

## **ENVIRONMENT**

Hargreaves Land Limited  
Planning Application 1 at Lincolnshire Lakes (North)  
Scunthorpe  
Sustainable Drainage Statement

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## 1. INTRODUCTION

1.1 A Sustainable Drainage Statement (SDS) sets out the principles of drainage design for a development and summarises the reasoning behind the chosen design. This includes consideration of national and local guidance, justification of specific flow rates, volumes of attenuated storage, as well as the appropriate level of treatment to be provided to surface water runoff.

1.2 This SDS has been produced by BWB Consulting on behalf of Hargreaves Land Limited in respect of a hybrid planning application for the proposed residential-led development ('the proposed Development') known as Lincolnshire Lakes North (Planning Application 1), Scunthorpe, hereafter, referred to as the 'Site' (approximate grid reference: SE 86164 09687). The application is summarised as follows:

*Full planning application for the construction of a new vehicular access off the M181/A1077(M) roundabout, a pedestrian and cycle link to Scotter Road, a foul pumping station, earthworks and 'off-plot' drainage, ecological and associated landscaping and infrastructure works.*

*Outline planning application, with all matters reserved, for the development of up to 550 residential dwellings (Use Class C3), a local centre (Use Class E) and associated 'on-plot' landscaping, drainage and other infrastructure works.*

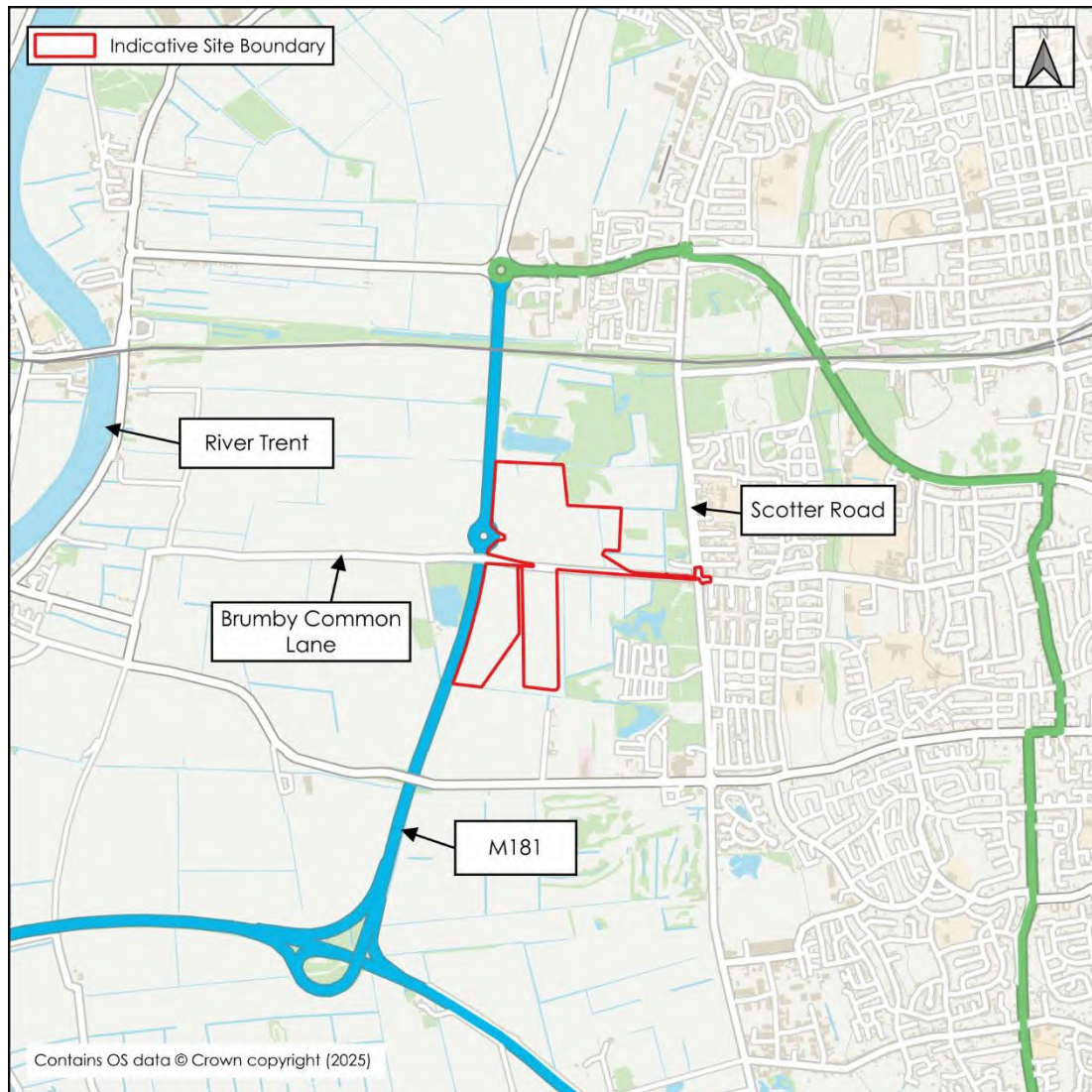
1.3 The report is intended to support a hybrid planning application and as such the level of detail included is commensurate and subject to the nature of the proposals.

1.4 A Flood Risk Assessment (FRA) has been produced for the Site (reference: LLP1-BWB-ZZ-XX-RP-YE-0001\_FRA) and this SDS accompanies this overarching document.

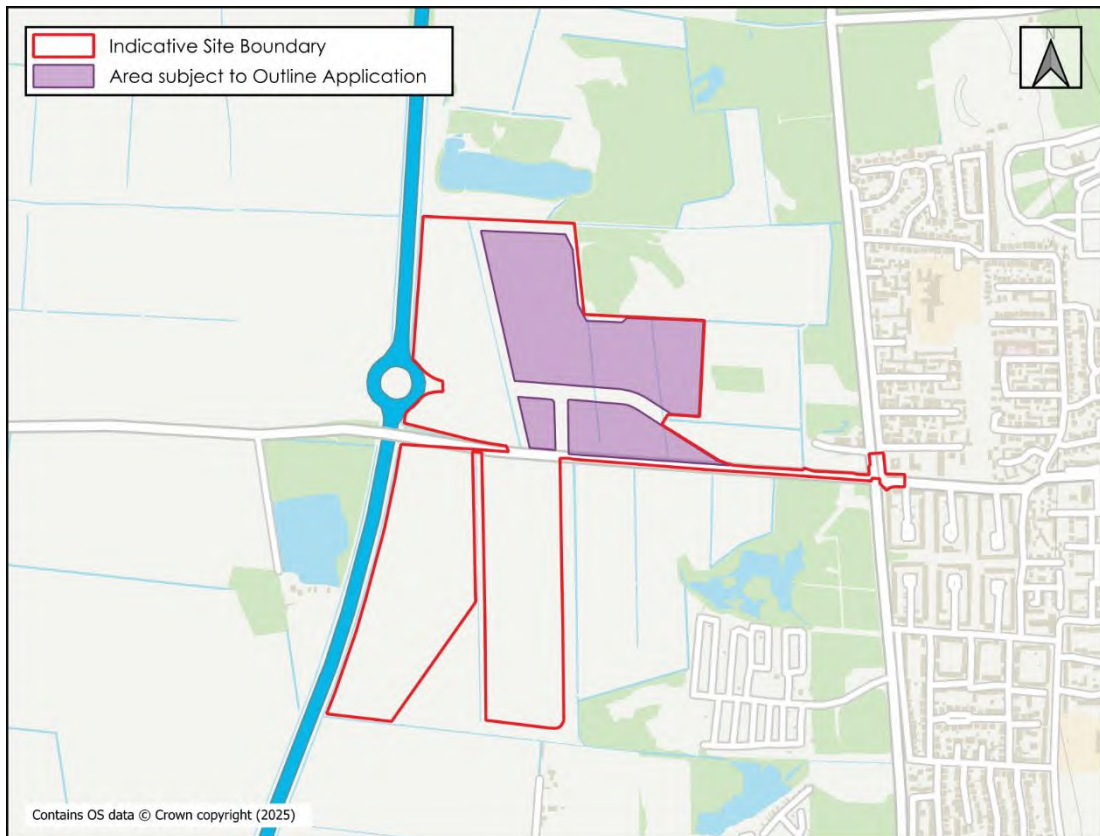
1.5 The location of the Site is illustrated within **Figure 1.1**, with contextual information provided within **Table 1.1**.

1.6 The area subject to the outline application is shown in **Figure 1.2** and will be the focus of this drainage strategy.

1.7 The Proposed Development is to be built out in a phased approach. The Illustrative Masterplan and phasing plans are included within **Appendix 1** and shows the area subject to the outline application. The land in the south of the site is to be used for ground improvement works as part of this application and will not initially be developed.



**Figure 1.1: Site Location**



**Figure 1.2: Area subject to outline application**

**Table 1.1: Site Details**

<b>Site Name</b>	Lincolnshire Lakes – Phase 1
<b>Location</b>	Scunthorpe
<b>NGR (approx.)</b>	SE 861 64 09687
<b>Application Site Area (ha)</b>	56.51 (approx.)
<b>Development Type</b>	Residential Local Centre
<b>Lead Local Flood Authority (LLFA)</b>	North Lincolnshire Council
<b>Local Planning Authority (LPA)</b>	North Lincolnshire Council
<b>Environment Agency Area</b>	Lincolnshire and Northamptonshire
<b>Sewerage Undertaker</b>	Severn Trent
<b>Internal Drainage Board (IDB)</b>	Scunthorpe & Gainsborough Water Management Board

## Sustainable Drainage Guidance

- 1.8 Sustainable Drainage Systems (SuDS) aim to reduce the impact of development by replicating the natural runoff regime in a sustainable, cost-effective manner, whilst protecting water quality and reducing pollution. The four key objectives of SuDS design are to achieve improvements in water quantity, water quality, amenity provision and biodiversity.
- 1.9 North Lincolnshire Council, in their role as the Lead Local Flood Authority (LLFA) have published 'Sustainable Drainage Systems (SuDS) Guidance'<sup>1</sup> and 'Local Flood Risk Management Strategy (LFRMS)<sup>2</sup>. This guidance states that it is not acceptable to use the roads as flood conduits, formal overland routes should be formed from SuDS techniques if required.
- 1.10 North Lincolnshire Council (LLFA) and Scunthorpe & Gainsborough Water Management Board (IDB) were also contacted prior to the writing of this report for any information relating to flood risk or drainage. A response was received from the LLFA; however, they could not provide any relevant information. No response has yet been received from the IDB in relation to drainage.
- 1.11 The 'Lincolnshire Lakes Area Action Plan'<sup>3</sup> states that run-off rates should be limited to 1.4l/s/ha as required by the IDB.
- 1.12 As well as the LLFA guidance, the Non-Statutory Technical Standards for Sustainable Drainage Systems<sup>4</sup> as published by DEFRA and The SuDS Manual<sup>5</sup> have also been utilised to inform the strategy.
- 1.13 Table 2 from the Environment Agency's (EA) 'Flood risk assessments: climate change allowances'<sup>6</sup>, included as **Table 1.2** , shows anticipated changes in peak rainfall intensity.

<sup>1</sup> Sustainable Drainage Systems (SuDS) Guidance (North Lincolnshire Council, July 2025)

<sup>2</sup> Local Flood Risk Management Strategy (North Lincolnshire Council, August 2016)

<sup>3</sup> Lincolnshire Lakes Area Action Plan (North Lincolnshire Council, August 2019)

<sup>4</sup> 2015, DEFRA. Non-statutory technical standards for sustainable drainage systems

<sup>5</sup> The SuDS Manual (CIRIA, 2015)

<sup>6</sup> <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

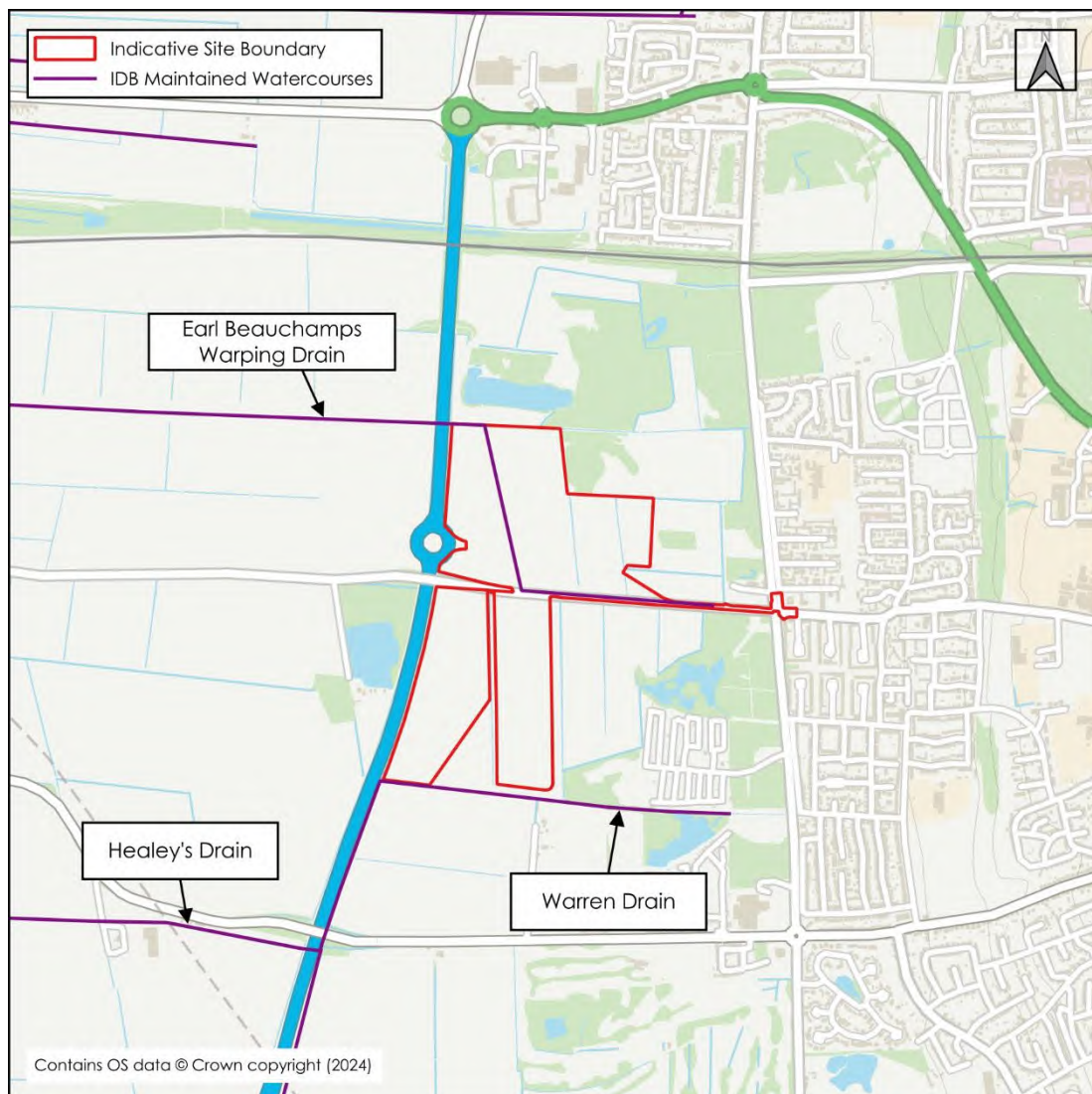
**Table 1.2: Peak Rainfall Climate Change Allowances for the Lower Trent and Erewash Management Catchment**

Lower Trent and Erewash Management Catchment peak rainfall allowances	Total Potential Change Anticipated for the '2050s' (Lifetime up to 2060)	Total Potential Change Anticipated for the '2070s' (2061 to 2125)
1 in 30-Year Rainfall Event		
Upper End	35%	35%
Central	20%	25%
1 in 100-Year Rainfall Event		
Upper End	40%	40%
Central	20%	25%

- 1.14 The EA's guidance on peak rainfall intensity climate change allowances states that residential development should be considered to have a minimum lifetime of 100 years. The Proposed Development falls into the 2070s epoch therefore a 40% climate change allowance should be applied. It should be noted that the 1 in 30-year event plus 35% climate change event will need to be considered through detailed design. These allowances have also been applied to the local centres.
- 1.15 A 10% allowance for urban creep is required to be included in the impermeable area calculations for residential development.

