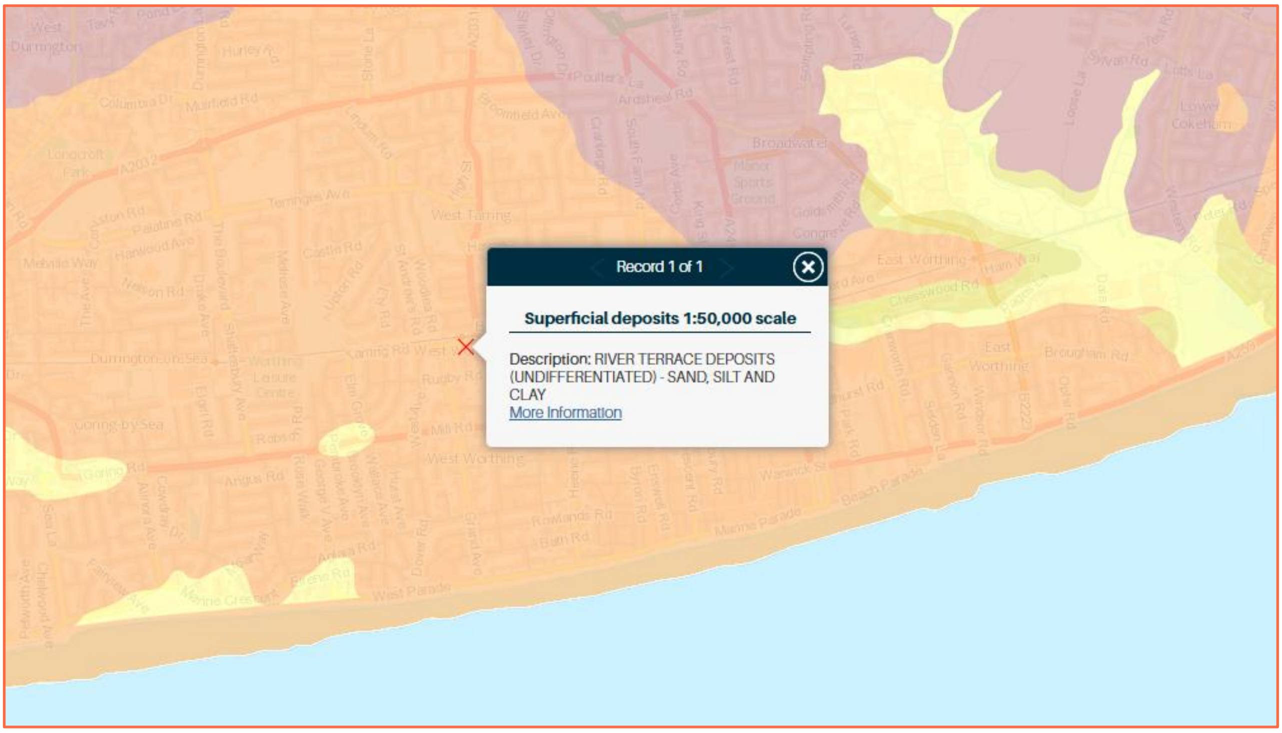


Figure 5: BGS superficial deposits (Source: BGS)

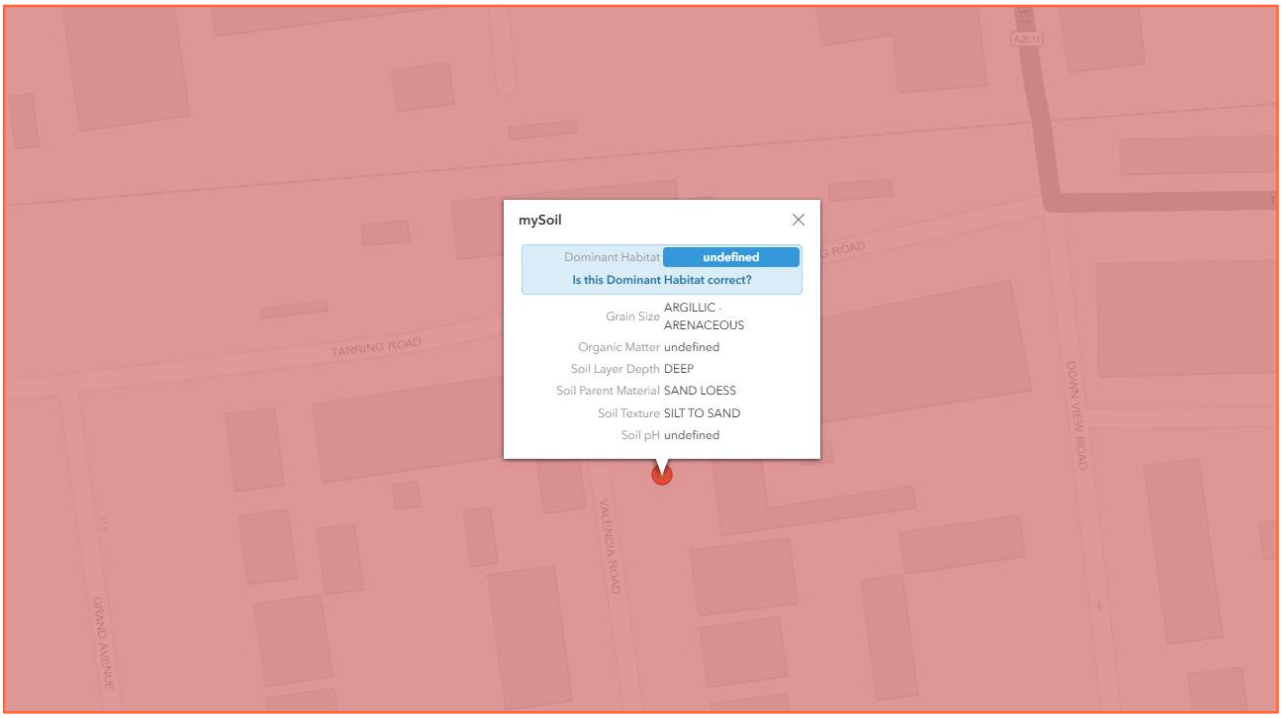


Figure 6: Soil map (Source: UK Soils, BGS)

Nearby Watercourses / Drainage Features:

2.10. The English channel is approximately 1.3km south of the site.

3. Development Proposal

3.1. The proposed planning application is for the construction of a new single residential unit. Post development the area draining into the Tanked Permeable Paving gravel sub-base will amount to approximately 83m².

3.2. Proposed plans are provided in the report Appendix.

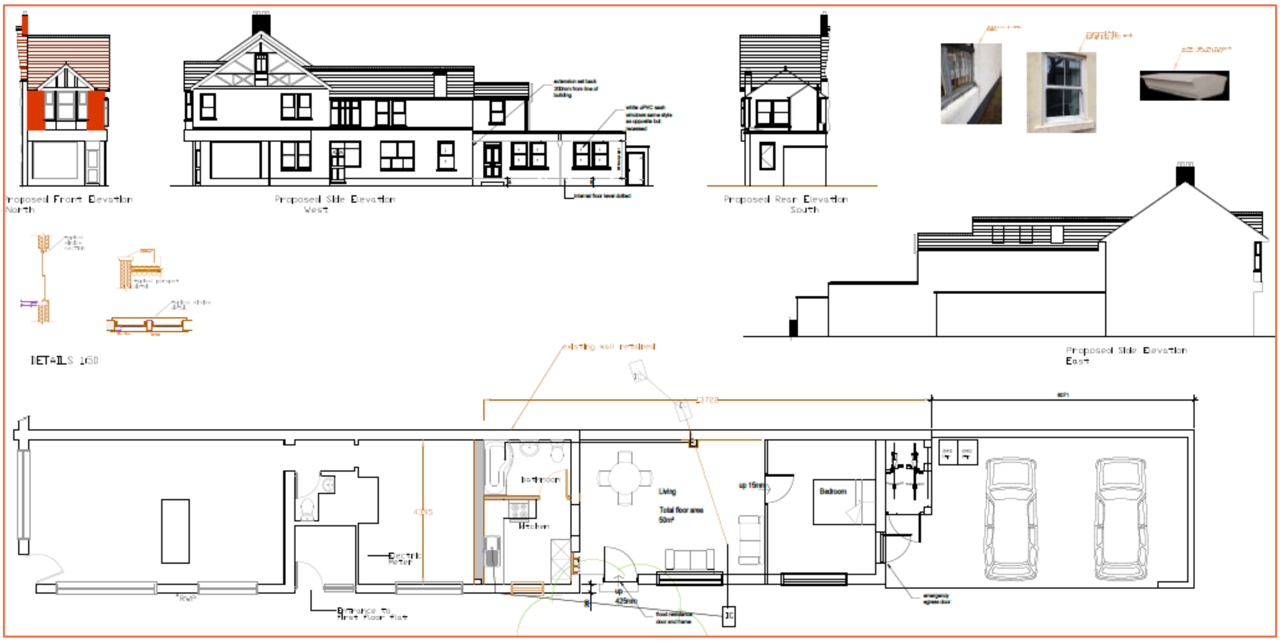


Figure 7: Proposed ground floor and elevation plan (Source: BPM Architectural Services)

