Flood Risk Assessment & Drainage Strategy at

Higher Standen Drive
Clitheroe
BB7 1QY

Client: Applethwaite Homes Limited

Reference: 35161-SUT-ZZ-00-RP-C-0001

Date: March 2026

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A	October 2025	Initial Issue	JG	AD	SB
B	January 2026	Site Layout Updated	JG	AD	SB
C	January 2026	Amended to planning consultant comments	JG	AD	SB
D	March 2026	Drainage layout updated	JG	AD	SB

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Flood Risk Assessment

1 Introduction

1.1 As part of the planning requirements for the development at Higher Standen Drive, Clitheroe it is necessary to prepare a site-specific flood risk assessment to ensure the flood risk is appropriately considered to protect people and the property from flooding.

1.2 The development boundary, Figure 1, is 2.52 hectares and situated within Flood Zone 1 as defined by the Environment Agency.

1.3 The National Planning Policy Framework (NPPF) Paragraph 170 seeks to promote development in areas at low risk of flooding and to reduce the flood risk resulting from development. This assessment will demonstrate that all sources of flooding have been considered and that development of the site is appropriate.

1.4 The existing site is greenfield. The proposed site is to be developed with 60 dwellings along with associated roadways. The proposed site plan is provided in Appendix A for reference.

1.5 The development site is located along Higher Standen Drive. The location data for the site is:

Post Code:	**BB7 1QY**		
Grid Reference:	SD 74674 40673		
Coordinates:	X: 374674	Y: 440673	
Latitude:	53°51'42"	**Longitude:**	002°23'12"W
What3Words:	coaster.shoelaces.campfires		

Table 1: Location Details.

Figure 1: Site Boundary

1.6 Flood risk information for planning has been obtained from the Environment Agency (EA) website and is provided in Appendix C. The EA data confirms the site falls within Flood Zone 1.

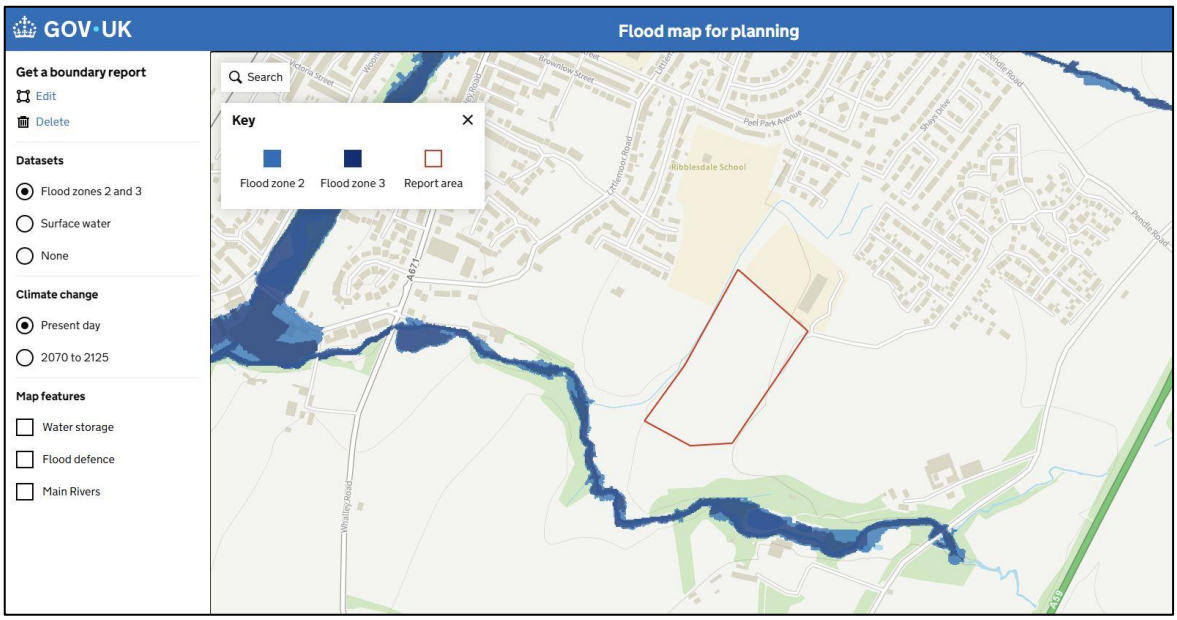


Figure 2: Environment Agency Flood Map for Planning

2 Planning Context

2.1. The National Planning Policy Framework expects local planning authorities to protect people and property from flooding. In fulfilling their duty local planning authorities are to ensure the following steps are assessed prior to granting planning permission:

2.1.1 Assess flood risk

2.1.1.1 The Local Planning Authority (LPA) must undertake a Strategic Flood Risk Assessment to inform the local plan and identify development sites that are in areas of low flood risk.

2.1.1.2 Sites greater than 1 hectare or in areas of flood risk must have a Site-Specific Flood Risk Assessment prepared.

2.1.2 Avoid flood risk

2.1.2.1 The LPA should apply the sequential test to, as far as practicable, locate development sites in area at the least risk of flooding, and if required carry out the exception test.

2.1.3 Manage and mitigate flood risk

2.1.3.1 Where alternative sites are not available the LPA should ensure that development is flood resilient and resistant, safe for the users over the development's lifetime and will not increase overall flood risk.

2.1.3.2 LPAs and developers should manage flood risk through the inclusion of sustainable drainage techniques.

2.2. There is no general statutory duty on the Government to protect land or property against flooding. However, the Government recognises the need for action to be taken to safeguard the wider social and economic wellbeing of the country.

2.3. Landowners have the primary responsibility for safeguarding their land and others property against natural hazards such as flooding. Individual property owners and users are also responsible for managing the drainage of their land in such a way as to prevent, as far as is reasonably practicable, adverse impacts on neighbouring land.

2.4. Those proposing development are responsible for:

2.4.1 Demonstrating that it is consistent with the NPPF.

2.4.2 Providing an assessment of:

2.4.2.1 Whether any proposed development is likely to be affected by flooding from any source.

2.4.2.2 Whether it will increase flood risk elsewhere.

2.4.2.3 The measures to deal with these effects and risks.

- Satisfying the local planning authority that any flood risk to the development or additional risk arising from the proposal will be successfully managed with the minimum environmental effect.
- Designs which reduce flood risk to the development and elsewhere, by incorporating sustainable drainage systems and where necessary flood resilience measures.
- Identifying opportunities to reduce flood risk, enhance biodiversity and amenity and seek collective solutions to managing flood risk.

3 Catchment/Site Description

3.1 The topography of the site generally slopes from north-east to south-west. The maximum elevation is 102.56mAOD, the minimum elevation is 93.61mAOD. The topographic survey is included within the appendix A for reference.

3.2 A review of the United Utilities sewer records, provided in the pre development enquiry, show foul and surface water sewers in Higher Standen Drive.

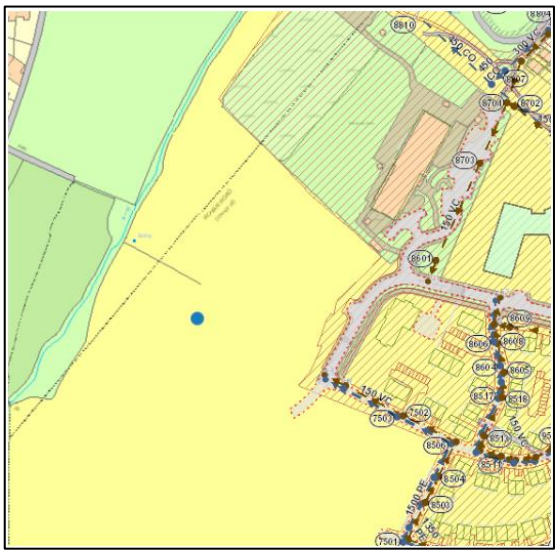


Figure 3: United Utilities sewer records.

3.3 The OS Maps website confirms that the nearest open waterbody is located along the western boundary of the site, an extract of the Map is in Figure 4.

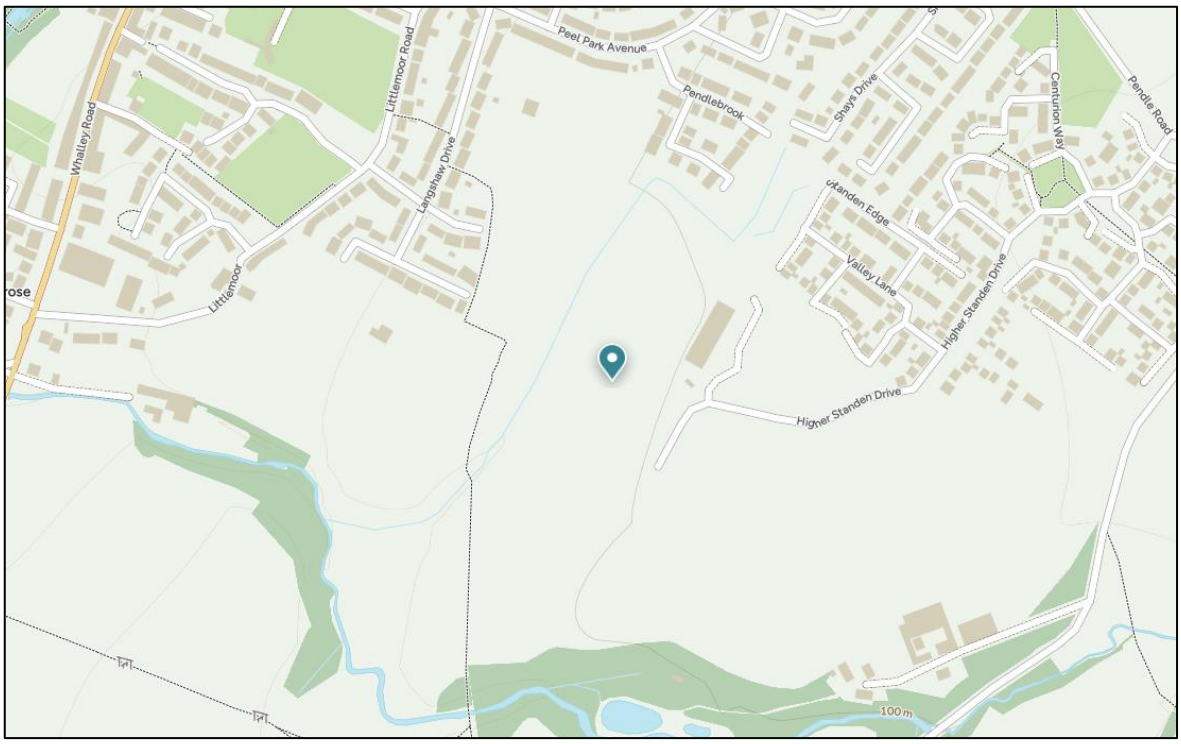


Figure 4: Existing Waterbody. (Source: OS Maps)

3.4 The British Geological Survey (BGS) Geology of Britain viewer defines the bedrock geology as Clitheroe Limestone Formation and Hodder Mudstone Formation - Mudstone. Superficial deposits are noted as Till, Devensian - Diamicton.

3.5 The National Soils Resources Institute, through the Soilscapes web viewer, identify the soil type as Soilscape 17, Slowly permeable seasonally wet acid loamy and clayey soils.

3.6 Flood Risk Assessment

3.6.1 The National Planning Policy Framework (NPPF) seeks to promote development in areas at low risk of flooding and to reduce the flood risk resulting from development. The purpose of this site-specific flood risk assessment is to demonstrate that the site can be considered to fall within an area of low annual probability and assess the risk to the site from all sources of flooding.

3.6.2 The planning flood maps from the Environment Agency confirm that the site is in Flood Zone 1 due the low risk posed by sea or river or surface water flooding.

3.6.3 According to the NPPF Annex 3 : Flood risk vulnerability classification building residential use is classed as ‘more vulnerable’.

3.6.4 A review of Table 3 of the NPPF Technical guide indicates that an exception test is not required for areas classed as more vulnerable that falls within Flood Zone 1.

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	×	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	×	×	×

Key: ✓ Development is appropriate.
× Development should not be permitted.

Figure 5: Table 3 from the NPPF Technical Guide illustrating site classification.

3.7 Sources of Flooding

3.7.1 Flooding is a natural hazard and can happen at any time in a wide variety of locations. There are several forms of flooding, which present a range of different risks. The speed of inundation and the duration of different forms of flooding vary greatly. With climate change, the frequency, patterns, and severity of flooding are forecast to change and become more damaging.

3.7.2 The limits of flood risk areas cannot be defined precisely because floods with similar probability can arise from different combinations of weather, sources, rainfall patterns, local topography, and patterns of development.

3.7.3 Every flood will have different consequences on people, property and the environment and depends on the land use.

3.8 Flooding from the River and the Sea

3.8.1 Flooding from rivers or the sea is classed as a very low/no risk for the development site as seen in Figure 6 as it is not situated near a sea or river.

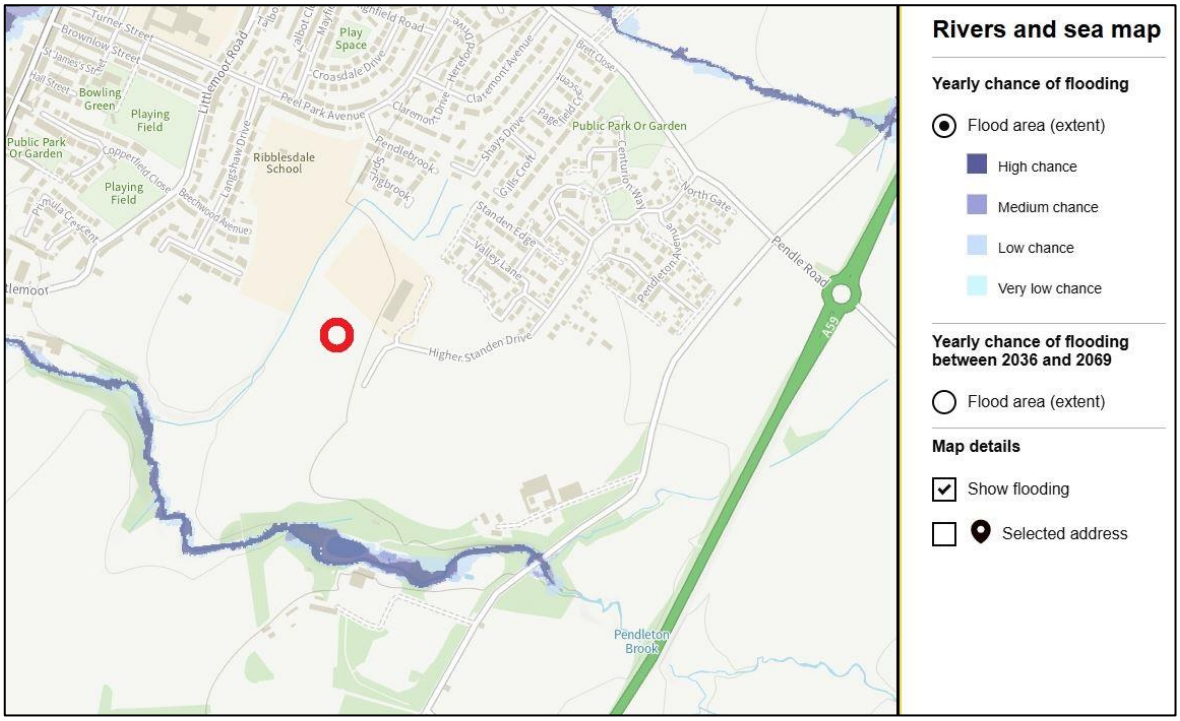


Figure 6: Environment Agency Flood Map - Extents of Flooding from Rivers or the Sea

3.9 Flooding from Surface Water

3.9.1 Flooding from surface water may occur in times of intense rainfall at a local site level as any drainage system may not be able to disperse the rainfall quickly enough. Surface flooding occurs when both the natural interception capacity of the ground is exceeded and the capacity of inlets to the drainage system are exceeded.

3.9.2 The Environment Agency provides surface water flood maps for the high (greater than 3.3% AEP), medium (1% AEP) and low (0.1% AEP) risk scenarios. All the surface water flood maps from the Environment Agency website are provided in Appendix C for reference, although the low-risk scenario is generally considered above the design return period.

3.9.3 The Environment Agency cautions that due to the limitations within the model (single drainage rate, national level modelling, LiDAR data etc.) the surface water flood maps do not provide a definitive risk of surface water flooding at the plot level. The following assessment reflects the current scenario and provides an indication of the potential surface water flood risk in the absence of drainage network designed to facilitate the proposed development through the management of surface water.

3.9.4 The extent of surface water flooding, Figure 7, indicates that there is a low risk of surface water flooding occurring within the site boundary. The surface water flood risk is shown occurring to a small section to the north of the site. The flooding occurs for the 0.1, 1 and 3.3% AEP event.

3.9.5 The surface water flooding within the site extents is limited to north part and the western boundary of the site. Proposed development will not cause any issues post development.

