

SILVER STREET, GASTARD

MOWLES GROUP

Technical Note – Drainage strategy
& Flood Risk Assessment

26-4193-KTN-TN-01-A

17th July 2026



The Site
24 Chosen View Road
Cheltenham
GL51 9LT

DOCUMENT CONTROL

Document Status

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1.0 INTRODUCTION

- 1.1 K-Ten Consulting Ltd (K-Ten) provide professional Flood Risk, Infrastructure and Drainage services throughout the UK.
- 1.2 K -Ten has been commissioned by Mowles Group (the Applicant) to prepare technical drainage design information to discharge Wiltshire Council planning condition #4 relating to drainage, for the erection of four new residential and associated access and parking at Nos 6 and 7 Silver Street, Gastard, Corsham, Wiltshire
- 1.3 Planning Condition #4 states

'No development shall commence on site until a scheme for the discharge of surface water from the site has been submitted to and approved in writing by the local planning authority. The scheme shall be informed by a site specific Flood Risk Assessment (FRA) and incorporate sustainable drainage details including any off-site works and any permissions for connections to private drainage systems/land drainage consent.'

- 1.4 Refer to **Appendix A** Architect's plans for further details of the development and site location.
- 1.5 This Technical Note incorporates a site-specific Flood Risk Assessment and presents the proposed surface water drainage strategy. It has been prepared to support the discharge of Planning Condition 4 and address the relevant requirements of the Local Planning Authority and Lead Local Flood Authority.
- 1.6 The drainage design has been prepared in accordance with the following guidance, standards, and best practice documents, as applicable:
 - National Planning Policy Framework;
 - Planning Practice Guidance – Flood Risk and Coastal Change;
 - National Standards for Sustainable Drainage Systems, Defra, 2025;
 - CIRIA Report C753 – The SuDS Manual;
 - BS EN 752:2017 – Drain and sewer systems outside buildings – Sewer system management;
 - BS 8582:2013 – Code of practice for surface water management for development sites;
 - Building Regulations Approved Document H – Drainage and waste disposal;
 - Wiltshire Council's local flood risk and sustainable drainage guidance.

2.0 EXISTING SITE DETAILS

Site Location

- 2.1 The site is located on the northern side of Silver Street within the village of Gastard, which forms part of the civil parish of Corsham. The site is bounded by equestrian paddocks to the north, residential property to the east, Silver Street to the south, and a garage and retail premises to the west. The wider surrounding area is predominantly rural and agricultural in character.
- 2.2 The approximate site co-ordinates are E 388272, N 168702 and National Grid reference ST882687, with the nearest post code SN13 9PY.
- 2.3 The pre-developed site is considered to be 'greenfield' with its most recent use as an equestrian paddock. Apart from a disused stable building, there are no other buildings or infrastructure located within the site.

Existing Hydrology

- 2.4 An existing drainage ditch runs along the northern site boundary. Based on available mapping and the local topography, the ditch is understood to form part of the local land drainage network and ultimately connect to Byde Mill Brook, approximately 700 m north of the site. Byde Mill Brook flows generally eastwards and forms part of the wider Bristol Avon catchment.

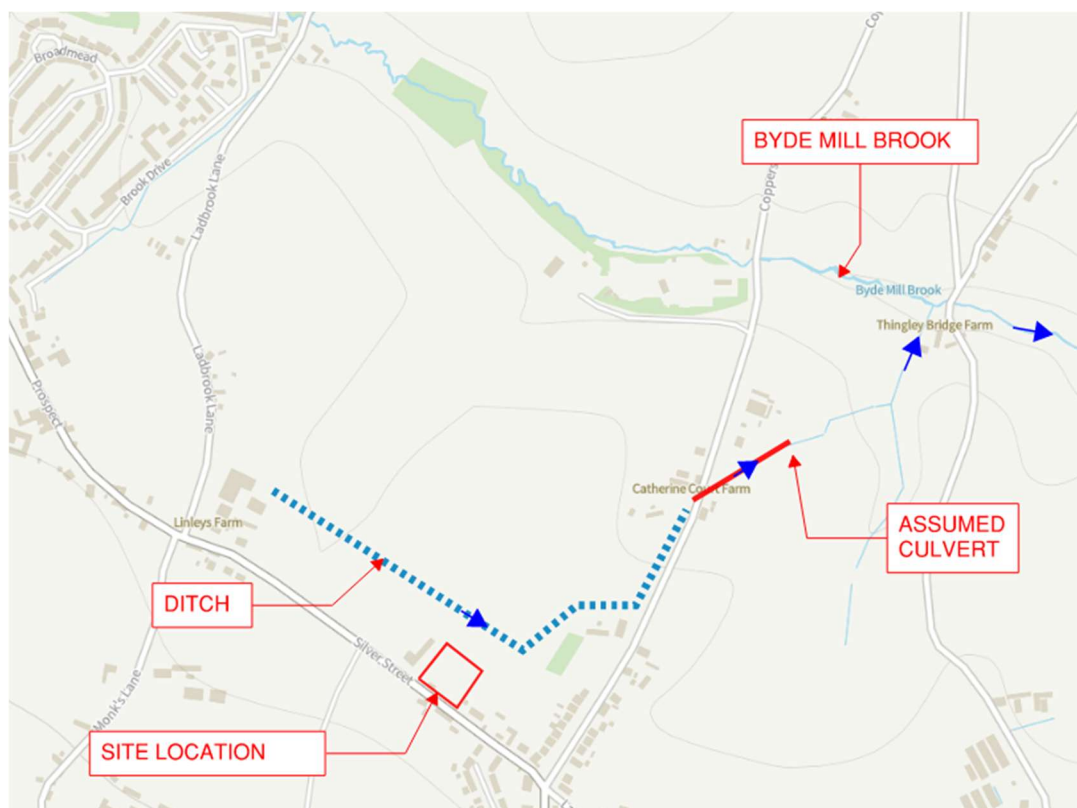


Figure 1 – Ditch & watercourse network map

Flood Risk Summary

- 2.5 According to the Environment Agency's Flood Map for Planning, the site lies entirely within Flood Zone 1, representing land with a low probability of fluvial flooding and an annual flood probability of less than 1 in 1,000.
- 2.6 No part of the development footprint is shown to fall within Flood Zones 2 or 3, and the site does not intersect with any mapped areas of functional floodplain. As such, the proposed development is considered appropriate in principle with regard to national planning policy for flood risk.
- 2.7 Environment Agency's Flood Map for Planning e surface water risk, the national Risk of Flooding from Surface Water mapping identifies some overland flow pathways within the wider catchment associated with Wotton Brook; however, no significant flow paths cross the site itself.
- 2.8 The site topography slopes away from the immediate building area, resulting in a low risk of surface water accumulation. The proposed development will incorporate a managed drainage system with attenuation storage, which will further reduce the likelihood of surface water flooding on site.
- 2.9 There are no identified risks from groundwater, canal, reservoir or artificial sources at this location. Although shallow perched groundwater is possible due to local clay soils, this is not expected to present a significant flood hazard, and drainage infrastructure will be designed with appropriate protection measures.
- 2.10 In summary, the site is at low risk from all sources of flooding, and the proposed development does not introduce any mechanism by which flood risk would be increased either on-site or elsewhere.
- 2.11 With the implementation of a controlled surface water drainage strategy, the development will remain safe for its lifetime and will not exacerbate flood risk within the surrounding catchment.
- 2.12 Refer to **Appendix C** for the EA Flood Map.

Geology & Soils

- 2.13 British Geological Survey mapping indicates that the site is underlain by the Forest Marble Formation, comprising interbedded mudstone and limestone of the Great Oolite Group. No significant superficial deposits are recorded at the site.
- 2.14 The Forest Marble Formation can give rise to variable ground conditions, with weathered cohesive soils and relatively impermeable mudstone horizons occurring alongside more fractured limestone bands. Consequently, the infiltration characteristics of the formation can vary considerably over short distances and cannot be reliably determined from published geological mapping alone.
- 2.15 Where cohesive soils or mudstone horizons predominate, infiltration rates are likely to be limited. Although the limestone bands may provide locally enhanced permeability, infiltration into fractured strata can be unpredictable and may create preferential groundwater flow paths rather than providing consistent soakaway performance.
- 2.16 The surface water drainage strategy is consistent with the drainage strategy prepared by Glanville and submitted in support of the original planning application. That strategy proposed attenuation and controlled discharge to the existing drainage ditch rather than disposal through infiltration.
- 2.17 The drainage principles presented by Glanville formed part of the information considered during the planning process and subsequent appeal, following which planning permission was granted. The proposed drainage strategy therefore retains the previously accepted drainage approach and develops it to provide the detailed design information required to discharge Planning Condition 4.
- 2.18 Accordingly, the detailed surface water drainage design is based on attenuation and controlled discharge to the existing ditch along the northern site boundary, subject to confirmation of the necessary ownership rights, permissions and land drainage consents.

Topography

- 2.19 A topographical survey was undertaken by Land & Building Surveys in July 2023. The survey indicates that the site generally falls northwards and north-eastwards, from a high point of approximately 86.09 m Above Ordnance Datum (AOD) in the southwest to a low point of approximately 83.17 m AOD in the northeast. This represents an average gradient of approximately 1 in 45 across the site.
- 2.20 The generally consistent fall across the site provides a defined direction for overland surface water flow. No significant isolated low points or pronounced depressions that would be likely to result in substantial surface water ponding have been identified within the development area.
- 2.21 The existing topography is therefore suitable for an attenuation-led surface water drainage strategy, with the drainage system arranged to follow the natural fall of the land towards the proposed outfall. Defined exceedance routes will be maintained to direct surface water safely away from the proposed dwellings during rainfall events that exceed the design capacity of the drainage system.

Existing Drainage

- 2.22 Surface water runoff from the existing stable building currently discharges directly to the ground.
- 2.23 Public sewer records show there is a 225Ø Public Foul sewer running along Silver Street east to west. The sewer is approximately 3.3m deep. Refer to **Appendix D**.

Greenfield Runoff

- 2.24 A greenfield runoff assessment has been undertaken using Causeway Flow for the total positively drained catchment of 1,475 m² (0.148 ha), comprising the proposed roof, access, parking and other impermeable areas. The assessment uses FEH rainfall data and the relevant hydrological characteristics of the site.

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.99
Greenfield Method	FEH	Growth Factor 100 year	2.57
Positively Drained Area (ha)	0.148	Betterment (%)	0
SAAR (mm)	773	QMed	0.5
Host	10	QBar	0.6
BFIHost	0.520	Q 2 year (l/s)	0.5
Region	4	Q 30 year (l/s)	1.2
QBar/QMed conversion factor	1.124	Q 100 year (l/s)	1.5
Growth Factor 2 year	0.89		

- 2.25 The assessment determined a greenfield Q_{bar} of 0.6l/s, representing the mean annual peak runoff rate from the equivalent undeveloped catchment.
- 2.26 The National Standards for Sustainable Drainage Systems require post-development runoff rates to be restricted as close as practicable to the equivalent greenfield runoff rates. The standards also recognise that site-specific constraints may prevent strict achievement of an individual standard, provided that the opportunity for compliance has been maximised and an appropriately justified departure is agreed with the approving body.
- 2.27 For design purposes, the maximum discharge rate has been restricted to 2.0 l/s. Although this is higher than the calculated greenfield QBAR rate of 0.6 l/s, it represents a practical and maintainable discharge rate for the relatively small catchment while limiting the risk of blockage associated with a very small flow-control opening.
- 2.28 The proposed discharge rate is consistent with the drainage strategy prepared by Glanville and submitted in support of the original planning application and subsequent planning appeal. The principle of attenuating surface water runoff and discharging it at a restricted rate of 2.0 l/s formed part of the drainage information supporting the approved development.
- 2.29 Surface water runoff will be attenuated within the proposed drainage system before being discharged to the existing ditch at a maximum rate of **2.0 l/s**.

3.0 PROPOSED SURFACE WATER DRAINAGE STRATEGY

- 3.1 A surface water strategy is proposed to manage and reduce the flood risk and surface water run-off from the development, in accordance with SuDS principles.
- 3.2 The SuDS hierarchy dictates that surface water run off should be managed as high up the following list as practically possible:
 - a) into the ground (via infiltration) and re-use, or then;
 - b) to a surface water body, or then;
 - c) to a surface water sewer, highway drain or another drainage system, or then;
 - d) to a combined sewer.
- 3.3 Infiltration has not been adopted as the primary means of surface water disposal due to the variable underlying geology and the absence of site-specific infiltration testing demonstrating that soakaways would provide a reliable and sustainable drainage solution. This approach is also consistent with the drainage strategy prepared by Glanville in support of the original planning application and subsequent planning appeal.
- 3.4 An existing drainage ditch is located along the northern site boundary and forms part of the local land drainage network. Discharge to this ditch accords with the next available level of the surface water drainage hierarchy.
- 3.5 The proposed drainage strategy therefore adopts an attenuation-led approach. Surface water runoff will be managed and stored within the site before being discharged at a maximum restricted rate of 2.0 l/s to the existing ditch along the northern site boundary.
- 3.6 A SuDS management and treatment train is proposed comprising rainwater harvesting tanks, permeable paving and detention basins. These features will provide source control, attenuation and water-quality treatment before runoff is discharged to the existing northern boundary ditch.
- 3.7 A proposed new drainage ditch will extend northwards from the site, through the adjoining field and discharge into the existing watercourse. The ditch will provide additional surface water conveyance and temporary storage while reducing flow velocities and providing water-quality, biodiversity and ecological benefits. The necessary landowner permissions, easements and land drainage consents will be secured prior to construction.

3.8 The proposed development impermeable catchment is calculated as follows:

Catchment description	Catchment Area
Proposed roof and hardstanding areas	1,475m ² (0.148 Ha)

- 3.9 Runoff from the proposed roof areas will be collected via rainwater downpipes. A proportion of the downpipes will discharge to above-ground rainwater harvesting tanks for reuse purposes, with overflow connections directed to the proposed below-ground surface water drainage system. The remaining rainwater downpipes will connect directly to the proposed below-ground drainage network.
- 3.10 The proposed hardstanding areas will be constructed using permeable paving underlain by an open-graded 4/20mm crush rock with no fines sub-base. The sub-base will provide both structural support and below-ground attenuation storage through the available void ratio within the granular material. Surface water runoff entering the permeable paving system will be temporarily stored, filtered and attenuated prior to discharge to a perforated land drain located within a drainage trench beneath the permeable paving formation, before ultimately connecting to the proposed underground surface water drainage system.
- 3.11 Surface water runoff from the proposed development will be restricted to a discharge rate of **2.0 l/s**. This restricted discharge rate is consistent with the drainage principles established within the Glanville drainage strategy submitted in support of the original planning application and subsequent planning appeal of Wiltshire Council.
- 3.12 On-site attenuation storage will be provided within the permeable paving sub-base and associated SuDS features to accommodate all rainfall events up to and including the 1 in 100 year storm event, inclusive of a 40% allowance for climate change, without increasing flood risk elsewhere.
- 3.13 Refer to **Appendix B** for Drainage Strategy Plan and **Appendix F** for drainage details.
- 3.14 Attenuation shall be provided within the open graded permeable paving formation sub-base, and detention basins for the 100 year event plus a 40% allowance for climate change.
- 3.15 Attenuation has been designed and simulated with *Causeway Flow* design software with the following design criteria:
- Rainfall – FEH22
 - Design Event – up to and including 100 year plus 40% climate change
 - Impermeable Catchment – 1475m² (0.148 hectares)
 - Storm Duration (simulation) – 15 min to 10080 min
 - CV Winter and Summer – 1.0
- 3.16 Refer to **Appendix E** for Drainage calculation report and simulation outputs.