4. Surface Water Drainage Strategy

Existing Drainage:

4.1. The existing site is understood to discharge its surface water to sewer at an unattenuated rate.

4.2. Southern Water sewer records indicate a surface wand foul water sewer located below Valencia Road and Tarring Road.

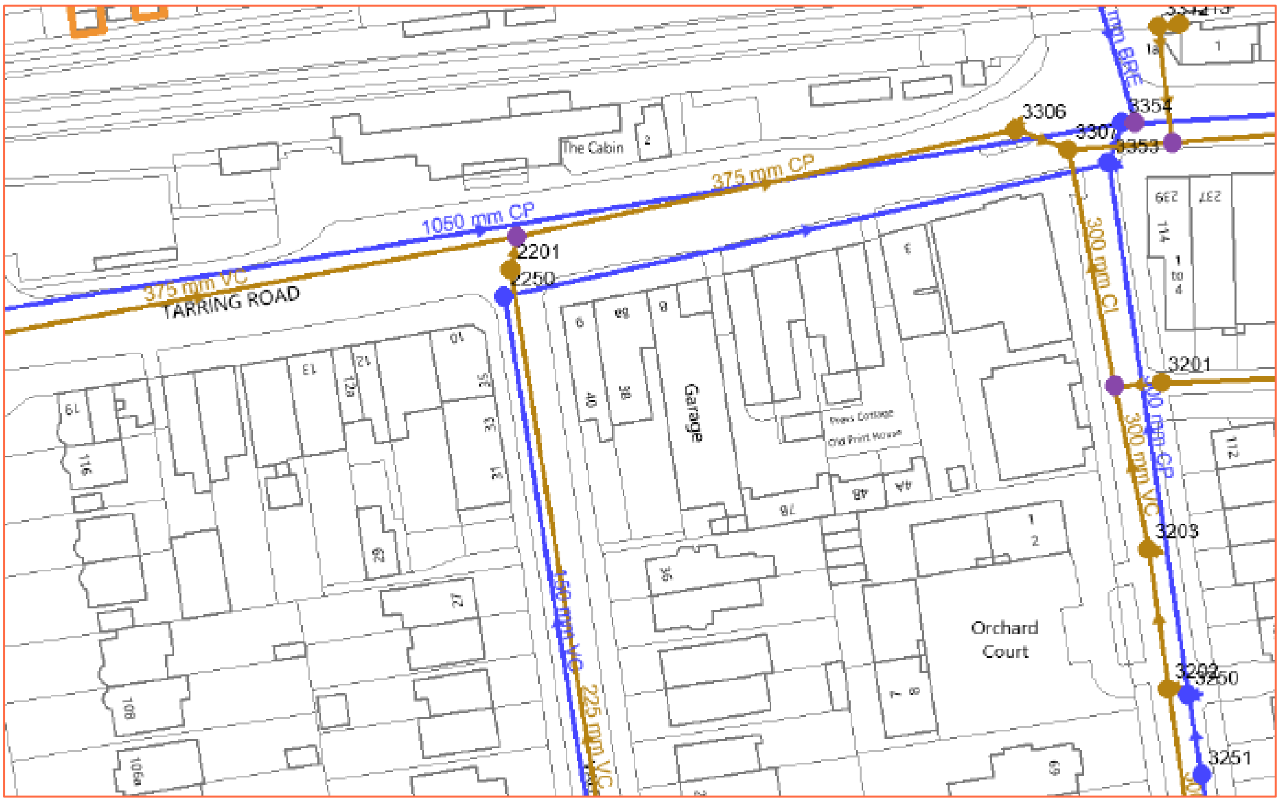


Figure 8: Local Sewer Network (Source: Southern Water)

Drainage Hierarchy:

4.3. In order to mitigate flood risk posed by post development runoff, adequate control measures will need to be considered within the site. This will ensure that surface water runoff is dealt with at source and flood risk is not increased elsewhere.

4.4. The drainage strategy for the site has been prepared according to the drainage discharge hierarchy from CIRIA C753 The SuDS Manual, as follows:

1. Infiltration to the maximum extent that is practical;
2. Discharge to surface waters;
3. Discharge to surface water sewer;
4. Discharge to combined sewer.

Infiltration Potential:

4.5. The 1:50,000 BGS map showed the site to be located upon the bedrock of Seaford Chalk Formation – Chalk. The soil type taken from the UKSO Soil Map Viewer shows the site to located upon relatively deep soils of sand Loess parent material with a soil texture of silt to sand. However, due to site constraints (e.g. required 5m offset from building), soakaways are not feasible at the site.

Proposed Discharge Rate and Location:

4.6. The greenfield runoff rate for the area of the site being attenuated has been calculated as 0.0 l/s for the 1:1 annual runoff event, 0.0 l/s for the 1:30 year event and 0.0 l/s for the 1:100 year event. Refer to calculations in Appendix.

4.7. Runoff from the proposed roof area will discharge into the tanked permeable paving gravel sub-base.

4.8. From the tanked permeable paving, runoff will be gradually discharged to the surface water sewer. The discharge will be limited to 0.1 l/s for all storms up to the 1:100 year + 45% climate change event via an orifice plate. Due to the small size of the orifice plate, an overflow will be provided to allow discharge from the storage should the orifice become obstructed.

4.9. All remaining areas will continue to drain using their existing drainage arrangements.

Tanked Permeable Paving:

4.10. Permeable paving attenuation amounting to approximately 38.5m^2 will be located to the south of the dwelling.

4.11. Post development the area draining into the Tanked Permeable Paving gravel sub-base will amount to approximately 83m^2.

4.12. No urban creep has been applied as the full increase in roof area and all ground surfacing has been accounted for within the calculations.

4.13. Preliminary calculations indicate that sufficient storage required to attenuate runoff arising from the 1:100 year + 45% climate change event can be provided within the substrate base of tanked permeable paving area of dimensions of 38.5m^2 x 0.675m deep x 0.30 (voids).

4.14. Preliminary calculations indicated that some 7.8m^3 of storage is required to attenuate the runoff for all storms up to and including the 1:100 year + 45% climate change event.

4.15. *Please note that that the levels and locations of the tanked permeable paving within the Causeway calculations are arbitrary for modelling purposes*.

4.16. All preliminary surface water drainage calculations have been undertaken using Causeway software. Refer to Appendix.

Water Quality:

4.17. Water quality has been assessed in line with the Simple Index approach from Chapter 26 of CIRIA C753 The SuDS Manual:

Step 1 – Allocate suitable pollution hazard indices for the proposed land use.
Step 2 – Select SuDS with a total pollution mitigation index that equals or exceeds the pollution hazard index.

4.18. The highest pollution hazard level for the proposed land use is Low (residential car parks). The pollution hazard indices for this land use are shown in the table below.

Land Uses	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential car parks and low trafficked roads	Low	0.5	0.4	0.4

Table 1: Pollution hazard indices for the proposed site (from Table 26.2 of CIRIA C753 The SuDS Manual)

4.19. All SuDS components are assessed for their effectiveness in pollutant removal prior to discharge in Table 26.3 in CIRIA C753 The SuDS Manual. The pollution mitigation indices for permeable pavements are show in the Table below.

SuDS Component	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Permeable Pavement	0.7	0.6	0.7

Table 2: Pollution mitigation hazard indices for permeable pavements

4.20. The Pollution Mitigation Indices for permeable pavement are greater than the Pollution Hazard Indices for residential car parks. Therefore, permeable pavements will provide sufficient water quality treatment.

4.21. Roof water will contain negligible contaminant concentrations and does not warrant treatment. Nevertheless, it is suggested to include debris / sediment traps on any new drainage.

Design Exceedance:

4.22. Should the onsite drainage system fail under extreme rainfall events or blockage, flooding may occur within the site. In the event of the drainage system failure, the runoff flow can be managed through detailing the new external levels to direct water away from structures.