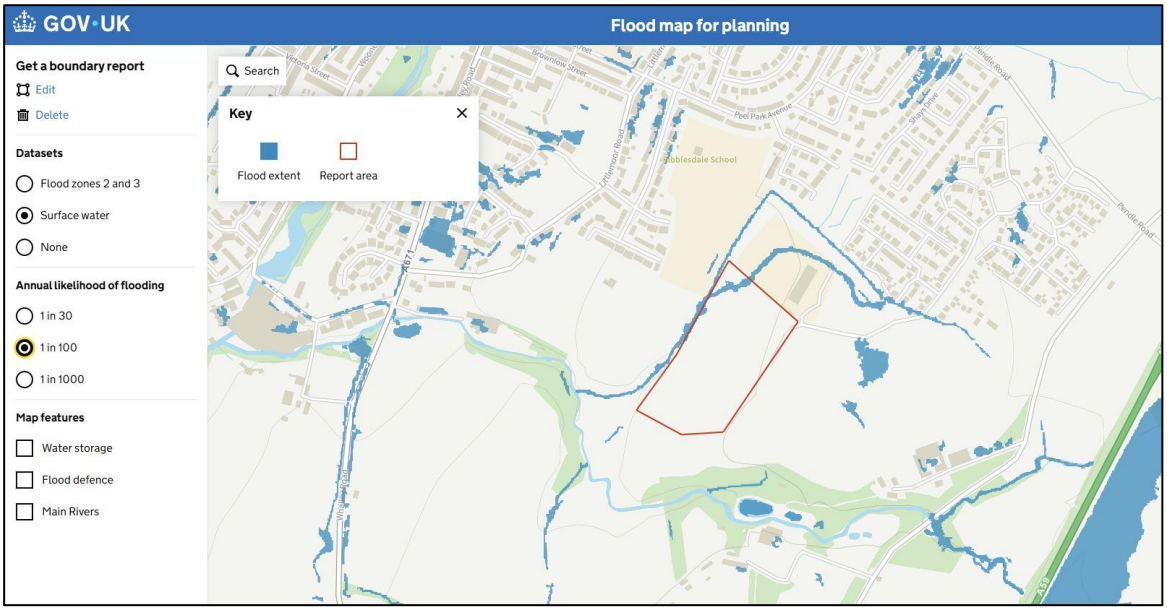


Figure 7: Environment Agency Extent of Surface Water Flooding Map

3.9.6 The risk of surface water flooding to the development can be mitigated by ensuring the surface water management network safely manages rainfall events to the required standard. Also, a careful consideration of finished floor levels is made during the design of proposed site levels.

3.9.7 Following implementation of the mitigation measures the risk of surface water flooding to the site can be considered low.

3.10 Flooding from Sewers

3.10.1 Flooding from the sewers occurs when surcharging during periods of excess flow breaks ground, typically at manholes or road gullies. The proposed development is not likely to increase the risk posed by sewer flooding as the surface water runoff, a primary cause of sewer surcharging, from the site is to be managed in accordance with the requirements of the NPPF and LLFA.

3.10.2 The development area is a greenfield site, so it is currently undeveloped, therefore greenfield discharge rate will be applied for the surface water.

3.10.3 According to United Utilities maps, there are 150mm diameter foul and 1500mm diameter surface water sewers within Higher Standen Drive.

3.10.4 Drainage for the proposed development will be designed to current best practice for the foul sewers using Approved Document H. Surface water drainage for the site will be designed to cater for the 100-year plus climate change event in accordance with current guidance and will incorporate long-term storage and SuDS as appropriate.

3.10.5 There are no sewers within the site boundary, so no alterations will be made. Proposed drainage within the site will be designed to the current requirements of the LLFA the site can be considered at low risk of sewer flooding.

3.11 Flooding from Infrastructure

3.11.1 Flooding from infrastructure occurs when canals, dams or other manmade structures capacity is exceeded, or fail. The Environment Agency Flood Map for Planning confirms the site is not within a flood risk area for a reservoir and the site is not located near canals.

3.11.2 There is no risk of flooding associated with infrastructure failure.

3.12 Flooding from Groundwater

3.12.1 The Environment Agency Flood Map for Planning confirms the site is not within a flood risk area from groundwater. This indicates that the site falls within a low likelyhood area for groundwater flooding.

3.12.2 The site has sufficient topographic relief for groundwater emergence not to cause a significant risk.

3.12.3 Appropriate finished floor level (FFL) are to be considered to mitigate against any potential flooding.

3.12.4 There are no other sources of flooding that affect the site. Overall flood risk to the proposed development can be considered low.

4 Climate Change

4.1 Paragraph 162 of the National Planning Policy Framework (NPPF) requires that plans should take a proactive approach to mitigating and adapting to climate change.

4.2 Paragraph 181 of the NPPF requires all plans to adopt a sequential risk-based approach taking into account all sources of flood risk and future impacts of climate change.

4.3 To appropriately mitigate the increased flood risk caused by climate change the Government has published guidance (https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances) related to the appropriate climate change allowances.

3.3% Annual Exceedance Rainfall Event		
Epoch	**Central Allowance**	**Upper End Allowance**
2050s	25%	35%
2070s	30%	40%
1% Annual Exceedance Rainfall Event		
Epoch	Central Allowance	Upper End Allowance
2050s	25%	40%
2070s	35%	50%

Table 2: Climate Change Allowances.

4.4 For development with a lifetime between 2061 and 2125 the 2070s epoch data should be used.

4.5 To mitigate the impact of climate change on the development the upper end allowances should be considered for both the 1% and 3.3% annual exceedance probability events and the development should be design for the 1% annual exceedance probability event so that there is:

4.5.1 No increased flooding elsewhere.

4.5.2 And the development is safe from surface water flooding.

4.6 Where new surface water drainage is proposed an allowance for climate change shall be included to mitigate the risk.

5 Emergency Access/Escape

5.1 With flood risk to the site considered low and the area being within a flood zone 1 for sea and rivers, there is no requirement for an emergency access or escape routes.

6 Flood Risk Summary and Conclusion

6.1 From the above assessment of flood risk, it has been established that the development site is entirely within Flood Zone 1 for river and sea flooding.

6.2 Surface water flood risk can be mitigated through careful consideration of finished floor levels and implementation of a SuDS drainage scheme that helps to manage runoff from the development.

6.3 The surface water drainage network will be designed taking climate change into consideration and to help ensure the development is safe for its lifetime.

6.4 The development will not increase the risk of flooding off site.

Surface Water Drainage Strategy

7 Policy Context

7.1 The LLFA expect the surface water management strategy to comply with:

7.2 Paragraph 80 of the Planning Practice Guidance (PPG);

7.3 Paragraph 175 of the National Planning Policy Framework; and

7.4 National Standards for SuDS requires that surface water from development be discharged in line discharge hierarchy:

7.4.1 Rainwater harvesting.

7.4.2 Infiltrate into the ground close to source

7.4.3 Discharge runoff to a surface water body.

7.4.4 Discharge runoff to a surface water sewer, or other surface water drainage system.

7.4.5 Discharge to a combined sewer.

7.5 The implementation of the hierarchy will be discussed in greater detail in Section 11.

7.6 Paragraph 181 of the National Planning Policy requires major developments to incorporate sustainable drainage systems unless there is clear evidence that their inclusion would be inappropriate. Sustainable drainage systems should:

7.6.1 Take account of advice from the LLFA.

7.6.2 Have appropriate proposed minimum operational standards.

7.6.3 Have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and

7.6.4 Where possible, provide multifunctional benefits.

7.7 The National Standards for SuDS are:

7.7.1 S1 requires, that runoff should be discharged following the hierarchy stated above. Appropriate evidence is to be provided to demonstrate all higher priority final destinations have been utilised to the maximum extent practicable. Higher cost alone shall not be a reason to utilise lower priority destinations. Where more than one destination is utilised, each final destination's ability to accept runoff shall be maximised in order of priority.

7.7.2 S2 requires, that at least the first 5mm of rainfall for the majority of rainfall events does not result in runoff from the site to surface waters or piped drainage systems. Evidence shall be provided that the approach to managing runoff from 'everyday' rainfall has been developed alongside and in support of the management of runoff quality and the delivery of amenity and biodiversity benefits.

7.7.3 S3 requires, development runoff is managed during extreme rainfall, including allowances for climate chance and urban creep. Across all discharge methods the flood risk should be mitigated to ensure there is no increased risk elsewhere. Any flooding for events up to the 1% AEP shall be managed within the development. Any flooding from off-site sources shall be managed on site or safely routed through the site, ensuring no increased downstream risks compared to the predevelopment scenario.

7.7.4 S4 requires, a SuDS approach that protects surface waters, groundwater and coastal waters by managing the quality of the surface water runoff to adequately address water quality risks from the development. The proposals shall utilise SuDS based on a robust water quality risk assessment, appropriate to the pollution hazard and sensitivity of receiving waters. It should reflect industry recognised guidance or other quantitative assessments as agreed with the approving body and permitting requirements.

7.7.5 S5 requires, that SuDS should maximise benefits for amenity through the creation of multi-functional places and landscapes.

7.7.6 S6 requires SuDS be used to ensure surface water drainage system maximises biodiversity benefits throughout the development lifecycle. This can be done by creating diverse, self-sustaining and resilient local ecosystems. Also, supporting natural local habitat and species and contributing to the delivery of local biodiversity strategies and contributing to habitat connectivity.

7.7.7 S7 requires that drainage systems can be easily and safely constructed and maintained. A maintenance plan is to be provided that support the design objectives within standards 1 to 6. Surface water drainage design should examine any potential failure scenarios that can occur during the operational design life and manage these risks. It shall be designed to ensure structural integrity under anticipated loading conditions to ensure the structural integrity of the proposed or existing components is not affected.

7.8 The requirements of the local and national policy will be addressed by the proposed site layout and proposed drainage system, discussed in detail in Sections 9 and 11.

8 Existing Drainage

8.1 Compliance with policy begins with a review of the existing site and its drainage characteristics.

8.2 As discussed within the flood risk assessment, the development site is considered to have a greenfield land classification as it falls within an area with no existing building and no existing drainage serving the area.

8.3 The nearest waterbody to the development is located along the western boundary of the site.

8.4 The site topography directs runoff from the north-east to the south-west.

8.5 The standard S3 of the Non-Statutory Technical Standards for Sustainable Drainage requires that surface water runoff from development sites be as close as reasonably practicable to greenfield rates.

9 Proposed Site Layout

9.1 The proposed layout consists of 60 dwellings and associated roads, and is shown on Appendix A.

9.2 Proposed site levels have been developed to reflect the proposed use while maintaining the topographic relief of the existing site.

9.3 To mitigate residual flood risk proposed FFLs will be 150mm above existing ground levels except where provision is made for level access.

10 Urban Creep

10.1 Urban creep (10%) is applied to every dwelling. This can be found in the hydraulic calculations (Appendix E).

11 Proposed Surface Water Drainage

11.1 Planning policy requires that the proposed network manage surface water runoff in line with the discharge hierarchy noted in Section 7.

11.2 The first level of the hierarchy requires the use of rainwater harvesting systems. The site is located within a non-water stressed area; therefore, this option has not been explored.

11.3 The second level of the hierarchy requires that infiltration solutions be considered for the management of surface water runoff.

11.3.1 Infiltration systems can take the form of soakaways, detention ponds, permeable pavements, bio-retention areas, etc.

11.3.2 The Soilscapes viewer identified the general area as Soilscape 17, Slowly permeable seasonally wet acid loamy and clayey soils.

11.3.3 Soakaway testing to BRE365 will be required to confirm the viability of infiltration as means of managing surface water. However, based on the Soilscape classification and superficial geology, we assumed that infiltration would not be feasible.

11.4 The third tier of the hierarchy requires surface water to be discharged to a surface water body. There is an unknown waterbody along the western boundary of the site, hence, the drainage strategy will illustrate detention basins with a piped network out-falling to this waterbody.

11.4.1 The fourth tier of the hierarchy requires surface water to runoff to a surface water sewer, highway drain or other surface water drainage system. As previously mentioned in point 3.2, the United Utilities (UU) sewer records confirm that there is a surface water 1500mm diameter sewer in Higher Standen Drive.

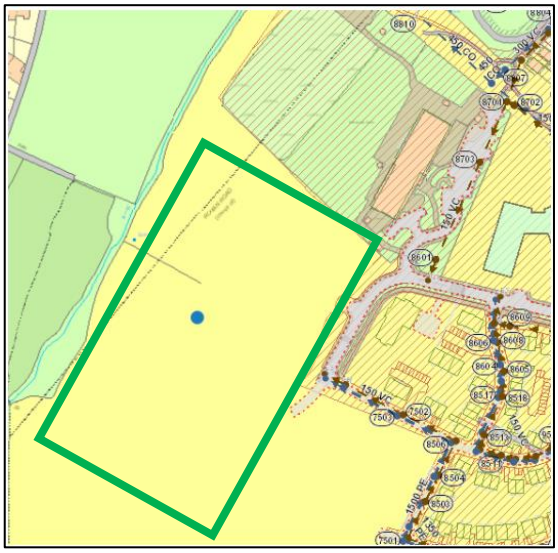


Figure 8: United Utilities sewer records.

11.5 The fifth tier requires surface water to be discharged to a combined sewer network.

11.5.1 UU sewer records shows no combined sewers in the vicinity of the site.

11.6 For the purpose of this drainage strategy, a connection to the waterbody will be considered, this option would be replaced or supplemented with an infiltration-based solution should BRE365 testing confirm infiltration as a viable means of surface water management.

11.7 Details of the proposed drainage strategy are presented on the proposed drainage plans in Appendix A.

11.8 As mentioned before, the site is considered greenfield to established the discharge rate. The greenfield (Q_{Bar}) runoff rate for the site was calculated as being 18.83l/s. The HR Wallingford calculations are provided in the Appendix B.

11.9 The proposed drainage networks require flow controls and attenuation, to achieve the required discharge rates and manage surface water to mitigate the flood risk stemming from the development, prior to discharge.

11.10 Attenuation is provided in the form of detention basins, prior to controlled discharge to the existing waterbody.

11.11 The calculations for the proposed drainage strategy network are provided in the Appendix E, for reference, these confirm the attenuation volume and discharge rate. The calculations confirm the resultant surface water runoff can be managed to satisfy the limiting discharge rate.

11.12 The simulation results confirm that the proposed surface water network satisfies the required design standards for all events up to and including the 100-year plus 50% climate change event.

11.13 The proposed surface water drainage network can be considered to fulfil the policy requirements as far as practicable.

12 Water Quality

12.1 Water quality guidance is set out in Chapter 26 of the SuDS Manual (CIRIA C753). For the anticipated hazards the simple index approach is suitable.

12.2 Pollution hazard indices for the simple index approach are provided in Table 26.2 of the SuDS Manual. The development site primarily consists of roofs, roads and driveways. The pollution hazard from these land use classifications can be considered low.

12.3 The use of detention basins will help to remove suspended solids, metals and hydrocarbons from the network before discharging to the waterbody.

13 Proposed Foul Water Network

13.1 The proposed foul water network will be designed in accordance with the requirement of Approved Document H.

13.2 The anticipated peak foul flows from the dwellings, based on an average of 0.05 l/s per unit (57 dwellings), is 2.85 l/s (based on SfA6). The final foul flows will need to be confirmed.

13.3 Foul water will be discharged to the foul water sewers located in Higher Standen Drive. This needs to be confirmed by United Utilities.

14 Maintenance and Management

14.1 The proposed drainage network will be adopted and managed by United Utilities.

The piped network, detention basins and flow controls will be maintained in accordance with the requirements noted in CIRIA C753 The SuDS Manual.

15 Surface Water Management summary and Conclusion

15.1 The proposed drainage network manages surface water runoff up to the 100-year plus 50% climate event.

15.2 Long-term storage is provided within the detention basins and the runoff rates are controlled to comply with standards S2 and S3 of the Non-Statutory Technical Standards for Sustainable Drainage Systems, as far as practicable, through the inclusion of a flow control in accordance with CIRIA C753.

15.3 The surface water discharge rate is controlled in line with the requirements of the Statutory Undertaker and the LLFA, discharge consent will be required prior to construction.

15.4 The proposed drainage network includes SuDS as far as practicable given the layout of the site and constraints set by the existing infrastructure.

15.5 Through the implementation of the proposed drainage strategy the site does not increase flooding within or downstream of the catchment including an allowance for climate change.