## 2. EXISTING CONDITIONS

- 2.1 The Site is situated within North Lincolnshire, located approximately 2.7km southwest of Scunthorpe town centre. The Site comprises two parcels and is bisected by Brumby Common Lane. In a wider site context, the Site is bound to the north and south by greenfield land comprising agricultural and forested land, to the east by Scotter Road and existing residential development, and to the west by the M181/A1077(M).
- 2.2 The existing site condition is mostly greenfield, comprising agricultural land.
- 2.3 A network of IDB drains is shown to be present within and surrounding the Site. The IDB drains are understood to be maintained by the Scunthorpe & Gainsborough Water Management Board who maintain the water levels and pumping stations which ultimately outfall to the River Trent. The IDB watercourses in proximity to the Site can be seen in **Figure 2.1** below.



**Figure 2.1: IDB Maintained Watercourses**

- 2.4 A topographical survey of the Site is included as **Appendix 2**. The Site is generally flat with levels ranging generally between 1.9mAOD and 3.0mAOD.
- 2.5 The Phase 2 Ge-Environmental Assessment by BWB (referenced LLP1-BWB-XX-XX-T-G-002\_Ph2) states the ground geology comprised of varying depths of topsoil overlying warp deposits, in turn overlying the Sutton Sand Formation. Water strikes and seepages were recorded during the ground investigation. During the subsequent monitoring, groundwater was present in all boreholes monitored, with groundwater levels ranging between 0.94m and 1.62m below ground level.
- 2.6 The existing Site is understood to drain via a combination of limited infiltration, followed by runoff to the watercourses within and adjacent to the Site ultimately discharging to the IDB Drains.
- 2.7 The local sewerage undertaker is Severn Trent Water. A copy of their asset plans is included as **Appendix 3** and shows a public surface water and foul water network situated to the east of the Site, located within the existing residential development. Sewerage assets are shown to pass through the far eastern portion of the Site which overlaps with Scotter Road and West Common Lane.
- 2.8 Public surface water sewers are shown to be directed in a westerly direction towards the Site, and ultimately outfall to a wetland area and pond known as Brumby Common. Public foul sewers are shown to be directed in a south-westerly direction towards a pumping station located within an existing residential area, known as Parkland, located approximately 700m south of the Site.

## Existing Runoff Rates

- 2.9 An assessment of the existing surface water runoff rates has been undertaken on a per hectare basis and is summarised within **Table 2.1**. Calculations are included within **Appendix 4**.
- 2.10 The runoff rates have been estimated using the IH124 method, with appropriate prorated adjustments for a site of less than 50ha, as recommended in Interim Code of Practice for Sustainable Drainage<sup>7</sup>. This was undertaken using HR Wallingford Greenfield runoff estimation tool, which makes the necessary adjustments for small sites automatically.

**Table 2.1: Existing Runoff Rate from the Site per Hectare**

Return Period (Yrs.)	Runoff Rate (l/s/ha)
1	1.3
Mean Annual Flow Rate (QBAR)	1.5
30	3.1
100	4.0

## Existing Runoff Volume

- 2.11 An assessment of the existing surface water runoff rates from the Planning Application 1 proposed impermeable area (14.75ha) has been made for a 1 in 100-year, 6-hour storm.
- 2.12 As the existing Site is permeable, the runoff volume has been calculated using the Discharge Volume within Causeway 'Flow' to be **2,124m<sup>3</sup>**, results are included within **Appendix 5**.

<sup>7</sup> The National SUDS Working Group (2004), Interim Code of Practice for Sustainable Drainage

### 3. SURFACE WATER DRAINAGE STRATEGY

3.1 The total Planning Application 1 area is 56.51ha. Catchments proposed with residential housing development used an estimate of 60% impermeability, and an allowance of 10% for urban creep. Catchments for Local Centres used an estimate of 90% impermeability. The total impermeable area for Planning Application 1 has been calculated to be 14.75ha as shown below in **Table 3.1**.

**Table 3.1: Catchment Areas**

Catchment	Catchment Area (ha)	Percentage Impermeable (%)	Impermeable Area (ha)
HA1	6.88	70	4.82
HA2	5.27	70	3.69
HA3	3.31	70	2.31
LC1	1.05	90	0.95
LC2	1.09	90	0.98
Access Road Phase 1	0.74	90	0.66
Access Road Phase 2	0.93	90	0.84
Brumby Common Ln	0.50	100	0.50
<b>Total</b>	<b>24.2</b>	<b>-</b>	<b>14.75</b>

3.2 Due to the hybrid nature of the application, the access road and western drainage infrastructure has been designed to a greater level of detail than the residential parcels.

3.3 Parcels BG4, HA6, AB3 and HA7 in the south of the Site are being utilised as borrow pits for ground surcharging in the north of the Site for this Phase of the Proposed Development. Hence there are no drainage proposals in this part of the Site.

#### Drainage Hierarchy

3.4 The Planning Policy Guidance<sup>8</sup> and the SuDS Manual<sup>9</sup> identify that surface water runoff from a development should be disposed of as high up the following hierarchy as reasonably practicable:

- i. into the ground (infiltration);
- ii. to a surface water body;
- iii. to a surface water sewer, highway drain, or another drainage system; and

<sup>8</sup> Planning Practice Guidance. <http://planningguidance.planningportal.gov.uk/>.  
<sup>9</sup> The SuDS Manual (C753). CIRIA 2015.

- iv. to a combined sewer.
- 3.5 The aim of this approach is to manage surface water runoff close to where it falls and mimic natural drainage as closely as possible.
- 3.6 Due to the high groundwater levels, disposal of surface water via infiltration is not feasible in this instance.
- 3.7 As there are existing ditches and watercourses within the Site, it is proposed to discharge surface water to these watercourses following the development. This is in keeping with the existing conditions of the Site.

**Peak Flow Control**

- 3.8 In order to comply with the Non-Statutory Technical Standards for Sustainable Drainage Systems S2-S3<sup>10</sup>, runoff from greenfield developments should not exceed the equivalent greenfield rates for the 1 and 100-year return period events.
- 3.9 The Site is proposed to discharge surface water at a rate of 1.4l/s/ha as required by the IDB and stated in the Lincolnshire Lakes Area Action Plan.
- 3.10 All rainfall events will be restricted to this rate up to the 1 in 100-year plus climate change event. This is summarised within **Table 3.2**.

**Table 3.2: Existing & Proposed Runoff Rates per Hectare**

Return Period (Yr.)	Existing Runoff Rate (l/s/ha)	Proposed Discharge Rate (l/s/ha)
1	1.3	1.4
QBAR	1.5	
30	3.1	
100	4.0	
100 + 40%	-	

- 3.11 This approach fulfils the necessary peak runoff control criteria.
- 3.12 The above table demonstrates there would be no adverse impact on the flows to the receiving watercourse and provides a 65% betterment to the 1 in 100 year event runoff rate.

<sup>10</sup> 2015, DEFRA. Non-statutory technical standards for sustainable drainage systems

## Attenuated Storage

- 3.13 As the Proposed Development requires a restricted runoff rate, it will be necessary to provide attenuated storage to balance the excess volume in a safe manner within the Site.
- 3.14 The surface water storage should be located within the Site in a position where it can receive runoff from the Proposed Development and discharge from the Site by gravity and is also in a position where it is hydraulically isolated from any fluvial floodplain or external surface water floodplain / overland flow route that may be present in the Site.
- 3.15 Sufficient storage for events up to the 1 in 100-year storm with a 40% allowance for climate change should be provided, and a 10% allowance should be applied to the current proposed residential development area to allow for urban creep over the lifetime of the Proposed Development.
- 3.16 The necessary surface water storage volume is found within a combination of attenuation features throughout the Site. A large area of Blue / Green Infrastructure is proposed in the west of the Site which will be integrated into the public open space. Further attenuation will also be provided in swales situated throughout the development parcels. The Proposed Development has been split into multiple catchments based on existing topography and the development parcels splits.
- 3.17 Each parcel shown on the Outline Drainage Strategy in **Appendix 6** collects and attenuates in local swales which then discharge into the roadside proposed watercourse. From here it is then conveyed to the outfall at the IDB ditch (Earl Beauchamps Warping Drain) adjacent to parcel HA1. The flow into this IDB ditch will be limited at 16.8l/s via a flow control chamber. Excess flows will discharge over a weir in the flow control chamber back into the roadside watercourse which will then convey the flows north to the second outfall into the IDB ditches, which will discharge at 2.5l/s. The Blue / green Infrastructure area in the west contains attenuation basins which are situated in between the parcels and outfall point which provide additional attenuation storage allowing excess flows to discharge at 2.5l/s. Parcel LC 1 is an exception as it does not discharge into the roadside proposed watercourse and instead is discharged into the Blue / Green infrastructure parcel BG1 where it is attenuated and discharged into an IDB drain at a limited rated of 1.3l/s. This is the third outfall.
- 3.18 A simulation has been run using Micro Drainage 'Quick Storage Estimate' to identify the necessary storage provision for each parcel. Using the discharge rates outlined below and applying the proposed impermeable area, the volume of attenuated storage required for the Proposed Development has been calculated for storm events up to the 100 year + 40% storm. The results are summarised in **Table 3.3** and calculations are included as **Appendix 7**.

**Table 3.3: Catchment Area Details**

Catchments	Impermeable Area (Ha)	Proposed Discharge Run-Off Rate (ls/s)	Lower Range Attenuation (m <sup>3</sup> )	Upper Range Attenuation (m <sup>3</sup> )
HA1	4.82	6.7	3,877	5,119
HA2	3.69	5.2	2,969	3,921
HA3	2.31	3.2	1,863	2,460
LC1	0.95	1.3	762	1,007
LC2	0.98	1.4	792	1,045
Access Road Phase 1	0.66	0.9	534	705
Access Road Phase 2	0.84	1.2	677	894
Brumby Common Ln	0.50	0.7	403	532
<b>Total</b>	<b>14.75</b>	<b>20.7</b>	<b>11,876</b>	<b>15,682</b>

3.19 A MicroDrainage 'Network' model was prepared to simulate the proposed drainage system. Results are included as **Appendix 8** and show no flooding in the system up to the 1 in 100 year + 40% event.

### Runoff Volume Control

3.20 The Non-Statutory Technical Standards for Sustainable Drainage Systems S4-S6<sup>11</sup> states that where reasonably practical the runoff volume from a development for the 1 in 100-year 6 hour rainfall event should not exceed the runoff volume prior to development or redevelopment. Additionally, if practicable on previously developed sites, the runoff volume should not exceed the equivalent greenfield runoff volume. Where it is not reasonably practicable to constrain the volume of runoff from a development at or below the existing volume, then the runoff must be discharged in a manner that does not adversely affect flood risk, i.e.:

- i. The additional runoff volume resulting from the development (the 'long term storage volume') should be discharged separately from the site at a rate of 2L/s/ha or less; or,
- ii. All the runoff volume from the development should be discharged at a rate equivalent to the mean annual flow rate (QBAR) rate under greenfield conditions or less; or,

<sup>11</sup> 2015, DEFRA. Non-statutory technical standards for sustainable drainage systems

iii. All the runoff volume from the development should be discharged at a rate of 2L/s/ha or less.

3.21 The 1 in 100-year 6-hour storm runoff volume from the Site will increase because of the Proposed Development and the increase in impermeable area. However, as the runoff from the Proposed Development will be discharged at less than QBAR, the volume control criteria will be met.

### **Sustainable Drainage Systems**

3.22 A surface and foul water layout for the Proposed Development is shown on BWB Dwg No. **LIN-BWB-CIV-XX-D-C-0500**, which is included as **Appendix 6**.

3.23 Surface water runoff from all the parcels will be locally captured via swales and conveyed to the new roadside watercourse. From here they will either be discharged directly to the IDB ditches via a flow control chamber and downstream defender or be further stored in above ground attenuation basins within the Blue / Green Infrastructure area.

3.24 The interception volume (defined as the first 5mm of most rainfall events) will be contained within the storage provided to prevent contamination from high pollutant concentrations. This will be achieved via residual infiltration and / or evapotranspiration from the swales and basins. Further SuDS features such as permeable paving in shared parking areas, water butts and rain gardens should be considered at detailed design stage.

### **Water Quality Assessment**

3.25 The impact on the receiving watercourses will be mitigated by discharging the surface water flow through the SuDS management train within the site which is primarily made up of enhanced detention basins, swales and downstream defenders.

3.26 The Simple Index Approach (SIA) is used to determine pollution hazard indices based on land use to determine the SuDS features needed. The pollutants and the associated hazards within the site are shown in **Table 3.4**.

