

Land West of Worthing Road, Southwater

Flood Risk Assessment

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Job Number: **31276/2**

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May 2025	-	Draft for Comment
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November 2025	2	Pre-application
January 2026	3	Planning
May 2026	4	Planning

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Acronyms	
AOD	Above Ordnance Datum
EA	Environment Agency
FRA	Flood Risk Assessment
NPPF	National Planning Policy Framework
PPG	Planning Practice Guidance
WSCC	West Sussex County Council
LLFA	Lead Local Flood Authority
SW	Southern Water

1 Introduction

Price & Myers have been commissioned to undertake a Flood Risk Assessment (FRA) and Drainage Strategy for the proposed residential development at the Land to West of Worthing Road, Southwater, West Sussex.

This report has been carried out in accordance with the DEFRA's National Standards for Sustainable Drainage Systems (SuDS), the National Planning Policy Framework (NPPF), the Planning Practice Guidance (PPG) "Flood Risk & Coastal Change" and Horsham District Council Strategic Flood Risk Assessments (SFRA, April 2010 and January 2020). This report also incorporates advice and guidance from the Environment Agency (EA) and CIRIA documents.

The EA's flood map for planning shows that the site is in Flood Zone 1. An area at low risk of tidal and/or fluvial flooding. However, the EA's maps show that parts of the site are at risk of flooding from surface water. Therefore, this FRA will focus on the flood risk from surface water, as well as assessing the flood risk from all other sources.

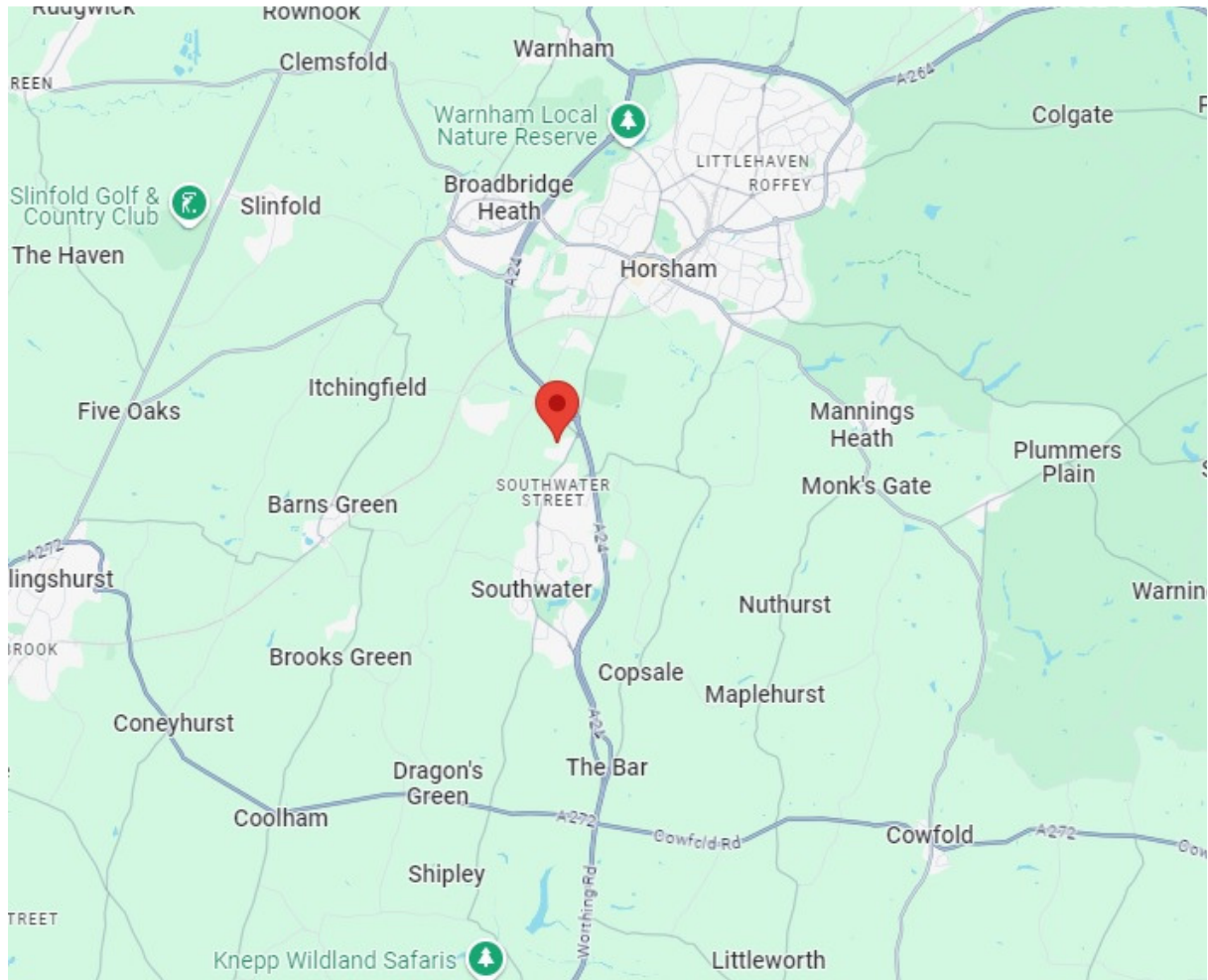


Figure 1.1: Site Location (Google Maps)

2 Site Description and Location

The site is situated to the west of Worthing Road and it covers an area of approximately 1.65 ha. It is currently undeveloped and occupied by soft landscaped areas. It is bounded by existing residential properties to the south and east and undeveloped land to the west and north.

An ordinary watercourse crosses the western part of the site and runs alongside the site's north boundary in a western direction. The nearest postcode to the site is RH13 9AT and the OS grid reference is 515873E 128131N. The site falls to the northwest, the maximum level difference is approximately 4.5m and the average ground level is 55m AOD. Access to the site is available from Worthing Road.

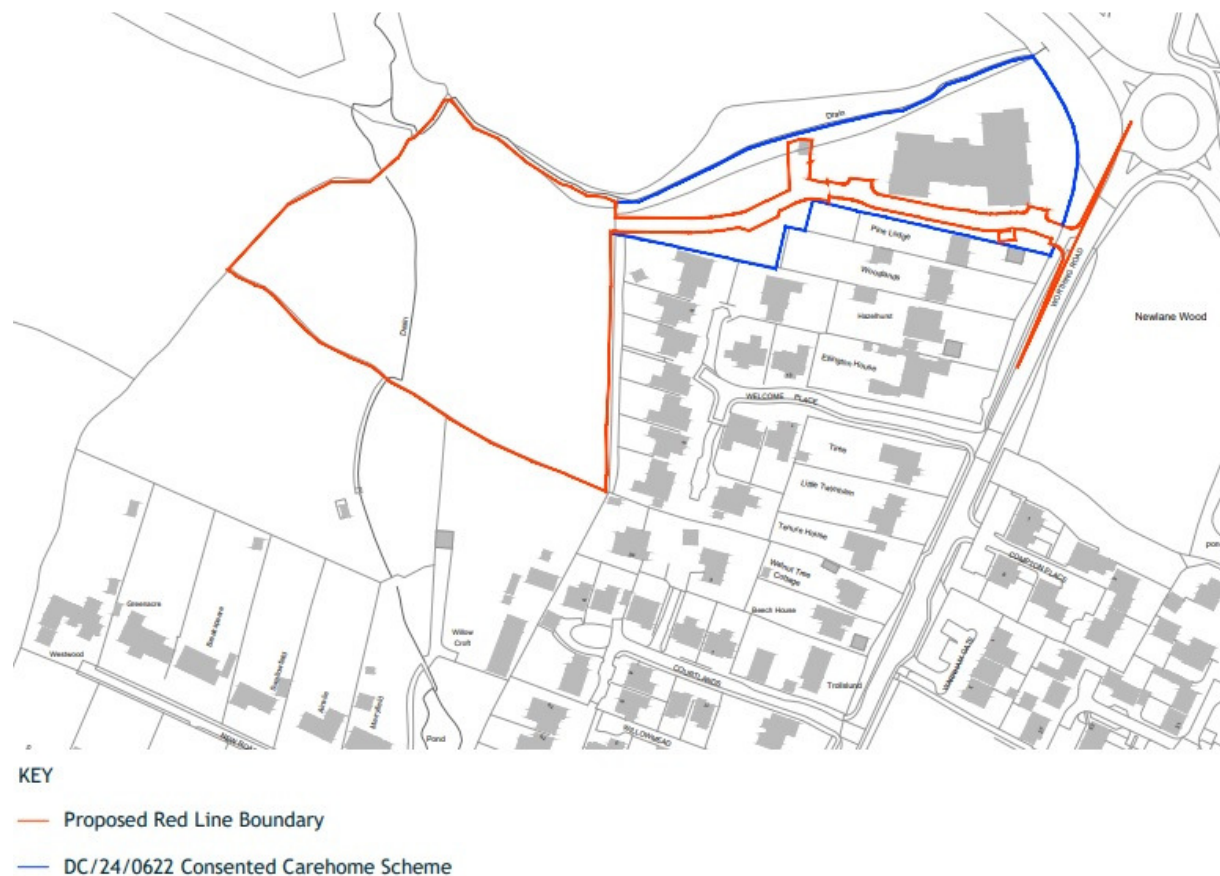


Figure 2.1: Existing Site Arrangements

2.1 Existing Drainage

There are currently no foul or surface water drainage networks on the site, as it is undeveloped. Surface water from the site discharges into the local ditches. Southern Water asset location maps indicate that the nearest public foul water sewer is approximately 150 m east of the site boundary. Figure 2.2 shows the location of the existing public sewer.

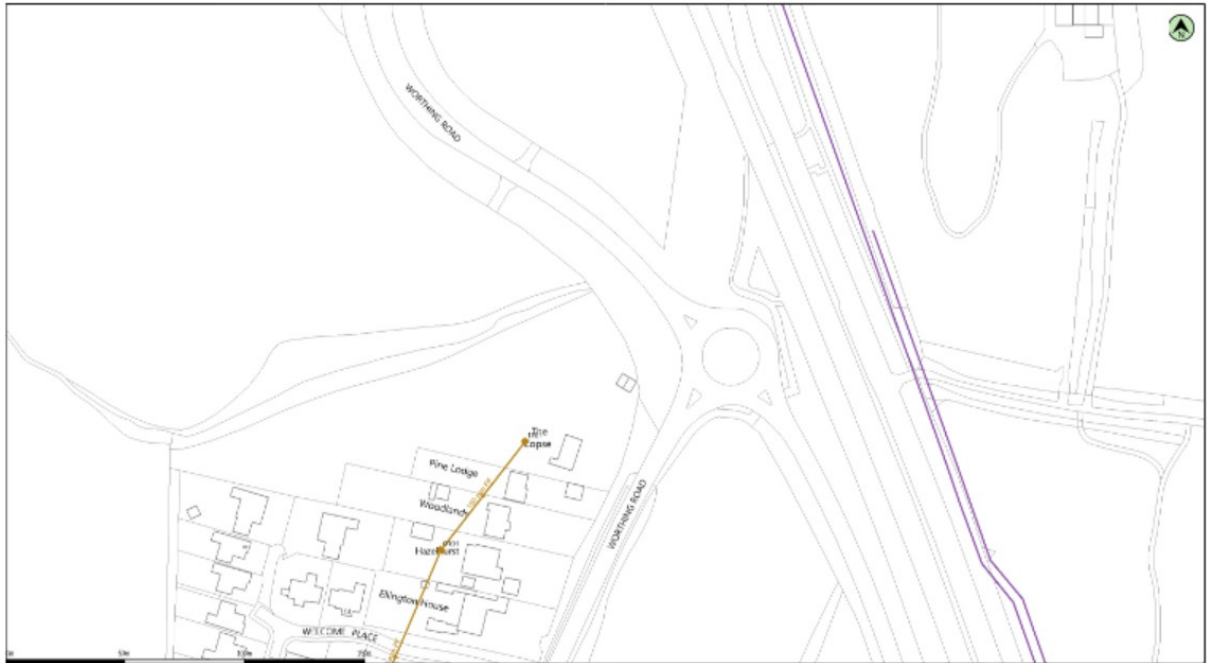


Figure 2.2: Southern Water's Sewer Records

3 Development Proposal

The development proposals involve the construction of 23 new houses, along with associated access roads and both soft and hard landscaped areas. Access to the site will be provided for pedestrians and vehicles via a new road connected to Worthing Road. All structures will be set back from the existing stream, maintaining a minimum easement of 3 metres for maintenance purposes.



Figure 3.1: Proposed Site Layout

4 Flood Risk Assessment

4.1 Flood Risk from Watercourses and Tidal Flooding

The EA's flood map for planning shows that the site is located in Flood Zone 1. Land in Flood Zone 1 is at low risk of flooding from rivers, having an annual probability of river flooding of less than 0.1%.

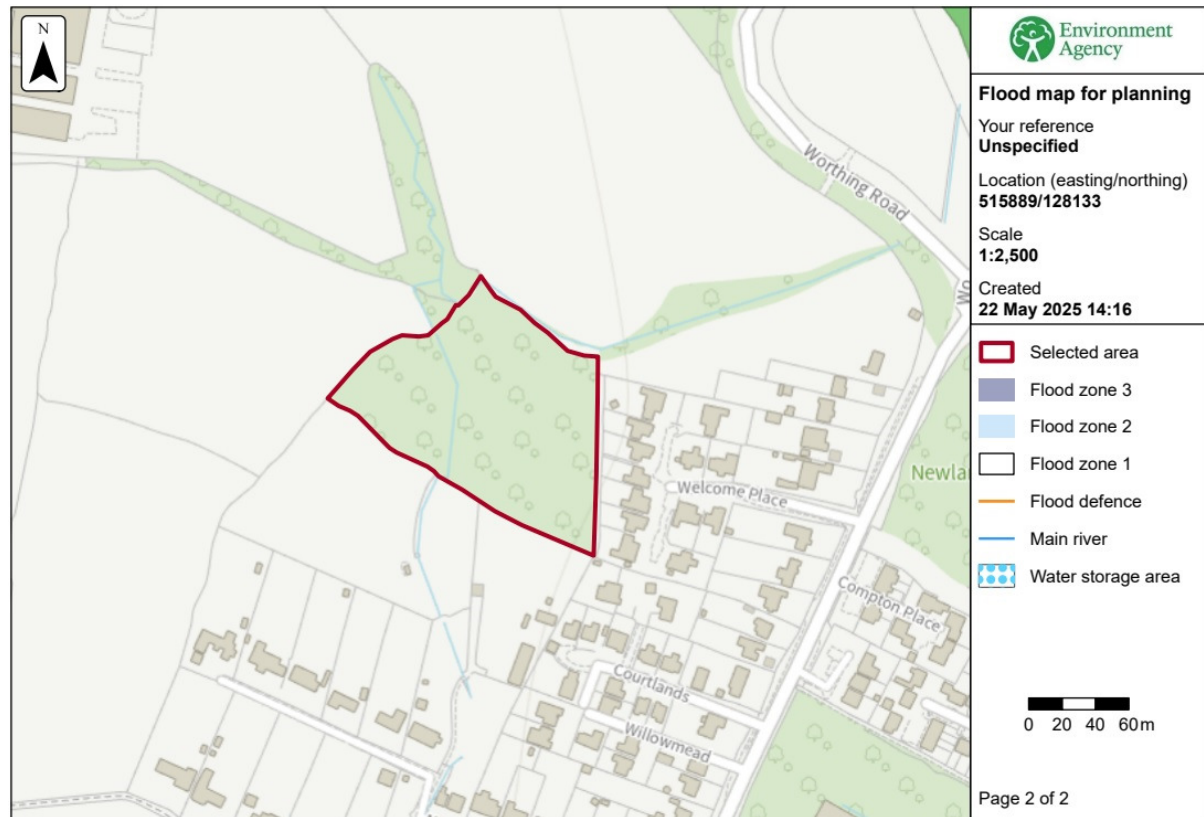


Figure 4.1: Environment Agency's Flood Map for Planning

4.2 Historical Records

The SFRA (2010) states that "pluvial flooding has been noted to have affected a large number of roads in Horsham, Pulborough, Southwater, Thakeham, Washington, Slinfold, Cowfold and Henfield during heavy rainfall events. Section 2.7 provides information on historical flood incidents within the District. This information shows that there is no recorded flood history at the location of the site.