15.6 The proposed drainage network is considered to satisfy the requirement of local and national planning policy.

16 Appendix A – Drawings

Topographical Survey

Proposed Layout

Existing Catchment Plan

Proposed Catchment Plan

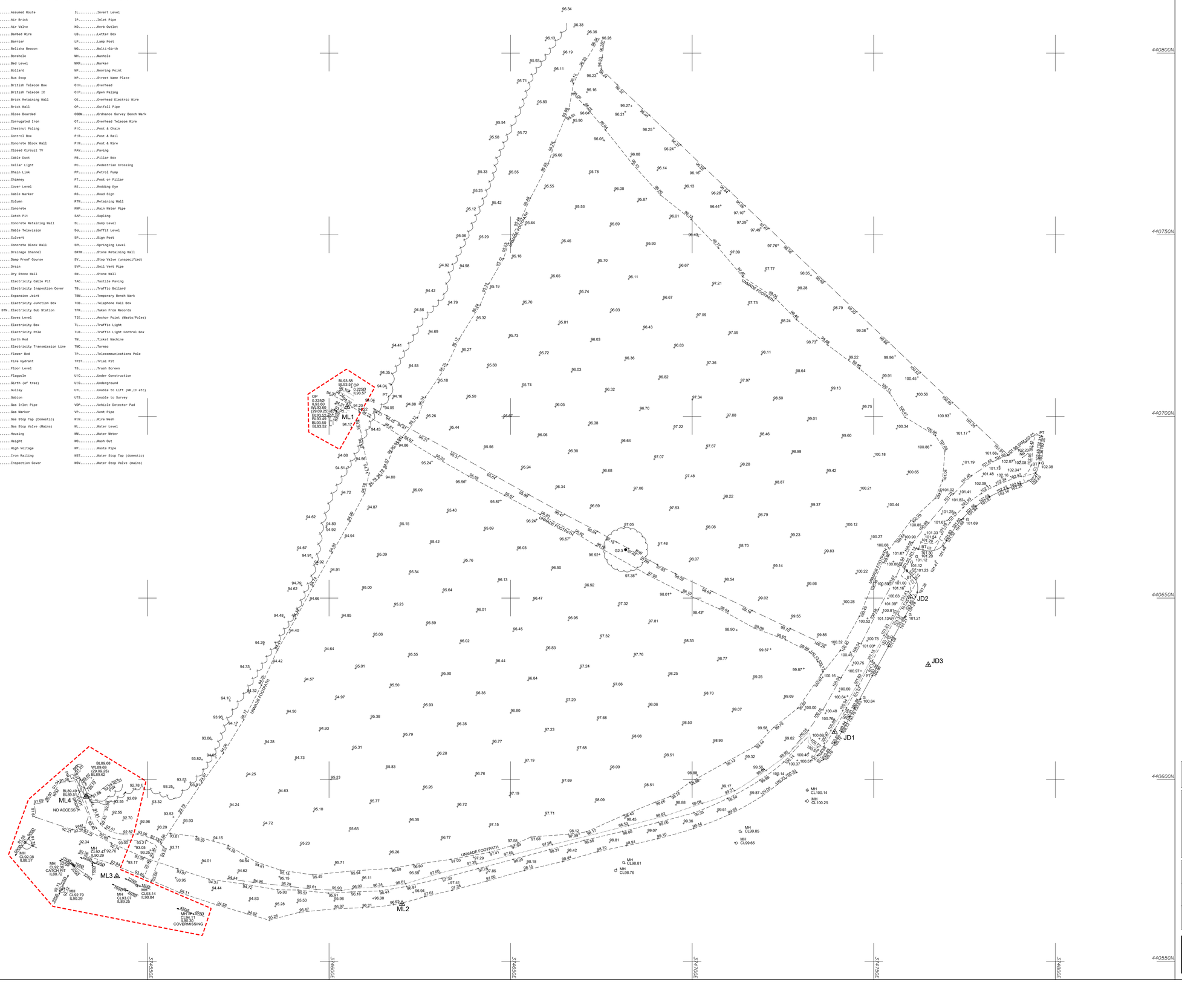
Flood Flow Route Plan

Drainage Strategy

STANDARD REFERENCE & ABBREVIATIONS

(AR).....Assumed Route
AB.....Air Brick
AV.....Air Valve
B/B.....Barbed Wire
BAR.....Barrier
BB.....Belisha Beacon
BH.....Borehole
BL.....Bed Level
BOL.....Bollard
BS.....Bus Stop
BT BOX.....British Telecom Box
BT.....British Telecom IC
BRTW.....Brick Retaining Wall
BW.....Brick Wall
C/B.....Close Boarded
C/I.....Corrugated Iron
C/P.....Chestnut Paling
CB.....Control Box
CBW.....Concrete Block Wall
CCTV.....Closed Circuit TV
CD.....Cable Duct
CEL.....Cellar Light
CH/L.....Chain Link
CHY.....Chimney
CL.....Cover Level
CM.....Cable Marker
COL.....Column
CONC.....Concrete
CP.....Catch Pit
CRTW.....Concrete Retaining Wall
CTV.....Cable Television
CUL.....Culvert
CW.....Concrete Block Wall
DC.....Drainage Channel
DPC.....Damp Proof Course
DR.....Drain
DSW.....Dry Stone Wall
ECP.....Electricity Cable Pit
EIC.....Electricity Inspection Cover
EJ.....Expansion Joint
EJB.....Electricity Junction Box
EL SUB STN..Electricity Sub Station
EL.....Eaves Level
ELB.....Electricity Box
EP.....Electricity Pole
ER.....Earth Rod
ETL.....Electricity Transmission Line
FB.....Flower Bed
FH.....Fire Hydrant
FL.....Floor Level
FP.....Flagpole
G*.*.....Girth (of tree)
G.....Gulley
GAB.....Gabion
GIP.....Gas Inlet Pipe
GMKR.....Gas Marker
GST.....Gas Stop Tap (Domestic)
GSV.....Gas Stop Valve (Mains)
HSE.....Housing
HT.....Height
HV.....High Voltage
I/R.....Iron Railing
IC.....Inspection Cover

IL.....Invert Level
IP.....Inlet Pipe
KO.....Kerb Outlet
LB.....Letter Box
LP.....Lamp Post
MG.....Multi-Girth
MH.....Manhole
MKR.....Marker
MP.....Mooring Point
NP.....Street Name Plate
O/H.....Overhead
O/P.....Open Paling
OE.....Overhead Electric Wire
OP.....Outfall Pipe
OSBM.....Ordnance Survey Bench Mark
OT.....Overhead Telecom Wire
P/G.....Post & Chain
P/R.....Post & Rail
P/W.....Post & Wire
PAV.....Paving
PB.....Pillar Box
PC.....Pedestrian Crossing
PP.....Petrol Pump
PT.....Post or Pillar
RE.....Rodding Eye
RS.....Road Sign
RTW.....Retaining Wall
RWP.....Rain Water Pipe
SAP.....Sapling
SL.....Sump Level
SOL.....Soffit Level
SP.....Sign Post
SPL.....Springing Level
SRTW.....Stone Retaining Wall
SV.....Stop Valve (unspecified)
SVP.....Soil Vent Pipe
SW.....Stone Wall
TAC.....Tactile Paving
TB.....Traffic Bollard
TBM.....Temporary Bench Mark
TCB.....Telephone Call Box
TFR.....Taken From Records
TIE.....Anchor Point (Wants/Poles)
TL.....Traffic Light
TLB.....Traffic Light Control Box
TM.....Ticket Machine
TMC.....Tarmac
TP.....Telecommunications Pole
TPIT.....Trial Pit
TS.....Trash Screen
U/G.....Under Construction
U/G.....Underground
UTL.....Unable to Lift (BM,IC etc)
UTS.....Unable to Survey
VDP.....Vehicle Detector Pad
VP.....Vent Pipe
W/W.....Wire Mesh
WL.....Water Level
WM.....Water Meter
WO.....Wash Out
WP.....Waste Pipe
WST.....Water Stop Tap (Domestic)
WSV.....Water Stop Valve (mains)



N

Note:
The survey is plotted on a plane local Grid. Orientation to National Grid.
All levels relate to Ordnance Datum, achieved using the OS National GPS Network.

Survey Control Markers established for Mapping purposes only and should not be used for Construction without the written approval of Survey Operations Ltd.

Areas within bold, dashed line surveyed September 2025 added to Survey Operations drawing number 24E052.

Revision - Date - Description
A - 12/03/98 - Manhole information added to drawing.

SURVEY STATIONS

Name	Easting	Northing	Height
JD1	374739.25	440613.14	100.99
JD2	374760.18	440650.21	101.53
JD3	374765.01	440631.61	101.47
ML1	374605.01	440702.69	94.28
ML2	374620.11	440565.83	97.01
ML3	374541.58	440573.43	93.04
ML4	374533.06	440595.32	91.51

SurveY OPERATIONS
Smith Street, Skelmersdale, Lancs. WN8 8LN
Tel: 01695 725662 Fax: 01695 51816
Email: mail@survops.co.uk – www.survops.co.uk

Client
Applethwaite Ltd

Drawing Title
Topographical Survey of Land at:
Land at Higher Standen
Clitheroe

Scale(s)	1:500	Surveyor	ML
Date	Oct 25	Drawn	OKS
Job Number	25I231	Checked	SO/MH

Sheet Size & Drg Number & Revision
A1 25I231/001 A

Land at Higher Standen Drive, Clitheroe BB7 1HF

ACCOMODATION SCHEDULE

Ref	House Type	Beds	Sq. Ft	FMV	Affordable	Total Beds	Total SqFt
Lon	Longthwaite	3	1174	6		18	7044
Yew	Yewdale	2	1126	4		8	4504
Fir	Firbank	3	1154	6		18	6924
Swi	Swindale	4	1289	1		4	1289
Con	Coniston	4	1301	5		20	6505
Win	Windermere	4	1363	6		24	8178
Lev	Levens	4	1430	2		8	2860
Cro	Crofton	4	1932	10		40	19320
Hav	Haverthwaite	5	2309	2		10	4618
Bar	Barton	2	760		10	20	7600
Sca	Scarfell	1	510		4	4	2040
Sca	Scarfell	1	527		4	4	2108
Total				**42**	**18**		
Grandtotal				**60**		**178**	**72990**

Key

Application Boundary

Boundary Treatments

1.8m Brick wall with timber infill panels

1.8m Timber fence

Hard Landscaping

Access Road / Footway

Shared Surface Road

Ramp

Private Footpath/Patio - Paving Slabs

Private Driveway/Parking

Private Shared Drive

Denotes dual aspect type

Exisiting neighbouring buildings

Topographical survey line (brown lines) measured where possible

Ordnance survey line (black lines)

Existing Trees

Trees to be retained

Trees / Bushes to be removed

Affordable housing location

Affordable housing plot

Applethwaite

Planning

General Arrangements

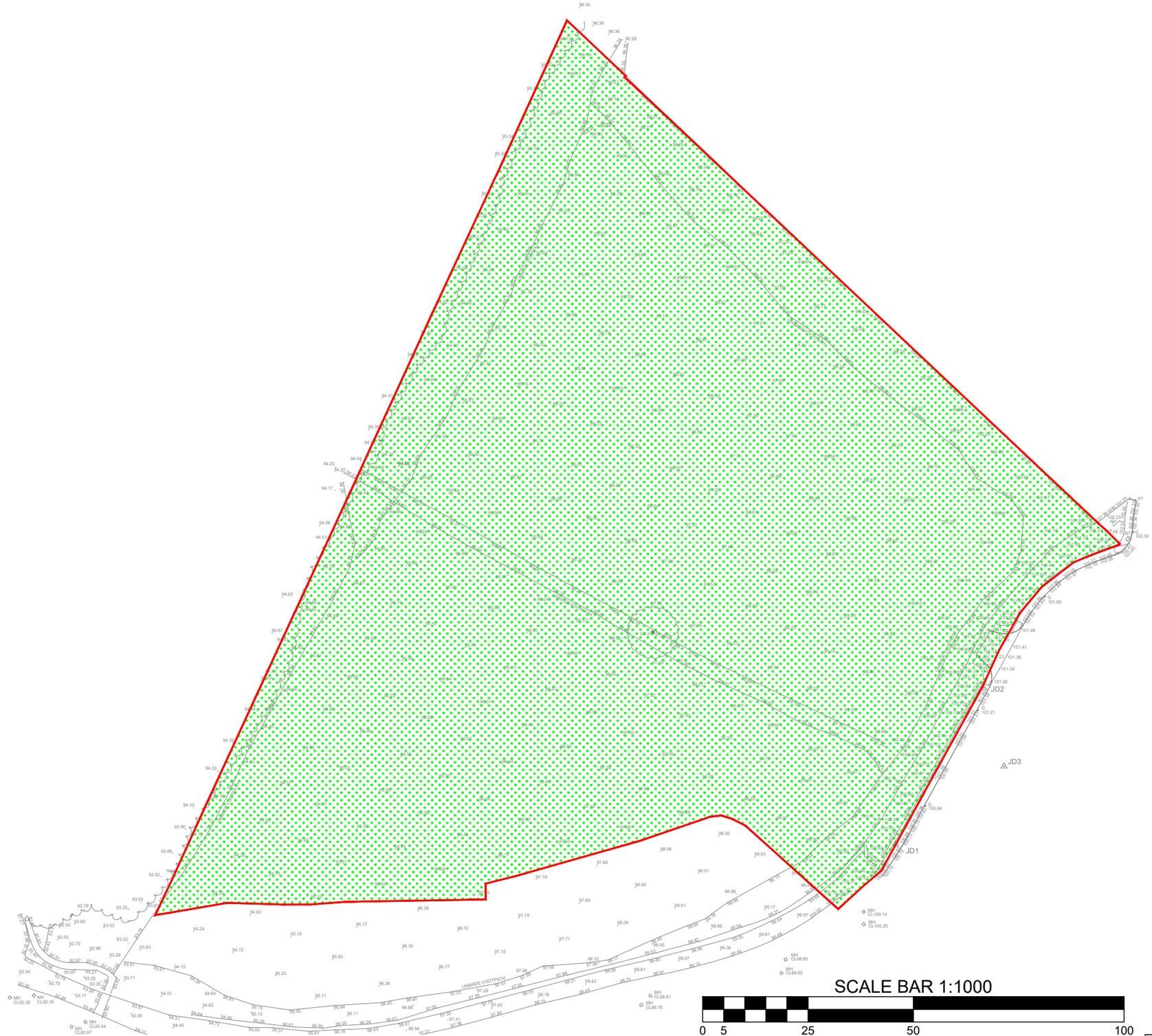
SCALE BAR 1:500 (0, 2.55, 10, 15, 25 m)

URBAN DESIGN GROUP REGISTERED PRACTICE

Drawing No.	25-166-P01	Rev.	-
Scale:	1:500		
Date:	Jan 26		
Sheet Size:	A1		

Woodcroft design
urban design | masterplanning | architecture

N



GENERAL NOTES

THIS DRAWING TO READ IN CONJUNCTION WITH ALL RELEVANT STRUCTURAL AND ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR / FABRICATOR PRIOR TO COMMENCEMENT OF WORKS.

ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.

ALL WORKS TO BE CARRIED OUT IN STRICT ACCORDANCE WITH THE ENGINEER'S SPECIFICATIONS, RELEVANT BRITISH STANDARDS AND WHERE APPLICABLE LOCAL AUTHORITIES REQUIREMENTS.

KEY

SITE BOUNDARY (25228 m²)

PERMEABLE AREA: 25228 m² (2.52ha)

Sutcliffe
Structural & Civil Engineering
Geotechnical & Environmental Investigations
Building Surveying
Pre Planning Services

Liverpool Head Office: 0151 227 3155
Manchester Office: 0161 817 5180
North Wales Office: 01978 664 071
London Office: 020 8016 4320

www.sutcliffe.co.uk

Drawing Status

PRELIMINARY DRAWING

Client

APPLETHWAITE HOMES LIMITED

Project

HIGHER STANDEN DRIVE
CLITHEROE

Drawing Title

EXISTING CATCHMENT PLAN

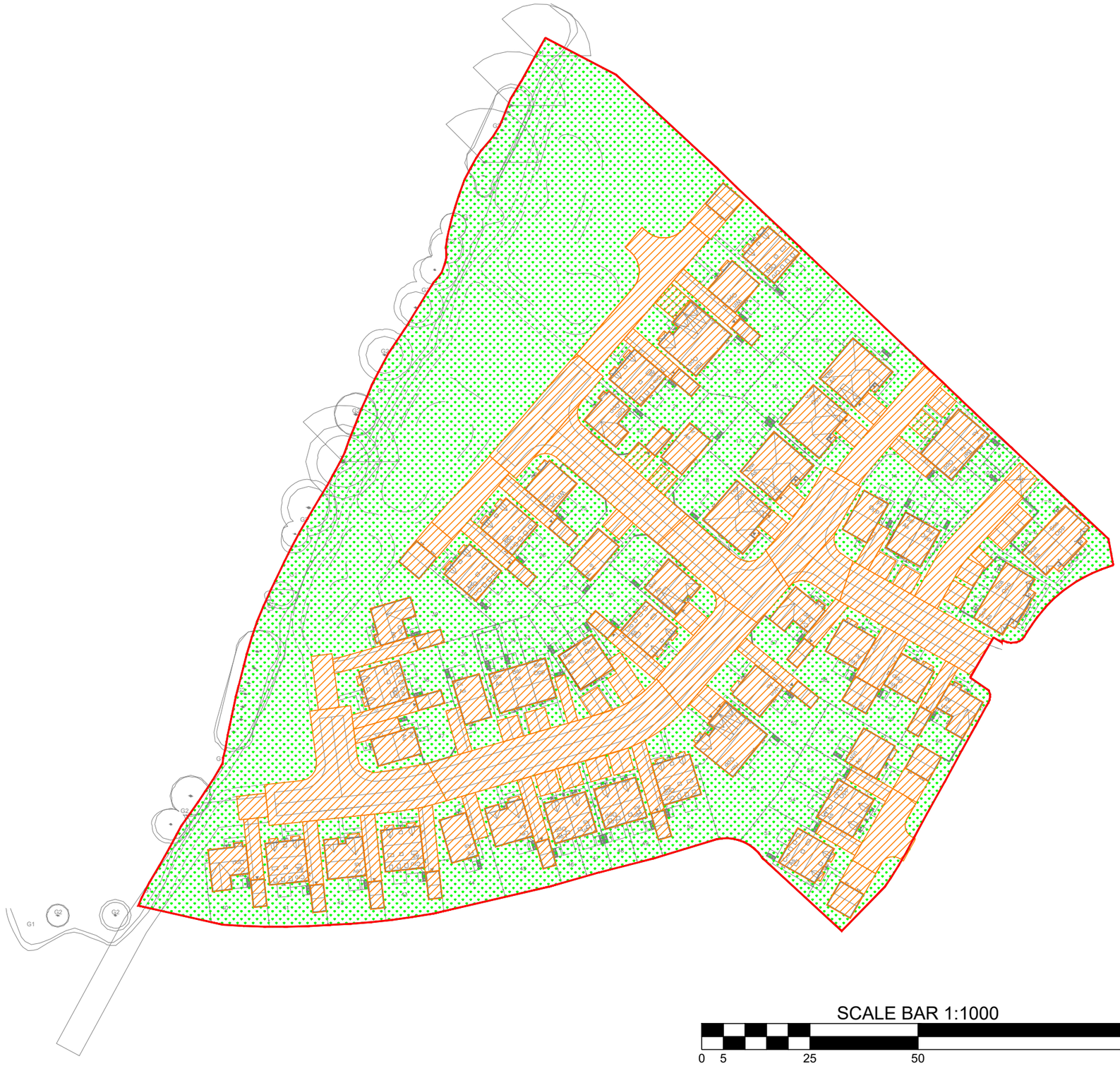
Rev	Description	Date	By	Chkd
P01	PRELIMINARY DRAWING	09.10.25	JG	AD