**Table 3.4: Pollution Hazard Indices**

Land Use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential Roofs	Very low	0.2	0.2	0.05
Individual property driveways, residential car parks, low traffic roads	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways	Medium	0.7	0.6	0.7

3.27 The SuDS Mitigation Index based upon the predominate proposed SuDS features for the site is shown in **Table 3.5**.

**Table 3.5: Total SuDS Mitigation Indices**

Land Use	Total suspended solids (TSS)	Metals	Hydrocarbons
Swale	0.5	0.6	0.6
Attenuation Basin	0.5	0.5	0.6
Downstream Defender	0.5	0.4	0.5

3.28 The pollution hazard rating and proposed SuDS Mitigation Index for the Site is compared within **Table 3.6**. Where more than one SuDS component is proposed, a factor of 0.5 has been applied to the downstream (i.e., secondary and / or tertiary) treatment stages to account for the reduced performance due to reduced inflow concentrations.

**Table 3.6: Comparison of Pollution Hazard Rating against Proposed Mitigation Index**

Pollution Type	Pollution Hazard Rating	Proposed Mitigation Index	Sufficient Treatment Provided?
<i>Route 1 - Swale, Attenuation Basin, and Downstream Defender</i>			
TSS	0.7	0.75	✓
Metals	0.6	0.85	✓
Hydrocarbons	0.7	0.9	✓
<i>Route 2 – Local Swale, Roadside Swale, and Downstream Defender</i>			
TSS	0.5	0.75	✓
Metals	0.4	0.9	✓
Hydrocarbons	0.4	0.9	✓

### Residual Risk and Designing for Exceedance

- 3.29 To protect against extreme events in exceedance of the drainage infrastructure, the external levels of the Proposed Development should be profiled to direct water away from vulnerable infrastructure and towards the nearest drainage point.
- 3.30 In addition to the volume of storage provided within the main attenuation, there will be capacity within the upstream drainage systems features which has not been accounted for at this stage and a further level of redundancy to the network will therefore be provided
- 3.31 The detention basins will be designed to have a minimum 300mm freeboard in the 100-year plus 40% climate change event to cater for events in exceedance of the design.

## **4. MAINTENANCE**

- 4.1 The proposed drainage system should be designed in accordance with the Design and Construction Guidance (DCG) and proposed for adoption by Severn Trent Water. If any parts of the drainage network remain unadopted, or until the point that they are, an appropriate maintenance company should be appointed. Any drainage features within private curtilage will be the homeowner's responsibility.
- 4.2 Requirements for the ongoing maintenance of the drainage network should form part of the Operation and Maintenance manual for the Site. Any specialist or proprietary products that are specified at detailed design should have a manufacturer specific maintenance regime which should be included within the document.
- 4.3 It is envisaged that the Operation and Maintenance manual will be developed at the construction design stage once manufacturer specific products are known, but some examples are included below.
- iv. All drainage features should be in open areas which are readily accessible;
  - v. Gullies should be inspected and de-silted at least once a year, where necessary;
  - vi. Pipes, manholes and silt traps should be inspected and de-silted at least once a year, where necessary;
  - vii. The surface water detention basins will be predominantly dry, and the base will be seeded with a wildflower grass seed mix that can tolerate wet ground conditions;
  - viii. Regular inspections of the detention basins should be undertaken to remove litter / debris, invasive / colonising vegetation and silt build up, as necessary;
  - ix. Inlet and outlet structures to be regularly inspected, with remedial work as required to maintain water flows and prevent silt / vegetation build up;
  - x. Vegetation / grass with the detention basins should be maintained appropriately to allow establishment and promote habitat formation, without impeding the operation of the inlet and outlet structure; and
  - xi. Flow controls should be inspected every 6 months, litter / debris and silt build up should be removed, as necessary.

## **5. FOUL WATER DRAINAGE**

- 5.1 As the existing Site is currently undeveloped and there are no positive foul drainage connections within the Site, a new foul connection must be sought.
- 5.2 Severn Trent Water are the sewerage undertaker for the area. A copy of their asset records is included as **Appendix 4**.
- 5.3 A developer enquiry was submitted to Severn Trent Water in order to determine the capacity of the receiving sewer and the most appropriate point of connection. Their response is included as **Appendix 9**, and states that network improvements are required to enable the increase flow demand from future developments.
- 5.4 Foul Water will be pumped via a rising main approximately 2.6km south east to connect onto the existing sewer network in Burringham Road following a sewer requisition. This will be delivered as part of the full planning application and hence will be included within one of the initial construction stages.
- 5.5 The location of the pumping station and the route of the rising main are shown on the Drainage Strategy included as **Appendix 6**. A plan showing the arrangement of the pumping station compound is included within **Appendix 10**.
- 5.6 The pumping station will require a 15m cordon sanitaire between the wet well and the nearest habitable dwelling and must be accessible from an adopted highway.

## 6. SUMMARY

- 6.1 This statement and supporting appendices demonstrate that the drainage design for the Proposed Development will comply with the relevant local and national standards, specifically the hierarchy of discharge, runoff rate and volume criterion.
- 6.2 This SDS is intended to support a hybrid planning application and as such the level of detail included is commensurate and subject to the nature of the proposals.

**Table 6.1: Sustainable Drainage Statement Summary**

		Existing Site	Proposed Development
<b>Site Area (Ha)</b>		56.51	
<b>Impermeable Area (Ha)</b>		0	14.75
<b>Outfall Location</b>		Watercourse	Watercourse
<b>Peak Runoff Rate (l/s/ha)</b>	<b>QBAR</b>	1.54	1.4
	<b>1 in 30-Year</b>	1.28	
	<b>1 in 100-Year</b>	3.07	
	<b>1 in 100-Year + CC</b>	-	
<b>Runoff Volume (100yr RP 6 hour Storm)</b>		8,139m <sup>3</sup>	N/A
<b>Volume Control</b>		-	Discharge rate limited to below QBAR
<b>Proposed Storage Volume</b>		-	11,876m <sup>3</sup> – 15,682m <sup>3</sup>
<b>Flow Control Type</b>		-	Vortex
<b>SuDS Features</b>		-	Swales Attenuation Basins Downstream Defender
<b>Maintenance Responsibility</b>		-	Severn Trent Water

- 6.3 It is envisaged that the final drainage strategy will be determined during the detailed design stage, as the Proposed Development layout is finalised.

**APPENDICES**

**Appendix 1: Illustrative Masterplan and Phasing Plans**

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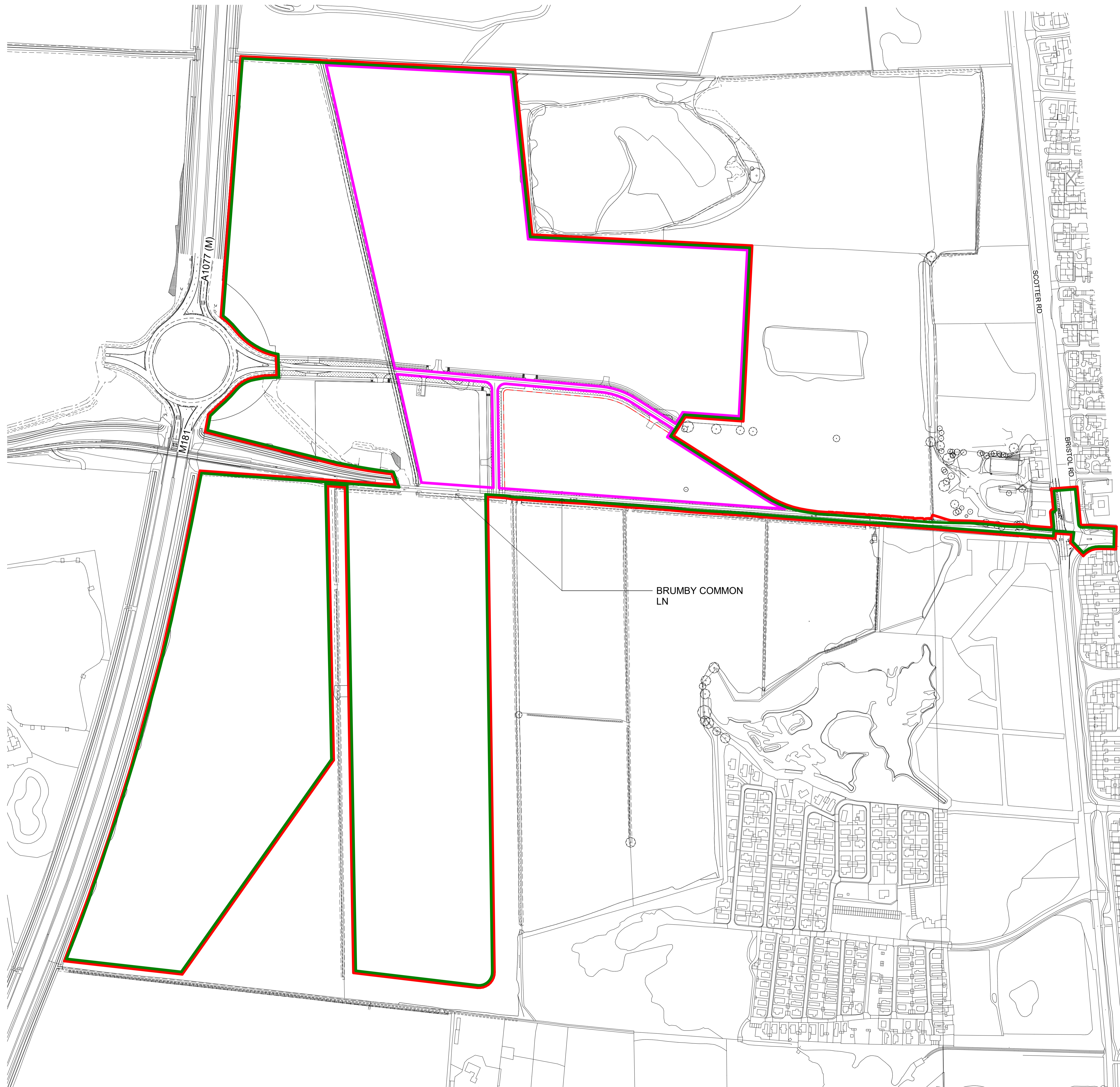
Project: LINCOLNSHIRE LAKES

Client: **Hargreaves Land**

Drawing Title: LINCOLNSHIRE LAKES PA01 - ILLUSTRATIVE MASTERPLAN

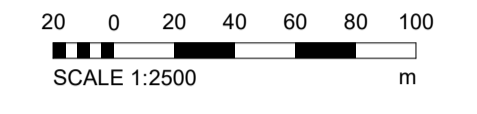
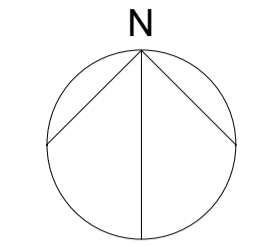
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- KEY**
- PA#1 RED LINE BOUNDARY
  - FULL PLANNING BOUNDARY
  - OUTLINE PLANNING AREA

**PA1 GROSS AREA**

Name	Acres	Hectares
PA1	139.65 acres	56.51 hectare

**FULL PLANNING AREA**

Name	Acres	Hectares
PA1	139.65 acres	56.51 hectare

**OUTLINE PLANNING GROSS AREA**

Name	Acres	Hectares
OUTLINE PLANNING	48.91 acres	19.79 hectare

P6	UPDATES TO RLB	19.12.24	TD	CG
P5	INDIVIDUAL PLOT BOUNDARIES REMOVED, AREAS TABLE UPDATED	12.12.24	HE	CG
P4	UPDATED RED LINE BOUNDARY	11.12.24	HE	CG
P3	PHASING AND OUTLINE PLANNING BOUNDARIES UPDATED	10.12.24	HE	CG
P2	RED LINE BOUNDARY UPDATED ON SCOTTER ROAD	09.12.24	HE	CG
P1	FIRST ISSUE	03.12.24	TD	CG
Rev	Description	Date	Dm	Ckd

Status  
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LINCOLNSHIRE LAKES

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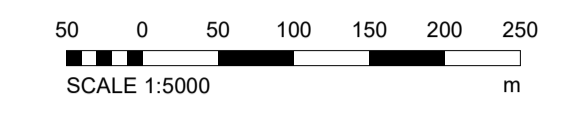
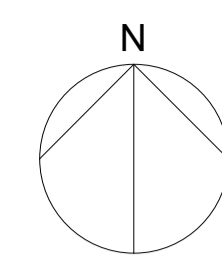


Drawing Title  
 LINCOLNSHIRE LAKES PA#1 FULL & OUTLINE  
 PLANNING BOUNDARIES

Proj Ref	Origin	Zone	Level	Type	Role	Num	Status	Rev
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SMR Job Ref	Sheet	Scale	Drawn					
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**KEY**  
 — RED LINE BOUNDARY  
 — OTHER LAND UNDER CLIENT OWNERSHIP