4.3 Flood Risk from Groundwater

Groundwater flooding occurs when water originating from sub-surface permeable strata emerges from the ground, typically after prolonged rainfall.

GSI Ltd drilled boreholes on site in July 2023. Brown clay was recorded in the first 1.5m below ground level (bgl), blue clay between 1.5m and 3m bgl, stone layer between 3m and 6m bgl, then a mix of sandstone and clay was recorded. Standing water was recorded at 1.5m bgl. As no basements are included which are vulnerable to groundwater flooding, the flood risk from groundwater is considered low.

4.4 Flood Risk from Surface Water and Overland Flows

Surface water flooding occurs when intense rainfall is unable to soak into the ground or enter a drainage system due to blockages or the capacity of the system being exceeded. Overland flows can also be generated by burst water mains, failed dams and any failure in a system storing or transferring water.

The EA’s flood maps show that most of the site area lies outside the flood extent. A ditch crosses the site, collecting water from areas to the south as well as from within the site itself, and it is connected to a watercourse that flows along the northern boundary. Refer to Figure 4.1 and Appendix A for the route of the ditch.

The EA’s flood map extents for the climate change scenario below show that a narrow strip of the site is at high risk of flooding from surface water. The floodplain follows the ditch’s route, where water will be collected and conveyed during a storm event. The EA’s map also shows that a strip of land in the northern corner of the site is at high risk of surface water flooding. Additionally, the EA’s map indicates that a strip of land in the southeast corner of the site is at low risk of surface water flooding.

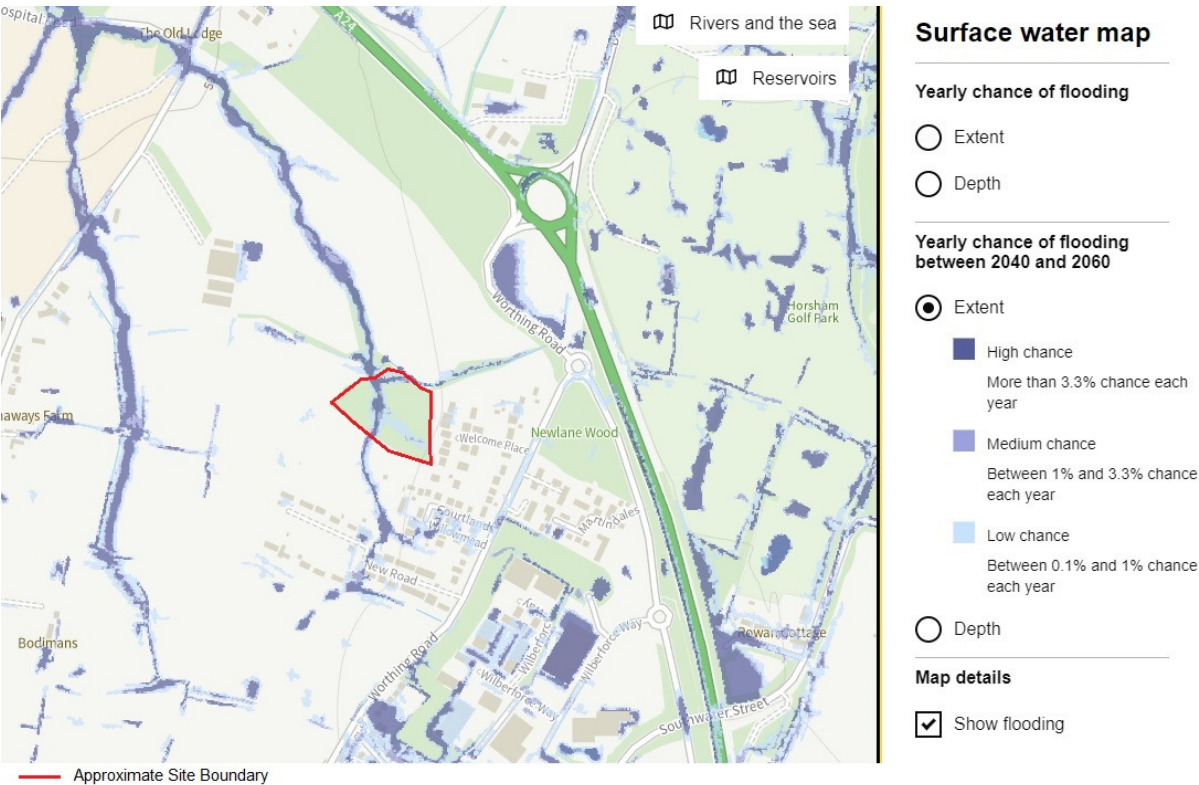


Figure 4.2: EA Surface Water Flood Extent Map (EA, 2025)

The EA has produced a guidance on using and understanding the new flood maps “Risk of flooding from surface water – understanding and using the map”. Section 3.5 of these guidelines state that *“once we combined the data from local detailed models and the national model, we removed flooding to a depth of less than 75mm. This is because in surface water flood modelling, most land is covered by some water as rain falls across the area. While this very shallow floodwater may be an inconvenience, it is generally unlikely to prevent access or cause flooding to properties”*. The EA’s flood depth map for the climate change scenario (Figure 4.3) shows that floodwater is confined to the ditch only, as the depth in other areas on site is too shallow to prevent access or cause property flooding. Therefore, the EA has removed the affected areas in the north and southeast corners of the site, where floodwater depths are less than 75 mm.

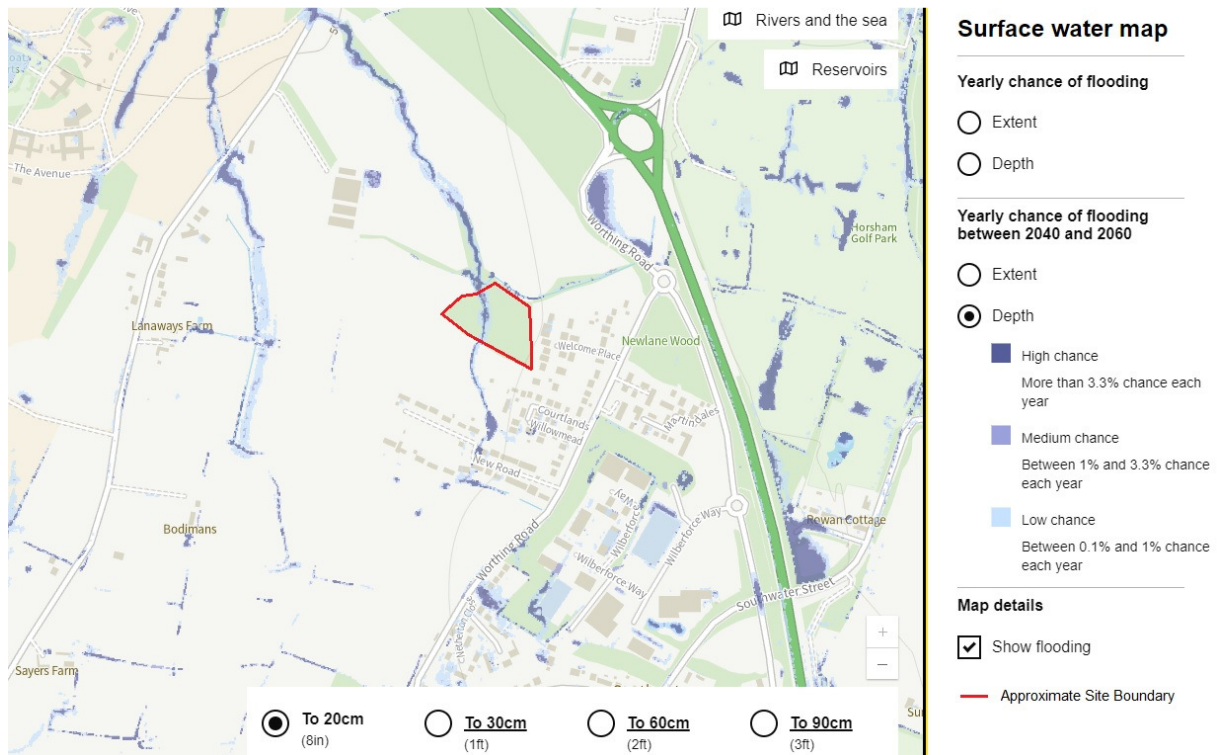


Figure 4.3: EA Surface Water Flood Depth Map (EA, 2025)

Price & Myers undertook a hydraulic analysis to further assess the flood risk at this location. Refer to Appendix G for the hydrological and hydraulic analysis report.

The model was simulated for the 1 in 100-year, 1 in 100-year plus climate change, and 1 in 1000-year flood scenarios. Figure 4.4 illustrates the flood extent for the 1 in 1000-year storm event, representing the worst-case scenario for the site. Compared to Figure 4.3, this map shows a difference: the northern corner of the site remains within the floodplain. This is due to the inclusion of shallow floodwater depths in Figure 4.4.



Figure 4.4: 1 in 1000 year Modelled Flood Extent

The modelled results, along with the EA's flood map, informed the development of the site layout, ensuring that all buildings and evacuation routes are located outside the floodplain. Avoiding these areas also eliminates the need to alter ground levels within the floodplain, thereby ensuring that the proposed works will not increase flood risk elsewhere.

4.5 Flood Risk from Reservoir Failure

The EA's Long-Term Flood Risk from Reservoirs map (Figure 4.5) shows that the site is not within an affected area. Therefore, the flood risk from reservoir failure is considered low.

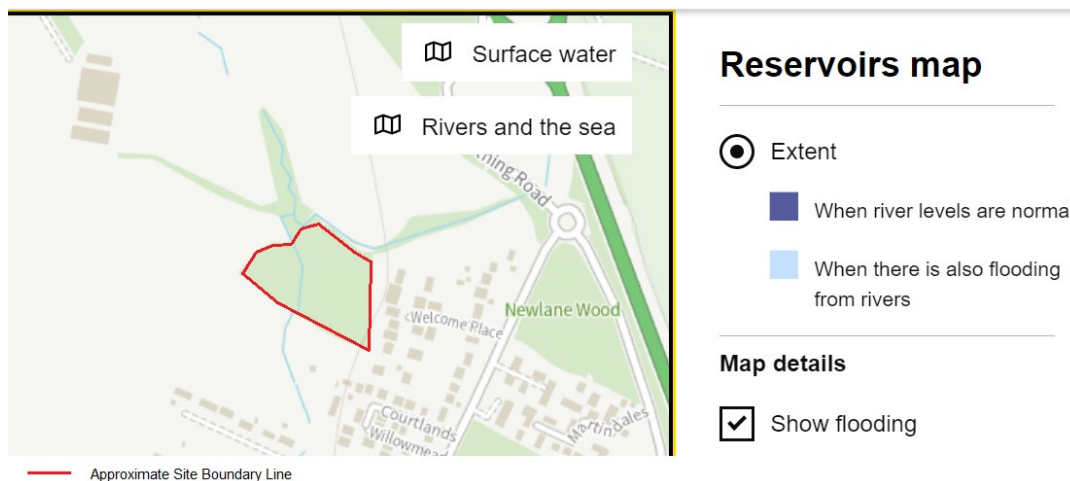


Figure 4.5: 1 EA Flood Risk from Reservoir Failure Map (EA, 2025)

4.6 Sequential Test

The NPPF states that the sequential test should be used in areas known to be at risk now or in the future from any form of flooding, except in situations where a site-specific flood risk assessment demonstrates that no built development within the site boundary, including access or escape routes, land raising or other potentially vulnerable elements, would be located on an area that would be at risk of flooding from any source, now and in the future (having regard to potential changes in flood risk).

While parts of the site are at risk of flooding from surface water, the site layout has been developed to avoid placing buildings and escape routes within the floodplain. Furthermore, no ground modification works will take place within the floodplain. Therefore, the planning application for the proposed development is not subject to the Sequential Test.

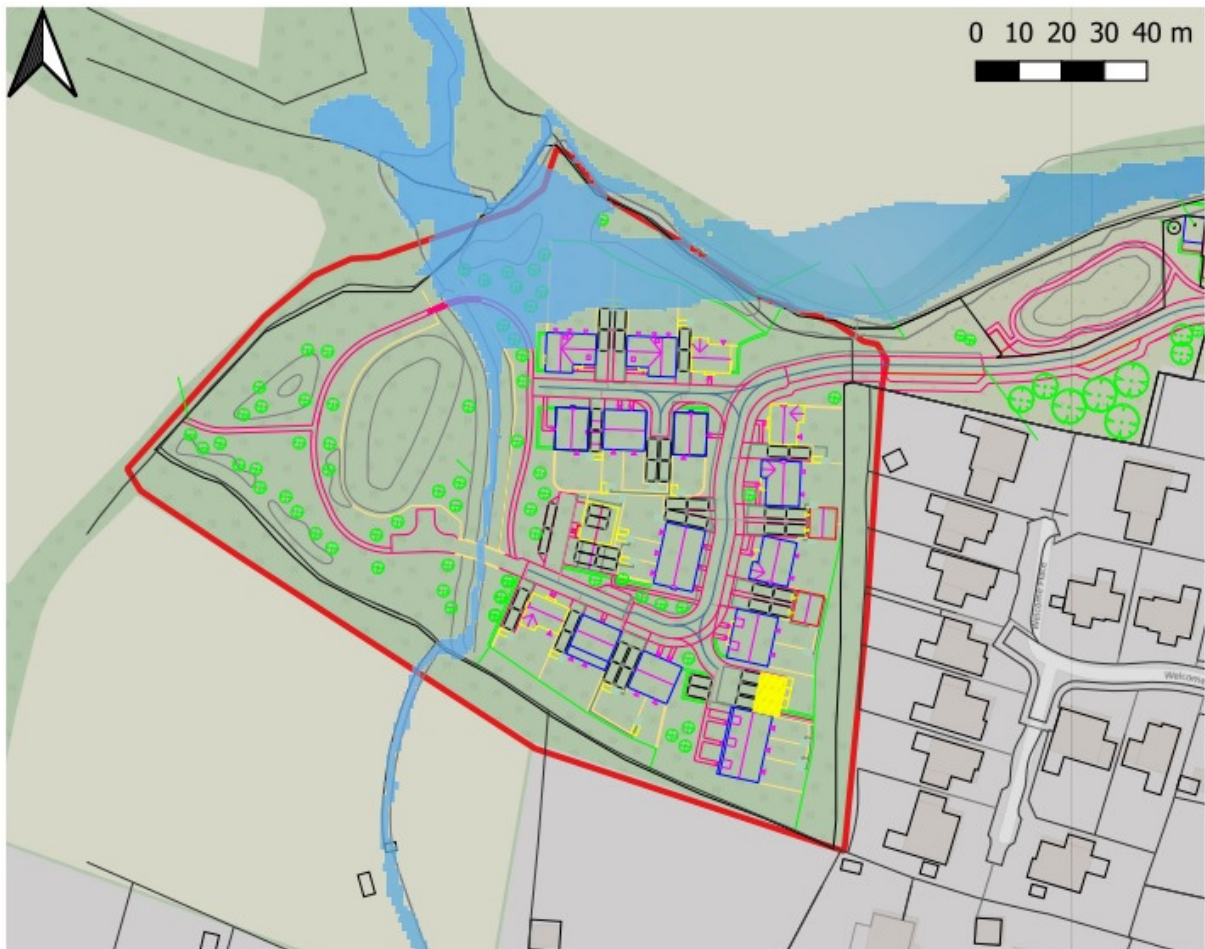


Figure 4.5: 1 in 100 year plus 45% Modelled Flood Map

5 Surface Water Run-off Assessment

5.1 Existing Run-off

Southern Water's sewer records show that there are no surface water public sewers at this location. As the site is undeveloped it currently generates greenfield run-off rates.

5.2 Post Development Run-off

The proposed impermeable areas will occupy an area of approximately 0.446 Ha. It should be noted that most of the access road drains surface water into the pond designed for the care home. The peak run-off rates from the existing building and surrounding paved areas were calculated based on the modified rational method:

$$Q_{x_{ex}} = 2.78 \times A \times i$$

Where 'x' is the return period in years, 'A' is the catchment area in ha and 'i' is the rainfall intensity in mm/hr provided by the FEH method.