Date	Drawn By	Checked By
OCT. 25	JG	AD

Scale at A3	Project Number	Status	Revision
1:1000	35161		P01

Sheet Number

35161-SUT-ZZ-XX-DR-C-6000



GENERAL NOTES

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KEY

SITE BOUNDARY (25696 m²)

PERMEABLE AREA: 14.828 m² (1.48ha)

IMPERMEABLE AREA: 10.868m² (1.08ha)

SCALE BAR 1:1000

0 5 25 50 100

Rev	Description	Date	By	Chkd
P02	SITE LAYOUT UPDATED	12.01.26	JG	AD
P01	PRELIMINARY DRAWING	09.10.25	JG	AD

Sutcliffe
Structural & Civil Engineering
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Liverpool Head Office: 0151 227 3155
Manchester Office: 0161 817 5180
North Wales Office: 01978 664 071
London Office: 020 8016 4320
www.sutcliffe.co.uk

Drawing Status
PRELIMINARY DRAWING

Client
APPLETHWAITE HOMES LIMITED

Project
HIGHER STANDEN DRIVE
CLITHEROE

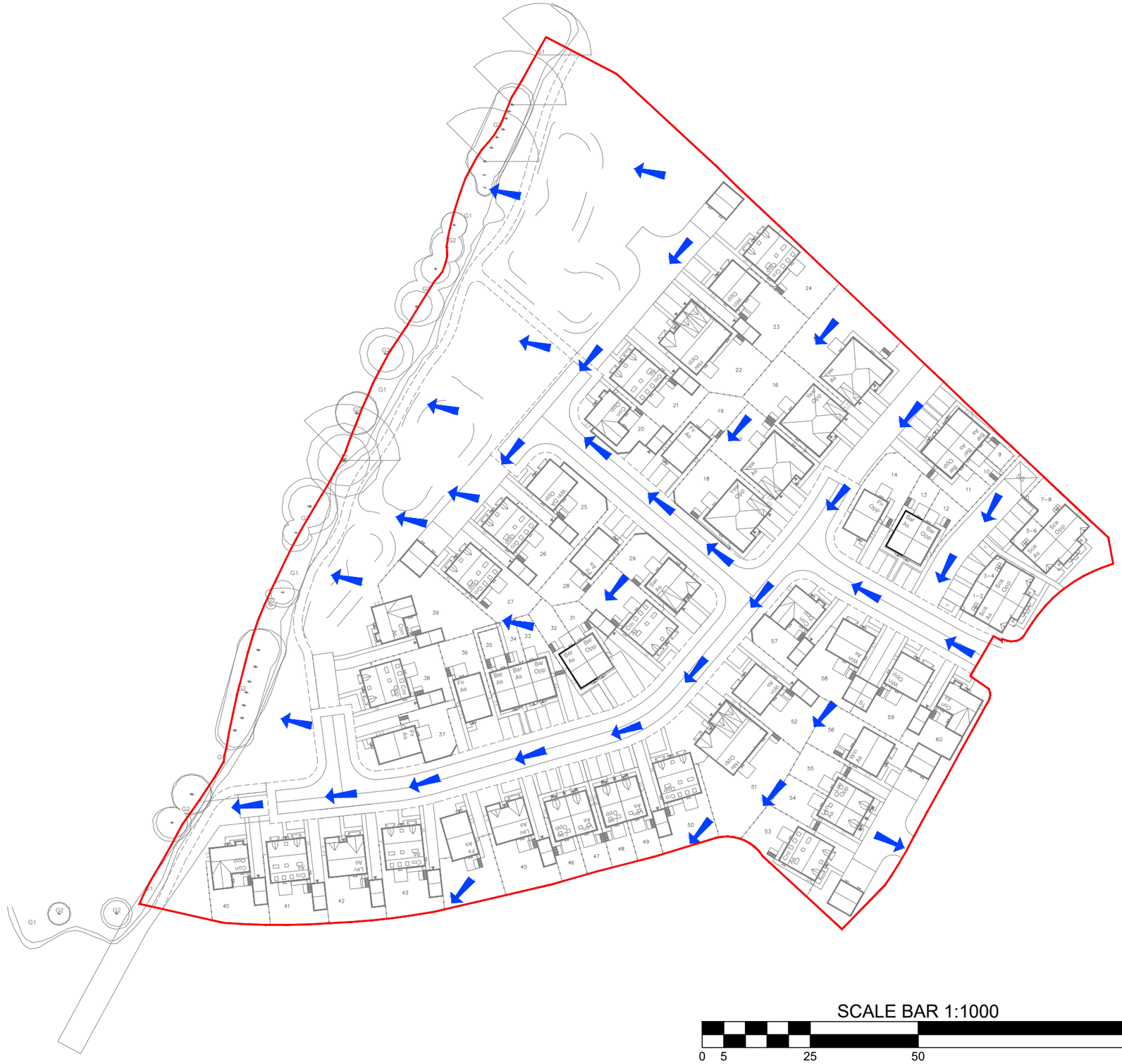
Drawing Title
PROPOSED CATCHMENT PLAN

Date	Drawn By	Checked By
OCT. 25	JG	AD

Scale at A3	Project Number	Status	Revision
1:1000	35161		P02

Sheet Number
35161-SUT-ZZ-XX-DR-C-6001

N



GENERAL NOTES

THIS DRAWING TO READ IN CONJUNCTION WITH ALL RELEVANT STRUCTURAL AND ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

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KEY

SITE BOUNDARY

FLOOD FLOW ROUTE

SCALE BAR 1:1000

0 5 25 50 100

Rev	Description	Date	By	Chkd
P02	SITE LAYOUT UPDATED	12.01.26	JG	AD
P01	PRELIMINARY DRAWING	09.10.25	JG	AD

Sutcliffe

Structural & Civil Engineering
Geotechnical & Environmental Investigations
Building Surveying
Pre Planning Services

Liverpool Head Office: 0151 227 3155
Manchester Office: 0161 817 5180
North Wales Office: 01978 664 071
London Office: 020 8016 4320

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Drawing Status

PRELIMINARY DRAWING

Client

APPLETHWAITE HOMES LIMITED

Project

HIGHER STANDEN DRIVE
CLITHEROE

Drawing Title

FLOOD FLOW ROUTE PLAN

Date	Drawn By	Checked By
OCT. 25	JG	AD

Scale at A3	Project Number	Status	Revision
1:1000	35161		P02

Sheet Number

35161-SUT-ZZ-XX-DR-C-6002

N

DESIGN CONTINGENCY

FOR COST PURPOSES THE CONTRACTOR IS TO INCLUDE THE FOLLOWING CONTINGENCY (% OF PRIMARY CIVILS DESIGN COST) AT THE RELEVANT PROJECT STATUS INDICATED ON THE DRAWING.

S2 - CONCEPT DESIGN - 25%
S3 - SPATIAL COORDINATION - 15%
S4 - TECHNICAL DESIGN - 10%
A5 - PRODUCTION INFORMATION - 5%

GENERAL NOTES

THIS DRAWING TO READ IN CONJUNCTION WITH ALL RELEVANT STRUCTURAL AND ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

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DRAINAGE KEY

- SITE BOUNDARY
- SURFACE WATER SEWER / MH
- FOUL WATER SEWER / MH
- 196.00 EXISTING LEVEL
- 3m EASEMENT
- ONLINE ATTENUATION BASIN

PHASE 6

Basin 1
Top: 95.341
Bottom: 94.341
Volume: 408 m³

Basin 2
Top: 95.059
Bottom: 94.059
Volume: 271 m³

Basin 3
Top: 94.993
Bottom: 93.893
Volume: 140 m³

S7 - Flow Control
Q: 5.0 l/s
CL: 95.958
IL: 94.129

S14 - Flow Control
Q: 18.83 l/s
CL: 94.80
IL: 93.973

S1 CL: 100.322 IL: 99.013
S2 CL: 98.768 IL: 97.082
S3 CL: 98.515 IL: 96.850
S4 CL: 98.163 IL: 95.115
S5 CL: 97.225 IL: 94.798
S8 CL: 97.892 IL: 96.350
S9 CL: 97.509 IL: 95.595
S10 CL: 97.264 IL: 95.067
S11 CL: 95.987 IL: 94.188
S12 CL: 95.736 IL: 94.143
S13 CL: 95.511 IL: 94.068
S15 CL: 94.63 IL: 93.90
F1 CL: 100.469 IL: 99.119
F2 CL: 98.853 IL: 97.376
F3 CL: 98.444 IL: 96.948
F4 CL: 96.872 IL: 94.70
F5 CL: 98.120 IL: 94.234
F6 CL: 97.532 IL: 94.029
F7 CL: 97.308 IL: 93.952
F8 CL: 95.997 IL: 93.613
F9 CL: 94.889 IL: 93.292
F10 CL: 93.50 IL: 92.162
EX F25 CL: 92.603 IL: 90.249
BD IL 91.974

No provision for sewer easement to serve employment parcel.

S552
24mm orifice plate flow control. Restricted to: 1 l/s (Contraflow 500 series from SUDStore ltd)

Cellular Crate 5 (S551)
Crate Base = 90.000
Area = 27sq.m
Storage Volume = 54cu.m.
Crate Depth = 92.000 (2 row)

S541
24mm orifice plate flow control. Restricted to: 2 l/s (Contraflow from SUDStore ltd)

Cellular Crate 4 (S541)
Crate Base = 94.250
Area = 55sq.m
Storage Volume = 66cu.m.
Crate Depth = 96.270 FFL 96.120 (3 row)

Cellular Crate 3 (S531)
Crate Base = 96.600
FFL 97.430
Storage Volume = 60cu.m.
Crate Depth = FFL 97.800 (3 row)

S531
25mm orifice plate flow control. Restricted to: 2 l/s (Contraflow from SUDStore ltd)

Spine Road chamber locations to be updated. To be reviewed at detailed design.

S515
(2.4 Dia flow control manhole)
Hydrobrake ✕ FFL 100.800
Flow Regulator
MD-SHE-0147-1310-2200-1310
Restricted to:
13.10 l/s @ 2.20m design head
✕ FFL 100.500 = 147mm

S527
(2.4 Dia flow control manhole)
Hydrobrake Optimum
Flow Regulator
MD-SHE-0154-1590-2750-1590
Restricted to:
15.90 l/s @ 2.75m design head
Orifice size = 116mm

ASSUMED LOCATION AND IL FW OUTFALL

Easement is within root protection areas. be investigated her at detailed design.

Plots to drain to existing phase 4 network via existing laterals, allowance of 3000m² from previous design.

SCALE BAR 1:500

Rev	Description	Date	By	Chkd
P06	FOUL WATER OUTFALL AMENDED	17.03.26	JG	AD
P05	TW SITE ADDED	09.03.26	JG	AD
P04	SITE LAYOUT UPDATED	12.01.26	JG	AD
P03	FOUL OUTFALL EASEMENT AMENDED	20.10.25	JG	AD
P02	AMENDED TO SUIT ROMAN ROAD	11.07.25	JG	AD
P01	ISSUE FOR INFORMATION	10.07.25	JG	AD

Drawing Status
PRELIMINARY DRAWING

Sutcliffe
Structural & Civil Engineering
Geotechnical & Environmental Investigations
Building Surveying
Pre Planning Services
Liverpool Head Office 0151 227 3155 · Manchester Office 0161 817 5160 · North Wales Office 01978 664 071 · London Office 020 8816 4320
www.sutcliffe.co.uk

Client
APPLETHWAITE HOMES LIMITED

Project
HIGHER STANDEN DRIVE
CLITHEROE

Drawing Title
OUTLINE DRAINAGE STRATEGY

Date	Drawn By	Checked By
JULY 25	JG	AD
Scale at A1	Project Number	Status	Revision
1:500	35161		P06

Sheet Number
35161-SUT-ZZ-XX-DR-C-6020

17 Appendix B – Greenfield runoff calculations

Greenfield runoff rate estimation tool

www.uksuds.com | Greenfield runoff rate estimation tool (https://www.uksuds.com/)

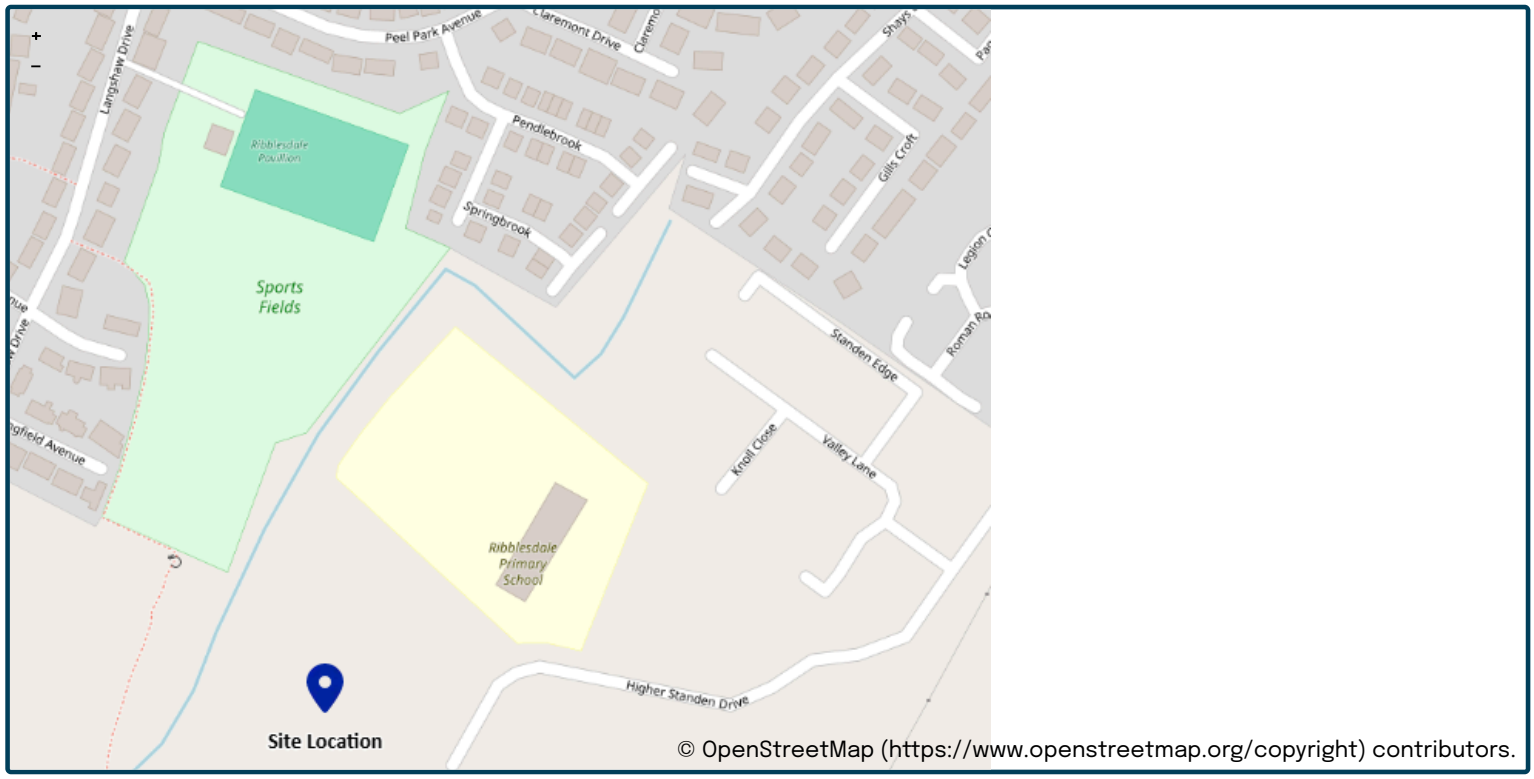
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). 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	09/10/2025
Calculated by	JG
Reference	35161
Model version	2.1.2

Location

Site name	HIGHER STANDEN DRIVE
Site location	CLITHEROE



Site easting (British National Grid)	374666
Site northing (British National Grid)	440636

Site details

Total site area (ha)	2.07 ha

Greenfield runoff

Method

Method	IH124

IH124

	My value		Map value
SAAR (mm)	1203 mm		1203
How should SPR be derived?	WRAP soil type		
WRAP soil type	4		4
SPR	0.47		
QBar (IH124) (l/s)	18.83 l/s		