Adoption and Maintenance:

4.23. It is proposed that all SuDS facilities will be maintained privately by the end users.

4.24. A draft Maintenance Schedule is outlined below.

4.25. In addition, it is recommended that all drainage elements are inspected following the first storm event and monthly for the first 3 months following commissioning.

Permeable Paving:

4.26. Permeable surfaces should be maintained with the following actions at the specified intervals to preserve their infiltration capacity and structural integrity, or in line with the manufacturer's recommendations.

Maintenance Schedule	Action	Frequency
Routine Maintenance	• Clean of silt and other sediments using a brush and vacuum. • Remove any other debris.	Three times a year: - End of winter - Mid-summer - After autumn leaf fall Or as required.
Occasional Maintenance	• Removal of weeds manually or with weedkiller. • Stabilise adjacent landscaped areas to prevent sediment spills onto surface.	Action as required.
Remedial Actions	• Replace damaged or lost blocks. • Level depressions in the surface. • Apply pure rock salt de-icer free from additional sand or grit.	Action as required.
	• Rehabilitation of upper substructure by remedial sweeping of joints and reapplication of jointing material.	Every 10 – 15 years or as required (if infiltration performance is reduced due to clogging of joints).
Monitoring	• Initial inspection.	Monthly for 3 months post-installation.
	• Inspect for poor infiltration performance or structural damage and take remedial action as necessary.	Every three months 48hrs after storm events.
	• Visually inspect for blocked joints between pavers.	Annually.
	• Monitor inspection chambers.	Annually.

Table 3: Suggested maintenance regime for permeable paving

4.27. Materials removed from the voids or the layers below the surface of the paving may contain hazardous substances such as heavy metals and hydrocarbons which may need to be disposed of as controlled waste.

Pipework, Inspection Chambers, Catchpits and Flow Controls:

4.28. It is not envisaged that silt build up within the pipework systems will require a rigorous maintenance regime so long as silt is removed from upstream catch pits on a regular basis. Notwithstanding this, a suitable maintenance regime for the systems is outlined in the table below.

Maintenance Schedule	Action	Frequency
Routine Maintenance	• Remove silt and debris from inspection chambers, catchpits and flow controls. • Cleaning of gutters and downpipe filters.	Annually or as required.
	• Remove root ingress.	Action as required.
Monitoring	• Inspect for silt and debris.	Every three months.
	• CCTV survey of drainage system to identify alignment issues, cracked pipes or leaking joints.	Every 10 years.

Table 4: Suggested maintenance regime for pipework, inspection chambers, catchpits and flow controls

5. Discussion and Conclusion

5.1. This Surface Water Drainage Strategy has been prepared by Unda Consulting Limited on behalf of Stag Construction Services Ltd, in support of a planning application for the construction of a new single residential unit. The proposed development is being undertaken at 9 Station Parade, Tarring Road, West Sussex, BN11 4SS. This report sets out the surface water drainage arrangements for the proposed development.

5.2. The site comprises of a two storey building. The ground floor is a commercial entity. A residential unit is situated on the first floor. The site also has an associated parking area towards the rear. The surrounding area is characterised by residential properties and commercial buildings.

5.3. LiDAR remotely sensed digital elevation data suggests that the ground topography on site ranges from approximately 7.60mAOD to 7.90mAOD.

5.4. The 1:50,000 BGS map shows that the bedrock underlying the site is Seaford Chalk Formation – Chalk.

5.5. The BGS mapping shows superficial deposits of River Terrace deposits (Undifferentiated) – sand, silt, and clay underlying the site.

5.6. The soil type taken from the UKSO Soil Map Viewer, shows the site to located upon relatively deep soils of sand Loess parent material with a soil texture of silt to sand.

5.7. The existing site is understood to discharge its surface water to sewer at an unattenuated rate.

5.8. Southern Water sewer records indicate a surface wand foul water sewer located below Valencia Road and Tarring Road.

5.9. The 1:50,000 BGS map showed the site to be located upon the bedrock of Seaford Chalk Formation – Chalk. The soil type taken from the UKSO Soil Map Viewer shows the site to located upon relatively deep soils of sand Loess parent material with a soil texture of silt to sand. However, due to site constraints (e.g. required 5m offset from building), soakaways are not feasible at the site.

5.10. The greenfield runoff rate for the area of the site being attenuated has been calculated as 0.0 l/s for the 1:1 annual runoff event, 0.0 l/s for the 1:30 year event and 0.0 l/s for the 1:100 year event. Refer to calculations in Appendix.

5.11. Runoff from the proposed roof area will discharge into the tanked permeable paving gravel sub-base.

5.12. From the tanked permeable paving, runoff will be gradually discharged to the surface water sewer. The discharge will be limited to 0.1 l/s for all storms up to the 1:100 year + 45% climate change event via an orifice plate. Due to the small size of the orifice plate, an overflow will be provided to allow discharge from the storage should the orifice become obstructed.

5.13. All remaining areas will continue to drain using their existing drainage arrangements.

5.14. Permeable paving attenuation amounting to approximately 38.5m^2 will be located to the south of the dwelling.

5.15. Post development the area draining into the Tanked Permeable Paving gravel sub-base will amount to approximately 83m^2.

5.16. No urban creep has been applied as the full increase in roof area and all ground surfacing has been accounted for within the calculations.

5.17. Preliminary calculations indicate that sufficient storage required to attenuate runoff arising from the 1:100 year + 45% climate change event can be provided within the substrate base of tanked permeable paving area of dimensions of 38.5m^2 x 0.675m deep x 0.30 (voids).

5.18. Preliminary calculations indicated that some 7.8m^3 of storage is required to attenuate the runoff for all storms up to and including the 1:100 year + 45% climate change event.

5.19. *Please note that that the levels and locations of the tanked permeable paving storage within the Causeway calculations are arbitrary for modelling purposes*.

5.20. All preliminary surface water drainage calculations have been undertaken using Causeway software. Refer to Appendix.

5.21.

5.22. The Pollution Mitigation Indices for permeable pavement are greater than the Pollution Hazard Indices for residential car parks. Therefore, permeable pavements will provide sufficient water quality treatment.

5.23. Roof water will contain negligible contaminant concentrations and does not warrant treatment. Nevertheless, it is suggested o include debris / sediment traps on any new drainage.

5.24. It is proposed that all SuDS facilities will be maintained privately by the end users. A draft Maintenance Schedule is outlined within the report.

5.25. Should the onsite drainage system fail under extreme rainfall events or blockage, flooding may occur within the site. In the event of the drainage system failure, the runoff flow can be managed through detailing the new external levels to direct water away from structures.

This drainage strategy has been undertaken in accordance with the principles set out in NPPF. We can conclude that providing the development adheres to the conditions advised above, the said development proposals can be accommodated without increasing flood risk within the locality in accordance with objectives set by Central Government and the EA.

Unda Consulting Limited
January 2026

Unda Consulting Limited, Unit 3, Oak Cottage, County Oak Way, County Oak, Crawley, RH11 7ST. +44 (0) 1293 214 444. info@unda.co.uk

Appendix

A – Development Plans:

- Site location, existing and proposed plans – BPM Architectural Services.

B – Sewer records:

- Sewer Records – Southern Water.

C – Causeway Calculations:

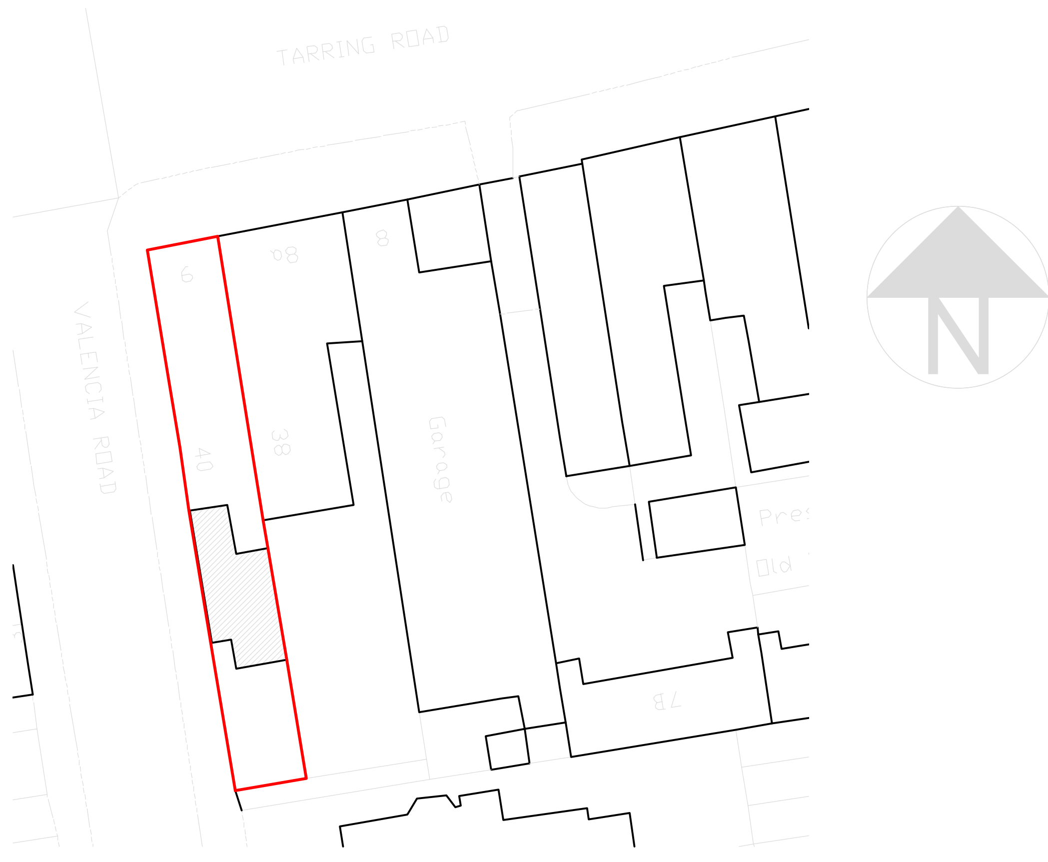
- IH124 Pre-Development Greenfield Runoff Calculations for the area of the site being attenuated;
- Tanked Permeable Paving Calculations.

D – Drainage Layout Plans:

- Proposed Drainage Layout [95586-01].

Location plan 1:1250

1:1250 — 0 10 20 30 40 50 60 70 80 90 100



Block plan 1:500

1:500 — 0 10 20 30 40 50m

amendments
RevA: 23/03/22

bpm Architectural Services Ltd.

client	Lea Daniel
project	9 Station Parade Tarring Road Worthing BN11 4SS
project ref:	17057
Drawing No.	03A
drawing title	Location and block plan
drawn by	L.F.
date	Mar 22
scale	1:500/1250@ A3

www.bpmnet.co.uk
info@bpmnet.co.uk

Do not scale off drawing, check all dimensions on site before all work is commenced

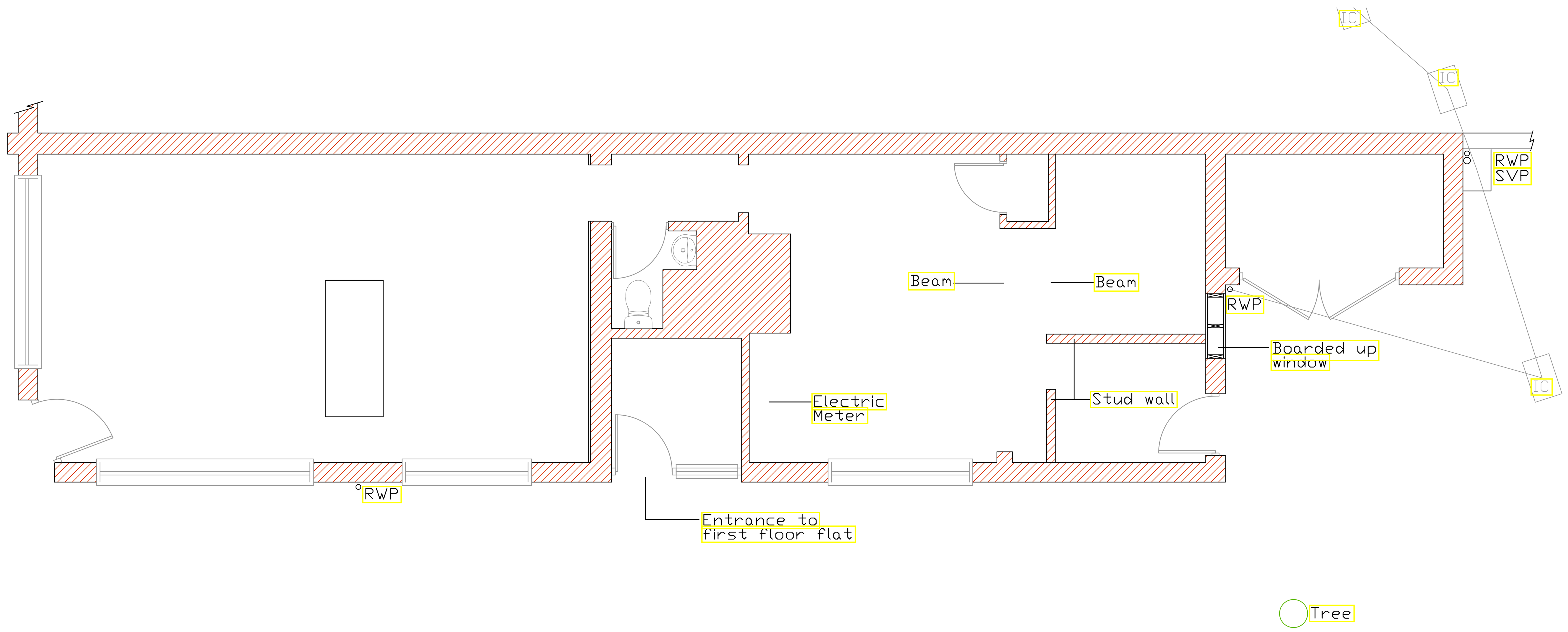
All goods materials workmanship to conform with current building regs BSS and COP's

Existing Front Elevation
North

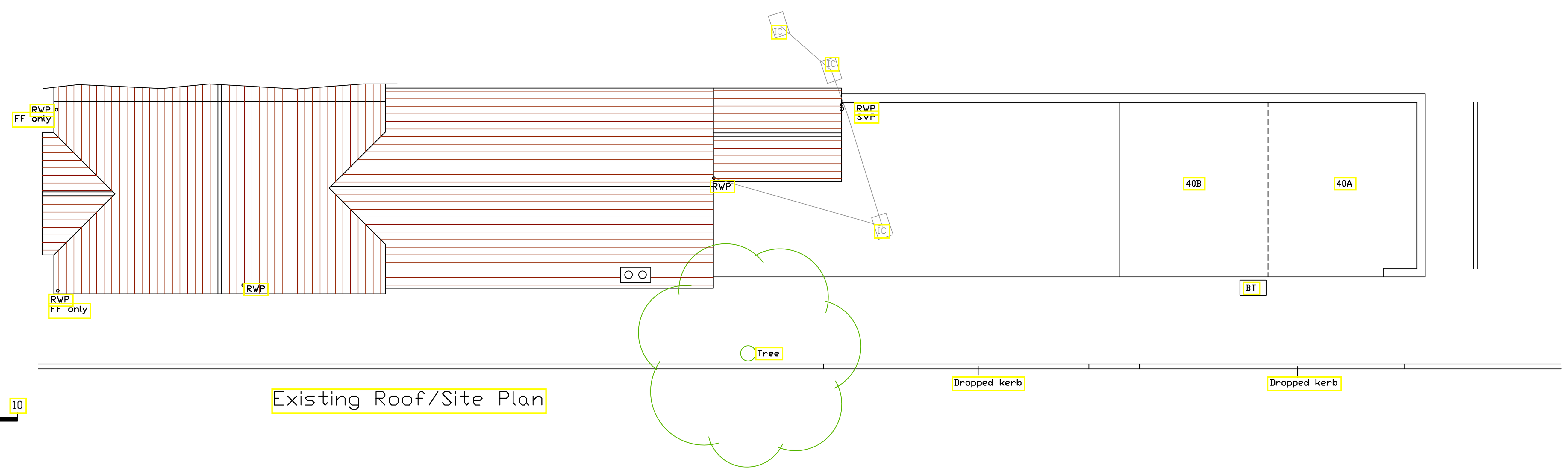
Existing Side Elevation
West

Existing Rear Elevation
South

EXISTING ELEVATIONS 1:100



EXISTING FLOOR PLANS 1:50



Existing Roof/Site Plan

1 0 5 10
Scale bar 1:50

1 0 5 10
Scale bar 1:100

EXISTING ROOF PLAN 1:100

All dimensions to be checked on site prior to commencement of work, except for planning purposes.