$Q_{1_{ex}}$	$= 2.78 \times 0.446 \times 28.939$	$= 35.88 \text{ l/s}$
$Q_{30_{ex}}$	$= 2.78 \times 0.446 \times 94.937$	$= 117.71 \text{ l/s}$
$Q_{100_{ex}}$	$= 2.78 \times 0.446 \times 145.479$	$= 180.38 \text{ l/s}$

5.3 Climate Change

The EA's "climate change allowances for peak rainfall in England" map shows that the site is within the Arun and Western Streams Management catchment area and that a 45% allowance for climate should be considered in the drainage design.

5.4 Proposed Surface Water Drainage

In accordance with EA guidelines, the National Standards for SuDS and CIRIA documents, surface water run-off should be managed as close to its source as possible. The preferred means of surface water drainage for any new development is an infiltration drainage system. SuDS can reduce the impact of urbanisation on watercourse flows, ensure the protection and enhancement of water quality and encourage recharge of groundwater in a manner that mimics nature. If drainage to an infiltration system or soakaways proves to be an unsuitable option for the site, then drainage to a watercourse must be assessed. Drainage to the public sewers can be considered only when all other alternative options are unsuitable.

The National Standards for SuDS states that surface water runoff shall be treated as a resource and managed in a way that avoids negative impacts of the development on flood risk. Runoff from the development shall be discharged to the following final destinations, to the maximum extent practicable, in accordance with the below hierarchy:

- priority 1: collected for non-potable use
- priority 2: infiltrated to ground
- priority 3: discharged to an above ground surface water body
- priority 4: discharged to a surface water sewer, or another piped surface water drainage system
- priority 5: discharged to a combined sewer.

5.4.1 Surface Water Destination

The local geology suggests that the ground conditions are not suitable for infiltration techniques. A soakaway test was undertaken on site at a depth of 1.2m bgl, confirming that the porosity properties of the soil are unsuitable for infiltration techniques (Appendix E). Furthermore, shallow groundwater was recorded in the borehole further restricting the opportunities for infiltration systems, as a minimum 1m unsaturated zone must be provided between the base of infiltration systems and the groundwater.

5.4.2 Runoff Rate and Attenuation

The site currently discharges runoff to local watercourses and is therefore part of their catchment area. Surface water discharge from the proposed development to these watercourses will mimic existing conditions, provided the discharge rate matches current rates.

The National Standards for SuDS state that runoff rates should match Greenfield rates. Runoff should where possible be restricted to the greenfield Qbar rate during all events up to and including the 1 in 100 year rainfall event with climate change. The Qbar rate from the proposed impermeable areas is 3.3 l/sec.

SuDS such as detention basins and permeable paving will be able to meet the National Standards for SuDS' requirements. A detention basin is proposed in the west side of the site where the topography naturally directs surface water. Furthermore, an underground attenuation tank will be provided in order to provide the required volume for surface water storage during extreme storm events. A hydrobrake will be used to control surface water from the site to the stream to 3.3 l/sec. Impermeable membranes will be provided to prevent the ingress of groundwater into the drainage system.

Surface water from the car parking areas and access road will be collected in permeable paving systems, raingardens and the detention basin, providing treatment before discharging into the watercourse.

Hydraulic calculations show that for the 1 in 2 years storm event scenario, surcharging occurs only within the detention basin and in manholes S9 and S11 where the tank and hydrobrake are located and aim to control surface water. It is therefore reasonable for the water level to be elevated in manholes S9 and S11 and in the detention basin.

5.4.3 Rainwater Harvesting

Rainwater harvesting promotes the storage and re-use of rainwater collected from roofs and hard surfaced areas. This type of system contributes to the reduction of runoff rates and volumes within a development.

The capacity of rainwater harvesting systems to attenuate rainwater depends on the water use within the building. If there is no activity in the building or other water use and the harvester is full, no attenuation will be provided during a subsequent storm event. In the worst-case scenario, the rainwater harvester will provide no attenuation and therefore these systems must be excluded from drainage calculations. Rainwater butts will be provided in all houses, reducing the proposed development's water demand.

5.4.4 Accounting for Greenfield Runoff and Urban Creep

The hardstanding areas occupy 0.493 ha of the catchment area that will discharge into the new SuDS. Therefore, the Greenfield run-of rate has been calculated for the impermeable areas only, refer to Appendix D for the calculations.

The National Standards for SuDS state that a 10% urban creep allowance must be made in the calculations for new developments. Therefore, the total catchment area draining to the drainage network, including an allowance for urban creep, is 0.54 ha.

5.4.5 Design Parameters

Calculations based on the FEH method show that the proposed SuDS will be able to control surface water from the proposed development in the 1 in 100 year plus climate change storm event. The outfall was surcharged for the duration of the simulation using a hydrograph. The flood level for the 1 in 100-year plus 45% storm event was taken from the hydraulic model of the watercourse and was used to surcharge the outfall.



Figure 5.1: 1 in 100 year plus 45% Flood Level at the Outfall

5.4.6 Designing for Exceedance

The 1 in 30 years storm event is the design storm event for the proposed development. However, the proposed SuDS will be able to accommodate surface water in high storm events exceeding the design storm event, as section 5.4.2 states. The site's topography shows that surface water from the site will flow towards the stream if the capacity of the drainage network is exceeded. Refer to Appendix F for the overland flow paths. This will occur in storm events with a return period higher than 1 in 100 year plus 45%. Furthermore, all building entrances will be raised 150mm above the external areas preventing overland flows from flooding the internal areas.

5.4.7 Water Pollution

SuDS have the potential to provide water quality benefits to runoff entering the environment. The SuDS Manual states that SuDS should be designed to treat runoff to reduce the risk of environmental pollution. Chapter 26 of The SuDS Manual sets out the 'simple index approach' to water quality risk management. This approach has been used to quantify the benefits of the proposed SuDS scheme on water quality.

Step 1 of the simple index approach is to identify the pollution hazard indices for the proposed land use. The proposed residential development is considered to have a 'Very Low/Low' pollution hazard level as Table 5.1 below shows.

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very Low	0.2	0.2	0.05
Individual property driveways, residential car parks, low traffic roads and non-residential car parking with infrequent change	Low	0.5	0.4	0.4

Table 5.1: Pollution Hazard Indices, taken from Table 26.2 of The SuDS Manual (CIRIA, 2015)

Step 2 of the simple index approach is to select SuDS with a total pollution mitigation index that equals or exceeds the pollution hazard index. As the destination of the runoff is to surface water and there is no infiltration from the SuDS to groundwater, the surface water pollution mitigation indices should be used as shown in Table 5.2. The indicative surface water pollution mitigation indices for permeable pavements, and detention basins are shown in Table 5.2 below:

Type of SuDS Component	TSS	Metals	Hydrocarbons
Permeable Pavement	0.7	0.6	0.7
Detention Basin	0.5	0.5	0.6
Raingarden	0.8	0.8	0.8

Table 5.2 Surface Water Pollution Mitigation Indices, taken from Table 26.3 of The SuDS Manual

Provided that the mitigation indices of the treatment techniques are greater than or equal to the hazard indices for the proposed development then there should be no reduction in the overall water quality within the receiving watercourse or groundwater body. Surface water from roofs and hardstanding areas will pass through two SuDS before discharging to the stream. These would be either a combination of raingardens and detention basins or permeable pavements and detention basins. Therefore, the incorporation of the proposed SuDS will provide suitable prevention from pollution to surface water.

6 Surface Water Maintenance Strategy

The successful implementation and operation of a SuDS system depend on a robust and clear maintenance strategy being implemented. The following measures should form part of the site's proposed management plan. The drainage system will be maintained by a private management company and will form part of the overall maintenance regime for the site.

The drainage layout drawing shows that SuDS are provided for all vehicular trafficked areas.

Maintenance and cleaning of gullies, gutters, rainwater pipes and stormwater manholes will ensure adequate performance. This maintenance program is outlined below;

Regular maintenance should include:

1. Inspect channel drains, gutters and gully inlet grates and remove any debris every 3 months or as determined to be reasonable based on experience with the installed systems to ensure that all drainage components are working in their intended fashion and that they are free of debris; quarterly, inspect gully sumps and bottom of drain manholes; if the depth of sediment in sumps exceeds 50% capacity, the sediment must be removed. Excessive sediment shall be removed and properly disposed of by a licensed drainage cleaning company.
2. Inspect all vegetated areas and remove litter and debris as necessary. Replant bare areas or areas with sparse growth.
3. Inspection of external bin stores for spillage and scattered litter must be performed on a regular basis to prevent the spread of pollutants into the stormwater management system.
4. The porous surfacing must be brushed three times a year with a mechanical suction brush. It is recommended that this should be carried in the spring, mid-summer and after leaf fall in autumn.

Winter Maintenance Program:

Ensure that drainage structures are not blocked by ice, snow, debris, or rubbish during the winter months.

Fertiliser Use

Only slow-release organic low-phosphorous fertilisers will be used in any landscaped areas in order to limit the amount of nutrients that could enter the stormwater system.

The site owner is the watercourse's riparian owner and therefore, is responsible for inspecting and maintaining the section of the watercourse that runs within their land. The management plan should include measures for maintaining the vegetation on the banks, removing debris from the watercourse and cleaning any debris from the main channel. Furthermore, the details for the new drainage connection to the watercourse must be agreed with the LLFA. Details of the new outlet are provided in Appendix C.

SUDS Element	Maintenance		
	Activity	Required Action	Typical Frequency
Permeable Paving	Monitoring / Inspections	Initial inspection	Monthly for three months after installation
		Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 hours after large storms in first six months
		Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
		Monitor inspection chambers	Annually
	Regular Maintenance	Brushing and vacuuming -standard cosmetic sweep over whole surface	Once a year after autumn leaf fall
		Rubbish and litter removal	As required
	Remedial Actions	Remediate any landscaping which through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving.	As required
		Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	
		Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required
Detention Basin	Regular Maintenance	Remove litter and debris	Monthly, or as required
		Cut the grass – public areas	Monthly during growing season
		Cut the meadow grass	Half yearly – before nesting season in spring and in autumn
		Inspect marginal and bankside vegetation and remove nuisance plants (for first 3 years)	Monthly, at start, then as required
		Inspect inlets, outlets, banksides, structures, pipework etc. for evidence of blockage and/or physical damage	Monthly
		Inspect water body for signs of poor water quality	Monthly from May – October
		Inspect silt accumulation rates in any forebay and in main body of the pond and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options	Half yearly
		Check any mechanical devices, e.g. penstocks	

SUDS Element	Maintenance		
	Activity	Required Action	Typical Frequency
		Hand cut submerged and emergent aquatic plants (at minimum of 0.1 m above pond base; include max 25% of pond surface)	Annually
		Remove 25% of bank vegetation from water's edge to a minimum of 1 m above water level	
		Tidy all dead growth before start of growing season	
		Remove sediment from any forebay.	Every 1–5 years, or as required
		Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays.	Every 5 years, or as required
	Occasional Maintenance	Remove sediment from the main body of big ponds when pool volume is reduced by 20%.	With effective pre-treatment, this will only be required rarely, e.g. every 25–50 years
	Remedial Actions	Repair erosion or other damage	As required
		Replant, where necessary	
		Aerate pond when signs of eutrophication are detected	
		Realign rip-rap or repair other damage	
		Repair / rehabilitate inlets, outlets and overflows.	
Attenuation Tank	Monitoring / Inspections	Inspect all inlets, outlets, vents, overflows and control structures to ensure they are working as they should	Annually or after severe storms
		Inspect and identify any elements that are not operating correctly.	Monthly for three months, then half yearly or as required.
	Regular Maintenance	Remove sediments / debris from catch pits / gullies and control structures	Annually, after severe storms or as required
	Remedial Actions	Repair inlets, outlets, vents, overflows and control structures.	As required
		Clear leaves and litter	Half yearly
		Road sweeping to ensure rain garden inlets are swept	Half yearly
		Plants to be pruned	Half yearly

Table 6.1 SuDS Maintenance Strategy as taken from the CIRIA SUDS Manual

7 Foul Water Assessment

As outlined in Section 2.1, the nearest foul water public sewer is located approximately 150m to the east of the site. The depth of the existing foul water drain was unknown at the time of writing this report. However, the local topography suggests that a gravity connection from the site to this sewer is not feasible. Therefore, a pump will be utilised for foul water drainage, providing 24 hours storage as per the Building Regulations requirements.

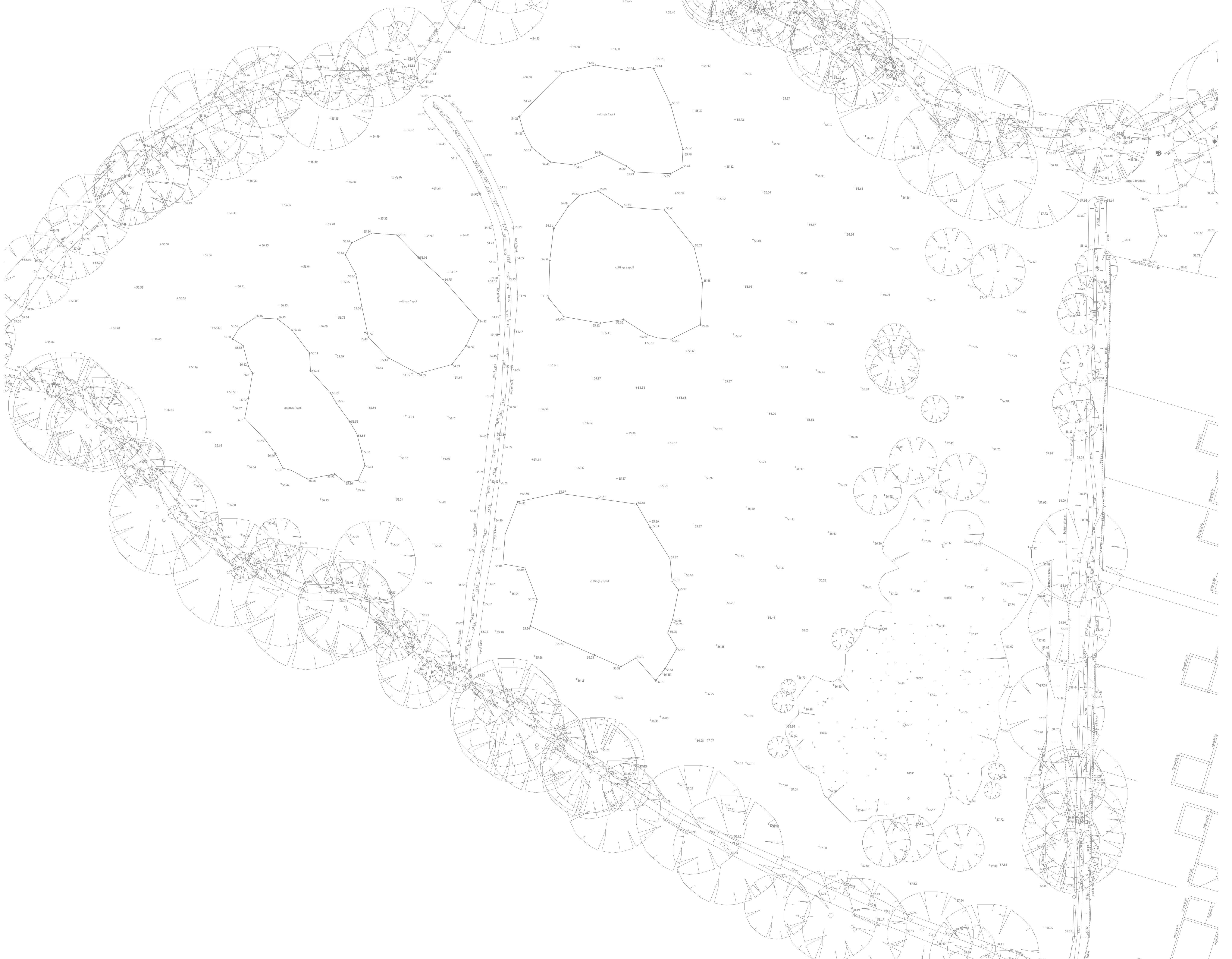
Southern Water was consulted for a mixed-use development, including 33 dwellings and a 76-bed care home. Their sewer capacity check assessment for this development concluded that there is sufficient capacity in the public sewer to accommodate the foul water flows from the proposed development (Appendix F). Therefore, the existing foul water sewer will be able to accommodate the flows from the proposed development considering that the proposed development is for 23 houses and the consented application of the care home is for 70 beds. A Section 106 application must be submitted to Southern Water for the proposed drainage connection from the site to the public sewer.