Growth curve factors

	My value		Map value
Hydrological region	10		10
1 year growth factor	0.87		
2 year growth factor	0.93		
10 year growth factor	1.38		
30 year growth factor	1.7		
100 year growth factor	2.08		
200 year growth factor	2.37		

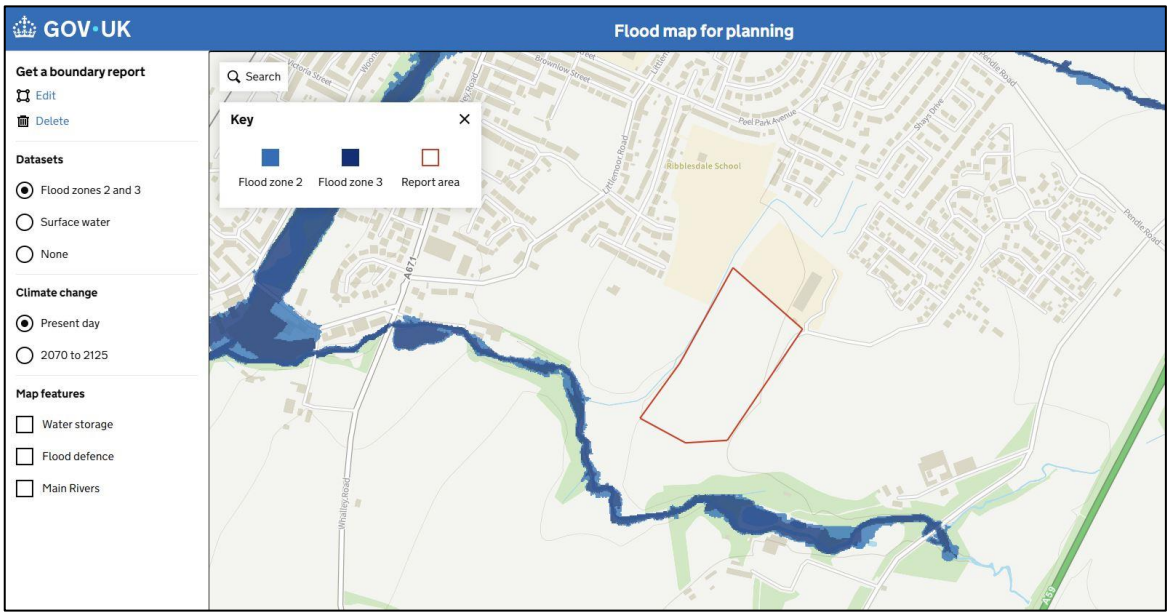
Results

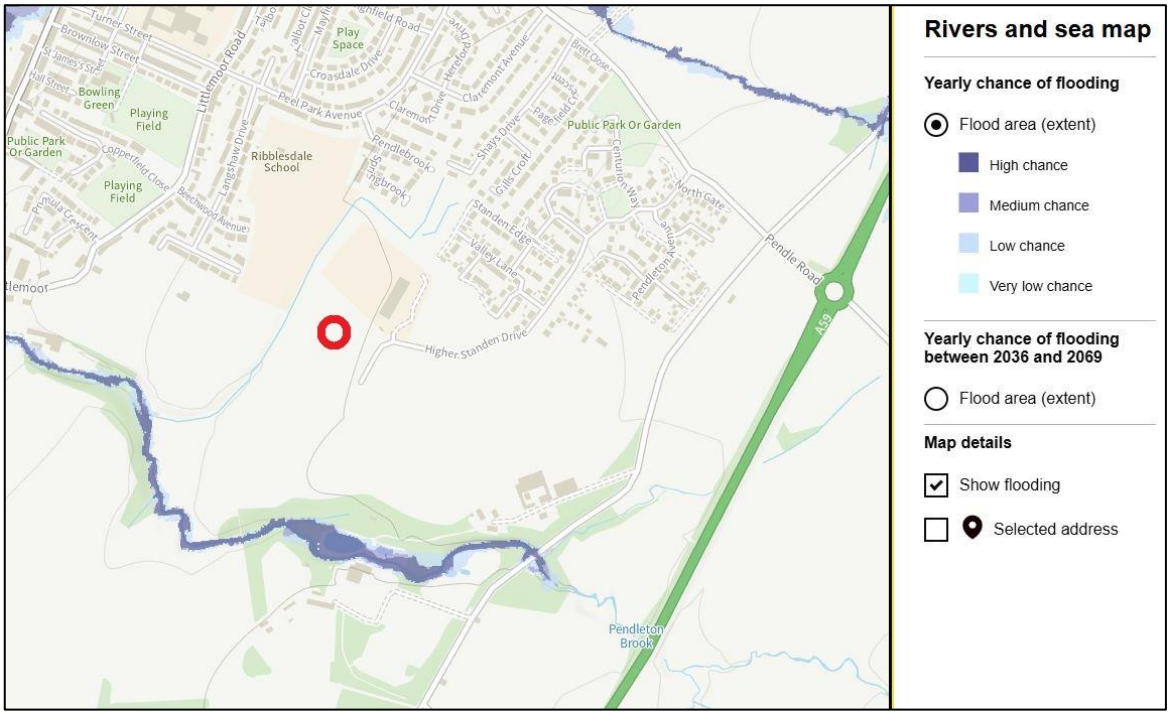
Method	IH124
Flow rate 1 year (l/s)	16.4 l/s
Flow rate 2 year (l/s)	17.5 l/s
Flow rate 10 years (l/s)	26.0 l/s
Flow rate 30 years (l/s)	32.0 l/s
Flow rate 100 years (l/s)	39.2 l/s
Flow rate 200 years (l/s)	44.6 l/s

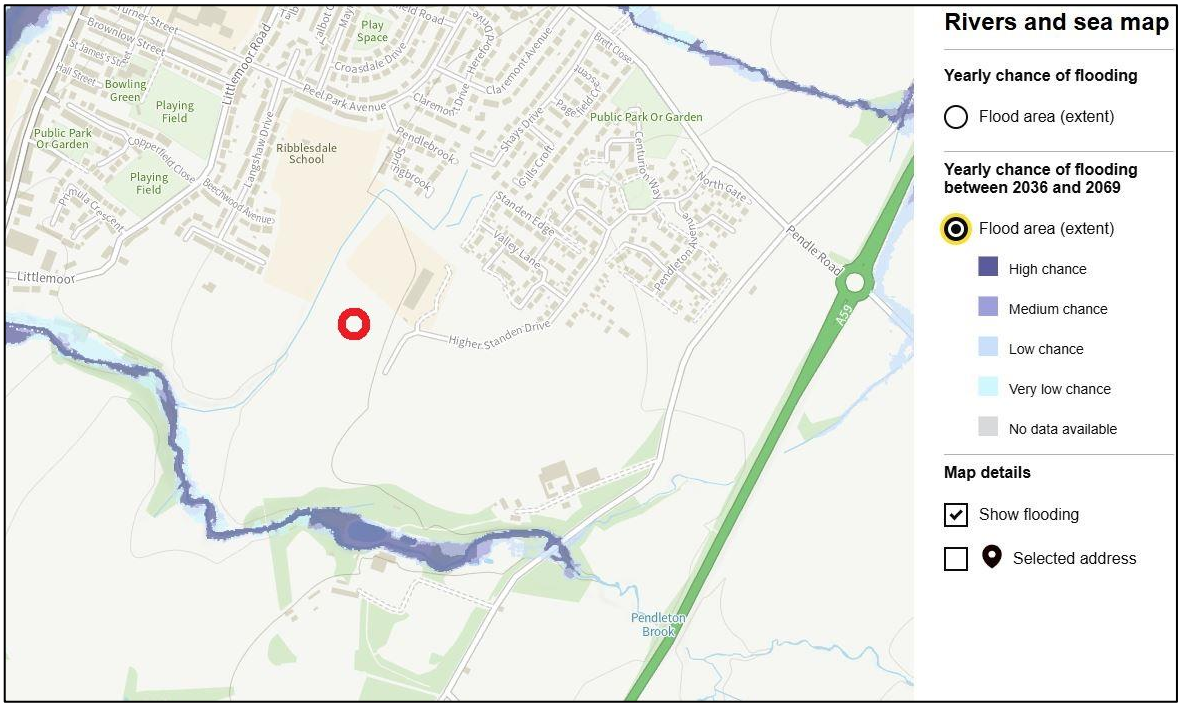
Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than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

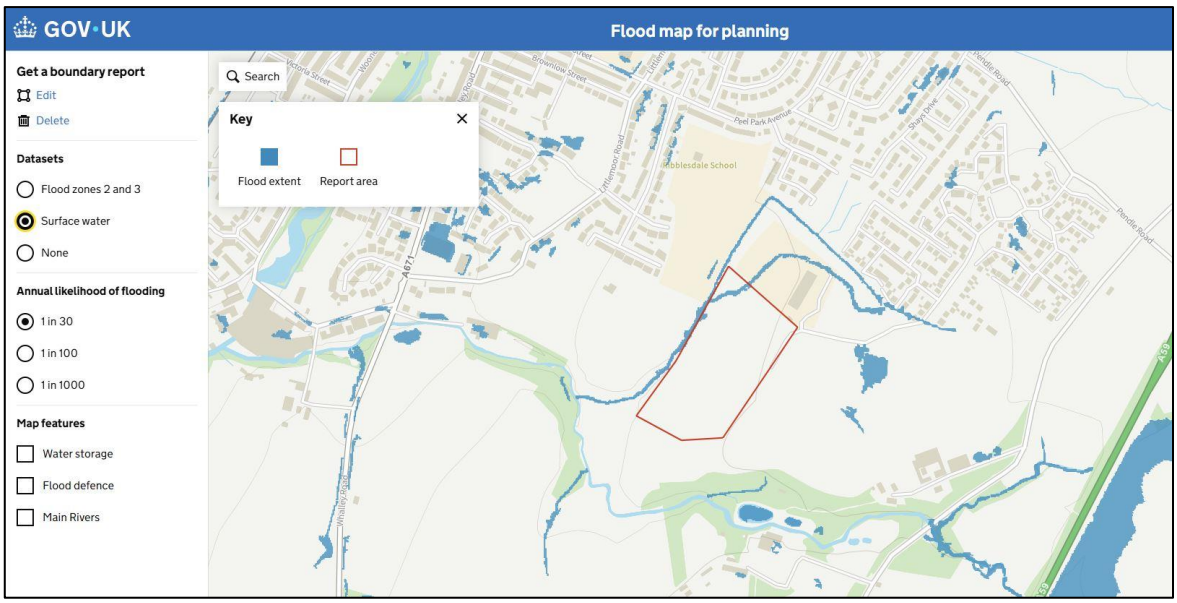
18 Appendix C – Environmental Agency Data

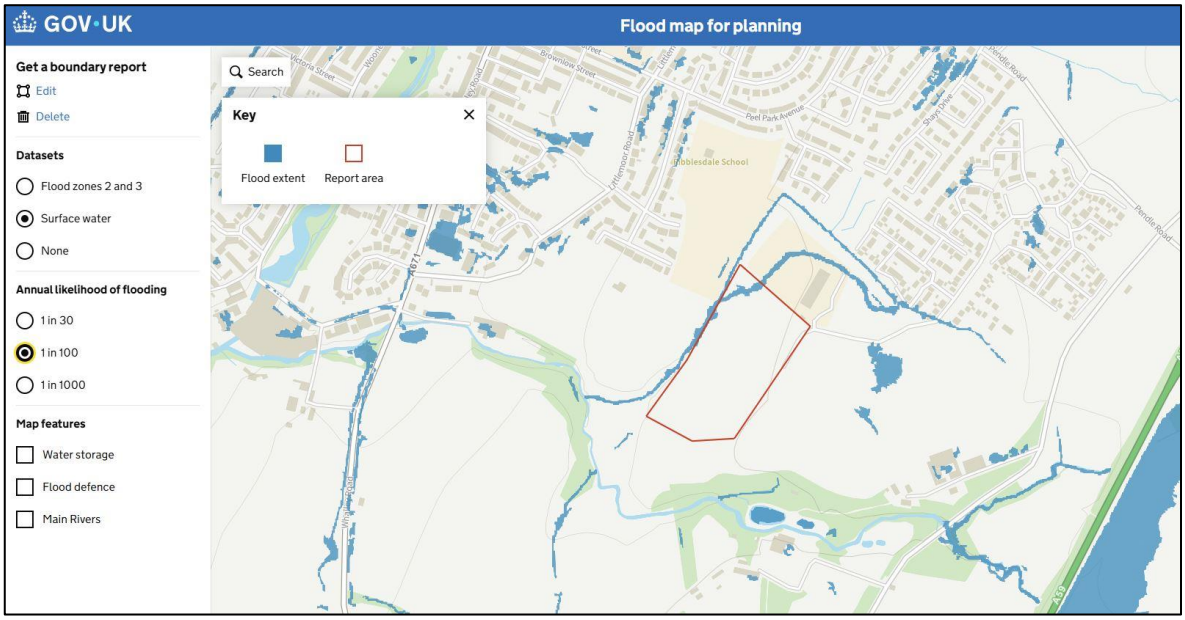
EA Flood maps






Rivers and sea map
Yearly chance of flooding
Flood area (extent)
Yearly chance of flooding between 2036 and 2069
Flood area (extent)
High chance
Medium chance
Low chance
Very low chance
No data available
Map details
Show flooding
Selected address
Higher Standen Drive
Littlemoor
Pendle Road
Pendleton Brook
Ribblesdale School
Public Park Or Garden
Playing Field
Bowling Green
Play Space
A59


GOV.UK
Flood map for planning
Get a boundary report
Edit
Delete
Datasets
Flood zones 2 and 3
Surface water
None
Annual likelihood of flooding
1 in 30
1 in 100
1 in 1000
Map features
Water storage
Flood defence
Main Rivers
Search
Key
Flood extent
Report area
A671
Ribblesdale School
Pendle Road


GOV·UK
Flood map for planning
Get a boundary report
Edit
Delete
Datasets
Flood zones 2 and 3
Surface water
None
Annual likelihood of flooding
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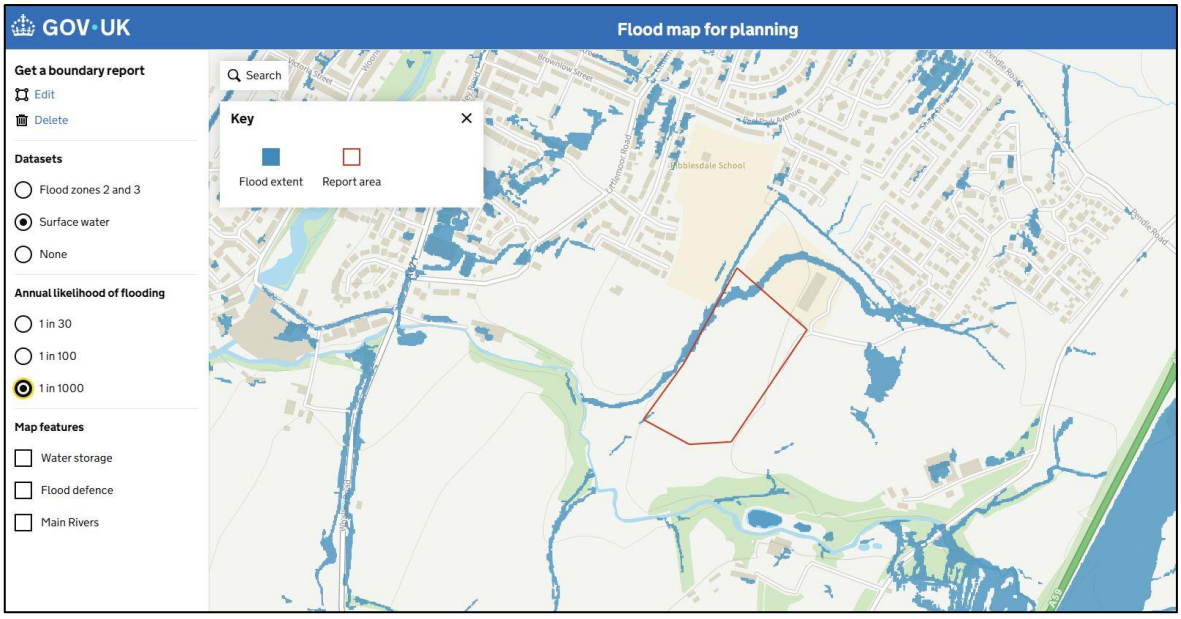
Map features
Water storage
Flood defence
Main Rivers
Search
Key
Flood extent
Report area


GOV·UK
Flood map for planning
Get a boundary report
Edit
Delete
Datasets
Flood zones 2 and 3
Surface water
None
Annual likelihood of flooding
1 in 30
1 in 100
1 in 1000
Map features
Water storage
Flood defence
Main Rivers
Search
Key
Flood extent
Report area

Flood risk summary

Your selected location: 1, Higher Peak Crescent, Clitheroe, BB7 1QY

This information tells you the flood risk of the land around a building, not the building itself.

▶ How we assess an area's flood risk

▶ Flood risk and climate change

Surface water

More about your surface water flood risk

Yearly chance of flooding

Very low	Low	Medium	High

Yearly chance of flooding between 2040 and 2060

Very low	Low	Medium	High

What surface water is

Surface water flooding is sometimes known as flash flooding. It happens when rainwater cannot drain away through normal drainage systems.

