

**Flood Risk Assessment
and SuDS Strategy
March 2026**

The logo consists of a dark blue square with the letters 'EAS' in white, sans-serif font.

**Rolly's Lane
Ashwell
North Herts
SG7 5PY**

Henry Colborn Trust

Document History

JOB NUMBER: 6122/2025
DOCUMENT REF: Rolly's Lane Ashwell – FRA and SuDS
REVISIONS: C

Revision	Comments	By	Checked	Authorised	Date
A	Client Draft	HB	JC	SA	08/01/2026
B	Updated SuDS	HB	JC	SA	19/01/2026
C	Final	HB	SA	SA	09/03/2026

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The content of this report is based on information available as of March 2026, the validity of the statements made may therefore vary over time as planning guidance / policies and the evidence base change.

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1 Introduction

- 1.1 EAS has been commissioned to provide a Flood Risk Assessment (FRA) and SuDS Drainage report to inform a planning application for Rolly's Lane, Ashwell, North Herts, SG7 5PY (hereafter referred to as 'the site').
- 1.2 This proposal is for the construction of two new dwellings. The development site plan and location plan are included in **Appendix A**.
- 1.3 The EA Flood Map for Planning shows the site is located in Flood Zone 1, defined as having less than a 0.1% (1 in 1000) annual probability of river or tidal flooding.
- 1.4 The site is not considered to be at risk of surface water flooding, reservoir flooding or sewer flooding.
- 1.5 This Flood Risk Assessment reviews all sources of flooding and details necessary mitigation measures.
- 1.6 The contents of this SuDS report are based on the advice set out in the National Planning Policy Framework (NPPF) published in December 2024, Annex 3: Flood risk vulnerability classification, also from the NPPF and PPG 'Guidance for Flood Risk and Coastal Change', updated in September 2025.
- 1.7 This report is based on the Environment Agency flood maps, geology mapping, OS mapping, topographic survey, Strategic Flood Risk Assessment and local policy.
- 1.8 This document includes the following sections:
 - Section 2 – describes any relevant local and national planning policy;
 - Section 3 – provides a site description and background information
 - Section 4 – review any potential sources of flooding;
 - Section 5 – details the proposed drainage strategy;
 - Section 6 – outlines maintenance and management schedules; and
 - Section 7 – summarises and concludes the report.

2 Policy Context

Introduction

2.1 This section sets out the policy context. This report is based on the advice set out in the National Planning Policy Framework (NPPF) last updated December 2024 and the Planning Practice Guidance (PPG) updated in September 2025.

2.2 Paragraph 181 of the NPPF discusses the use for site-specific flood-risk assessments and what the assessment should demonstrate:

“When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment⁶³. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;

b) the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;

c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;

d) any residual risk can be safely managed; and

e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.”

2.3 Paragraph 181 footnote 63 of the NPPF states:

“A site-specific flood risk assessment should be provided for all developments in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.”

2.4 The flood zones are defined as:

- Flood Zone 1 - less than a 0.1% (1 in 1000) annual probability of river or tidal flooding.
- Flood Zone 2 - between a 0.1% and 1% (1 in 1000 and 1 in 100) annual probability of river flooding; or between a 0.1% and 0.5% (1 in 1000 and 1 in 200) annual probability of flooding from tidal sources.

- Flood Zone 3a- This zone comprises land assessed as having a 1% (1 in 100) or greater annual probability of river flooding; and for tidal flooding at least a 0.5% (1 in 200) annual probability of flooding from tidal sources.
 - Flood Zone 3b - This zone comprises land where water has to flow or be stored in times of flood. This classification is usually classified as land which had a 3.33% (1 in 30) annual probability of flooding.
- 2.5 Paragraph 170 discusses the suitability of development location, particularly with regards to future risks induced by climate change:
- “Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere”.*
- 2.6 Paragraph 182 of the NPPF discusses the application of sustainable drainage systems:
- “Applications which could affect drainage on or around the site should incorporate sustainable drainage systems to control flow rates and reduce volumes of runoff, and which are proportionate to the nature and scale of the proposal. These should provide multifunctional benefits wherever possible, through facilitating improvements in water quality and biodiversity, as well as benefits for amenity. Sustainable drainage systems provided as part of proposals for major development should:*
- take account of advice from the Lead Local Flood Authority;
 - have appropriate proposed minimum operational standards; and
 - have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development.”
- 2.7 The site is located in Flood Zone 1. Flood Zone 1 is defined as having less than a 0.1% (1 in 1000) annual probability of river or tidal flooding.
- 2.8 The EA Flood Map has been enclosed in **Appendix B**.

Local Policy

North Herts Local Plan 2011-2031

- 2.9 The North Herts Local Plan was adopted in November 2022. Relevant policies are included below for reference.
- 2.10 As of January 2024, an update to the local plan is underway, and would cover development for the district for up to 2045.
- 2.11 Policy NE7: Reducing Flood Risk

Planning permission for development proposals will be granted provided that (as applicable):

- a) Development is located outside of medium and high-risk flood areas (flood zone 2 and 3) and other areas affected by other sources of flooding where possible;*
- b) Where (a) is not possible, application of the sequential and exception tests is demonstrated where development is proposed in areas of flood risk using the Strategic Flood Risk Assessment (SFRA) and Environment Agency flood maps;*
- c) A FRA has been prepared in accordance with national guidance that considers the lifetime of the development, climate change impacts and safe access and egress; North Hertfordshire Local Plan 2011-2031 159*
- d) It will be located, designed and laid out to ensure the risk of flooding is reduced whilst not increasing flood risk elsewhere;*
- e) The impact of any residual flood risk will be minimised through flood resistant, resilient design and construction;*
- f) Any flood protection and mitigation measures necessary will not cause harm to nature conservation, heritage assets, and/ or landscape and recreation and, where possible, will have a positive impact in these respects; and*
- g) Overland flow routes and functional floodplain areas are protected from all development other than that which is “water compatible” and this must be designed and constructed to remain operational and safe for users during flood events, resulting in no net loss of flood plain storage and not impeding water flows or increasing flood risk elsewhere.*

North Hertfordshire District Council Strategic Flood Risk Assessment 2008 (Updated in Sept 2016)

- 2.12 The North Hertfordshire SFRA was updated in 2016 as a result of improved accuracy of mapping information following the 2008 document.
- 2.13 The site has not been specifically shown to have experienced historic fluvial flooding or sewer flooding.

Hertfordshire Interactive Flood Risk Management Viewer

- 2.14 Hertfordshire provides an interactive mapping website which displays the difference sources of flood risk across Hertfordshire County. The result of this mapping in relation to the proposed site is outlined below.
- 2.15 The interactive map can be viewed here:
<https://webmaps.hertfordshire.gov.uk/waterman/index.htm>.
- 2.16 The mapping confirms the site is located in Flood Zone 1.

- 2.17 There are no Hertfordshire County Council recorded incidents of flooding at the site. There is a recorded incident of flooding approximately 160m southeast of the site, however no further details have been provided.
- 2.18 The nearest Main River to the site is the River Cam, approximately 4km to the north.
- 2.19 There is an ordinary watercourse located approximately 200m east of the site. This is believed to be a tributary of the River Cam.
- 2.20 The site is located within a Flood Management Area.
- 2.21 The site remains outside the 30yr, 100yr and 1000yr modelled surface water flood extents. This flood mapping is likely to have been replaced by the more recent national surface water flood modelling as set out in Section 4.
- 2.22 The site is not located within an area considered to be susceptible to groundwater flooding. This contradicts the DEFRA Magic Map findings in section 3.11, which is a more recent dataset. This has been discussed further in section 3 of this report.

3 Existing Site Assessment

Site Description

- 3.1 The site is located off Rolly's Lane, Ashwell, Hertfordshire, SG7 5PY.
- 3.2 The site is currently vacant, with planning application for the construction of two dwellings. The site forms part of an old school, the sports courts of which were retained but now have no use. The site is almost entirely hardstanding. The site covers 0.143ha. The development site plan and location plan are included in **Appendix A**.
- 3.3 The site is bound by Rolly's Lane to the north, an undeveloped field to the east, and residential properties to the south and west.

Local Watercourses

- 3.4 A tributary of the River Cam is located approximately 200m east of the site. This is recognised as an EA Main River approximately 4km north of the site.

Site Levels

- 3.5 A topographical survey is contained in **Appendix C**.
- 3.6 Levels across the site are relatively flat, with a gentle slope from south to north, falling from 46.38mAOD in the south to 45.15mAOD in the north.

Geology

- 3.7 With reference to the British Geological Survey online mapping (www.bgs.ac.uk), the site is located within an area with a bedrock of West Melbury Marly Chalk Formation, with no superficial deposits.
- 3.8 There are no boreholes within the vicinity of the site.
- 3.9 The DEFRA Magic Map shows the site is not located within a Source Protection Zone; the site is located on principle bedrock aquifer; and the site is located in a high groundwater vulnerability area with soluble rock risk.
- 3.10 The BGS GeoSure Soluble Rocks Dataset shows the site is located within an area classified 'A'. Information on Hazard rating for 'A' states: '*soluble rocks are either not thought to be present, or are not prone to dissolution. Dissolution features are unlikely to be present*'. Information on advice for specialist states: '*no special ground investigation required or increased construction costs or increased financial risk due to potential problems with soluble rocks*'. This information has been provided within **Appendix D**.

Sewer Records and Existing Drainage

- 3.11 The North Herts SFRA shows there are no historic sewer flood records for Ashwell.
- 3.12 The Anglian Water Sewer Mapping enclosed in **Appendix E** shows the nearest foul sewer networks to the site are located along Gardiners Lane and Mill Street, both of which connect to Rollys' Lane. There are no sewer records within the vicinity of the site.
- 3.13 The topographical survey contained in **Appendix C** shows no existing formal drainage network.
- 3.14 It is assumed that surface water on site infiltrates to ground.

4 Potential Source of Flooding

Fluvial/Tidal

- 4.1 The EA Flood Map for Planning shows the site is located in Flood Zone 1. The map can be viewed in **Appendix B**.
- 4.2 Flood Zone 1 is defined to have less than a 0.1% (1 in 1000) annual probability of river or tidal flooding. Therefore, the risk of fluvial and tidal flooding is considered to be low.

Surface Water

- 4.3 The Long-Term Flood Map and the risk of flooding from surface water (RoFSW) data was updated in January 2025.
- 4.4 The RoFSW products are an assessment of where surface water flooding may occur when rainwater does not drain away through the normal drainage systems or soak into the ground but lies on or flows over the ground instead. It includes information about flooding extents and depths. Risk is displayed as one of three likelihood categories:
- High - greater than or equal to 1 in 30 (3.3%) chance of flooding in any year
 - Medium – Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year
 - Low – Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year
- 4.5 As well as present day risk of flooding from surface water, climate change scenarios have been produced to indicate the predicted impacts of climate change on future flood risk. The climate change allowances are based on the latest UK Climate Projections (UKCP18) from the Met Office, using the Representative Concentration Pathway (RCP) 8.5. A near-term epoch (2040 – 2060 “2050s” epoch) and central allowances are being used initially.
- 4.6 For the purpose of this flood risk assessment, the RoFSW the Climate Change 1 2040-2060 data set has been used.
- 4.7 **Appendix F** shows the risk of surface water flooding at any depth. The site is not shown to be at risk.

Reservoir

- 4.8 The EA long term risk map displays the risk from reservoirs. The site is not shown to be at risk of reservoir flooding.
- 4.9 The risk of reservoir flood map is included in **Appendix G**.

Groundwater

- 4.10 The site is located in a soluble rock risk, high groundwater vulnerability area.
- 4.11 There are no borehole records within the vicinity of the site.
- 4.12 As mentioned in section 3.10, The BGS GeoSure Soluble Rocks Dataset shows the site is located within an area classified 'A'. Information on Advice for Specialist states: *'no special ground investigation required or increased construction costs or increased financial risk due to potential problems with soluble rocks'*.
- 4.13 The development is not proposed to include any basements, therefore the risk of flooding from groundwater is considered to be low.

Sewer

- 4.14 Anglian Water sewer records are enclosed in **Appendix E**.
- 4.15 There are no adopted sewers within the vicinity of the site and due to the rural location of the site, the risk of sewer flooding is anticipated to be low.

Mitigation Measures

- 4.16 Due to the low risk of flooding from all sources no mitigation measures are required.

5 Proposed Drainage Strategy

Relevant SuDS Policy

- 5.1 SuDS mimic natural drainage patterns and provide a method of surface water drainage which can decrease the quantity of water discharged and hence reduce the risk of flooding. SuDS design should meet the “four pillars” of SuDS of: water quantity, water quality, amenity and biodiversity, wherever possible.
- 5.2 In decreasing order of preference, the preferred means of disposal of surface water runoff is:
- Discharge to ground.
 - Discharge to a surface water body.
 - Discharge to a surface water sewer.
 - Discharge to a combined sewer.

Site-Specific SuDS

- 5.3 The various SuDS methods need to be considered in relation to site-specific constraints. Several SuDS options are available to reduce or temporarily hold back the discharge of surface water runoff. Table 6.1 outlines the constraints and opportunities to each of the SuDS devices in accordance with the hierarchical approach outlined in The SuDS Manual CIRIA C753. It also indicates what could and could not be incorporated within the development, based upon site-specific criteria.

Device	Description	Constraints / Comments	Appropriate
Living roofs (source control)	Provide soft landscaping at roof level which reduces surface water runoff.	No suitable location on site	No
Infiltration devices & Soakaways (source control)	Store runoff and allow water to percolate into the ground via natural infiltration.	Soakaways proposed in each of the rear gardens	Yes
Pervious surfaces (source control)	Storm water is allowed to infiltrate through the surface into a storage layer, from which it can either infiltrate and/or slowly release to sewers.	Proposed in car park areas	Yes

Rainwater harvesting (source control)	Reduces the annual average rate of runoff from the Site by reusing water for non-potable uses e.g. toilet flushing, recycling processes.	Not proposed at this stage	Possibly
Swales (permeable conveyance)	Broad shallow channels that convey / store runoff, and allow infiltration (ground conditions permitting).	No suitable location onsite	No
Filter drains & perforated pipes (permeable conveyance)	Trenches filled with granular materials (to take flows from adjacent impermeable areas) that convey runoff while allowing infiltration.	Proposed for water quality requirements	Yes
Filter Strips (permeable conveyance)	Wide gently sloping areas of grass or dense vegetation that remove pollutants from run-off from adjacent areas.	Not suitable for this site	No
Infiltration basins (end of pipe treatment)	Depressions in the surface designed to store runoff and allow infiltration.	No suitable location onsite	No
Wet ponds & constructed wetlands (end of pipe treatment)	Provide water quality treatment & temporary storage above the permanent water level.	No suitable location onsite	No
Attenuation Underground (end of pipe treatment)	Oversized pipes or geo-cellular tanks designed to store water below ground level.	Not required	No
Raingardens	Rain gardens are relatively small depressions in the ground that can act as infiltration points for roof water and other 'clean' surface water.	Proposed for each property	Yes

Table 6.1 Site Specific SuDS

Consideration of SuDS Hierarchy

- 5.4 The site is located within an area with a bedrock of West Melbury Marly Chalk Formation, with no superficial deposits. Infiltration is therefore likely to be viable.
- 5.5 Therefore, in line with the SuDS hierarchy, an infiltration-based SuDS strategy has been proposed.
- 5.6 In the absence of infiltration testing at this stage, all infiltration features have been modelled to infiltrate at the average rate of 1×10^{-5} m/s (0.036m/hr) which is noted in Ciria C753 Table 25.1 as generic rate for soils of sand-grade textures. Although the site comprises of a bedrock of chalk, this value has been selected as a conservative estimate to ensure a robust SuDS design pending site-specific infiltration testing once planning approval is granted.

Surface Water Drainage Design Parameters

5.7 The following best practice design parameters have been considered:

- The local 2070s 'Upper End' Climate Change allowance is 40% and has been applied to the hydraulic drainage network design.
- The Hydraulic Model has been for a 1:2yr Storm Event, 1:30yr Storm Event, 1:30yr + 40% Climate Change Event, 1:100yr Storm Event and 1:100yr + 40% Climate Change Storm Event.
- FEH22 rainfall data has been used.
- The CV Value for Winter and Summer storms has been set to 1.0.
- A 5min time of entry has been used.
- 10% Urban Creep has been applied, adding 20.5m² to the total contributing area.
- Unlined storage devices have a half drain time within 24 hours (1440 mins), and lined storage devices to half-drain within 48 hours (2880 mins).

Pre-development Run-off Rate and Volume - Greenfield

5.8 Greenfield runoff rates were estimated using the ReFH2 method within Causeway Flow. The total proposed impermeable area of 568m² has been used to calculate the runoff rates. The runoff rate for 1 hectare has been estimated and scaled to the total impermeable area for the 1 in 1 year, 1 in 2 year, 1 in 30 year and 1 in 100 year events below. The Causeway Flow results are included at **Appendix H**:

- 1 in 1 year – 0.4 l/s/ha (0.227 l/s)
- 1 in 2 year – 0.5 l/s/ha (0.284 l/s)
- 1 in 30 year – 1.4 l/s/ha (0.795 l/s)
- 1 in 100 year – 1.9 l/s/ha (1.079 l/s)

5.9 Causeway Flow Greenfield ReFH2 Method was used to calculate the 1:100yr 360min Storm Event Discharge Volume for 0.568m². The results are included in **Appendix H**, resulting in a discharge volume of 13.63m³.

Post-development Runoff Rates and Discharge Volumes

5.10 The proposals allow for surface water to discharge to ground by infiltration, as such this does not apply.

Proposed Infiltration Based SuDS Strategy

- 5.11 The Causeway Flow Hydraulic Model Outputs are included in **Appendix I** and the proposed SuDS Layout is included in **Appendix J**.
- 5.12 As outlined in Table 6.1 above, SuDS Features shall be utilised to form the Surface Water Drainage Strategy in order to meet the 4 Pillars of SuDS.
- Water Quantity – Raingarden Planter, Permeable Paving, Filter Drain
 - Water Quality – Raingarden Planter, Permeable Paving, Filter Drain
 - Biodiversity – Raingarden Planter
 - Amenity – Raingarden Planter
- 5.13 It is proposed to utilise the above SuDS features with the proposed drainage strategy to adequately manage surface water runoff from the development.
- 5.14 The proposed drainage strategy consists of rainwater downpipes, fitted with a shoe, which takes runoff from the roof of the dwellings either to one of the raingarden planters, or directly onto the permeable paving driveway. Regular rainwater downpipes shall be fitted where runoff is directed through surface water pipes towards the soakaway.
- 5.15 A raingarden planter has been proposed for each of the properties, beneath a rainwater downpipe on the northern elevation. These are to provide additional attenuation, whilst satisfying the biodiversity and amenity pillars of SuDS.
- 5.16 The permeable paving (PP1) has a minimum sub-base depth of 450mm, to provide attenuation storage for all storms up to and including the 1 in 100yr +40%CC event. This will allow infiltration and therefore manages itself. PP1 covers an area of 238m², modelled with a 1:70 gradient as per the existing site levels.
- 5.17 Roof runoff collected at the rear of each property is to be directed to a filter drain, measuring 2.83m in length for the western property, and 3.86m for the eastern property, and 1m wide. This is to provide water quality benefits, in line with the national SuDS standards.
- 5.18 The soakaway in the garden of the western property (Soakaway 1) has an area of 3m² and a depth of 1m. The second soakaway in the garden of the eastern property (Soakaway 2) has an area of 2.25m² and a depth of 1.3m. Both have been sized and positioned to allow the required 5m easement from any buildings or structures and 2.5m from a site boundary.
- 5.19 The permeable paving and soakaways have been modelled to infiltrate at the average rate of 1x10⁻⁵ m/s (0.036m/hr) which is noted in Ciria C753 Table 25.1 as generic rate for soils of sand-grade texture. This is a conservative estimate to ensure a robust SuDS design pending site-specific infiltration testing once planning is received.
- 5.20 The half-drain times for PP1 is 136 mins; for Soakaway 1 is 595 mins; and for Soakaway 2 is 678 mins, all well within the 1440 min requirement.

Long Term Storage

- 5.21 The proposals seek to dispose surface water runoff via infiltration, as such Long-Term Storage is not required.

Exceedance Event

- 5.22 The proposed surface water drainage strategy is designed to accommodate a 1:100yr + 40% Climate Change Storm Event. In the unlikely event that an exceedance event occurs, flood waters will flow away from the site in a northerly direction, away from the buildings. An Exceedance Route Plan is shown on the SuDS layout in **Appendix J**.

Water Quality

- 5.23 The proposed drainage strategy is designed to meet the water quality requirements set out by Table 26.2 of the CIRIA SuDS Manual C753, which sets out the specific pollution hazard indices for low traffic roads and residential roofs in Table 6.3 below.

Land Use	Hazard Level	Pollution Hazard Indices		
		Suspended Solids	Metals	Hydrocarbons
Residential roofs	Very low	0.2	0.2	0.05
Individual Property Driveways and Low Traffic Roads	Low	0.5	0.4	0.4
Pollution Mitigation Required		0.5	0.4	0.4

Table 6.3 Land Use Pollution Hazard Ratings. Extracted from the CIRIA SuDS Manual C753 Simple Index Approach Tool.

- 5.24 Table 6.4 below shows how the proposed SuDS features will adequately mitigate the associated risks on water pollution and maintain water quality.

SuDS Component	Pollution Mitigation Indices		
	Suspended Solids	Metals	Hydrocarbons
Permeable Paving	0.7	0.6	0.7
Raingarden Planter	0.8	0.8	0.8
Filter Drain	0.4	0.4	0.4

Table 6.4 SuDS Component Pollution Mitigation for the proposed SuDS features extracted and adapted from the CIRIA SuDS Manual C753 Simple Index Approach Tool.

- 5.25 Table 6.4 above illustrates the pollution mitigation indices can be achieved with permeable paving managing pollution indices from the driveway. The raingarden planters or filter drains are suitable for the management of roof pollution indices.

6 Maintenance of Development Drainage

- 6.1 The maintenance of the SuDS features will remain the responsibility of the site owner or an appointed maintenance company. The site owner/appointed management company will be responsible for maintaining the permeable paving, raingarden planters, filter drains and soakaways.
- 6.2 Regular inspections and maintenance should be carried out for each of these elements, particularly after periods of heavy rainfall. Maintenance tasks and frequencies for the swale and permeable paving are detailed in the CIRIA SUDS Manual (C753) and have been summarised below in Table 7.1-7.4.

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Brushing and vacuuming.	Three times per year at the end of winter, mid-summer, after autumn leaf fall, or as required based on site specific observations of clogging or manufacturer's recommendations
Occasional Maintenance	Stabilise and mow contributing and adjacent areas.	As required
	Removal of weeds.	As required
Remedial Actions	Remediate any landscaping which, through vegetation maintenance of soil slip, has been raised to within 50mm of the level of paving.	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance of a hazard to the user, and replace lost jointing material.	As required
	Rehabilitation of surface and upper sub-surface by remedial sweeping.	Every 10-15 years or as required
Monitoring	Initial inspection.	Monthly for 3 months after installation
	Inspect for evidence of poor operation and/or weed growth. If required, take remedial action.	Every 3 months, 48 hours after a large storm
	Inspect silt accumulation rates and establish appropriate brushing frequencies.	Annually
	Monitor inspection chambers.	Annually

Table 7.1: Maintenance tasks and frequencies for Permeable Paving (The SUDS Manual C753, CIRIA).

Maintenance Schedule	Required Action	Frequency
Regular Inspections	Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrain (if appropriate) to determine if maintenance is necessary	Quarterly
	Check operation of underdrains by inspection of flows after rain	Annually
	Assess plants for disease infection, poor growth, invasive species etc and replace as necessary	Annually
	Inspect inlets and outlets for blockage	Quarterly
Regular Maintenance	Remove litter and surface debris and weeds	Quarterly
	Replace any plants, to maintain planting density	As required
	Remove sediment, litter and debris build up from around inlets or from forebays	Quarterly to biannually
Occasional Maintenance	Infill and holes or scour in the filter medium, improve erosion protection if required	As required
	Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch	As required
Remedial Actions	Remove and replace filter medium and vegetation above	As required but likely to be >20 years

Table 7.2: Maintenance tasks and frequencies for Bioretention Systems, including Raingarden Planters (The SUDS Manual C753, CIRIA).

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Remove litter (including leaf litter) and debris from filter drain surface, access chambers and pre-treatment devices.	Monthly or as required
	Inspect filter drain surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage.	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulations, and establish appropriate silt removal frequencies.	Bi-annually
	Remove sediment from pre-treated devices.	As required

Occasional Maintenance	Remove or control tree roots where they are encroaching the sides of the filter drain, using recommended methods (e.g. NJUG, 2007 or BS 3998:2010).	As required
	At locations with high pollution loads, remove surface geotextile and replace and wash or replace overlying filter medium.	Five yearly, or as required
	Clear perforated pipework for blockages.	As required

Table 7.3: Maintenance tasks and frequencies for Filter Drains (The SUDS Manual C753, CIRIA).

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Inspect for sediment and debris in pre-treatment components and flood of inspection tube or chamber and inside of concrete manhole rings.	Annually
	Cleaning of gutters and any filters on downpipes.	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages.	Annually (or as required)
Occasional Maintenance	Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber and inside of concrete and manhole rings.	As required, based on inspections
Remedial Actions	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failures occur.	As required
	Replacement of clogged geotextile (will require reconstruction of soakaway).	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation.	Monthly for first year, then annually
	Check soakaway to ensure emptying is occurring.	Annually

Table 7.4: Maintenance tasks and frequencies for Soakaways (The SUDS Manual C753, CIRIA).

- 6.3 It is recommended that during the first 12 months of operation all SuDS and drainage features are visually inspected on a monthly basis to determine any seasonal patterns this includes all SuDS features, inspection chambers, inlets and outlets. This will determine whether or not the recommended service intervals set out by CIRIA in the figures above will be sufficient for maintenance beyond the first year.
- 6.4 After the first 12 months, the maintenance schedule should be designed to at least meet the requirements set out by CIRIA based on the outcome of the monitoring.

Manholes, Sewers and Inspection Chambers

- 6.5 All inspection chambers and manholes should be inspected on a bi-annual basis with further visual checks carried out throughout the year, such as in November after the heaviest leaf-fall has occurred.
- 6.6 Should a blockage occur at any time, it is advised to seek professional help to jet the drainage system to clean and clear the system.

Gutters and Downpipes

- 6.7 It is good practice to ensure that these are occasionally inspected to ensure they are in good order and free of leaves & debris. Once annually should be sufficient.

7 Summary & Conclusions

- 7.1 EAS has been commissioned to provide an FRA and SuDS Drainage report to inform a planning application for two new dwellings at Rolly's Lane, Ashwell, North Herts, SG7 5PY.

Flood Risk Summary

- 7.2 The EA Flood Map for Planning shows the site is located in Flood Zone 1. Flood Zone 1 is defined to have less than a 0.1% (1 in 1000) annual probability of river or tidal flooding.
- 7.3 Despite the site shown to be susceptible to groundwater emergence and soluble rock risk, as mentioned in section 3 and 4, The BGS GeoSure Soluble Rocks Dataset shows the site is located within an area classified 'A'. Information on Advice for Specialist states: *'no special ground investigation required or increased construction costs or increased financial risk due to potential problems with soluble rocks'*.
- 7.4 The site is not shown to be at risk of surface water flooding.
- 7.5 Due to the low risk of flooding from all sources no mitigation measures are required.

SuDS Summary

- 7.6 The SuDS hierarchy has been methodically assessed. An infiltration strategy has been proposed, deemed viable due to a bedrock of West Melbury Marly Chalk Formation, with no superficial deposits underlying the site.
- 7.7 The proposed drainage strategy consists of rainwater downpipes which takes runoff from the roof of the dwellings either down to one of the raingarden planters, directly onto the permeable paving driveway, or through surface water pipes towards the soakaway.
- 7.8 A raingarden planter has been proposed for each of the properties, beneath a rainwater downpipe on the northern elevation.
- 7.9 The permeable paving (PP1) has a minimum sub-base depth of 450mm, to provide attenuation storage for all storms up to and including the 1 in 100yr +40%CC event. This will allow infiltration and therefore manages itself.
- 7.10 Roof runoff collected at the rear of each property is to be directed to a filter drain. This is to provide water quality benefits, in line with the SuDS standards.
- 7.11 A soakaway has been proposed in the garden of each property. Both have been sized and positioned to allow the required 5m easement from any buildings.
- 7.12 The permeable paving and soakaways have been modelled to infiltrate at the average rate of 1×10^{-5} m/s (0.036m/hr) which is noted in Ciria C753 Table 25.1 as generic rate for soils of sand-

grade texture, for a conservative estimate to ensure a robust SuDS design pending site-specific infiltration testing once planning is received.

Conclusion

- 7.13 In conclusion, the site has been identified to be at a low risk of flooding and proposed a SuDS strategy that shall manage surface water runoff whilst considering the four pillars of SuDS.

Appendices:

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Appendix: A – Development and Location Plans

SHEET NO.
P001
SITE LOCATION AND
BLOCK PLAN

DATECURRENT REVISION

PROJECT NAME
ASHWELL TENNIS
COURTS

PROJECT NUMBER1566
PROJECT STATUSFOR PLANNING
PROJECT ADDRESSASHWELL TENNIS
COURTS, ROLLYS LANE,
ASHWELL, BALDOCK

NOTES
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As indicatedA2



SITE LOCATION PLAN
1:1250



BLOCK PLAN
1:200

SHEET NO.

P001.2

EXISTING SITE PLAN

DATE

CURRENT REVISION

PROJECT NAME

ASHWELL TENNIS COURTS

PROJECT NUMBER1566

PROJECT STATUSFOR PLANNING

PROJECT ADDRESSASHWELL TENNIS COURTS,
ROLLYS LANE, ASHWELL,
BALDOCK

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1 :
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EXISTING HARD STANDING AREA (TARMAC).

EXISTING HEDGEROW AND VEGETATION.

EXISTING REAR ACCESS POINT.

SHEET NO.
P002.1
PROPOSED GROUND
FLOOR PLAN

DATECURRENT REVISION

PROJECT NAME
ASHWELL TENNIS COURTS

PROJECT NUMBER1566
PROJECT STATUSFOR PLANNING
PROJECT ADDRESSASHWELL TENNIS COURTS,
ROLLYS LANE, ASHWELL,
BALDOCK

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BLACK PAINTED STEEL ESTATE RAILINGS
WITH LAUREL HEDGEROW LINING BEHIND.

PLANTING AND HEDGEROW.

EV CHARGING.

TIMBER REFUSE STORE

AIRSOURCE HEAT PUMP.

TIMBER GATE TO REAR GARDEN.

2X PARKING SPACES.

TIMBER CYCLE STORE

REAR ACCESS TO PLOTS.

PROPOSED FOOTPATH TO REAR GARDENS.

EXISTING FOOTPATH.

EXISTING ACCESS TO BE RE-USED.

CLAY BRICK PAVING SITE ENTRANCE.

REFUSE COLLECTION POINT.

EV CHARGING.

TIMBER REFUSE STORE

LOOSE GRAVEL SURFACE - EDGES
CONTAINED BY CLAY BRICKS.

AIRSOURCE HEAT PUMP.

2X PARKING SPACES.

PROPOSED SINGLE GARAGE - 1X PARKING BAY FOR
EACH PROPERTY.

TIMBER CYCLE STORE

SMALL TREES TO BE PLANTED ON BORDER
FOR PRIVACY.

PLOT 1
SITE AREA - 797.1m²
AMENITY AREA - 547.6m²
HOUSE FOOTPRINT - 97.6m²
GARAGE FOOTPRINT - 31m²

PLOT 2
SITE AREA - 606.8m²
AMENITY AREA - 358.7m²
HOUSE FOOTPRINT - 101m²
GARAGE FOOTPRINT - 31m²

SHEET NO.

P002.2

PROPOSED FIRST FLOOR
PLAN

DATE

CURRENT REVISION

PROJECT NAME

ASHWELL TENNIS COURTS

PROJECT NUMBER 1566

PROJECT STATUS FOR PLANNING

PROJECT ADDRESS ASHWELL TENNIS COURTS,
ROLLYS LANE, ASHWELL,
BALDOCK

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1 :
100PAPER SIZE
A1OBSCURED SIDE WINDOWS - OPENABLE
FROM 1700mm ABOVE FFL.OBSCURED SIDE WINDOWS - OPENABLE
FROM 1700mm ABOVE FFL.

G2

01992 937062 | STUDIO@G2.CO.UK | G2.CO.UK

SHEET NO.
P002.3
**PROPOSED FRONT AND
SIDE ELEVATIONS**

DATE
CURRENT REVISION

PROJECT NAME
ASHWELL TENNIS COURTS

PROJECT NUMBER 1566
PROJECT STATUS FOR PLANNING
PROJECT ADDRESS ASHWELL TENNIS COURTS,
ROLLYS LANE, ASHWELL,
BALDOCK

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PROPOSED FRONT ELEVATION - VIEW FROM ROLLY'S LANE - SCALE 1:50



PROPOSED SIDE ELEVATION - SCALE 1:50



1:50



PROPOSED SITE PLAN - SCALE 1:200



1:200

SHEET NO.
P002.4
PROPOSED REAR AND SIDE ELEVATIONS

DATECURRENT REVISION

PROJECT NAME
ASHWELL TENNIS COURTS

PROJECT NUMBER1566
PROJECT STATUSFOR PLANNING
PROJECT ADDRESSASHWELL TENNIS COURTS,
ROLLYS LANE, ASHWELL,
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PROPOSED REAR ELEVATION - SCALE 1:50



PROPOSED SIDE ELEVATION - SCALE 1:50



1:50



PROPOSED SITE PLAN - SCALE 1:200



1:200

SHEET NO.
P002.5
PERSPECTIVE IMAGES

DATECURRENT REVISION

PROJECT NAME
ASHWELL TENNIS COURTS

PROJECT NUMBER1566
PROJECT STATUSFOR PLANNING
PROJECT ADDRESSASHWELL TENNIS COURTS,
ROLLYS LANE, ASHWELL,
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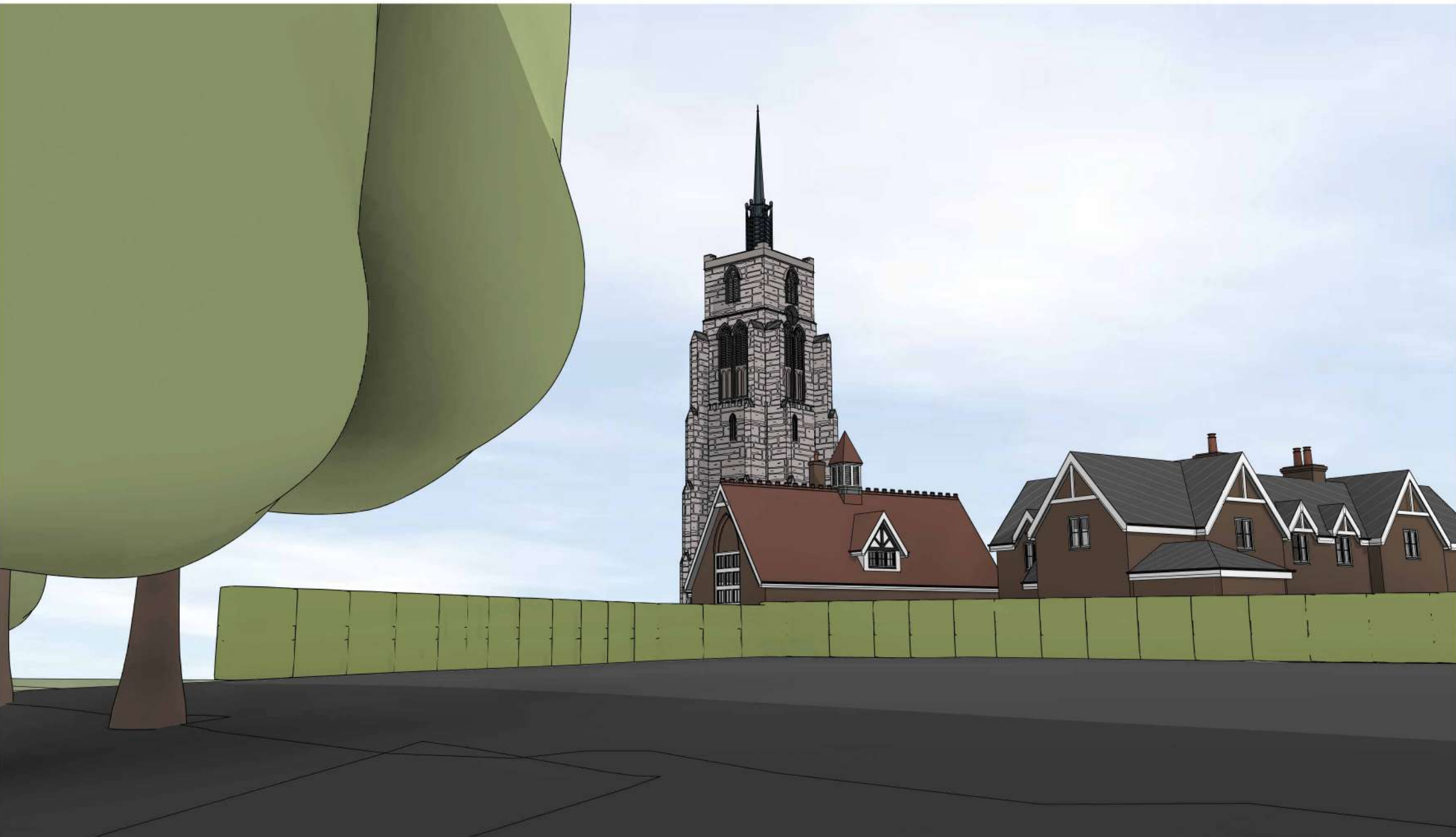
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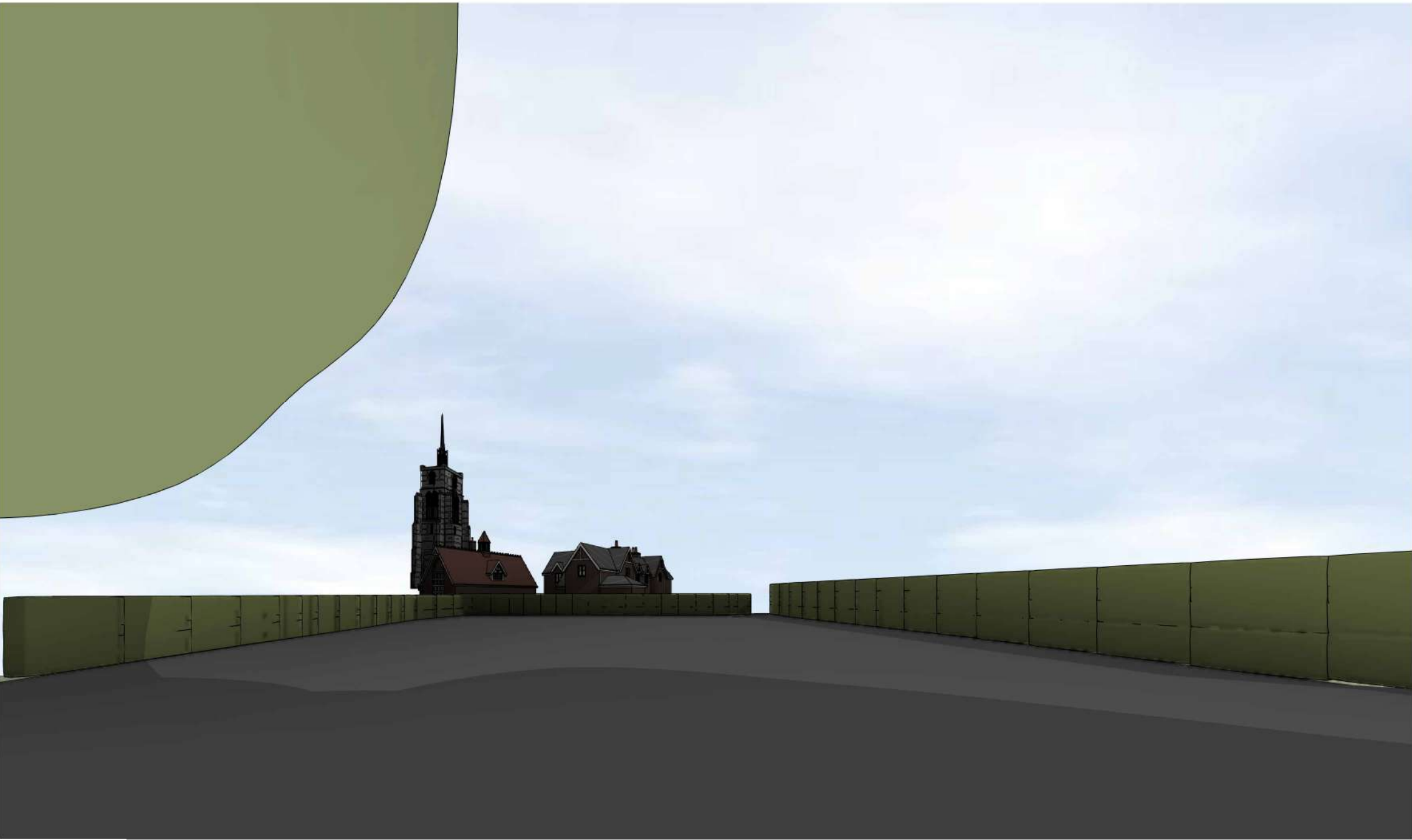
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A1



EXISTING VIEW 1



EXISTING VIEW 1



EXISTING VIEW 2



EXISTING VIEW 2



EXISTING VIEW 3



EXISTING VIEW 3

Appendix: B – EA Flood Map for Planning

Flood map for planning

Your reference	Location (easting/northing)	Created
Unspecified	526616/239851	2 September 2025 16:17

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

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

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

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

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

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2025 AC0000807064. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

Your reference

Unspecified

Location (easting/northing)
526616/239851

Scale
1:2,500

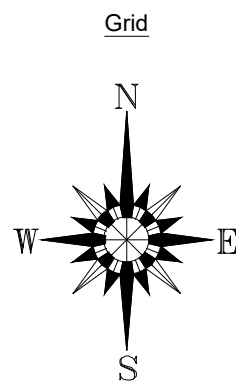
Created
2 Sep 2025 16:17

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



0 20 40 60m

Appendix: C – Topographical Survey



SURVEY STATIONS - COORDINATE SCHEDULE

Station	Easting	Northing	Level
S1	526588.440	239877.858	45.074
S2	526633.087	239873.457	45.421
S3	526625.142	239850.544	46.253
S4	526610.483	239850.668	46.216

Survey station S3 has a direct relationship to the Ordnance Survey active network. All other stations have been descaled about this point. The scale factor for these quoted stations is 1. This is effectively a local coordinate system with a good connection to the OS to facilitate overlaying of further OS digital data. Please contact Maltby Surveys if further clarification is required.

LEGEND

BANKING		WALL	
BUSHES & HEDGES		BUILDING	
TREES		OPEN SIDED BUILDING	
GATES		GLASS ROOFED	
		CONTOURS	

ABBREVIATIONS (WHERE APPLICABLE)

ARCH HEAD HEIGHT	AHH	MARKER	MKR
ARCH HEAD LEVEL	AHL	MONITORING WELL	MW
ARCH SPRINGER HEIGHT	ASH	NOTICE BOARD	NB
ARCH SPRINGER LEVEL	ASL	NAME PLATE	NP
AIR VALVE	AV	OVERHEAD WIRES	OHW
BED LEVEL	BL	PARKING METER	PM
BELISHA BEACON	BB	RIDGE LEVEL	RL
BOLLARD	B	ROOF LEVEL	RL
BRITISH TELECOM BOX	BTB	ROAD SIGN	RS
BRICKWORK	BTMH	RODDING EYE	RE
BUS STOP	BKWK	RETAINING WALL	RTW
CABLE TV	BS	RAIN WATER PIPE	RWP
COVER LEVEL	CATV	SLUICE VALVE	SV
CABLE MARKER	CL	STOP COCK	SC
COLUMN	CM	SOFFIT LEVEL	SOF
CONCRETE POST	CP	STRUCTURAL SLAB LEVEL	SSL
EAVES LEVEL	EAV	TREE STUMP	ST
ELECTRICAL COVER	ELEC	SOIL AND VENT PIPE	SUP
ELECTRICITY CONTROL BOX	ECB	THRESHOLD LEVEL	THL
ELECTRICITY POLE	EP	TELEGRAPH POLE	TP
EARTH ROD	ER	TELEPHONE CALL BOX	TCB
FLOWER BED	FB	TOP OF KERB	TK
FINISHED FLOOR LEVEL	FFL	TURNSTILE	TS
FIRE HYDRANT	FH	TRAFFIC LIGHT	TL
FLOOR LEVEL	FL	TOP OF WALL	TW
FLAG STAFF	FS	UNABLE TO LIFT	UTL
GAS PIPE	GP	UNABLE TO SURVEY	UTS
GAS VALVE	GV	VENT PIPE	VP
GULLY	G	WATER METER	WM
GATE STOP	GS	WATER LEVEL	WL
INSPECTION COVER	IC	WASH OUT	WO
INVERT LEVEL	IL	WASTE PIPE	WP
LAMP POST	LP	WATER TANK	WT
		WATER VALVE	WV

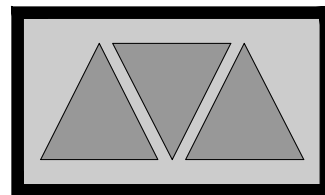
FENCES

BARBED WIRE FENCE	BWF	LARCH LAP FENCE	LLF
CORRUGATED IRON FENCE	CIF	METAL RAILING FENCE	MRF
CLOSE BOARD FENCE	CBF	POST AND RAIL FENCE	PIF
CHAIN LINK FENCE	CLF	PICKET FENCE	PIF
CHESTNUT PALING FENCE	CPF	POST AND RAIL FENCE	PIF
FENCE POST	FPO	POST AND WIRE FENCE	PWF
INTERWOVEN FENCE	IWF	STEEL PALISADE SECURITY FENCE	SPSF
IRON RAILING FENCE	IRF	TUBULAR STEEL RAIL FENCE	TSRF

REV.	NOTES	DWN	DATE
A	----	---	---/---/---

Notes:
Grid and levels relate to OS GPS Active Network.
Sheet is North orientated unless stated.
Survey Scale 1:100, Plot Scale 1:200.

Maltby Surveys Ltd



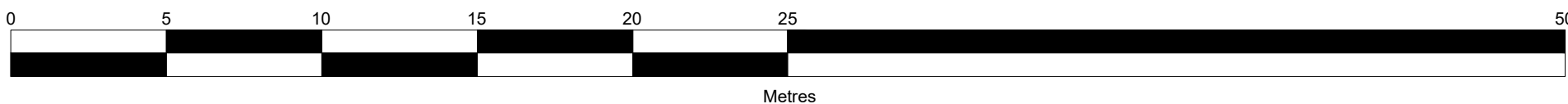
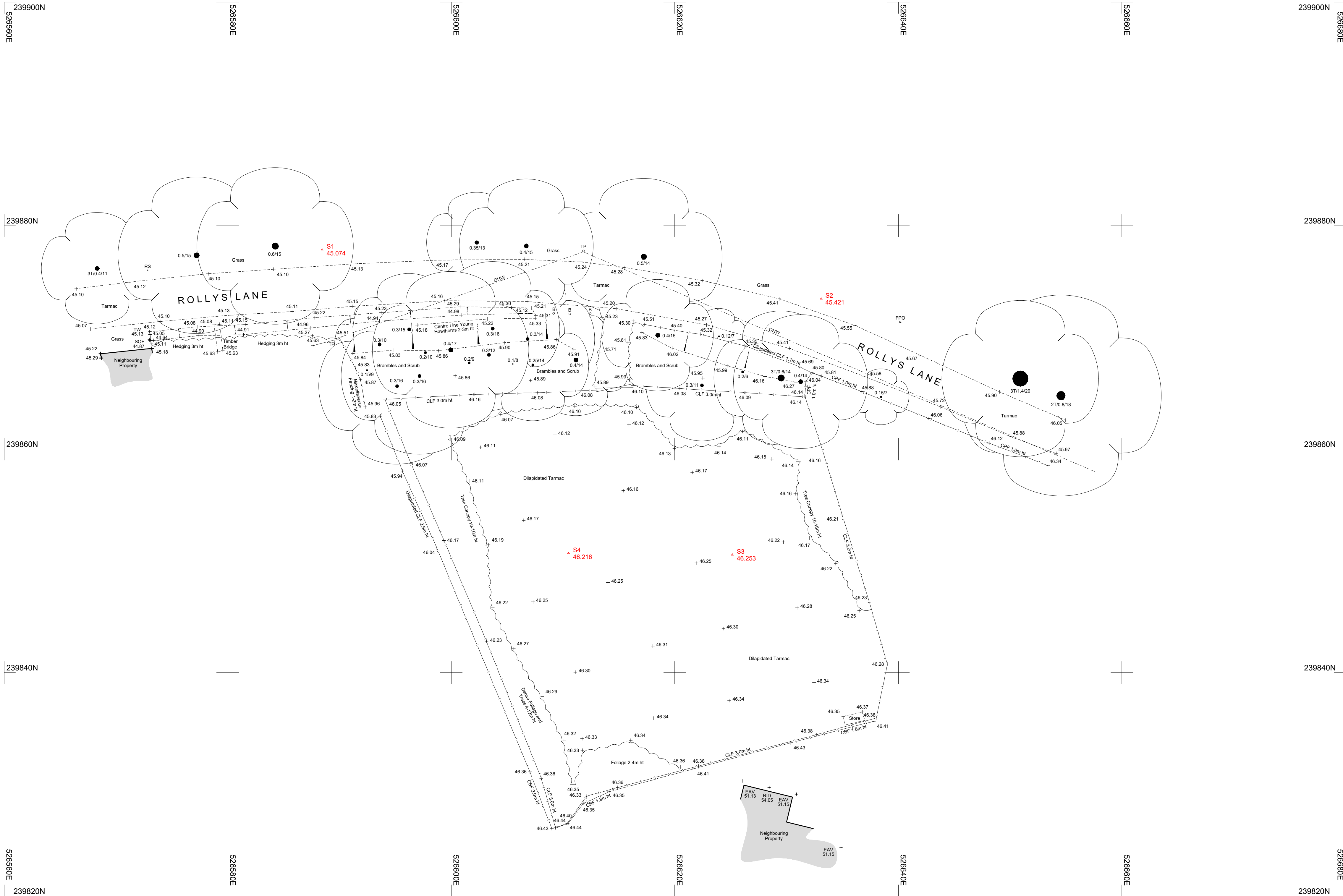
2 QUEENS ROAD
HAYWARDS HEATH
WEST SUSSEX
RH16 1EB
Tel: 01444 416246
E-Mail: mis@maltbysurveys.com
WebSite: www.maltbysurveys.com

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HENRY COLBORN TRUST, ASHWELL

TOPOGRAPHICAL SURVEY

Job No	Rev	Drawing Number
25/186	-	25/186/100
Date :	Aug 2025	



Appendix: D – BGS GeoSure Information

BGS GeoSure Information



SolubleRocks

-  - A
-  - B
-  - C
-  - D
-  - E

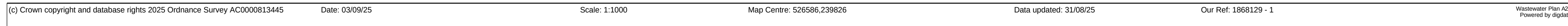


Site

<https://www.bgs.ac.uk/datasets/bgs-geosure-soluble-rocks/soluble-rocks-property-hazard-information/>

Hazard rating	Advice for public	Advice for specialist
A — soluble rocks are either not thought to be present, or are not prone to dissolution. Dissolution features are unlikely to be present.	No actions required to avoid problems due to soluble rocks.	No special ground investigation required or increased construction costs or increased financial risk due to potential problems with soluble rocks.
B — soluble rocks are present but unlikely to cause problems except under exceptional conditions.	No actions required to avoid problems due to soluble rocks.	No special ground investigation required or increased construction costs. An increase in financial risk due to problems with soluble rocks is unlikely.
C — significant soluble rocks are present. Low possibility of localised subsidence or dissolution related-degradation of bedrock occurring naturally, but may be possible in adverse conditions such as high surface or subsurface water flow.	Consider implications for stability when changes to surface drainage or new construction are planned. Do not dispose of surface drainage to the adjacent ground.	New build — site investigation should consider potential for dissolution problems on the site and its surroundings. Care should be taken with local drainage into the adjacent bedrock. Existing property— possible increase in insurance risk due to soluble rocks. Some possibility of potential liability due to groundwater pollution may be present.
D — very significant soluble rocks are present with a moderate possibility of localised natural subsidence or dissolution-related degradation of bedrock, especially in adverse conditions such as concentrated surface or subsurface water flow.	Consider obtaining specialist advice before loading the land or undertaking building work. Do not dispose of surface drainage to the adjacent ground. Maintain drainage infrastructure.	New build — specialist site investigation and stability assessment may be necessary before construction. Construction work may cause subsidence. Isolate surface drainage from the karst system and groundwater. Increased construction costs are possible. Existing property— possible increase in insurance risk due to soluble rocks. Some possibility of potential liability due to groundwater pollution may be present.
E — very significant soluble rocks are present with a high possibility of localised subsidence or dissolution-related degradation of bedrock occurring naturally, especially in adverse conditions such as concentrated surface or subsurface water flow.	Obtain specialist advice to advise on need for stabilisation work and/or land management plan to maintain stability. Do not dispose of surface drainage into the adjacent ground. Maintain drainage infrastructure.	New build — specialist land stability assessment necessary. Investigation, remediation and/or mitigation works may be necessary to stabilise the area. Construction work may cause subsidence. Isolate surface drainage from the karst system and groundwater. Increased construction costs. Existing property — probable increase in insurance risk due to soluble rocks. Probable potential liability due to groundwater pollution.

Appendix: E – Anglian Water Sewer Records



Foul Sewer				
Surface Sewer		Outfall*		Sewage Treatment Works
Combined Sewer				
Final Effluent		Inlet*		Public Pumping Station
Rising Main*				
Private Sewer*		Manhole*		Decommissioned Pumping Station
Decommissioned Sewer*				

*(Colour denotes effluent type)

heidi.brown@eastp.co.uk
Rollys Lane



Appendix: F – DEFRA Surface Water Mapping



Surface Water Flood Risk

Rolly's Lane, Ashwell, North Herts

Risk of surface water flooding, inclusive of climate change (2050s), at any depth

Key:

Flood Likelihood Category:

- Low
- Medium
- High
- Site Boundary



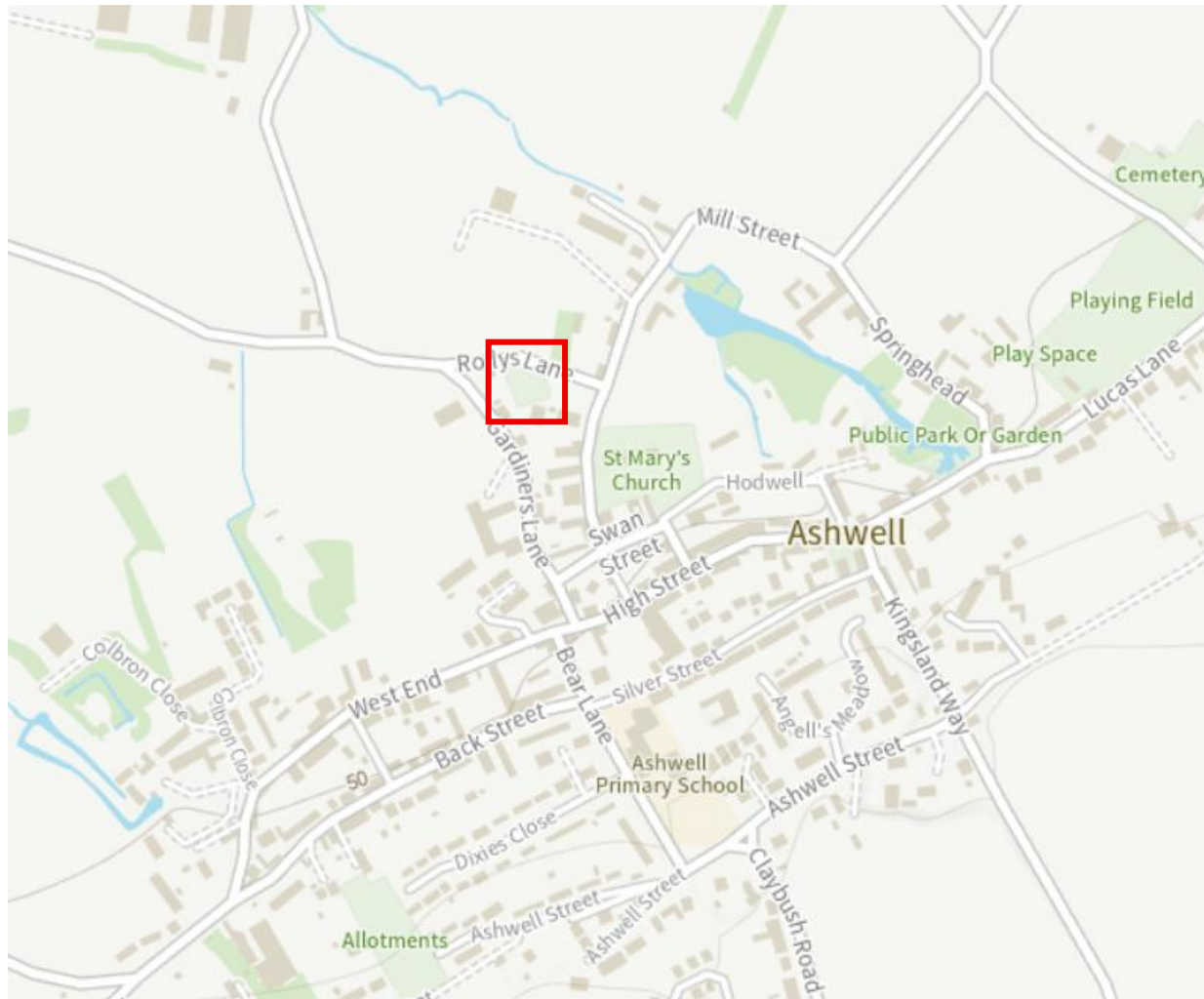
EAS Transport Planning
1st Floor Millers House
Roydon Road
Stanstead Abbots
SG12 8HN

Map Source: Google Satellite



Appendix: G – Reservoir Flood Map

Risk of Reservoir Flooding



Reservoirs map

- ☐ Extent
 - ☒ When river levels are normal
 - ☐ When there is also flooding from rivers

Map detail

- ☒ Show flooding
- ☐ Site

Appendix: H – Greenfield Runoff Rates

**Design Settings**

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

Simulation Settings

Rainfall Methodology	FEH-22	Drain Down Time (mins)	1440	30 year (l/s)	0.0
Rainfall Events	Singular	Additional Storage (m ³ /ha)	0.0	100 year (l/s)	0.0
Summer CV	1.000	Starting Level (m)		Check Discharge Volume	✓
Winter CV	1.000	Check Discharge Rate(s)	✓	100 year 360 minute (m ³)	
Analysis Speed	Normal	1 year (l/s)	0.0		
Skip Steady State	x	2 year (l/s)	0.0		

Storm Durations

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

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

Pre-development Discharge Rate

Site Makeup	Greenfield	Betterment (%)	0
Greenfield Method	ReFH2	Q 1 year (l/s)	0.4
Region	England, Wales, NI	Q 2 year (l/s)	0.5
Include Baseflow	x	Q 30 year (l/s)	1.4
Positively Drained Area (ha)	1.000	Q 100 year (l/s)	1.9

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	ReFH2	Storm Duration (mins)	360
Region	England, Wales, NI	Betterment (%)	0
Include Baseflow	x	Runoff Volume (m ³)	24
Positively Drained Area (ha)	1.000		

Appendix: I – Causeway Flow Outputs: SuDS

Design Settings

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

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
3	0.003	5.00	46.150	600	18.914	49.808	1.090	45.060
4	0.003	5.00	46.310	600	10.531	33.074	1.351	44.959
5			46.310	600	10.611	21.655	1.368	44.942
1	0.002	5.00	46.340	600	38.220	16.079	1.201	45.139
2	0.003	5.00	46.310	600	38.476	33.376	1.241	45.069
Soakaway 1			46.300		26.076	21.825	1.384	44.916
9	0.003	5.00	46.150	600	73.831	47.185	1.070	45.080
10	0.003	5.00	46.340	600	88.335	23.504	1.351	44.989
11			46.340	600	88.190	13.908	1.397	44.943
6	0.003	5.00	46.300	600	57.368	28.397	1.173	45.127
8	0.002	5.00	46.320	600	57.243	20.873	1.225	45.095
Soakaway 2			46.340		72.916	14.209	1.424	44.916
PP1	0.044		46.160		48.276	40.365	0.580	45.580
7		5.00	46.340	600	57.224	12.784	1.212	45.128

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	3	4	17.100	0.600	45.060	44.959	0.101	169.3	225	5.28	50.0
1.001	4	5	2.830	0.600	44.959	44.942	0.017	166.5	225	5.35	50.0
2.002	5	Soakaway 1	4.430	0.600	44.942	44.916	0.026	170.4	225	5.42	50.0
2.000	1	2	7.000	0.600	45.139	45.069	0.070	100.0	150	5.12	50.0
2.001	2	4	11.050	0.600	45.069	44.959	0.110	100.5	150	5.30	50.0
3.000	9	10	15.520	0.600	45.080	44.989	0.091	170.5	225	5.26	50.0
3.001	10	11	3.860	0.600	44.989	44.966	0.023	167.8	225	5.32	50.0
3.002	11	Soakaway 2	4.610	0.600	44.943	44.916	0.027	170.7	225	5.40	50.0
4.000	6	8	3.200	0.600	45.127	45.095	0.032	100.0	150	5.05	50.0

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	1.002	39.8	0.5	0.865	1.126	0.003	0.0	18	0.347
1.001	1.010	40.2	2.0	1.126	1.143	0.011	0.0	34	0.527
2.002	0.999	39.7	2.0	1.143	1.159	0.011	0.0	34	0.520
2.000	1.005	17.8	0.4	1.051	1.091	0.002	0.0	15	0.397
2.001	1.002	17.7	0.9	1.091	1.201	0.005	0.0	23	0.526
3.000	0.998	39.7	0.5	0.845	1.126	0.003	0.0	18	0.346
3.001	1.006	40.0	2.0	1.126	1.149	0.011	0.0	34	0.524
3.002	0.997	39.7	2.0	1.172	1.199	0.011	0.0	34	0.520
4.000	1.005	17.8	0.5	1.023	1.075	0.003	0.0	18	0.446

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)
4.001	8	10	10.580	0.600	45.095	44.989	0.106	99.8	150	5.23	50.0
2.000_1	7	8	3.270	0.600	45.128	45.095	0.033	99.1	150	5.05	50.0

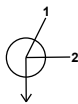
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
4.001	1.006	17.8	0.9	1.075	1.201	0.005	0.0	23	0.528
2.000_1	1.009	17.8	0.0	1.062	1.075	0.000	0.0	0	0.000

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	17.100	169.3	225	Circular	46.150	45.060	0.865	46.310	44.959	1.126
1.001	2.830	166.5	225	Circular	46.310	44.959	1.126	46.310	44.942	1.143
2.002	4.430	170.4	225	Circular	46.310	44.942	1.143	46.300	44.916	1.159
2.000	7.000	100.0	150	Circular	46.340	45.139	1.051	46.310	45.069	1.091
2.001	11.050	100.5	150	Circular	46.310	45.069	1.091	46.310	44.959	1.201
3.000	15.520	170.5	225	Circular	46.150	45.080	0.845	46.340	44.989	1.126
3.001	3.860	167.8	225	Circular	46.340	44.989	1.126	46.340	44.966	1.149
3.002	4.610	170.7	225	Circular	46.340	44.943	1.172	46.340	44.916	1.199
4.000	3.200	100.0	150	Circular	46.300	45.127	1.023	46.320	45.095	1.075
4.001	10.580	99.8	150	Circular	46.320	45.095	1.075	46.340	44.989	1.201
2.000_1	3.270	99.1	150	Circular	46.340	45.128	1.062	46.320	45.095	1.075

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	3	600	Manhole	Adoptable	4	600	Manhole	Adoptable
1.001	4	600	Manhole	Adoptable	5	600	Manhole	Adoptable
2.002	5	600	Manhole	Adoptable	Soakaway 1		Junction	
2.000	1	600	Manhole	Adoptable	2	600	Manhole	Adoptable
2.001	2	600	Manhole	Adoptable	4	600	Manhole	Adoptable
3.000	9	600	Manhole	Adoptable	10	600	Manhole	Adoptable
3.001	10	600	Manhole	Adoptable	11	600	Manhole	Adoptable
3.002	11	600	Manhole	Adoptable	Soakaway 2		Junction	
4.000	6	600	Manhole	Adoptable	8	600	Manhole	Adoptable
4.001	8	600	Manhole	Adoptable	10	600	Manhole	Adoptable
2.000_1	7	600	Manhole	Adoptable	8	600	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
3	18.914	49.808	46.150	1.090	600					
							0	1.000	45.060	225
4	10.531	33.074	46.310	1.351	600		1	1.000	44.959	225
							2	2.001	44.959	150
							0	1.001	44.959	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
5	10.611	21.655	46.310	1.368	600		1 1.001	44.942	225
						0	2.002	44.942	225
1	38.220	16.079	46.340	1.201	600		0 2.000	45.139	150
2	38.476	33.376	46.310	1.241	600		1 2.000	45.069	150
						0	2.001	45.069	150
Soakaway 1	26.076	21.825	46.300	1.384			1 2.002	44.916	225
9	73.831	47.185	46.150	1.070	600		0 3.000	45.080	225
10	88.335	23.504	46.340	1.351	600		1 4.001 2 3.000	44.989	150 225
						0	3.001	44.989	225
11	88.190	13.908	46.340	1.397	600		1 3.001	44.966	225
						0	3.002	44.943	225
6	57.368	28.397	46.300	1.173	600		0 4.000	45.127	150
8	57.243	20.873	46.320	1.225	600		1 4.000 2 2.000_1	45.095	150 150
						0	4.001	45.095	150
Soakaway 2	72.916	14.209	46.340	1.424			1 3.002	44.916	225
PP1	48.276	40.365	46.160	0.580					
7	57.224	12.784	46.340	1.212	600		0 2.000_1	45.128	150

Node 5 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Link	1.001
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	44.942	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	1192	Diameter (mm)	1000

Node 11 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Link	3.001
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	44.966	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	1224	Diameter (mm)	1000

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	3	11	45.078	0.018	0.5	0.0050	0.0000	OK
15 minute summer	4	11	44.994	0.035	1.8	0.0098	0.0000	OK
15 minute summer	5	11	44.975	0.033	1.8	0.0281	0.0000	OK
15 minute summer	1	12	45.153	0.014	0.3	0.0039	0.0000	OK
15 minute summer	2	11	45.091	0.022	0.8	0.0061	0.0000	OK
360 minute winter	Soakaway 1	240	44.839	-0.077	0.4	1.9347	0.0000	OK
15 minute summer	9	11	45.098	0.018	0.5	0.0050	0.0000	OK
15 minute summer	10	11	45.023	0.034	1.8	0.0097	0.0000	OK
15 minute summer	11	11	44.976	0.033	1.8	0.0119	0.0000	OK
15 minute summer	6	11	45.145	0.018	0.5	0.0051	0.0000	OK
15 minute summer	8	11	45.117	0.022	0.8	0.0061	0.0000	OK
360 minute winter	Soakaway 2	248	44.748	-0.168	0.4	1.9396	0.0000	OK
240 minute summer	PP1	156	45.733	0.153	2.5	3.7828	0.0000	OK
15 minute summer	7	1	45.128	0.000	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)
15 minute summer	3	1.000	4	0.5	0.197	0.013	0.0454
15 minute summer	4	1.001	5	1.8	0.478	0.045	0.0106
15 minute summer	5	2.002	Soakaway 1	1.8	0.502	0.045	0.0158
15 minute summer	1	2.000	2	0.3	0.270	0.017	0.0082
15 minute summer	2	2.001	4	0.8	0.364	0.045	0.0257
360 minute winter	Soakaway 1	Infiltration		0.0			
15 minute summer	9	3.000	10	0.5	0.201	0.013	0.0406
15 minute summer	10	3.001	11	1.8	0.494	0.045	0.0140
15 minute summer	11	3.002	Soakaway 2	1.8	0.502	0.045	0.0165
15 minute summer	6	4.000	8	0.5	0.366	0.028	0.0044
15 minute summer	8	4.001	10	0.8	0.358	0.045	0.0242
360 minute winter	Soakaway 2	Infiltration		0.0			
240 minute summer	PP1	Infiltration		0.8			
15 minute summer	7	2.000_1	8	0.0	0.000	0.000	0.0026

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.52%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	3	172	45.273	0.213	0.3	0.0602	0.0000	OK
180 minute winter	4	188	45.282	0.323	1.1	0.0914	0.0000	SURCHARGED
180 minute winter	5	168	45.269	0.327	1.1	0.3287	0.0000	SURCHARGED
180 minute winter	1	172	45.273	0.134	0.2	0.0381	0.0000	OK
180 minute winter	2	172	45.273	0.204	0.5	0.0577	0.0000	SURCHARGED
180 minute winter	Soakaway 1	172	45.271	0.355	1.1	2.8514	0.0000	OK
180 minute winter	9	172	45.259	0.179	0.3	0.0505	0.0000	OK
180 minute winter	10	172	45.260	0.271	1.1	0.0767	0.0000	SURCHARGED
180 minute winter	11	172	45.258	0.315	1.1	0.3686	0.0000	SURCHARGED
180 minute winter	6	172	45.259	0.132	0.3	0.0375	0.0000	OK
180 minute winter	8	172	45.258	0.163	0.5	0.0462	0.0000	SURCHARGED
180 minute winter	Soakaway 2	172	45.258	0.342	1.1	2.8416	0.0000	OK
180 minute summer	PP1	132	45.851	0.271	6.8	11.5029	0.0000	OK
180 minute winter	7	172	45.259	0.131	0.1	0.0372	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
180 minute winter	3	1.000	4	0.4	0.168	0.010	0.6726
180 minute winter	4	1.001	5	1.1	0.424	0.027	0.1126
180 minute winter	5	2.002	Soakaway 1	1.1	0.435	0.028	0.1762
180 minute winter	1	2.000	2	0.2	0.253	0.011	0.1198
180 minute winter	2	2.001	4	0.5	0.311	0.028	0.1945
180 minute winter	Soakaway 1	Infiltration		0.0			
180 minute winter	9	3.000	10	0.3	0.170	0.008	0.5714
180 minute winter	10	3.001	11	1.1	0.429	0.028	0.1535
180 minute winter	11	3.002	Soakaway 2	1.1	0.435	0.028	0.1833
180 minute winter	6	4.000	8	0.3	0.342	0.017	0.0544
180 minute winter	8	4.001	10	0.5	0.312	0.028	0.1863
180 minute winter	Soakaway 2	Infiltration		0.0			
180 minute summer	PP1	Infiltration		1.2			
180 minute winter	7	2.000_1	8	-0.1	-0.038	-0.005	0.0554

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.83%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute summer	3	232	45.650	0.590	0.5	0.1671	0.0000	SURCHARGED
240 minute summer	4	236	45.662	0.703	1.6	0.1989	0.0000	SURCHARGED
240 minute summer	5	232	45.645	0.703	1.4	0.7542	0.0000	SURCHARGED
240 minute summer	1	232	45.651	0.512	0.4	0.1450	0.0000	SURCHARGED
240 minute summer	2	232	45.650	0.581	0.9	0.1645	0.0000	SURCHARGED
240 minute summer	Soakaway 1	236	45.652	0.736	1.4	2.8514	0.0000	OK
240 minute summer	9	232	45.578	0.498	0.5	0.1409	0.0000	SURCHARGED
240 minute summer	10	232	45.580	0.591	1.8	0.1672	0.0000	SURCHARGED
240 minute summer	11	232	45.577	0.634	1.4	0.8275	0.0000	SURCHARGED
240 minute summer	6	232	45.579	0.452	0.5	0.1279	0.0000	SURCHARGED
240 minute summer	8	232	45.578	0.483	0.9	0.1366	0.0000	SURCHARGED
240 minute summer	Soakaway 2	232	45.579	0.663	1.4	2.8416	0.0000	OK
180 minute summer	PP1	144	45.942	0.362	9.5	17.9819	0.0000	OK
240 minute summer	7	232	45.579	0.451	0.3	0.1276	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
240 minute summer	3	1.000	4	0.6	0.175	0.015	0.6801
240 minute summer	4	1.001	5	1.4	0.418	0.034	0.1126
240 minute summer	5	2.002	Soakaway 1	1.4	0.435	0.035	0.1762
240 minute summer	1	2.000	2	0.5	0.274	0.026	0.1232
240 minute summer	2	2.001	4	0.8	0.334	0.045	0.1945
240 minute summer	Soakaway 1	Infiltration		0.0			
240 minute summer	9	3.000	10	0.5	0.182	0.012	0.6172
240 minute summer	10	3.001	11	1.4	0.461	0.035	0.1535
240 minute summer	11	3.002	Soakaway 2	1.4	0.435	0.035	0.1833
240 minute summer	6	4.000	8	0.5	0.364	0.028	0.0563
240 minute summer	8	4.001	10	0.8	0.347	0.044	0.1863
240 minute summer	Soakaway 2	Infiltration		0.0			
180 minute summer	PP1	Infiltration		1.3			
240 minute summer	7	2.000_1	8	-0.3	-0.038	-0.014	0.0576

Results for 100 year 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
240 minute winter	3	232	45.550	0.490	0.5	0.1387	0.0000	SURCHARGED
240 minute winter	4	232	45.556	0.597	1.1	0.1689	0.0000	SURCHARGED
240 minute winter	5	228	45.544	0.602	1.1	0.6408	0.0000	SURCHARGED
240 minute winter	1	232	45.551	0.412	0.3	0.1166	0.0000	SURCHARGED
240 minute winter	2	232	45.550	0.481	0.5	0.1362	0.0000	SURCHARGED
240 minute winter	Soakaway 1	232	45.549	0.633	1.1	2.8514	0.0000	OK
240 minute winter	9	232	45.494	0.414	0.3	0.1171	0.0000	SURCHARGED
240 minute winter	10	232	45.495	0.506	1.1	0.1432	0.0000	SURCHARGED
240 minute winter	11	232	45.493	0.550	1.1	0.7056	0.0000	SURCHARGED
240 minute winter	6	232	45.495	0.368	0.3	0.1041	0.0000	SURCHARGED
240 minute winter	8	232	45.493	0.398	0.5	0.1127	0.0000	SURCHARGED
240 minute winter	Soakaway 2	232	45.494	0.578	1.1	2.8416	0.0000	OK
180 minute summer	PP1	136	45.909	0.329	8.5	15.6075	0.0000	OK
240 minute winter	7	232	45.495	0.367	0.2	0.1038	0.0000	SURCHARGED

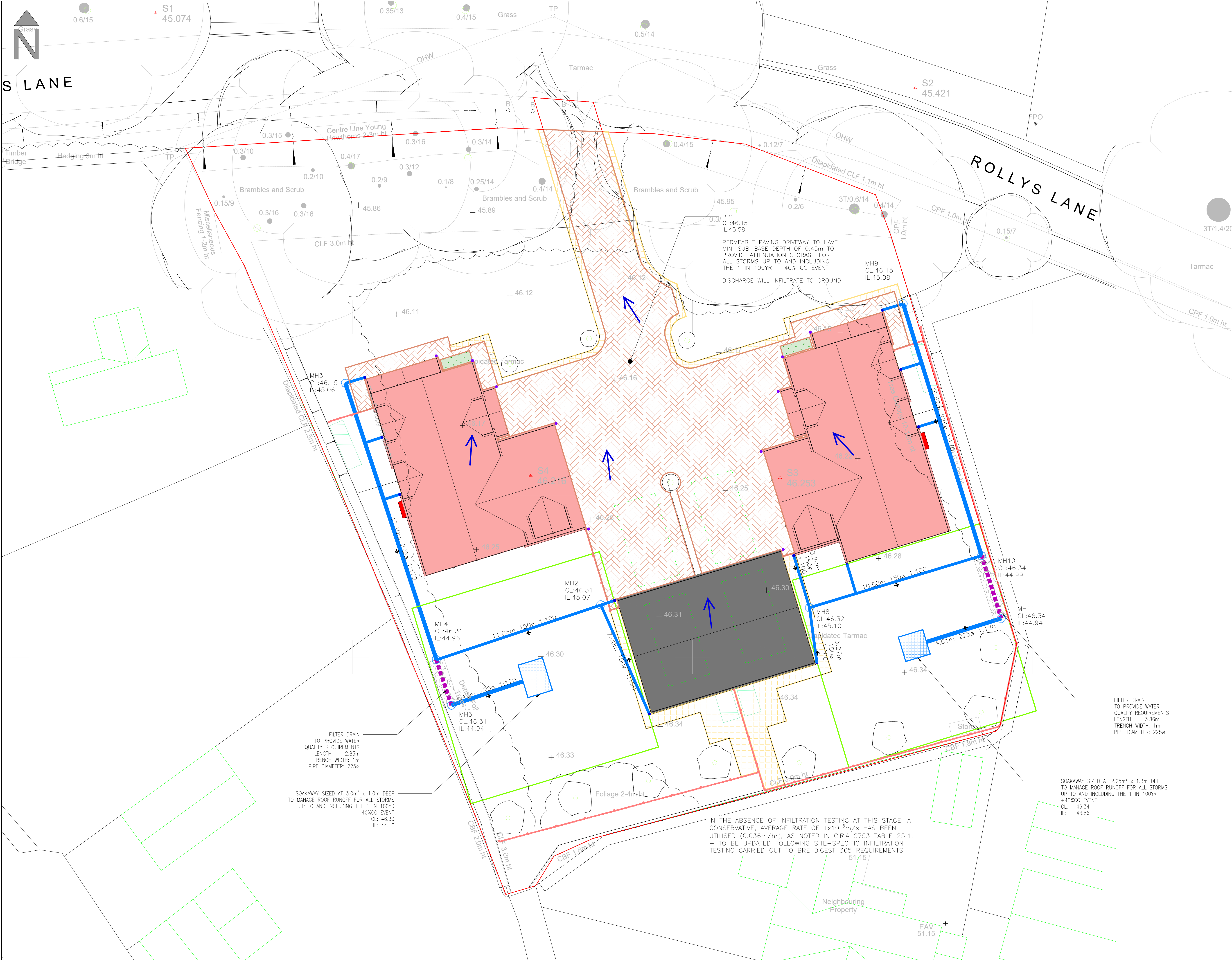
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
240 minute winter	3	1.000	4	0.5	0.168	0.012	0.6801
240 minute winter	4	1.001	5	1.1	0.424	0.027	0.1126
240 minute winter	5	2.002	Soakaway 1	1.1	0.424	0.028	0.1762
240 minute winter	1	2.000	2	0.2	0.253	0.011	0.1232
240 minute winter	2	2.001	4	0.5	0.311	0.028	0.1945
240 minute winter	Soakaway 1	Infiltration		0.0			
240 minute winter	9	3.000	10	0.3	0.170	0.008	0.6172
240 minute winter	10	3.001	11	1.1	0.429	0.028	0.1535
240 minute winter	11	3.002	Soakaway 2	1.1	0.435	0.028	0.1833
240 minute winter	6	4.000	8	0.3	0.342	0.017	0.0563
240 minute winter	8	4.001	10	0.5	0.312	0.030	0.1863
240 minute winter	Soakaway 2	Infiltration		0.0			
180 minute summer	PP1	Infiltration		1.3			
240 minute winter	7	2.000_1	8	-0.2	-0.023	-0.011	0.0576

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 97.25%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	3	344	46.061	1.001	0.8	0.2834	0.0000	FLOOD RISK
360 minute winter	4	344	46.062	1.103	3.6	0.3123	0.0000	FLOOD RISK
360 minute winter	5	344	46.059	1.117	3.6	1.2233	0.0000	FLOOD RISK
360 minute winter	1	344	46.062	0.923	0.4	0.2612	0.0000	FLOOD RISK
360 minute winter	2	344	46.062	0.993	0.5	0.2809	0.0000	FLOOD RISK
360 minute winter	Soakaway 1	344	46.060	1.144	1.9	2.8514	0.0000	OK
360 minute winter	9	344	45.920	0.840	0.3	0.2377	0.0000	FLOOD RISK
360 minute winter	10	344	45.921	0.932	1.1	0.2639	0.0000	SURCHARGED
360 minute winter	11	344	45.919	0.976	1.0	1.3202	0.0000	SURCHARGED
360 minute winter	6	344	45.921	0.794	0.3	0.2247	0.0000	SURCHARGED
360 minute winter	8	344	45.920	0.825	0.5	0.2333	0.0000	SURCHARGED
360 minute winter	Soakaway 2	344	45.920	1.004	0.7	2.8416	0.0000	OK
180 minute winter	PP1	172	46.028	0.448	8.2	24.1214	0.0000	OK
360 minute winter	7	344	45.921	0.793	0.3	0.2244	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
360 minute winter	3	1.000	4	-0.5	0.153	-0.012	0.6801
360 minute winter	4	1.001	5	0.7	0.369	0.018	0.1126
360 minute winter	5	2.002	Soakaway 1	0.9	0.381	0.023	0.1762
360 minute winter	1	2.000	2	0.3	0.233	0.017	0.1232
360 minute winter	2	2.001	4	0.5	0.262	0.028	0.1945
360 minute winter	Soakaway 1	Infiltration		0.0			
360 minute winter	9	3.000	10	0.3	0.155	0.008	0.6172
360 minute winter	10	3.001	11	1.0	0.377	0.024	0.1535
360 minute winter	11	3.002	Soakaway 2	0.7	0.381	0.018	0.1833
360 minute winter	6	4.000	8	0.3	0.313	0.017	0.0563
360 minute winter	8	4.001	10	0.5	0.262	0.028	0.1863
360 minute winter	Soakaway 2	Infiltration		0.0			
180 minute winter	PP1	Infiltration		1.3			
360 minute winter	7	2.000_1	8	-0.3	-0.026	-0.015	0.0576

Appendix: J – Proposed SuDS Layout



KEY

SITE BOUNDARY (TOTAL SITE AREA 0.0568ha)

PROPOSED BUILDING

PROPOSED GARAGE

PERMEABLE PAVING WITH MIN. 450mm SUB-BASE

PROPOSED HARDSTANDING

SOAKAWAY TO ALLOW INFILTRATION (SEE DRAWING FOR DIMENSIONS)

5m EASEMENT

FILTER DRAIN (LENGTH: 2.0m; WIDTH: 1.0m)

RAISED PLANTER WITH RESTRICTED OUTFALL (1.8mX0.65mX0.9m)

SURFACE WATER PIPE NETWORK

SURFACE WATER MANHOLE

RAINWATER DOWNPIPE

RAINWATER DOWNPIPE FITTED WITH A SHOE

EXCEEDANCE FLOW ARROW

NB: IN THE ABSENCE OF INFILTRATION TESTING AT THIS STAGE, A CONSERVATIVE, AVERAGE RATE OF 1x10⁻⁵m/s HAS BEEN UTILISED (0.036m/hr), AS NOTED IN CIRIA C753 TABLE 25.1. – TO BE UPDATED FOLLOWING SITE-SPECIFIC INFILTRATION TESTING CARRIED OUT TO BRE DIGEST 365 REQUIREMENTS

REV	DATE	BY	DESCRIPTION	CHK	APP
-	-	-	-	-	-

DRAWING STATUS:

FOR PLANNING

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ROLLY'S LANE, ASHWELL
NORTH HERTS, SG7 5PY

TITLE:

PROPOSED SUDS STRATEGY

SCALE @ A1:	DESIGN-DRAWN:	DATE:
1:100	HB	19.01.26
PROJECT No:	DRAWING No:	
6122	SK02 – REV B	