8 Conclusions

- The proposals are for the erection of 23 houses with associated soft and hard-landscaped areas.
- The site is at low risk of flooding from watercourses, groundwater, sewers, and reservoir failure.
- A small part of the site is at risk of flooding from surface water. However, no buildings, escape routes or ground level modifications are proposed at this location.
- The proposed development will increase the impermeable areas on site and therefore the run-off rates.
- The ground conditions prevent the use of infiltration systems for surface water drainage.
- SuDS will be used for attenuation purposes, including a detention basin, raingardens, permeable paving, and an underground tank.
- A hydrobrake will be provided aiming to restrict the run-off from the proposed development to the stream as close to Greenfield rates as practically possible.
- Foul water from the proposed development will be discharged to the public sewers.
- Therefore, the proposed redevelopment has an acceptable flood risk within the terms and requirements of NPPF.

Appendix A

Topographical Survey Drawing



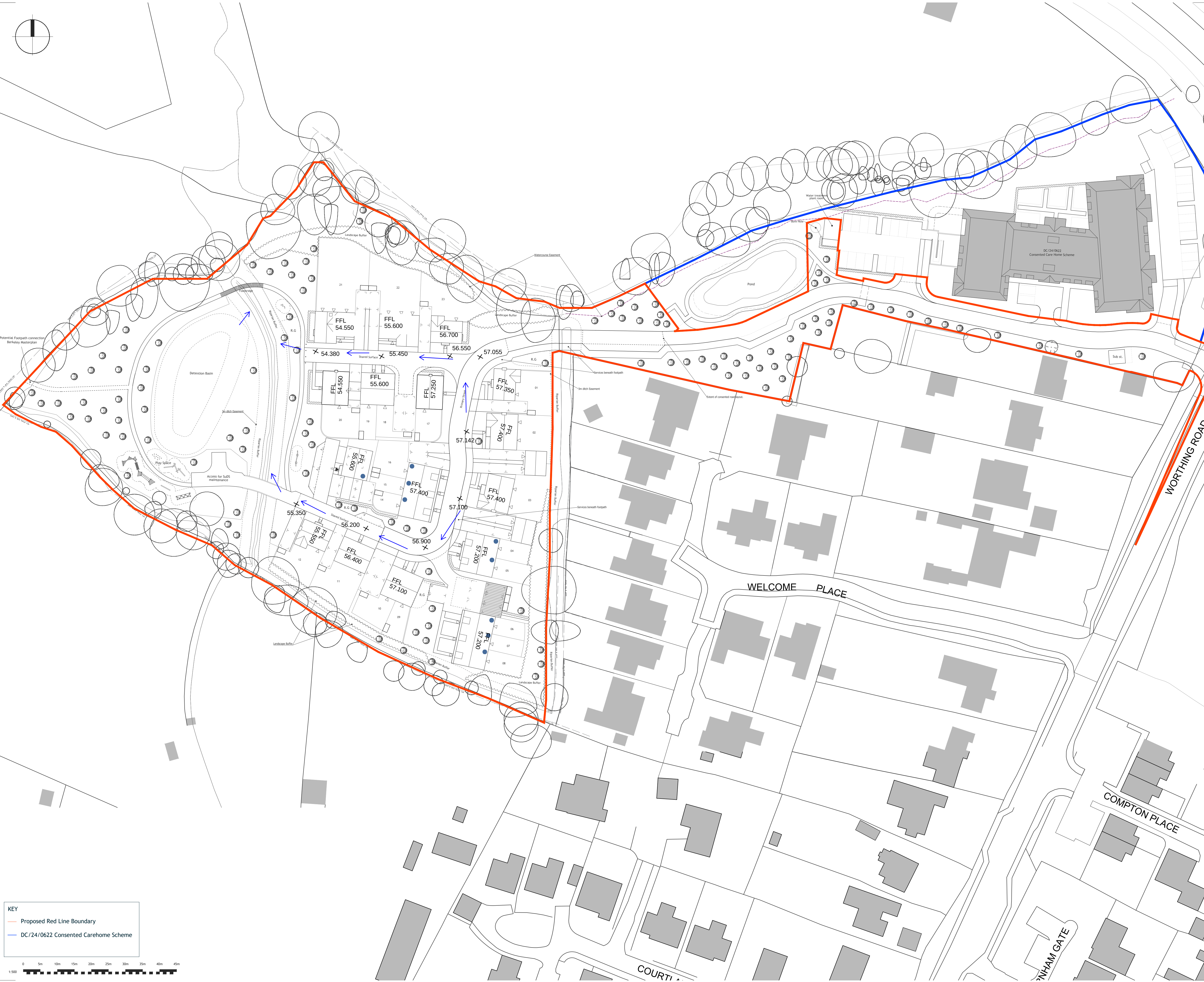
Appendix B

Exceedance Routes

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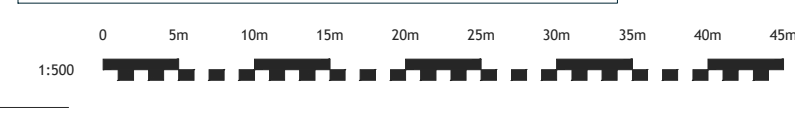
Planning
This drawing is produced for PLANNING PURPOSES ONLY and is not to be used for construction. Figure dimensions are for guidance purposes only. DO NOT SCALE OFF THIS DRAWING

Rev	Description	Drawn	Chkd	Date
A	Plot 21 revised following drainage consultants feedback	JR	BK	10/11/2025
B	Layout revised following pre-app advice.	JR	BK	21/11/2025
C	Layout revised following drainage consultants feedback	JR	BK	03/12/2025
D	Layout revised following landscape and ecologist comments	JR	BK	09/12/2025
E	Layout revised following Arb comments	JR	BK	11/12/2025
F	Workcourse easements added to drawing	JR	BK	15/12/2025
G	Amendments made following drainage engineers comments	JR	BK	06/01/2026
H	Amendments made following consultant comments	JR	BK	19/05/2026
	Amendments made to layout following consultant feedback	JR	BK	26/05/2026
	Amendments made to layout following consultant comments	JR	BK	27/05/2026



KEY

- Proposed Red Line Boundary
- DC/24/0622 Consented Carehome Scheme



Exceedance Routes

PRICE & MYERS

Appendix C

Proposed Drawings

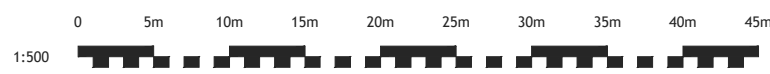
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	Amendments made to layout following consultant comments	JR	BK	27/05/2026

Drainage Key:

- Permeable paving
- Raingarden
- Tank
- Detention Basin
- Hydrobrake Manhole
- S1 Surface Water Manhole
- F1 Foul Water Manhole
- Ex Existing Southern Water Manhole
- FWP Foul Water Pump (25 hrs Storage)
- Surface Water Drain
- Foul Water Drain
- Existing Foul Water Sewer
- Foul Water Rising Main
- 3m Easement

KEY

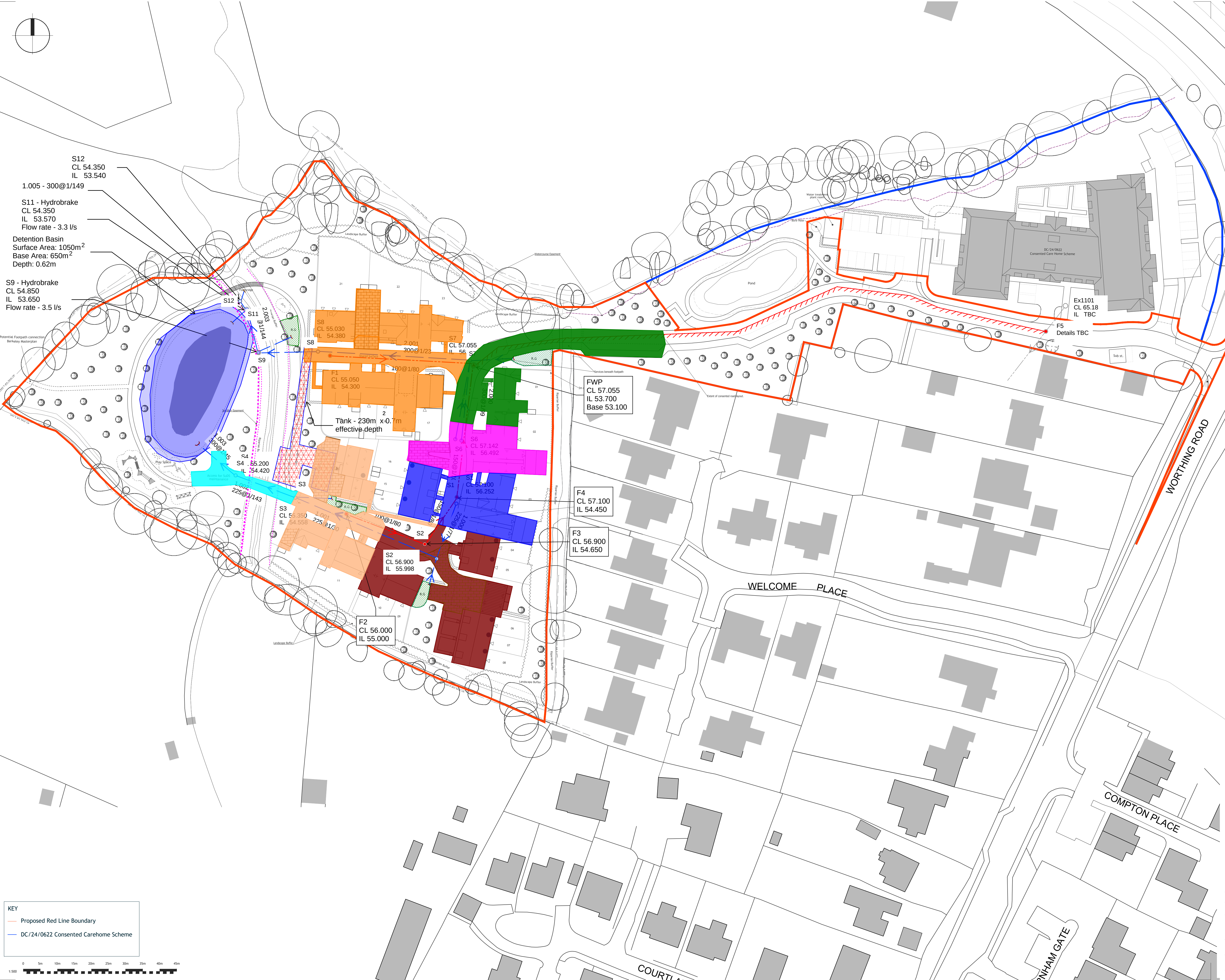
- Proposed Red Line Boundary
- DC/24/0622 Consented Carehome Scheme



Rev	Description	Drawn	Chkd	Date
A	Plot 21 revised following drainage consultants feedback	JR	BK	10/11/2025
B	Layout revised following pre-app advice.	JR	BK	21/11/2025
C	Layout revised following drainage consultants feedback	JR	BK	03/12/2025
D	Layout revised following landscape and ecologist comments	JR	BK	09/12/2025
E	Layout revised following Arbo comments	JR	BK	11/12/2025
F	Workcourse easements added to drawing	JR	BK	15/12/2025
G	Amendments made following drainage engineers comments	JR	BK	06/01/2026
H	Amendments made following consultant comments	JR	BK	19/05/2026
	Amendments made to layout following consultant feedback	JR	BK	26/05/2026
	Amendments made to layout following consultant comments	JR	BK	27/05/2026

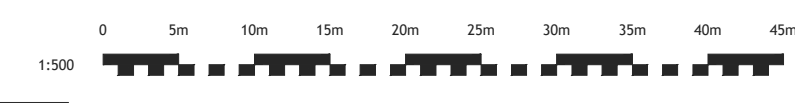
Drainage Key:

- 0.015ha - Discharges into S7
- 0.015ha - Discharges into S8
- 0.015ha - Discharges into S6
- 0.015ha - Discharges into S1
- 0.015ha - Discharges into S2
- 0.015ha - Discharges into S3
- 0.015ha - Discharges into S4
- Pond Area = 0.105ha (S10)
- FWP