- 3.17 The hydraulic modelling demonstrates that approximately **99m³** of attenuation storage is required for the development. This will be provided within the two detention basins and the available void space within the open-graded permeable paving sub-base.
- 3.18 Two grassed detention basins are proposed, each approximately 30 m long and 0.65 m deep, with internal side slopes of 1 vertical to 2 horizontal. Each basin will provide approximately 20.4m³ of attenuation storage, resulting in a combined basin storage volume of approximately **40.8m³**. Freeboard will be provided above the maximum modelled water level within each detention basin.
- 3.19 Utilising the sub-base of the porous surfacing of the access road given a depth of 500mm gives an additional **58.5m³** of storage assuming a 30% void ratio.
- 3.20 The maximum water levels within the detention basins are as follows:

Return Event (Yrs)	2	30	100 + 40% C.C
Max water depth (m)	0.085	0.268	0.579
Max Outflow (l/s)	2.0	2.0	2.0

- 3.21 All proposed development run off for the 100 year event plus and allowance for 40% climate change will be contained completely within the site.
- 3.22 A vortex flow control device incorporating a reduced-diameter orifice plate will be installed within the final downstream chamber upstream of the outfall connection to the watercourse. The flow control will restrict discharge from the site to 2.0 l/s. Hydraulic calculations indicate that a **70mm** diameter orifice is required as part of the vortex control device to achieve the proposed restricted discharge rate.
- 3.23 Silt trap chambers will be installed upstream of the attenuation features to reduce the risk of sediment accumulation within the downstream drainage system and maintain the long-term hydraulic performance of the proposed SuDS network.
- 3.24 All drainage infrastructure will be designed and constructed in accordance with Building Regulations Approved Document H and relevant industry best practice guidance.
- 3.25 Exceedance flows generated during rainfall events exceeding the 1 in 100-year return period event, including a 40% allowance for climate change, will follow the natural site topography towards the northern boundary through the field of the site without increasing flood risk to buildings or neighbouring land.
- 3.26 In the event of failure of individual drainage components, impacts are expected to be localised and short-term.
- 3.27 Rainwater pipes may overflow locally if blocked and chambers may surcharge upstream. In each case, the system has been designed with accessible inspection points and maintenance arrangements to restore function.

3.28 Refer to the exceedance flow routing plans contained in **Appendix G**.

3.29 Typical details of the principal SuDS features are provided within **Appendix F**.

4.0 SURFACE WATER QUALITY

- 4.1 Water quality has been assessed in accordance with The SuDS Manual (CIRIA C753) which states the design of surface water should consider minimising contaminants within surface water runoff discharged from the site.
- 4.2 The level of treatment required is dependent on the proposed land use according to the pollution hazard indices (refer to SuDS Manual table 26.2).
- 4.3 To ensure that adequate treatment is provided the SuDS mitigation indices for the development must be equal or exceed, the pollution hazard indices shown within SuDS Manual table 26.2. Permeable construction has been proposed.
- 4.4 Refer to below Water Quality Indices Table, as per C753 SuDS Manual, confirming compliance with mitigation indices against Pollution Hazard indices.

	Pollution Hazard Level	Total suspended solids	Metals	Hydro-Carbons
Land Use: Individual property driveways, residential car parks, low traffic roads (Table 26.2)	Low	0.5	0.4	0.4
Land Use: Residential roofs (Table 26.2)	Very Low	0.2	0.2	0.05
Total:		0.5	0.6	0.45
SuDS Component 1: Permeable Paving (Table 26.3)		0.7	0.6	0.7
SuDS Component 2: Vegetated Ditch/Swale (Table 26.3)		0.5	0.6	0.6
Total:		1.2	1.2	1.3
TOTAL SUDS MITIGATION > POLLUTION HAZARD INDICES		Yes	Yes	Yes

Water Quality Indices (C753 The SuDS Manual)

- 4.5 It is also good practice that gullies and chambers incorporate appropriate silt management measures and have suitable silt traps/catchpits to reduce sediments within the drainage system.

5.0 MAINTENANCE AND MANAGEMENT

- 5.1 Maintenance of SuDS features is required in order to ensure that the surface water drainage system operates effectively, and the risk of flooding of the site and surrounding areas is reduced.
- 5.2 A maintenance schedule should be undertaken to ensure that the drainage system remains fully operational for the design lifetime. The below table summarises a maintenance plan for the drainage systems and components within the development.
- 5.3 The SuDS Manual (CIRIA C753) and specific product suppliers' guidelines should also be referred to for further information on maintenance and frequency.
- 5.4 All on site drainage will be maintained and managed by the private property owner

Drainage Component	Required Action	Typical Frequency
General pipework, manholes, chambers, silt traps and headwalls	Stabilise adjacent areas	As required
	Remove weeds and vegetation	As required
	Clear/Jet any poor performing structures	As required
	Inspect all drainage features for poor operation	3 monthly, 48 hours after large storms in first six months
	Monitor inspection chambers and silt traps. Inspect silt accumulation and determine silt clearance frequencies	Annually
Private Drains	Inspection	CCTV survey every 5-10 years.
	Regular Maintenance	Jet clean system fully every 5-10 years. (Recommend prior to CCTV drainage survey)
	Remedial / Occasional Maintenance	Carry out remedial works as identified in CCTV survey.
Catchpits	Inspection	Quarterly
	Regular maintenance	Remove silt and debris as necessary to prevent build up.
Overflows and flood routes	Overflows. Jet pipes leading from overflow structures annually and check by running water through the overflow. Check free flow at next SUDS feature – inlet to basin or chamber.	Annually
	Remove any accumulated grass cuttings or other debris on top of grass weirs or stone filled baskets overflows.	Monthly
	Flood Routes. Make visual inspection. Check route is not blocked by new fences, walls, soil or other rubbish. Remove as necessary.	Monthly

Drainage Component	Required Action	Typical Frequency
	Overflows. If overflow is not clear then dismantle structure and reassemble to design detail.	As required
Permeable Paving	Surface visual inspection for ponding, damaged blocks and build up of silt/detritus	Annually or after major storm events
	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
	Remove litter, weeds and debris	Monthly
Detention Basin	Visual inspection for standing water, erosion, excessive sediment accumulation, dead planting and signs of poor drainage performance	Monthly during first year, then quarterly
	Remove litter, leaves, weeds and debris from inlet, planting areas and overflow structures	Monthly
	Inspect inlet and overflow structures to ensure unrestricted flow paths	Quarterly and after major storm events
	Water and establish planting during initial establishment period	As required during first 12 months
	Remove invasive or dead vegetation and replace planting where necessary	As required
	Prune and manage vegetation to maintain healthy growth and hydraulic performance	Biannually
	Remove accumulated sediment from forebays, inlets and surface areas	Annually or as required
	Inspect for signs of soil compaction, scour or erosion and undertake remedial works if necessary	Annually
	Replace mulch and reinstate planting media where degradation is identified	Every 5 years or as required

6.0 FOUL DRAINAGE

- 6.1 Foul drainage from the proposed development will connect to the existing 225mm Ø foul sewer in Silver Street.
- 6.2 A direct Section 106 agreement will be required with Wessex Water.
- 6.3 The foul water discharge rate has been calculated in accordance with standard design practice, based on peak discharge averaged over an 8-hour period. This represents a typical daily occupation window and provides a conservative assessment whereby occupants are assumed to be present for the majority of the day.
- 6.4 The design parameters adopted are as follows:
 - Proposed population: 20 persons
 - Water usage rate: 150 litres/person/day
 - Dry weather flow factor: 6
- 6.5 Foul discharge rate calculation:
$$(20 \text{ persons} \times 150 \text{ litres} \times 6) \div (8 \times 60 \times 60) = 0.625 \text{ l/s}$$
- 6.6 The resulting average foul water discharge rate is therefore calculated as approximately 0.63l/s.
- 6.7 The proposed foul drainage system will be designed and constructed in accordance with the Building Regulations Approved Document H – Drainage and Waste Disposal.
- 6.8 Prior to construction, invert levels will be verified to confirm suitability for connection.
- 6.9 Refer to **Appendix B** for foul drainage layout arrangement.

7.0 CONCLUSION

- 7.1 This Technical Note has assessed the flood risk affecting the proposed development and presents a detailed surface water drainage strategy to support the discharge of Wiltshire Council Planning Condition 4 at 6-7 Silver Street, Gastard.
- 7.2 The site is located entirely within Flood Zone 1 and is considered to be at low risk of flooding from fluvial, surface water, groundwater and other sources. The proposed development is therefore considered appropriate in flood risk terms.
- 7.3 Infiltration has not been adopted as the primary means of surface water disposal due to the underlying geology demonstrating that soakaways would not provide a reliable and sustainable solution. This approach is consistent with the drainage strategy prepared by Glanville in support of the original planning application and subsequent planning appeal.
- 7.4 The proposed strategy follows the surface water drainage hierarchy by incorporating rainwater harvesting for non-potable reuse, permeable paving, grassed detention basins and a vegetated drainage ditch. These measures will provide source control, attenuation, controlled conveyance and water-quality treatment before runoff reaches the receiving watercourse.
- 7.5 Surface water runoff from the 1,475 m² positively drained impermeable catchment will be restricted to a maximum discharge rate of 2.0 l/s. This rate is consistent with the drainage principles established through the original planning submission.
- 7.6 Hydraulic modelling undertaken using Causeway Flow demonstrates that approximately 99 m³ of attenuation storage is required. This will be provided within two grassed detention basins and the available void space within the permeable paving sub-base.
- 7.7 The proposed drainage system has been designed to accommodate the critical 1% annual exceedance probability rainfall event, including a 40% allowance for climate change, without flooding to the proposed dwellings or increasing flood risk elsewhere. Exceedance flows will be directed northwards, following the natural topography and away from the proposed buildings.
- 7.8 The proposed SuDS management train provides appropriate treatment of runoff in accordance with CIRIA C753. The permeable paving, detention basins and vegetated ditch will provide filtration, sediment settlement and biological treatment while also delivering biodiversity and amenity benefits.
- 7.9 The proposed new drainage ditch will extend northwards through the adjoining field and discharge into the existing watercourse. The necessary landowner permissions, easements and land drainage consents for the off-site drainage works will be secured prior to construction.
- 7.10 The proposed drainage infrastructure will remain under private management, with routine inspection and maintenance undertaken in accordance with the schedule contained within this report to ensure its effective operation throughout the lifetime of the development.
- 7.11 Foul water from the proposed dwellings will discharge to the existing 225 mm public foul sewer within Silver Street, subject to a Section 106 connection agreement with Wessex Water and confirmation of the relevant connection levels.

- 7.12 The proposed drainage strategy provides a suitable, sustainable and maintainable means of managing surface water runoff from the development and provides an appropriate basis for the discharge of Planning Condition 4.

APPENDIX A

ARCHITECTURAL LAYOUT

NOTE: The contractor is responsible for the checking of all site dimensions and levels. These should be checked prior to ordering of any components and before commencement of the works on site. All dimensions should be brought to the immediate attention of the Contract Administrator.

KEY:

Denotes Site Boundary
The Development Land

Denotes Ownership Boundary
Property title no - WT419349
Great Orchard, Silver Street,
Gastard, Corsham, SN13 9PY

Red line taken to kerb edge
Red shaded area denotes
footpath/pavement
proposed as part of the
development as advised by
the Traffic Consultant

SILVER STREET

TCB
(dis)

The Harp
and Crown
(PH)

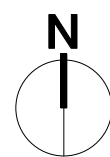
GP

86.0m

1

Site Boundary Location Plan
Scale: 1:500@A1

0 10 20 30 40 50 M



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Drawing combines a Topographic Survey of the site carried out in July 2023
overlayed with Ordnance Survey information and Land Registry Title Ownership -
Please note there will be discrepancy in the level of detail between the two data
sets. Information is provided without prejudice for information purposes only

D1	16.02.24	Issued for Planning	JS	LR
D6	25.01.24	Revised to remove 5m zone - Issued for Comment	JS	LR
D6	15.01.24	Revised to show redline around 5m zone	JS	LR
D4	28.11.23	Revised to include Title & Tenure Information	JS	LR
D3	24.11.23	Revised to suit client requirements	JS	LR
D2	22.09.23	Revised to suit comments - Topo removed etc	JS	LR
D1	24.08.23	Issued for Comment	JS	LR
REV	DATE	NOTES	DRAWN	CHECKED