▶ Why surface water flooding is a problem

Rivers and the sea

More about your rivers and sea flood risk

Yearly chance of flooding

Very low	Low	Medium	High

Yearly chance of flooding between 2036 and 2069

Very low	Low	Medium	High

What makes rivers and sea flooding more likely

Low-lying areas that are close to rivers or the sea are more likely to flood when water levels rise.

This information takes into account any flood defences.

▶ Why flood defences cannot completely prevent flooding

Other flood risks

More about groundwater and reservoirs

Groundwater

Flooding from groundwater is unlikely in this area.

Reservoirs

Flooding from reservoirs is unlikely in this area.

19 Appendix D – Correspondence

WASTEWATER PRE-DEVELOPMENT ENQUIRY

United Utilities Grasmere House, 2nd Floor
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP

6th October 2025

Dear **Javier**

Pre-Development Enquiry for **Higher Standen Drive, Clitheroe, BB7 1QY** UU Reference Number: **08205440**

We have assessed your application based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your strategy will need review by other authorities as part of the planning process. We advise conducting necessary site investigations to confirm viability of your proposals.

Modelled Flood Risk Please see the image at the end of this letter for details

I can confirm that we do not have modelled flood risk within the vicinity of the proposed development.

Please note that our modelling data is indicative, and only representative of the 1:100year storm event.

Please see **comment 2** of the attached guidance sheet

Asset Protection

1. We have reviewed our records and can confirm that there does not appear to be any charted public sewers located within the boundary of the proposed development.

Please see **comment 3** of the attached guidance sheet and **Working Near Our Pipelines Guidance document**

Foul Water

Foul flow from this site will be allowed to drain into the public foul water/combined sewer system.

Our preferred point of discharge would be to the 150mm diameter public foul sewer within Spring Brook located NorthWest of your proposed development at a maximum pass forward flow an unrestricted rate.

Manhole reference SD74407905, Grid reference 374784, 40956

Please see the images at the end of this letter for clarification

WASTEWATER PRE-DEVELOPMENT ENQUIRY

Surface Water

Follow the National Planning Policy Guidance drainage hierarchy and Provide evidence for discounting higher options before considering public sewer discharge. Consult the Lead Local Flood Authority regarding surface water concerns.

Please see comment **4** within the guidance sheet

Infiltration

Please see comment **4** within the guidance sheet

Waterbody

If an evidence-based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you contact the Lead Local Flood Authority and/or Environment Agency to discuss a point of discharge to the **stream** to the West of the proposed site.

We would encourage you to engage with any third-party landowner and riparian owner to agree access and discharge rights to the water body if this is not in your ownership.

Public Sewer

United Utilities will consider a connection to the 900mm diameter public surface water sewer within Spring Brook located NorthWest of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities requests that any agreed rate does not exceed **22.9l/s.**

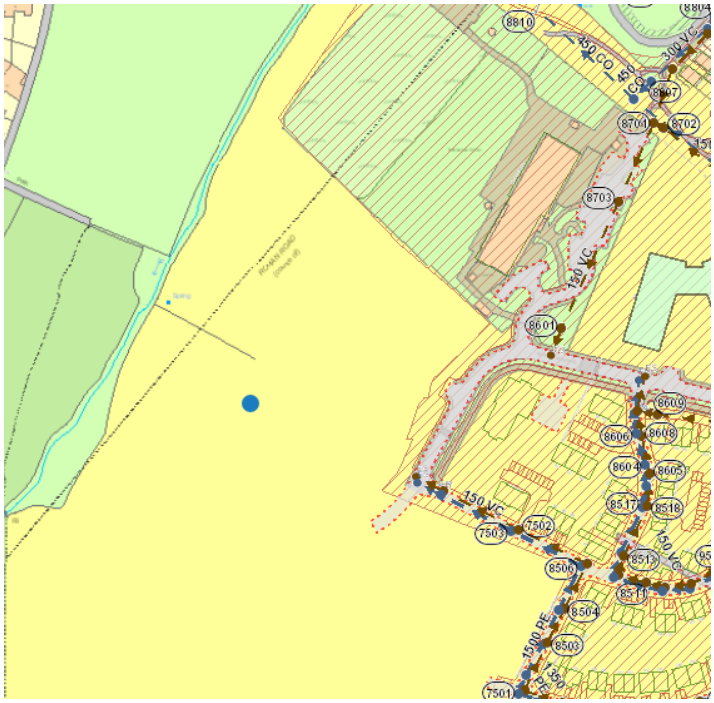
Manhole reference SD74408904, Grid reference 374806, 440943

Please see images at the end of this letter for clarification

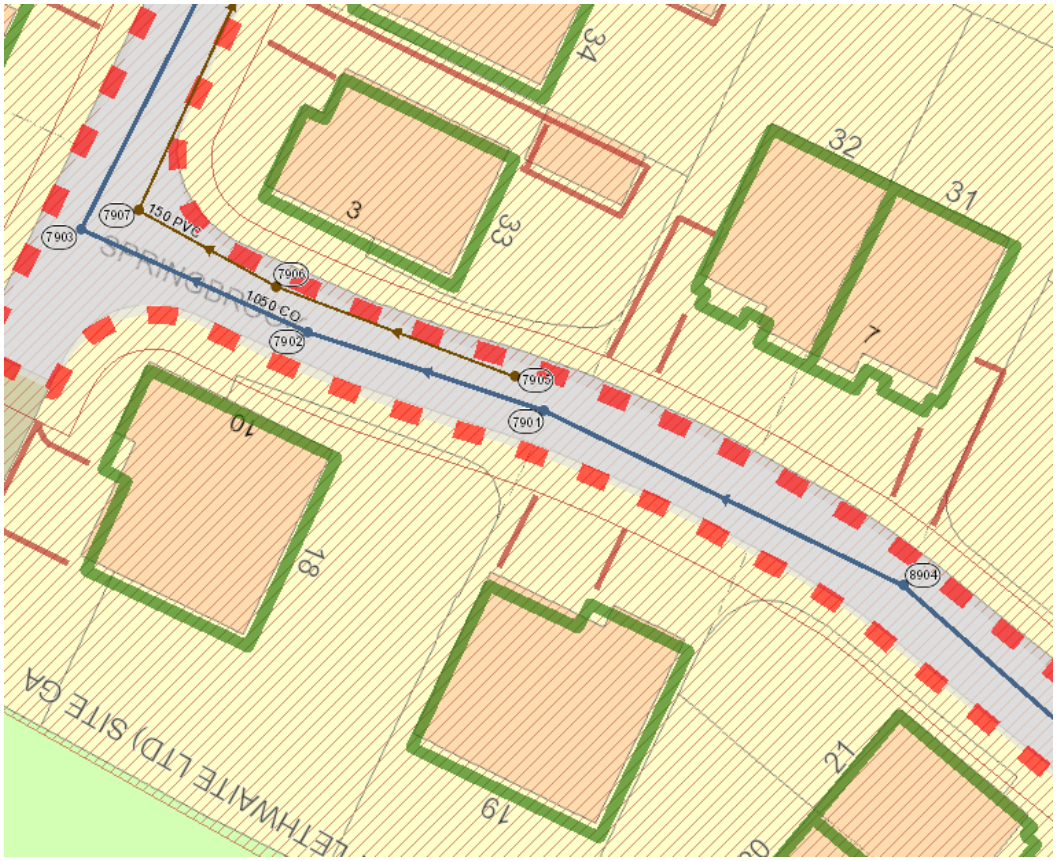
WASTEWATER PRE-DEVELOPMENT ENQUIRY

United Utilities
Water for the North West

Site Images



Foul and Surface Water Connection:



20 Appendix E – Calculations

Network Details

Manhole Schedule

Manhole	Catchment Area (ha)	Diameter (m)	Type	CL (m)	IL (m)	Depth To Soffit (m)	Easting (m)	Northing (m)
S1	0.136	1.350	Type C	100.322	99.013	1.084	374748.959	440668.289
S2	0.083	1.350	Type C	98.768	97.082	1.461	374723.734	440682.532
S3	0.117	1.350	Type C	98.515	96.850	1.290	374716.106	440689.529
S4	0.031	1.500	Type B	98.163	95.115	2.598	374704.779	440676.843
S5	0.162	1.500	Type B	97.225	94.798	1.977	374686.723	440692.784
Basin 1	0.000	1.500	Type C	95.341	94.341	0.550	374660.646	440743.116
S7	0.000	2.400	Unknown	95.958	94.129	1.229	374656.542	440718.536
Basin 2	0.100	1.800	Unknown	95.059	94.059	0.400	374630.751	440708.324
S8	0.055	1.350	Type C	97.892	96.350	1.392	374695.994	440666.014
S9	0.056	1.350	Type B	97.509	95.595	1.613	374683.530	440651.860
S10	0.141	1.500	Type B	97.264	95.067	1.746	374673.838	440645.873
S11	0.148	1.500	Type C	95.987	94.188	1.349	374627.066	440632.612
S12	0.073	1.800	Unknown	95.736	94.143	1.143	374609.133	440630.425
S13	0.053	1.800	Unknown	95.511	94.068	0.843	374604.750	440660.045
Basin 3	0.000	1.800	Unknown	94.993	93.993	0.400	374617.394	440687.111
S14	0.000	2.700	Unknown	94.800	93.973	0.602	374609.574	440689.240
S15	0.000	0.000	Type C	94.630	93.900	0.505	374597.378	440690.028

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (m)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
1.000	S1	99.013	S2	97.082	Circ	0.225mØ	28.969	15.0	0.600	1.084	1.461
1.001	S2	97.082	S3	96.925	Circ	0.3mØ	10.351	66.1	0.600	1.386	1.290
1.002	S3	96.850	S4	96.577	Circ	0.375mØ	17.007	62.3	0.600	1.289	1.210
1.003	S4	95.115	S5	94.798	Circ	0.45mØ	24.086	76.0	0.600	2.598	1.977
1.004	S5	94.798	S7	94.279	Circ	0.45mØ	39.674	76.4	0.600	1.977	1.229
2.000	Basin 1	94.341	S7	94.279	Circ	0.45mØ	24.920	400.0	0.600	0.550	1.229
1.005	S7	94.129	Basin 2	94.060	Circ	0.6mØ	27.739	400.0	0.600	1.229	0.399
1.006	Basin 2	94.059	Basin 3	93.993	Circ	0.6mØ	25.068	379.8	0.600	0.400	0.400
3.000	S8	96.350	S9	95.745	Circ	0.15mØ	18.859	31.2	0.600	1.392	1.613
3.001	S9	95.595	S10	95.217	Circ	0.3mØ	11.392	30.1	0.600	1.613	1.746
3.002	S10	95.067	S11	94.188	Circ	0.45mØ	48.615	55.3	0.600	1.746	1.349
3.003	S11	94.188	S12	94.143	Circ	0.45mØ	18.066	400.0	0.600	1.349	1.143
3.004	S12	94.143	S13	94.068	Circ	0.6mØ	29.943	400.0	0.600	0.993	0.843
3.005	S13	94.068	Basin 3	93.993	Circ	0.6mØ	29.874	400.0	0.600	0.843	0.400
1.007	Basin 3	93.993	S14	93.973	Circ	0.6mØ	8.105	400.0	0.600	0.400	0.227
1.008	S14	93.973	S15	93.900	Circ	0.225mØ	12.221	167.0	0.600	0.602	0.505

Outfall Details

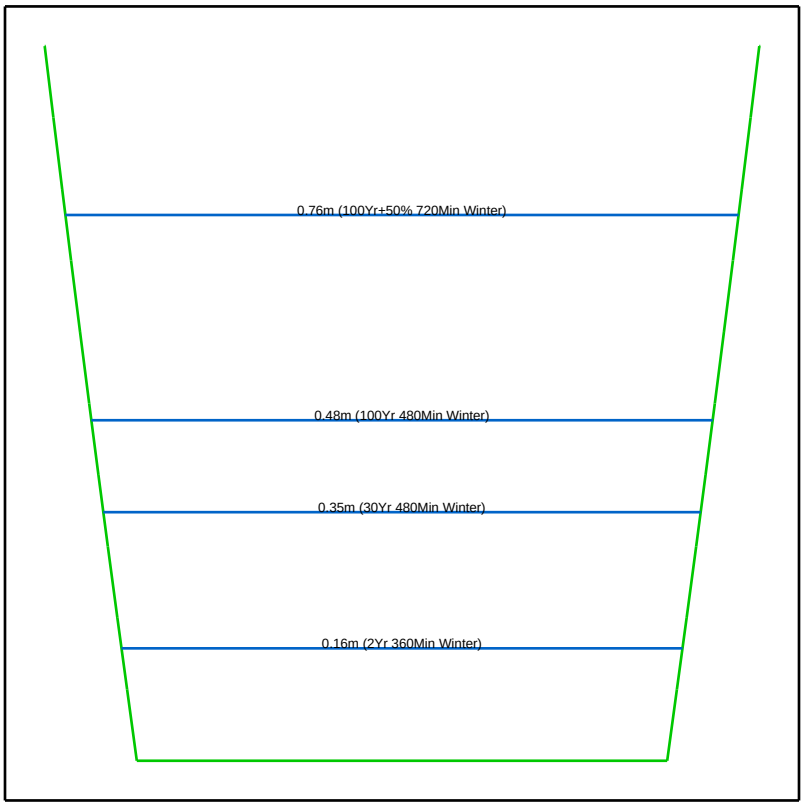
Outfall Manhole S15 : Free Discharge

Flow Control Details

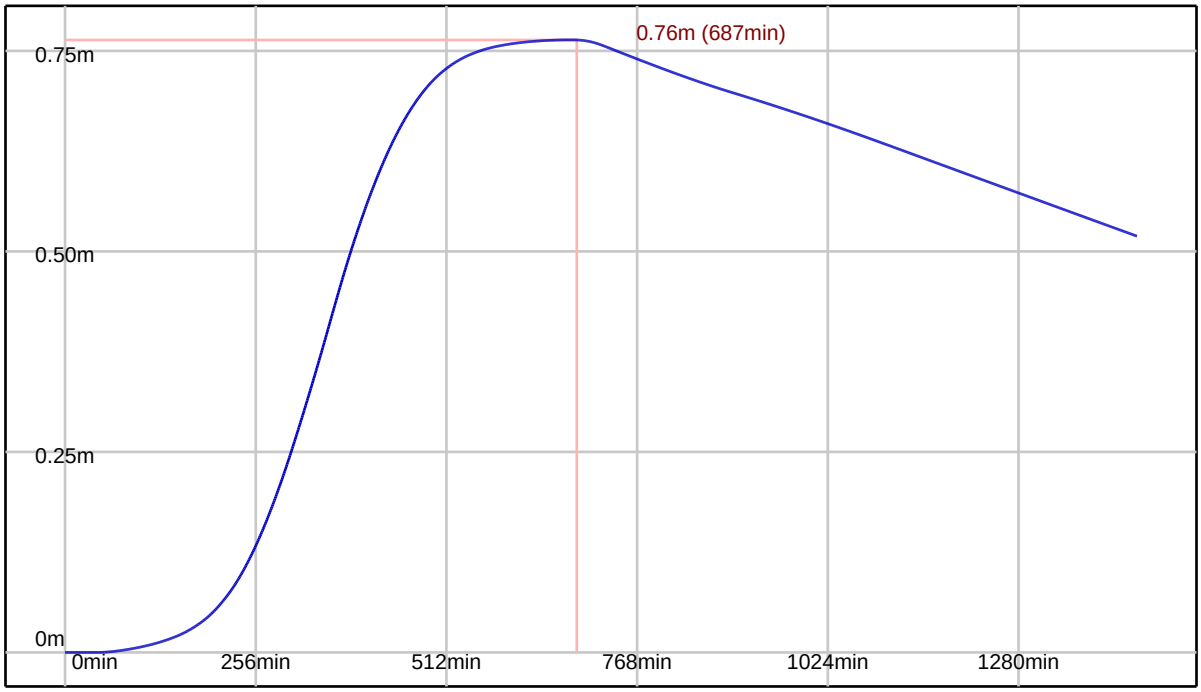
Pond Structure at Manhole Basin 1

Pond Invert (m)	Max Depth (m)	Volume To Water Level (m3)	Water Level (m)	Freeboard (m)	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
94.341	1.000	408.692	95.041	0.300	0.00000000	0.00000000	2.00

Pond Depth/Area Diagram at Basin 1



Pond at Basin 1 (100Yr+50% 720Min Winter)