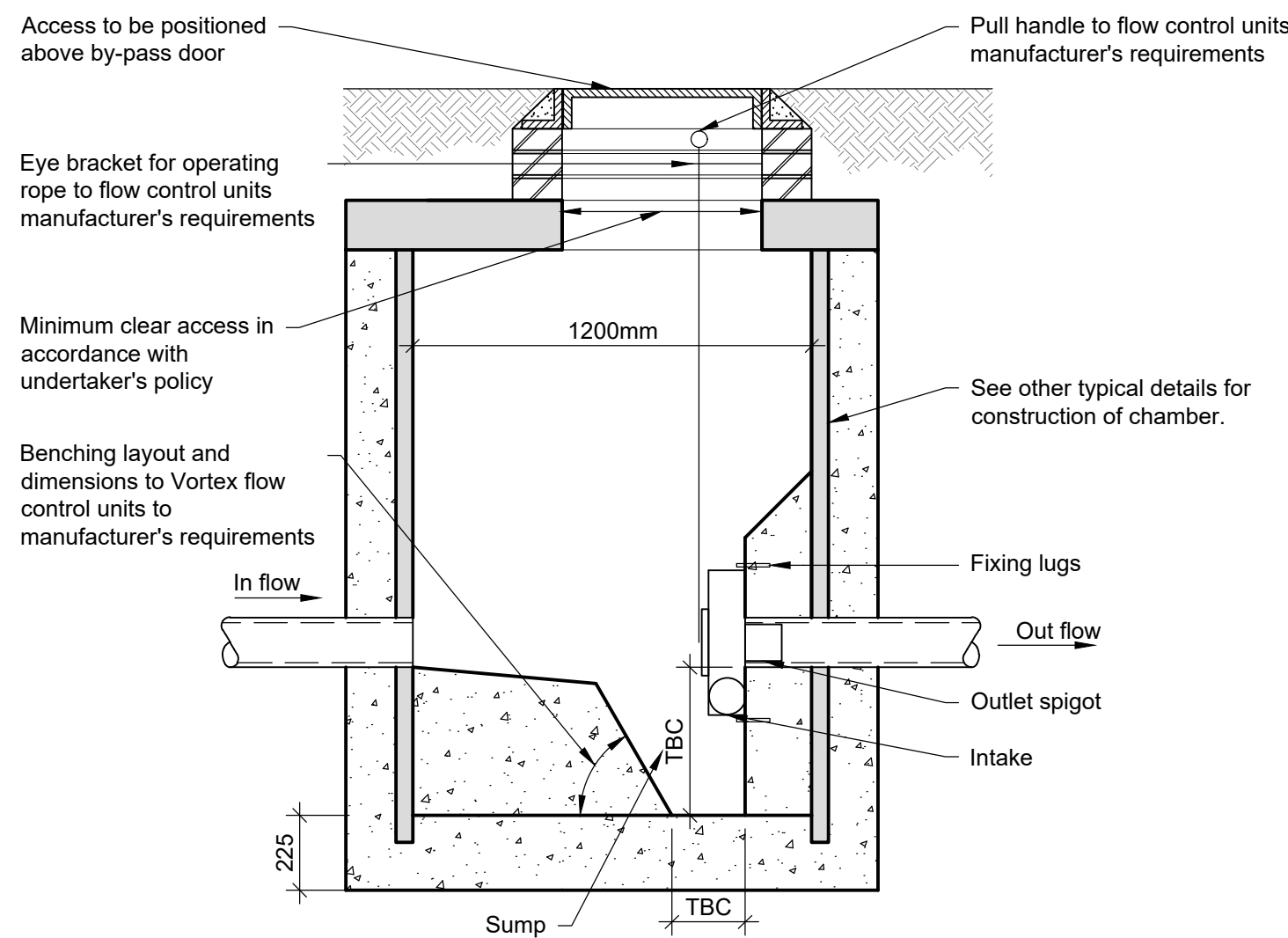


KEY

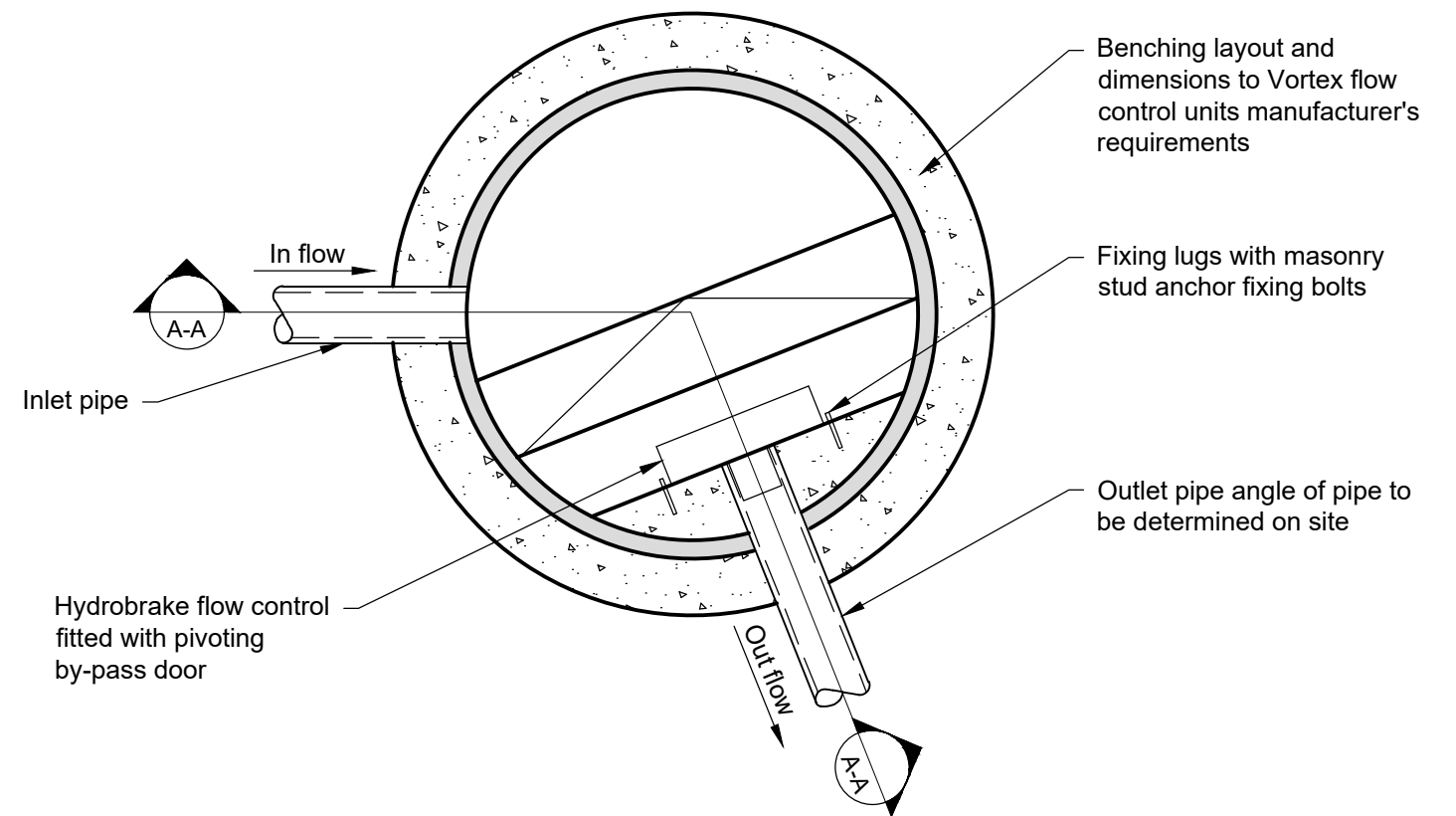
- Proposed Red Line Boundary
- DC/24/0622 Consented Carehome Scheme



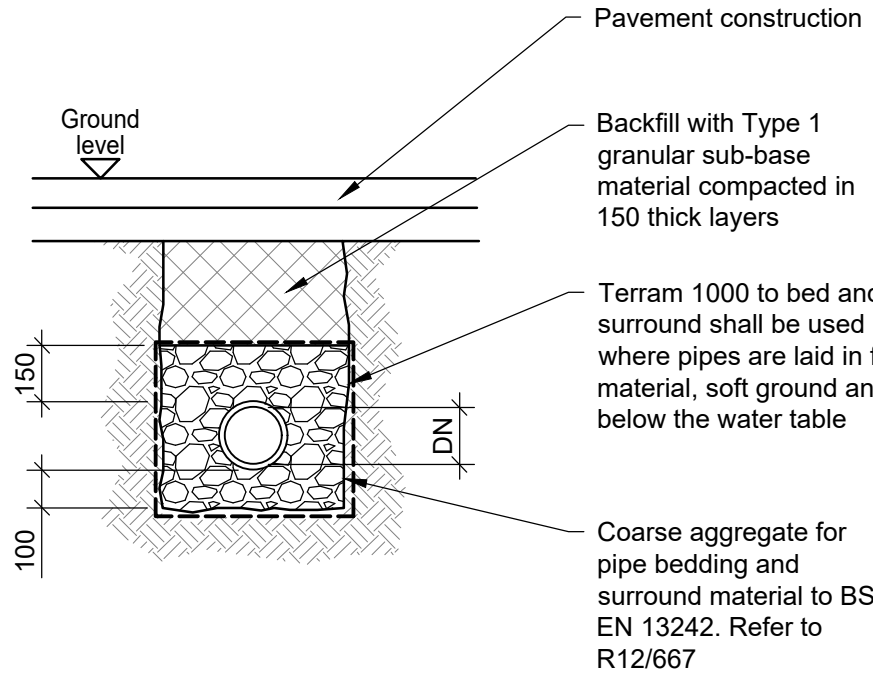
- NOTES :
1. This drawing is to be read in conjunction with all relevant Architect's, Engineer's and specialists' drawings and specifications.
 2. Do not scale from this drawing in either paper or digital form. Use written dimensions only. To check that this drawing has been printed to the intended scale this bar should be 50mm long @ A1 or 25mm long @ A3.
 3. Health & Safety : All specific drawing notes are to be read in conjunction with the project "Information Pack" and "Site Rules".
 4. For general notes refer to Drawing No.



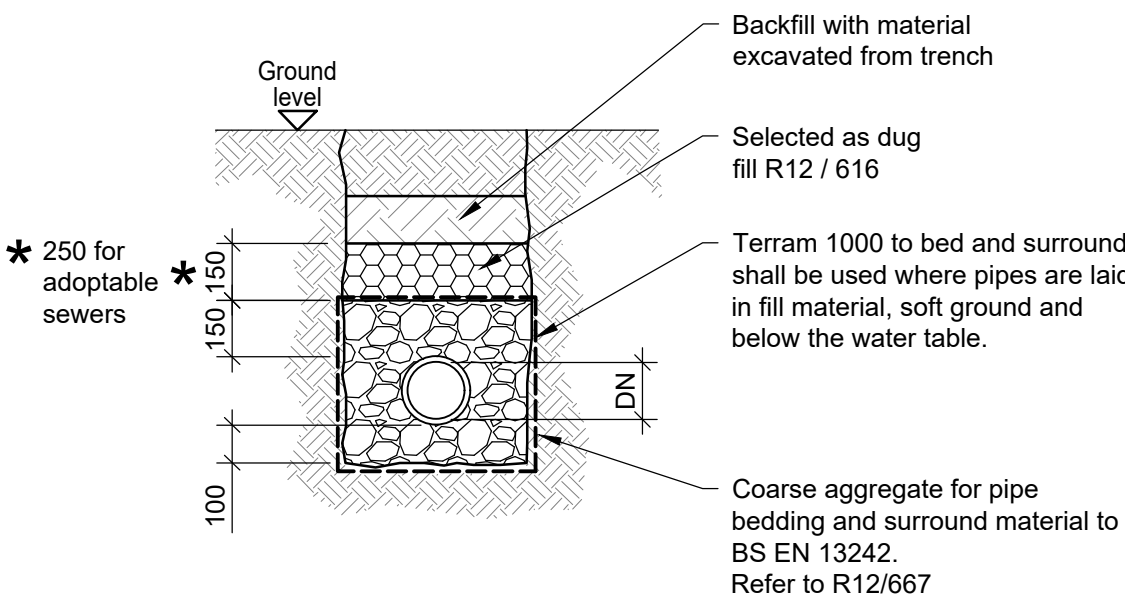
HYDROBRAKE FLOW CONTROL CHAMBER - SECTION A-A
TO MANUFACTURER'S REQUIREMENTS



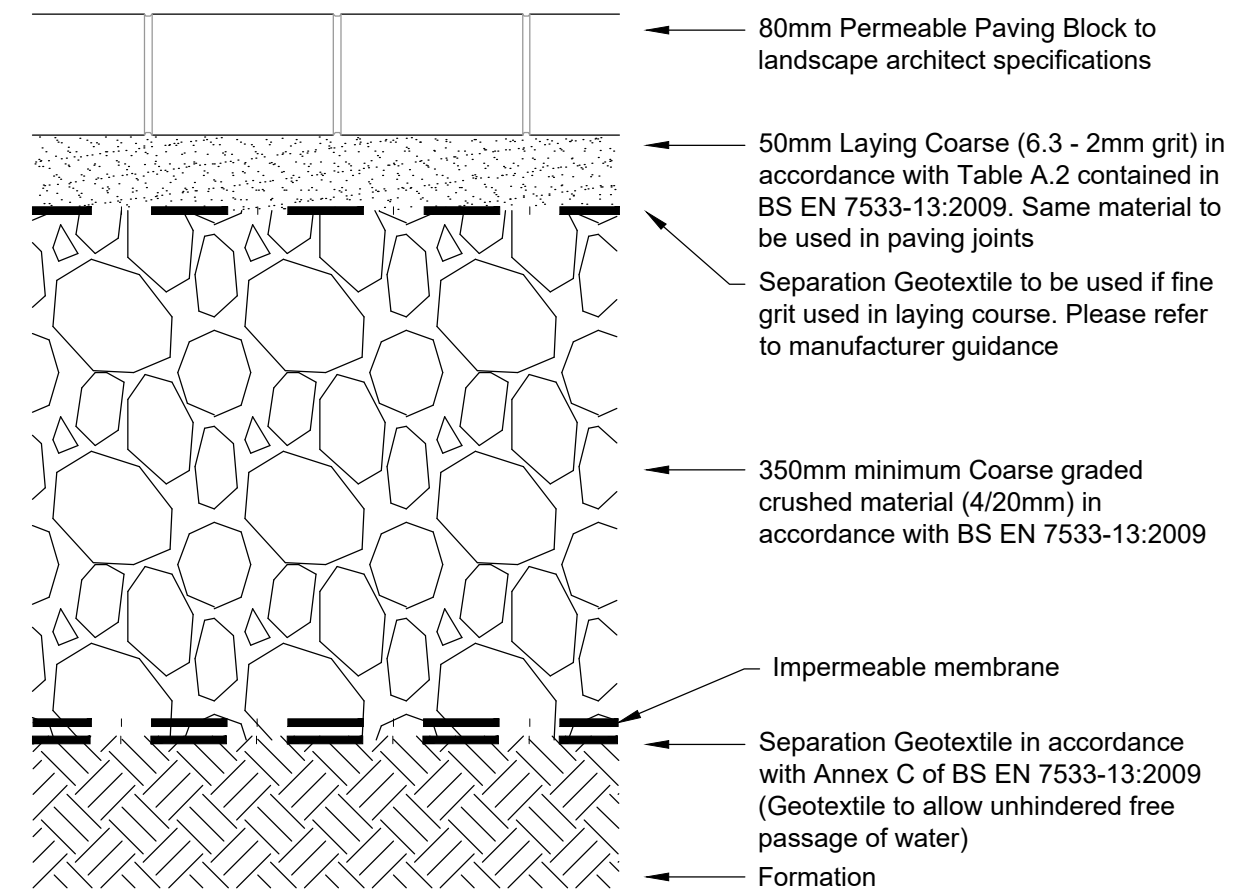
HYDROBRAKE CHAMBER - PLAN VIEW



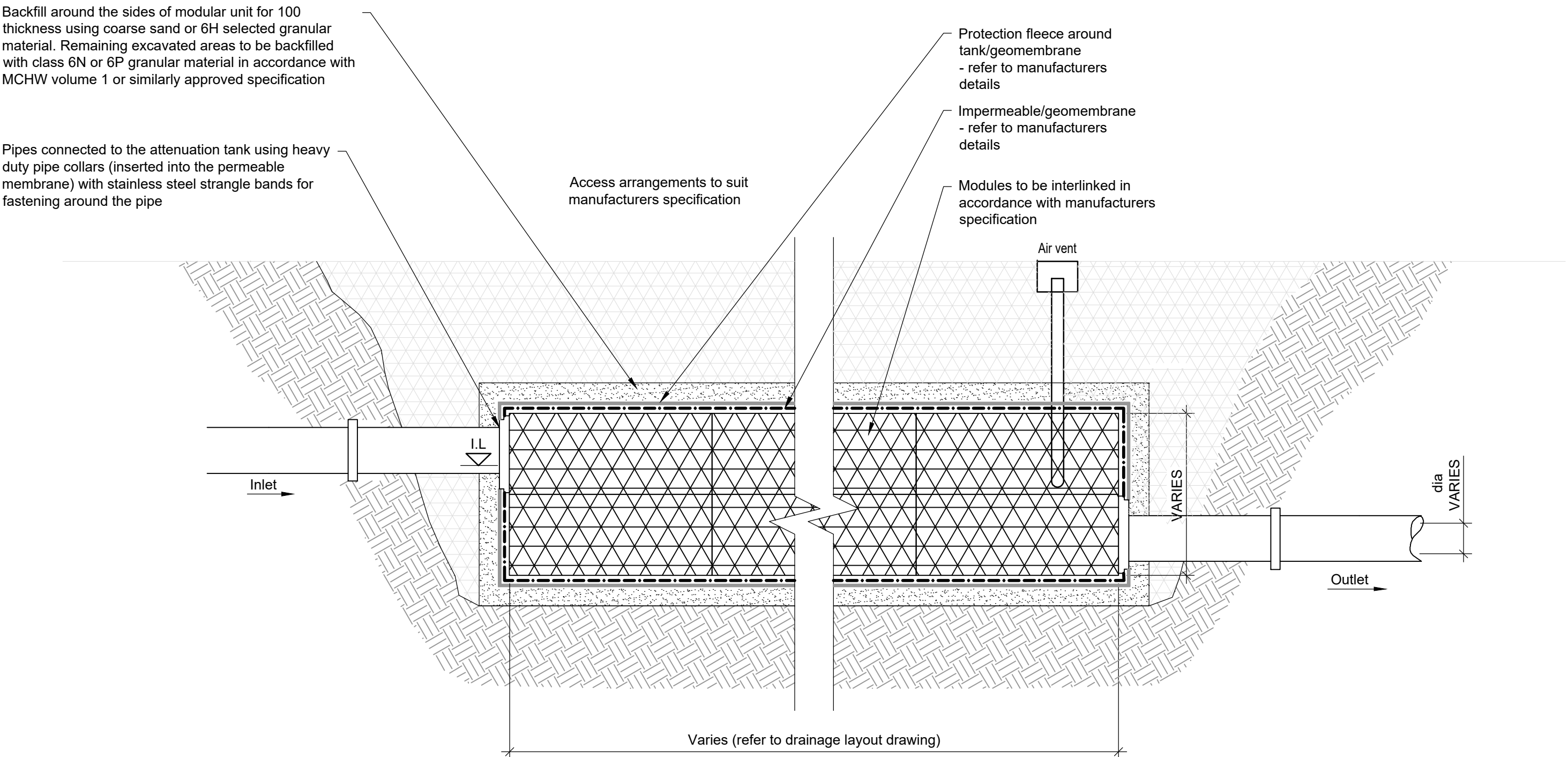
CLASS S SURROUND
GRANULAR SURROUND & BACKFILL FOR AREAS SUBJECT TO VEHICLE LOADING