Loop Architects Ltd

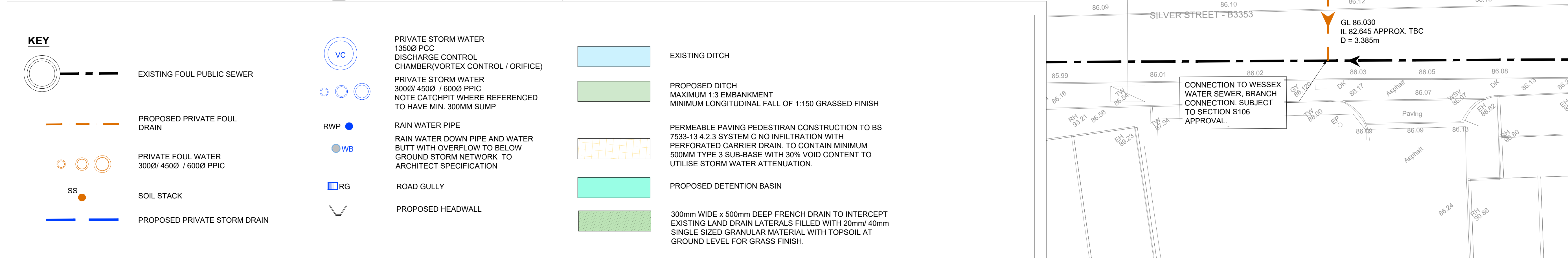
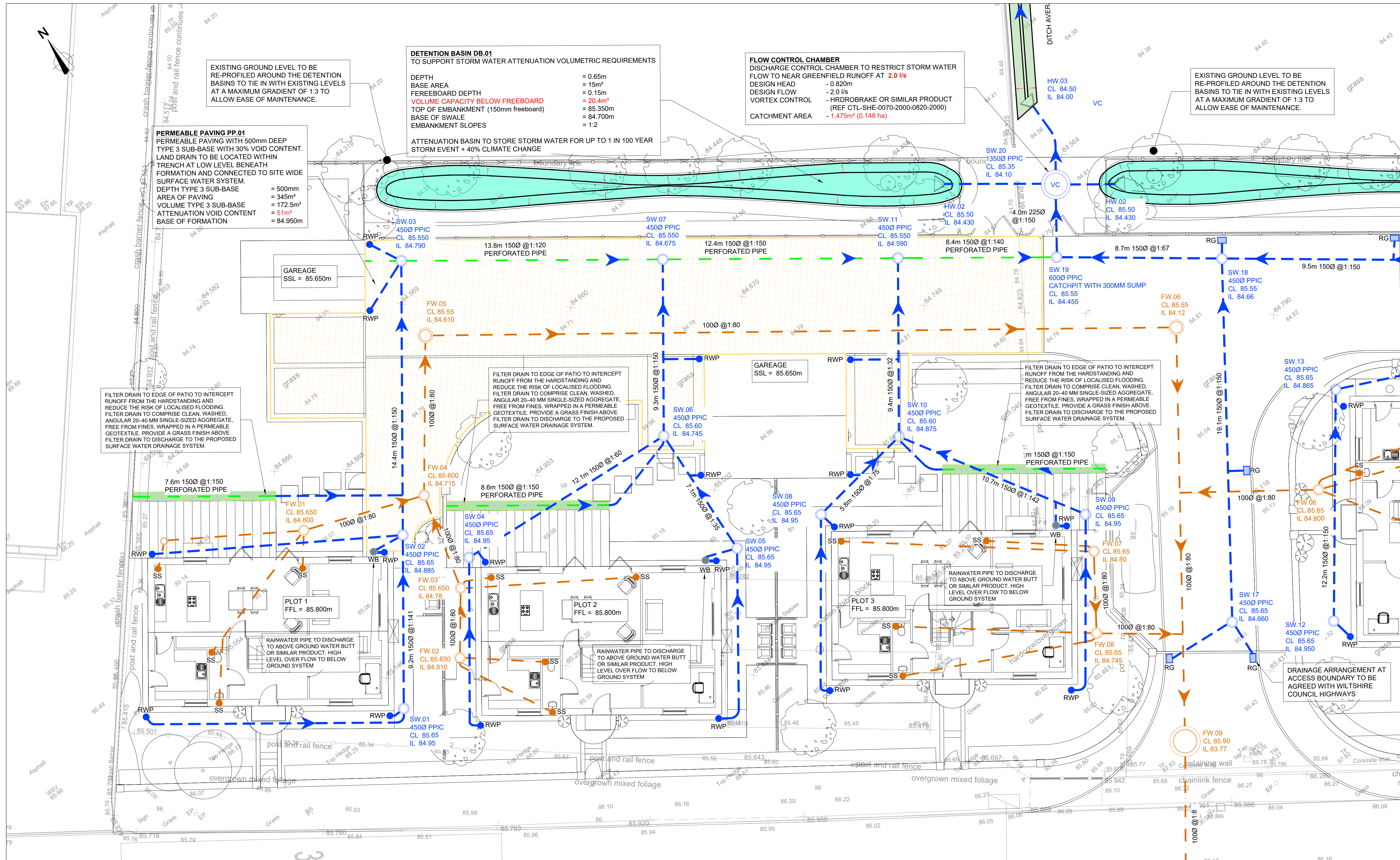
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Client Name	24.08.23	Scale
Silver Street, Gastard		1:500

Drawn by	Issued by
LP Planning Ltd	Site Boundary OS

Project Name	Project Number	Sheet
PLANNING	2315-100	01

APPENDIX B
DRAINAGE LAYOUT



Notes:

- This drawing is to be read in conjunction with relevant Architects, Engineers and specialist manufacturers drawings, reports and specifications.
- All levels are shown in metres above Ordnance Datum (m AOD) unless otherwise shown.
- Any ambiguities or discrepancies within this drawing and any other information given elsewhere must be reported to K-Ten for clarification before pricing / works commence.
- Do not scale from this drawing for construction purposes.
- It is recommended that all sewers and drains be laid starting from the downstream connection to the existing sewer/main and working upstream to the new development.
- All private drainage to comply with current Building Regulations, BS EN-752 Drain and Sewer systems outside Buildings and other relevant British Standards and Codes of Practices.
- Connections to existing sewers in accordance with the Local Water Authority guidelines & approval.
- Connections to existing river or watercourse in accordance with the Local Authority and E.A guidelines & approval.
- Sewers and drains of different diameters should be laid soft to soft unless shown otherwise in the drawing. Outfall chamber outgoing pipe where a vortex control device is fitted to be installed at lowest incoming invert level.
- All access chambers covers and frames to be installed to BS EN 124.
- Drainage Pipe work routes under building footprint will require Co-ordination with foundations.
- Cover levels shown on this drawing refer to approximate surface levels. It is the contractors responsibility to ensure that access covers and frames are set at the final surface levels.
- Where possible the contractor is to orientate manhole biscuits and covers to locate them parallel to kerbs and paving.
- The Contractor should comply with hsig) 47 "Avoiding Danger from Underground Services" when excavating around existing services.
- It is the contractors responsibility to determine the location and depth of all existing services, mains and cables prior to construction.
- The pipe diameters cover and invert levels of any existing manholes are to be verified on site prior to the commencement of the works.
- All external non-perforated drainage within trafficked areas with less than 1.2m cover to have concrete protection. All external non-perforated drainage within landscaped areas with cover less than 0.6m to have concrete protection. All drainage with greater cover than the minimum required to have type S bed and surround.
- Foul drainage pipe connection to public sewer to be plastic twin-walled/ribbed pipe constructed to Water Industry Standard (WIS)4-35-01.
- All drainage in highway to be installed in accordance with Sewers Sector Guidance.
- All access chambers covers and frames to be installed to BS EN 124.
- All drainage to be installed in accordance with Civil Engineering Specification for the Water industry 7th Edition.
- Prior to commencing the works the contractor is to confirm details of the existing drainage system as noted on the drawing.
- This drawing is for information only for planning submission. This is not to be used for construction purposes.
- Drainage outfall connections and strategy to be agreed with the relevant authorities.
- Gutters to have down-pipe leaf guards and rainwater down-pipes to have rolling access.
- All existing invert levels shown are indicative and to be checked by the contractor prior to starting works.
- Drainage strategy to be approved by Wiltshire Council.

CLIENT:
MOWLES GROUP

PROJECT:
SILVER STREET
GASTARD

TITLE:
DRAINAGE LAYOUT
SHEET 2

SCALE @ A1:
1:100

DATE:
15.07.2026

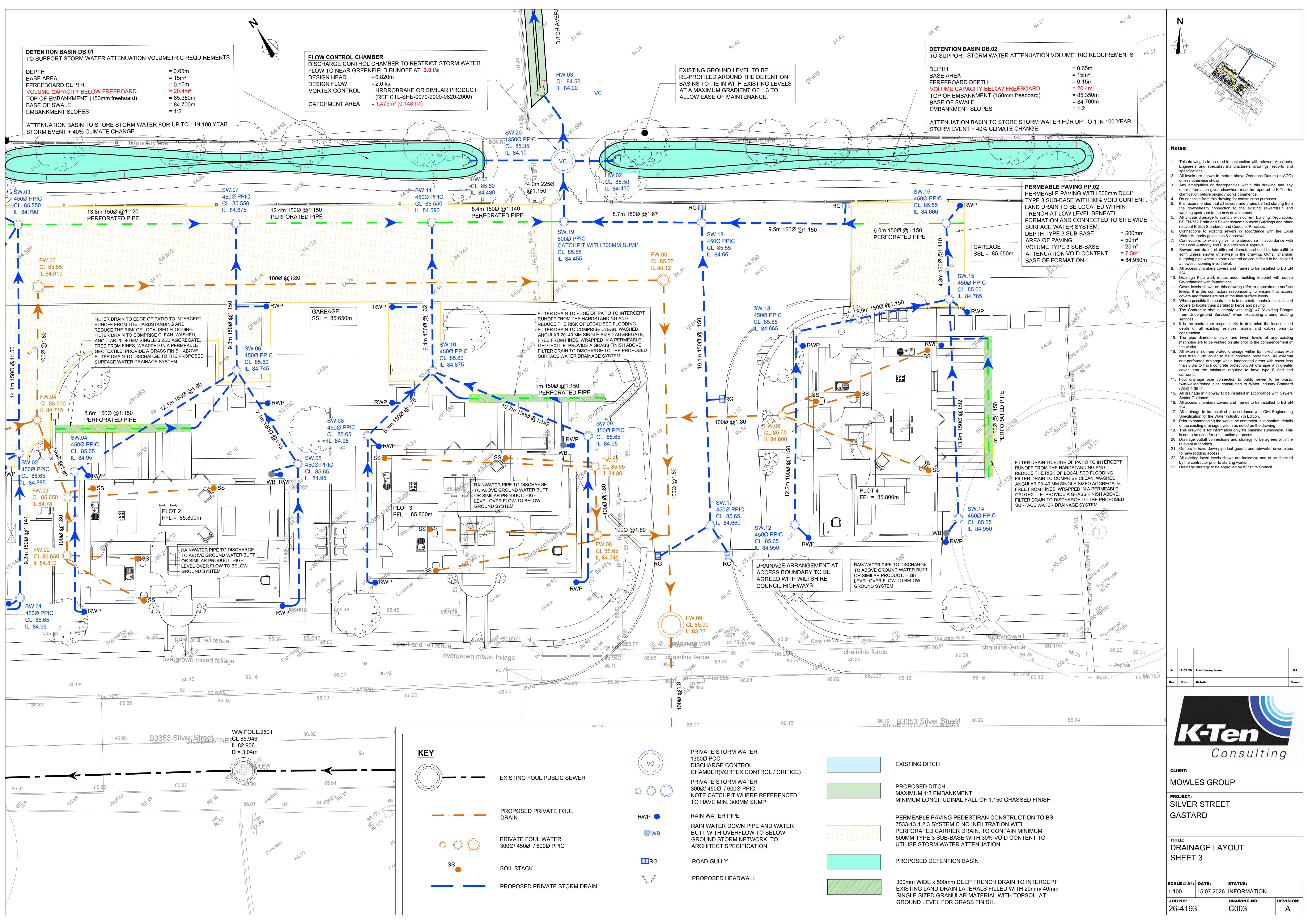
STATUS:
INFORMATION

JOB NO:
26-4193

DRAWING NO:
C002

REVISION:
A

K-Ten Consulting



CLIENT:		
MOWLES GROUP		
PROJECT:		
SILVER STREET GASTARD		
TITLE:		
DRAINAGE LAYOUT SHEET 3		
SCALE @ A1:		
1:100	DATE: 15.07.2026	STATUS: INFORMATION
JOB NO: 26-4193	DRAWING NO: C003	REVISION: A

APPENDIX C

EA FLOOD MAP

Flood map for planning

Your reference
26-4193 Silver Street

Location (easting/northing)
388282/168707

Created
17 July 2026 10:51

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following**:

- bigger than 1 hectare (ha)
- in an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

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.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2026 AC0000807064. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

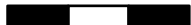
Your reference
26-4193 Silver Street

Location (easting/northing)
388282/168707

Scale
1:2,500

Created
17 Jul 2026 10:51

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

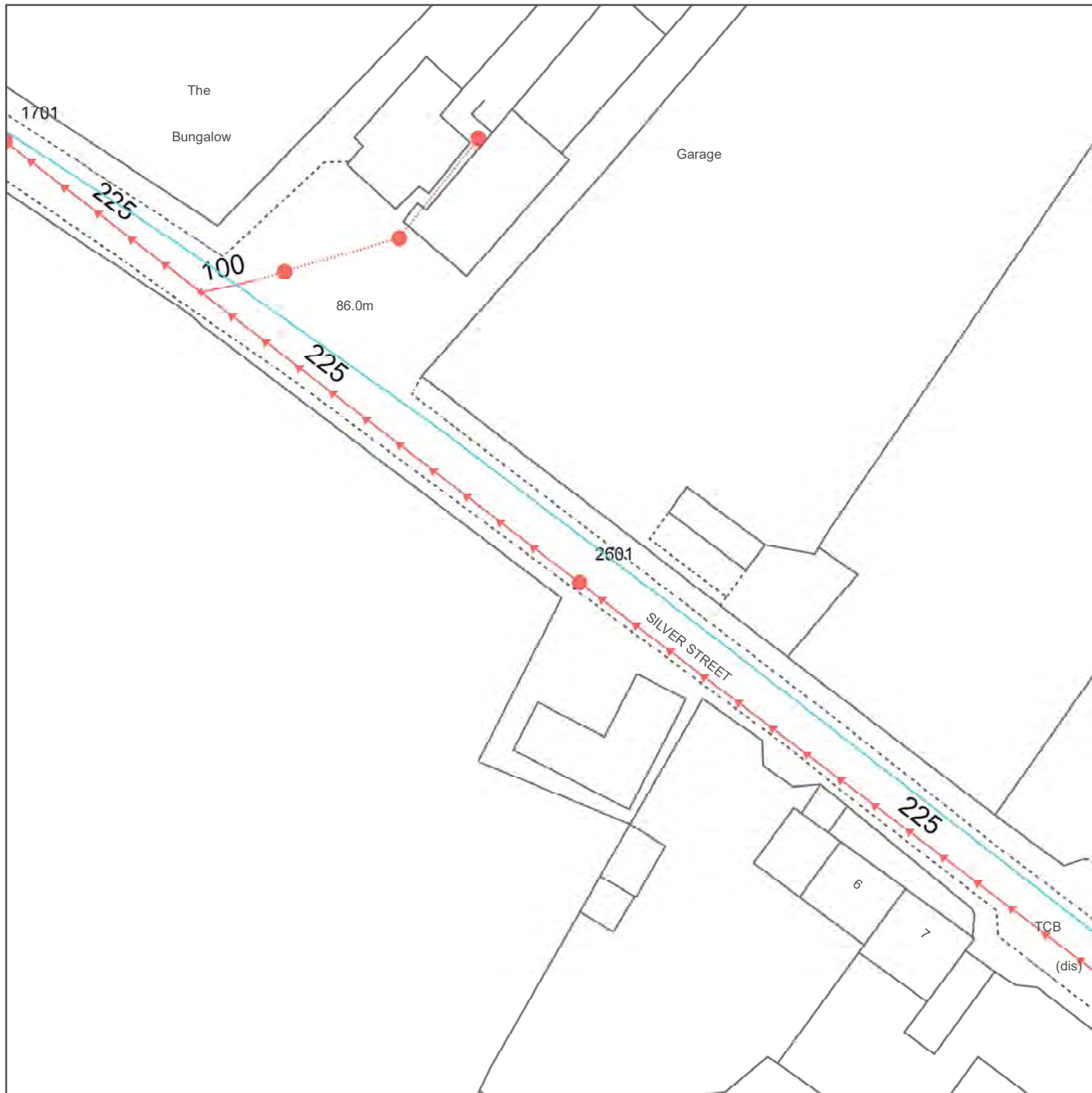


0 20 40 60m

APPENDIX D

SEWER MAP

Wessex Water Network Map



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WATER MAINS		SEWERS		STRATEGIC		PUBLIC		PRIVATE		SECTION 104		OTHER WESSEX PIPES		NON-WESSEX / UNKNOWN	
	Distribution		Foul		Surface								Rising Mains		Private Rising Mains
	Washout		Surface										Standby Rising Mains		Culverted Watercourse
	Raw Water		Combined										Effluent Disposal		Highway Drain
	Abandoned		Abandoned										Overflow		Use Unknown
	Private												Syphon		Status Unknown
Colours generally indicate the use of the sewer/drain (i.e Red - Foul, Dark Blue - Surface, Magenta - Combined/Dual Use, Light Green - Highway Drain, Mid Green - Overflow).															
Some styles of line and symbol are shown on the key in sample/typical colours.															
FITTINGS		STRUCTURES			Pumping Station - Surface										
	Hydrant		Manhole - Foul		Pumping Stn - Foul/Combined										
	Other		Manhole - Surface		Gully										
			Manhole - Combined		Vent Column										
			Inlet		Rodding Eye										
			Outfall		Catchpit										
			Lamphole		Flushing Chamber										
			Bifurcation - Foul		Soakaway										
			Bifurcation - Surface		Non Return Valve										
			Bifurcation - Combined		Air Valve		Hatch Box		Washout						
			Combined Sewage Overflow												
OTHER STRUCTURES															
Attenuation Tank															
Storage Tank															
Tunnel															
Interceptor															
<															

Information in this map is provided for identification purposes only. No warranty as to accuracy is given or implied. The precise route of pipe work may not exactly match that shown. Wessex Water does not accept liability for inaccuracies. Sewers and lateral drains adopted by Wessex Water under the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011 are to be plotted over time and may not yet be shown. In carrying out any works, you accept liability for the cost of any repairs to Wessex Water apparatus damaged as a result of your works. You are advised to commence excavations using hand tools only. Mechanical digging equipment should not be used until pipe work has been precisely located. If you are considering any form of building works and pipe work is shown within the boundary of your property or a property to be purchased (or very close by) a surveyor should plot its exact position prior to commencing works or purchase. If you are proposing to build over or near Wessex Water's apparatus you should contact the Developer Services Team, tel: 01225 526333 or e-mail: developer.enquiries@wessexwater.co.uk to discuss your proposals. Details of assets within Wessex Water's land ownership are unavailable through this service.