CALDOTEC LTD
11 THE PARADE
WILLOWHAYNE CRESCENT
EAST PRESTON
WEST SUSSEX
BN16 1NS
Telephone
01903 859176

EXISTING FLOOR PLANS, SECTION & REAR ELEVATION
9 Station Parade
Rear of Dovetail Interiors
Tarring Road
West Sussex
BN11 4SS

CLIENT Messrs Hurdley & Atkins

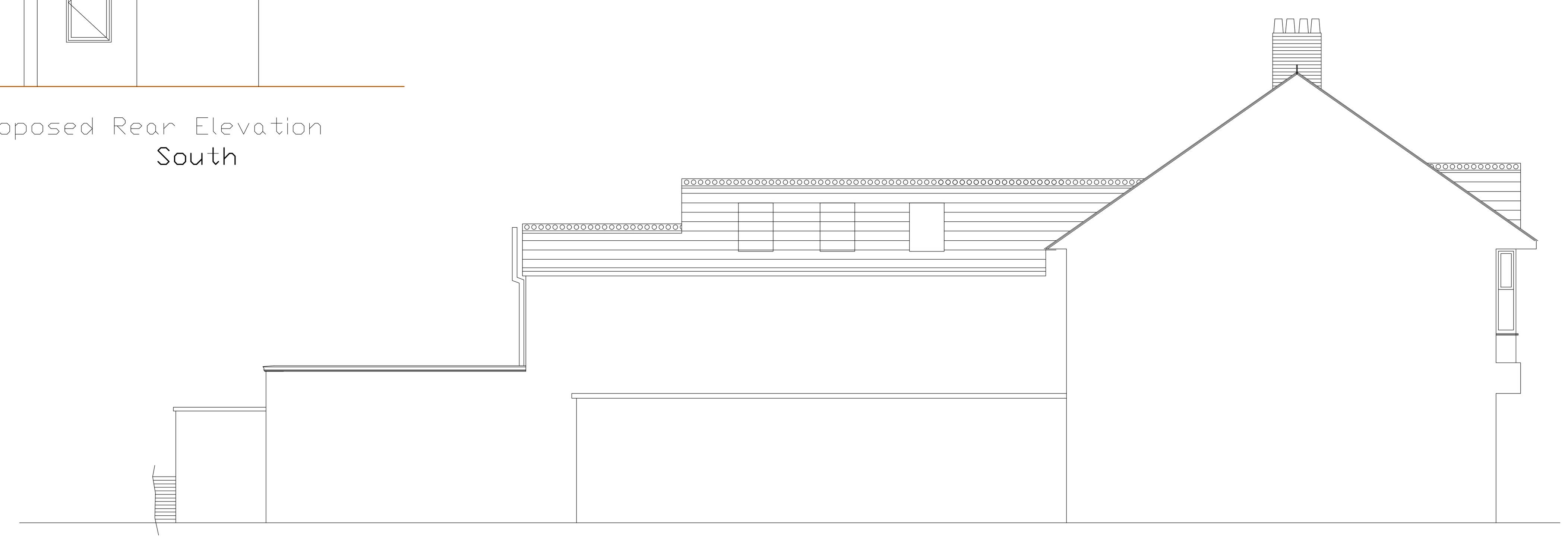
Issue	Details	By	Date

SCALE AS SHOWN on A1
DATE 17/07/17
DRAWING NUMBER 17057/01

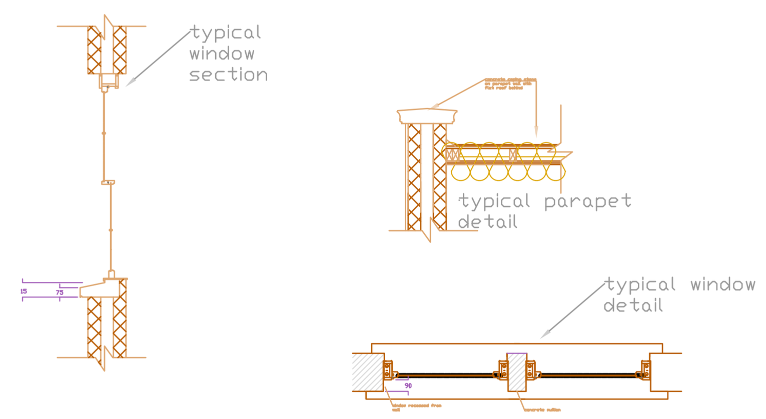
Proposed Front Elevation
North

Proposed Side Elevation
West

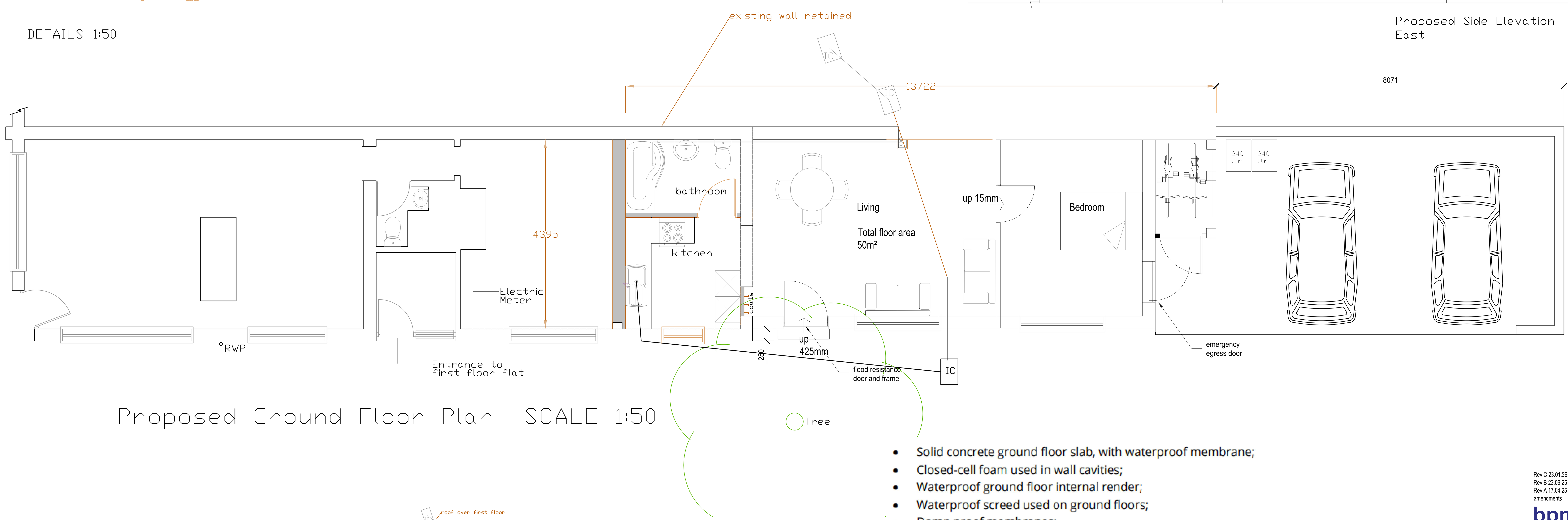
Proposed Rear Elevation
South



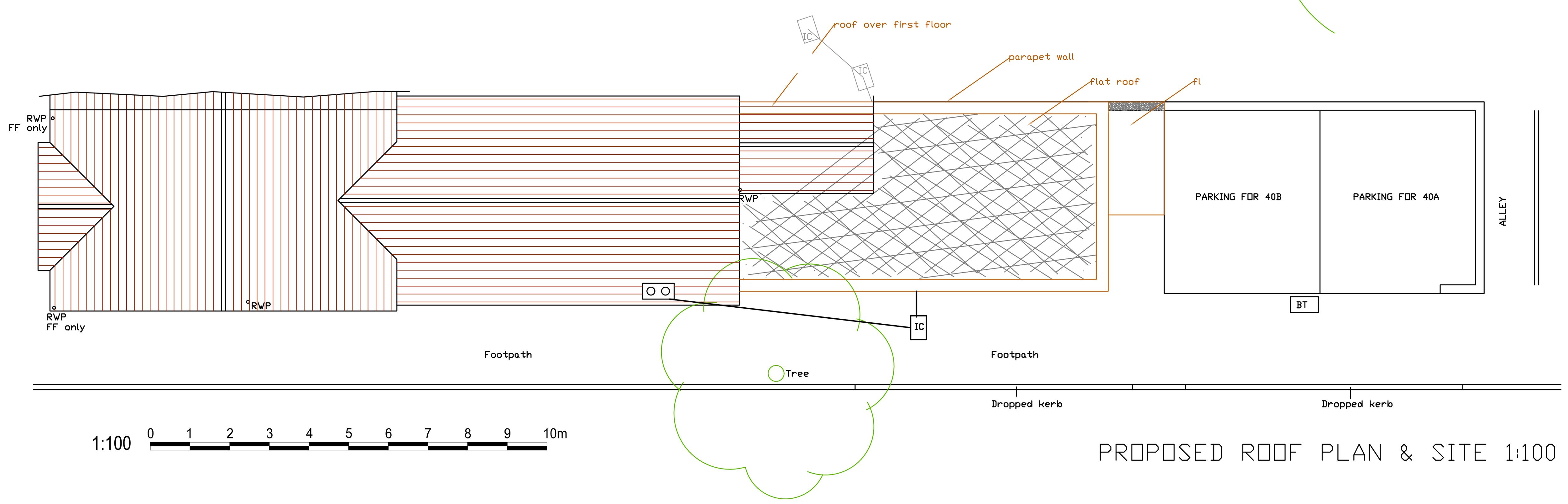
Proposed Side Elevation
East



DETAILS 1:50



Proposed Ground Floor Plan SCALE 1:50



PROPOSED ROOF PLAN & SITE 1:100

- Solid concrete ground floor slab, with waterproof membrane;
- Closed-cell foam used in wall cavities;
- Waterproof ground floor internal render;
- Waterproof screed used on ground floors;
- Damp proof membranes;
- External walls rendered resistant to flooding to at least 600mm above ground floor level;
- Exterior ventilation outlets, utility points and air bricks fitted with removable waterproof covers;
- Raised wiring and power outlets at least 600mm above ground floor level;
- Ground floor electrical main ring run from first floor level; and on separately switched circuit from first floor;
- Electrical incomer and meter situated at least 600mm above ground floor level;
- Boilers, control and water storage / immersion installed at least 600mm above ground floor level;
- Gas meter installed at least 600mm above ground floor level;
- Plumbing insulation of closed-cell design;
- Non-return valves fitted to all drain and sewer outlets;
- Manhole covers secured;
- Kitchen units of solid, water resistant material at ground floor level;
- Use of MDF carpentry (i.e. skirting, architrave, built-in storage) avoided at ground floor level;

1:50 0 1 2 3 4 5 6 7 8 9 10m

Rev C 23.01.26 Floor height
Rev B 23.09.25 Flat roof to cycle store