P1	FIRST ISSUE	15.01.24	TD	CG
Rev	Description	Date	Dm	Ckd

Status

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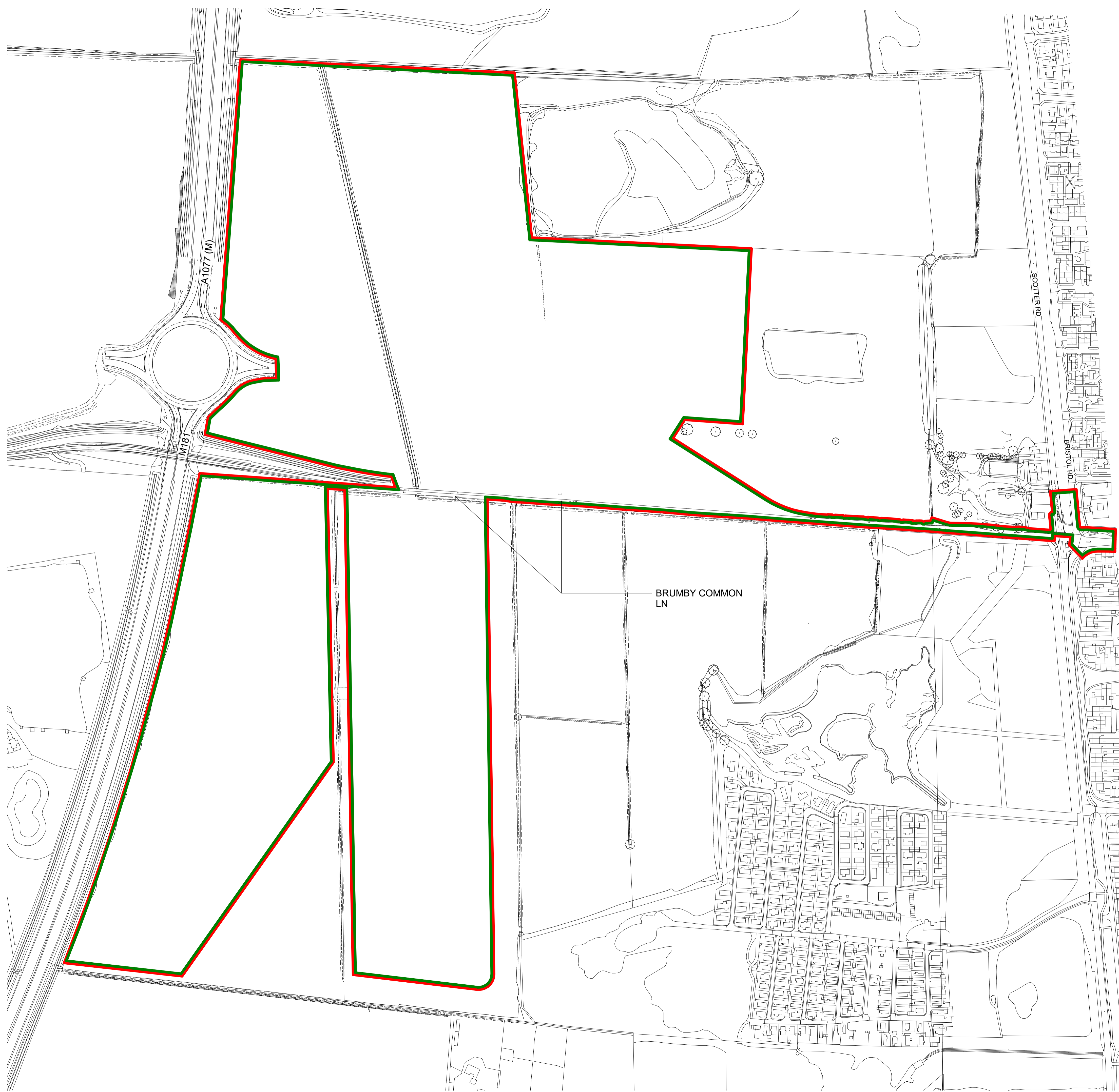
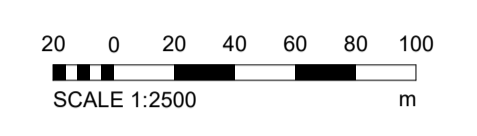
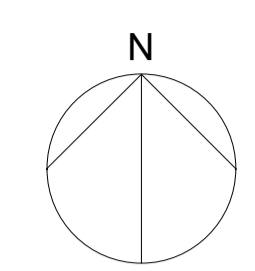
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**KEY**  
 PA#1 RED LINE BOUNDARY  
 FULL PLANNING BOUNDARY

**PA1 GROSS AREA**

Name	Acres	Hectares
PA1	139.65 acres	56.51 hectare

**FULL PLANNING AREA**

Name	Acres	Hectares
PA1	139.65 acres	56.51 hectare

Rev	Description	Date	Dm	TD	CG
P1	FIRST ISSUE	15.01.24			

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Client

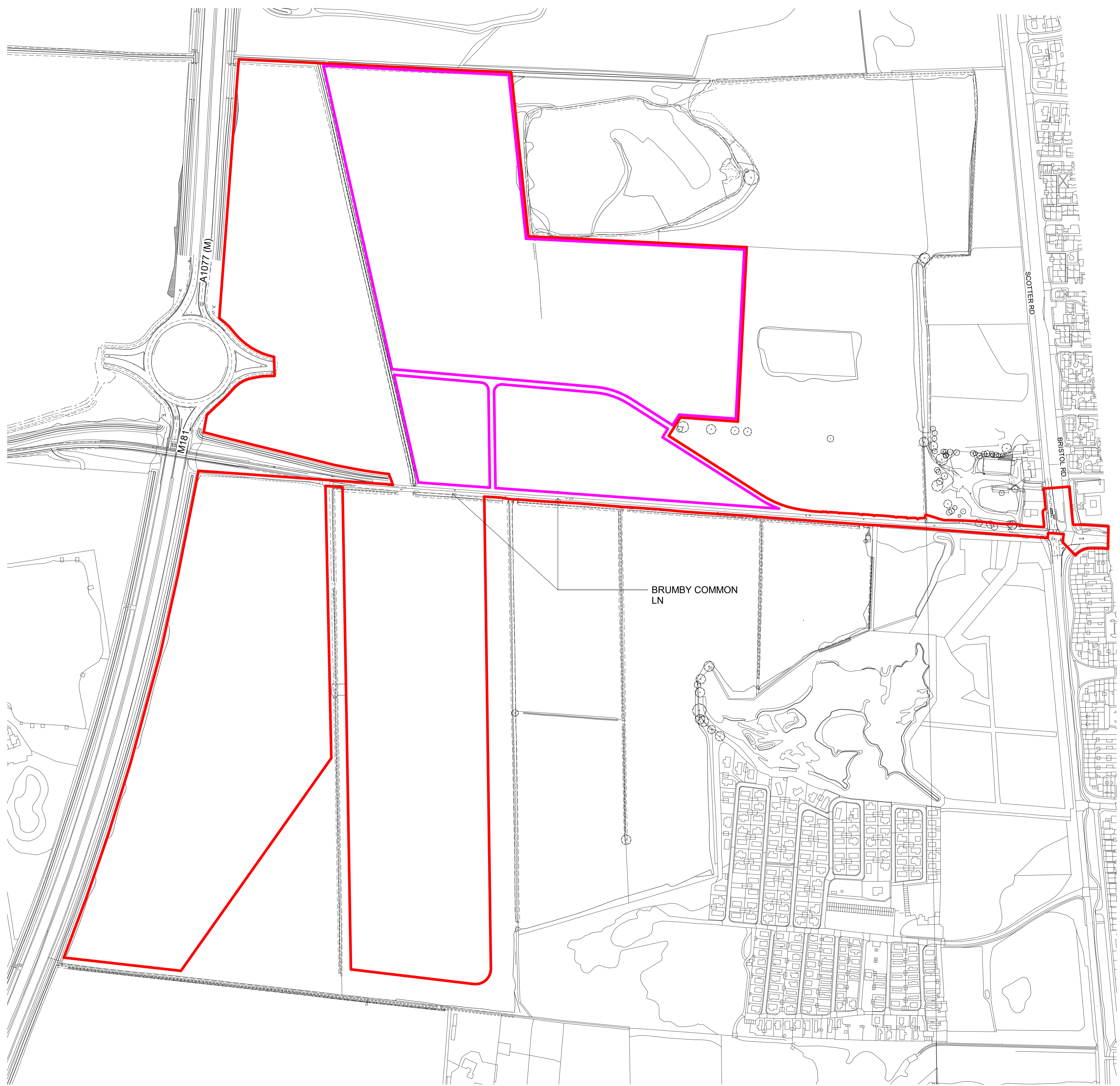
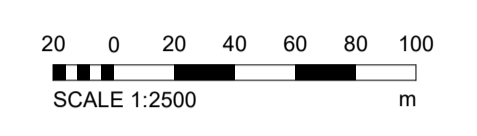
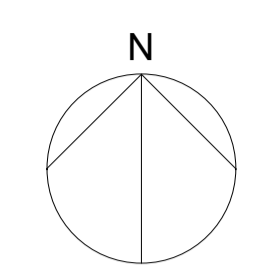
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SMR Job Ref	Sheet	Scale	Drawn
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- KEY**
- PA#1 RED LINE BOUNDARY
  - OUTLINE PLANNING AREA

**PA1 GROSS AREA**

Name	Acres	Hectares
PA1	139.65 acres	56.51 hectare

**OUTLINE PLANNING GROSS AREA**

Name	Acres	Hectares
OUTLINE PLANNING	48.91 acres	19.79 hectare

Rev	Description	Date	Dm	CG
P1	FIRST ISSUE	15.01.24	TD	CG

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Drawing Title  
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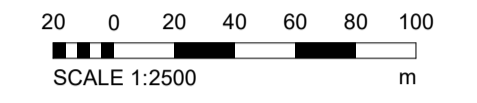
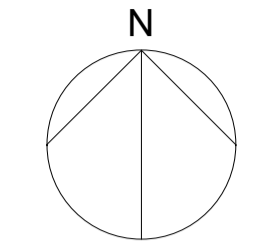
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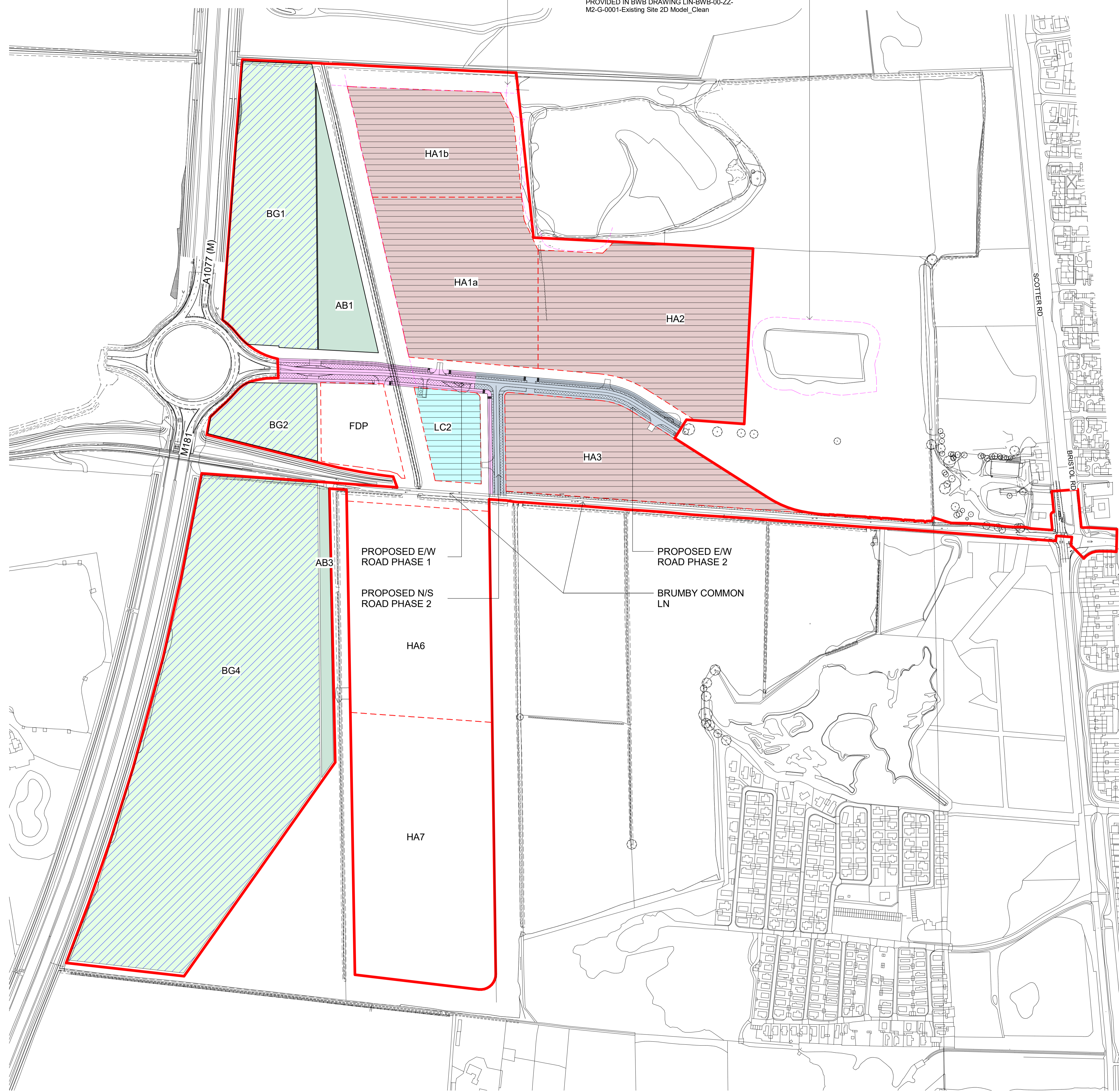
MAGENTA DASHED LINE 15m OFFSET FROM OVERHEAD TREE CANOPY EXTENT AS PROVIDED IN BWB DRAWING LIN-BWB-00-ZZ-M2-G-0001-Existing Site 2D Model\_Clean

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--- 15m OFFSET FROM CANOPY LINE  
 --- 22m OFFSET FROM TOP OF DITCH LINE



- KEY**
- PA#1 RED LINE BOUNDARY
  - HOUSING ALLOCATION
  - BLUE/GREEN INFRASTRUCTURE
  - ADDITIONAL BLUE/GREEN INFRASTRUCTURE
  - LOCAL CENTRE
  - PHASE 1 PEDESTRIANS/CYCLE ROAD
  - PHASE 2 PEDESTRIANS/CYCLE ROAD

**PA1 GROSS AREA**

Name	Acres	Hectares
PA1	139.65 acres	56.51 hectare

**PHASING ALLOCATION NETT AREAS - PA #1**

Name	Acres	Hectares
AB1	3.41 acres	1.38 hectare
AB3	1.26 acres	0.51 hectare
BG1	9.52 acres	3.85 hectare
BG2	2.32 acres	0.94 hectare
BG4	32.01 acres	12.95 hectare
FDP	2.57 acres	1.04 hectare
HA1a	10.00 acres	4.05 hectare
HA1b	7.00 acres	2.83 hectare
HA2	13.02 acres	5.27 hectare
HA3	8.17 acres	3.31 hectare
HA6	12.58 acres	5.09 hectare
HA7	15.71 acres	6.36 hectare
LC2	2.15 acres	0.87 hectare

P1	FIRST ISSUE	15.01.24	TD	CG
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Project