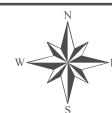
OTHER STRUCTURES

	Attenuation Tank		Chamber
	Storage Tank		Tunnel
			Interceptor

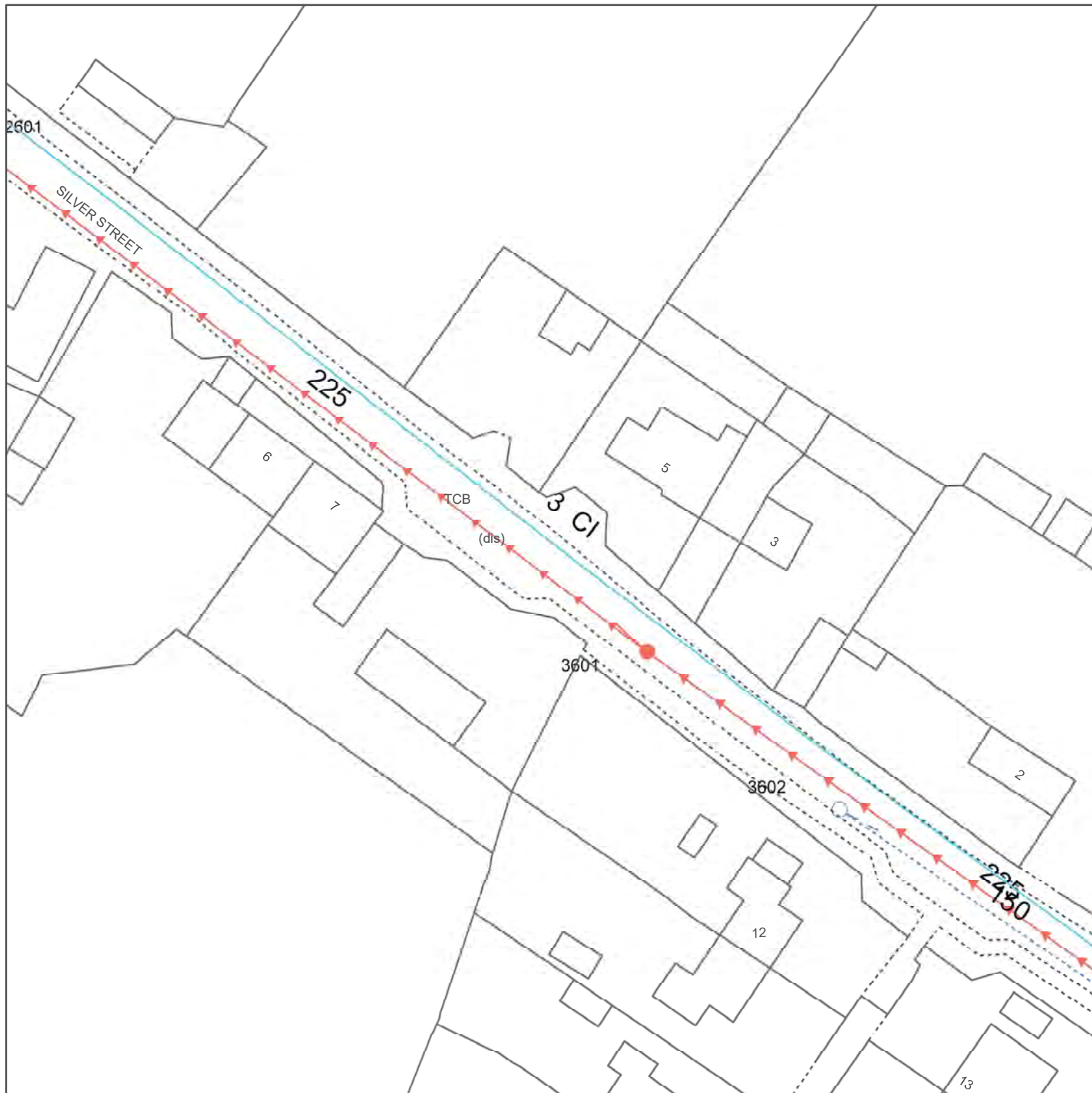
Wessex Water
YTL GROUP



Date: 21/07/2023
Centre: 388228, 168686
Scale: 1:625
(when printed at A4 size)



Wessex Water Network Map



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[illegible]

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OTHER STRUCTURES

	Attenuation Tank		Chamber
	Storage Tank		Tunnel
			Interceptor

Wessex Water
YTL GROUP

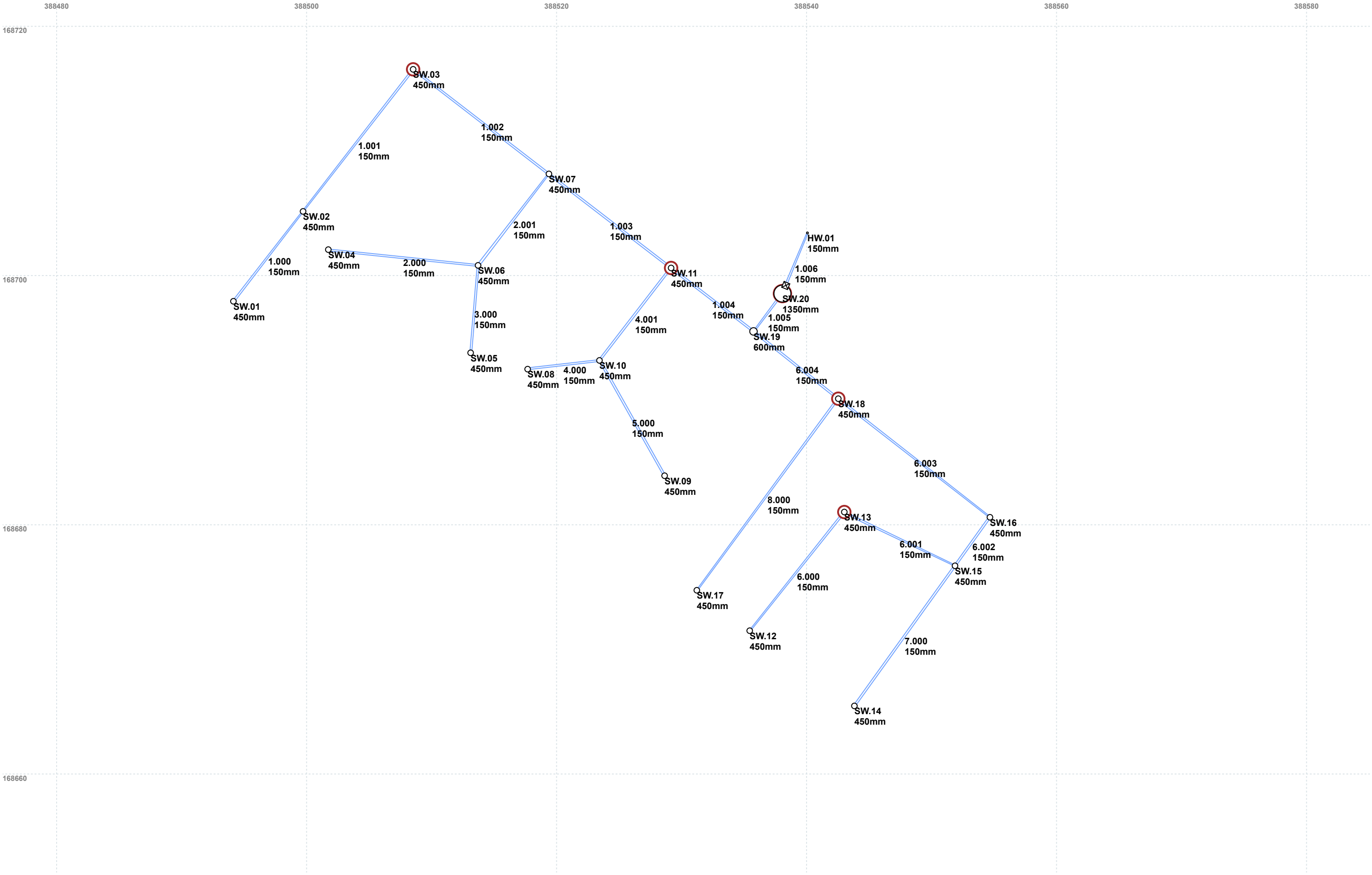


Date: 24/08/2023
Centre: 388295, 168637
Scale: 1:625
(when printed at A4 size)



APPENDIX E

SURFACE WATER CALCULATIONS



Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	4.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	100.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
✓ SW.01	0.008	4.00	85.650	450	388494.146	168697.935	0.700
✓ SW.02	0.007	4.00	85.650	450	388499.717	168705.149	0.765
✓ SW.03	0.001	4.00	85.550	450	388508.523	168716.549	0.760
✓ SW.04	0.008	4.00	85.650	450	388501.738	168702.081	0.700
✓ SW.05	0.006	4.00	85.650	450	388513.124	168693.801	0.700
✓ SW.06	0.007	4.00	85.600	450	388513.718	168700.817	0.855
✓ SW.07	0.007	4.00	85.550	450	388519.388	168708.158	0.875
✓ SW.08	0.008	4.00	85.650	450	388517.685	168692.489	0.700
✓ SW.09	0.006	4.00	85.650	450	388528.643	168683.936	0.700
✓ SW.10	0.004	4.00	85.600	450	388523.431	168693.189	0.725
✓ SW.11	0.008	4.00	85.550	450	388529.162	168700.609	0.960
✓ SW.12	0.004	4.00	85.650	450	388535.451	168671.499	0.700
✓ SW.13	0.002	4.00	85.650	450	388543.020	168681.023	0.785
✓ SW.14	0.003	4.00	85.650	450	388543.827	168665.463	0.700
✓ SW.15	0.005	4.00	85.600	450	388551.876	168676.708	0.800
✓ SW.16	0.005	4.00	85.550	450	388554.672	168680.601	0.785
✓ SW.17	0.007	4.00	85.650	450	388531.220	168674.745	0.860
✓ SW.18	0.012	4.00	85.550	450	388542.539	168690.119	0.890
✓ SW.19	0.022	4.00	85.550	600	388535.754	168695.517	1.095
✓ SW.20	0.009	4.00	85.350	1350	388538.069	168698.553	1.250
✓ HW.01			84.600	150	388540.070	168703.420	0.600

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	SW.01	SW.02	9.115	0.600	84.950	84.885	0.065	140.2	150	4.18	49.2
1.001	SW.02	SW.03	14.405	0.600	84.885	84.790	0.095	151.6	150	4.47	49.2
1.002	SW.03	SW.07	13.728	0.600	84.790	84.675	0.115	119.4	150	4.72	49.2
2.000	SW.04	SW.06	12.046	0.600	84.950	84.745	0.205	58.8	150	4.15	49.2
3.000	SW.05	SW.06	7.041	0.600	84.950	84.745	0.205	34.3	150	4.07	49.2
2.001	SW.06	SW.07	9.276	0.600	84.745	84.675	0.070	132.5	150	4.33	49.2

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	0.846	15.0	1.1	0.550	0.615	0.008	0.0	27	0.491
1.001	0.814	14.4	2.0	0.615	0.610	0.015	0.0	38	0.573
1.002	0.918	16.2	2.1	0.610	0.725	0.016	0.0	37	0.636
2.000	1.314	23.2	1.1	0.550	0.705	0.008	0.0	22	0.669
3.000	1.723	30.4	0.8	0.550	0.705	0.006	0.0	17	0.737
2.001	0.871	15.4	2.8	0.705	0.725	0.021	0.0	43	0.661

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.003	SW.07	SW.11	12.350	0.600	84.675	84.590	0.085	145.3	150	4.97	49.2
4.000	SW.08	SW.10	5.788	0.600	84.950	84.875	0.075	77.2	150	4.08	49.2
5.000	SW.09	SW.10	10.620	0.600	84.950	84.875	0.075	141.6	150	4.21	49.2
4.001	SW.10	SW.11	9.376	0.600	84.875	84.590	0.285	32.9	150	4.30	49.2
1.004	SW.11	SW.19	8.330	0.600	84.590	84.530	0.060	138.8	150	5.13	48.7
6.000	SW.12	SW.13	12.165	0.600	84.950	84.865	0.085	143.1	150	4.24	49.2
6.001	SW.13	SW.15	9.851	0.600	84.865	84.800	0.065	151.6	150	4.44	49.2
7.000	SW.14	SW.15	13.829	0.600	84.950	84.800	0.150	92.2	150	4.22	49.2
6.002	SW.15	SW.16	4.793	0.600	84.800	84.765	0.035	136.9	150	4.54	49.2
6.003	SW.16	SW.18	15.421	0.600	84.765	84.660	0.105	146.9	150	4.85	49.2
8.000	SW.17	SW.18	19.091	0.600	84.790	84.660	0.130	146.9	150	4.38	49.2
6.004	SW.18	SW.19	8.670	0.600	84.660	84.530	0.130	66.7	150	4.97	49.2
1.005	SW.19	SW.20	3.818	0.600	84.455	84.175	0.280	13.6	150	5.16	48.7
1.006	SW.20	HW.01	5.262	0.600	84.100	84.000	0.100	52.6	150	5.22	48.5