Rev A 17.04.25 Flood measures
amendments

bpm Architectural Services Ltd.

client	Lea Daniel
project	9 Station Parade, Tarring Road, Worthing BN11 4SS
project ref: 17057	Drawing No. 02C
drawing title	Proposed
drawn by	J Boys
date Feb 25	scale 1:50/100@ A1
	www.bpmnet.co.uk info@bpmnet.co.uk

Do not scale off drawing, check all dimensions on site before all work is commenced

All goods materials workmanship to conform with current building regs BSS and COP's

(c) Crown copyright and database rights 2022 Ordnance Survey 100031673 | Date: 10/09/22 | Scale: 1:1250 | Map Centre: 513302,103278 | Data updated: 16/08/22 | Our Ref: 948042 - 1 | Clean Water Plan A4

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2022 Ordnance Survey 100031673 .This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.

Water Main | Proposed Main | Trunk Main | Non-potable Main | Abandoned Main

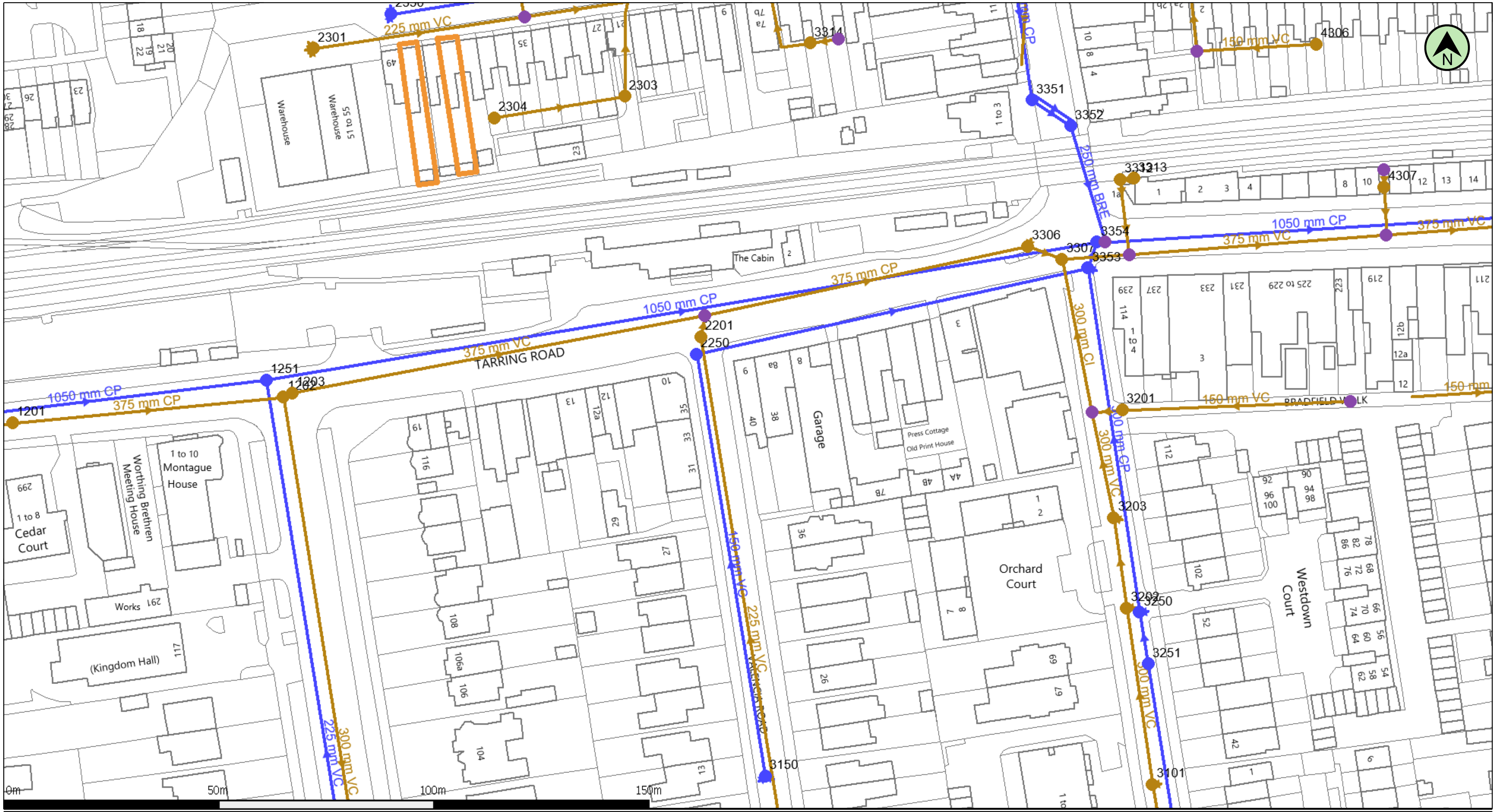
Water Hydrant | Water Meter | Water Valve

lea-daniel@hotmail.com

40a Valencia Road

BN11 4QD

WATER for LIFE from Southern Water.



(c) Crown copyright and database rights 2022 Ordnance Survey 100031673	Date: 10/09/22	Scale: 1:1250	Map Centre: 513302,103278	Data updated: 16/08/22	Our Ref: 948042 - 2	Wastewater Plan A4

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2022 Ordnance Survey 100031673 .This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.

Foul Gravity Sewer
Combined Gravity Sewer
Culverted Water Course or Treated Effluent
Surface Water Gravity Sewer
Rising Main, Vacuum or Syphon
Combined Outfall
Foul Outfall
Surface Water Outfall
Surface Water Inlet
Combined Pumping Station
Surface Water Pumping Station
Foul Pumping Station
WWTW Water Treatment Works
Section 104 Area
Building Over Agreement Area
Foul Manhole
Combined Manhole
Surface Water Manhole
Side Entry Manhole, Decarcation Chamber, Dummy Manhole or Surface Water Soakaway

lea-daniel@hotmail.com

40a Valencia Road

BN11 4QD

WATER for LIFE from Southern Water.