LINCOLNSHIRE LAKES

Client



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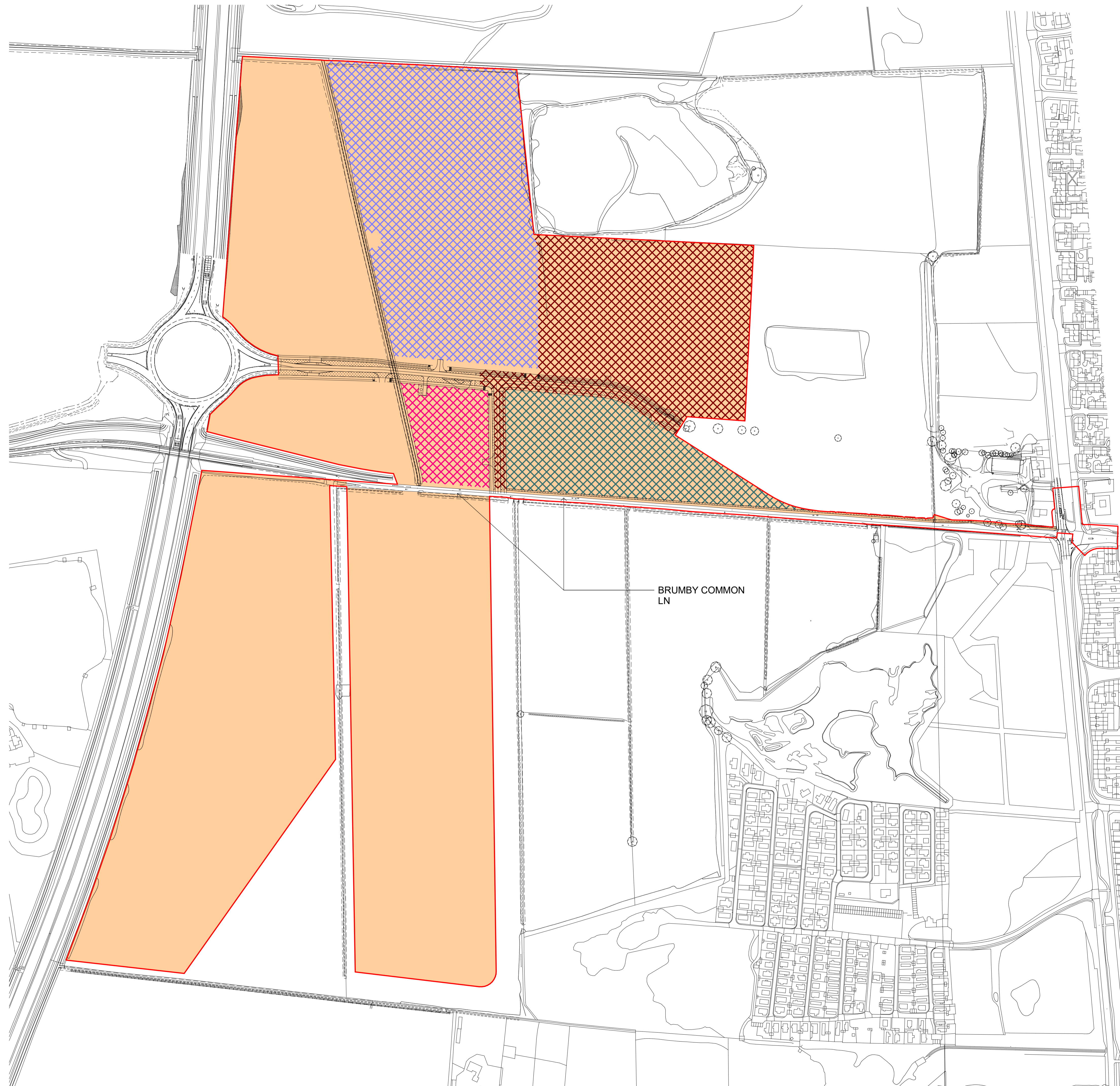
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Proj Ref Origin Zone Level Type Role Num Status Rev

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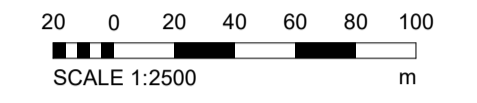
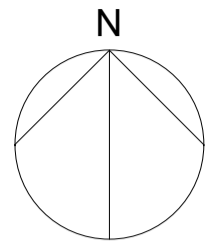
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- KEY**
- PA#1 RED LINE BOUNDARY
  - PHASE 1
  - PHASE 2
  - PHASE 3
  - PHASE 4
  - PHASE 5

Rev	Description	Date	Dm	TD	CG
P1	FIRST ISSUE	15.01.24			

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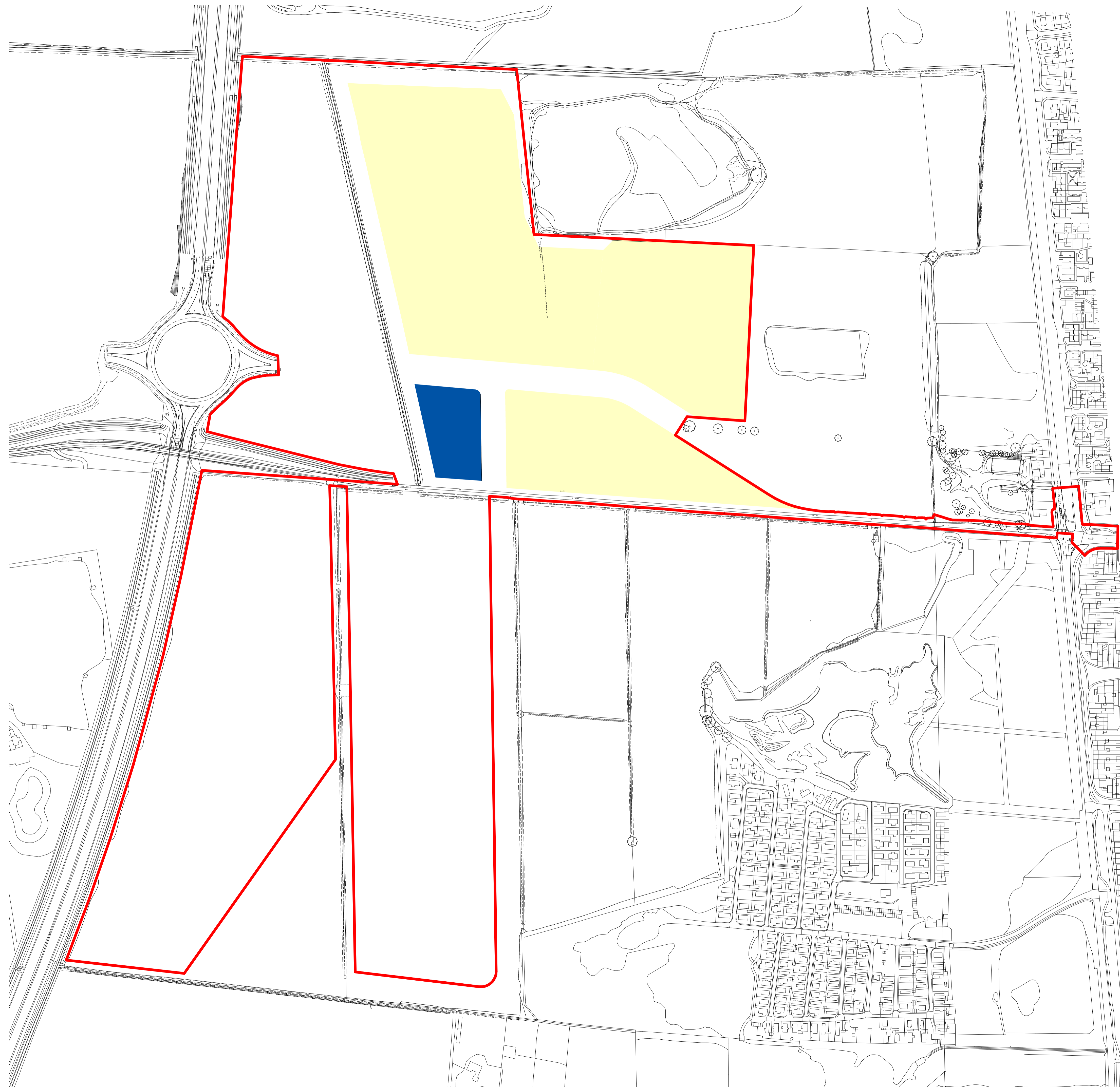
Project  
LINCOLNSHIRE LAKES

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Client  
Hargreaves Land

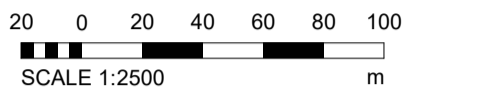
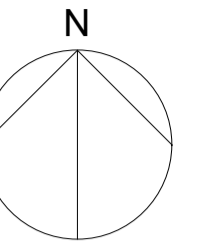
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SMR Job Ref	Sheet	Scale	Drawn					
7730-00-2020	A1	NOTED	HE					



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- KEY**
- PA#1 RED LINE BOUNDARY
  - RESIDENTIAL
  - LOCAL CENTRE

Rev	Description	Date	Dm	TD	CG
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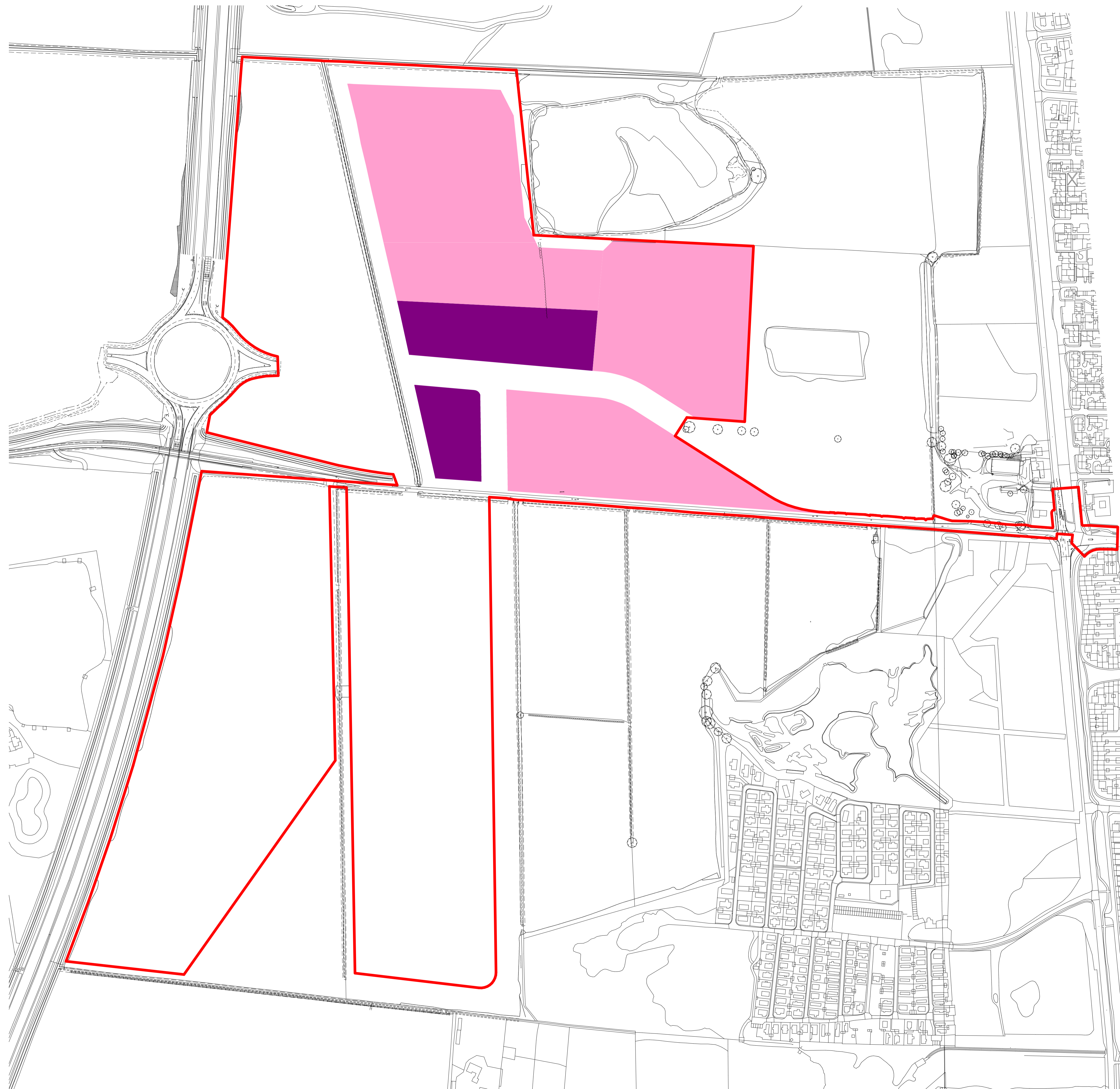
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Project  
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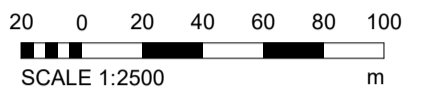
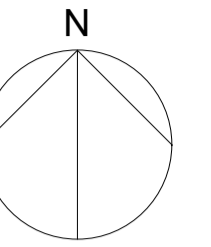
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- KEY**
- PA#1 RED LINE BOUNDARY
  - UP TO THREE STOREYS - MAX HEIGHT 15m
  - UP TO FOUR STOREYS - MAX HEIGHT 17m

Rev	Description	Date	Dm	TD	CG
P1	FIRST ISSUE	15.01.24			

Status  
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Drawing Title  
 LINCOLNSHIRE LAKES PARAMETER PLANS - BUILDING HEIGHTS

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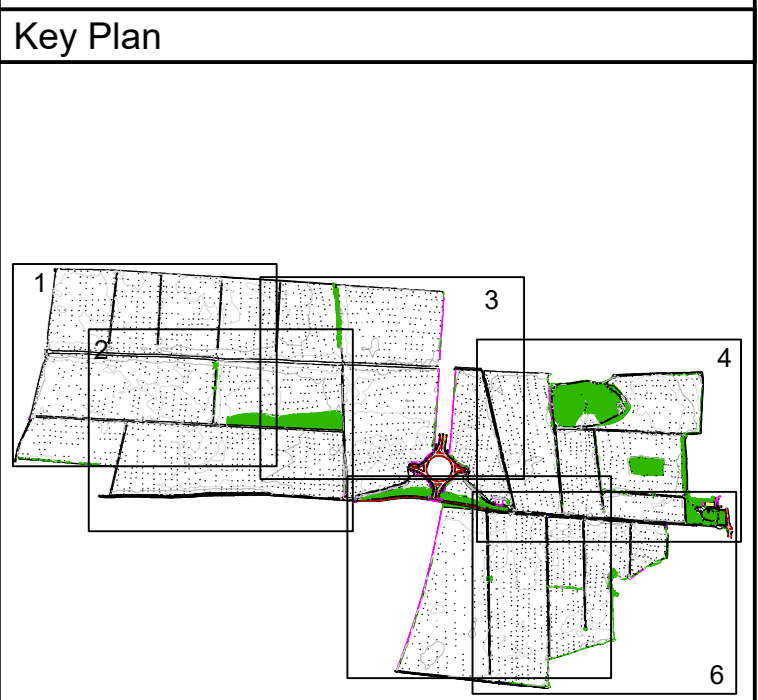
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7730-00-2022	A1	NOTED	HE