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.003	0.831	14.7	5.9	0.725	0.810	0.044	0.0	66	0.785
4.000	1.145	20.2	1.1	0.550	0.575	0.008	0.0	23	0.602
5.000	0.842	14.9	0.8	0.550	0.575	0.006	0.0	24	0.448
4.001	1.761	31.1	2.4	0.575	0.810	0.018	0.0	28	1.053
1.004	0.851	15.0	9.2	0.810	0.870	0.070	0.0	85	0.894
6.000	0.838	14.8	0.5	0.550	0.635	0.004	0.0	20	0.395
6.001	0.814	14.4	0.8	0.635	0.650	0.006	0.0	24	0.439
7.000	1.047	18.5	0.4	0.550	0.650	0.003	0.0	16	0.424
6.002	0.857	15.1	1.9	0.650	0.635	0.014	0.0	35	0.582
6.003	0.827	14.6	2.5	0.635	0.740	0.019	0.0	42	0.623
8.000	0.827	14.6	0.9	0.710	0.740	0.007	0.0	25	0.460
6.004	1.233	21.8	5.1	0.740	0.870	0.038	0.0	49	1.004
1.005	2.742	48.5	17.2	0.945	1.025	0.130	0.0	62	2.516
1.006	1.390	24.6	18.3	1.100	0.450	0.139	0.0	96	1.519

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	9.115	140.2	150	Circular_Default Sewer Type	85.650	84.950	0.550	85.650	84.885	0.615
1.001	14.405	151.6	150	Circular_Default Sewer Type	85.650	84.885	0.615	85.550	84.790	0.610
1.002	13.728	119.4	150	Circular_Default Sewer Type	85.550	84.790	0.610	85.550	84.675	0.725
2.000	12.046	58.8	150	Circular_Default Sewer Type	85.650	84.950	0.550	85.600	84.745	0.705
3.000	7.041	34.3	150	Circular_Default Sewer Type	85.650	84.950	0.550	85.600	84.745	0.705
2.001	9.276	132.5	150	Circular_Default Sewer Type	85.600	84.745	0.705	85.550	84.675	0.725

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	SW.01	450	Manhole	Adoptable	SW.02	450	Manhole	Adoptable
1.001	SW.02	450	Manhole	Adoptable	SW.03	450	Manhole	Adoptable
1.002	SW.03	450	Manhole	Adoptable	SW.07	450	Manhole	Adoptable
2.000	SW.04	450	Manhole	Adoptable	SW.06	450	Manhole	Adoptable
3.000	SW.05	450	Manhole	Adoptable	SW.06	450	Manhole	Adoptable
2.001	SW.06	450	Manhole	Adoptable	SW.07	450	Manhole	Adoptable

Pipeline Schedule

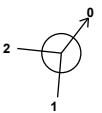
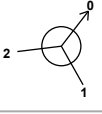
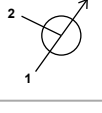
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.003	12.350	145.3	150	Circular_Default Sewer Type	85.550	84.675	0.725	85.550	84.590	0.810
4.000	5.788	77.2	150	Circular_Default Sewer Type	85.650	84.950	0.550	85.600	84.875	0.575
5.000	10.620	141.6	150	Circular_Default Sewer Type	85.650	84.950	0.550	85.600	84.875	0.575
4.001	9.376	32.9	150	Circular_Default Sewer Type	85.600	84.875	0.575	85.550	84.590	0.810
1.004	8.330	138.8	150	Circular_Default Sewer Type	85.550	84.590	0.810	85.550	84.530	0.870
6.000	12.165	143.1	150	Circular_Default Sewer Type	85.650	84.950	0.550	85.650	84.865	0.635
6.001	9.851	151.6	150	Circular_Default Sewer Type	85.650	84.865	0.635	85.600	84.800	0.650
7.000	13.829	92.2	150	Circular_Default Sewer Type	85.650	84.950	0.550	85.600	84.800	0.650
6.002	4.793	136.9	150	Circular_Default Sewer Type	85.600	84.800	0.650	85.550	84.765	0.635
6.003	15.421	146.9	150	Circular_Default Sewer Type	85.550	84.765	0.635	85.550	84.660	0.740
8.000	19.091	146.9	150	Circular_Default Sewer Type	85.650	84.790	0.710	85.550	84.660	0.740
6.004	8.670	66.7	150	Circular_Default Sewer Type	85.550	84.660	0.740	85.550	84.530	0.870
1.005	3.818	13.6	150	Circular_Default Sewer Type	85.550	84.455	0.945	85.350	84.175	1.025
1.006	5.262	52.6	150	Circular_Default Sewer Type	85.350	84.100	1.100	84.600	84.000	0.450

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.003	SW.07	450	Manhole	Adoptable	SW.11	450	Manhole	Adoptable
4.000	SW.08	450	Manhole	Adoptable	SW.10	450	Manhole	Adoptable
5.000	SW.09	450	Manhole	Adoptable	SW.10	450	Manhole	Adoptable
4.001	SW.10	450	Manhole	Adoptable	SW.11	450	Manhole	Adoptable
1.004	SW.11	450	Manhole	Adoptable	SW.19	600	Manhole	Adoptable
6.000	SW.12	450	Manhole	Adoptable	SW.13	450	Manhole	Adoptable
6.001	SW.13	450	Manhole	Adoptable	SW.15	450	Manhole	Adoptable
7.000	SW.14	450	Manhole	Adoptable	SW.15	450	Manhole	Adoptable
6.002	SW.15	450	Manhole	Adoptable	SW.16	450	Manhole	Adoptable
6.003	SW.16	450	Manhole	Adoptable	SW.18	450	Manhole	Adoptable
8.000	SW.17	450	Manhole	Adoptable	SW.18	450	Manhole	Adoptable
6.004	SW.18	450	Manhole	Adoptable	SW.19	600	Manhole	Adoptable
1.005	SW.19	600	Manhole	Adoptable	SW.20	1350	Manhole	Adoptable
1.006	SW.20	1350	Manhole	Adoptable	HW.01	150	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
SW.01	388494.146	168697.935	85.650	0.700	450				
						0	1.000	84.950	150
SW.02	388499.717	168705.149	85.650	0.765	450		1	1.000	84.885
						0	1.001	84.885	150
SW.03	388508.523	168716.549	85.550	0.760	450		1	1.001	84.790
						0	1.002	84.790	150
SW.04	388501.738	168702.081	85.650	0.700	450				
						0	2.000	84.950	150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
SW.05	388513.124	168693.801	85.650	0.700	450				
						0	3.000	84.950	150
SW.06	388513.718	168700.817	85.600	0.855	450		1 2	3.000 2.000	84.745 84.745
						0	2.001	84.745	150
SW.07	388519.388	168708.158	85.550	0.875	450		1 2	2.001 1.002	84.675 84.675
						0	1.003	84.675	150
SW.08	388517.685	168692.489	85.650	0.700	450				
						0	4.000	84.950	150
SW.09	388528.643	168683.936	85.650	0.700	450				
						0	5.000	84.950	150
SW.10	388523.431	168693.189	85.600	0.725	450		1 2	5.000 4.000	84.875 84.875
						0	4.001	84.875	150
SW.11	388529.162	168700.609	85.550	0.960	450		1 2	4.001 1.003	84.590 84.590
						0	1.004	84.590	150
SW.12	388535.451	168671.499	85.650	0.700	450				
						0	6.000	84.950	150
SW.13	388543.020	168681.023	85.650	0.785	450		1	6.000	84.865
						0	6.001	84.865	150
SW.14	388543.827	168665.463	85.650	0.700	450				
						0	7.000	84.950	150
SW.15	388551.876	168676.708	85.600	0.800	450		1 2	7.000 6.001	84.800 84.800
						0	6.002	84.800	150
SW.16	388554.672	168680.601	85.550	0.785	450		1	6.002	84.765
						0	6.003	84.765	150
SW.17	388531.220	168674.745	85.650	0.860	450				
						0	8.000	84.790	150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
SW.18	388542.539	168690.119	85.550	0.890	450		1	8.000	84.660
							2	6.003	84.660
							0	6.004	84.660
SW.19	388535.754	168695.517	85.550	1.095	600		1	6.004	84.530
							2	1.004	84.530
							0	1.005	84.455
SW.20	388538.069	168698.553	85.350	1.250	1350		1	1.005	84.175
							0	1.006	84.100
HW.01	388540.070	168703.420	84.600	0.600	150		1	1.006	84.000

Simulation Settings

Rainfall Methodology	FEH-22	Skip Steady State	✓	2 year (l/s)	0.5
Rainfall Events	Singular	Drain Down Time (mins)	2160	30 year (l/s)	1.2
Summer CV	0.750	Additional Storage (m³/ha)	20.0	100 year (l/s)	1.5
Winter CV	0.840	Starting Level (m)		Check Discharge Volume	✓
Analysis Speed	Normal	Check Discharge Rate(s)	✓	100 year 360 minute (m³)	

Storm Durations

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

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
10	0	0	0
30	0	0	0
100	0	0	0
100	40	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.99
Greenfield Method	FEH	Growth Factor 100 year	2.57
Positively Drained Area (ha)	0.148	Betterment (%)	0
SAAR (mm)	773	QMed	0.5
Host	10	QBar	0.6
BFIHost	0.520	Q 2 year (l/s)	0.5
Region	4	Q 30 year (l/s)	1.2
QBar/QMed conversion factor	1.124	Q 100 year (l/s)	1.5
Growth Factor 2 year	0.89		

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)	0.148	Storm Duration (mins)	360
Soil Index	1	Betterment (%)	0
SPR	0.10	PR	
CWI		Runoff Volume (m ³)	

Node SW.20 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	84.100	Product Number	CTL-SHE-0070-2000-0820-2000
Design Depth (m)	0.820	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node SW.13 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	84.865	Slope (1:X)	200.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	255	Depth (m)	0.500
Safety Factor	2.0	Width (m)	6.000	Inf Depth (m)	
Porosity	0.30	Length (m)	8.500		

Node SW.11 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	84.590	Slope (1:X)	200.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	270	Depth (m)	0.500
Safety Factor	2.0	Width (m)	6.000	Inf Depth (m)	
Porosity	0.30	Length (m)	11.000		

Node SW.03 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	84.790	Slope (1:X)	200.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	345	Depth (m)	0.500
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

Node SW.18 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	84.660	Slope (1:X)	200.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	285	Depth (m)	0.500
Safety Factor	2.0	Width (m)	6.000	Inf Depth (m)	
Porosity	0.30	Length (m)	7.000		

Node SW.20 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	84.750
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	480

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	30.0	30.0	0.500	52.6	55.3	0.501	52.6	55.3

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
2 year 15 minute summer	97.196	27.503
2 year 15 minute winter	68.208	27.503
2 year 30 minute summer	62.027	17.552
2 year 30 minute winter	43.528	17.552
2 year 60 minute summer	41.532	10.976
2 year 60 minute winter	27.593	10.976
2 year 120 minute summer	29.469	7.788
2 year 120 minute winter	19.579	7.788
2 year 180 minute summer	24.214	6.231
2 year 180 minute winter	15.739	6.231
2 year 240 minute summer	19.938	5.269
2 year 240 minute winter	13.246	5.269
2 year 360 minute summer	15.933	4.100
2 year 360 minute winter	10.357	4.100
2 year 480 minute summer	12.855	3.397
2 year 480 minute winter	8.540	3.397
2 year 600 minute summer	10.678	2.921
2 year 600 minute winter	7.296	2.921
2 year 720 minute summer	9.603	2.574
2 year 720 minute winter	6.454	2.574
2 year 960 minute summer	7.960	2.096
2 year 960 minute winter	5.273	2.096
2 year 1440 minute summer	5.814	1.558
2 year 1440 minute winter	3.907	1.558
2 year 2160 minute summer	4.189	1.158
2 year 2160 minute winter	2.886	1.158
2 year 2880 minute summer	3.518	0.943
2 year 2880 minute winter	2.364	0.943
2 year 4320 minute summer	2.746	0.718
2 year 4320 minute winter	1.808	0.718
2 year 5760 minute summer	2.343	0.600
2 year 5760 minute winter	1.516	0.600
2 year 7200 minute summer	2.064	0.526
2 year 7200 minute winter	1.332	0.526
2 year 8640 minute summer	1.870	0.477
2 year 8640 minute winter	1.207	0.477
2 year 10080 minute summer	1.732	0.442
2 year 10080 minute winter	1.118	0.442
10 year 15 minute summer	196.441	55.586
10 year 15 minute winter	137.853	55.586
10 year 30 minute summer	126.321	35.745
10 year 30 minute winter	88.647	35.745
10 year 60 minute summer	83.522	22.072
10 year 60 minute winter	55.490	22.072
10 year 120 minute summer	53.060	14.022
10 year 120 minute winter	35.252	14.022
10 year 180 minute summer	41.614	10.709
10 year 180 minute winter	27.050	10.709
10 year 240 minute summer	33.389	8.824
10 year 240 minute winter	22.183	8.824
10 year 360 minute summer	25.985	6.687
10 year 360 minute winter	16.891	6.687

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
10 year 480 minute summer	20.713	5.474
10 year 480 minute winter	13.762	5.474
10 year 600 minute summer	17.092	4.675
10 year 600 minute winter	11.678	4.675
10 year 720 minute summer	15.308	4.103
10 year 720 minute winter	10.288	4.103
10 year 960 minute summer	12.634	3.327
10 year 960 minute winter	8.369	3.327
10 year 1440 minute summer	9.133	2.448
10 year 1440 minute winter	6.138	2.448
10 year 2160 minute summer	6.473	1.789
10 year 2160 minute winter	4.460	1.789
10 year 2880 minute summer	5.349	1.434
10 year 2880 minute winter	3.595	1.434
10 year 4320 minute summer	4.038	1.056
10 year 4320 minute winter	2.659	1.056
10 year 5760 minute summer	3.349	0.857
10 year 5760 minute winter	2.168	0.857
10 year 7200 minute summer	2.888	0.737
10 year 7200 minute winter	1.864	0.737
10 year 8640 minute summer	2.572	0.656
10 year 8640 minute winter	1.660	0.656
10 year 10080 minute summer	2.347	0.599
10 year 10080 minute winter	1.515	0.599
30 year 15 minute summer	259.808	73.517
30 year 15 minute winter	182.321	73.517
30 year 30 minute summer	168.639	47.719
30 year 30 minute winter	118.343	47.719
30 year 60 minute summer	111.854	29.560
30 year 60 minute winter	74.313	29.560
30 year 120 minute summer	68.974	18.228
30 year 120 minute winter	45.825	18.228
30 year 180 minute summer	53.518	13.772
30 year 180 minute winter	34.788	13.772
30 year 240 minute summer	42.781	11.306
30 year 240 minute winter	28.422	11.306
30 year 360 minute summer	33.351	8.582
30 year 360 minute winter	21.679	8.582
30 year 480 minute summer	26.743	7.067
30 year 480 minute winter	17.767	7.067
30 year 600 minute summer	22.182	6.067
30 year 600 minute winter	15.156	6.067
30 year 720 minute summer	19.947	5.346
30 year 720 minute winter	13.406	5.346
30 year 960 minute summer	16.523	4.351
30 year 960 minute winter	10.945	4.351
30 year 1440 minute summer	12.017	3.221
30 year 1440 minute winter	8.076	3.221
30 year 2160 minute summer	8.472	2.341
30 year 2160 minute winter	5.838	2.341
30 year 2880 minute summer	6.928	1.857
30 year 2880 minute winter	4.656	1.857