CLASS S SURROUND
GRANULAR SURROUND & BACKFILL FOR SOFT OR HARD LANDSCAPING AREAS NOT SUBJECT TO VEHICLE LOADING



PERMEABLE BLOCK PAVING



MODULAR ATTENUATION TANK DETAILS

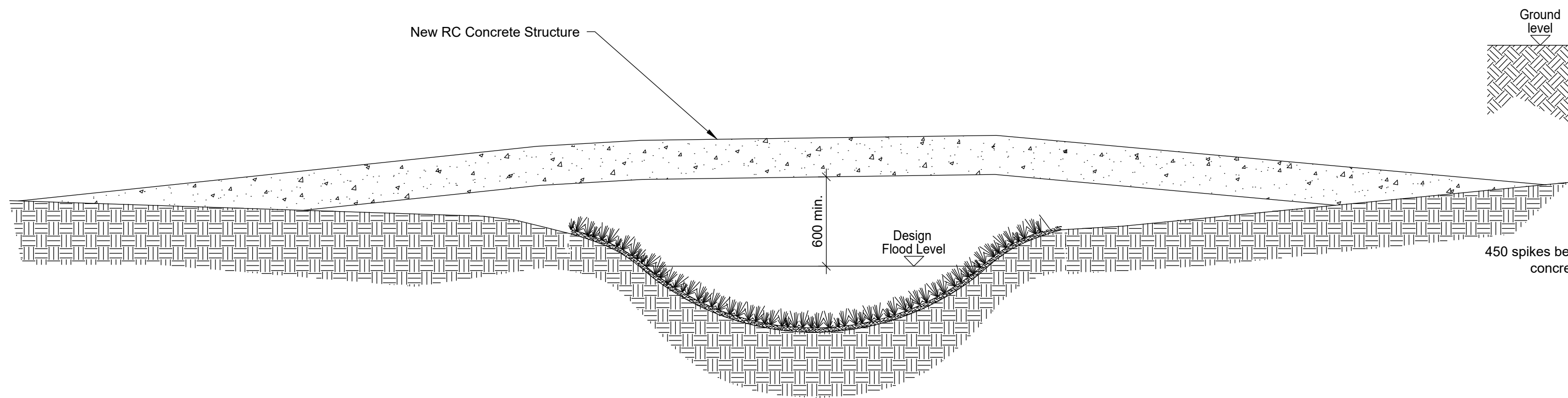
P2	12/1/25	DLin	DLin	Issued for Pre-application
P1	29/05/25	DLin	DLin	Issued for Pre-application
Rev	Date	Drawn	Eng	Amendment

LAND WEST OF WORTHING ROAD

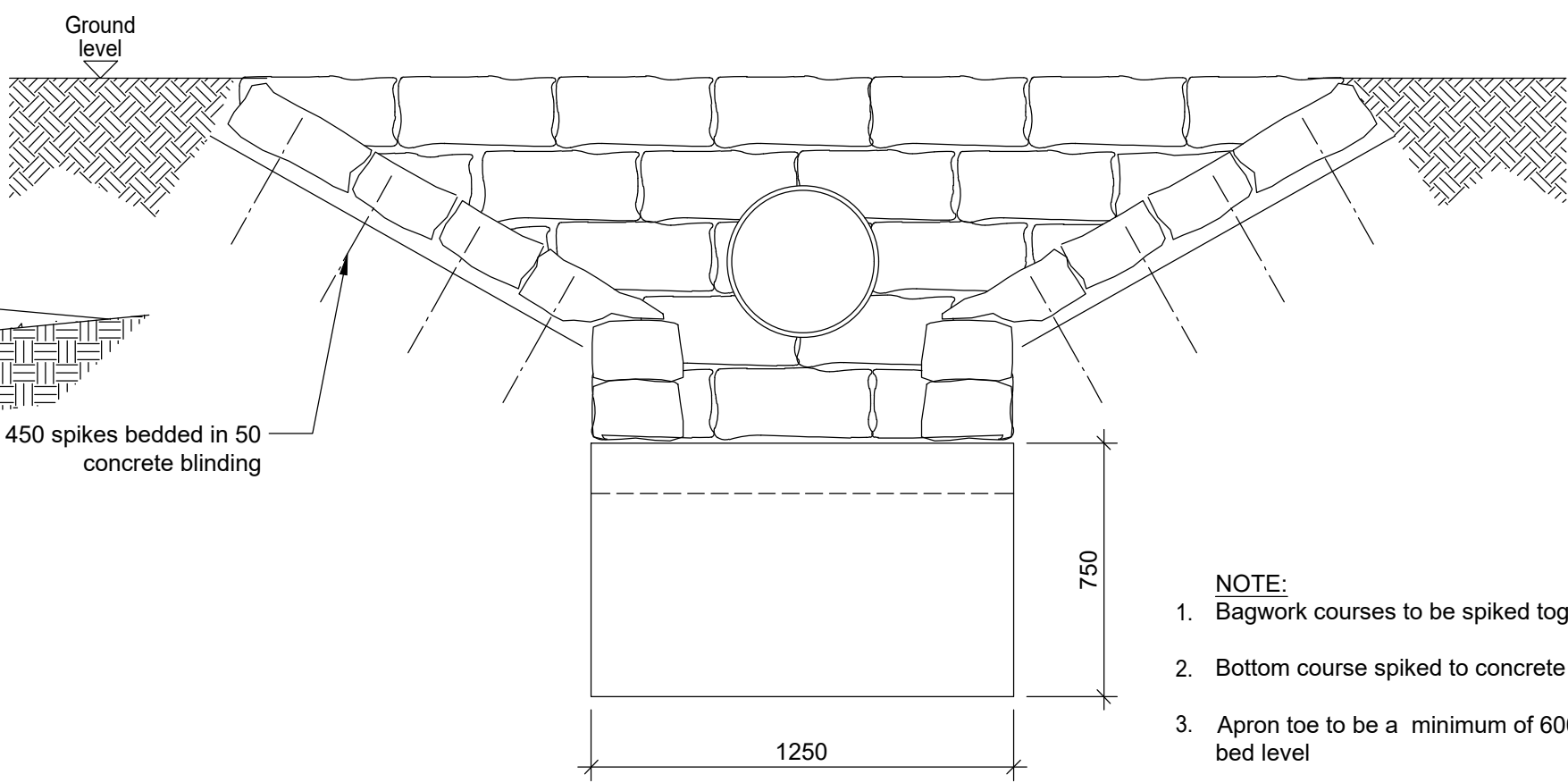
BELOW GROUND DRAINAGE DETAILS SHEET 1

Status
FOR INFORMATION
NOT FOR CONSTRUCTION

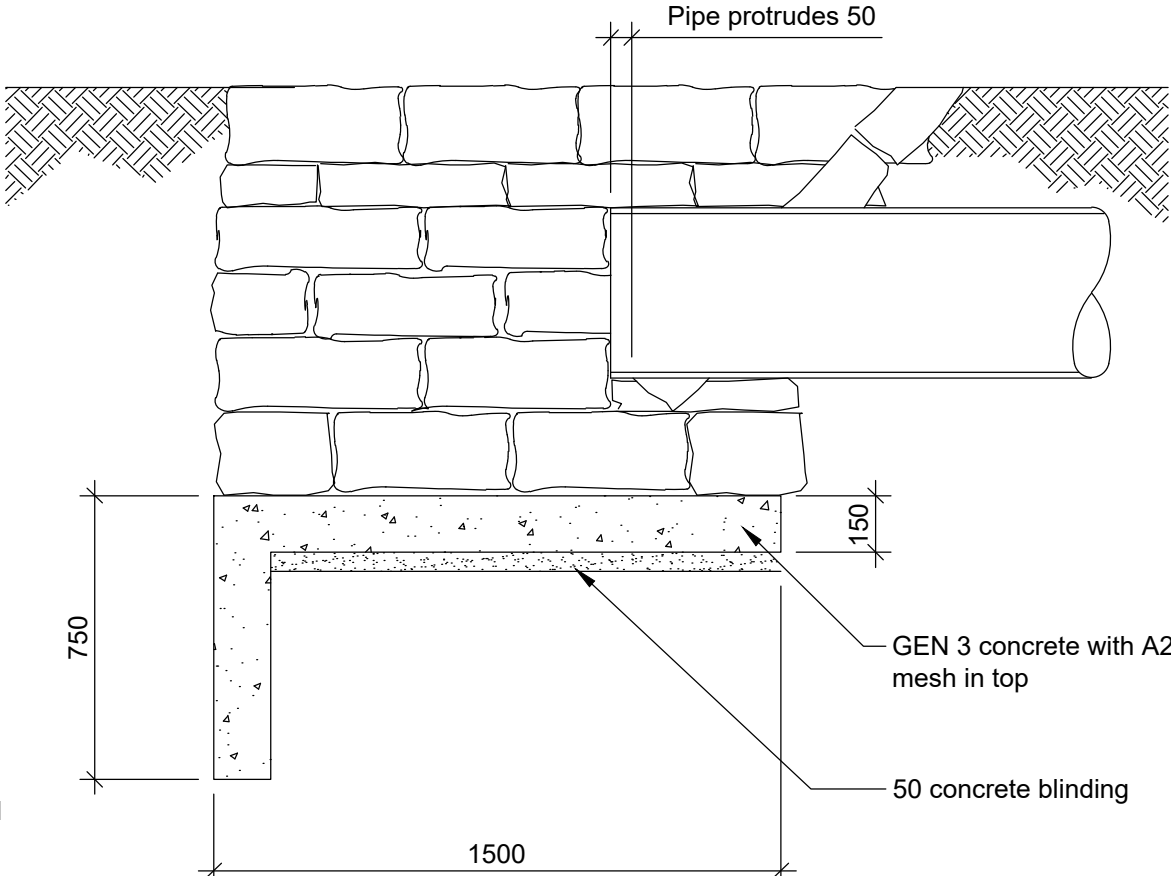
Drawn	PJ	Eng	DLin
Scales	1:20 at A1	1:40 at A3	
Drawing No	31276 / 6100	Rev	P2



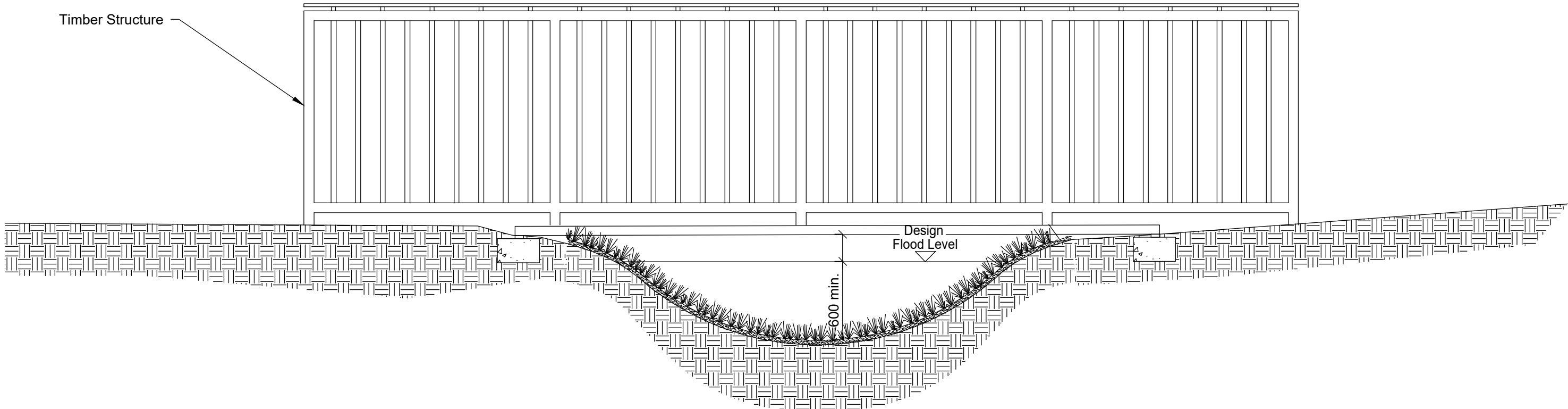
ROAD BRIDGE TYPICAL DETAIL



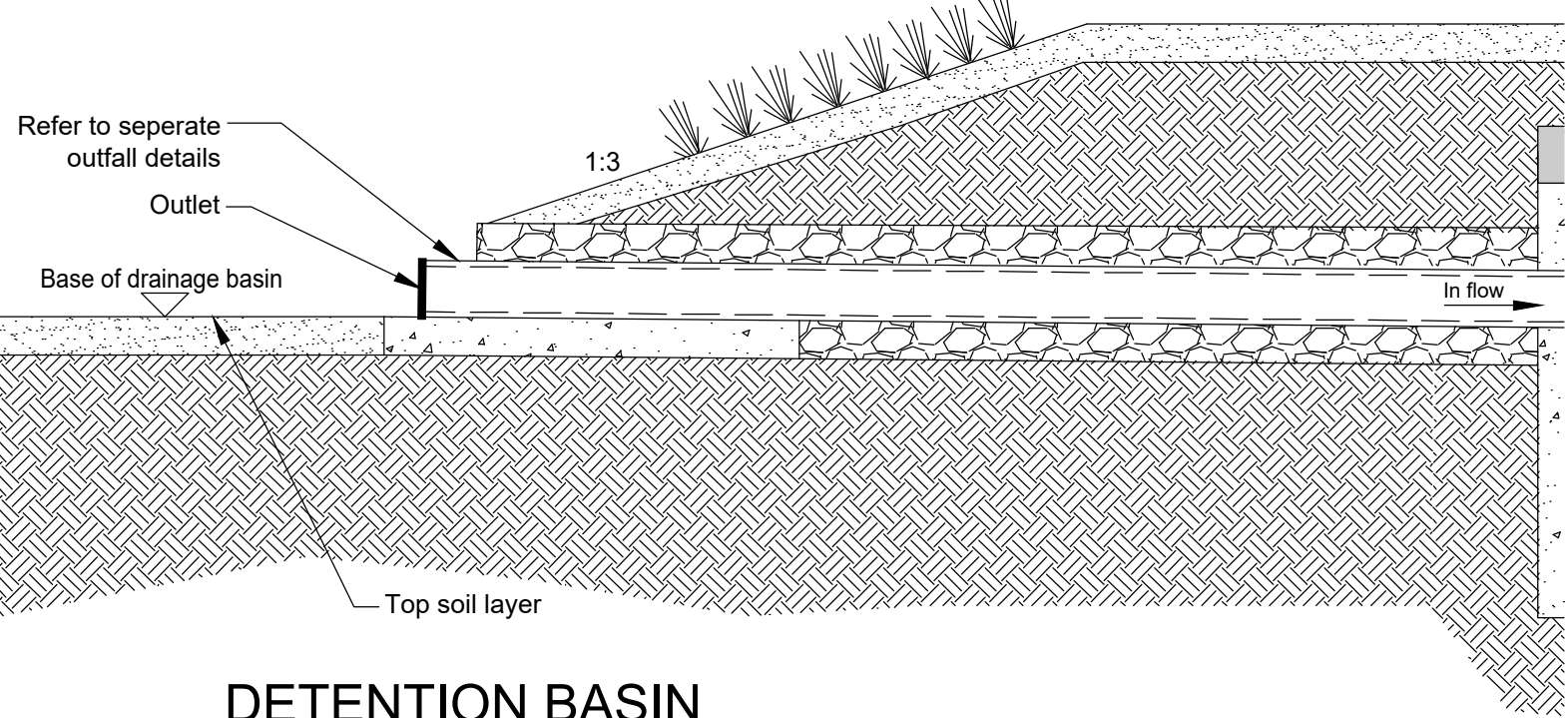
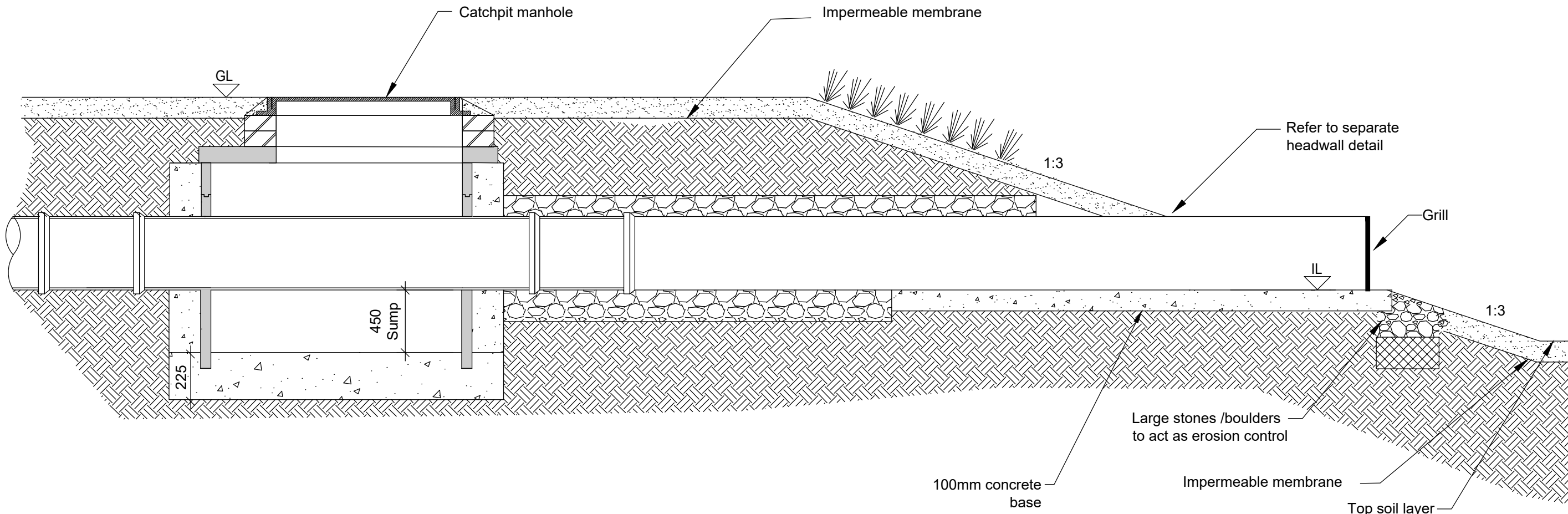
- NOTE:
1. Bagwork courses to be spiked together
 2. Bottom course spiked to concrete apron
 3. Apron toe to be a minimum of 600 below hard bed level
 4. Spikes to be 10 MS rods