**Appendix 2: Topographical Survey**

Station Coordinates			
Station Name	Eastings (m)	Northings (m)	Height (m)
BT1	487175.553	409527.238	4.109
BT2	487177.791	409515.308	5.715
BT3	487188.029	409506.115	4.254
BWB01	48856.179	409481.027	2.679
BWB02	488576.583	409501.442	2.723
BWB03	488440.018	409511.019	2.944
BWB05	488784.891	409500.884	2.472
BWB06	488680.073	409506.250	2.281



- Notes**
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  2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
  3. All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
  4. Any discrepancies noted on site are to be reported to the engineer immediately.
  5. No scale factor has been applied to this survey, therefore the OS coordinates are to be treated as arbitrary. Please refer to survey station information below for on site control establishment.
  6. All coordinates and height data relate to OSGB36(15). Control stations are coordinated by means of GPS receiving real time corrections via OS smart net.
  7. All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space entry.
  8. OS license number: 100022432



**Legend**

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

AP	Anchor Point	FBW	Fence Barbed Wire	LB	Liter Bin
BG	Back Gully	FCB	Fence Clowed Board	LP	Lamp Post
BO	Subsid	FCL	Fence Chain Link	MM	Mantle
BS	Bus Stop	FEL	Fence Electric	MV	Service Marker
C	Crest	FMB	Fence Metal Bar	PS	Post Box
BT	British Telecom	FMP	Fence Metal Panel	PT	Post
CL	Cover Level	FOB	Fence Open Board	RE	Roading Eye
CMF	Cable Marker	FW	Fence Post & Wire	SE	Step
CCTV	Security Camera	FSP	Fence Steel Palisade	ST	Stop Tap
Channel	Drainage Channel	FVM	Fence Wire Mesh	SV	Stop Valve
DK	Drop Kerb	FFL	Finished Floor Level	TCB	Telephone Call Box
DP	Down Pipe	FP	Flagpole	TL	Threshold Level
EW	Electric	GV	Gas Valve	TL	Traffic Light
EP	Electricity Post	GV	Gully	TS	Traffic Signal
ER	Earth Rod	HC	Height	UFS	Unstable to Survey
FL	Floodlight	IFL	Internal Floor Level	WL	Water Level
		IL	Level Level	WM	Water Meter
		IS	(as a reduced level)	WO	Wash Out

P2	23.10.24	Watercourse Details Added	DS	SS
P1	10.07.23	Provisional Issue	BC	SS
Rev	Date	Details of Issue / Revision	Drawn	Revised

**Issues & Revisions**

Birmingham | 0121 233 3322  
 Leeds | 0113 233 8000  
 London | 020 7407 3879  
 Manchester | 0161 233 4280  
 Nottingham | 0115 924 1100  
 www.bwbconsulting.com

**Client**  
**Hargreaves Services PLC**

**Project Title**  
**Lincolnshire Lakes, Scunthorpe**

**Drawing Title**  
**Existing SitePlan Sheet 1 of 6**

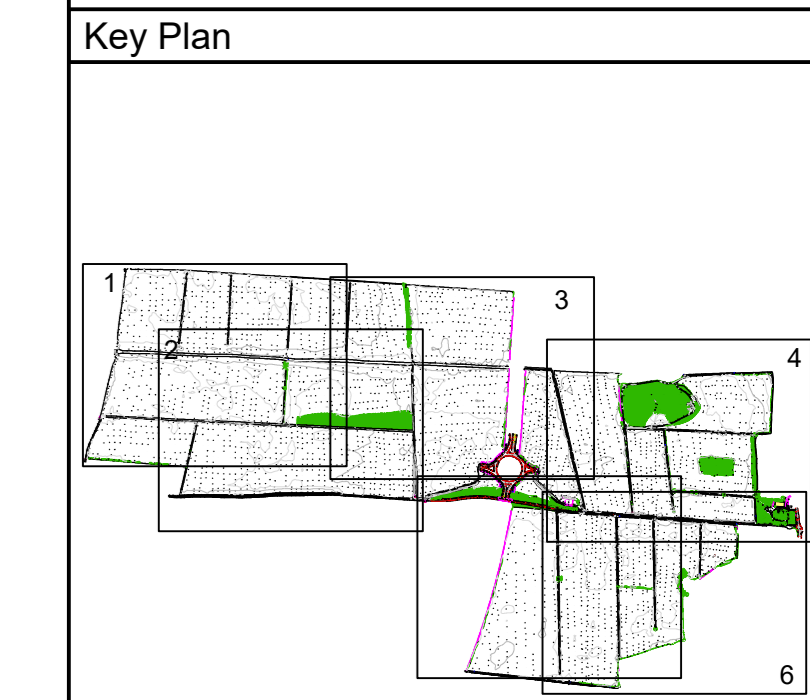
Drawn:	B. Connolly	Reviewed:	S. Shreeves
BWB Ref:	221423.00	Date:	10.07.23
Scale:	As per drawing	Scale:	1:1000

**Information**

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
LIN-BWB-00-01-DR-G-0001	S2	P2



- Notes**
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  6. All coordinates and height data relate to OSGB36(15). Control stations are coordinated by means of GPS receiving real time corrections via OS smart net.
  7. All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space entry.
  8. OS license number: 10022432



- Legend**
- |                    |   |
|--------------------|---|
| OS Buildings       | Contour Lines                             |
| Surveyed Buildings | Inspection Chamber                        |
| Building           | Flow direction and pipe diameter          |
| Wall               | Station and Name                          |
| Kerb Channel Line  | BH 1                                      |
| Top of Kerb        | Monitoring Borehole                       |
| Edge of Surface    | Tree / Bush / Sapling                     |
| Bottom of Bank     | Area of Vegetation/ Extent of Tree Canopy |
| Canopy / Overhang  | Hedge                                     |
| Line Marking       | Body of Water                             |
| Centre Line        | Body of Water from OS                     |
| Watercourse        | Spot Level                                |
| Centre Line        | Assumed Surface                           |
| Barrier            | Water Drainage Line                       |
| Fence              | Surface Water Drainage Line               |
| 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 Subsid            | FCL Fence Chain Link     | MM Manhole             |
| BS Bus Stop          | FEL Fence Electric       | MV Service Marker      |
| BT British Telecom   | FMP Fence Metal Panel    | PS Post Box            |
| C Crest              | FMB Fence Metal Railing  | PF Post                |
| CL Cover Level       | FOB Fence Open Board     | RE Rodding Eye         |
| CMF Cable Marker     | FWF Fence Post & Wire    | SE Stop Sign           |
| Post                 | FSP Fence Steel Palisade | ST Stop Tap            |
| CCTV/Security Camera | FVM Fence Wire Mesh      | SV Stop Valve          |
| CTV Cable TV         | FFL Finished Floor Level | TCB Telephone Call Box |
| Drainage Channel     | FFP Flagpole             | TL Threshold Level     |
| DK Drop Kerb         | GV Gas Valve             | TL Traffic Light       |
| DP Down Pipe         | GY Gully                 | TP Telegraph Post      |
| EW Electric          | HT Height                | TS Traffic Signal      |
| EP Electricity Post  | IC Inspection Chamber    | UTS Unstable to Survey |
| ER Earth Rod         | IFL Internal Floor Level | WL Water Level         |
| FI Fire Hydrant      | IL Invert Level          | WM Water Meter         |
| FL Floodlight        | IL (as a reduced level)  | WO Wash Out            |

P2	23.10.24	Watercourse Details Added	DS	SS
P1	10.07.23	Provisional Issue	BC	SS
Rev	Date	Details of Issue / Revision	Dwn	Rev

**Issues & Revisions**

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**Client**  
**Hargreaves Services PLC**

**Project Title**  
**Lincolnshire Lakes, Scunthorpe**

**Drawing Title**  
**Existing SitePlan**  
**Sheet 2 of 6**

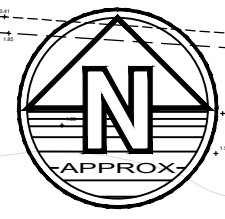
Drawn:	B. Connolly	Reviewed:	S. Shrooves
BWB Ref:	221423.00	Date:	10.07.23
Scale:	As shown	Scale:	1:1000

**Information**

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
LIN-BWB-00-02-DR-G-0001	S2	P2

**Station Coordinates**

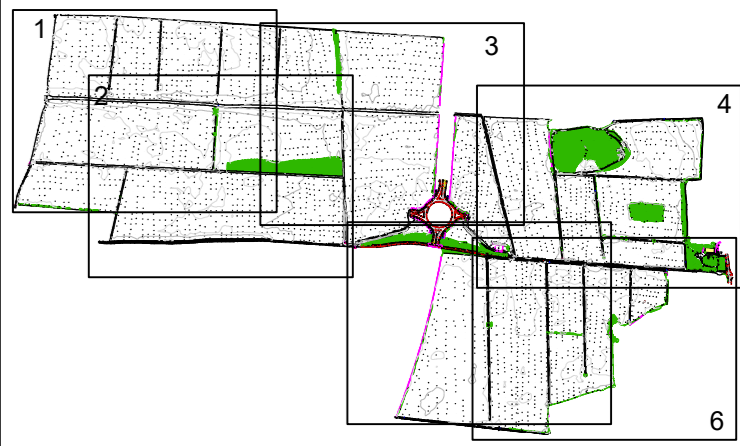
Station Name	Eastings (m)	Northings (m)	Height (m)
BT1	487175.583	492627.238	4.189
BT2	487177.791	492615.386	5.715
BT3	487188.029	492626.115	4.254
BWB01	486956.179	492481.027	2.679
BWB02	486976.583	492501.442	2.723
BWB03	486449.018	492511.019	2.344
BWB05	485784.031	492680.844	2.472
BWB06	486860.073	492626.250	2.281



Station Coordinates			
Station Name	Eastings (m)	Northings (m)	Height (m)
BT1	487175.553	409627.238	4.109
BT2	487177.791	409615.306	5.715
BT3	487188.029	409606.115	4.254
BWB01	486856.179	409681.027	2.679
BWB02	486876.583	409691.442	2.723
BWB03	486440.018	409611.019	2.944
BWB05	486784.831	409660.844	2.472
BWB06	486860.073	409666.250	2.281

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  - All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space entry.
  - OS license number: 100022432

**Key Plan**



**Legend**

- |                    |   |
|--------------------|---|
| OS Buildings       | Contour Lines                             |
| Surveyed Buildings | Inspection Chamber                        |
| Building           | Flow direction and pipe diameter          |
| Wall               | Station and Name                          |
| Kerb Channel Line  | BH 1                                      |
| Top of Kerb        | Monitoring Borehole                       |
| Edge of Surface    | Tree / Bush / Sapling                     |
| Top of Bank        | Area of Vegetation/ Extent of Tree Canopy |
| Bottom of Bank     | Hedge                                     |
| Canopy / Overhang  | Body of Water                             |
| Line Marking       | Body of Water from OS                     |
| Centre Line        | Spot Level                                |
| Watercourse        | Assumed Surface                           |
| Centre Line        | Water Drainage Line                       |
| Banner             | Surface Water Drainage Line               |
| 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    MV Service Marker  
 BT British Telecom    FMP Fence Metal Panel    PS Post Box  
 C Crest    FMB Fence Metal Railing    FT Foot  
 CL Cover Level    FOB Fence Open Board    RE Rodding Eye  
 CMB Cable Marker    FFW Fence Post & Wire    SP Stop Post  
 Post    FSP Fence Steel Palisade    ST Stop Tap  
 CCTV/Security Camera    FVM Fence Wire Mesh    SV Stop Valve  
 CTV Cable TV    FFL Finished Floor Level    TCB Telephone Call Box  
 DC Drainage Channel    FFP Flagpole    THL Threshold Level  
 DK Drop Kerb    GV Gas Valve    TL Traffic Light  
 DP Down Pipe    GY Gully    TY Telegraph Post  
 EWC Electric    Ht Height    TS Traffic Signal  
 EP Electricity Post    IC Inspection Chamber    UFS Unable to Survey  
 ER Earth Rod    IFL Internal Floor Level    WL Water Level  
 FH Fire Hydrant    LL Level Level    WM Water Meter  
 FL Floodlight    (as a reduced level)    WO Wash Out

P2	23.10.24	Watercourse Details Added	DS	SS
P1	10.07.23	Provisional Issue	BC	SS
Rev	Date	Details of Issue / Revision	Dwn	Rev

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**Client**  
Hargreaves Services PLC

**Project Title**  
Lincolnshire Lakes,  
Scunthorpe

**Drawing Title**  
Existing SitePlan  
Sheet 3 of 6

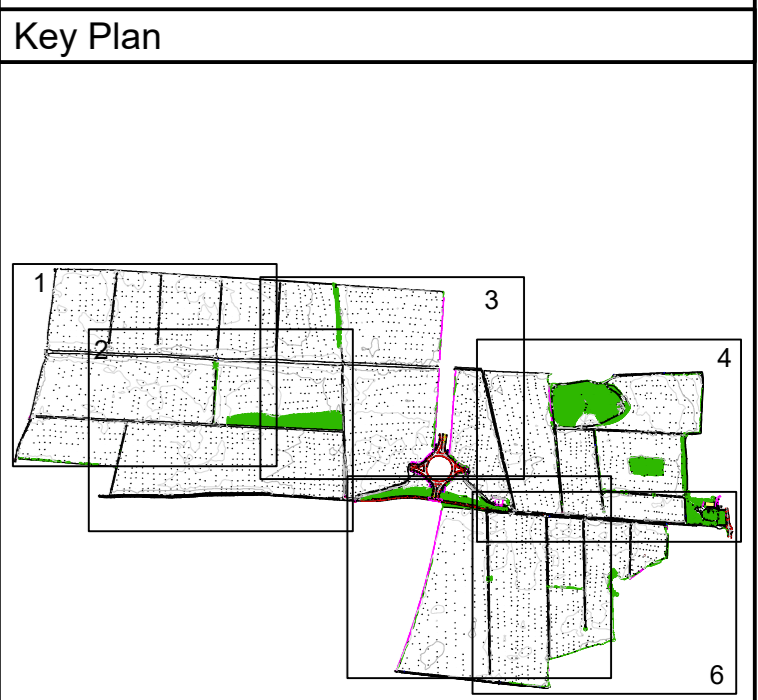
Drawn:	B. Connelly	Reviewed:	S. Shrooves
BWB Ref:	221423.00	Date:	10.07.23
Scale:	1:1000		

Information			
Project - Originator - Zone - Level - Type - Role - Number	Status	Rev	
LIN-BWB-00-03-DR-G-0001	S2	P2	