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
30 year 4320 minute summer	5.085	1.330
30 year 4320 minute winter	3.349	1.330
30 year 5760 minute summer	4.115	1.053
30 year 5760 minute winter	2.663	1.053
30 year 7200 minute summer	3.479	0.888
30 year 7200 minute winter	2.246	0.888
30 year 8640 minute summer	3.047	0.777
30 year 8640 minute winter	1.966	0.777
30 year 10080 minute summer	2.741	0.699
30 year 10080 minute winter	1.769	0.699
100 year 15 minute summer	333.542	94.381
100 year 15 minute winter	234.065	94.381
100 year 30 minute summer	217.994	61.685
100 year 30 minute winter	152.978	61.685
100 year 60 minute summer	145.358	38.414
100 year 60 minute winter	96.572	38.414
100 year 120 minute summer	88.234	23.318
100 year 120 minute winter	58.621	23.318
100 year 180 minute summer	68.493	17.626
100 year 180 minute winter	44.522	17.626
100 year 240 minute summer	54.993	14.533
100 year 240 minute winter	36.536	14.533
100 year 360 minute summer	43.352	11.156
100 year 360 minute winter	28.180	11.156
100 year 480 minute summer	34.993	9.248
100 year 480 minute winter	23.249	9.248
100 year 600 minute summer	29.156	7.975
100 year 600 minute winter	19.921	7.975
100 year 720 minute summer	26.305	7.050
100 year 720 minute winter	17.679	7.050
100 year 960 minute summer	21.904	5.768
100 year 960 minute winter	14.510	5.768
100 year 1440 minute summer	15.908	4.264
100 year 1440 minute winter	10.691	4.264
100 year 2160 minute summer	11.129	3.076
100 year 2160 minute winter	7.668	3.076
100 year 2880 minute summer	9.008	2.414
100 year 2880 minute winter	6.054	2.414
100 year 4320 minute summer	6.472	1.692
100 year 4320 minute winter	4.262	1.692
100 year 5760 minute summer	5.137	1.315
100 year 5760 minute winter	3.325	1.315
100 year 7200 minute summer	4.256	1.086
100 year 7200 minute winter	2.747	1.086
100 year 8640 minute summer	3.656	0.933
100 year 8640 minute winter	2.359	0.933
100 year 10080 minute summer	3.230	0.824
100 year 10080 minute winter	2.085	0.824
100 year +40% CC 15 minute summer	466.959	132.133
100 year +40% CC 15 minute winter	327.690	132.133
100 year +40% CC 30 minute summer	305.191	86.359
100 year +40% CC 30 minute winter	214.169	86.359

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +40% CC 60 minute summer	203.501	53.779
100 year +40% CC 60 minute winter	135.201	53.779
100 year +40% CC 120 minute summer	123.528	32.645
100 year +40% CC 120 minute winter	82.069	32.645
100 year +40% CC 180 minute summer	95.890	24.676
100 year +40% CC 180 minute winter	62.331	24.676
100 year +40% CC 240 minute summer	76.990	20.346
100 year +40% CC 240 minute winter	51.151	20.346
100 year +40% CC 360 minute summer	60.693	15.618
100 year +40% CC 360 minute winter	39.452	15.618
100 year +40% CC 480 minute summer	48.991	12.947
100 year +40% CC 480 minute winter	32.548	12.947
100 year +40% CC 600 minute summer	40.818	11.165
100 year +40% CC 600 minute winter	27.889	11.165
100 year +40% CC 720 minute summer	36.827	9.870
100 year +40% CC 720 minute winter	24.750	9.870
100 year +40% CC 960 minute summer	30.666	8.075
100 year +40% CC 960 minute winter	20.314	8.075
100 year +40% CC 1440 minute summer	22.271	5.969
100 year +40% CC 1440 minute winter	14.968	5.969
100 year +40% CC 2160 minute summer	15.581	4.306
100 year +40% CC 2160 minute winter	10.736	4.306
100 year +40% CC 2880 minute summer	12.612	3.380
100 year +40% CC 2880 minute winter	8.476	3.380
100 year +40% CC 4320 minute summer	9.060	2.369
100 year +40% CC 4320 minute winter	5.967	2.369
100 year +40% CC 5760 minute summer	7.192	1.841
100 year +40% CC 5760 minute winter	4.655	1.841
100 year +40% CC 7200 minute summer	5.959	1.520
100 year +40% CC 7200 minute winter	3.846	1.520
100 year +40% CC 8640 minute summer	5.118	1.306
100 year +40% CC 8640 minute winter	3.303	1.306
100 year +40% CC 10080 minute summer	4.522	1.154
100 year +40% CC 10080 minute winter	2.919	1.154

Results for 2 year Critical Storm Duration. Lowest mass balance: 95.25%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SW.01	10	84.977	0.027	1.1	0.0107	0.0000	OK
15 minute summer	SW.02	10	84.925	0.040	2.0	0.0137	0.0000	OK
15 minute winter	SW.03	12	84.821	0.031	2.1	0.2932	0.0000	OK
15 minute winter	SW.04	10	84.972	0.022	1.1	0.0086	0.0000	OK
15 minute winter	SW.05	10	84.967	0.017	0.8	0.0056	0.0000	OK
15 minute summer	SW.06	10	84.788	0.043	2.8	0.0140	0.0000	OK
120 minute winter	SW.07	92	84.786	0.111	2.0	0.0355	0.0000	OK
15 minute summer	SW.08	10	84.974	0.024	1.1	0.0094	0.0000	OK
15 minute winter	SW.09	10	84.974	0.024	0.8	0.0078	0.0000	OK
15 minute winter	SW.10	10	84.903	0.028	2.4	0.0076	0.0000	OK
120 minute winter	SW.11	92	84.786	0.196	3.9	3.4087	0.0000	SURCHARGED
15 minute winter	SW.12	9	84.969	0.019	0.5	0.0053	0.0000	OK
15 minute winter	SW.13	12	84.886	0.021	0.8	0.0878	0.0000	OK
15 minute winter	SW.14	10	84.965	0.015	0.4	0.0037	0.0000	OK
15 minute winter	SW.15	11	84.835	0.035	1.7	0.0099	0.0000	OK
15 minute winter	SW.16	10	84.806	0.041	2.3	0.0116	0.0000	OK
15 minute winter	SW.17	10	84.815	0.025	0.9	0.0081	0.0000	OK
120 minute winter	SW.18	94	84.786	0.126	2.5	1.4226	0.0000	OK
120 minute winter	SW.19	92	84.786	0.331	3.8	0.2267	0.0000	SURCHARGED
120 minute winter	SW.20	92	84.785	0.685	3.7	2.1826	0.0000	SURCHARGED
240 minute winter	HW.01	96	84.029	0.029	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SW.01	1.000	SW.02	1.1	0.373	0.074	0.0271	
15 minute summer	SW.02	1.001	SW.03	2.0	0.716	0.140	0.0423	
15 minute winter	SW.03	1.002	SW.07	1.5	0.355	0.093	0.0815	
15 minute winter	SW.04	2.000	SW.06	1.1	0.389	0.047	0.0350	
15 minute winter	SW.05	3.000	SW.06	0.8	0.322	0.026	0.0185	
15 minute summer	SW.06	2.001	SW.07	2.8	0.525	0.182	0.0504	
120 minute winter	SW.07	1.003	SW.11	1.8	0.429	0.125	0.1954	
15 minute summer	SW.08	4.000	SW.10	1.1	0.536	0.054	0.0119	
15 minute winter	SW.09	5.000	SW.10	0.8	0.395	0.054	0.0216	
15 minute winter	SW.10	4.001	SW.11	2.4	0.611	0.077	0.0889	
120 minute winter	SW.11	1.004	SW.19	1.9	0.552	0.125	0.1466	
15 minute winter	SW.12	6.000	SW.13	0.5	0.401	0.034	0.0171	
15 minute winter	SW.13	6.001	SW.15	0.6	0.302	0.044	0.0228	
15 minute winter	SW.14	7.000	SW.15	0.4	0.211	0.022	0.0278	
15 minute winter	SW.15	6.002	SW.16	1.6	0.468	0.106	0.0166	
15 minute winter	SW.16	6.003	SW.18	2.3	0.571	0.155	0.1044	
15 minute winter	SW.17	8.000	SW.18	0.9	0.335	0.062	0.1193	
120 minute winter	SW.18	6.004	SW.19	1.5	0.614	0.070	0.1448	
120 minute winter	SW.19	1.005	SW.20	3.4	1.132	0.069	0.0672	
120 minute winter	SW.20	1.006	HW.01	2.0	0.813	0.081	0.0130	18.3

Results for 10 year Critical Storm Duration. Lowest mass balance: 95.17%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SW.01	10	84.988	0.038	2.1	0.0147	0.0000	OK
15 minute summer	SW.02	10	84.942	0.057	4.0	0.0195	0.0000	OK
120 minute winter	SW.03	116	84.898	0.108	2.4	2.5058	0.0000	OK
15 minute winter	SW.04	10	84.980	0.030	2.1	0.0118	0.0000	OK
15 minute winter	SW.05	10	84.973	0.023	1.6	0.0077	0.0000	OK
180 minute winter	SW.06	140	84.898	0.153	1.3	0.0493	0.0000	SURCHARGED
180 minute winter	SW.07	140	84.898	0.223	2.5	0.0710	0.0000	SURCHARGED
15 minute winter	SW.08	10	84.984	0.034	2.1	0.0131	0.0000	OK
15 minute summer	SW.09	10	84.983	0.033	1.6	0.0110	0.0000	OK
15 minute summer	SW.10	10	84.915	0.040	4.8	0.0107	0.0000	OK
180 minute winter	SW.11	144	84.898	0.308	4.0	5.6470	0.0000	SURCHARGED
15 minute summer	SW.12	10	84.978	0.028	1.1	0.0077	0.0000	OK
180 minute winter	SW.13	144	84.897	0.032	0.4	0.1951	0.0000	OK
15 minute winter	SW.14	10	84.971	0.021	0.8	0.0052	0.0000	OK
180 minute winter	SW.15	144	84.897	0.097	0.8	0.0276	0.0000	OK
180 minute winter	SW.16	144	84.897	0.132	1.1	0.0378	0.0000	OK
180 minute winter	SW.17	140	84.897	0.107	0.4	0.0345	0.0000	OK
180 minute winter	SW.18	144	84.897	0.237	2.3	2.8729	0.0000	SURCHARGED
180 minute winter	SW.19	144	84.897	0.442	4.3	0.3029	0.0000	SURCHARGED
180 minute winter	SW.20	144	84.896	0.796	4.9	6.1463	0.0000	SURCHARGED
360 minute winter	HW.01	128	84.029	0.029	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SW.01	1.000	SW.02	2.1	0.441	0.140	0.0438	
15 minute summer	SW.02	1.001	SW.03	4.0	0.862	0.280	0.0699	
120 minute winter	SW.03	1.002	SW.07	1.2	0.292	0.077	0.2138	
15 minute winter	SW.04	2.000	SW.06	2.1	0.451	0.090	0.0838	
15 minute winter	SW.05	3.000	SW.06	1.6	0.384	0.053	0.0473	
180 minute winter	SW.06	2.001	SW.07	1.2	0.361	0.077	0.1633	
180 minute winter	SW.07	1.003	SW.11	2.3	0.427	0.155	0.2174	
15 minute winter	SW.08	4.000	SW.10	2.1	0.627	0.104	0.0194	
15 minute summer	SW.09	5.000	SW.10	1.6	0.482	0.108	0.0354	
15 minute summer	SW.10	4.001	SW.11	4.8	0.742	0.154	0.1001	
180 minute winter	SW.11	1.004	SW.19	2.1	0.548	0.140	0.1466	
15 minute summer	SW.12	6.000	SW.13	1.1	0.513	0.075	0.0276	
180 minute winter	SW.13	6.001	SW.15	0.3	0.248	0.024	0.0733	
15 minute winter	SW.14	7.000	SW.15	0.8	0.259	0.043	0.0472	
180 minute winter	SW.15	6.002	SW.16	0.8	0.395	0.055	0.0684	
180 minute winter	SW.16	6.003	SW.18	1.1	0.397	0.075	0.2626	
180 minute winter	SW.17	8.000	SW.18	0.4	0.209	0.027	0.2967	
180 minute winter	SW.18	6.004	SW.19	1.3	0.599	0.061	0.1526	
180 minute winter	SW.19	1.005	SW.20	4.3	1.086	0.088	0.0672	
180 minute winter	SW.20	1.006	HW.01	2.0	0.813	0.081	0.0130	37.4

Results for 30 year Critical Storm Duration. Lowest mass balance: 95.15%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SW.01	10	84.994	0.044	2.8	0.0170	0.0000	OK
120 minute winter	SW.02	118	84.969	0.084	1.6	0.0288	0.0000	OK
120 minute winter	SW.03	118	84.969	0.179	3.7	4.6579	0.0000	SURCHARGED
15 minute summer	SW.04	10	84.985	0.035	2.8	0.0136	0.0000	OK
15 minute summer	SW.05	10	84.977	0.027	2.1	0.0088	0.0000	OK
120 minute winter	SW.06	116	84.969	0.224	2.2	0.0724	0.0000	SURCHARGED
120 minute winter	SW.07	116	84.969	0.294	3.6	0.0938	0.0000	SURCHARGED
15 minute summer	SW.08	10	84.990	0.040	2.8	0.0153	0.0000	OK
15 minute winter	SW.09	10	84.989	0.039	2.1	0.0127	0.0000	OK
120 minute winter	SW.10	116	84.969	0.094	1.9	0.0252	0.0000	OK
120 minute winter	SW.11	116	84.969	0.379	5.9	7.0818	0.0000	SURCHARGED
15 minute summer	SW.12	10	84.982	0.032	1.4	0.0087	0.0000	OK
120 minute winter	SW.13	114	84.969	0.104	1.3	1.2804	0.0000	OK
15 minute summer	SW.14	10	84.975	0.025	1.1	0.0061	0.0000	OK
120 minute winter	SW.15	114	84.969	0.169	1.4	0.0479	0.0000	SURCHARGED
120 minute winter	SW.16	114	84.969	0.204	1.9	0.0582	0.0000	SURCHARGED
120 minute winter	SW.17	116	84.969	0.179	0.7	0.0575	0.0000	SURCHARGED
120 minute winter	SW.18	116	84.969	0.309	3.6	3.8014	0.0000	SURCHARGED
120 minute winter	SW.19	116	84.968	0.513	5.9	0.3517	0.0000	SURCHARGED
120 minute winter	SW.20	116	84.968	0.868	6.7	8.9814	0.0000	SURCHARGED
120 minute winter	HW.01	116	84.029	0.029	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SW.01	1.000	SW.02	2.8	0.479	0.187	0.0536	
120 minute winter	SW.02	1.001	SW.03	1.6	0.548	0.109	0.2000	
120 minute winter	SW.03	1.002	SW.07	-2.1	0.289	-0.127	0.2417	
15 minute summer	SW.04	2.000	SW.06	2.8	0.467	0.121	0.1064	
15 minute summer	SW.05	3.000	SW.06	2.1	0.398	0.069	0.0591	
120 minute winter	SW.06	2.001	SW.07	2.0	0.392	0.129	0.1633	
120 minute winter	SW.07	1.003	SW.11	3.4	0.423	0.230	0.2174	
15 minute summer	SW.08	4.000	SW.10	2.8	0.679	0.138	0.0239	
15 minute winter	SW.09	5.000	SW.10	2.1	0.518	0.141	0.0431	
120 minute winter	SW.10	4.001	SW.11	1.9	0.466	0.060	0.1369	
120 minute winter	SW.11	1.004	SW.19	2.6	0.536	0.175	0.1466	
15 minute summer	SW.12	6.000	SW.13	1.4	0.540	0.095	0.0334	
120 minute winter	SW.13	6.001	SW.15	-0.8	0.293	-0.055	0.1506	
15 minute summer	SW.14	7.000	SW.15	1.1	0.278	0.059	0.0597	
120 minute winter	SW.15	6.002	SW.16	1.4	0.447	0.090	0.0844	
120 minute winter	SW.16	6.003	SW.18	1.8	0.426	0.120	0.2715	
120 minute winter	SW.17	8.000	SW.18	0.7	0.220	0.045	0.3361	
120 minute winter	SW.18	6.004	SW.19	1.8	0.589	0.084	0.1526	
120 minute winter	SW.19	1.005	SW.20	5.8	1.139	0.119	0.0672	
120 minute winter	SW.20	1.006	HW.01	2.0	0.815	0.082	0.0131	42.4