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
1201	F	8.21	5.56	-
1202	F	7.85	5.49	-
1203	F	7.85	5.46	-
2201	F	7.81	5.42	-
2301	F	9.04	7.81	-
2303	F	0.00	0.00	-
2304	F	0.00	0.00	-
3101	F	8.22	5.58	-
3201	F	7.77	0.00	-
3202	F	8.02	5.43	-
3203	F	7.90	0.00	-
3306	F	7.99	5.10	-
3307	F	7.80	5.10	-
3312	F	0.00	0.00	-
3313	F	0.00	0.00	-
3314	F	0.00	0.00	-
4306	F	0.00	0.00	-
4307	F	0.00	0.00	-
1251	S	7.81	5.66	-
2250	S	7.63	0.00	-
2350	S	9.04	8.26	-
3150	S	7.93	7.08	-
3250	S	7.99	6.41	-
3251	S	8.05	6.44	-
3351	S	8.37	0.00	-
3352	S	8.40	6.69	-
3353	S	7.73	6.14	-
3354	S	7.86	0.00	-

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
MH1	0.009	5.00	10.000	100.000	100.000	0.675	9.325

Simulation Settings

Rainfall Methodology	FEH-22	Skip Steady State	x	1 year (l/s)	0.0
Rainfall Events	Singular	Drain Down Time (mins)	240	30 year (l/s)	0.0
Summer CV	1.000	Additional Storage (m³/ha)	0.0	100 year (l/s)	0.0
Winter CV	1.000	Starting Level (m)		Check Discharge Volume	x
Analysis Speed	Normal	Check Discharge Rate(s)	✓		

Storm Durations

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

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

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	2.40
Greenfield Method	IH124	Growth Factor 100 year	3.19
Positively Drained Area (ha)	0.008	Betterment (%)	0
SAAR (mm)	718	QBar	0.0
Soil Index	2	Q 1 year (l/s)	0.0
SPR	0.30	Q 30 year (l/s)	0.0
Region	7	Q 100 year (l/s)	0.0
Growth Factor 1 year	0.85		

Node MH1 Online Orifice Control

Flap Valve	x	Invert Level (m)	9.325	Discharge Coefficient	0.600
Replaces Downstream Link	x	Diameter (m)	0.009		

Node MH1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	9.325	Slope (1:X)	1000.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	
Safety Factor	2.0	Width (m)	3.850	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

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
480 minute winter	MH1	448	9.996	0.671	0.9	7.6908	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
480 minute winter	MH1	Orifice	0.1	4.4

Results for 100 year +45% CC 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	MH1	20	9.630	0.305	8.2	3.4641	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
15 minute summer	MH1	Orifice	0.1	1.3

Results for 100 year +45% CC 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	MH1	20	9.631	0.306	7.7	3.4726	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
15 minute winter	MH1	Orifice	0.1	1.3

Results for 100 year +45% CC 30 minute summer. 270 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	MH1	35	9.728	0.403	7.5	4.5962	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
30 minute summer	MH1	Orifice	0.1	1.5

Results for 100 year +45% CC 30 minute winter. 270 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	MH1	34	9.728	0.403	6.1	4.6017	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
30 minute winter	MH1	Orifice	0.1	1.5

Results for 100 year +45% CC 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m^3)	Flood (m^3)	Status
60 minute summer	MH1	64	9.834	0.509	5.7	5.8166	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m^3)
60 minute summer	MH1	Orifice	0.1	1.9

Results for 100 year +45% CC 60 minute winter. 300 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	MH1	63	9.836	0.511	4.2	5.8496	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
60 minute winter	MH1	Orifice	0.1	1.9

Results for 100 year +45% CC 120 minute summer. 360 minute analysis at 2 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute summer	MH1	124	9.913	0.588	3.7	6.7313	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
120 minute summer	MH1	Orifice	0.1	2.3

Results for 100 year +45% CC 120 minute winter. 360 minute analysis at 2 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	MH1	122	9.918	0.593	2.5	6.7966	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
120 minute winter	MH1	Orifice	0.1	2.3

Results for 100 year +45% CC 180 minute summer. 420 minute analysis at 4 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute summer	MH1	184	9.950	0.625	2.7	7.1659	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
180 minute summer	MH1	Orifice	0.1	2.7

Results for 100 year +45% CC 180 minute winter. 420 minute analysis at 4 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	MH1	180	9.946	0.621	1.9	7.1195	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
180 minute winter	MH1	Orifice	0.1	2.7

Results for 100 year +45% CC 240 minute summer. 480 minute analysis at 4 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute summer	MH1	244	9.966	0.641	2.3	7.3413	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
240 minute summer	MH1	Orifice	0.1	3.0

Results for 100 year +45% CC 240 minute winter. 480 minute analysis at 4 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	MH1	240	9.980	0.655	1.5	7.5107	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
240 minute winter	MH1	Orifice	0.1	3.1

Results for 100 year +45% CC 360 minute summer. 600 minute analysis at 8 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute summer	MH1	352	9.990	0.665	1.7	7.6270	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
360 minute summer	MH1	Orifice	0.1	3.7

Results for 100 year +45% CC 360 minute winter. 600 minute analysis at 8 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	MH1	352	9.981	0.656	1.1	7.5175	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
360 minute winter	MH1	Orifice	0.1	3.7

Results for 100 year +45% CC 480 minute summer. 720 minute analysis at 8 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute summer	MH1	400	9.964	0.639	1.3	7.3286	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
480 minute summer	MH1	Orifice	0.1	4.3

Results for 100 year +45% CC 480 minute winter. 720 minute analysis at 8 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	MH1	448	9.996	0.671	0.9	7.6908	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
480 minute winter	MH1	Orifice	0.1	4.4

Results for 100 year +45% CC 600 minute summer. 840 minute analysis at 15 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute summer	MH1	465	9.966	0.641	1.1	7.3459	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
600 minute summer	MH1	Orifice	0.1	4.9

Results for 100 year +45% CC 600 minute winter. 840 minute analysis at 15 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	MH1	480	9.960	0.635	0.7	7.2752	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
600 minute winter	MH1	Orifice	0.1	4.9

Results for 100 year +45% CC 720 minute summer. 960 minute analysis at 15 minute timestep. 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	MH1	525	9.937	0.612	0.9	7.0094	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
720 minute summer	MH1	Orifice	0.1	5.4

Results for 100 year +45% CC 720 minute winter. 960 minute analysis at 15 minute timestep. 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 winter	MH1	555	9.956	0.631	0.6	7.2340	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
720 minute winter	MH1	Orifice	0.1	5.5

Results for 100 year +45% CC 960 minute summer. 1200 minute analysis at 15 minute timestep. 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	MH1	660	9.957	0.632	0.7	7.2480	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
960 minute summer	MH1	Orifice	0.1	6.8

Results for 100 year +45% CC 960 minute winter. 1200 minute analysis at 15 minute timestep. 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	MH1	705	9.944	0.619	0.5	7.0896	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
960 minute winter	MH1	Orifice	0.1	6.7

Results for 100 year +45% CC 1440 minute summer. 1680 minute analysis at 30 minute timestep. 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	MH1	960	9.914	0.589	0.5	6.7449	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
1440 minute summer	MH1	Orifice	0.1	8.7

Results for 100 year +45% CC 1440 minute winter. 1680 minute analysis at 30 minute timestep. 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 winter	MH1	1020	9.882	0.557	0.3	6.3753	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
1440 minute winter	MH1	Orifice	0.1	8.8

Results for 100 year +45% CC 2160 minute summer. 2400 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2160 minute summer	MH1	1380	9.880	0.555	0.4	6.3531	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
2160 minute summer	MH1	Orifice	0.1	10.3

Results for 100 year +45% CC 2160 minute winter. 2400 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2160 minute winter	MH1	1440	9.771	0.446	0.2	5.0991	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
2160 minute winter	MH1	Orifice	0.1	9.4

Results for 100 year +45% CC 2880 minute summer. 3120 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute summer	MH1	1740	9.776	0.451	0.3	5.1522	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
2880 minute summer	MH1	Orifice	0.1	10.4

Results for 100 year +45% CC 2880 minute winter. 3120 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute winter	MH1	1740	9.741	0.416	0.2	4.7485	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
2880 minute winter	MH1	Orifice	0.1	11.0

Results for 100 year +45% CC 4320 minute summer. 4560 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
4320 minute summer	MH1	2460	9.741	0.416	0.2	4.7485	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
4320 minute summer	MH1	Orifice	0.1	11.5

Results for 100 year +45% CC 4320 minute winter. 4560 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
4320 minute winter	MH1	3060	9.606	0.281	0.1	3.1909	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
4320 minute winter	MH1	Orifice	0.1	10.8