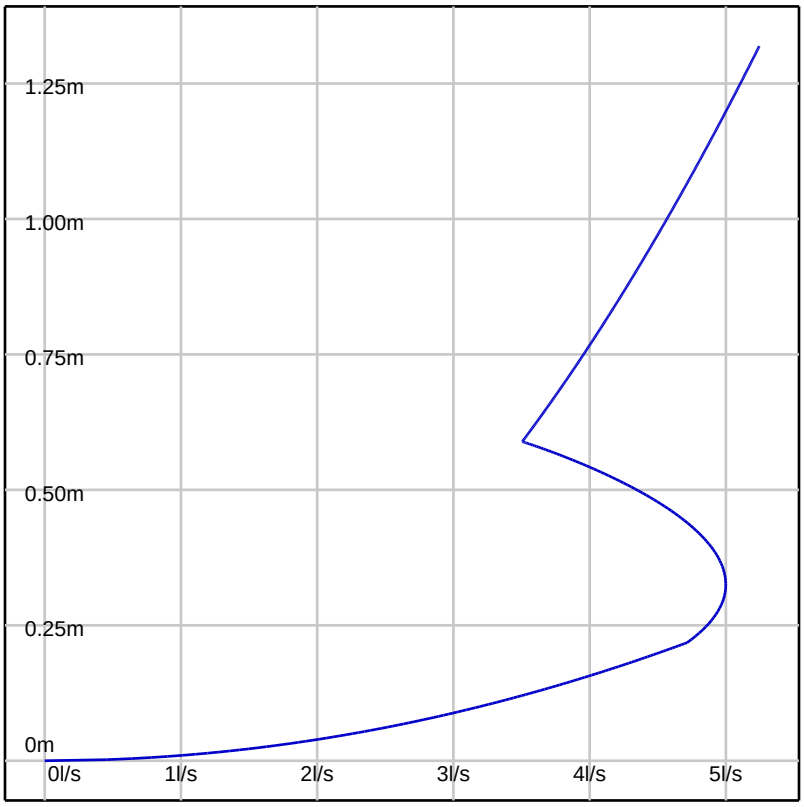


Controls within Manhole S7

ACO Q-Brake Control at Manhole S7

Model Ref	Design Depth (m)	Design Flow (l/s)	Depth Above Invert (m)	FF Head (m)	FF Flow (l/s)	KF Head (m)	KF Flow (l/s)
ACO_DD1.2000-DF5.0000	1.200	5.000	0.000	0.244	4.839	0.589	3.505

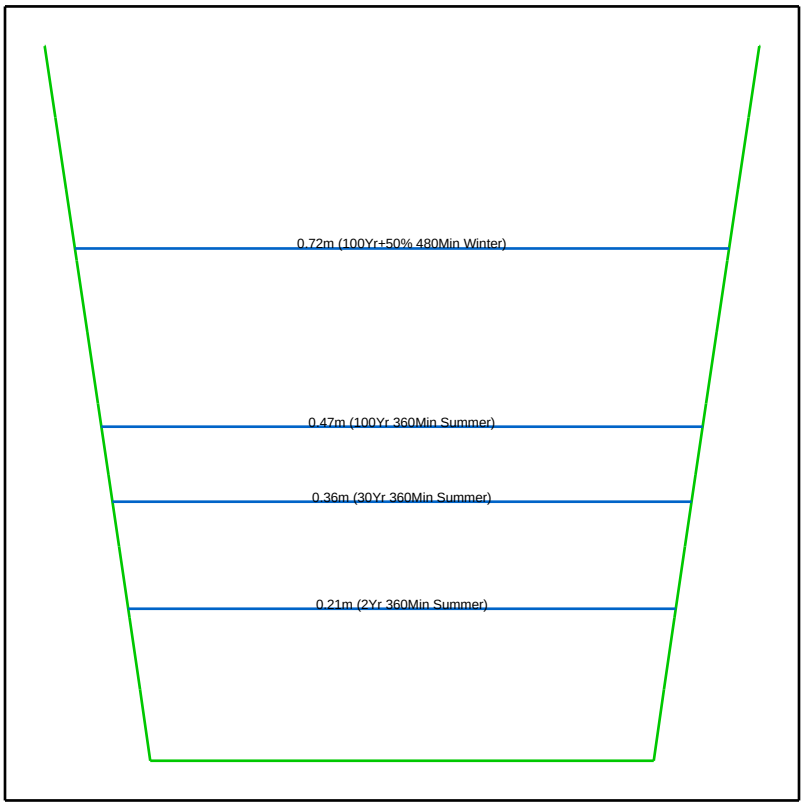
ACO Q-Brake Control at S7



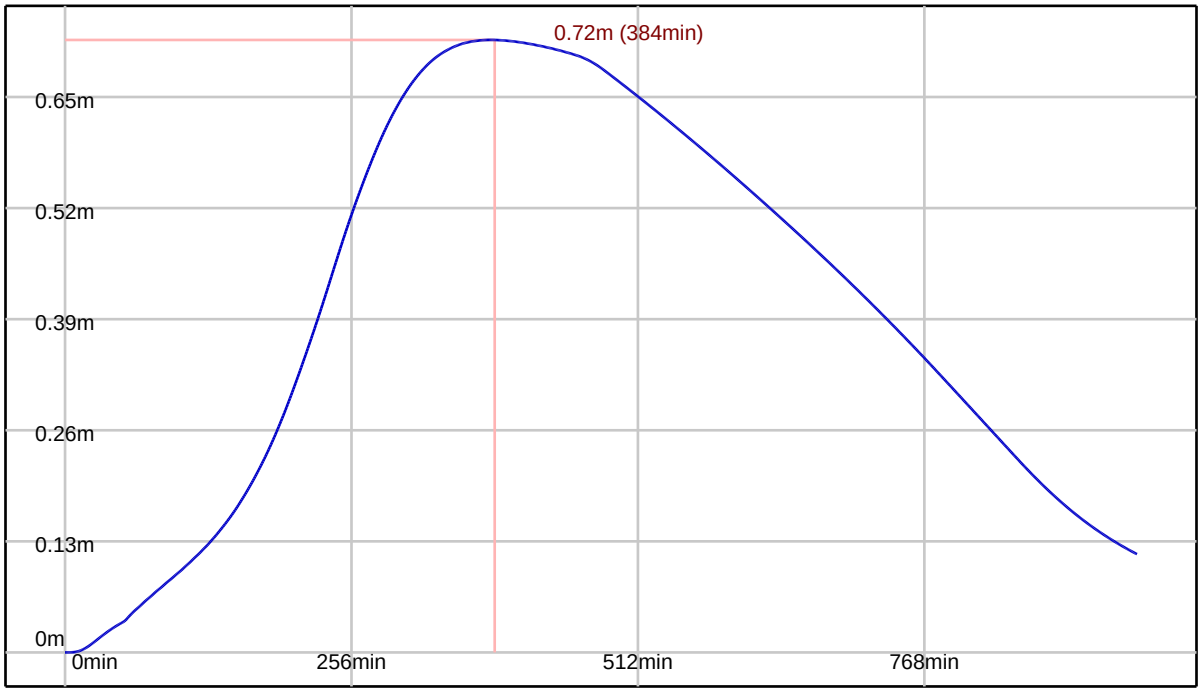
Pond Structure at Manhole Basin 2

Pond Invert (m)	Max Depth (m)	Volume To Water Level (m3)	Water Level (m)	Freeboard (m)	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
94.059	1.000	271.403	94.759	0.300	0.00000000	0.00000000	2.00

Pond Depth/Area Diagram at Basin 2



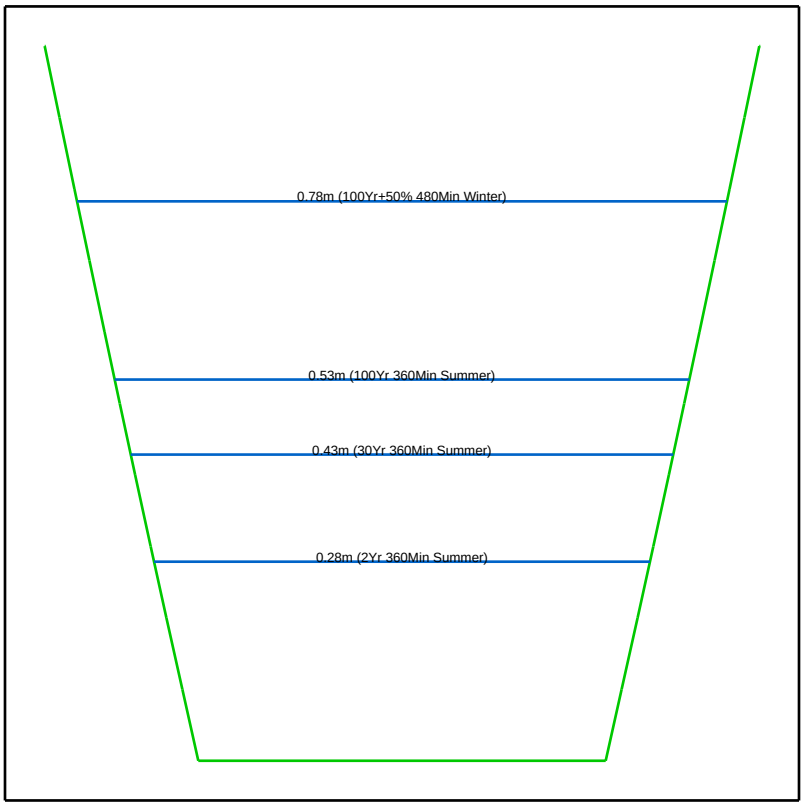
Pond at Basin 2 (100Yr+50% 480Min Winter)



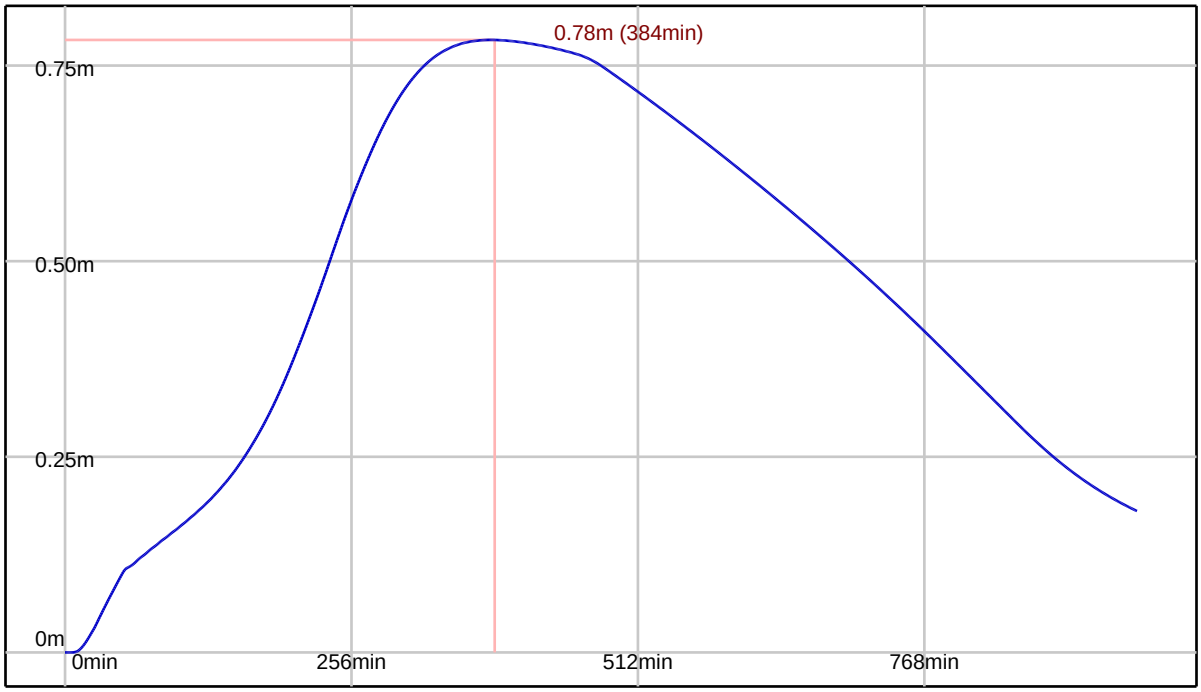
Pond Structure at Manhole Basin 3

Pond Invert (m)	Max Depth (m)	Volume To Water Level (m3)	Water Level (m)	Freeboard (m)	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
93.993	1.000	110.320	94.693	0.300	0.00000000	0.00000000	2.00

Pond Depth/Area Diagram at Basin 3



Pond at Basin 3 (100Yr+50% 480Min Winter)

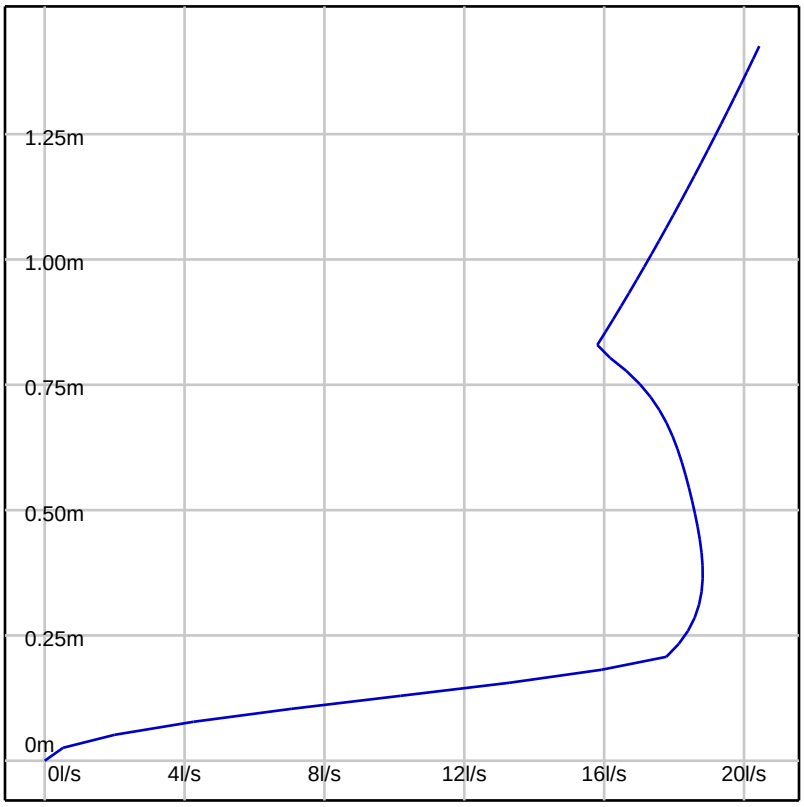


Controls within Manhole S14

Hydro-Brake® Optimum Control at Manhole S14

Model Ref	Design Depth (m)	Design Flow (l/s)	Depth Above Invert (m)	FF Head (m)	FF Flow (l/s)	KF Head (m)	KF Flow (l/s)
SHE-0191-1883-1200-1883	1.200	18.830	0.000	0.373	18.820	0.823	15.742

Hydro-Brake® Optimum Control at S14



Simulation Settings

FSR: M5-60=19.00, R=0.27, Locale=England and Wales

Summer (Cv: 1.00), Winter (Cv: 1.00)

Global Time of Entry: 5.0 mins

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

Return Periods (yrs) + Climate Change: (2, +0%), (30, +0%), (100, +0%), (100, +50%)

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
2Yr 15Min Winter	35.611	0.00	-0.36	100Yr 15Min Summer	81.289	0.00	-0.18
2Yr 15Min Summer	35.611	0.00	-0.70	100Yr 15Min Winter	81.289	0.00	-0.05
2Yr 30Min Winter	24.104	0.00	-0.08	100Yr 30Min Summer	57.113	0.00	0.00
2Yr 30Min Summer	24.104	0.00	-0.21	100Yr 30Min Winter	57.113	0.00	-0.03
2Yr 60Min Winter	15.824	0.00	0.00	100Yr 60Min Summer	38.413	0.00	-0.02
2Yr 60Min Summer	15.824	0.00	-0.19	100Yr 60Min Winter	38.413	0.00	-0.05
2Yr 120Min Summer	10.245	0.00	-0.08	100Yr 120Min Summer	24.857	0.00	-0.09
2Yr 120Min Winter	10.245	0.00	-0.09	100Yr 120Min Winter	24.857	0.00	-0.06
2Yr 180Min Winter	7.936	0.00	-0.08	100Yr 180Min Summer	18.880	0.00	-0.05
2Yr 180Min Summer	7.936	0.00	-0.07	100Yr 180Min Winter	18.880	0.00	-0.05
2Yr 240Min Winter	6.619	0.00	-0.04	100Yr 240Min Summer	15.435	0.00	-0.03
2Yr 240Min Summer	6.619	0.00	-0.03	100Yr 240Min Winter	15.435	0.00	-0.04
2Yr 360Min Summer	5.117	0.00	-0.01	100Yr 360Min Summer	11.618	0.00	-0.03
2Yr 360Min Winter	5.117	0.00	-0.01	100Yr 360Min Winter	11.618	0.00	-0.04
2Yr 480Min Winter	4.261	0.00	-0.01	100Yr 480Min Summer	9.476	0.00	-0.03
2Yr 480Min Summer	4.261	0.00	0.00	100Yr 480Min Winter	9.476	0.00	-0.04
2Yr 600Min Winter	3.696	0.00	-0.01	100Yr 600Min Summer	8.081	0.00	-0.03
2Yr 600Min Summer	3.696	0.00	0.00	100Yr 600Min Winter	8.081	0.00	-0.03
2Yr 720Min Winter	3.291	0.00	-0.01	100Yr 720Min Summer	7.089	0.00	-0.02
2Yr 720Min Summer	3.291	0.00	0.00	100Yr 720Min Winter	7.089	0.00	-0.03
2Yr 960Min Summer	2.741	0.00	0.00	100Yr 960Min Summer	5.758	0.00	0.00
2Yr 960Min Winter	2.741	0.00	0.00	100Yr 960Min Winter	5.758	0.00	-0.00
2Yr 1440Min Summer	2.118	0.00	0.00	100Yr 1440Min Summer	4.283	0.00	0.00
2Yr 1440Min Winter	2.118	0.00	0.00	100Yr 1440Min Winter	4.283	0.00	0.00
2Yr 2160Min Summer	1.637	0.00	0.01	100Yr 2160Min Summer	3.175	0.00	0.00
2Yr 2160Min Winter	1.637	0.00	0.00	100Yr 2160Min Winter	3.175	0.00	0.00
2Yr 2880Min Winter	1.365	0.00	0.00	100Yr 2880Min Summer	2.562	0.00	0.00
2Yr 2880Min Summer	1.365	0.00	0.01	100Yr 2880Min Winter	2.562	0.00	0.00
2Yr 4320Min Summer	1.055	0.00	0.00	100Yr 4320Min Summer	1.899	0.00	0.00
2Yr 4320Min Winter	1.055	0.00	0.00	100Yr 4320Min Winter	1.899	0.00	0.00
2Yr 5760Min Summer	0.878	0.00	0.00	100Yr 5760Min Summer	1.537	0.00	0.00
2Yr 5760Min Winter	0.878	0.00	0.00	100Yr 5760Min Winter	1.537	0.00	0.00
2Yr 7200Min Winter	0.762	0.00	0.00	100Yr 7200Min Summer	1.305	0.00	0.00
2Yr 7200Min Summer	0.762	0.00	0.00	100Yr 7200Min Winter	1.305	0.00	0.00
2Yr 8640Min Summer	0.678	0.00	0.00	100Yr 8640Min Summer	1.142	0.00	0.00
2Yr 8640Min Winter	0.678	0.00	0.00	100Yr 8640Min Winter	1.142	0.00	0.00
2Yr 10080Min Summer	0.614	0.00	0.00	100Yr 10080Min Summer	1.021	0.00	0.00
2Yr 10080Min Winter	0.614	0.00	0.00	100Yr 10080Min Winter	1.021	0.00	0.00
30Yr 15Min Summer	63.054	0.00	-0.29	100Yr+50% 15Min Summer	121.934	0.00	-0.42
30Yr 15Min Winter	63.054	0.00	-0.09	100Yr+50% 15Min Winter	121.934	0.00	-0.28
30Yr 30Min Summer	43.796	0.00	0.00	100Yr+50% 30Min Summer	85.669	0.00	-0.18
30Yr 30Min Winter	43.796	0.00	0.00	100Yr+50% 30Min Winter	85.669	0.00	-0.04
30Yr 60Min Summer	29.238	0.00	-0.01	100Yr+50% 60Min Summer	57.620	0.00	0.12
30Yr 60Min Winter	29.238	0.00	-0.04	100Yr+50% 60Min Winter	57.620	0.00	0.11
30Yr 120Min Summer	18.923	0.00	-0.12	100Yr+50% 120Min Summer	37.286	0.00	0.12
30Yr 120Min Winter	18.923	0.00	-0.07	100Yr+50% 120Min Winter	37.286	0.00	0.16
30Yr 180Min Summer	14.460	0.00	-0.08	100Yr+50% 180Min Summer	28.320	0.00	0.17
30Yr 180Min Winter	14.460	0.00	-0.08	100Yr+50% 180Min Winter	28.320	0.00	0.16
30Yr 240Min Summer	11.894	0.00	-0.06	100Yr+50% 240Min Summer	23.152	0.00	0.15
30Yr 240Min Winter	11.894	0.00	-0.07	100Yr+50% 240Min Winter	23.152	0.00	0.15
30Yr 360Min Winter	9.026	0.00	-0.05	100Yr+50% 360Min Summer	17.427	0.00	0.13
30Yr 360Min Summer	9.026	0.00	-0.04	100Yr+50% 360Min Winter	17.427	0.00	0.13
30Yr 480Min Summer	7.410	0.00	-0.03	100Yr+50% 480Min Summer	14.214	0.00	0.12
30Yr 480Min Winter	7.410	0.00	-0.04	100Yr+50% 480Min Winter	14.214	0.00	0.13
30Yr 600Min Summer	6.352	0.00	-0.01	100Yr+50% 600Min Summer	12.121	0.00	0.10

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
30Yr 600Min Winter	6.352	0.00	-0.01	100Yr+50% 600Min Winter	12.121	0.00	0.10
30Yr 720Min Winter	5.598	0.00	0.00	100Yr+50% 720Min Summer	10.634	0.00	0.07
30Yr 720Min Summer	5.598	0.00	0.00	100Yr+50% 720Min Winter	10.634	0.00	0.07
30Yr 960Min Summer	4.582	0.00	0.00	100Yr+50% 960Min Summer	8.637	0.00	0.01
30Yr 960Min Winter	4.582	0.00	0.00	100Yr+50% 960Min Winter	8.637	0.00	0.01
30Yr 1440Min Summer	3.448	0.00	0.00	100Yr+50% 1440Min Summer	6.424	0.00	-0.03
30Yr 1440Min Winter	3.448	0.00	0.00	100Yr+50% 1440Min Winter	6.424	0.00	-0.03
30Yr 2160Min Summer	2.589	0.00	0.00	100Yr+50% 2160Min Summer	4.762	0.00	-0.01
30Yr 2160Min Winter	2.589	0.00	0.00	100Yr+50% 2160Min Winter	4.762	0.00	-0.01
30Yr 2880Min Summer	2.111	0.00	0.00	100Yr+50% 2880Min Summer	3.843	0.00	-0.01
30Yr 2880Min Winter	2.111	0.00	0.00	100Yr+50% 2880Min Winter	3.843	0.00	-0.01
30Yr 4320Min Summer	1.585	0.00	0.00	100Yr+50% 4320Min Summer	2.849	0.00	-0.00
30Yr 4320Min Winter	1.585	0.00	0.00	100Yr+50% 4320Min Winter	2.849	0.00	-0.00
30Yr 5760Min Summer	1.294	0.00	0.00	100Yr+50% 5760Min Summer	2.305	0.00	-0.00
30Yr 5760Min Winter	1.294	0.00	0.00	100Yr+50% 5760Min Winter	2.305	0.00	0.00
30Yr 7200Min Summer	1.106	0.00	0.00	100Yr+50% 7200Min Summer	1.957	0.00	0.00
30Yr 7200Min Winter	1.106	0.00	0.00	100Yr+50% 7200Min Winter	1.957	0.00	0.00
30Yr 8640Min Winter	0.973	0.00	0.00	100Yr+50% 8640Min Summer	1.713	0.00	0.00
30Yr 8640Min Summer	0.973	0.00	0.00	100Yr+50% 8640Min Winter	1.713	0.00	0.00
30Yr 10080Min Summer	0.874	0.00	0.00	100Yr+50% 10080Min Winter	1.532	0.00	0.00
30Yr 10080Min Winter	0.874	0.00	0.00	100Yr+50% 10080Min Summer	1.532	0.00	0.00

Simulation Results

Return Period Yrs: 2.0

Climate Change %: 0

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1	15 min Summer	8	99.083	0.070	28.584		OK
S2	15 min Summer	8	97.200	0.118	45.831		OK
S3	15 min Summer	8	96.983	0.132	70.080		OK
S4	15 min Summer	8	95.250	0.135	76.256		OK
S5	15 min Summer	8	94.962	0.164	110.031		OK
Basin 1	360 min Winter	273	94.498	0.157	0.000		OK
S7	15 min Summer	9	94.647	0.518	108.884		OK
Basin 2	360 min Summer	222	94.272	0.213	6.652		OK
S8	15 min Summer	8	96.412	0.062	11.617		OK
S9	15 min Summer	8	95.663	0.068	23.216		OK
S10	15 min Summer	8	95.171	0.103	52.843		OK
S11	15 min Summer	8	94.408	0.220	83.483		OK
S12	15 min Summer	9	94.358	0.215	97.576		OK
S13	15 min Summer	9	94.290	0.222	109.157		OK
Basin 3	360 min Summer	222	94.272	0.279	17.052		OK
S14	360 min Summer	222	94.272	0.298	17.045		Surcharged
S15	360 min Summer	222	94.001	0.101	17.044		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Summer	8	S1	S2	0.094	1.816	28.472	0.211	OK
1.001	15 min Summer	8	S2	S3	0.118	1.768	45.464	0.332	OK
1.002	15 min Summer	8	S3	S4	0.132	2.002	69.710	0.275	OK
1.003	15 min Summer	8	S4	S5	0.150	1.640	75.988	0.205	OK
1.004	15 min Summer	9	S5	S7	0.266	1.191	109.223	0.295	OK
2.000	15 min Summer	23	Basin 1	S7	0.296	0.227	6.823	0.043	OK
1.005	360 min Summer	365	S7	Basin 2	0.178	0.447	5.016	0.015	OK
1.006	360 min Summer	264	Basin 2	Basin 3	0.245	0.175	9.524	0.027	OK
3.000	15 min Summer	8	S8	S9	0.062	1.667	11.513	0.360	OK
3.001	15 min Summer	8	S9	S10	0.068	1.938	23.112	0.114	OK
3.002	15 min Summer	8	S10	S11	0.162	1.020	52.405	0.120	OK
3.003	15 min Summer	9	S11	S12	0.217	1.091	82.882	0.517	OK
3.004	15 min Summer	9	S12	S13	0.219	1.056	98.389	0.288	OK
3.005	360 min Summer	222	S13	Basin 3	0.241	0.416	28.365	0.083	OK
1.007	360 min Summer	222	Basin 3	S14	0.288	0.274	17.052	0.050	OK
1.008	360 min Summer	222	S14	S15	0.101	0.983	17.044	0.426	OK

Return Period Yrs: 30.0

Climate Change %: 0

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1	15 min Summer	8	99.108	0.095	50.629		OK
S2	15 min Summer	8	97.245	0.164	81.211		OK
S3	15 min Summer	8	97.032	0.182	124.223		OK
S4	15 min Summer	8	95.299	0.184	135.150		OK
S5	15 min Summer	8	95.024	0.226	194.881		OK
Basin 1	480 min Winter	392	94.689	0.348	0.000		OK
S7	15 min Summer	8	94.765	0.636	194.200		Surcharged
Basin 2	360 min Summer	238	94.421	0.362	7.033		OK
S8	15 min Summer	8	96.437	0.087	20.577		OK
S9	15 min Summer	8	95.686	0.090	41.137		OK
S10	15 min Summer	8	95.206	0.139	93.643		OK
S11	15 min Summer	8	94.496	0.308	148.059		OK
S12	15 min Summer	8	94.438	0.295	172.843		OK
S13	360 min Summer	238	94.421	0.353	11.670		OK
Basin 3	360 min Summer	238	94.421	0.428	18.741		OK
S14	360 min Summer	238	94.421	0.448	18.791		Surcharged
S15	360 min Summer	237	94.007	0.107	18.791		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Summer	8	S1	S2	0.129	2.139	50.464	0.374	OK
1.001	15 min Summer	8	S2	S3	0.163	2.049	80.621	0.589	OK
1.002	15 min Summer	8	S3	S4	0.182	2.332	123.557	0.487	OK
1.003	15 min Summer	8	S4	S5	0.205	1.907	134.583	0.363	OK
1.004	15 min Summer	8	S5	S7	0.338	1.515	194.200	0.525	OK
2.000	15 min Summer	36	Basin 1	S7	0.379	0.112	6.104	0.038	OK
1.005	360 min Summer	369	S7	Basin 2	0.327	0.478	5.178	0.015	OK
1.006	360 min Summer	369	Basin 2	Basin 3	0.395	0.189	13.817	0.039	OK
3.000	15 min Summer	8	S8	S9	0.087	1.925	20.409	0.639	OK
3.001	15 min Summer	8	S9	S10	0.090	2.283	40.982	0.202	OK
3.002	15 min Summer	8	S10	S11	0.223	1.181	93.013	0.214	OK
3.003	15 min Summer	9	S11	S12	0.302	1.297	146.418	0.913	OK
3.004	360 min Summer	238	S12	S13	0.316	0.567	44.955	0.131	OK
3.005	360 min Summer	238	S13	Basin 3	0.391	0.483	48.643	0.142	OK
1.007	360 min Summer	238	Basin 3	S14	0.438	0.330	19.039	0.056	OK
1.008	360 min Summer	237	S14	S15	0.107	1.008	18.791	0.469	OK

Return Period Yrs: 100.0

Climate Change %: 0

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1	15 min Summer	8	99.122	0.109	65.279		OK
S2	15 min Summer	8	97.275	0.193	104.726		OK
S3	15 min Summer	8	97.062	0.212	160.224		OK
S4	15 min Summer	8	95.331	0.216	174.304		OK
S5	15 min Summer	8	95.088	0.290	251.097		OK
Basin 1	480 min Winter	430	94.818	0.477	0.000		Surcharged
S7	15 min Summer	9	94.839	0.710	249.124		Surcharged
Basin 2	360 min Summer	251	94.526	0.467	7.073		OK
S8	15 min Summer	8	96.454	0.103	26.531		OK
S9	15 min Summer	8	95.699	0.103	53.026		OK
S10	15 min Summer	8	95.226	0.158	120.740		OK
S11	15 min Summer	8	94.554	0.366	190.985		OK
S12	360 min Summer	250	94.526	0.383	10.562		OK
S13	360 min Summer	250	94.526	0.458	11.741		OK
Basin 3	360 min Summer	251	94.526	0.533	18.687		OK
S14	360 min Summer	251	94.526	0.553	18.730		Flood Risk
S15	600 min Summer	322	94.007	0.107	18.817		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Summer	8	S1	S2	0.151	2.292	65.081	0.482	OK
1.001	15 min Summer	8	S2	S3	0.193	2.169	104.005	0.760	OK
1.002	15 min Summer	8	S3	S4	0.212	2.480	159.355	0.628	OK
1.003	15 min Summer	8	S4	S5	0.253	1.933	173.352	0.467	OK
1.004	15 min Summer	8	S5	S7	0.370	1.786	249.612	0.675	OK
2.000	360 min Winter	366	Basin 1	S7	0.450	0.034	4.985	0.031	OK
1.005	360 min Summer	374	S7	Basin 2	0.432	0.482	5.165	0.015	OK
1.006	360 min Summer	374	Basin 2	Basin 3	0.500	0.172	13.858	0.039	OK
3.000	15 min Summer	8	S8	S9	0.103	2.028	26.300	0.823	OK
3.001	15 min Summer	8	S9	S10	0.103	2.452	52.842	0.260	OK
3.002	15 min Summer	8	S10	S11	0.262	1.249	120.009	0.276	OK
3.003	360 min Summer	250	S11	S12	0.361	0.778	49.315	0.307	OK
3.004	360 min Summer	250	S12	S13	0.421	0.554	57.089	0.167	OK
3.005	360 min Summer	250	S13	Basin 3	0.496	0.510	61.802	0.181	OK
1.007	360 min Summer	251	Basin 3	S14	0.543	0.348	19.499	0.057	OK
1.008	360 min Summer	389	S14	S15	0.107	1.008	18.817	0.470	OK

Return Period Yrs: 100.0

Climate Change %: 50

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1	15 min Summer	8	99.154	0.141	97.963		OK
S2	15 min Summer	8	97.394	0.312	157.175		Surcharged
S3	15 min Summer	8	97.128	0.278	236.812		OK
S4	15 min Summer	9	95.618	0.503	256.314		Surcharged
S5	15 min Summer	9	95.483	0.685	366.253		Surcharged
Basin 1	720 min Winter	678	95.105	0.764	0.000		Flood Risk
S7	720 min Winter	677	95.105	0.976	4.858		Surcharged
Basin 2	480 min Winter	381	94.776	0.717	6.974		Flood Risk
S8	15 min Summer	9	96.693	0.342	38.180		Surcharged
S9	15 min Summer	8	95.720	0.125	75.314		OK
S10	15 min Summer	8	95.262	0.195	176.884		OK
S11	480 min Winter	380	94.776	0.588	8.142		Surcharged
S12	480 min Winter	380	94.776	0.633	9.615		Surcharged
S13	480 min Winter	380	94.776	0.708	10.694		Surcharged
Basin 3	480 min Winter	380	94.776	0.783	17.607		Flood Risk
S14	480 min Winter	380	94.776	0.803	17.581		Flood Risk
S15	15 min Winter	10	94.007	0.107	18.830		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Summer	8	S1	S2	0.183	2.823	97.682	0.724	OK
1.001	15 min Summer	9	S2	S3	0.291	2.287	152.720	1.116	OK
1.002	15 min Summer	8	S3	S4	0.278	2.688	235.651	0.929	OK
1.003	15 min Summer	9	S4	S5	0.450	1.909	254.369	0.686	OK
1.004	30 min Summer	17	S5	S7	0.450	2.174	345.733	0.935	OK
2.000	7200 min Summer	4581	Basin 1	S7	0.450	0.387	7.585	0.047	OK
1.005	180 min Winter	299	S7	Basin 2	0.600	0.492	5.111	0.015	Surcharged
1.006	180 min Summer	189	Basin 2	Basin 3	0.600	0.061	13.894	0.040	Surcharged
3.000	30 min Summer	17	S8	S9	0.150	2.004	35.168	1.101	Surcharged
3.001	15 min Summer	9	S9	S10	0.125	2.705	75.416	0.371	OK
3.002	15 min Summer	8	S10	S11	0.322	1.441	175.769	0.404	OK
3.003	180 min Summer	106	S11	S12	0.450	0.997	117.470	0.732	OK
3.004	360 min Summer	232	S12	S13	0.600	0.531	85.187	0.249	Surcharged
3.005	180 min Summer	113	S13	Basin 3	0.600	0.675	147.676	0.432	Surcharged
1.007	180 min Summer	101	Basin 3	S14	0.600	0.378	20.854	0.061	Surcharged
1.008	15 min Winter	10	S14	S15	0.107	1.009	18.830	0.470	OK