Results for 100 year Critical Storm Duration. Lowest mass balance: 96.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	SW.01	280	85.055	0.105	0.5	0.0409	0.0000	OK
360 minute winter	SW.02	280	85.055	0.170	1.0	0.0583	0.0000	SURCHARGED
360 minute winter	SW.03	280	85.055	0.265	2.0	7.2625	0.0000	SURCHARGED
360 minute winter	SW.04	280	85.055	0.105	0.5	0.0409	0.0000	OK
360 minute winter	SW.05	280	85.055	0.105	0.4	0.0348	0.0000	OK
360 minute winter	SW.06	280	85.055	0.310	1.4	0.1002	0.0000	SURCHARGED
360 minute winter	SW.07	280	85.055	0.380	2.1	0.1213	0.0000	SURCHARGED
360 minute winter	SW.08	280	85.055	0.105	0.5	0.0408	0.0000	OK
360 minute winter	SW.09	280	85.055	0.105	0.4	0.0347	0.0000	OK
360 minute winter	SW.10	280	85.055	0.180	1.2	0.0485	0.0000	SURCHARGED
360 minute winter	SW.11	280	85.055	0.465	3.3	8.8191	0.0000	SURCHARGED
360 minute winter	SW.12	272	85.055	0.105	0.3	0.0287	0.0000	OK
360 minute winter	SW.13	272	85.055	0.190	0.9	2.6196	0.0000	SURCHARGED
360 minute winter	SW.14	280	85.055	0.105	0.2	0.0258	0.0000	OK
360 minute winter	SW.15	280	85.055	0.255	0.8	0.0725	0.0000	SURCHARGED
360 minute winter	SW.16	280	85.055	0.290	1.1	0.0830	0.0000	SURCHARGED
360 minute winter	SW.17	272	85.055	0.265	0.5	0.0853	0.0000	SURCHARGED
360 minute winter	SW.18	272	85.055	0.395	2.0	4.9257	0.0000	SURCHARGED
360 minute winter	SW.19	280	85.055	0.600	3.7	0.4108	0.0000	SURCHARGED
360 minute winter	SW.20	280	85.054	0.954	4.2	12.7219	0.0000	FLOOD RISK
360 minute winter	HW.01	280	84.030	0.030	2.1	0.0000	0.0000	OK

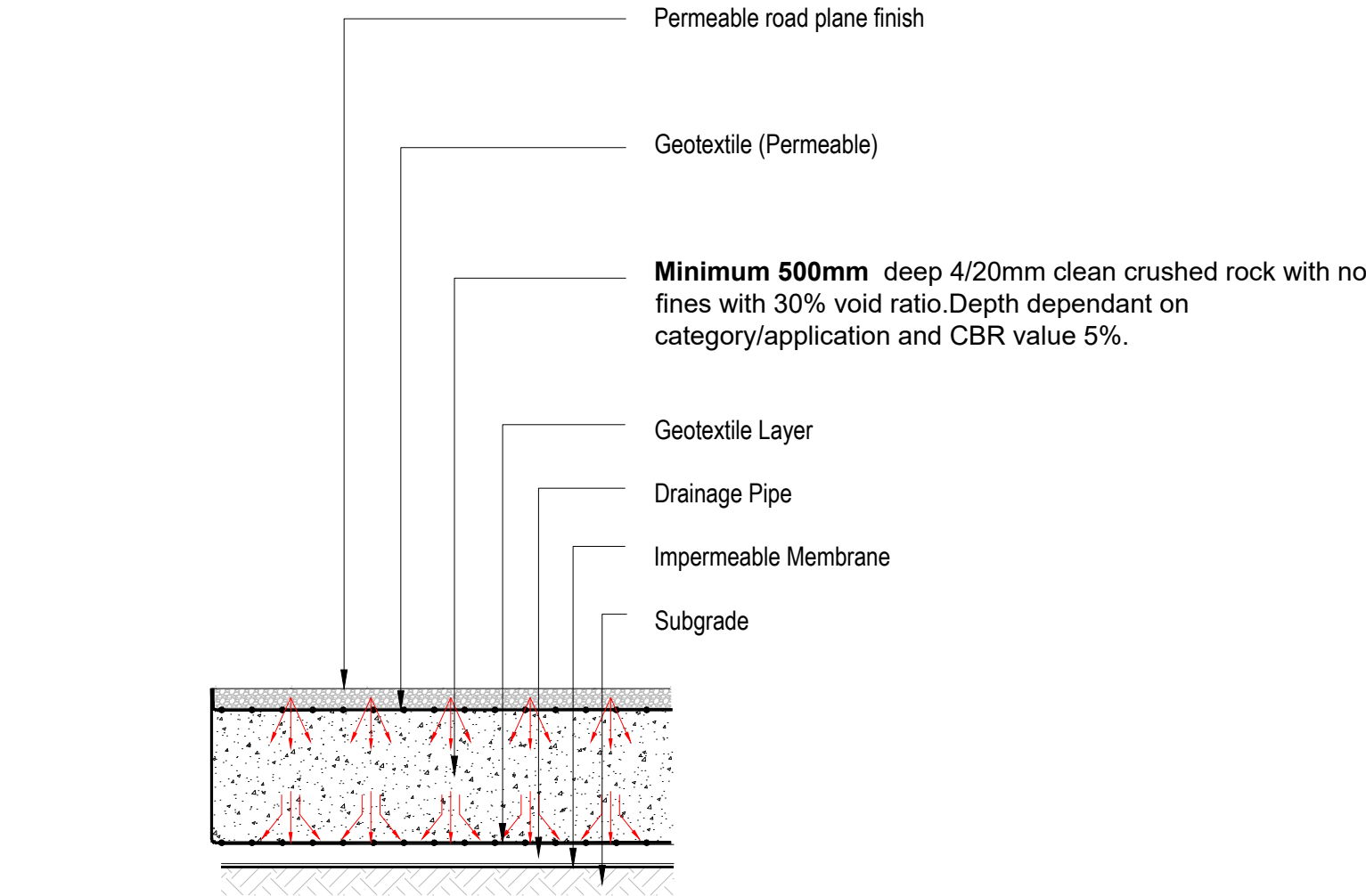
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	SW.01	1.000	SW.02	0.5	0.311	0.033	0.1405	
360 minute winter	SW.02	1.001	SW.03	1.0	0.450	0.069	0.2536	
360 minute winter	SW.03	1.002	SW.07	-1.0	0.251	-0.059	0.2417	
360 minute winter	SW.04	2.000	SW.06	0.5	0.292	0.022	0.1857	
360 minute winter	SW.05	3.000	SW.06	0.4	0.246	0.013	0.1085	
360 minute winter	SW.06	2.001	SW.07	1.3	0.339	0.087	0.1633	
360 minute winter	SW.07	1.003	SW.11	2.0	0.410	0.134	0.2174	
360 minute winter	SW.08	4.000	SW.10	0.5	0.425	0.025	0.0891	
360 minute winter	SW.09	5.000	SW.10	0.4	0.330	0.027	0.1635	
360 minute winter	SW.10	4.001	SW.11	1.2	0.268	0.038	0.1651	
360 minute winter	SW.11	1.004	SW.19	1.8	0.502	0.120	0.1466	
360 minute winter	SW.12	6.000	SW.13	0.3	0.300	0.020	0.1872	
360 minute winter	SW.13	6.001	SW.15	-0.5	0.253	-0.036	0.1734	
360 minute winter	SW.14	7.000	SW.15	0.2	0.176	0.011	0.2131	
360 minute winter	SW.15	6.002	SW.16	0.8	0.368	0.052	0.0844	
360 minute winter	SW.16	6.003	SW.18	1.0	0.337	0.071	0.2715	
360 minute winter	SW.17	8.000	SW.18	0.4	0.218	0.029	0.3361	
360 minute winter	SW.18	6.004	SW.19	1.2	0.558	0.055	0.1526	
360 minute winter	SW.19	1.005	SW.20	3.7	1.036	0.075	0.0672	
360 minute winter	SW.20	1.006	HW.01	2.1	0.825	0.086	0.0135	78.1

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 97.61%

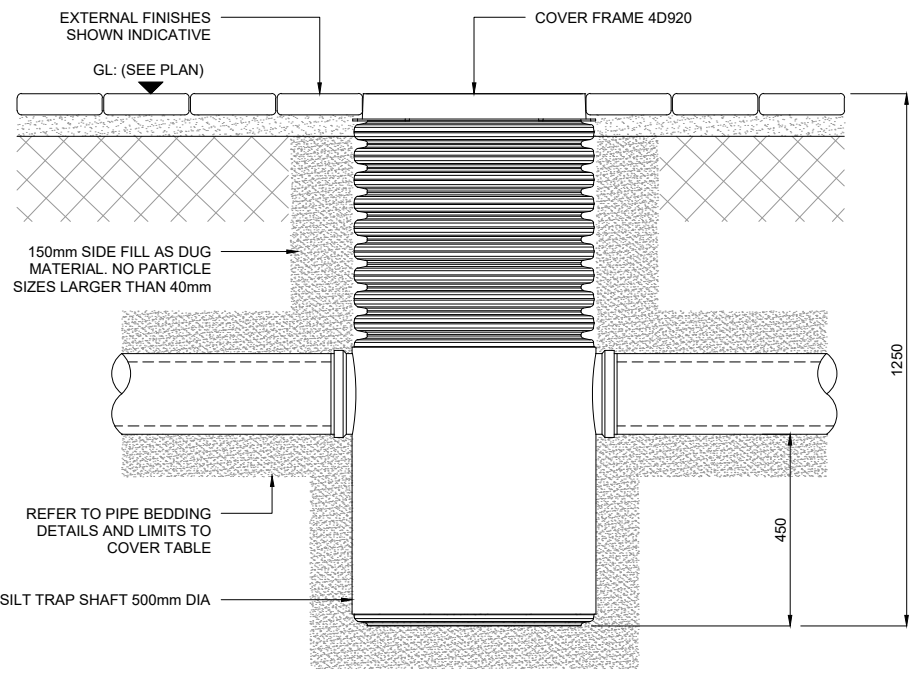
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	SW.01	450	85.281	0.331	0.5	0.1285	0.0000	SURCHARGED
600 minute winter	SW.02	450	85.281	0.396	0.9	0.1355	0.0000	SURCHARGED
600 minute winter	SW.03	450	85.281	0.491	1.6	14.0747	0.0000	FLOOD RISK
600 minute winter	SW.04	450	85.281	0.331	0.5	0.1284	0.0000	SURCHARGED
600 minute winter	SW.05	450	85.281	0.331	0.4	0.1092	0.0000	SURCHARGED
600 minute winter	SW.06	450	85.281	0.536	1.3	0.1731	0.0000	SURCHARGED
600 minute winter	SW.07	450	85.281	0.606	1.7	0.1933	0.0000	FLOOD RISK
600 minute winter	SW.08	450	85.281	0.331	0.5	0.1284	0.0000	SURCHARGED
600 minute winter	SW.09	450	85.281	0.331	0.4	0.1092	0.0000	SURCHARGED
600 minute winter	SW.10	450	85.281	0.406	1.1	0.1092	0.0000	SURCHARGED
600 minute winter	SW.11	450	85.281	0.691	2.7	9.5934	0.0000	FLOOD RISK
600 minute winter	SW.12	450	85.281	0.331	0.3	0.0903	0.0000	SURCHARGED
600 minute winter	SW.13	450	85.281	0.416	0.9	6.1211	0.0000	SURCHARGED
600 minute winter	SW.14	450	85.281	0.331	0.2	0.0810	0.0000	SURCHARGED
600 minute winter	SW.15	450	85.281	0.481	0.8	0.1365	0.0000	SURCHARGED
600 minute winter	SW.16	450	85.281	0.516	1.0	0.1475	0.0000	FLOOD RISK
600 minute winter	SW.17	450	85.281	0.491	0.5	0.1580	0.0000	SURCHARGED
600 minute winter	SW.18	450	85.281	0.621	1.8	6.3538	0.0000	FLOOD RISK
600 minute winter	SW.19	450	85.280	0.825	4.1	0.5654	0.0000	FLOOD RISK
600 minute winter	SW.20	450	85.279	1.179	4.5	24.0675	0.0000	FLOOD RISK
600 minute winter	HW.01	450	84.031	0.031	2.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute winter	SW.01	1.000	SW.02	0.5	0.311	0.033	0.1605	
600 minute winter	SW.02	1.001	SW.03	0.9	0.420	0.062	0.2536	
600 minute winter	SW.03	1.002	SW.07	-0.7	0.241	-0.042	0.2417	
600 minute winter	SW.04	2.000	SW.06	0.5	0.276	0.022	0.2121	
600 minute winter	SW.05	3.000	SW.06	0.4	0.229	0.013	0.1240	
600 minute winter	SW.06	2.001	SW.07	1.2	0.319	0.081	0.1633	
600 minute winter	SW.07	1.003	SW.11	1.4	0.416	0.097	0.2174	
600 minute winter	SW.08	4.000	SW.10	0.5	0.395	0.025	0.1019	
600 minute winter	SW.09	5.000	SW.10	0.4	0.295	0.027	0.1870	
600 minute winter	SW.10	4.001	SW.11	1.0	0.245	0.034	0.1651	
600 minute winter	SW.11	1.004	SW.19	2.2	0.478	0.146	0.1466	
600 minute winter	SW.12	6.000	SW.13	0.3	0.258	0.017	0.2142	
600 minute winter	SW.13	6.001	SW.15	-0.5	0.246	-0.038	0.1734	
600 minute winter	SW.14	7.000	SW.15	0.2	0.166	0.011	0.2435	
600 minute winter	SW.15	6.002	SW.16	0.7	0.363	0.046	0.0844	
600 minute winter	SW.16	6.003	SW.18	0.9	0.335	0.062	0.2715	
600 minute winter	SW.17	8.000	SW.18	0.4	0.223	0.031	0.3361	
600 minute winter	SW.18	6.004	SW.19	1.1	0.552	0.052	0.1526	
600 minute winter	SW.19	1.005	SW.20	4.0	0.996	0.083	0.0672	
600 minute winter	SW.20	1.006	HW.01	2.3	0.848	0.095	0.0145	132.5