BAGWORK HEADWALL



FOOTBRIDGE TYPICAL DETAIL



DETENTION BASIN

- Notes :
1. This drawing is to be read in conjunction with all relevant Architect's, Engineer's and specialists' drawings and specifications.
 2. Do not scale from this drawing in either paper or digital form. Use written dimensions only. To check that this drawing has been printed to the intended scale this bar should be 50mm long @ A1 or 25mm long @ A3.
 3. Health & Safety : All specific drawing notes are to be read in conjunction with the project "Information Pack" and "Site Rules".

Ver	Date	Drawn	Eng	Amendment
P3	28/05/26	DLin	DLin	Planning
P2	10/1/25	DLin	DLin	Issued for Pre-application
P1	29/05/25	DLin	DLin	Issued for Pre-application

LAND WEST OF
WORTHING ROAD

BELOW GROUND
DRAINAGE DETAILS
SHEET 2

FOR INFORMATION
NOT FOR CONSTRUCTION

Drawn	DLin	Eng	DLin
Scales	1:20 at A1 UNO	1:40	at A3 UNO
Drawing No	31875 / 6111	Ver	P3

PRICE&MYERS
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37 Alfred Place London WC1E 7DP
020 7631 5128
mail@pricemyers.com www.pricemyers.com

Appendix D

Calculations

Greenfield Run-off

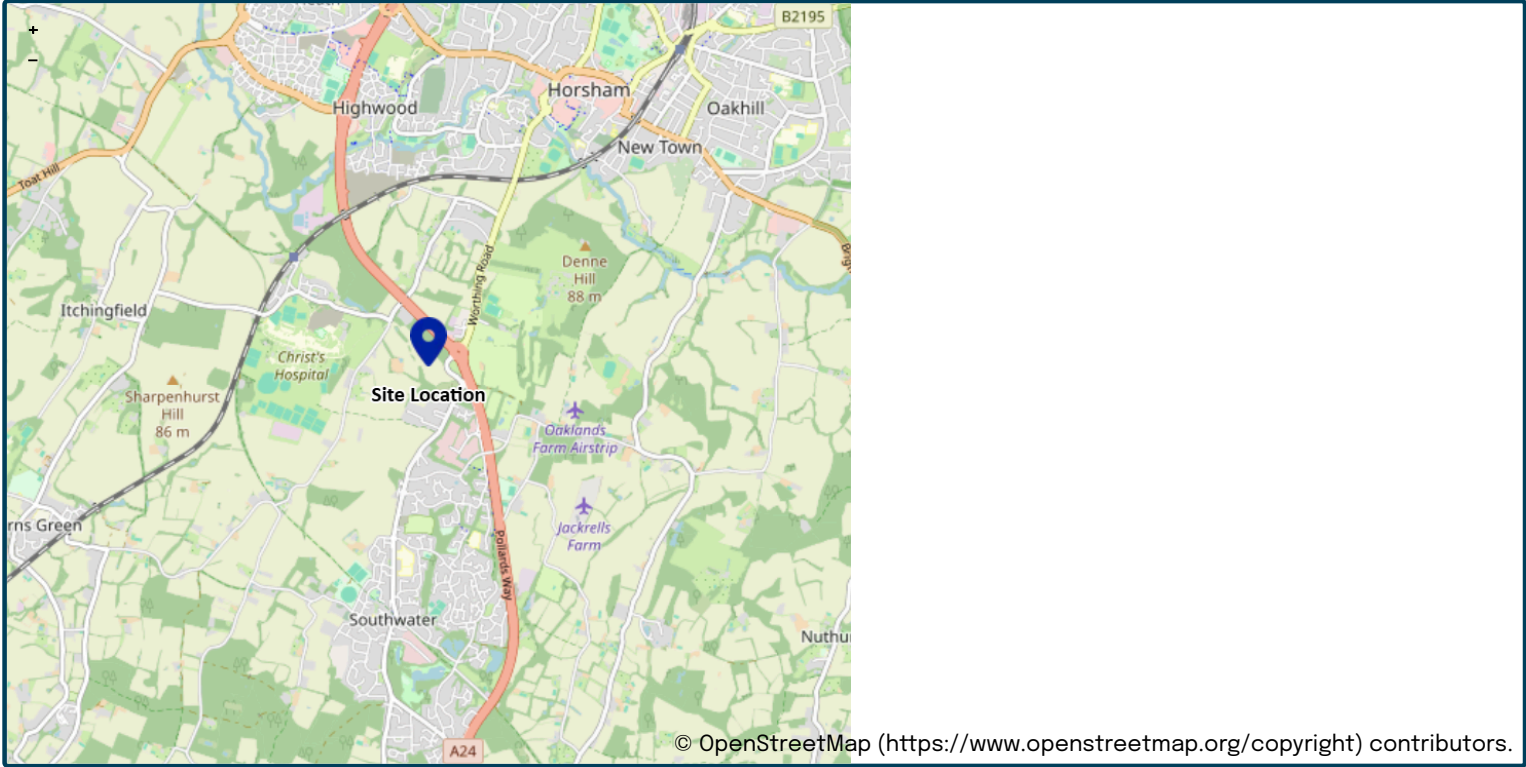
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015).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

Project details

Date	12/11/2025
Calculated by	DLin
Reference	31276/PH2
Model version	2.2.2

Location

Site name	Worthing Road
Site location	



Site easting (British National Grid)	515896
Site northing (British National Grid)	128165

Site details

Total site area (ha)	0.446	ha
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Greenfield runoff

Method

Method	FEH statistical (2025)
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FEH statistical (2025)

	<u>My value</u>	<u>Map value</u>
SAAR9120 (mm)	824	mm
BFIHOST19scaled	.265	
QMed-QBar conversion	1.136	1.136
QMed (l/s)	3.3	l/s
QBar (FEH statistical 2025) (l/s)	3.7	l/s

Growth curve factors

	<u>My value</u>	<u>Map value</u>
Hydrological region	7	7
1 year growth factor	0.85	
2 year growth factor	0.88	
10 year growth factor	1.62	
30 year growth factor	2.3	
100 year growth factor	3.19	
200 year growth factor	3.74	

Results

Method	FEH statistical (2025)
Flow rate 1 year (l/s)	3.2
Flow rate 2 year (l/s)	3.3
Flow rate 10 years (l/s)	6.0
Flow rate 30 years (l/s)	8.5
Flow rate 100 years (l/s)	11.8
Flow rate 200 years (l/s)	13.9

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent ‘zero’ figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.2) developed by HR Wallingford and available at uksuds.com (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Surface Water Drainage

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)	1.000
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	x
Maximum Rainfall (mm/hr)	250.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.047	5.00	57.100	1200	515925.360	128116.573	0.848
S2	0.107	5.00	56.900	1200	515918.204	128098.285	0.902
S3	0.072	5.00	55.350	1350	515878.130	128113.233	0.792
S4	0.017	5.00	55.200	1200	515859.922	128120.707	0.855
S6	0.039	5.00	57.142	1200	515928.064	128136.403	0.650
S7	0.080	5.00	57.055	1200	515928.501	128154.945	0.750
S8	0.129	5.00	55.030	1200	515883.895	128157.394	0.725
S9			54.850	1200	515862.641	128152.759	1.200
S10	0.105	5.00	54.350	1200	515848.786	128146.276	0.620
S11			54.350	1800	515862.011	128167.816	0.780
S12			54.350	1200	515863.985	128171.824	0.810

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	S1	S2	19.638	0.600	56.252	55.998	0.254	77.3	225	5.22	166.3
1.001	S2	S3	42.771	0.600	55.998	54.558	1.440	29.7	225	5.52	163.5
1.002	S3	S4	19.683	0.600	54.558	54.420	0.138	142.6	225	5.82	160.6
1.003	S4	S10	27.888	0.600	54.345	53.730	0.615	45.3	300	6.01	158.7
2.000	S6	S7	18.547	0.600	56.492	56.305	0.187	99.2	300	5.20	166.6
2.001	S7	S8	44.674	0.600	56.305	54.380	1.925	23.2	300	5.42	164.4
2.002	S8	S9	21.753	0.600	54.305	54.162	0.143	152.1	375	5.67	162.0
2.003	S9	S11	11.500	0.600	53.650	53.570	0.080	143.8	150	5.90	159.8
1.004	S10	S11	25.276	0.600	53.730	53.570	0.160	158.0	150	6.54	153.9
1.005	S11	S12	4.468	0.600	53.570	53.540	0.030	148.9	300	6.60	153.4

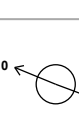
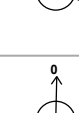
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.488	59.2	28.3	0.623	0.677	0.047	0.0	109	1.471
1.001	2.409	95.8	91.0	0.677	0.567	0.154	0.0	176	2.728
1.002	1.092	43.4	131.2	0.567	0.555	0.226	0.0	225	1.113
1.003	2.341	165.4	139.4	0.555	0.320	0.243	0.0	212	2.611
2.000	1.578	111.6	23.5	0.350	0.450	0.039	0.0	93	1.257
2.001	3.277	231.6	70.7	0.450	0.350	0.119	0.0	113	2.890
2.002	1.466	162.0	145.2	0.350	0.313	0.248	0.0	279	1.650
2.003	0.836	14.8	143.2	1.050	0.630	0.248	0.0	150	0.852
1.004	0.797	14.1	193.5	0.470	0.630	0.348	0.0	150	0.812
1.005	1.286	90.9	330.3	0.480	0.510	0.596	0.0	300	1.302

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	19.638	77.3	225	Circular	57.100	56.252	0.623	56.900	55.998	0.677
1.001	42.771	29.7	225	Circular	56.900	55.998	0.677	55.350	54.558	0.567
1.002	19.683	142.6	225	Circular	55.350	54.558	0.567	55.200	54.420	0.555
1.003	27.888	45.3	300	Circular	55.200	54.345	0.555	54.350	53.730	0.320
2.000	18.547	99.2	300	Circular	57.142	56.492	0.350	57.055	56.305	0.450
2.001	44.674	23.2	300	Circular	57.055	56.305	0.450	55.030	54.380	0.350
2.002	21.753	152.1	375	Circular	55.030	54.305	0.350	54.850	54.162	0.313
2.003	11.500	143.8	150	Circular	54.850	53.650	1.050	54.350	53.570	0.630
1.004	25.276	158.0	150	Circular	54.350	53.730	0.470	54.350	53.570	0.630
1.005	4.468	148.9	300	Circular	54.350	53.570	0.480	54.350	53.540	0.510

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1	1200	Manhole	Adoptable	S2	1200	Manhole	Adoptable
1.001	S2	1200	Manhole	Adoptable	S3	1350	Manhole	Adoptable
1.002	S3	1350	Manhole	Adoptable	S4	1200	Manhole	Adoptable
1.003	S4	1200	Manhole	Adoptable	S10	1200	Manhole	Adoptable
2.000	S6	1200	Manhole	Adoptable	S7	1200	Manhole	Adoptable
2.001	S7	1200	Manhole	Adoptable	S8	1200	Manhole	Adoptable
2.002	S8	1200	Manhole	Adoptable	S9	1200	Manhole	Adoptable
2.003	S9	1200	Manhole	Adoptable	S11	1800	Manhole	Adoptable
1.004	S10	1200	Manhole	Adoptable	S11	1800	Manhole	Adoptable
1.005	S11	1800	Manhole	Adoptable	S12	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S1	515925.360	128116.573	57.100	0.848	1200		0	1.000	56.252	225
S2	515918.204	128098.285	56.900	0.902	1200		1	1.000	55.998	225
							0	1.001	55.998	225
S3	515878.130	128113.233	55.350	0.792	1350		1	1.001	54.558	225
							0	1.002	54.558	225
S4	515859.922	128120.707	55.200	0.855	1200		1	1.002	54.420	225
							0	1.003	54.345	300
S6	515928.064	128136.403	57.142	0.650	1200		0	2.000	56.492	300
S7	515928.501	128154.945	57.055	0.750	1200		1	2.000	56.305	300
							0	2.001	56.305	300

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S8	515883.895	128157.394	55.030	0.725	1200		1	2.001	54.380	300
S9	515862.641	128152.759	54.850	1.200	1200		0	2.002	54.305	375
							1	2.002	54.162	375
							0	2.003	53.650	150
S10	515848.786	128146.276	54.350	0.620	1200		1	1.003	53.730	300
S11	515862.011	128167.816	54.350	0.780	1800		0	1.004	53.730	150
							1	2.003	53.570	150
							2	1.004	53.570	150
S12	515863.985	128171.824	54.350	0.810	1200		0	1.005	53.570	300
							1	1.005	53.540	300

Simulation Settings

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

Storm Durations

15	60	180	360	600	960	2160
30	120	240	480	720	1440	2880

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	45	0	0
100	45	0	0

Node S12 Surcharged Outfall

Overrides Design Area	x	Depression Storage Area (m²)	0	Evapo-transpiration (mm/day)	0
Overrides Design Additional Inflow	x	Depression Storage Depth (mm)	0		

Applies to All storms

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
0	0.560	360	0.560	720	0.560	1080	0.560	1440	0.560	1800	0.560
60	0.560	420	0.560	780	0.560	1140	0.560	1500	0.560	1860	0.560
120	0.560	480	0.560	840	0.560	1200	0.560	1560	0.560	1920	0.560
180	0.560	540	0.560	900	0.560	1260	0.560	1620	0.560	1980	0.560
240	0.560	600	0.560	960	0.560	1320	0.560	1680	0.560	2040	0.560
300	0.560	660	0.560	1020	0.560	1380	0.560	1740	0.560	2100	0.560

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
2160	0.560	2340	0.560	2520	0.560	2700	0.560	2880	0.560		
2220	0.560	2400	0.560	2580	0.560	2760	0.560				
2280	0.560	2460	0.560	2640	0.560	2820	0.560				

Node S9 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	53.650	Product Number	CTL-SHE-0093-3500-0700-3500
Design Depth (m)	0.700	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	3.5	Min Node Diameter (mm)	1200

Node S11 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	53.570	Product Number	CTL-SHE-0090-3300-0780-3300
Design Depth (m)	0.780	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	3.3	Min Node Diameter (mm)	1200

Node S10 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	53.750
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	650.0	0.0	0.620	1050.0	0.0