Results for 100 year +45% CC 5760 minute summer. 6000 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
5760 minute summer	MH1	3660	9.657	0.332	0.2	3.7775	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
5760 minute summer	MH1	Orifice	0.1	10.8

Results for 100 year +45% CC 5760 minute winter. 6000 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
5760 minute winter	MH1	3900	9.619	0.294	0.1	3.3350	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
5760 minute winter	MH1	Orifice	0.1	12.2

Results for 100 year +45% CC 7200 minute summer. 7440 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
7200 minute summer	MH1	4500	9.636	0.311	0.2	3.5332	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
7200 minute summer	MH1	Orifice	0.1	11.5

Results for 100 year +45% CC 7200 minute winter. 7440 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
7200 minute winter	MH1	4740	9.629	0.304	0.1	3.4535	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
7200 minute winter	MH1	Orifice	0.1	13.7

Results for 100 year +45% CC 8640 minute summer. 8880 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m^3)	Flood (m^3)	Status
8640 minute summer	MH1	5280	9.613	0.288	0.1	3.2665	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m^3)
8640 minute summer	MH1	Orifice	0.1	11.5

Results for 100 year +45% CC 8640 minute winter. 8880 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
8640 minute winter	MH1	5520	9.633	0.308	0.1	3.5047	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
8640 minute winter	MH1	Orifice	0.1	14.4

Results for 100 year +45% CC 10080 minute summer. 10320 minute analysis at 60 minute timestep. Mass balance: 100.00%

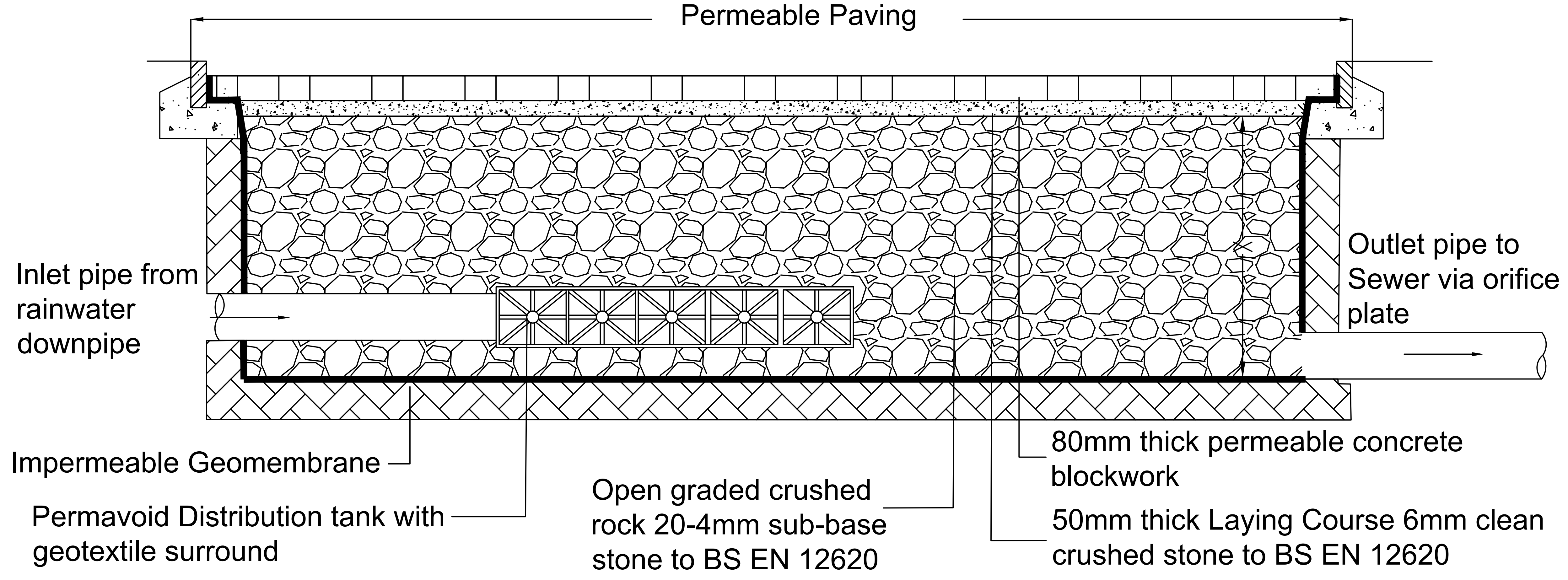
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
10080 minute summer	MH1	6060	9.619	0.294	0.1	3.3350	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
10080 minute summer	MH1	Orifice	0.1	12.2

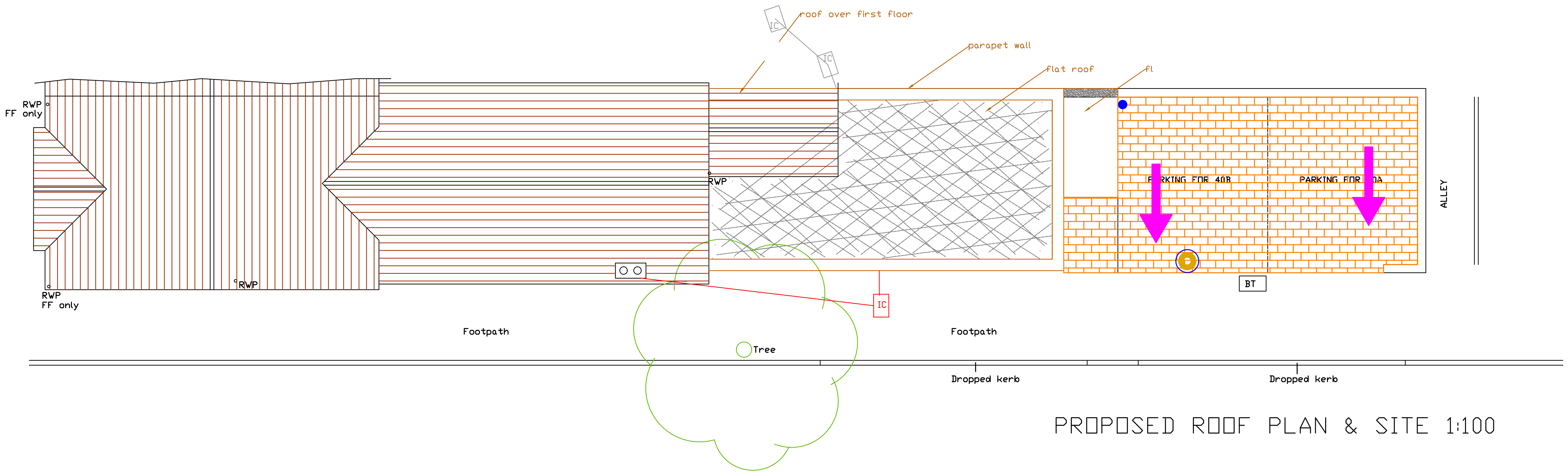
Results for 100 year +45% CC 10080 minute winter. 10320 minute analysis at 60 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
10080 minute winter	MH1	6300	9.637	0.312	0.1	3.5512	0.0000	OK

Link Event	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
10080 minute winter	MH1	Orifice	0.1	15.1



Tanked Permeable Paving Detail
NTS



PROPOSED ROOF PLAN & SITE 1:100

Notes:

1. Discharge of surface water via Tanked Permeable Paving. Preliminary calculations indicate that sufficient storage required to attenuate runoff arising from the impermeable areas being attenuated, during the critical 1 in 100 year + 45% Climate Change event, can be provided within Tanked Permeable Paving of dimensions 38.5m^2 x 0.675m deep x 0.3 (voids).

Legend

- Proposed Tanked Permeable Paving
- Proposed Surface Water Downpipe
- Proposed Orifice Plate
- Proposed Surface Water Manhole
- Design Exceedance Route

Unda Consulting Limited
Unit 3
Oak Cottage
County Oak Way
County Oak
Crawley
RH11 7ST
Tel: 01293 214444
Email: info@unda.co.uk
Web: www.unda.co.uk

Client:
Stag Construction Services Ltd

Site Address:
9 Station Parade
Tarring Road
West Sussex
BN11 4SS

Job Reference:	Date:
95586-Boys-StationRd_SWDS	26-Jan-26
Drawing Number:	**Revision:**
95586-01	v1

Designed by:	Drawn by:	Checked by:
AR	AR	EW

Scale:
1:100@A2

Disclaimer:
The drawings provided are for planning purposes only.