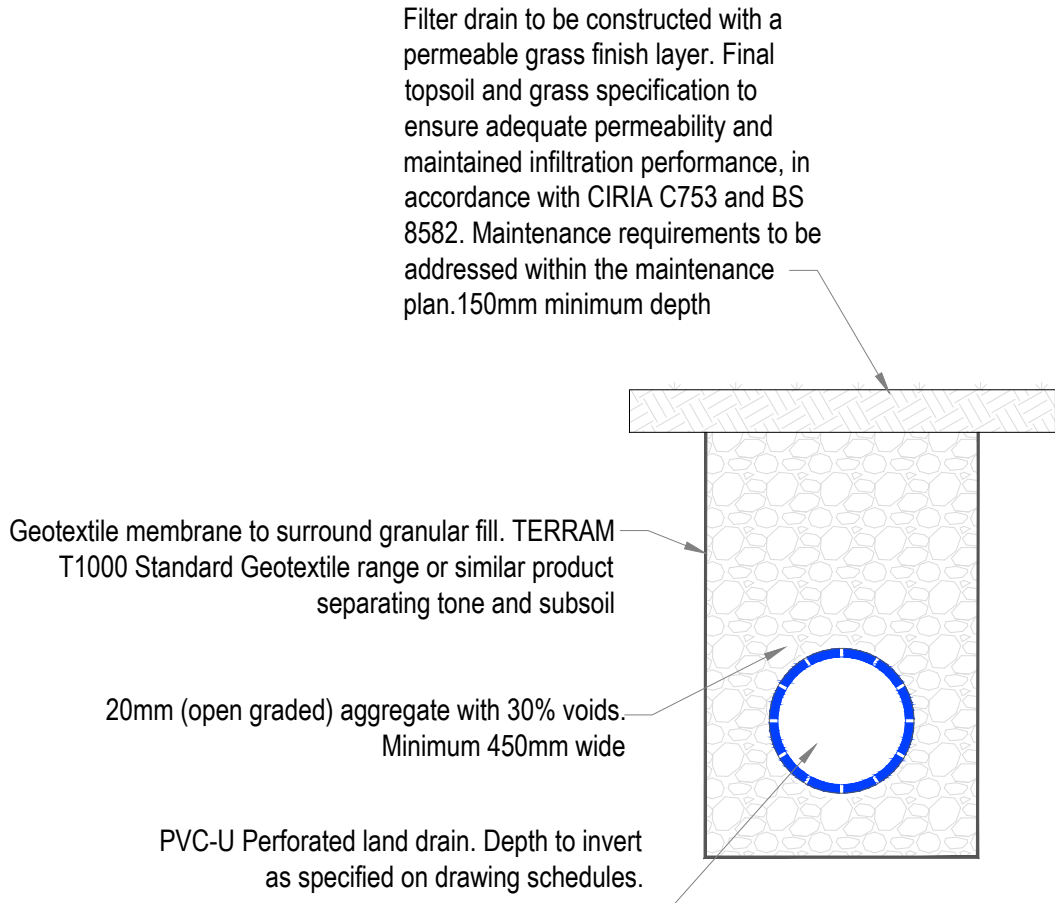
APPENDIX F
DRAINAGE DETAILS



ACCESS PAVEMENT CONSTRUCTION
(SYSTEM C - NO INFILTRATION INTO SUBGRADE BS7533-13)



TYPICAL SILT TRAP DETAIL



PROPOSED FILTER DETAIL*
Depth to invert as specified on drawing

Grass Finish Layer:

150mm minimum depth certified free-draining topsoil. Topsoil to be sandy loam or loamy sand, screened, friable and stone content <20% by volume. Clay content to be limited to <15% by weight. Organic matter content 3–8%. Topsoil to achieve a minimum saturated hydraulic conductivity of 1×10^{-8} m/s (or infiltration rate ≥ 36 mm/hr) unless otherwise agreed. No imported subsoil or site-won cohesive material to be used within the permeable layer. Turf or seed mix to comprise hard-wearing, deep-rooting perennial rye/fescue mix suitable for SuDS applications. No compaction beyond light consolidation to achieve a firm but open-textured surface. Topsoil to be placed and levelled without trafficking in wet conditions.

Separation and Construction:

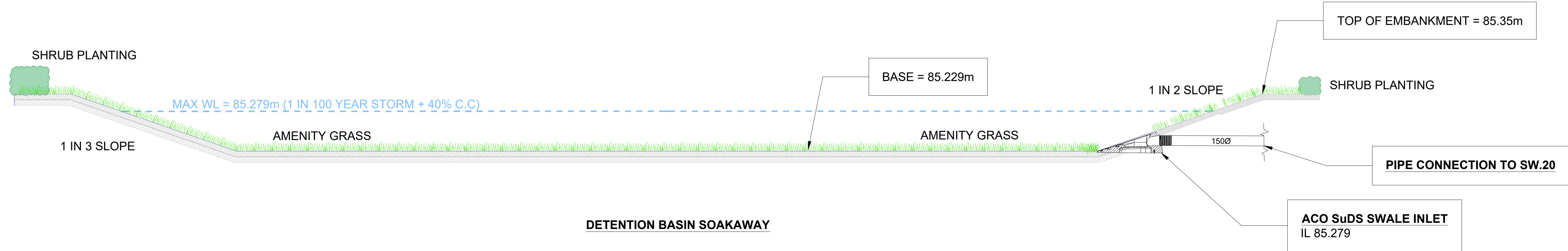
Topsoil layer to be laid over a non-woven geotextile separator (permeability to exceed that of the overlying soil) to prevent migration of fines into the underlying filter media. Underlying filter material to comply with clean, washed, angular aggregate specification as detailed elsewhere on drawing. Surface gradients to direct runoff evenly across the filter drain without ponding or concentration.

Performance Requirements:

Finished surface to be free-draining with no visible ponding 24 hours after a rainfall event. Construction and performance to comply with guidance set out in CIRIA C753 (The SuDS Manual) and BS 8582. Any evidence of smearing, over-compaction, or reduced infiltration during construction to be rectified by removal and replacement of affected material.

Notes:

1. This drawing is to be read in conjunction with relevant Architects, Engineers and specialist manufacturers drawings, reports and specifications.
2. All levels are shown in metres above Ordnance Datum (m AOD) unless otherwise shown.
3. Any ambiguities or discrepancies within this drawing and any other information given elsewhere must be reported to K-Ten for clarification before pricing / works commence.
4. Do not scale from this drawing for construction purposes.
5. It is recommended that all sewers and drains be laid starting from the downstream connection to the existing sewer/drain and working upstream to the new development.
6. All private drainage to comply with current Building Regulations, BS EN 752 Drain and Sewer systems outside Buildings and other relevant British Standards and Codes of Practices.
7. Connections to existing sewers in accordance with the Local Water Authority guidelines & approval.
8. Connections to existing sewers in accordance with the Local Authority and E A guidelines & approval.
9. Sewers and drains of different diameters should be laid soft to soft unless shown otherwise in the drawing. Outfall chamber outgoing pipe where a vortex control device is fitted to be installed at lowest incoming invert level.
10. All access chambers covers and frames to be installed to BS EN 124.
11. Drainage Pipe work routes under building footprint will require Co-ordination with foundations.
12. Cover levels shown on this drawing refer to approximate surface levels. It is the contractors responsibility to ensure that access covers and frames are set at the final surface levels.
13. Where possible the contractor is to orientate manhole biscuits and covers to locate them parallel to kerbs and paving.
14. The Contractor should comply with hsg(i) 47 "Avoiding Danger from Underground Services" when excavating around existing services.
15. It is the contractors responsibility to determine the location and depth of all existing services, mains and cables prior to construction.
16. The pipe diameters cover and invert levels of any existing manholes are to be verified on site prior to the commencement of the works.
17. All external non-perforated drainage within trafficked areas with less than 1.2m cover to have concrete protection. All external non-perforated drainage within landscaped areas with cover less than 0.6m to have concrete protection. All drainage with greater cover than the minimum required to have type S bed and surround.
18. Foul drainage pipe connection to public sewer to be plastic twin-walled/ribbed pipe constructed to Water Industry Standard (WIS)4-35-01.
19. All drainage in highway to be installed in accordance with Sewers Sector Guidance.
20. All access chambers covers and frames to be installed to BS EN 124.
21. All drainage to be installed in accordance with Civil Engineering Specification for the Water Industry 7th Edition.
22. Prior to commencing the works the contractor is to confirm details of the existing drainage system as noted on the drawing.
23. This drawing is for information only for planning submission. This is not to be used for construction purposes.
24. Drainage outfall connections and strategy to be agreed with the relevant authorities.
25. Gutters to have down-pipe leaf guards and rainwater down-pipes to have rodding access.
26. All existing invert levels shown are indicative and to be checked by the contractor prior to starting works.
27. Drainage strategy to be approved by Wiltshire Council.



DETENTION BASIN SOAKAWAY

A	17.07.26	Preliminary Issue	GJ
Rev	Date	Details	Drawn



CLIENT:
MOWLES GROUP

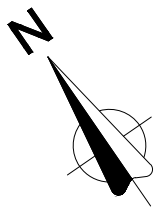
PROJECT:
SILVER STREET
GASTARD

TITLE:
DRAINAGE DETAILS

SCALE @ A1:	DATE:	STATUS:
1:250	15.07.2026	INFORMATION
JOB NO:	DRAWING NO:	REVISION:
26-4193	C020	A

APPENDIX G

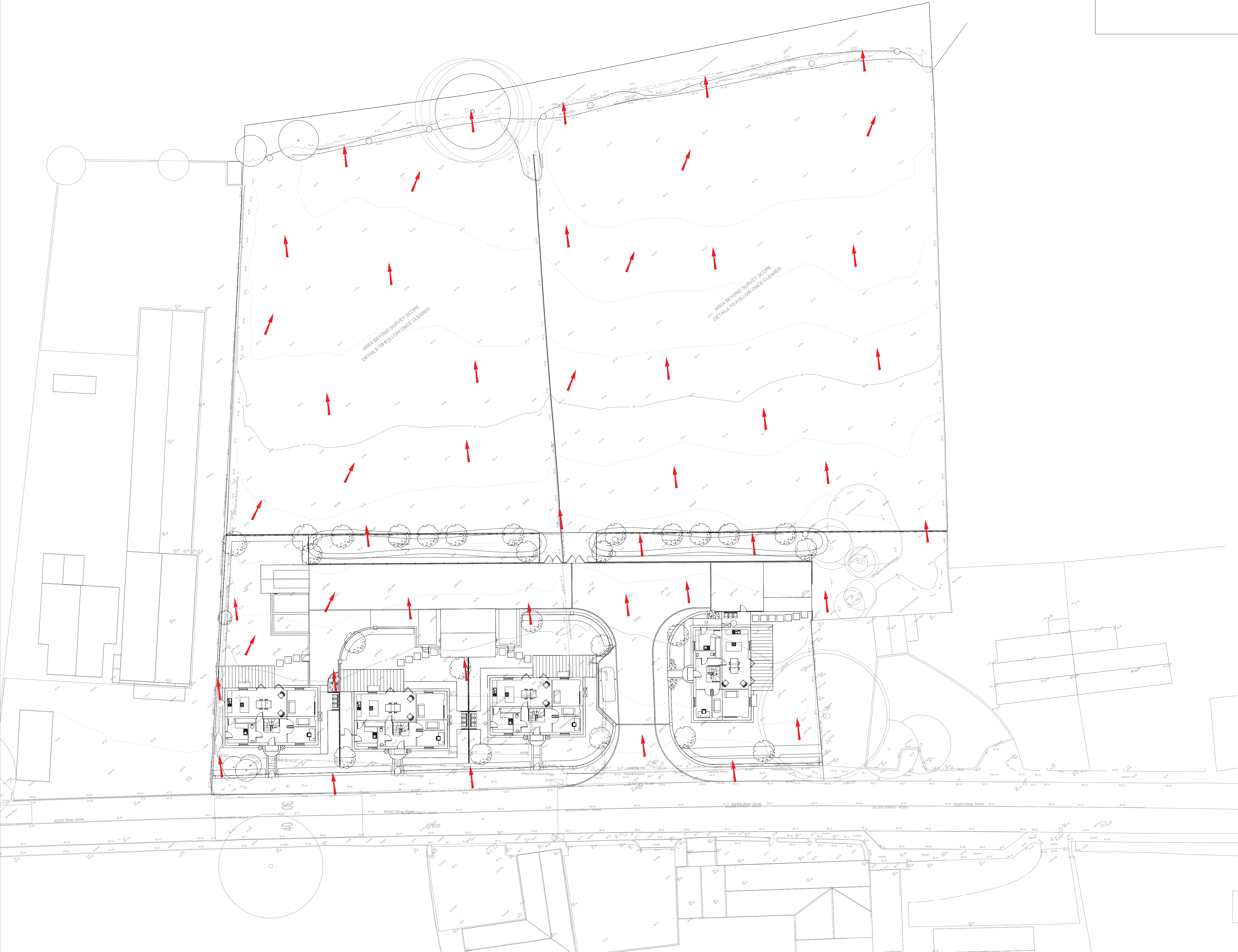
EXCEEDANCE FLOW ROUTING PLAN



KEY

 SURFACE WATER FLOW EXCEEDANCE ROUTE

- Notes:**
1. This drawing is to be read in conjunction with relevant Architects, Engineers and specialist manufacturers drawings, reports and specifications.
 2. All levels are shown in metres above Ordnance Datum (m AOD) unless otherwise shown.
 3. Any ambiguities or discrepancies within this drawing and any other information given elsewhere must be reported to K-Ten for clarification before pricing / works commence.
 4. Do not scale from this drawing for construction purposes.



Rev	Date	Details	GJ



CLIENT:
MOWLES GROUP

PROJECT:
SILVER STREET
GASTARD

TITLE:
EXCEEDANCE ROUTES

SCALE @ A1: 1:250	DATE: 15.07.2026	STATUS: INFORMATION

JOB NO: 26-4193	DRAWING NO: C010	REVISION: A