Station Coordinates			
Station Name	Eastings (m)	Northings (m)	Height (m)
BT1	487175.553	409527.238	4.109
BT2	487177.791	409515.306	5.715
BT3	487188.029	409506.115	4.254
BWB01	48856.179	409481.027	2.679
BWB02	488576.583	409501.442	2.723
BWB03	488440.018	409511.019	2.944
BWB05	488784.891	409500.884	2.472
BWB06	488680.073	409506.250	2.281



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  7. All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space entry.
  8. OS license number: 100022432



**Legend**

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

AP Anchor Point	FBW Fence Barbed Wire	LB Litter Bin
BG Back Gully	FCB Fence Clad Board	LP Lamp Post
BO Bollard	FCL Fence Chain Link	MM Manhole
BS Bus Stop	FEL Fence Electric	MV Service Marker
BT British Telecom	FMP Fence Metal Panel	PS Post Box
C Crest	FMR Fence Metal Railing	PF Post
CL Cover Level	FOB Fence Open Board	RE Roding Eye
CMP Cable Marker	FWW Fence Post & Wire	SP Stop Sign
Post	FSP Fence Steel Palisade	ST Stop Sign
CCTV/Security Camera	FVM Fence Wire Mesh	SV Stop Valve
DC Drainage Channel	FPL Finished Floor Level	TCB Telephone Call Box
DK Drop Kerb	FP Flagpole	THL Threshold Level
DP Down Pipe	GV Gas Valve	TL Traffic Light
EP Electric	GY Gully	TS Telegraph Post
ER Earth Rod	HL Height	TS Traffic Signal
FI Fire Hydrant	IC Inspection Chamber	UTS Unstable to Survey
FL Floodlight	IFL Internal Floor Level	WL Water Level
	IL Invert Level	WM Water Meter
	(as a reduced level)	WO Wash Out

P2 23.10.24	Watercourse Details Added	DS	SS
P1 10.07.23	Provisional Issue	BC	SS
Rev	Date	Details of Issue / Revision	Drawn / Rev

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**Client**  
**Hargreaves Services PLC**

**Project Title**  
**Lincolnshire Lakes, Scunthorpe**

**Drawing Title**  
**Existing SitePlan Sheet 4 of 6**

Drawn:	B. Connolly	Reviewed:	S. Shrooves
BWB Ref:	221423.00	Date:	10.07.23
Scale:	As per drawing	Scale:	1:1000

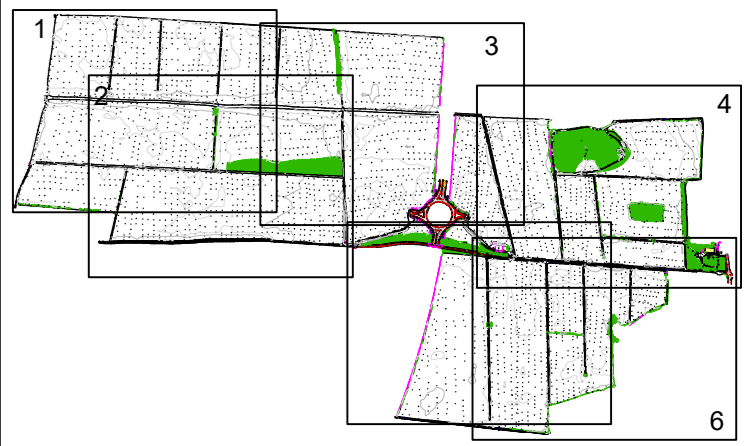
**Information**

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
LIN-BWB-00-04-DR-G-0001	S2	P2



- Notes**
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**Key Plan**



**Legend**

- |                    |   |
|--------------------|---|
| OS Buildings       | Contour Lines                             |
| Surveyed Buildings | Inspection Chamber                        |
| Building           | Flow direction and pipe diameter          |
| Wall               | Station and Name                          |
| Kerb Channel Line  | Monitoring Borehole                       |
| Top of Kerb        | Tree / Bush / Sapling                     |
| Edge of Surface    | Area of Vegetation/ Extent of Tree Canopy |
| Bottom of Bank     | Hedge                                     |
| Canopy / Overhang  | Body of Water                             |
| Line Marking       | Spot Level                                |
| Centre Line        | Assumed Surface Water Drainage Line       |
| Watercourse        | Surface Water Drainage Line               |
| Centre Line        |   |
| Barrier            |   |
| Fence              |   |
| Gate               |   |
| Overhead Powerline |   |
| Overhead Utilities |   |
- 
- |                      |                          |                                     |
|----------------------|--------------------------|-------------------------------------|
| AP Anchor Point      | FBW Fence Barbed Wire    | LB Litter Bin                       |
| BG Back Gully        | FCB Fence Crawled Board  | LP Lamp Post                        |
| BO Bollard           | FCL Fence Chain Link     | MM Manhole                          |
| BS Bus Stop          | FEL Fence Electric       | MV Service Marker                   |
| BT British Telecom   | FMP Fence Metal Panel    | PS Post Box                         |
| C Crest              | FMB Fence Metal Bar      | PF Post                             |
| CL Cover Level       | FOB Fence Open Board     | RE Rodding Eye                      |
| CMF Cable Marker     | FBW Fence Post & Wire    | SE Stop Sign                        |
| Post                 | FSP Fence Steel Palisade | ST Stop Tap                         |
| CCTV/Security Camera | FVM Fence Wire Mesh      | SV Stop Valve                       |
| Cable TV             | FFL Finished Floor Level | TCB Telephone Call Box              |
| DC Drainage Channel  | FP Flagpole              | THL Threshold Level                 |
| DK Drop Kerb         | GV Gas Valve             | TL Traffic Light                    |
| DP Down Pipe         | GY Gully                 | TP Telegraph Post                   |
| EW Electric          | HT Height                | TS Traffic Signal                   |
| EP Electricity Post  | IC Inspection Chamber    | UFS Unstable to Survey              |
| ER Earth Rod         | IFL Internal Floor Level | WL Water Level                      |
| FH Fire Hydrant      | IL Level Level           | WM Water Meter (as a reduced level) |
| FL Floodlight        |                          | WO Wash Out                         |

Station Coordinates			
Station Name	Eastings (m)	Northings (m)	Height (m)
BT1	487175.563	492627.238	4.109
BT2	487177.791	492615.366	5.715
BT3	487188.029	492626.115	4.254
BWB01	486956.179	492481.027	2.679
BWB02	486976.583	492501.442	2.723
BWB03	486449.018	492511.019	2.344
BWB05	485784.031	492680.844	2.472
BWB06	486860.073	492656.250	2.281

P2	23.10.24	Watercourse Details Added	DS	SS
P1	10.07.23	Provisional Issue	BC	SS
Rev	Date	Details of Issue / Revision	Drawn	Reviewed

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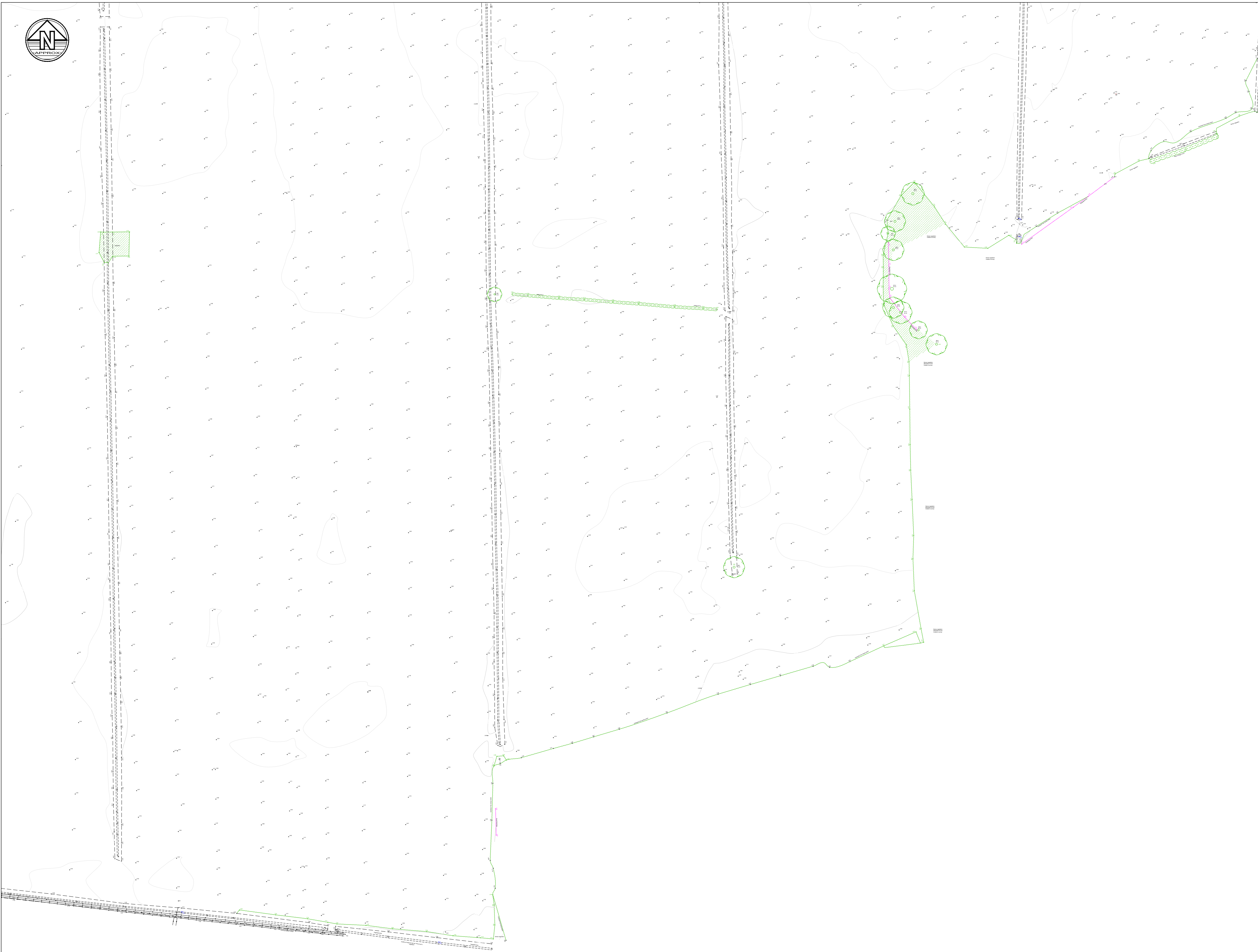
Client  
**Hargreaves Services PLC**

Project Title  
**Lincolnshire Lakes, Scunthorpe**

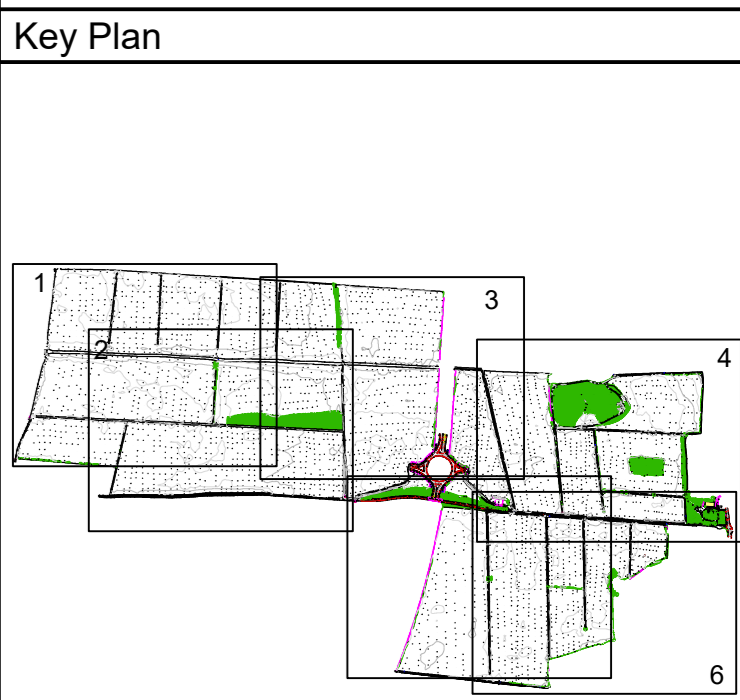
Drawing Title  
**Existing SitePlan Sheet 5 of 6**

Drawn:	B. Connolly	Reviewed:	S. Shrooves
BWB Ref:	221423.00	Date:	10.07.23
Scale:	As Shown	Scale:	1:1000

Information			
Project - Originator - Zone - Level - Type - Role - Number	Status	Rev	
LIN-BWB-00-05-DR-G-0001	S2	P2	



- Notes**
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  8. OS license number: 10022432



- 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
  - Stakes 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 Cladded Board    LP Lamp Post  
 BO Bollard    FCL Fence Chain Link    MH Manhole  
 BS Bus Stop    FEL Fence Electric    MV Service Marker  
 BT British Telecom    FMP Fence Metal Panel    PS Post Box  
 C Crest    FMB Fence Metal Bar    FT Foot  
 CL Cover Level    FOB Fence Open Board    RE Rodding Eye  
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 Post    FSP Fence Steel Palisade    ST Stop Tap  
 CCTV/Security Camera    FVM Fence Wire Mesh    SV Stop Valve  
 CTV Cable TV    FFL Finished Floor Level    TCB Telephone Call Box  
 Drainage Channel    FIP Flagpole    CFB Cuff Box  
 DK Drop Kerb    GV Gas Valve    THL Threshold Level  
 DP Down Pipe    GY Gully    TL Traffic Light  
 Elec Electric    Hc Height    TS Traffic Signal  
 EP Electricity Post    IC Inspection Chamber    UFS Unstable to Survey  
 ER Earth Rod    IFL Internal Floor Level    WL Water Level  
 FH Fire Hydrant    IL Invert Level    WM Water Meter  
 FL Floodlight    IL (as a reduced level)    WO Wash Out

P2: 23.10.24	Watercourse Details Added	DS	SS
P1: 10.07.23	Provisional Issue	BC	SS
Rev	Date	Details of Issue / Revision	Drawn By

**Issues & Revisions**

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**Client**  
**Hargreaves Services PLC**

**Project Title**  
**Lincolnshire Lakes, Scunthorpe**

**Drawing Title**  
**Existing SitePlan**  
**Sheet 6 of 6**

Drawn:	B. Connolly	Reviewed:	S. Shrooves
BWB Ref:	221423.00	Date:	10.07.23
Scale:	1:1000		