Node S9 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	53.650
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	230.0	0.0	0.700	230.0	0.0

Node S3 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	54.800	Slope (1:X)	500.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	9	Depth (m)	
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	0.30	Length (m)	15.000		

Node S2 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	56.350	Slope (1:X)	500.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	0.30	Length (m)	29.000		

Node S3 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	54.800	Slope (1:X)	500.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	9	Depth (m)	
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.58%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	10	56.309	0.057	8.6	0.0649	0.0000	OK
15 minute summer	S2	10	56.080	0.082	27.9	0.0932	0.0000	OK
15 minute summer	S3	11	54.744	0.186	40.7	0.2665	0.0000	OK
15 minute summer	S4	11	54.472	0.127	43.1	0.1435	0.0000	OK
15 minute summer	S6	10	56.543	0.051	7.1	0.0577	0.0000	OK
15 minute summer	S7	10	56.366	0.061	21.6	0.0695	0.0000	OK
15 minute summer	S8	10	54.446	0.141	44.9	0.1599	0.0000	OK
2880 minute winter	S9	2820	54.022	0.372	1.7	81.6436	0.0000	SURCHARGED
2880 minute winter	S10	3120	54.009	0.279	3.0	190.8602	0.0000	SURCHARGED
2880 minute winter	S11	3120	54.009	0.439	0.7	1.1180	0.0000	SURCHARGED
15 minute summer	S12	1	54.100	0.560	0.0	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 summer	S1	1.000	S2	8.5	0.810	0.144	0.2074	
15 minute summer	S2	1.001	S3	27.7	1.185	0.289	1.0294	
15 minute summer	S3	1.002	S4	40.1	1.198	0.924	0.6590	
15 minute summer	S4	1.003	S10	43.4	2.712	0.262	0.4730	
15 minute summer	S6	2.000	S7	7.0	0.770	0.063	0.1694	
15 minute summer	S7	2.001	S8	21.5	1.963	0.093	0.4892	
15 minute summer	S8	2.002	S9	44.4	1.224	0.274	0.7883	
2880 minute winter	S9	2.003	S11	0.7	0.041	0.049	0.2025	
2880 minute winter	S10	1.004	S11	-0.7	0.066	-0.051	0.4450	
2880 minute winter	S11	1.005	S12	0.0	0.000	0.000	0.3146	0.0

Results for 30 year +45% CC Critical Storm Duration. Lowest mass balance: 99.73%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	11	56.476	0.224	32.3	0.2534	0.0000	OK
15 minute summer	S2	12	56.400	0.402	102.6	2.3555	0.0000	SURCHARGED
15 minute summer	S3	14	55.179	0.621	138.1	22.7896	0.0000	FLOOD RISK
15 minute summer	S4	11	54.517	0.172	82.7	0.1944	0.0000	OK
15 minute summer	S6	10	56.597	0.105	26.9	0.1187	0.0000	OK
15 minute summer	S7	10	56.427	0.122	81.8	0.1376	0.0000	OK
15 minute summer	S8	11	54.678	0.373	170.1	0.4220	0.0000	OK
600 minute summer	S9	450	54.366	0.716	22.0	157.1937	0.0000	SURCHARGED
2880 minute winter	S10	2160	54.241	0.511	8.2	398.1583	0.0000	FLOOD RISK
2880 minute winter	S11	2160	54.238	0.668	3.2	1.7012	0.0000	FLOOD RISK
15 minute summer	S12	1	54.100	0.560	0.0	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 summer	S1	1.000	S2	30.8	1.013	0.521	0.7806	
15 minute summer	S2	1.001	S3	91.2	2.294	0.952	1.7010	
15 minute summer	S3	1.002	S4	78.1	1.964	1.798	0.7749	
15 minute summer	S4	1.003	S10	82.7	2.922	0.500	0.9150	
15 minute summer	S6	2.000	S7	26.7	1.095	0.239	0.4521	
15 minute summer	S7	2.001	S8	81.3	1.996	0.351	2.1576	
15 minute summer	S8	2.002	S9	166.7	1.611	1.029	2.2269	
600 minute summer	S9	2.003	S11	3.5	0.198	0.236	0.2025	
2880 minute winter	S10	1.004	S11	-2.1	-0.119	-0.149	0.4450	
2880 minute winter	S11	1.005	S12	3.2	0.045	0.035	0.3146	260.0

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.76%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	11	56.584	0.332	40.9	0.3760	0.0000	SURCHARGED
15 minute summer	S2	13	56.473	0.475	132.9	8.7465	0.0000	SURCHARGED
30 minute summer	S3	24	55.304	0.746	143.8	30.4648	0.0000	FLOOD RISK
15 minute summer	S4	11	54.525	0.180	90.1	0.2034	0.0000	OK
15 minute summer	S6	10	56.612	0.120	33.9	0.1362	0.0000	OK
15 minute summer	S7	10	56.444	0.139	103.2	0.1567	0.0000	OK
15 minute summer	S8	10	54.833	0.528	214.7	0.5967	0.0000	FLOOD RISK
600 minute summer	S9	495	54.566	0.916	27.5	201.2547	0.0000	FLOOD RISK
2880 minute summer	S10	2160	54.349	0.619	14.1	505.8387	0.0000	FLOOD RISK
2880 minute summer	S11	2100	54.346	0.776	3.5	1.9752	0.0000	FLOOD RISK
15 minute summer	S12	1	54.100	0.560	0.0	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 summer	S1	1.000	S2	40.0	1.043	0.675	0.7810	
15 minute summer	S2	1.001	S3	90.4	2.289	0.944	1.7010	
30 minute summer	S3	1.002	S4	86.6	2.179	1.995	0.7749	
15 minute summer	S4	1.003	S10	90.2	2.937	0.545	1.0677	
15 minute summer	S6	2.000	S7	33.6	1.156	0.301	0.5398	
15 minute summer	S7	2.001	S8	102.6	1.972	0.443	2.2829	
15 minute summer	S8	2.002	S9	211.9	1.924	1.308	2.3218	
600 minute summer	S9	2.003	S11	3.5	0.199	0.237	0.2025	
2880 minute summer	S10	1.004	S11	-2.8	-0.157	-0.197	0.4450	
2880 minute summer	S11	1.005	S12	3.3	0.047	0.036	0.3146	319.3

Appendix E

Site Investigation Information

Ref: C2570

John Pakenham
GTA Civils22nd February 2023**Re: The Copse, Southwater – Soakaway Testing – Infiltration Test Result Summary**

Dear John

The following investigation was carried out at the above location in accordance with our quotation.

1. Site Works

The purpose of the investigation was to supply soakaway test data in general accordance with BRE document 365 (Soakaway Design) at two locations which would be the approximate intended location for a possible infiltration device to serve a new development site.

The appended drawing illustrates the position of the test pits. The BRE365 pit was excavated to a depth of 1.2m in line with the approximate depth of the proposed soakaway.

The testing commenced on 16th February 2023 in accordance with BRE 365.

2. BRE 365 Soakaway Test Findings

Testing of the sub soils which was noted as clay failed to produce a useable rate as the water failed to drain more than 10mm during 3 hours. The test was therefore declared a **FAIL**.

3. BRE 365 Soakaway Test Results

Test Pit No	Infiltration Rate (1-3 Tests)			Depth of Test	Soil Type
SAT1	N/A	N/A	N/A	1.2m	Clay
SAT1	N/A	N/A	N/A	1.2m	Clay



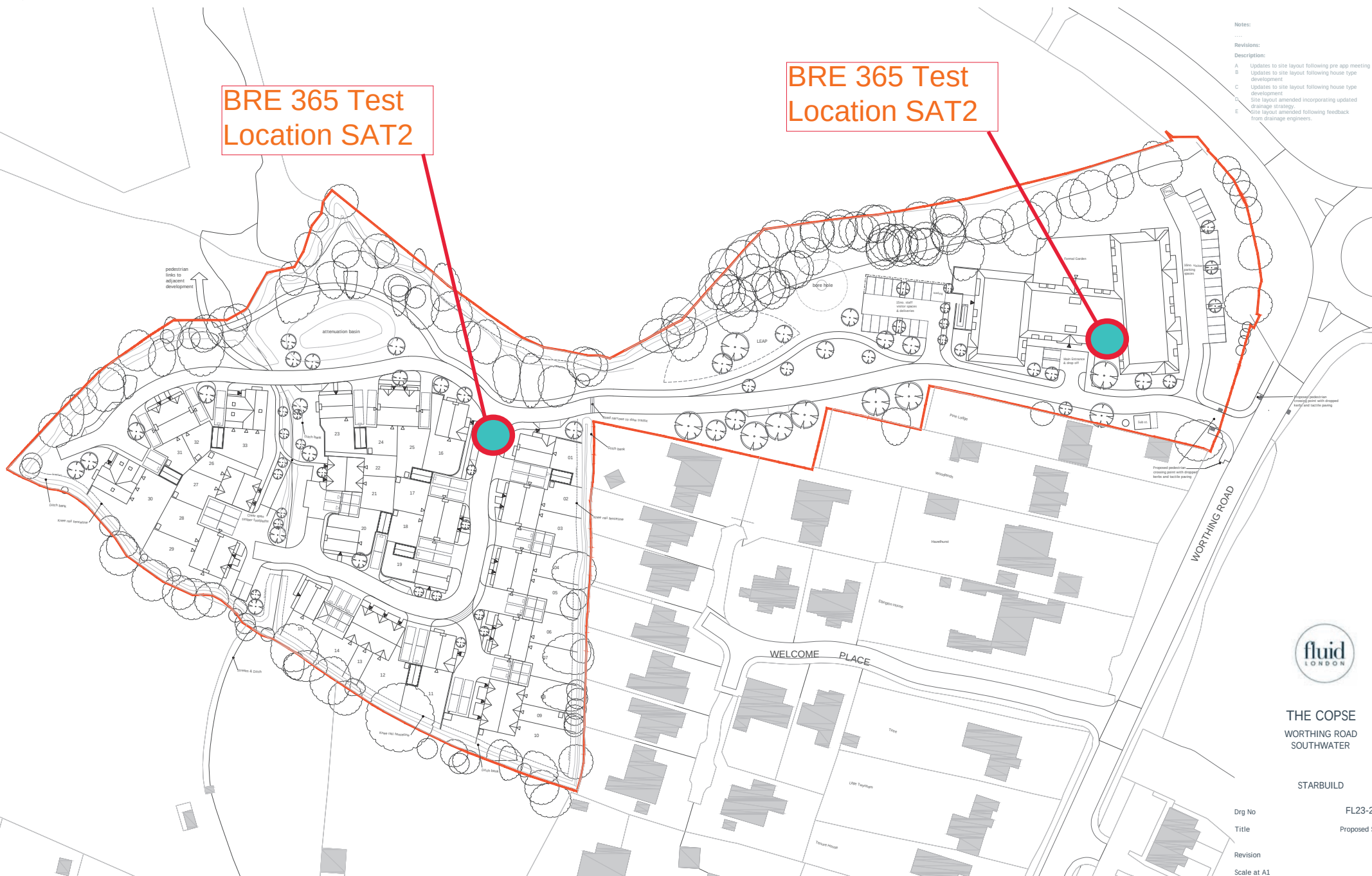
Notes:

Revisions:

Description:	Date:
A Updates to site layout following pre app meeting	28/02/23
B Updates to site layout following house type development	13/04/23
C Updates to site layout following house type development	15/06/23
D Site layout amended incorporating updated drainage strategy	03/07/23
E Site layout amended following feedback from drainage engineers	05/07/23

BRE 365 Test
Location SAT2

BRE 365 Test
Location SAT2



THE COPSE
WORTHING ROAD
SOUTHWATER

STARBUILD

Drg No	FL23-2028-055
Title	Proposed Site Layout
Revision	E
Scale at A1	1:500
Status	PLANNING
Date	Feb 2023



THE ACADEMY
OF URBANISM

Appendix B – Site Photographs



Appendix F

Southern Water Letter



Directorate of Planning
Horsham District Council
Parkside
Chart Way
Horsham
West Sussex
RH12 1RL

Your ref
DC/23/1350

Our ref
DSA000026016

Date
17/08/2023

Contact
Tel 0330 303 0119

Dear Sir/Madam,

Proposal: Hybrid planning application for the demolition of the existing dwelling and phased development comprising 33 dwellings, access, landscaping and other associated infrastructure (Full Planning); and erection of a 76 bed care home (Outline Planning) with all matters reserved except for access to the site.

Site: DC/23/1350: - The Copse Worthing Road, Horsham, West Sussex, RH13 9AT.

Thank you for your letter dated 27/07/2023.

Please see the attached extract from Southern Water records showing the approximate position of our existing public foul sewer within the development site. The exact position of the public asset must be determined on site by the applicant in consultation with Southern Water before the layout of the proposed development is finalised.

- The 150 mm diameter gravity sewer requires a clearance of 3 metres on either side of the gravity sewer to protect it from construction works and to allow for future maintenance access.
- No development or tree planting should be carried out within 3 metres of the external edge of the public gravity sewer without consent from Southern Water.
- No soakaways, swales, ponds, watercourses or any other surface water retaining or conveying features should be located within 5 metres of public or adoptable gravity sewers.
- All existing infrastructure should be protected during the course of construction works.

Please refer to: southernwater.co.uk/media/3011/stand-off-distances.pdf

It is possible that a sewer now deemed to be public could be crossing the development site. Therefore, should any sewer be found during construction works, an investigation of the sewer will be required to ascertain its ownership before any further works commence on site.



We have restrictions on the proposed tree planting adjacent to Southern Water sewers, rising mains or water mains and any such proposed assets in the vicinity of existing planting. Reference should be made to Southern Water's publication "A Guide to Tree Planting near water Mains and Sewers" (southernwater.co.uk/media/3027/ds-tree-planting-guide.pdf) and the Sewerage Sector Guidance (water.org.uk/sewerage-sector-guidance-approved-documents/) with regards to any landscaping proposals and our restrictions and maintenance of tree planting adjacent to sewers, rising mains and water mains.

Our investigations indicate that Southern Water can facilitate foul sewerage disposal to service the proposed development. Southern Water requires a formal application for a connection to the public sewer to be made by the applicant or developer.

To make an application visit Southern Water's Get Connected service: developerservices.southernwater.co.uk and please read our New Connections Charging Arrangements documents which are available on our website via the following link: southernwater.co.uk/developing-building/connection-charging-arrangements

The Council's technical staff and the relevant authority for land drainage consent should comment on the adequacy of the proposals to discharge surface water to the local watercourse.

If the applicant proposes to offer a new on-site drainage and pumping station for adoption as part of the foul/surface water public sewerage system, this would have to be designed and constructed to the specification of Southern Water Services Ltd. A secure compound would be required, to which access for large vehicles would need to be possible at all times. The compound will be required to be 100 square metres in area, or of some such approved lesser area as would provide an operationally satisfactory layout. In order to protect the amenity of prospective residents, no habitable rooms shall be located within 15 metres to the boundary of the proposed adoptable pumping station, due to the potential odour, vibration and noise generated by all types of pumping stations. The transfer of land ownership will be required at a later stage for adoption.

We request that should this planning application receive planning approval, the following informative is attached to the consent: Construction of the development shall not commence until details of the proposed means of foul sewerage and surface water disposal have been submitted to, and approved in writing by the Local Planning Authority in consultation with Southern Water.

Our investigations indicate that Southern Water can facilitate water supply to service the proposed development. Southern Water requires a formal application for a connection to the water supply to be made by the applicant or developer.

To make an application visit Southern Water's Get Connected service: developerservices.southernwater.co.uk and please read our New Connections Charging Arrangements documents which are available to read on our website via the following link southernwater.co.uk/developing-building/connection-charging-arrangements



For further advice, please contact Southern Water, Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX (Tel: 0330 303 0119).

Website: southernwater.co.uk or by email at: SouthernWaterPlanning@southernwater.co.uk

Yours faithfully,

Future Growth Planning Team
Developer Services

southernwater.co.uk/developing-building/planning-your-development

SOUTHERN WATER



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.

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O.S. REF: TQ1528SE

Scale: 1:2500

Screen Print

WARNING: BAC pipes are constructed of Bonded Asbestos Cement

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



Printed By: ShanbAk

Date: 17-8-2023

Southern Water MapGuide Browser

Requested By:

