PAP/2025/0155

Link ENGINEERING

Richborough

Land north of Orton Road, Warton

Flood Risk Assessment

LE25058–OR-LINK-GEN-XX-RP-C-FRA01_Flood Risk Assessment

March 2025

linkeng.co.uk

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P02	14.03.2025	VI	Updated Development Plan
P03	28.03.2025	VI	Revised Development Plan

Land North of Orton Road, Warton

LE25058-OR-LINK-GEN-XX-RP-C-FRA01_Flood Risk Assessment

CONTENTS

APPENDICES

1 INTRODUCTION

1.1 Background

1.1.1 Link was commissioned by Richborough to prepare a Flood Risk Assessment and associated Drainage Strategy in respect to a proposed development off Orton Road in Warton, Warwickshire. As required by Warwickshire County Council, North Warwickshire Borough Council, and the North Warwickshire Local Plan, this report has been prepared to provide Flood Risk, Sustainable Drainage Strategy and Drainage Management Plan in support of an outline planning application. The landowners of the site are Michael Ensor Caton and Andrew Norman Caton.

1.1.2 The proposed scheme shall comprise of the construction of up to 110 dwellings, with access, landscaping, sustainable drainage features, and associated infrastructure. All matters are reserved except for primary vehicular access from Church Road. The proposed scheme shall also incorporate new pedestrian pathways around the site, with access onto Church Road and the adjacent recreation ground. The proposed site plan is included within **Appendix A**.

1.2 Site Location

1.2.1 The site is located north of Orton Road in the village of Warton in north Warwickshire. The site shall act as a subsequent development to the completed scheme immediately to the east. Vehicular access is being provided off Church Road. A Site Location Plan is included in **Appendix A**.

1.2.2 The site is currently greenfield and as such does not currently have a post code. However, the nearest post code for the development to the east is B79 0JG.

1.3 Topography

1.3.1 A detailed topographical survey of the site has been completed, and this is included in **Appendix B** of this report. The existing site level range has been found to be approximately 89.5mAOD in the westernmost corner of the site, to 79.3mAOD in the south-east corner.

1.3.2 The main features within the site are open field, with much of the site boundary lined with vegetation.

1.4 Former Land Uses

1.4.1 Historical free to view mapping (https://maps.nls.uk/geo) has been reviewed as part of this flood risk assessment, which indicates that the site has had no former land uses besides open field.

1.5 Ground conditions

1.5.1 A review of the British Geological Survey's geological mapping has been undertaken to determine the likely ground conditions on the site. Geological maps on the British Geological Survey online tools identify the bedrock geology as a combination of sandstone, siltstone and mudstone.

1.5.2 Furthermore, publicly available boreholes in the proximity of the site have been reviewed, which suggest the proposed development is mainly to be constructed on sand, gravel, and marl strata.

1.6 Watercourses

1.6.1 No major water features have been identified within the proximity of the site, with the nearest watercourses being Bramcote Brook, located approximately 900m north of the site, and the River Anker, located approximately 950m south of the site.

1.7 Drainage

As the site is greenfield, it is expected that no drains are located on site. Correspondence with Severn Trent Water (STW) has identified a pumped foul sewer running eastwards within Orton Road, and existing storm and foul gravity public sewers further to the east in Orton Road. It is expected that, if it is concluded that infiltration cannot be utilised as a viable outfall method, the proposed drainage strategy for the development will outfall into these public sewers. A sewer record for the area provided by STW is included in **Appendix C**.

1.8 Flood Zones and Vulnerability Classification

1.8.1 The formal flood zone mapping https://flood-map-for-planning.service.gov.uk/, approved by the government and prepared for use in the planning process, identifies areas potentially at risk of flooding from fluvial or tidal sources without considering the presence of flood defences or structures such as culverts or minor watercourses. An extract from the mapping is included in Figure 1; the red line denotes the site boundary.

Figure 1: Flood Zone Mapping

1.8.2 The formal flood zone mapping shows the site to be located entirely within Flood Zone 1, indicating a low risk of flooding. Table 1 indicates what uses of land are appropriate for each flood zone, as set out within *Table 2 – Flood risk vulnerability and flood zone 'incompatibility'* in the PPG of the NPPF. The proposed use would be defined as More Vulnerable so hence the proposed use is deemed acceptable.

	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test	✓	✓	✓
Zone 3a	Exception Test	✗	Exception Test	✓	✓
Zone 3b	Exception Test	✗	✗	✗	✓

Table 1 - Flood risk vulnerability and flood zone 'incompatibility'

1.9 National Planning Flood Risk Policies Relevant to this Development

1.9.1 The National Planning Policy Framework (NPPF) last revised by the Department of Communities and Local Government (DCLG) on 7th March 2025, took immediate effect on that date. The document Technical Guidance on the National Policy Framework (TGNPPF) also published by the Department of Communities and Local Government, has now been withdrawn and superseded by the Planning Practice Guidance (PPG), published on 29th November 2016.

1.9.2 The requirement for conducting an FRA as part of a planning application is set out in Footnote 63 on page 51 of the NPPF, which states:

"A site-specific flood risk assessment should be provided for all development 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."

1.9.3 Essential content of a site-specific FRA is explained in the PPG, paragraph 20 as follows:

"A site-specific flood risk assessment is carried out by (or on behalf of) a developer to assess the flood risk to and from a development site and should accompany a planning application where prescribed in footnote 55 of the National Planning Policy Framework. The assessment should demonstrate to the decision-maker how flood risk will be managed now and over the development's lifetime, taking climate change into account, and with regard to the vulnerability of its users (see National Planning Policy Framework Annex 3 – Flood Risk Vulnerability).

"The objectives of a site-specific flood risk assessment are to establish:

- *whether a proposed development is likely to be affected by current or future flooding from any source;*
- *whether it will increase flood risk elsewhere;*
- *whether the measures proposed to deal with these effects and risks are appropriate;*
- *the evidence for the local planning authority to apply (if necessary) the Sequential Test, and;*
- *whether the development will be safe and pass the Exception Test, if applicable."*

1.9.4 For certain types of flood sensitive development, NPPF describes how the Local Planning Authority (LPA) should check that the site proposed has the lowest frequency of flooding of those available for the

development. This check is called the "Sequential Test." All development that is identified in the LPA's Local Development Framework Development Plan (LDFDP) has been Sequentially Tested using the LPA's Strategic Flood Risk Assessment (SFRA). When a test is required, and the development is not identified in the Development Plan, NPPF advises that the site-specific FRA includes the Test. NPPF also requires that the FRA includes an "Exception Test" for flood sensitive development proposed in areas with high frequency of flooding. The reason is to demonstrate that flood risk will be safely managed for the lifetime of the development.

1.9.5 "Non-Statutory Technical Standards for Sustainable Drainage Systems" published by Department for Environment, Food and Rural Affairs in March 2015 sets out Government expectations for surface water drainage systems serving major developments to restrict discharges to green field rates. The standards do not address the quality of surface water discharges and state circumstances when the discharge rate can be higher than green field, up to the existing flow in the case of redevelopment of brown field sites.

1.10 Local Policy Guidance

1.10.1 The North Warwickshire Local Plan, adopted in September 2021, outlines the requirements and considerations developers should follow as part of their proposals. As part of this report, the adopted policies have been reviewed, and the proposal has been developed to comply with their requirements. The relevant planning policy within the district plan, Policy LP33, is outlined below.

1.10.2 LP33 Water and Flood Risk Management

"*In line with the objectives of the Water Framework Directive, development proposals must not detrimentally affect the ecological status of a waterbody and where appropriate, incorporate measures to improve its ecological value.*

"*Opportunities should be sought to de-culvert rivers, in order to reduce flood risk through stopping flows backing up by undersized culverts. This should only be undertaken when it is demonstrated to not increase flood risk elsewhere. If de-culverting is not proposed evidence will be required to demonstrate why this is not possible. River channel restoration should also be undertaken to return the water course to its natural state and restore floodplain to reduce the impact of flooding downstream.*

"*New developments should also seek opportunities to improve natural riverine processes and instream and bankside morphology through watercourse re-naturalisation and the removal of manmade structures, both on the development site and in the wider catchment. Water runoff from new development must be no more than natural greenfield runoff rates and developments should hold this water back on the development site through high quality Sustainable Urban Drainage (SuDS), reducing pollution and flood risk to nearby watercourses. The culverting of watercourses will only be approved in exceptional circumstances.*

"*The multifunctional benefits of natural flood management, the re-naturalisation of watercourses and their floodplains and the safeguarding of land for local flood risk management schemes will be promoted when considering any developments in the Borough.*

"*New development proposals in or land raising within Flood Zone 3 (including Climate Change) should provide for the following:*

i) Floodplain Compensation; provide floodplain compensation on a level-for-level basis;

ii) should set back 8m from the top of the banks of Main Rivers and any culverted watercourse, regardless of the flood zone;

iii) Finished floor levels (FFL) within Flood Zone 3 (including climate Change) and on land adjacent should be set a minimum of 600mm above Flood Zone 3, (including climate change) flood level;

iv) have agreements in place that "less vulnerable" uses are prevented for changing to those that are more vulnerable, and (only applies to ground floor developments in line with SFRA section 12.4), and single storey residential development, basements and buildings on stilts should not be located within Flood Zone 3 (including climate change), and

v) include mitigation measures to account for up to the 1 in 100 year (1% AEP) plus climate change fluvial flood event as well as safe access and egress

"*In order to improve and protect water quality, infiltration measures are the preferred means of surface water disposal where ground conditions are appropriate and where practicable, the separation of surface water from sewers should be undertaken. New development proposals should be accompanied by a Water Statement that includes evidence to demonstrate that there is adequate sewerage infrastructure in place or that it will be in place prior to occupation.*"

2 FLOOD RISK

2.1 Flood Risk from Rivers and Watercourses

2.1.1 The site is shown on the available flood maps, see Figure 2, to be at a Very Low risk of flooding from fluvial sources. Therefore, the site is not considered to be at risk of flooding from rivers and watercourses.

Figure 2: Flood Risk from Rivers and Watercourses

2.2 Flooding from the Sea

2.2.1 The site is approximately 117km from the nearest sea, at a minimum elevation of approximately 79.3mAOD. Therefore, it is considered that the risk of flooding from the sea is negligible and is not discussed further within this report.

2.3 Flooding from Land

2.3.1 A source of flood risk to the site is from surface water flooding created by the site itself or adjacent areas. Based on the Surface Water Maps available, see Figure 3.

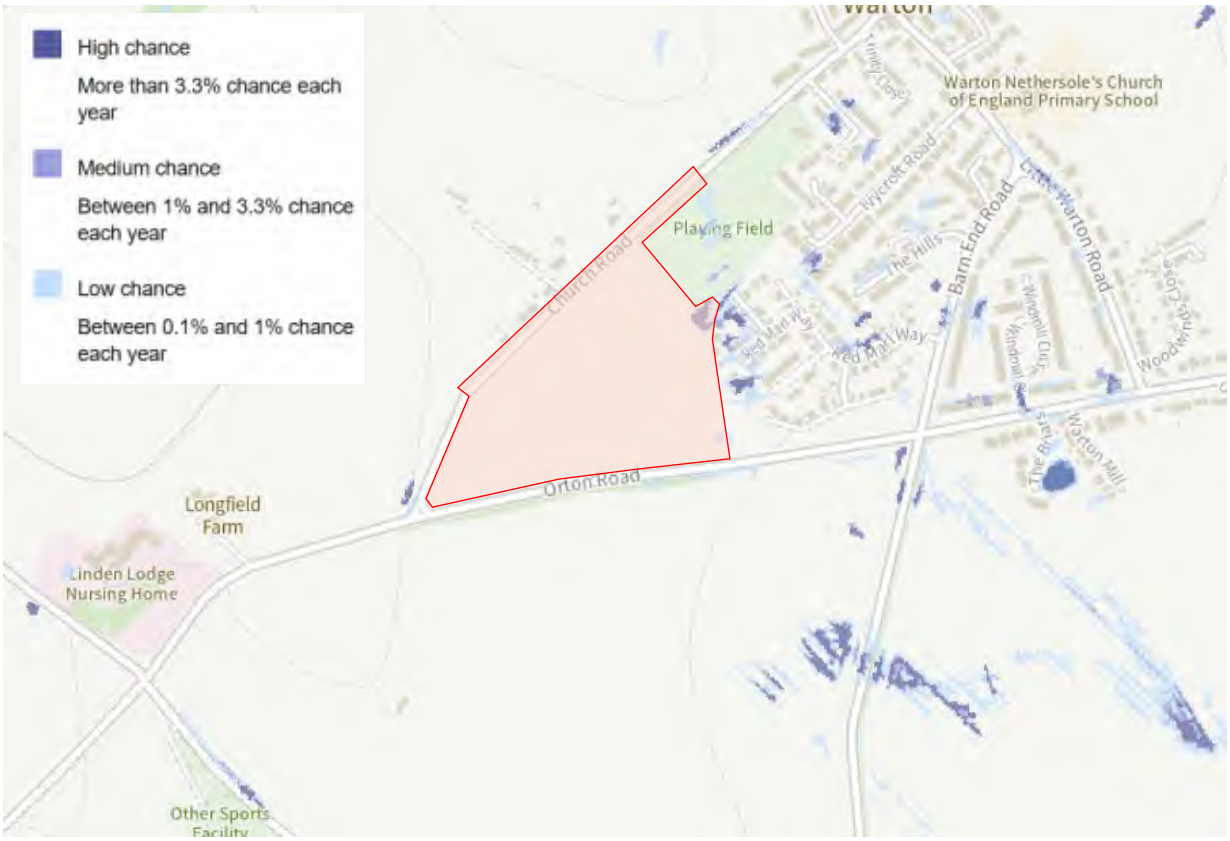


Figure 3: Flood Risk from Surface Water

2.3.2 The site is predominantly at a Low Risk of flooding from this source, with areas of higher flood risk encroaching slightly into the east of the site. This is primarily associated with the existing pond in the east of the site, and the existing adjacent development. The eastern boundary also forms the lowest region of the site topographically. Suitable mitigation measures shall be provided in Section 3 to overcome any risk presented by these areas.

2.3.3 Overall, the site in considered to be at a Low Risk of surface water flooding.

2.4 Flooding from Groundwater

2.4.1 Warwickshire's Level 1 Strategic Flood Risk Assessment includes groundwater vulnerability mapping across the county. The mapping suggests that the site is at a low vulnerability (<25%) of groundwater flooding. It should be noted that this mapping is high level and is based on a 1km^2 grid within which the site lays.

2.4.2 Borehole records in the vicinity of the site indicate groundwater levels are at least 30m below ground level in the area. Furthermore, no watercourses exist in close proximity to the site.

2.4.3 Therefore, it can be concluded that the proposed development is at low risk from flooding by groundwater.

2.5 Flooding from Sewers

2.5.1 Flooding can occur from other sources such as blocked drains and sewers. Correspondence with Severn Trent Water, the local water company, highlighted that there are no public sewers within the site. Furthermore,

it is expected that sewers in the area are periodically maintained by STW. Therefore, the proposed development is at low risk from flooding by blocked drains and sewers.

2.6 Flooding from Reservoirs, Canals and Other Artificial Sources

2.6.1 The reservoir flood map shown in Figure 4 shows the extent of flooding should a canal, reservoir, or other artificial source breach upstream of the development. This shows that the site would not be at risk of flooding from this source and as such this source of flooding is not considered a risk.

Figure 4: Flood Risk from Artificial Sources

3 MITIGATION

3.1 Flood Risk Management

3.1.1 It is suggested that the following flood risk management measures are considered to mitigate the risks identified above:

- *It is recommended that the development finished floor levels are set above the existing levels and at least 150mm above the proposed surrounding external levels;*
- *Wherever possible, the external ground profile in the development will ensure that surface water is directed away from the building / buildings / vulnerable areas;*
- *The proposed development will incorporate a positive surface water drainage system, described further in Section 4, which will intercept runoff from roofs and paved areas before discharging flows offsite at a rate no higher than the existing values.*

3.2 Residual Risks

3.2.1 Residual risks are the risks that remain once the flood risk management measures described above have been implemented. These are typically associated with extreme events that overwhelm drainage systems exceeding the flood levels used to design any mitigation measures. The primary residual risks that will affect this development are:

- *An extreme rainfall event which exceeds the capacity of the proposed surface water drainage system to both intercept and convey the flows. During such an event, water that is unable to enter the formal drainage system will flow over the ground through the development. The risk can be reduced by designing site levels to direct any runoff towards the highways, adjacent watercourses, or other corridors running through the site;*
- *A lack of, or insufficient, maintenance of the installed drainage system which may cause flow restriction;*
- *A rainfall event that exceeds the capacity of surrounding off-site drainage networks could also result in runoff entering the site via routes other than the highways.*

4 PROPOSED DRAINAGE STRATEGY

4.1 Outfall Assessment

4.1.1 As required by Part H of the Building Regulations and the paragraph 7-056 in Planning Policy Guidance of the NPPF, the required Drainage Hierarchy has been considered in the development of this strategy as summarised below.

Outfall Option	Available Option	Comment
Infiltration Drainage	×	The use of infiltration outfall has been discounted due to the anticipated bedrock geology and borehole data in the vicinity of the site. This should be confirmed by an infiltration testing to BRE365.
Watercourse	×	There are no watercourses in the vicinity of the site which could form a suitable outfall.
Surface Water Sewer	✓	It is proposed to discharge surface water flows from the site into the STW public surface water sewer to the east, at the junction between Orton Road and Windmill Close.
Combined Sewer	N/A	Not considered

Table 2 – Outfall Assessment

4.2 SuDS Assessment

4.2.1 As part of the surface water drainage strategy for the site a number of Sustainable Drainage Systems (SuDS) were considered. Table 3 below provides a list of the options considered and a justification for their inclusion or omission.

SuDS System	Used	Justification
Rainwater Harvesting System	No	The use of rainwater harvesting is not considered economically viable on this site considering installation and operational costs.
Green Roofs	No	Green roofs have not been proposed for this site as there is insufficient access to roof areas for maintenance and as such the system could not be effectively maintained to ensure long term performance.
Infiltration Systems	No	Systems such as soakaways and other infiltration systems are not suitable on this site due the anticipated geology and groundwater levels. BRE 365 testing should be undertaken to confirm this.
Proprietary Treatment Systems	No	The use of proprietary treatment systems is not considered economically viable or required on this site considering installation and operational costs.

Filter Strips	No	Filter strips have not been considered the most effective proposal for this site due to the proposed site layout.
Filter Drains	No	Filter Drains have not been considered the most effective proposal for this site due to the proposed site layout.
Swales	No	Swales are not suitable for this scheme due to available space and proposed land use.
Bioretention Systems	No	Bioretention Systems have not been considered the most effective proposal for this site due to the lack of available landscape areas.
Porous Pavements	Yes	Areas of the proposed development to be finished with porous pavements. The areas to be confirmed at detailed design stage.
Attenuation Storage Tanks (oversized pipes)	No	An above-ground attenuation pond has been selected instead of a tank.
Detention Basins	No	There is insufficient space for a detention basin on this site.
Ponds and Wetlands	Yes	An attenuation pond has been provided in the southeast corner of the site to treat and attenuate all surface water flows picked up by the drainage network.

Table 3 – SuDS Assessment

4.2.2 As this assessment forms part of an outline planning application the suitability SuDS features will have to be reviewed at reserved matters stage. It is proposed that suitable features will be provided to support both flood risk and water quality as defined by industry standards and local policies.

4.2.3 The outline proposals for the drainage system include private storm and foul pipes combined with an attenuation pond to store surface water flows before a controlled discharge.

4.3 Proposed Surface Water Drainage Strategy

4.3.1 It is anticipated that a new drainage system will comprise pipes and gullies, alongside the attenuation pond to treat and store flows ahead of discharge. All flows from developable land parcels shall enter the drainage network and be conveyed through the attenuation pond, before being discharged at a restricted rate via a flow control device. Surface water flows will then travel beneath Orton Road to the east, before ultimately discharging into an existing STW public sewer at the junction between Orton Road and Windmill Close.

4.3.2 In accordance with Policy LP33, on sustainable drainage systems and the Strategic Flood Risk Assessment for the area, it is proposed that the maximum discharge rate up to a 100-year storm plus 40% allowance for climate change is restricted to 24.1l/s (the Qbar rate for the site). A calculation extract for this proposed flow rate is included in **Appendix D**. In order to restrict the flow, it is proposed to use a flow control device downstream of the attenuation pond.

4.3.3 To support this assessment a Drainage Strategy Drawing No. OR-LINK-GEN-XX-DR-C-0500 has been prepared and is included at **Appendix D**, along with supporting calculations demonstrating the system's

performance. The proposed system has been assessed for a number of return periods and a series of rainfall events and the discharge rates for the critical storms are provided in Table 4.

Return Period	Allowable Discharge Rate (l/s)	Proposed Discharge Rate (l/s)
1 in 1 year	24.1	23.1
1 in 30 year + 35% CC	24.1	24.1
1 in 100 year + 40% CC	24.1	24.1

Table 4 – Surface water discharge rates

4.3.4 In addition to the surface water treatment provided by the SuDS features the following measures are to be included within the surface water drainage system to improve water quality prior to discharge offsite.

- *Trapped gullies;*
- *Sediment sump within flow control device.*

4.4 Water Quality

4.4.1 As per Table 26.2 in CIRIA 753 The SuDS Manual, the site is classed as residential and thus has a 'Low' Pollution Hazard Level. The corresponding pollution indices for this hazard level for the three main sources of pollution are provided in Table 4 .

Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Low	0.5	0.4	0.4

Table 5 – Pollution Hazard Level and Indices

4.4.2 Table 26.3 in CIRIA 753 provides mitigation indices for various SuDS features against the three main sources of pollution. The corresponding mitigation indices for the pond for each of the sources of pollution are provided in Table 5.

SuDS	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Pond	0.7	0.7	0.5

Table 6 – SuDS Pollution Hazard

4.4.3 This demonstrates that the pond is sufficient for mitigating against potential sources of pollution on site as the mitigation index for each source of pollution is greater than the corresponding pollution index.

4.5 Exceedance Flows

4.5.1 The potential source of overland flooding on the site is failure of the surface water drainage system or a rainfall event in excess of the systems or surrounding areas design parameters.

4.5.2 As noted above the site falls from west to east, so any overland exceedance flows shall be directed by the levels design through the highways. These routes have been highlighted on the Drainage Strategy Drawing No. OR-LINK-GEN-XX-DR-C-0500.

4.6 Foul Water Drainage Strategy

4.6.1 In similar fashion to the surface water drainage, the proposed foul drainage network shall convey flows from the residential land parcels southeast along Orton Road, before outfalling to an existing STW public foul sewer at the junction between Orton Road and Barn End Road.

4.6.2 In order to establish the foul outfall, a developer enquiry was submitted to STW, the local water company. The response to this developer enquiry application confirmed that the foul sewer to the east of the site has sufficient capacity to accept the foul flows from the proposed development and STW would be willing to accept a connection to their network at a preferred location (MH3202), subject to a formal S106 application being made ahead of connection.

4.6.3 The foul drainage strategy is shown on drawing OR-LINK-GEN-XX-DR-C-0500 included in **Appendix D**.

5 DRAINAGE MANAGEMENT PLAN

5.1 Responsibility

5.1.1 The occupier of the proposed development shall be responsible for the maintenance and operation of the drainage system, including any attenuation and flow control devices.

5.2 Maintenance of Pipe Networks

5.2.1 Maintenance and management of main storm sewers and chambers inclusive of pipework from paved areas and buildings (but excluding internal building drainage) should be visually inspected and jetted/cleaned as required. As a minimum, this should be carried out every 5 years. Methods of inspection to give indications of blockages etc. may include:

- *Pulling a mandrel through the pipe to identify physical faults (e.g., disjointed pipes).*
- *Flushing/jetting.*
- *CCTV.*
- *Measurement of water depths in pipe entries, catchpits or interceptors along a drain run may identify potentially blocked pipes.*

5.2.2 Gully gratings, manhole gratings and channel gratings shall be visually inspected at least once every year and replaced or re-set if damaged or dislodged. Gullies should be inspected at least once every year, ideally during springtime as the autumn and winter seasons produce the most detritus build up in the form of leaves, litter and silt. This material should be removed from the channels and disposed of at a licensed tip. This material should not be tipped in other areas of the development as it may pose a pollution threat to the surrounding drainage system.

5.2.3 Jetting should only be carried out after removal of the silt and debris, as jetting alone will simply wash the debris further downstream without removing the problem.

5.3 Maintenance of SuDS Features

5.3.1 The regular and correct maintenance of the SuDS features is essential to the continued performance. The SuDS Manual C753 provides advice on the management of the system. The recommended maintenance regimes for the attenuation pond, as highlighted in Table 6, is given in Table 23.1 in the SuDS Manual C753 respectively, which will form the basis of the strategy for the provided development.

TABLE 23.1 Operation and maintenance requirements for ponds and wetlands

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass – public areas	Monthly (during growing season)
	Cut the meadow grass	Half yearly (spring, before nesting season, and autumn)
	Inspect marginal and bankside vegetation and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Inspect inlets, outlets, banksides, structures, pipework etc for evidence of blockage and/or physical damage	Monthly
	Inspect water body for signs of poor water quality	Monthly (May – October)
	Inspect silt accumulation rates in any forebay and in main body of the pond and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options	Half yearly
	Check any mechanical devices, eg penstocks	Half yearly
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1 m above pond base; include max 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to a minimum of 1 m above water level	Annually
	Tidy all dead growth (scrub clearance) before start of growing season (Note: tree maintenance is usually part of overall landscape management contract)	Annually
	Remove sediment from any forebay.	Every 1–5 years, or as required
	Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays.	Every 5 years, or as required
Occasional maintenance	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	With effective pre-treatment, this will only be required rarely, eg every 25–50 years
Remedial actions	Repair erosion or other damage	As required
	Replant, where necessary	As required
	Aerate pond when signs of eutrophication are detected	As required
	Realign rip-rap or repair other damage	As required
	Repair / rehabilitate inlets, outlets and overflows.	As required

Table 6 – Table 23.1 of CIRIA 753

5.3.2 It should be noted that maintenance regimes detailed above are initial recommendations and the actual maintenance work undertaken should be adapted to suit the system performance by the maintenance provider.

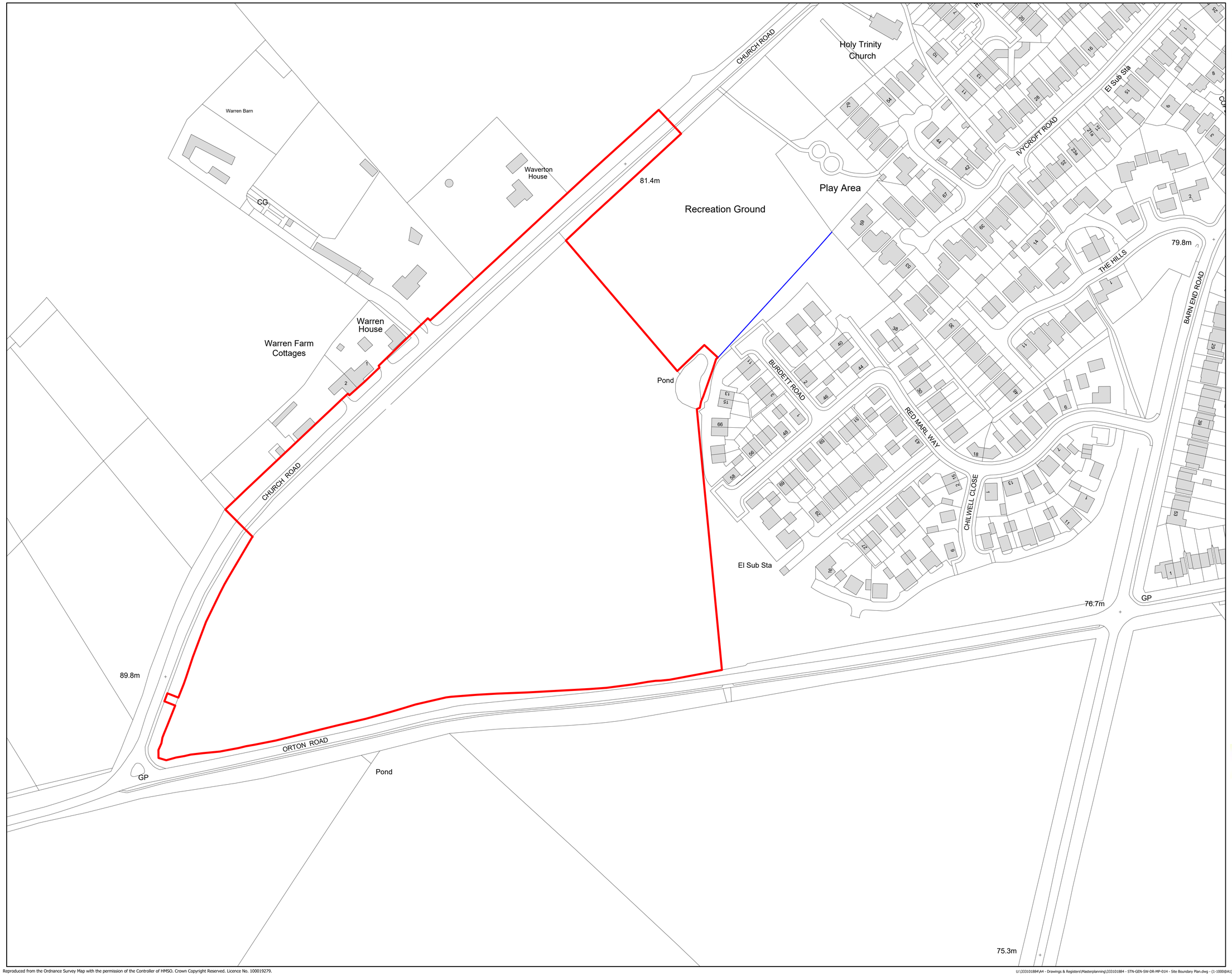
6 CONCLUSION

6.1.1 This site-specific Flood Risk Assessment has been prepared in accordance with NPPF guidance and local policy on Flood Risk. The government approved flood mapping shows the site to be located within Flood Zone 1, indicating a Low flood risk from both fluvial and pluvial sources on the site. Further to this, the proposed levels on the site shall be set such that in the unlikely event of these systems failing the development on the site will remain protected.

6.1.2 The drainage strategy demonstrated that an appropriate drainage system for both foul and surface water can be provided on the site which discharges to a suitable outfall. Subject to the mitigation measures proposed, the development may proceed without being subject to significant flood risk. Moreover, the development will not significantly increase flood risk to the wider catchment area.

APPENDICES

APPENDIX A – Proposed Site Plan



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Revision		Date	Drn	Ckd
H	Updated Site Boundary	25.03.25	J.W.	T.L.

Site Boundary

Land Within Land Owners Control (30cm wide Strip)

U:\333101884\A4 - Drawings & Registers\Masterplanning\333101884 - STN-GEN-SW-DR-MP-01H - Site Boundary Plan.dwg - (1-1000@A1)

Richborough

Project
LAND OFF ORTON ROAD, WARTON

Drawing Title
SITE BOUNDARY PLAN

N

Date	Scale	Drawn by	Check by
30.01.25	1:1,000@A1 1:2,000@A3	J.W.	T.L.
Project No	**Drawing No**		**Revision**
333101884	STN-GEN-SW-DR-MP-01		H

0 20 40 60m

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The scaling of this drawing cannot be assured

Revision		Date	Drn	Ckd
M	Legend and Access Graphic Update	26.03.25	J.W.	T.L.

- Site Boundary
- Proposed Residential Development
- Proposed Open Space and Paths
- Proposed Highway
- Proposed Sustainable Drainage
- Existing Recreation Ground
- Proposed Access/Egress for All Modes
- Proposed Access/Egress for Pedestrians
- Existing Landscape

CHURCH ROAD

ORTON ROAD

Richborough

Project
LAND OFF ORTON ROAD, WARTON

Drawing Title
ILLUSTRATIVE FRAMEWORK PLAN

N

Date	Scale	Drawn by	Check by
30.01.25	1:1,000@A1 1:2,000@A3	J.W.	T.L.

Project No	Drawing No	Revision
333101884	RG-M-Ai02	M

0 — 50m

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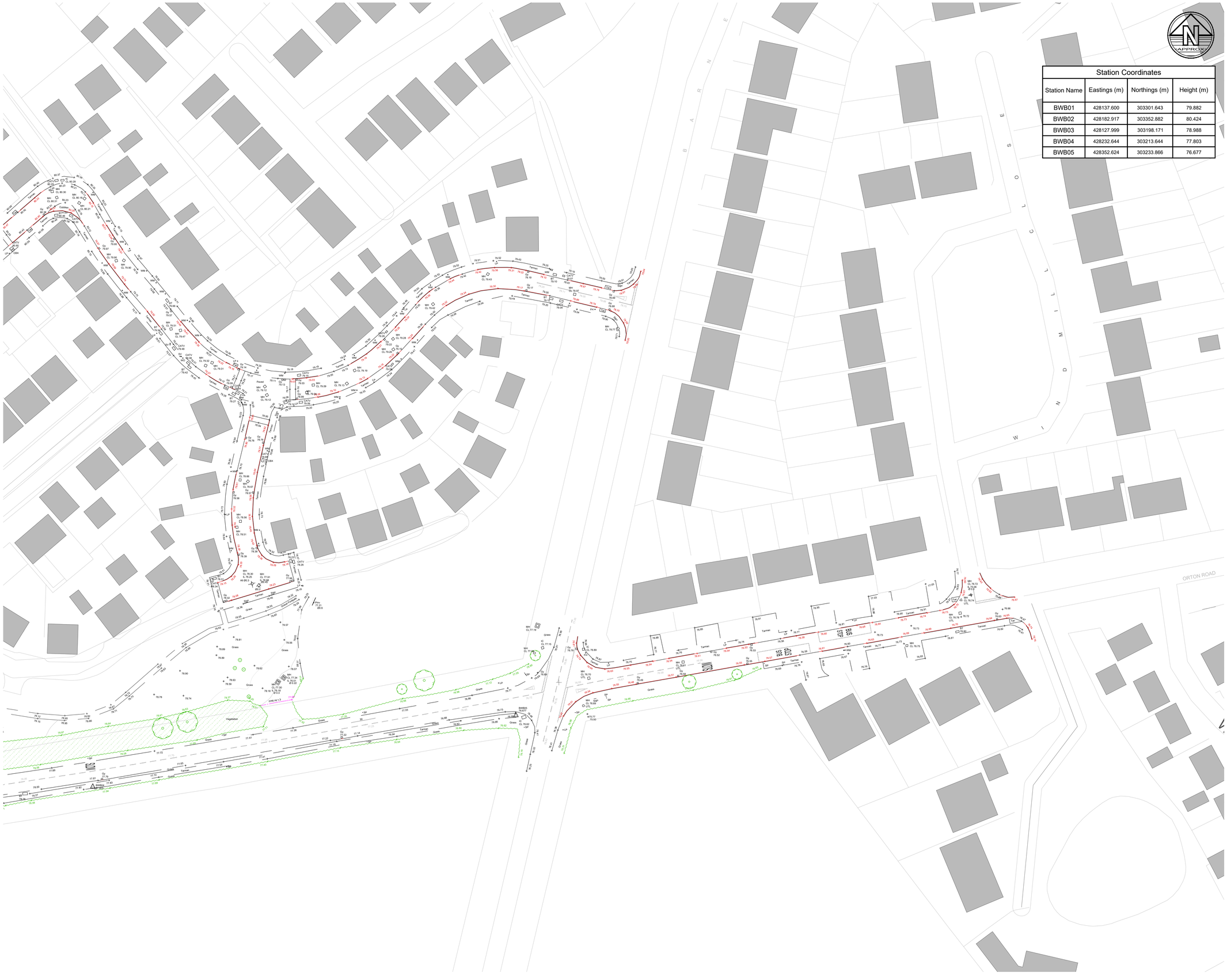
APPENDIX B – Topographical Survey



Station Coordinates			
Station Name	Eastings (m)	Northings (m)	Height (m)
BWB01	428137.600	303301.643	79.882
BWB02	428182.917	303352.882	80.424
BWB03	428127.999	303198.171	78.988
BWB04	428232.644	303213.644	77.803
BWB05	428352.624	303233.866	76.677

Notes

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8. OS license number: 100022432

Key Plan

Legend

- OS Buildings
- Surveyed Buildings
- Building
- Wall
- Kerb Channel Line
- Top of Kerb
- Edge of Surface
- Top of Bank
- Bottom of Bank
- Canopy / Overhang
- Line Marking
- Centre Line
- Watercourse Centre Line
- Barrier
- Fence
- Gate
- Overhead Powerline
- Overhead Utilities
- Contour Lines
- Inspection Chamber
- Flow direction and pipe diameter (0.25 / 1)
- Station and Name (BH 1)
- Monitoring Borehole
- Tree / Bush / Sapling
- Area of Vegetation/ Extent of Tree Canopy
- Hedge
- Body of Water
- Body of Water from OS
- Spot Level (+50.00)
- Assumed Surface Water Drainage Line
- Surface Water Drainage Line

AP	Anchor Point	FBW	Fence Barbed Wire	LB	Litter Bin
BG	Back Gully	FCB	Fence Closed Board	LP	Lamp Post
BO	Bollard	FCL	Fence Chain Link	MH	Manhole
BS	Bus Stop	FEL	Fence Electric	Mkr	Service Marker
BT	British Telecom	FMP	Fence Metal Panel	PB	Post Box
C	Crest	FMR	Fence Metal Railing	PT	Post
CL	Cover Level	FOB	Fence Open Board	RE	Rodding Eye
CMP	Cable Marker Post	FPW	Fence Post & Wire	SP	Sign Post
CCTV	Security Camera	FSP	Fence Steel Palisade	ST	Stop Tap
CTV	Cable TV	FWM	Fence Wire Mesh	SV	Stop Valve
DC	Drainage Channel	FFL	Finished Floor Level	TCB	Telephone Call Box
DK	Drop Kerb	FP	Flagpole	THL	Threshold Level
DP	Down Pipe	Gas	Gas	TL	Traffic Light
Elec	Electric	GV	Gas Valve	TP	Telegraph Post
EP	Electricity Post	GY	Gully	TS	Traffic Signal
ER	Earth Rod	Ht	Height	UTS	Unable to Survey
FH	Fire Hydrant	IC	Inspection Chamber	WL	Water Level
FL	Floodlight	IFL	Internal Floor Level	WM	Water Meter
		IL	Invert Level (as a reduced level)	WO	Wash Out

Rev	Date	Details of issue / revision	Drw	Rev
P1	18.02.25	First Issue	DS	SS

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Client

Richborough Estates Limited

Project Title

Land off Orton Road Phase 2

Drawing Title

Existing Site Plan Sheet 4 of 4

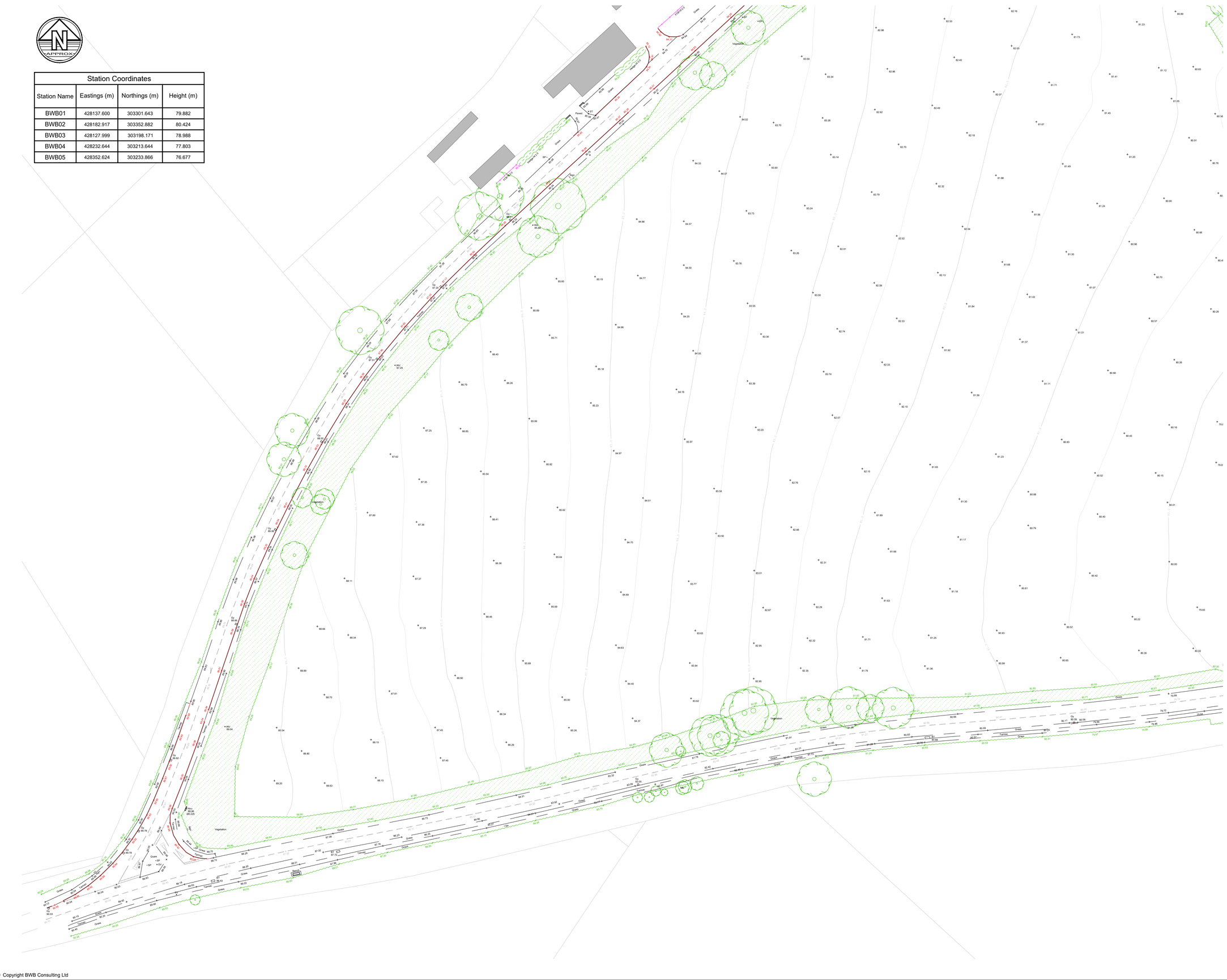
Drawn:	D.Smith	Reviewed:	S.Shreeves
BWB Ref:	244061	Date: 18.02.25	Scale@A1: 1:500

Drawing Status

Information

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
244061-BWB-00-04-DR-G-0001	**S2**	**P1**

Station Coordinates			
Station Name	Eastings (m)	Northings (m)	Height (m)
BWB01	428137.600	303301.643	79.882
BWB02	428182.917	303352.882	80.424
BWB03	428127.999	303198.171	78.988
BWB04	428232.644	303213.644	77.803
BWB05	428352.624	303233.866	76.677



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Key Plan

Legend

OS Buildings		Contour Lines	
Surveyed Buildings		Inspection Chamber	
Building		Flow direction and pipe diameter	0.25 / 1
Wall		Station and Name	BH 1
Kerb Channel Line		Monitoring Borehole	
Top of Kerb		Tree / Bush / Sapling	
Edge of Surface		Area of Vegetation/ Extent of Tree Canopy	
Top of Bank		Hedge	
Bottom of Bank		Body of Water	
Canopy / Overhang		Body of Water from OS	
Line Marking		Spot Level	50.00
Centre Line		Assumed Surface Water Drainage Line	
Watercourse Centre Line		Surface Water Drainage Line	
Barrier			
Fence			
Gate			
Overhead Powerline			
Overhead Utilities			

AP	Anchor Point	FBW	Fence Barbed Wire	LB	Litter Bin
BG	Back Gully	FCB	Fence Closed Board	LP	Lamp Post
BO	Bollard	FCL	Fence Chain Link	MH	Manhole
BS	Bus Stop	FEL	Fence Electric	Mkr	Service Marker
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CMP	Cable Marker Post	FPW	Fence Post & Wire	SP	Sign Post
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CCTV	Security Camera	FWM	Fence Wire Mesh	SV	Stop Valve
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Rev	Date	Details of issue / revision	Drw	Rev
P1	18.02.25	First Issue	DS	SS

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Client

Richborough Estates Limited

Project Title

Land off Orton Road Phase 2

Drawing Title

Existing Site Plan Sheet 1 of 4

Drawn:	D.Smith	Reviewed:	S.Shreeves
BWB Ref:	244061	Date: 18.02.25	Scale@A1: 1:500

Drawing Status

Information

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
244061-BWB-00-01-DR-G-0001	**S2**	**P1**

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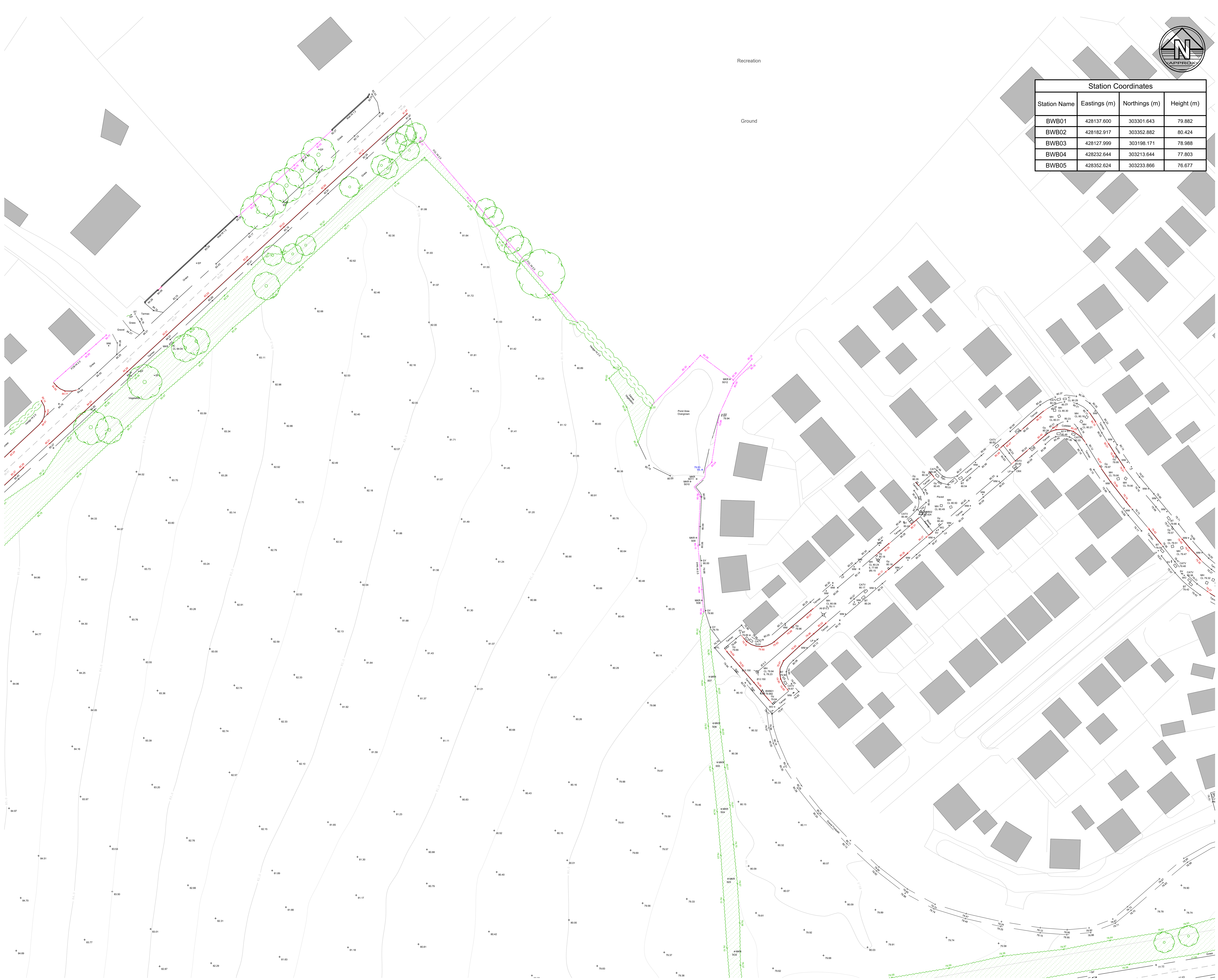

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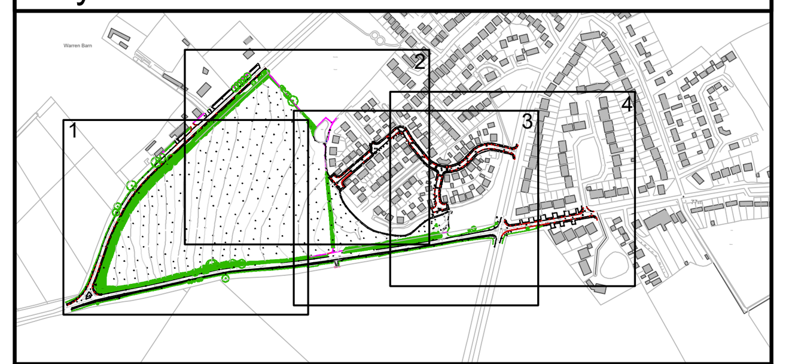
Key Plan



Legend

OS Buildings
Surveyed Buildings
Building
Wall
Kerb Channel Line
Top of Kerb
Edge of Surface
Top of Bank
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Line Marking
Centre Line
Watercourse Centre Line
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Inspection Chamber
0.25 Flow direction and pipe diameter
1 Station and Name
BH 1 Monitoring Borehole
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P1	18.02.25	First Issue	DS	SS

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Client
Richborough Estates Limited

Project Title
Land off Orton Road Phase 2

Drawing Title
Existing Site Plan Sheet 2 of 4

Drawn:	D.Smith	Reviewed:	S.Shreeves
BWB Ref:	244061	Date: 18.02.25	Scale@A1: 1:500

Drawing Status
Information

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
244061-BWB-00-02-DR-G-0001	S2	P1

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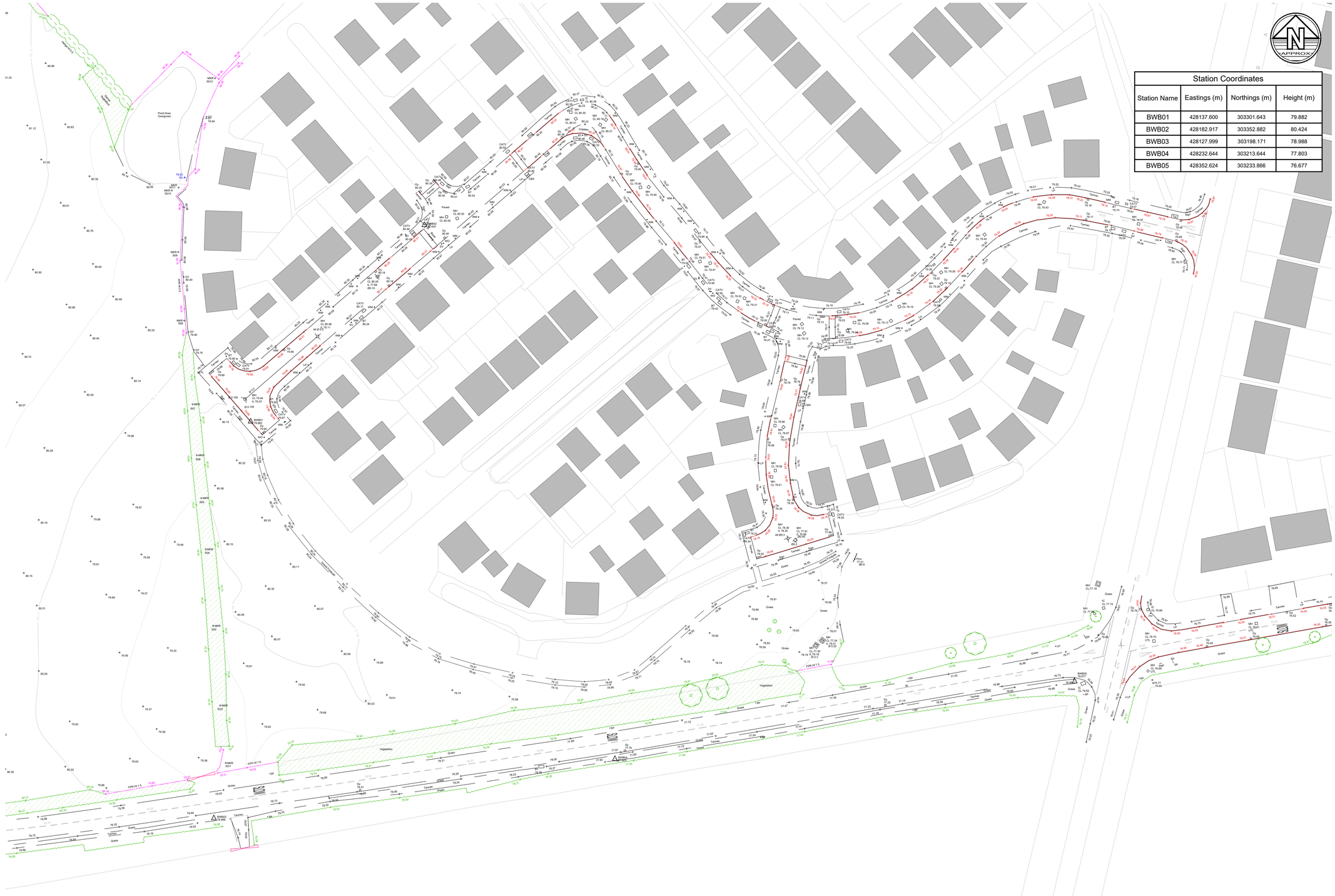

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- Overhead Powerline
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P1	18.02.25	First Issue	DS	SS

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Client

Richborough Estates Limited

Project Title

Land off Orton Road Phase 2

Drawing Title

Existing Site Plan Sheet 3 of 4

Drawn:	D.Smith	Reviewed:	S.Shreeves
BWB Ref:	244061	Date: 18.02.25	Scale@A1: 1:500

Drawing Status

Information

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
244061-BWB-00-03-DR-G-0001	**S2**	**P1**

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APPENDIX C – Severn Trent Water Correspondence and Sewer Records

WONDERFUL ON TAP

SEVERN TRENT

Severn Trent Water Ltd
Oxley Moor Road
Wolverhampton
WV9 5HN

www.stwater.co.uk
network.solutions@severntrent.co.uk

Contact: Jasveer Bullock
Contact No: 07970198053

Your ref:
Reference: 1138609

Megha Bhat
Link Engineering
148-149 Great Charles Street
Queensway
Birmingham
B3 3HT

16th January 2025

Dear Megha

Proposed Development: Land off Orton Road, Warton, Tamworth, B79 0JX (X – 427949, Y – 303261)

I refer to your 'Development Enquiry Request' for the development of 100 new dwellings at the above named site. Please find enclosed the sewer records that are included in the fee together with the Supplementary Guidance Notes which refer to surface water disposal from development sites.

Public Sewers in Site – Required Protection

Due to a change in legislation on 1 October 2011, there may be former private sewers on the site which have transferred to the responsibility of Severn Trent Water Ltd, which are not shown on the statutory sewer records but are located within your client's land. These sewers would also have protective strips that we will not allow to be built over. If such sewers are identified to be present on the site, please contact us for further guidance.

Foul Water Drainage

I can confirm we would not have any objections to the anticipated additional foul flows of approximately 1.56 litres/second 2xDWF to the 225mm diameter public foul sewer, as this will not have an adverse impact on the network. The nearest available point for a gravity connection is in the Orton Road with the nearest manhole reference 3202. However, there are 2 incoming pipes into this manhole, one being a pressurised sewer, therefore, we would advise that the connection is made upstream of that manhole towards manhole 3201 in the road, or connect downstream of manhole 3202 approximately 10 metres from the manhole.

There is also a 225mm diameter foul sewer in the grass verge on Orton Road that maybe a suitable connection point. However, this sewer is currently a private sewer which has been offered for adoption under the Section 104 process, therefore, if you wish to connect to this

sewer, you will need the permission of the owner of this asset to do so and confirmation that there is capacity within their network for the flows from your development.

Therefore, a connection to the public sewer (direct or indirect) is acceptable subject to a formal Section 106 sewer connection approval (see later.)

Surface Water Drainage

If following testing, it is demonstrated that soakaways would not be possible on the site; satisfactory evidence will need to be submitted from the SI consultant **(extract or a supplementary letter**).

If soakaways are not possible, there is a pond located within your site that you would need to investigate for the disposal of the surface water run-off, at a rate of 5 litres /second /hectare (greenfield rate). This would satisfy SGN1 (enclosed), in accordance with Warwickshire Council SUDS Policy as the Lead Local Flood Authority (LLFA) for the area and statutory consultee in the planning process. Please see the guidance notes attached for further information.

If it proven that the pond or other means of disposing surface water run-off is not achievable we would then consider a connection to the receiving 300mm diameter public surface water network at a rate of 5 litres /second /hectare (greenfield rate). The nearest connection point is to manhole 4251 located on the junction of Orton Road and Windmill Close (X- 428483, Y – 303274).

Subject to flows being agreed with the LLFA and Section 106 sewer connection application.

New Connections

For any new connections (including the re-use of existing connections) to the public sewerage system, the developer will need to submit Section 106 application forms. Our New Connections department are responsible for handling all such enquiries and applications. To contact them for an application form and associated guidance notes please call 0800 7076600 or you can download them from our website www.stwater.co.uk.

Please quote ref: 1138609 in any future correspondence (including e-mails) with STW Limited. Please note that ‘Development Enquiry’ responses are only valid for 6 months from the date of this letter.

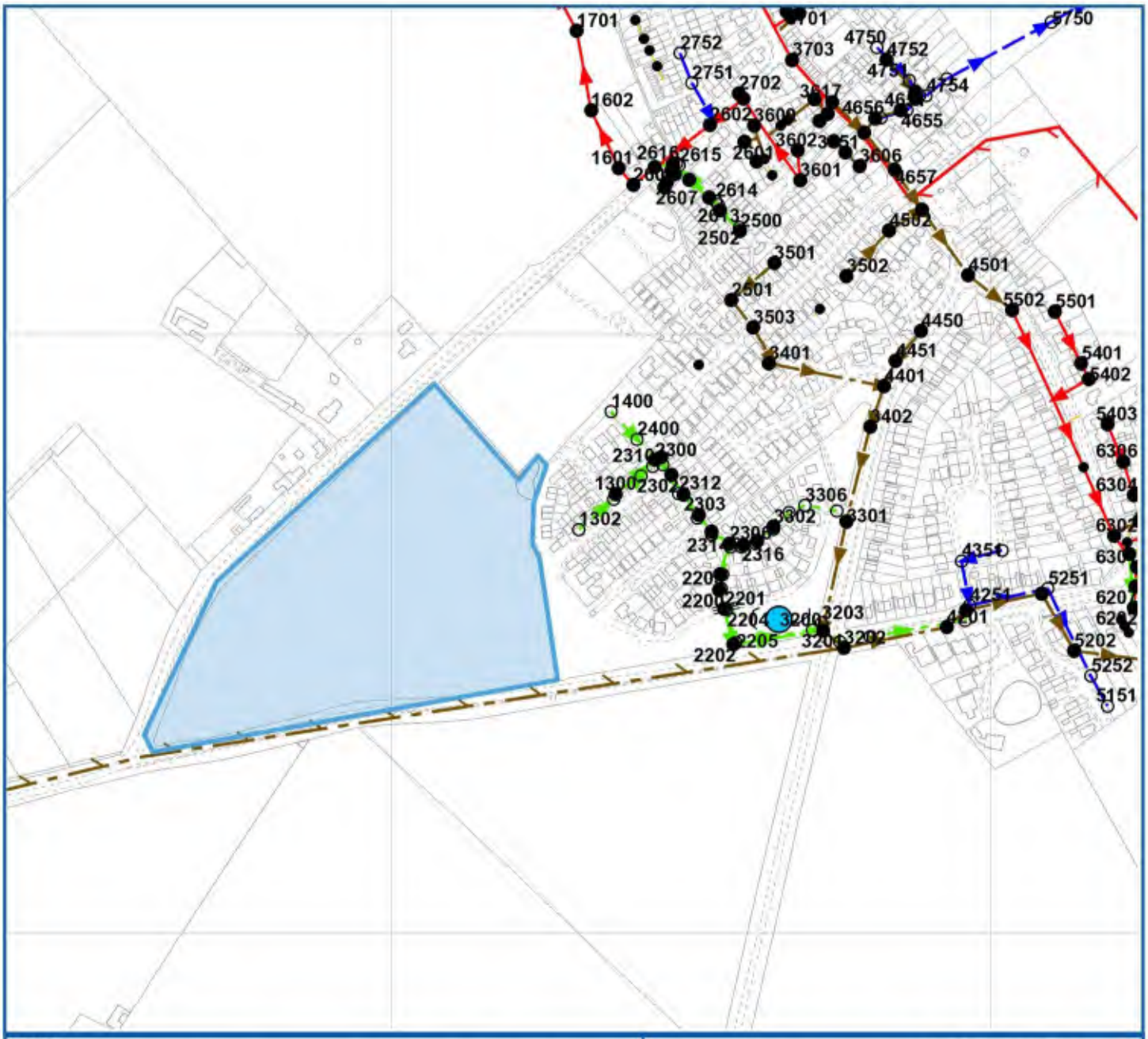
WONDERFUL ON TAP

SEVERN TRENT

Yours sincerely,

[redacted]

Jasveer Bullock (Mrs)
Network Solutions
Developer Services



LEGEND

Operational Site

Waste Water Pump
- Transferred Asset
- S24
- S104
- S102
- Null Private
- Null
- None
- Highway Drain
- Adopted Sewer

Storage
- Disposal Site
- Off-Line Waste Water Storage
- On-Line Waste Water Storage
- Wet Well

Waste Water Process Structure
- Sewage Treatment Point
- Sewage Treatment Structure
- Sludge Treatment Point
- Sludge Treatment Structure

Manhole
- Foul Bifurcation Manhole
- Combined Bifurcation Manhole
- Surface Water Bifurcation Manhole
- Dual Manhole
- Foul Single Manhole
- Combined Single Manhole
- Surface Water Single Manhole
- Twin Manhole
- Foul Adopted Manhole
- Combined Adopted Manhole
- Surface Adopted Manhole
- Transferred Manhole
- Unsurveyed Manhole

Gravity Sewer Pipe
- Foul Gravity Sewer
- Combined Gravity Sewer
- Surface Water Gravity Sewer
- S104 Surface Water Gravity Sewer
- S104 Combined Gravity Sewer
- S104 Foul Gravity Sewer
- Private Surface Water Gravity Sewer
- Private Combined Gravity Sewer
- Private Foul Gravity Sewer
- Surface Water Unsurveyed Pipe
- Combined Unsurveyed Pipe
- Foul Unsurveyed Pipe
- Transferred Surface Water Sewer
- Transferred Combined Sewer
- Transferred Foul Sewer
- Disposal Pipe
- Overflow Pipe
- Culverted Water Course
- Waste Interest Site Pipe
- Sewer Service Connection
- Gravity Sewer Others

Pressure Sewer Pipe
- Surface Water Pressure Sewer
- Combined Pressure Sewer
- Foul Pressure Sewer
- S104 Surface Water Pressure Sewer
- S104 Combined Pressure Sewer
- S104 Foul Pressure Sewer
- Private Surface Water Pressure Sewer
- Private Combined Pressure Sewer
- Private Foul Pressure Sewer
- Surface Water Vacuum Sewer
- Foul Vacuum Sewer
- Combined Vacuum Sewer
- S104 Surface Water Vacuum Sewer
- S104 Combined Vacuum Sewer
- S104 Foul Vacuum Sewer
- Private Surface Water Vacuum Sewer
- Private Combined Vacuum Sewer
- Private Foul Vacuum Sewer
- Surface Water Siphon
- Combined Siphon
- Foul Siphon
- Private Surface Water Siphon
- Private Combined Siphon
- Private Foul Siphon
- S104 Surface Water Siphon
- S104 Combined Siphon
- S104 Foul Siphon
- Surface Water Unsurveyed Pipe
- Combined Unsurveyed Pipe
- Foul Unsurveyed Pipe
- Disposal Pipe

Service Pipe
- Surface Water Lateral Drain
- Combined Lateral Drain
- Foul Lateral Drain
- S104 Surface Water Lateral Drain
- S104 Combined Lateral Drain
- S104 Foul Lateral Drain
- Private Surface Water Lateral Drain
- Private Combined Lateral Drain
- Private Foul Lateral Drain
- Transferred Surface Water Lateral Drain
- Transferred Combined Lateral Drain
- Transferred Foul Lateral Drain

Ancillary
- Balancing Lagoon
- Grease Trap
- Interceptor
- Screen

Chamber
- Metering Chamber
- Soakaway
- Overflow

Fitting
- Blind Stub
- Facility Connection
- Head Node
- Lamphole
- Sewerage Air Valve
- Sewerage Chemical Injection Point
- Sewerage Hatch Box
- Sewerage Pressure Washout
- Vent Column
- Waste Water Outfall

Control Valve
- Hydrobrake
- Penstock
- Sewerage Isolation Valve
- Sewerage Non Return Valve

Manhole Annotation

Print500mLine

Severn Trent Water Limited
Asset Data Management
PO Box 5344
Coventry
CV3 9FT
Telephone: 0345 601 6616

SEWER RECORD

O/S Map Scale: 1:5,000

This map is centred upon:

Date of Issue: 16-01-25

X: 428150.78 **Y:** 303346.72

Disclaimer Statement:

1 Do not scale off this Map.

2 This plan and any information supplied with it is furnished as a general guide, is only valid at the date of issue and no warranty as to its correctness is given or implied. In particular this plan and any information shown on it must not be relied upon in the event of any development or works (including but not limited to excavations) in the vicinity of SEVERN TRENT WATER assets or for the purposes of determining the suitability of a point of connection to the sewerage or distribution systems.

3 On 1 October 2011 most private sewers and private lateral drains in Severn Trent Water's sewerage area, which were connected to a public sewer as at 1 July 2011, Transferred to the ownership of Severn Trent Water and became public sewers and public lateral drains. A further transfer takes place on 1 October 2012. Private pumping stations, which form part of these sewers or lateral drains, will transfer to ownership of Severn Trent Water on or before 1 October 2016. Severn Trent Water does not possess complete records of these assets. These assets may not be displayed on the map.

5 Ordnance Survey licence number: **100031673**

Sewer Node Sewer Pipe Data

Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SK28033304	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28034450	<UNK>	<UNK>	<UNK>	F	<UNK>	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28033706	90.69	89.85	89.66	F	PVC	C	150	<UNK>	78.26	31/12/1899 00:00:00
SK28031956	81.15	79.43	78.94	S	VC	C	<UNK>	<UNK>	22.82	31/12/1899 00:00:00
SK28032904	84.6299	82.71	81.96	F	VC	C	150	<UNK>	22.35	31/12/1899 00:00:00
SK28032307	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033307	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28031957	81.7399	80.07	79.49	S	VC	C	<UNK>	<UNK>	30.5	31/12/1899 00:00:00
SK28034850	86.647	85.01	83.79	S	VC	C	225	<UNK>	17.1	31/12/1899 00:00:00
SK28033604	92.2699	91.85	91.57	F	VC	C	100	<UNK>	32.93	31/12/1899 00:00:00
SK28031902	81.6399	79.9	77.85	F	VC	C	<UNK>	<UNK>	21.57	31/12/1899 00:00:00
SK28033853	88.7969	87.1	86.54	S	VC	C	225	<UNK>	22.54	31/12/1899 00:00:00
SK28032301	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28036311	<UNK>	<UNK>	<UNK>	S	CO	<UNK>	1500	<UNK>	<UNK>	06/09/2022 00:00:00
SK28031857	80.29	78.96	77.14	S	VC	C	<UNK>	<UNK>	21.21	31/12/1899 00:00:00
SK28033601	88.5299	86.73	<UNK>	C	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK28033704	90.94	90.36	<UNK>	C	VC	C	100	<UNK>	0	31/12/1899 00:00:00
SK28035502	83.0299	0	<UNK>	C	<UNK>	<UNK>	0	0	0	31/12/1899 00:00:00
SK28033607	88.9599	88.11	<UNK>	F	VC	C	100	<UNK>	0	31/12/1899 00:00:00
SK28032311	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032502	<UNK>	<UNK>	<UNK>	S	U	C	225	<UNK>	<UNK>	05/05/2021 00:00:00
SK28035351	77.75	76.36	75.38	S	VC	C	<UNK>	<UNK>	35.89	31/12/1899 00:00:00
SK28036313	<UNK>	<UNK>	<UNK>	F	P	<UNK>	150	<UNK>	<UNK>	06/09/2022 00:00:00
SK28033402	79.62	77.44	76.61	F	VC	C	<UNK>	<UNK>	98.54	31/12/1899 00:00:00
SK28036202	77.1399	76.2	<UNK>	C	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK28036207	<UNK>	76.67	76.2	C	VC	C	225	<UNK>	71.969	31/12/1899 00:00:00
SK28034451	<UNK>	<UNK>	<UNK>	F	<UNK>	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28035201	76.9599	74.02	70.64	F	VC	C	<UNK>	<UNK>	16.29	31/12/1899 00:00:00
SK28032315	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28035403	81.6299	80.81	<UNK>	C	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28033616	92.15	91.28	<UNK>	F	VC	C	100	<UNK>	0	31/12/1899 00:00:00
SK28033851	90.4229	88.52	88.15	S	VC	C	225	<UNK>	37.41	31/12/1899 00:00:00
SK28035750	85.9599	84.23	80.54	S	CO	C	300	<UNK>	24.96	31/12/1899 00:00:00
SK28034200	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28034202	76.7099	74.55	74.04	F	VC	C	<UNK>	<UNK>	126.55	31/12/1899 00:00:00
SK28033703	91.3899	90.17	<UNK>	C	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK28033503	83.87	82.52	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28032605	<UNK>	<UNK>	<UNK>	F	VC	C	150	<UNK>	<UNK>	05/05/2021 00:00:00
SK28034652	90.8899	89.37	89.21	S	VC	C	150	<UNK>	141.75	31/12/1899 00:00:00
SK28032610	<UNK>	<UNK>	83.27	C	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28035252	74.8899	74.08	73.86	S	CO	C	<UNK>	<UNK>	130.23	31/12/1899 00:00:00

Sewer Node Sewer Pipe Data

Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SK28032615	<UNK>	<UNK>	<UNK>	S	U	C	225	<UNK>	<UNK>	05/05/2021 00:00:00
SK28032312	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28031819	82.61	81.2	80.53	F	VC	C	150	<UNK>	23.88	31/12/1899 00:00:00
SK28033609	89.0599	87.51	<UNK>	F	VC	C	100	<UNK>	0	31/12/1899 00:00:00
SK28031801	79.3	77.98	<UNK>	F	VC	C	100	<UNK>	0	31/12/1899 00:00:00
SK28032752	85.73	83.8	83.48	S	VC	C	<UNK>	<UNK>	84.16	31/12/1899 00:00:00
SK28032308	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032906	83.8499	81.95	80.82	F	VC	C	<UNK>	<UNK>	50.19	31/12/1899 00:00:00
SK28032316	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033204	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033750	89.623	88.8	88.73	S	VC	C	225	<UNK>	228.14	31/12/1899 00:00:00
SK28031805	80.1999	79.17	78.9	F	VC	C	100	<UNK>	33.56	31/12/1899 00:00:00
SK28031909	81.3199	79.48	76.57	F	VC	C	<UNK>	<UNK>	25.02	31/12/1899 00:00:00
SK28031806	80.1299	78.91	78.1	F	VC	C	100	<UNK>	46.85	31/12/1899 00:00:00
SK28034751	91.36	88.35	88.24	S	VC	C	225	<UNK>	153.55	31/12/1899 00:00:00
SK28031601	83.4599	81.55	78.01	C	VC	C	300	<UNK>	15.41	31/12/1899 00:00:00
SK28033650	90.68	88.33	86.99	F	VC	C	150	<UNK>	29.896	31/12/1899 00:00:00
SK28033605	91.72	91.25	90.567	F	VC	C	100	0	19.68	31/12/1899 00:00:00
SK28031851	78.5199	76.67	74.76	S	VC	C	225	<UNK>	9.93	31/12/1899 00:00:00
SK28033401	82.7099	78.6	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK28032600	<UNK>	<UNK>	<UNK>	C	VC	C	225	<UNK>	<UNK>	05/05/2021 00:00:00
SK28034657	88.1299	86.67	84.28	F	VC	C	225	<UNK>	16.5	31/12/1899 00:00:00
SK28031815	80.6399	78.82	<UNK>	C	VC	C	300	<UNK>	0	31/12/1899 00:00:00
SK28033617	91.55	90.72	<UNK>	F	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK28032202	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033603	92.2099	91.55	91.29	F	VC	C	100	<UNK>	65.5	31/12/1899 00:00:00
SK28031808	82.4899	81.14	80.87	F	VC	C	100	<UNK>	33.33	31/12/1899 00:00:00
SK28033301	79.08	76.6	75.81	F	VC	C	225	<UNK>	108.24	31/12/1899 00:00:00
SK28031907	80.12	<UNK>	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28031852	79.26	77.65	76.84	S	VC	C	150	<UNK>	54.51	31/12/1899 00:00:00
SK28031952	80.5999	79.55	79.06	S	VC	C	<UNK>	<UNK>	69.31	31/12/1899 00:00:00
SK28032304	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032911	87.5	86.89	<UNK>	C	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28034650	91.1999	88.23	88.21	S	CO	C	300	<UNK>	255	31/12/1899 00:00:00
SK28031817	78.3499	77.2	74.63	C	VC	C	225	<UNK>	21.79	31/12/1899 00:00:00
SK28032908	83.55	82.73	79.54	F	VC	C	<UNK>	<UNK>	10.79	31/12/1899 00:00:00
SK28031300	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032305	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28034753	91.26	88.96	88.88	F	VC	C	150	<UNK>	76.5	31/12/1899 00:00:00
SK28032309	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032801	82.98	81.9	81.24	F	VC	C	<UNK>	<UNK>	28.59	31/12/1899 00:00:00
SK28034952	79.871	78.39	78.2	S	VC	C	<UNK>	<UNK>	21.47	31/12/1899 00:00:00

Sewer Node Sewer Pipe Data

Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SK28032205	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28034201	76.8399	74.84	74.71	F	VC	C	225	<UNK>	179.62	31/12/1899 00:00:00
SK28032607	83.6399	83.4	<UNK>	C	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28036201	<UNK>	<UNK>	<UNK>	C	<UNK>	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28032803	85.12	82.09	81.42	C	VC	C	<UNK>	<UNK>	24.06	31/12/1899 00:00:00
SK28032804	88.69	88.18	<UNK>	C	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK28032606	83.98	83.24	<UNK>	C	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28031301	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28031822	79.1999	75.85	<UNK>	C	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK28032611	<UNK>	<UNK>	<UNK>	F	VC	C	150	<UNK>	<UNK>	05/05/2021 00:00:00
SK28034752	91.22	89.25	88.98	F	VC	C	150	<UNK>	153.48	31/12/1899 00:00:00
SK28033602	90.72	90.09	86.76	C	VC	C	100	<UNK>	7.53	31/12/1899 00:00:00
SK28032313	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28034755	90.73	87.94	84.27	S	CO	C	300	<UNK>	25.45	31/12/1899 00:00:00
SK28033850	90.146	88.72	88.54	S	VC	C	225	<UNK>	96.89	31/12/1899 00:00:00
SK28032501	83.8099	82.91	82.53	F	VC	C	<UNK>	<UNK>	76.87	31/12/1899 00:00:00
SK28032608	87.29	85.43	<UNK>	C	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK28034351	76.9199	75.35	75.12	S	VC	C	<UNK>	<UNK>	163.74	31/12/1899 00:00:00
SK28034501	83.73	82.59	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK28036300	<UNK>	<UNK>	<UNK>	F	VC	C	150	<UNK>	<UNK>	31/12/1899 00:00:00
SK28034602	85.0999	84.11	82.62	F	VC	C	225	<UNK>	45.25	31/12/1899 00:00:00
SK28032302	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032609	<UNK>	<UNK>	<UNK>	C	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28032901	82.65	81.96	81.04	F	VC	C	<UNK>	<UNK>	15.57	31/12/1899 00:00:00
SK28033901	86.79	85.21	84.22	F	VC	C	<UNK>	<UNK>	10.93	31/12/1899 00:00:00
SK28032613	<UNK>	<UNK>	<UNK>	S	U	C	225	<UNK>	<UNK>	05/05/2021 00:00:00
SK28034654	91.18	88.86	88.75	F	VC	C	150	<UNK>	147.55	31/12/1899 00:00:00
SK28032310	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28036307	<UNK>	<UNK>	<UNK>	C	U	U	0	0	0	31/12/1899 00:00:00
SK28033608	88.6999	88.18	88.11	F	VC	C	100	<UNK>	95.86	31/12/1899 00:00:00
SK28031855	80.1399	78.8	78.55	S	VC	C	100	<UNK>	41.76	31/12/1899 00:00:00
SK28035501	83.75	82.88	<UNK>	C	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28031901	81.6299	81.01	79.94	F	VC	C	100	<UNK>	5.56	31/12/1899 00:00:00
SK28036303	79.48	<UNK>	<UNK>	C	U	U	0	0	0	31/12/1899 00:00:00
SK28033201	77.11	75.81	75.6	F	VC	C	225	<UNK>	140.05	31/12/1899 00:00:00
SK28030801	76.75	74.59	<UNK>	C	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK28031814	78.83	77.56	<UNK>	C	VC	C	300	<UNK>	0	31/12/1899 00:00:00
SK28032812	89.04	<UNK>	<UNK>	C	VC	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28033707	90.8799	89.94	89.86	F	PVC	C	150	<UNK>	170	31/12/1899 00:00:00
SK28034950	84.216	82.52	78.58	S	VC	C	225	<UNK>	12.57	31/12/1899 00:00:00
SK28033902	86.55	84.21	83.41	F	VC	C	<UNK>	<UNK>	46.53	31/12/1899 00:00:00
SK28033701	90.79	90.43	90.38	C	VC	C	100	<UNK>	128	31/12/1899 00:00:00

Sewer Node Sewer Pipe Data

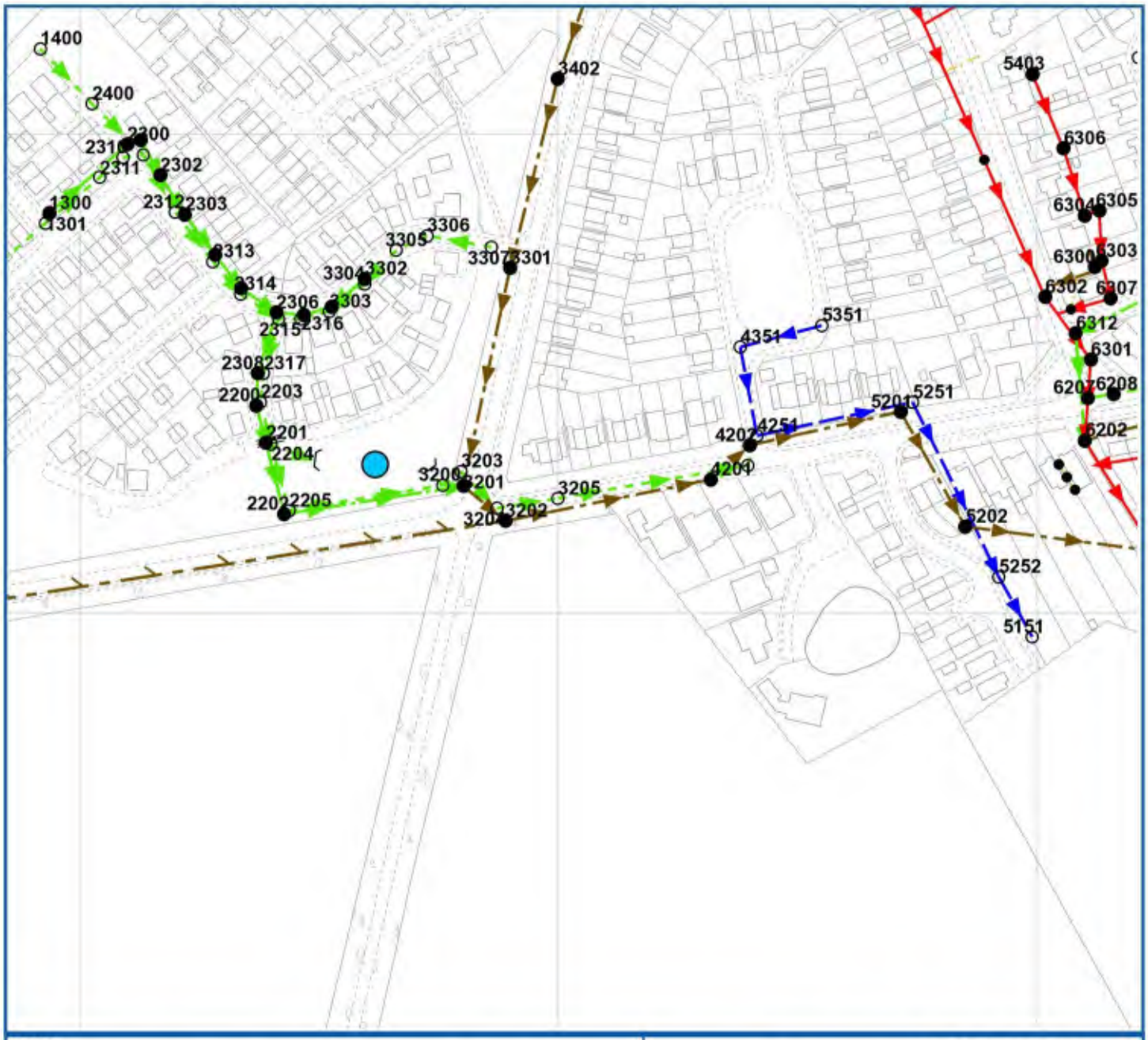
Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SK28033855	90.2009	88.41	<UNK>	F	VC	C	150	<UNK>	0.35	31/12/1899 00:00:00
SK28031818	81.5299	79.71	78.83	C	VC	C	300	<UNK>	11.36	31/12/1899 00:00:00
SK28034851	85.1119	83.75	82.55	S	VC	C	225	<UNK>	17.32	31/12/1899 00:00:00
SK28032910	86.7699	85.34	84.6	C	VC	C	300	<UNK>	21.66	31/12/1899 00:00:00
SK28031853	78.87	77.05	76.7	S	VC	C	225	<UNK>	48.83	31/12/1899 00:00:00
SK28031854	81.62	80.64	80.44	S	VC	C	100	<UNK>	57	31/12/1899 00:00:00
SK28032802	83.2399	80.37	<UNK>	C	VC	C	300	<UNK>	0	31/12/1899 00:00:00
SK28031302	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28034655	90.0299	88.73	88.54	F	VC	C	150	<UNK>	117.53	31/12/1899 00:00:00
SK28031400	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033205	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28034750	91.15	88.58	88.36	S	VC	C	225	<UNK>	173.64	31/12/1899 00:00:00
SK28033903	85.4199	83.35	83.15	F	VC	C	150	<UNK>	107.7	31/12/1899 00:00:00
SK28033305	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032603	83.5	82.1	81.94	C	VC	C	300	<UNK>	146.44	31/12/1899 00:00:00
SK28034251	76.72	75.07	74.73	S	VC	C	<UNK>	<UNK>	195.56	31/12/1899 00:00:00
SK28031602	80.8199	77.97	76.67	C	VC	C	225	<UNK>	51.6	31/12/1899 00:00:00
SK28032616	<UNK>	<UNK>	<UNK>	S	U	C	225	<UNK>	<UNK>	05/05/2021 00:00:00
SK28032317	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033854	88.2519	86.42	85.06	S	VC	C	225	<UNK>	25.82	31/12/1899 00:00:00
SK28033300	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033852	90.3359	88.23	87.13	S	VC	C	225	<UNK>	36.12	31/12/1899 00:00:00
SK28033502	85.83	84.92	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK28031858	81.29	80.41	79.02	S	VC	C	150	<UNK>	15.29	31/12/1899 00:00:00
SK28036208	<UNK>	<UNK>	<UNK>	F	P	<UNK>	150	<UNK>	<UNK>	16/08/2023 00:00:00
SK28036310	<UNK>	<UNK>	<UNK>	S	CO	<UNK>	600	<UNK>	<UNK>	06/09/2022 00:00:00
SK28036304	79.9899	79.16	79.13	C	VC	C	<UNK>	<UNK>	210.67	31/12/1899 00:00:00
SK28031905	80.9199	79.85	79	F	VC	C	<UNK>	<UNK>	46.94	31/12/1899 00:00:00
SK28032300	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28036400	<UNK>	<UNK>	<UNK>	S	CO	<UNK>	1500	<UNK>	<UNK>	06/09/2022 00:00:00
SK28033705	90.93	89.64	<UNK>	F	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK28032751	85.8799	83.46	<UNK>	S	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28032601	88.8399	88.43	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28030851	76.2699	74.74	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK28032400	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28031856	79.73	78.54	77.66	S	VC	C	100	<UNK>	30.91	31/12/1899 00:00:00
SK28032902	82.65	81.51	79.92	F	VC	C	<UNK>	<UNK>	13.33	31/12/1899 00:00:00
SK28031803	79.8499	78.46	78.07	F	VC	C	100	<UNK>	36.72	31/12/1899 00:00:00
SK28036306	81.04	<UNK>	79.16	C	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28032612	<UNK>	<UNK>	<UNK>	F	VC	C	150	<UNK>	<UNK>	05/05/2021 00:00:00
SK28031802	79.36	78.07	<UNK>	F	VC	C	100	<UNK>	0	31/12/1899 00:00:00
SK28032314	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00

Sewer Node Sewer Pipe Data

Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SK28033306	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28034502	<UNK>	<UNK>	84.16	F	<UNK>	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28031820	81.7699	80.5	79.94	F	VC	C	<UNK>	<UNK>	66.09	31/12/1899 00:00:00
SK28032951	82.4	80.46	79.32	S	VC	C	100	<UNK>	20.03	31/12/1899 00:00:00
SK28033302	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032905	84.7399	<UNK>	82.01	F	<UNK>	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28032203	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033501	85.22	84.23	82.9	F	VC	C	150	<UNK>	35.23	31/12/1899 00:00:00
SK28032909	86.8099	84.58	83.4	C	VC	C	300	<UNK>	19.51	31/12/1899 00:00:00
SK28032602	85.29	83.51	<UNK>	C	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28034656	90.7799	88.52	88.38	F	VC	C	150	<UNK>	113.07	31/12/1899 00:00:00
SK28036312	<UNK>	<UNK>	<UNK>	F	P	<UNK>	150	<UNK>	<UNK>	06/09/2022 00:00:00
SK28031951	77.9199	76.22	<UNK>	S	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28031908	81.4599	80.66	79.95	F	VC	C	<UNK>	<UNK>	30.89	31/12/1899 00:00:00
SK28032303	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032952	83.5	82.64	79.52	S	VC	C	100	<UNK>	9.34	31/12/1899 00:00:00
SK28036401	<UNK>	<UNK>	<UNK>	S	CO	<UNK>	1500	<UNK>	<UNK>	06/09/2022 00:00:00
SK28032907	85.4199	84.78	82.89	F	VC	C	<UNK>	<UNK>	14.9	31/12/1899 00:00:00
SK28031904	79.4899	77.8	76.55	F	VC	C	<UNK>	<UNK>	29.09	31/12/1899 00:00:00
SK28035402	82.5	0	0	C	<UNK>	<UNK>	0	0	0	31/12/1899 00:00:00
SK28032614	<UNK>	<UNK>	<UNK>	S	CC	R	600	2100	<UNK>	05/05/2021 00:00:00
SK28034951	80.231	78.54	78.4	S	VC	C	225	<UNK>	53.57	31/12/1899 00:00:00
SK28036301	77.8	76.67	76.2	C	VC	C	225	<UNK>	71.969	31/12/1899 00:00:00
SK28032903	85.23	83.12	82.77	F	VC	C	150	<UNK>	148.2	31/12/1899 00:00:00
SK28035251	77.0299	74.7	74.11	S	VC	C	300	<UNK>	137.95	31/12/1899 00:00:00
SK28032500	<UNK>	<UNK>	<UNK>	F	VC	C	150	<UNK>	<UNK>	05/05/2021 00:00:00
SK28032702	87.4199	86.07	85.7	C	VC	C	150	<UNK>	19.49	31/12/1899 00:00:00
SK28031953	81.3399	79.45	78.99	S	VC	C	150	<UNK>	27.5	31/12/1899 00:00:00
SK28032604	83.1999	81.94	81.58	C	VC	C	<UNK>	<UNK>	51.22	31/12/1899 00:00:00
SK28036302	78.97	77.9	<UNK>	C	VC	C	225	0	0.11	31/12/1899 00:00:00
SK28031955	80.93	79.32	79.27	S	VC	C	<UNK>	<UNK>	553.2	31/12/1899 00:00:00
SK28031903	80.3199	79.67	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28033303	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28035202	72.61	70.62	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK28032953	82.3499	<UNK>	80.47	S	<UNK>	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28032306	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033203	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28034651	91.0899	89.14	88.24	S	VC	C	225	<UNK>	18.23	31/12/1899 00:00:00
SK28033651	<UNK>	90.567	89.73	F	VC	C	100	<UNK>	19.7	31/12/1899 00:00:00
SK28031809	81.86	80.87	<UNK>	F	VC	C	100	<UNK>	0	31/12/1899 00:00:00
SK28031954	80.9899	78.91	76.28	S	VC	C	150	<UNK>	23.45	31/12/1899 00:00:00
SK28032201	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00

Sewer Node Sewer Pipe Data

Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SK28034754	91.3399	88.2	88.05	S	CO	C	300	<UNK>	147	31/12/1899 00:00:00
SK28036305	79.98	79.12	78.61	C	VC	C	<UNK>	<UNK>	41.22	31/12/1899 00:00:00
SK28033606	90.62	89.71	<UNK>	F	VC	C	100	<UNK>	0	31/12/1899 00:00:00
SK28033702	89.25	87.99	<UNK>	C	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK28031910	77.93	76.51	74.71	F	VC	C	<UNK>	<UNK>	45.59	31/12/1899 00:00:00
SK28031701	80.0599	76.65	75.88	C	VC	C	225	<UNK>	103.44	31/12/1899 00:00:00
SK28034401	79.8799	77.67	77.45	F	VC	C	225	<UNK>	162.95	31/12/1899 00:00:00
SK28035401	82.5999	<UNK>	81.62	C	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28032204	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032204	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033202	76.71	75.6	74.86	F	VC	C	225	<UNK>	118.73	31/12/1899 00:00:00
SK28033200	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033200	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032200	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	11/10/2019 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	C	VC	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	11/10/2019 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	C	VC	<UNK>	<UNK>	<UNK>	<UNK>	20/11/2024 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	C	VC	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00



LEGEND

Operational Site

Waste Water Pump
- Transferred Asset
- S24
- S104
- S102
- Null Private
- Null
- None
- Highway Drain
- Adopted Sewer

Storage
- Disposal Site
- Off-Line Waste Water Storage
- On-Line Waste Water Storage
- Wet Well

Waste Water Process Structure
- Sewage Treatment Point
- Sewage Treatment Structure
- Sludge Treatment Point
- Sludge Treatment Structure

Manhole
- Foul Bifurcation Manhole
- Combined Bifurcation Manhole
- Surface Water Bifurcation Manhole
- Dual Manhole
- Foul Single Manhole
- Combined Single Manhole
- Surface Water Single Manhole
- Twin Manhole
- Foul Adopted Manhole
- Combined Adopted Manhole
- Surface Adopted Manhole
- Transferred Manhole
- Unsurveyed Manhole

Gravity Sewer Pipe
- Foul Gravity Sewer
- Combined Gravity Sewer
- Surface Water Gravity Sewer
- S104 Surface Water Gravity Sewer
- S104 Combined Gravity Sewer
- S104 Foul Gravity Sewer
- Private Surface Water Gravity Sewer
- Private Combined Gravity Sewer
- Private Foul Gravity Sewer
- Surface Water Unsurveyed Pipe
- Combined Unsurveyed Pipe
- Foul Unsurveyed Pipe
- Transferred Surface Water Sewer
- Transferred Combined Sewer
- Transferred Foul Sewer
- Disposal Pipe
- Overflow Pipe
- Culverted Water Course
- Waste Interest Site Pipe
- Sewer Service Connection
- Gravity Sewer Others

Pressure Sewer Pipe
- Surface Water Pressure Sewer
- Combined Pressure Sewer
- Foul Pressure Sewer
- S104 Surface Water Pressure Sewer
- S104 Combined Pressure Sewer
- S104 Foul Pressure Sewer
- Private Surface Water Pressure Sewer
- Private Combined Pressure Sewer
- Private Foul Pressure Sewer
- Surface Water Vacuum Sewer
- Foul Vacuum Sewer
- Combined Vacuum Sewer
- S104 Surface Water Vacuum Sewer
- S104 Combined Vacuum Sewer
- S104 Foul Vacuum Sewer
- Private Surface Water Vacuum Sewer
- Private Combined Vacuum Sewer
- Private Foul Vacuum Sewer
- Surface Water Siphon
- Combined Siphon
- Foul Siphon
- Private Surface Water Siphon
- Private Combined Siphon
- Private Foul Siphon
- S104 Surface Water Siphon
- S104 Combined Siphon
- S104 Foul Siphon
- Surface Water Unsurveyed Pipe
- Combined Unsurveyed Pipe
- Foul Unsurveyed Pipe
- Disposal Pipe

Service Pipe
- Surface Water Lateral Drain
- Combined Lateral Drain
- Foul Lateral Drain
- S104 Surface Water Lateral Drain
- S104 Combined Lateral Drain
- S104 Foul Lateral Drain
- Private Surface Water Lateral Drain
- Private Combined Lateral Drain
- Private Foul Lateral Drain
- Transferred Surface Water Lateral Drain
- Transferred Combined Lateral Drain
- Transferred Foul Lateral Drain

Pressure Sewer Annotation

Gravity Sewer Annotation

Service Sewer Annotation

Ancillary
- Balancing Lagoon
- Grease Trap
- Interceptor
- Screen

Chamber
- Flushing Chamber
- Soakaway
- Overflow

Fitting
- Filled Slush
- Facility Connector
- Head Node
- Lamphole
- Sewerage Air Valve
- Sewerage Chemical Injection Point
- Sewerage Hatch Box
- Sewerage Pressure Washout
- Vent Column
- Waste Water Outfall

Control Valve
- Hydrobrake
- Penstock
- Sewerage Isolation Valve
- Sewerage Non Return Valve

Manhole Annotation

Print200mLine

Severn Trent Water Limited
Asset Data Management
PO Box 5344
Coventry
CV3 9FT
Telephone: 0345 601 6616

SEWER RECORD

O/S Map Scale: 1:2,500

This map is centred upon:

Date of Issue: 16-01-25

X: 428405.84 **Y:** 303239.64

Disclaimer Statement:

1 Do not scale off this Map.

2 This plan and any information supplied with it is furnished as a general guide, is only valid at the date of issue and no warranty as to its correctness is given or implied. In particular this plan and any information shown on it must not be relied upon in the event of any development or works (including but not limited to excavations) in the vicinity of SEVERN TRENT WATER assets or for the purposes of determining the suitability of a point of connection to the sewerage or distribution systems.

3 On 1 October 2011 most private sewers and private lateral drains in Severn Trent Water's sewerage area, which were connected to a public sewer as at 1 July 2011, Transferred to the ownership of Severn Trent Water and became public sewers and public lateral drains. A further transfer takes place on 1 October 2012. Private pumping stations, which form part of these sewers or lateral drains, will transfer to ownership of Severn Trent Water on or before 1 October 2016. Severn Trent Water does not possess complete records of these assets. These assets may not be displayed on the map.

5 Ordnance Survey licence number: **100031673**

Sewer Node Sewer Pipe Data

Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SK28035252	74.8899	74.08	73.86	S	CO	C	<UNK>	<UNK>	130.23	31/12/1899 00:00:00
SK28032312	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28034200	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28034202	76.7099	74.55	74.04	F	VC	C	<UNK>	<UNK>	126.55	31/12/1899 00:00:00
SK28033503	83.87	82.52	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28033304	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28034450	<UNK>	<UNK>	<UNK>	F	<UNK>	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28032307	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033307	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032301	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28036311	<UNK>	<UNK>	<UNK>	S	CO	<UNK>	1500	<UNK>	<UNK>	06/09/2022 00:00:00
SK28035502	83.0299	0	<UNK>	C	<UNK>	<UNK>	0	0	0	31/12/1899 00:00:00
SK28032311	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28035351	77.75	76.36	75.38	S	VC	C	<UNK>	<UNK>	35.89	31/12/1899 00:00:00
SK28036313	<UNK>	<UNK>	<UNK>	F	P	<UNK>	150	<UNK>	<UNK>	06/09/2022 00:00:00
SK28033402	79.62	77.44	76.61	F	VC	C	<UNK>	<UNK>	98.54	31/12/1899 00:00:00
SK28036202	77.1399	76.2	<UNK>	C	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK28036207	<UNK>	76.67	76.2	C	VC	C	225	<UNK>	71.969	31/12/1899 00:00:00
SK28034451	<UNK>	<UNK>	<UNK>	F	<UNK>	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28035201	76.9599	74.02	70.64	F	VC	C	<UNK>	<UNK>	16.29	31/12/1899 00:00:00
SK28035403	81.6299	80.81	<UNK>	C	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28032315	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032308	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032316	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033204	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033401	82.7099	78.6	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK28032202	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28034401	79.8799	77.67	77.45	F	VC	C	225	<UNK>	162.95	31/12/1899 00:00:00
SK28035401	82.5999	<UNK>	81.62	C	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28033202	76.71	75.6	74.86	F	VC	C	225	<UNK>	118.73	31/12/1899 00:00:00
SK28032204	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032204	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032501	83.8099	82.91	82.53	F	VC	C	<UNK>	<UNK>	76.87	31/12/1899 00:00:00
SK28034351	76.9199	75.35	75.12	S	VC	C	<UNK>	<UNK>	163.74	31/12/1899 00:00:00
SK28034501	83.73	82.59	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK28036300	<UNK>	<UNK>	<UNK>	F	VC	C	150	<UNK>	<UNK>	31/12/1899 00:00:00
SK28032302	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032310	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28036307	<UNK>	<UNK>	<UNK>	C	U	U	0	0	0	31/12/1899 00:00:00
SK28035501	83.75	82.88	<UNK>	C	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28036303	79.48	<UNK>	<UNK>	C	U	U	0	0	0	31/12/1899 00:00:00

Sewer Node Sewer Pipe Data

Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SK28033201	77.11	75.81	75.6	F	VC	C	225	<UNK>	140.05	31/12/1899 00:00:00
SK28033301	79.08	76.6	75.81	F	VC	C	225	<UNK>	108.24	31/12/1899 00:00:00
SK28032304	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28031301	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28031300	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032305	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033200	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033200	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032200	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28031302	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28031400	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033205	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033305	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28034251	76.72	75.07	74.73	S	VC	C	<UNK>	<UNK>	195.56	31/12/1899 00:00:00
SK28032317	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033300	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033502	85.83	84.92	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK28036208	<UNK>	<UNK>	<UNK>	F	P	<UNK>	150	<UNK>	<UNK>	16/08/2023 00:00:00
SK28036310	<UNK>	<UNK>	<UNK>	S	CO	<UNK>	600	<UNK>	<UNK>	06/09/2022 00:00:00
SK28036304	79.9899	79.16	79.13	C	VC	C	<UNK>	<UNK>	210.67	31/12/1899 00:00:00
SK28036400	<UNK>	<UNK>	<UNK>	S	CO	<UNK>	1500	<UNK>	<UNK>	06/09/2022 00:00:00
SK28032300	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032400	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28036306	81.04	<UNK>	79.16	C	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28033306	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032314	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033302	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032203	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033501	85.22	84.23	82.9	F	VC	C	150	<UNK>	35.23	31/12/1899 00:00:00
SK28036312	<UNK>	<UNK>	<UNK>	F	P	<UNK>	150	<UNK>	<UNK>	06/09/2022 00:00:00
SK28032303	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28036401	<UNK>	<UNK>	<UNK>	S	CO	<UNK>	1500	<UNK>	<UNK>	06/09/2022 00:00:00
SK28035402	82.5	0	0	C	<UNK>	<UNK>	0	0	0	31/12/1899 00:00:00
SK28036301	77.8	76.67	76.2	C	VC	C	225	<UNK>	71.969	31/12/1899 00:00:00
SK28035251	77.0299	74.7	74.11	S	VC	C	300	<UNK>	137.95	31/12/1899 00:00:00
SK28036302	78.97	77.9	<UNK>	C	VC	C	225	0	0.11	31/12/1899 00:00:00
SK28033303	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28035202	72.61	70.62	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK28032306	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28033203	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28032201	<UNK>	<UNK>	<UNK>	F	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28036305	79.98	79.12	78.61	C	VC	C	<UNK>	<UNK>	41.22	31/12/1899 00:00:00

Sewer Node Sewer Pipe Data

Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SK28032309	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28034201	76.8399	74.84	74.71	F	VC	C	225	<UNK>	179.62	31/12/1899 00:00:00
SK28032205	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
SK28036201	<UNK>	<UNK>	<UNK>	C	<UNK>	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK28032313	<UNK>	<UNK>	<UNK>	S	U	C	<UNK>	<UNK>	<UNK>	05/12/2019 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	C	VC	<UNK>	<UNK>	<UNK>	<UNK>	20/11/2024 00:00:00

APPENDIX D – Drainage Strategy Drawing No. OR-LINK-GEN-XX-DR-C-0500 & Supporting Calculation

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	James Hall
Site name:	LE25058
Site location:	Orton Road

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.

Site Details

Latitude:	52.62666° N
Longitude:	1.58813° W
Reference:	4031752180
Date:	Feb 25 2025 15:29

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 5.66

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics

	Default	Edited
SAAR (mm):	630	630
Hydrological region:	4	4
Growth curve factor 1 year:	0.83	0.83
Growth curve factor 30 years:	2	2
Growth curve factor 100 years:	2.57	2.57
Growth curve factor 200 years:	3.04	3.04

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	24.16	24.16
1 in 1 year (l/s):	20.05	20.05
1 in 30 years (l/s):	48.31	48.31
1 in 100 year (l/s):	62.08	62.08
1 in 200 years (l/s):	73.44	73.44

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	1	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	9.900
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)
1	0.113	5.00	86.500	1200	427892.174	303270.266	1.425
2	0.092	5.00	85.400	1200	427917.731	303264.042	1.500
3	0.086	5.00	84.100	1200	427941.181	303207.189	1.500
4	0.080	5.00	84.100	1200	427943.755	303240.705	1.713
5	0.168	5.00	84.800	1200	427934.712	303328.469	1.500
6	0.067	5.00	83.200	1200	427973.916	303280.080	1.500
7	0.100	5.00	83.000	1200	427978.262	303269.544	1.650
8	0.087	5.00	83.100	1200	428003.089	303382.779	1.425
9	0.151	5.00	82.100	1200	428033.663	303345.256	1.500
10	0.136	5.00	81.900	1200	428039.546	303328.903	1.575
11	0.193	5.00	80.600	1200	428083.769	303296.349	1.650
12	0.082	5.00	81.750	1200	428037.110	303302.729	2.881
13	0.073	5.00	81.500	1200	428028.965	303265.985	2.696
14	0.024	5.00	81.300	1200	428029.701	303245.491	2.532
15	0.216	5.00	81.050	1200	428041.769	303225.056	2.323
Pond			79.500		428091.311	303230.334	2.000
16_FC			79.400	1800	428117.422	303210.992	2.046
Outfall			79.080	1200	428127.886	303204.071	1.800

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	1	2	26.304	0.600	85.075	83.975	1.100	23.9	225	5.16	34.9
1.001	2	4	34.955	0.600	83.900	82.462	1.438	24.3	225	5.38	34.4
2.000	3	4	33.615	0.600	82.600	82.462	0.138	243.6	300	5.56	33.9
1.002	4	7	44.971	0.600	82.387	81.425	0.962	46.7	375	5.84	33.2
3.000	5	6	62.277	0.600	83.300	81.700	1.600	38.9	300	5.41	34.3
3.001	6	7	11.397	0.600	81.700	81.500	0.200	57.0	300	5.50	34.1
1.003	7	13	50.828	0.600	81.350	78.954	2.396	21.2	450	6.03	32.7

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
1.000	2.686	106.8	14.3	1.200	1.200	0.113	0.0
1.001	2.664	105.9	25.5	1.275	1.413	0.205	0.0
2.000	1.003	70.9	10.5	1.200	1.338	0.086	0.0
1.002	2.656	293.3	44.5	1.338	1.200	0.371	0.0
3.000	2.527	178.6	20.8	1.200	1.200	0.168	0.0
3.001	2.087	147.5	29.0	1.200	1.200	0.235	0.0
1.003	4.429	704.3	83.4	1.200	2.096	0.707	0.0

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)
4.000	8	9	48.402	0.600	81.675	80.675	1.000	48.4	225	5.43	34.2
4.001	9	10	17.379	0.600	80.600	80.400	0.200	86.9	300	5.60	33.8
4.002	10	12	26.287	0.600	80.325	79.094	1.231	21.4	375	5.71	33.5
5.000	11	12	47.093	0.600	78.950	78.869	0.081	581.4	600	5.78	33.3
4.003	12	13	37.636	0.600	78.869	78.804	0.065	579.0	600	6.41	31.8
1.004	13	14	20.507	0.600	78.804	78.768	0.036	569.6	675	6.72	31.0
1.005	14	15	23.732	0.600	78.768	78.727	0.041	578.8	675	7.09	30.2
1.006	15	Pond	49.822	0.600	78.727	77.500	1.227	40.6	675	7.29	29.8
1.007	Pond	16_FC	32.495	0.600	77.500	77.434	0.066	492.3	675	7.75	28.9
1.008	16_FC	Outfall	12.546	0.600	77.354	77.280	0.074	169.5	225	7.96	28.6

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
4.000	1.884	74.9	10.8	1.200	1.200	0.087	0.0
4.001	1.687	119.3	29.1	1.200	1.200	0.238	0.0
4.002	3.935	434.6	45.3	1.200	2.281	0.374	0.0
5.000	1.002	283.4	23.2	1.050	2.281	0.193	0.0
4.003	1.005	284.0	74.5	2.281	2.096	0.648	0.0
1.004	1.091	390.3	160.2	2.021	1.857	1.428	0.0
1.005	1.082	387.2	158.5	1.857	1.648	1.452	0.0
1.006	4.120	1474.3	179.7	1.648	1.325	1.668	0.0
1.007	1.174	420.2	174.1	1.325	1.291	1.668	0.0
1.008	1.001	39.8	172.4	1.821	1.575	1.668	0.0

Simulation Settings

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

Storm Durations

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

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	35	0	0
100	40	0	0

Node 16_FC Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	77.354	Product Number	CTL-SHE-0205-2410-1700-2410
Design Depth (m)	1.700	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	24.1	Min Node Diameter (mm)	1800

Node Pond Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	77.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	400.0	600.0	1.700	843.3	1153.0	2.000	938.5	1268.4

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.62%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	85.129	0.054	12.9	0.0607	0.0000	OK
15 minute summer	2	10	83.973	0.073	23.3	0.0825	0.0000	OK
15 minute summer	3	11	82.675	0.075	9.8	0.0851	0.0000	OK
15 minute summer	4	11	82.484	0.097	41.5	0.1094	0.0000	OK
15 minute summer	5	10	83.366	0.066	19.2	0.0742	0.0000	OK
15 minute summer	6	11	81.792	0.092	26.7	0.1044	0.0000	OK
15 minute summer	7	11	81.450	0.100	78.6	0.1134	0.0000	OK
15 minute summer	8	10	81.730	0.055	10.0	0.0625	0.0000	OK
15 minute summer	9	10	80.702	0.102	26.8	0.1153	0.0000	OK
15 minute summer	10	10	80.406	0.081	42.0	0.0914	0.0000	OK
15 minute summer	11	11	79.125	0.175	22.0	0.1977	0.0000	OK
15 minute summer	12	12	79.120	0.251	69.5	0.2833	0.0000	OK
15 minute summer	13	12	79.100	0.296	150.0	0.3346	0.0000	OK
15 minute summer	14	12	79.027	0.259	152.3	0.2925	0.0000	OK
15 minute summer	15	11	78.898	0.171	173.1	0.1934	0.0000	OK
240 minute summer	Pond	156	77.792	0.292	71.9	127.9608	0.0000	OK
240 minute summer	16_FC	156	77.792	0.438	23.6	1.1140	0.0000	SURCHARGED
240 minute summer	Outfall	156	77.402	0.122	23.1	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	12.8	1.795	0.120	0.1871	
15 minute summer	2	1.001	4	23.0	2.110	0.217	0.3816	
15 minute summer	3	2.000	4	9.5	0.704	0.135	0.4553	
15 minute summer	4	1.002	7	41.5	1.881	0.141	0.9916	
15 minute summer	5	3.000	6	19.0	1.285	0.106	0.9250	
15 minute summer	6	3.001	7	26.2	1.510	0.178	0.1981	
15 minute summer	7	1.003	13	78.9	2.713	0.112	1.7735	
15 minute summer	8	4.000	9	9.7	1.302	0.129	0.3610	
15 minute summer	9	4.001	10	26.6	1.321	0.223	0.3502	
15 minute summer	10	4.002	12	41.7	2.465	0.096	0.4448	
15 minute summer	11	5.000	12	19.2	0.338	0.068	4.2263	
15 minute summer	12	4.003	13	67.7	0.545	0.238	4.6996	
15 minute summer	13	1.004	14	150.2	1.088	0.385	2.8309	
15 minute summer	14	1.005	15	153.8	1.603	0.397	2.3224	
15 minute summer	15	1.006	Pond	175.3	4.158	0.119	2.4643	
30 minute summer	Pond	1.007	16_FC	25.7	0.513	0.061	3.2535	
240 minute summer	16_FC	1.008	Outfall	23.1	1.001	0.580	0.2894	275.3

Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 99.62%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	9	85.204	0.129	64.4	0.1457	0.0000	OK
15 minute summer	2	11	84.435	0.535	116.8	0.6053	0.0000	SURCHARGED
15 minute summer	3	10	82.789	0.189	48.8	0.2141	0.0000	OK
15 minute summer	4	11	82.630	0.243	200.3	0.2744	0.0000	OK
15 minute summer	5	10	83.454	0.154	95.6	0.1743	0.0000	OK
15 minute summer	6	10	81.971	0.271	133.3	0.3060	0.0000	OK
15 minute summer	7	11	81.585	0.235	385.6	0.2657	0.0000	OK
15 minute summer	8	10	81.807	0.132	49.8	0.1498	0.0000	OK
15 minute summer	9	10	81.018	0.418	135.4	0.4730	0.0000	SURCHARGED
15 minute summer	10	10	80.541	0.216	210.0	0.2447	0.0000	OK
15 minute summer	11	10	79.900	0.950	109.5	1.0749	0.0000	SURCHARGED
15 minute summer	12	11	79.885	1.016	362.7	1.1486	0.0000	SURCHARGED
15 minute summer	13	11	79.744	0.940	784.6	1.0633	0.0000	SURCHARGED
15 minute summer	14	11	79.482	0.714	800.5	0.8073	0.0000	SURCHARGED
15 minute summer	15	10	79.135	0.408	919.5	0.4616	0.0000	OK
240 minute winter	Pond	236	78.800	1.300	179.4	740.5344	0.0000	SURCHARGED
240 minute winter	16_FC	236	78.800	1.446	26.5	3.6802	0.0000	SURCHARGED
60 minute winter	Outfall	32	77.405	0.125	24.1	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	64.2	2.611	0.601	0.8256	
15 minute summer	2	1.001	4	109.1	2.952	1.030	1.3901	
15 minute summer	3	2.000	4	47.7	1.094	0.673	1.4757	
15 minute summer	4	1.002	7	200.5	2.785	0.683	3.2367	
15 minute summer	5	3.000	6	95.0	1.819	0.532	3.2176	
15 minute summer	6	3.001	7	130.8	2.138	0.887	0.6908	
15 minute summer	7	1.003	13	386.6	2.807	0.549	6.1533	
15 minute summer	8	4.000	9	49.4	1.568	0.660	1.5504	
15 minute summer	9	4.001	10	132.5	1.883	1.111	1.1963	
15 minute summer	10	4.002	12	207.9	2.938	0.478	2.3149	
15 minute summer	11	5.000	12	108.3	0.385	0.382	13.2650	
15 minute summer	12	4.003	13	358.6	1.273	1.263	10.6012	
15 minute summer	13	1.004	14	787.6	2.207	2.018	7.3205	
15 minute summer	14	1.005	15	801.9	2.655	2.071	6.9126	
15 minute summer	15	1.006	Pond	924.3	5.160	0.627	11.7408	
15 minute summer	Pond	1.007	16_FC	85.0	0.635	0.202	11.6000	
60 minute winter	16_FC	1.008	Outfall	24.1	1.010	0.605	0.2990	382.0

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.62%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	11	86.175	1.100	84.5	1.2440	0.0000	SURCHARGED
15 minute summer	2	11	85.400	1.500	146.8	1.6965	0.6224	FLOOD
15 minute summer	3	10	82.836	0.236	64.1	0.2665	0.0000	OK
15 minute summer	4	11	82.684	0.297	255.7	0.3358	0.0000	OK
15 minute summer	5	10	83.484	0.184	125.7	0.2078	0.0000	OK
15 minute summer	6	10	82.217	0.517	174.6	0.5850	0.0000	SURCHARGED
15 minute summer	7	11	81.690	0.340	500.8	0.3845	0.0000	OK
15 minute summer	8	11	82.413	0.738	65.4	0.8346	0.0000	SURCHARGED
15 minute summer	9	11	81.641	1.041	168.9	1.1769	0.0000	SURCHARGED
15 minute summer	10	11	81.070	0.745	266.4	0.8430	0.0000	SURCHARGED
15 minute summer	11	11	80.465	1.515	144.0	1.7133	0.0000	FLOOD RISK
15 minute summer	12	11	80.441	1.572	463.2	1.7782	0.0000	SURCHARGED
15 minute summer	13	11	80.203	1.399	1018.8	1.5825	0.0000	SURCHARGED
15 minute summer	14	11	79.757	0.989	1037.8	1.1191	0.0000	SURCHARGED
15 minute summer	15	11	79.210	0.483	1193.1	0.5464	0.0000	OK
360 minute winter	Pond	344	79.164	1.664	175.9	1026.6820	0.0000	SURCHARGED
360 minute winter	16_FC	344	79.164	1.810	25.9	4.6060	0.0000	FLOOD RISK
15 minute summer	Outfall	11	77.405	0.125	24.1	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	81.0	2.624	0.758	1.0461	
15 minute summer	2	1.001	4	136.5	3.433	1.289	1.3879	
15 minute summer	3	2.000	4	63.1	1.116	0.890	1.9192	
15 minute summer	4	1.002	7	257.5	2.898	0.878	3.9908	
15 minute summer	5	3.000	6	124.3	1.935	0.696	3.6006	
15 minute summer	6	3.001	7	171.8	2.440	1.165	0.7945	
15 minute summer	7	1.003	13	503.0	3.279	0.714	7.2921	
15 minute summer	8	4.000	9	63.4	1.593	0.846	1.9250	
15 minute summer	9	4.001	10	169.4	2.405	1.420	1.2238	
15 minute summer	10	4.002	12	267.1	2.884	0.615	2.8994	
15 minute summer	11	5.000	12	140.8	0.500	0.497	13.2650	
15 minute summer	12	4.003	13	463.9	1.647	1.633	10.6012	
15 minute summer	13	1.004	14	1020.9	2.860	2.616	7.3205	
15 minute summer	14	1.005	15	1038.7	3.050	2.683	7.4793	
15 minute summer	15	1.006	Pond	1195.6	5.495	0.811	14.7901	
15 minute winter	Pond	1.007	16_FC	79.3	0.646	0.189	11.6000	
15 minute summer	16_FC	1.008	Outfall	24.1	1.011	0.605	0.2990	346.7

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Rev.	Amendments	Date	By
P03	REVISED MASTERPLAN	28.03.25	VI
P02	UPDATED FOR PLANNING	14.03.25	JAH
P01	UPDATED FOR PLANNING	04.03.25	JAH
P0	INITIAL ISSUE.	27.02.25	JAH

Revisions

Client: Richborough

LINK ENGINEERING
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Project: LE25058 ORTON ROAD

Drawing: PROPOSED DRAINAGE STRATEGY

DWG No: OR-LINK-GEN-XX-DR-C-0500

Status: PLANNING (S5)

Scale @ A1	Drawn	Checked	Rev
1:500	JAH	VI	P03

BEDDING NOTES

1. GRANULAR PIPE BEDDING MATERIAL FOR PIPES, AND BACKFILLING FOR TEMPORARY DRAINS (TRENCH SUB-DRAINS), SHALL CONSIST OF AGGREGATES FROM NATURAL SOURCES OR SINTERED PULVERIZED-FUEL ASH COMPLYING WITH THE RELEVANT PROVISIONS OF BS.882 AND BS.3797, PART 2 RESPECTIVELY, SIZED IN ACCORDANCE WITH THE FOLLOWING TABLE:

NOMINAL BORE	ALTERNATIVE AGGREGATE SIZES (mm)	
	SINGLE-SIZED	GRADED
100	10	-
150	10 OR 14	14 TO 5
225 - 300	10, 14 OR 20	14 TO 5 OR 20 TO 5
375 - 525	14 OR 20	14 TO 5 OR 20 TO 5
EXCEEDING	14, 20 OR 40	14 TO 5, 20 TO 5 OR 40 TO 5

2. SELECTED BACKFILL MATERIAL, WHETHER SELECTED FROM LOCALLY EXCAVATED MATERIAL OR IMPORTED, SHALL CONSIST OF UNIFORM, READILY COMPACTIBLE MATERIAL, FREE FROM VEGETABLE MATTER, BUILDING RUBBISH & FROZEN MATERIAL, OR MATERIALS SUSCEPTIBLE TO SPONTANEOUS COMBUSTION, & EXCLUDING CLAY OF LIQUID LIMIT GREATER THAN 80 AND/OR PLASTIC LIMIT GREATER THAN 55 AND MATERIALS OF EXCESSIVELY HIGH MOISTURE CONTENT. CLAY LUMPS AND STONES SHALL BE RETAINED ON 75mm AND 37.5mm SIEVES RESPECTIVELY.

3. COMPRESSIBLE FILLER FOR INTERRUPTING CONCRETE PROTECTION TO PIPELINES SHALL CONSIST OF BITUMEN IMPREGNATED INSULATING BOARD TO BS.1142, PART 3 OR OTHER EQUALLY COMPRESSIBLE MATERIAL. THE THICKNESS OF COMPRESSIBLE FILLER SHALL BE AS FOLLOWS:

NOMINAL BORE OF PIPE (mm)	THICKNESS OF COMPRESSIBLE FILLER (mm)
LESS THAN 450	18
450 - 1200	36
EXCEEDING 1200	54

4. THE CONTRACTOR IS TO PROTECT BURIED PIPES (PARTICULARLY SHALLOW PIPES) FROM DAMAGE CAUSED BY LOADS IMPOSED BY CONSTRUCTION PLANT.

5. BELOW ROADS AND OTHER PAVED AREAS TRENCHES SHALL BE BACKFILLED WITH DfT SPECIFICATION TYPE 1 SUB-BASE MATERIAL UP TO ROAD/PAVING FORMATION LEVEL. ALL OTHER TRENCHES,UNLESS OTHERWISE SPECIFIED SHALL BE BACKFILLED TO FINISHED GROUND LEVEL OR UNDERSIDE OF TOPSOIL LAYER WITH WELL COMPACTED EXCAVATED MATERIAL.

GRANULAR BEDDINGS

1. DIMENSION Y: 1/6 BC OR 100mm UNDER BARRELS, AND 50mm MIN. UNDER SOCKETS WHICHEVER IS THE GREATER (400 MAX.). ROCK ETC 1/4 BC AND 150mm MIN UNDER SOCKETS (400mm MAX.)

2. DN : NOMINAL BORE OF PIPE
3. BC : EXTERNAL DIAMETER OF PIPE BARREL

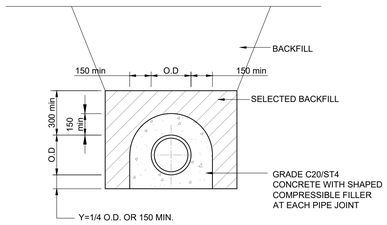
CONCRETE BEDDINGS

1. THE USE OF GRANULAR BEDDINGS BELOW CONCRETE BEDDINGS (BEDDING TYPES A2,A4,A6) ARE FOR USE IN WET CONDITIONS.
2. CONCRETE CRADLES MAY EXTEND TO SIDES OF TRENCH.
3. TRANSVERSE STEEL TO BE 0.4% MIN OF CONCRETE AT X-X (FM=3.4) UNLESS OTHERWISE STATED.
4. BEDDING BENEATH & AT SIDES OF PIPE TO BE WELL COMPACTED
5. BEDDING/BACKFILL DIRECTLY ABOVE PIPE TO BE LIGHTLY COMPACTED BY HAND. DIMENSION Y: 1/6BC OR 100mm UNDER BARRELS, AND 50mm UNDER SOCKETS WHICHEVER IS GREATER (SUBJECT TO 400mm MAX.).
6. DN = NOMINAL BORE OF PIPE.
7. BC = EXTERNAL DIAMETER OF PIPE BARREL.

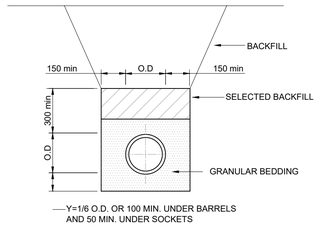
TRENCH WIDTH

1. THE MAXIMUM TRENCH WIDTHS ARE TO BE AS SHOWN BELOW UNLESS THE APPROVAL OF THE ENGINEER IS OBTAINED.

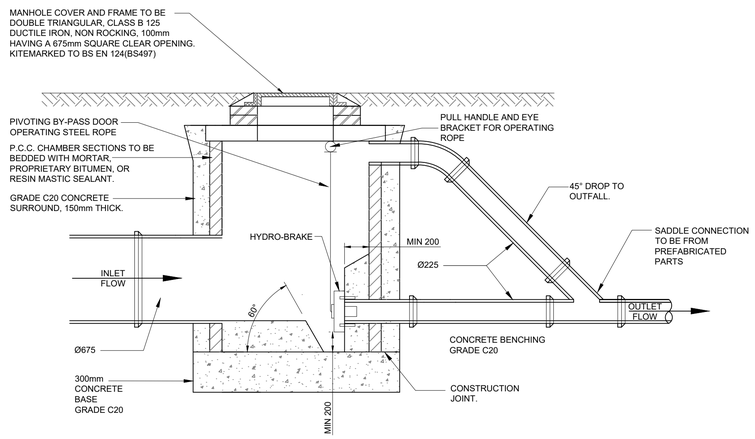
INTERNAL PIPE DIAMETER	MAXIMUM TRENCH WIDTH
100	600
150	600
225	700
300	850
375	1050
450	1150
525	1200
600	1350
675	1450
750	1500
825	1600
900	1900
975	2000
1050	2100
1200	2300



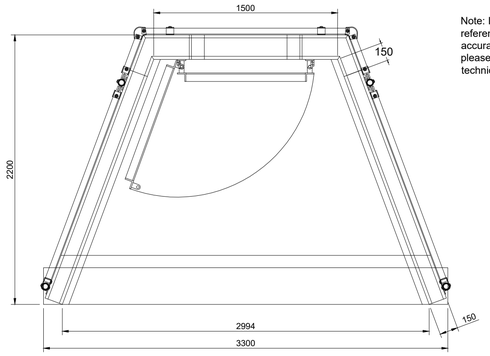
BED CLASS Z
PLAIN CONCRETE SURROUND
1:20



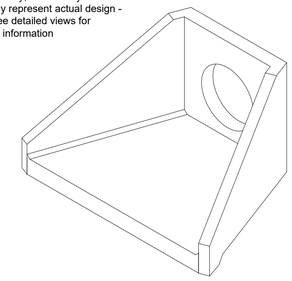
BED CLASS S
GRANULAR BED AND SURROUND
1:20

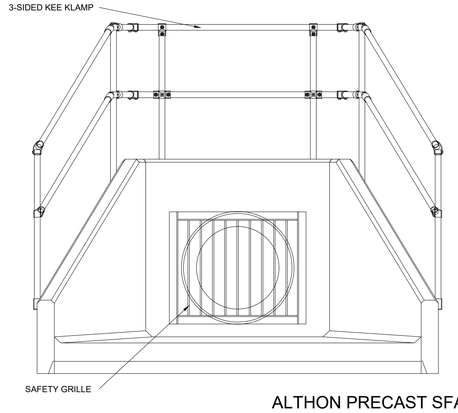


FLOW CONTROL CHAMBER
1:25

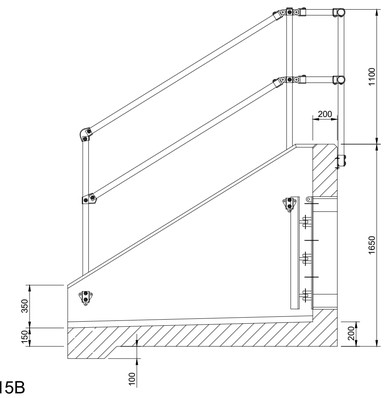


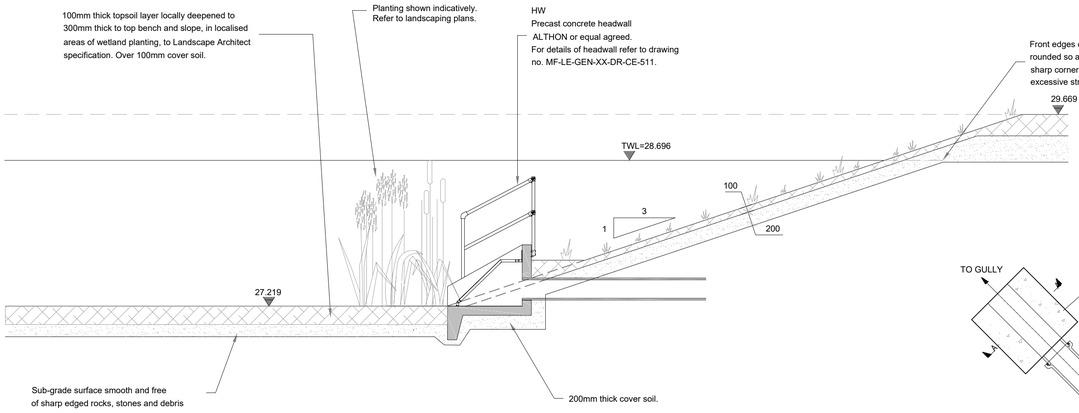
Note: Isometric drawing is for reference only, details may not accurately represent actual design - please see detailed views for technical information



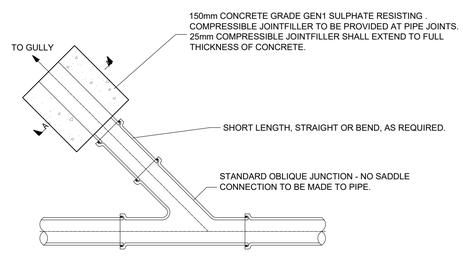


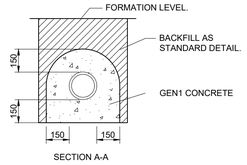
ALTHON PRECAST SFA15B HEADWALL - Ø675 PIPE
1:25





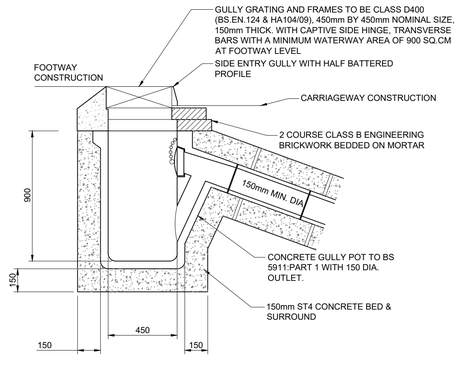
TYPICAL SECTION THROUGH UNLINED ATTENUATION POND SHOWING POND WITH HEADWALL
SCALE 1:50





SECTION A-A

GULLY CONNECTION
1:20



SIDE ENTRY TRAPPED ROAD GULLY DETAIL
1:20

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Rev.	Amendments	Date	By
P0	INITIAL ISSUE.	04.03.25	JAH

Revisions

Client: Richborough

Link ENGINEERING
Find us @ www.linkeng.co.uk

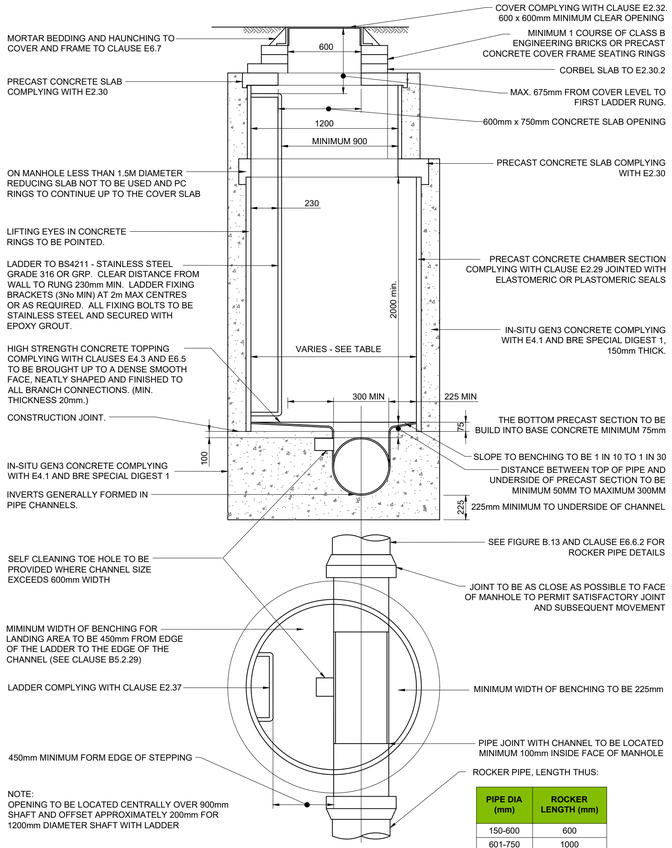
Project: LE25058 ORTON ROAD

Drawing: DRAINAGE DETAILS SHEET 1

Scale @ A1	Drawn	Checked	Rev
AS SHOWN	JAH	VBI	P0

Drawing No: OR-LINK-GEN-XX-DR-C-0550

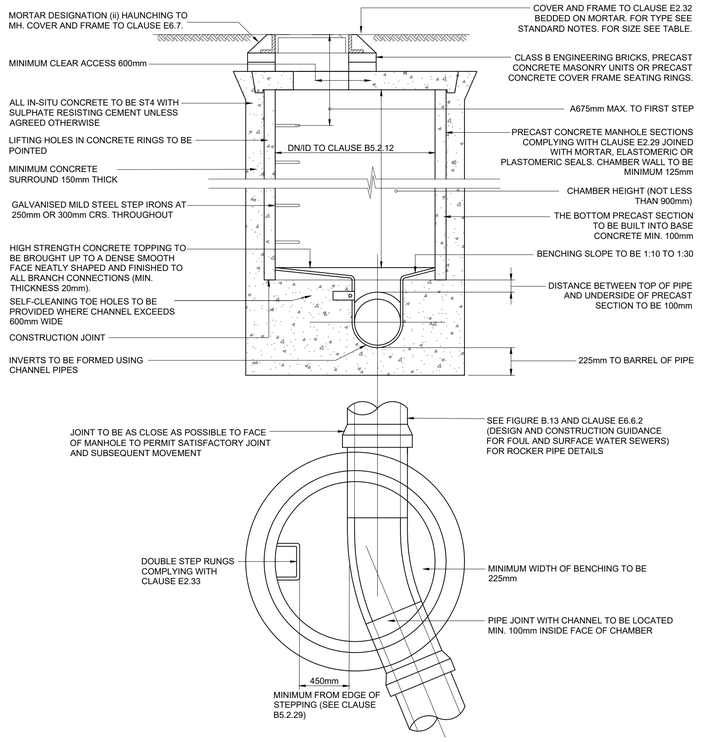
Status: PLANNING (S5)



PIPE DIA (mm)	ROCKER LENGTH (mm)
150-600	600
601-750	1000
>750	1250

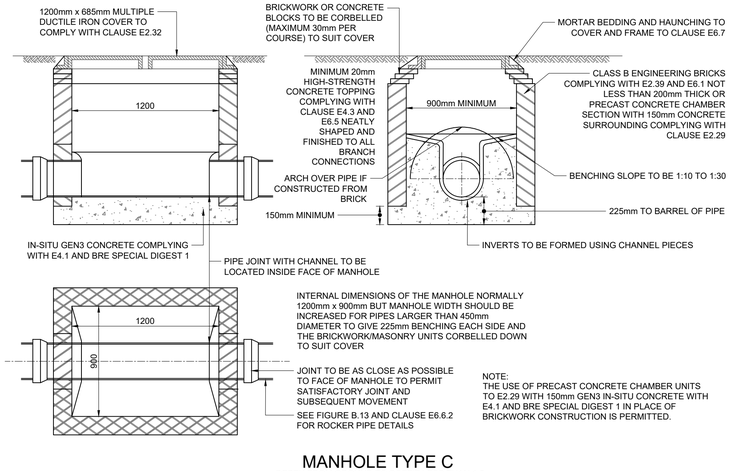
MANHOLE TYPE A

DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE 3m TO 6m
1:25



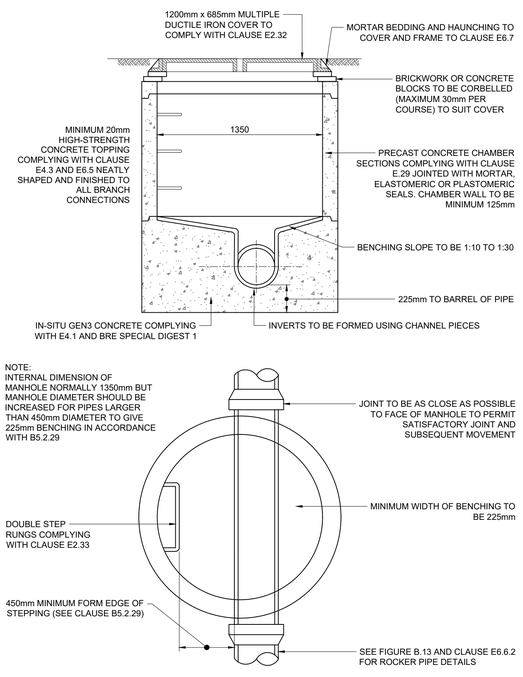
MANHOLE TYPE B

DEPTH FROM GROUND TO SOFFIT 3m
1:25



MANHOLE TYPE C

DEPTH FROM GROUND TO SOFFIT LESS THAN 1.5m
MAXIMUM PIPE SIZE 450MM DIAMETER
1:25



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MAXIMUM PIPE SIZE 450MM DIAMETER
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Rev.	Amendments	Date	By
P0	INITIAL ISSUE.	04.03.25	JAH

Revisions

Client: Richborough

Link ENGINEERING
Find us @ www.linkeng.co.uk

Project: LE25058 ORTON ROAD

Drawing: DRAINAGE DETAILS SHEET 2

Scale @ A1	Drawn	Checked	Rev
AS SHOWN	JAH	VBI	P0

DWGS No: OR-LINK-GEN-XX-DR-C-0551
Status: PLANNING (S5)