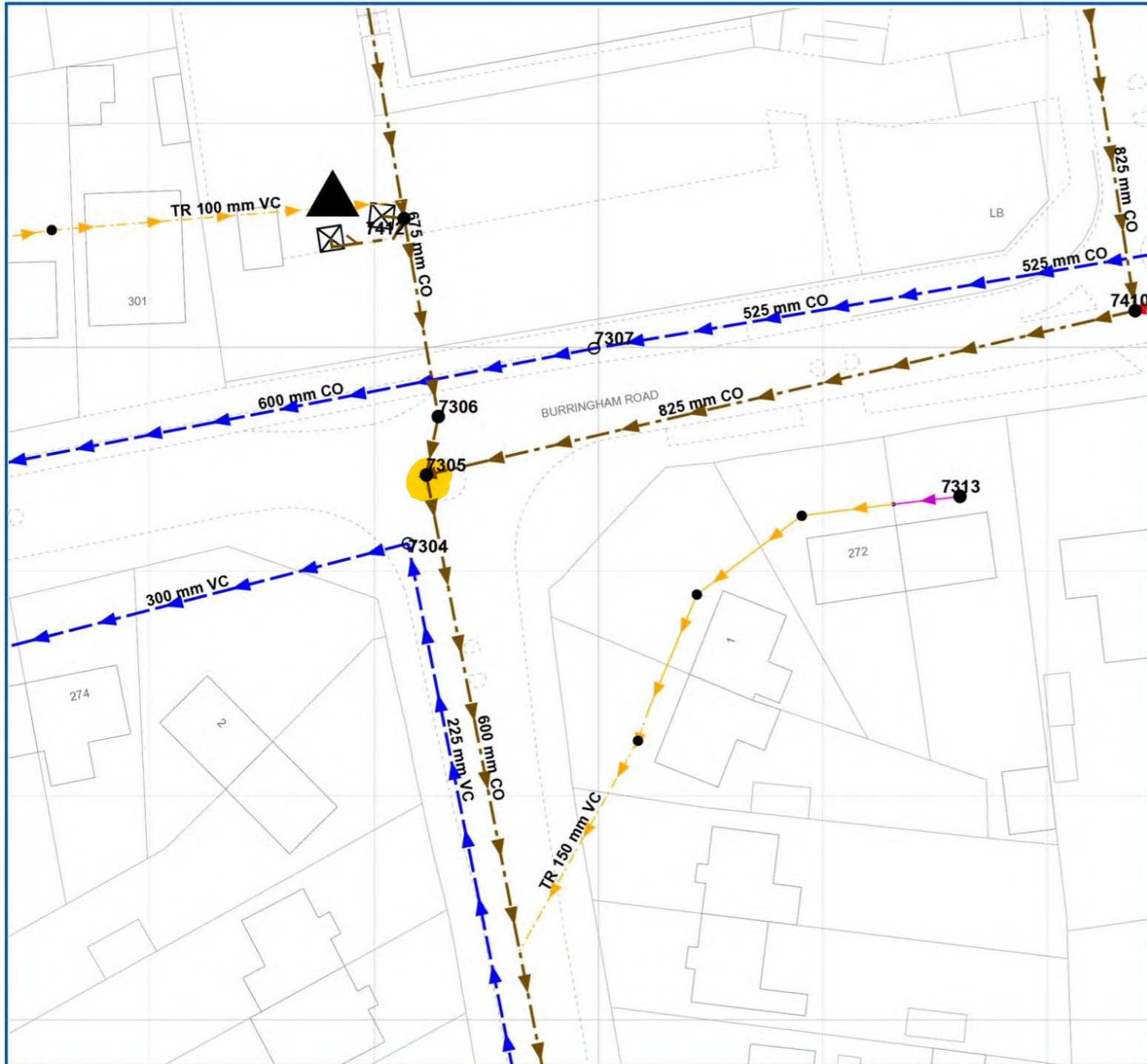
**Information**

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
LIN-BWB-00-06-DR-G-0001	S2	P6

**Station Coordinates**

Station Name	Eastings (m)	Northings (m)	Height (m)
BT1	48175.553	436237.238	4.109
BT2	48177.791	43615.336	5.715
BT3	48186.029	43626.115	4.254
BWB01	48695.179	439481.027	2.679
BWB02	48676.583	439501.442	2.723
BWB03	48640.018	439511.019	2.944
BWB05	48578.931	439560.844	2.412
BWB06	48590.073	439566.250	2.281

**Appendix 3: Severn Trent Water Sewer Records**



Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SE87087305	9.034	6.14	5.69	F	CO	C	600	<UNK>	198.4	31/12/1899 00:00:00
SE87087304	8.7989	6.79	6.74	S	VC	C	300	<UNK>	1065.8	31/12/1899 00:00:00
SE87087412	8.64	6.48	6.39	F	CO	C	675	0	199.44	31/12/1899 00:00:00
SE87087412	8.64	6.2	6.1	F	VC	C	225	0	16	31/12/1899 00:00:00
SE87087313	<UNK>	<UNK>	<UNK>	C	VC	U	100	<UNK>	0	04/04/2012 00:00:00
SE87087410	10.25	6.24	6.17	F	CO	C	<UNK>	<UNK>	927.14	31/12/1899 00:00:00
SE87087306	9.001	6.39	6.15	F	CO	C	675	<UNK>	22.08	31/12/1899 00:00:00
SE87087307	9.394	7.74	6.59	S	CO	C	600	<UNK>	78.31	31/12/1899 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	24/06/2019 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	C	VC	<UNK>	<UNK>	<UNK>	<UNK>	04/04/2012 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	05/07/2023 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	C	<UNK>	<UNK>	<UNK>	<UNK>	<UNK>	04/04/2012 00:00:00

**LEGEND**

Operational Site	Waste Water Pump	Transfered Asset	S24	S104	S102	Null Private	Null	None	Highway Drain	Adopted Sewer	Storage	DS	Off-Line Waste Water Storage	On-Line Waste Water Storage	Wet Well	Waste Water Process Structure	111	1111	11111	Manhole	Combined Effluxion Manhole	Surface Water Effluxion Manhole	Dual Manhole	Foul Single Manhole	Combined Single Manhole	Surface Water Single Manhole	Twin Manhole	Foul Adopted Manhole	Combined Adopted Manhole	Surface Adopted Manhole	Transfered 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	Foul Unsurveyed Pipe	Transfered Surface Water Sewer	Transfered Combined Sewer	Transfered Foul Sewer	Disposal Pipe	Overflow Pipe	Culverted Water Course	Waste Internal 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 Unsurveyed Pipe	Foul Unsurveyed Pipe	Disposal Pipe	Service Pipe	Surface Water Lateral Drain	Combined Lateral Drain	Surface Water Lateral Drain	Combined Lateral Drain	Private Surface Water Lateral Drain	Private Combined Lateral Drain	Private Foul Lateral Drain	Transfered Surface Water Lateral Dia	Transfered Combined Lateral Drain	Transfered Foul Lateral Drain	Ancillary	Balancing Lagoon	Grease Trap	Interceptor	Screen	Chamber	Flushing Chamber	Soakaway	Overflow	Connector	Sewer Junctions	Sewer Line Connection Node	Fitting	Blind Shaft	Facility Connector	Head Node	Lamp Pole	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	Landline Symbol	Culvert Symbol	Direction Of Flow Symbol	Boundary Half Meeting Symbol	Bench Mark Symbol	Railway Switch Symbol	Road Related Flow Symbol	Print20mLine
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**MATERIALS**

- NONE
- AC - ASBESTOS CEME
- BR - BRICK
- CC - CONCRETE BOX CULVERT
- CI - CAST IRON
- CO - CONCRETE
- CSB - CONCRETE SEGMENTS (BOLTED)
- CSU - CONCRETE SEGMENTS (UNBOLTED)
- DI - DUCTILE IRON
- GRP - GLASS REINFORCED PLASTIC
- MAC - MASONRY IN REGULAR COURSES
- MAR - MASONRY RANDOMLY COURSED
- PE - POLYETHYLENE
- PF - PITCH
- PP - POLYPROPYLENE
- PSC - PLASTIC STEEL COMPOSITE
- PVC - POLYVINYL CHLORIDE
- RPM - REINFORCED PLASTIC MATRIX
- SI - SPUN (GREY) IRON
- ST - STEEL
- U - UNKNOWN
- VC - VITRIFIED CLAY
- XXX - OTHER

**CATEGORIES**

- W - WEIR
- C - CASCADE
- DB - DAMBOARD
- SE - SIDE ENTRY
- FV - FLAP VALVE
- BD - BACK DROP
- S - SIPHON
- D - HIGHWAY DRAIN
- S104 - SECTION 104

**SHAPE**

- C - CIRCULAR
- E - EGG SHAPED
- O - OTHER
- R - RECTANGLE
- S - SQUARE
- T - TRAPEZOIDAL
- U - UNKNOWN

**PURPOSE**

- C - COMBINED
- E - FINAL EFFLUENT
- F - FOUL
- L - SLUDGE
- S - SURFACE WATER



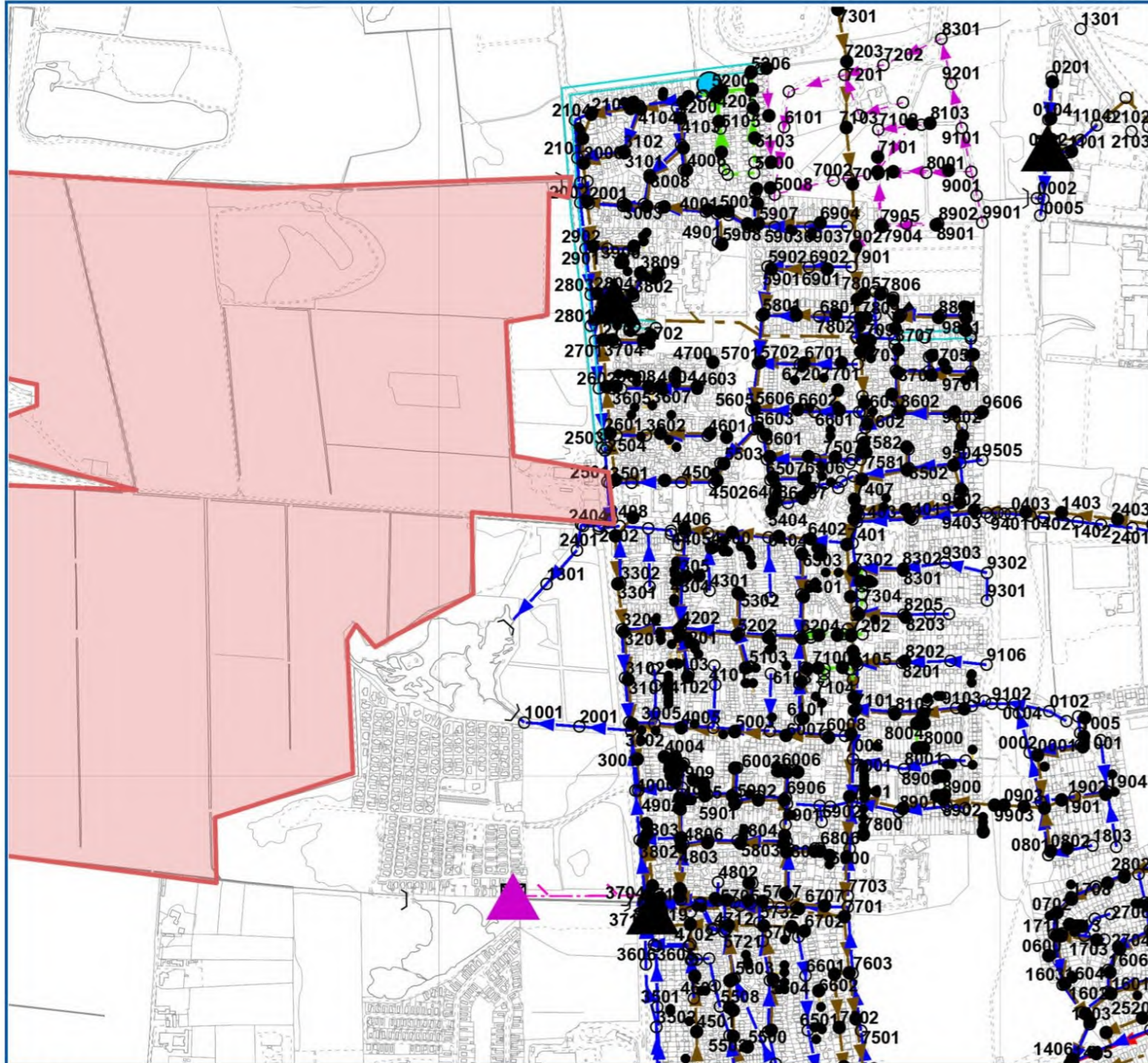
Severn Trent Water Limited  
 Asset Data Management  
 PO Box 5344  
 Coventry  
 CV3 9FT  
 Telephone: 0345 601 6616

**SEWER RECORD (Tabular)**

O/S Map Scale: 1:500  
 Date of Issue: 31-08-23  
 This map is centred upon:  
 X: 487718.24 Y: 408383.15

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Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SE87096100	8.7119	6.27	<UNK>	F	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SE87096100	8.7119	5.99	5.66	F	VC	C	<UNK>	<UNK>	233.979	31/12/1899 00:00:00
SE87096405	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SE87105010	<UNK>	<UNK>	<UNK>	S	U	C	750	<UNK>	<UNK>	04/03/2020 00:00:00
SE88101103	41.9879	39.97	39.64	S	VC	C	225	<UNK>	96.45	31/12/1899 00:00:00
SE87085501	6.109	4.08	3.83	F	VC	C	225	<UNK>	186.4	31/12/1899 00:00:00
SE87086707	8.5159	6.66	5.3	F	VC	C	225	<UNK>	82.2	31/12/1899 00:00:00
SE87095001	5.8689	3.96	3.47	F	VC	C	150	<UNK>	100.31	31/12/1899 00:00:00
SE87097501	9.2309	7.02	6.71	S	VC	C	225	<UNK>	83.65	31/12/1899 00:00:00
SE87103002	5.6519	3.63	3.31	F	VC	C	150	<UNK>	116.41	31/12/1899 00:00:00
SE88090401	34.462	30.95	25.841	S	VC	C	300	<UNK>	4.69	31/12/1899 00:00:00
SE87098711	14.4399	<UNK>	<UNK>	<UNK>	<UNK>	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00
SE87099706	18.107	16.99	16.51	S	VC	C	150	<UNK>	52.29	31/12/1899 00:00:00
SE88100004	40.4739	<UNK>	<UNK>	S	CO	C	1200	<UNK>	0	31/12/1899 00:00:00
SE87095605	6.689	4.9	4.69	S	CO	C	575	<UNK>	163.19	31/12/1899 00:00:00
SE87099402	21.684	17.84	17.36	S	CO	C	375	<UNK>	38.13	31/12/1899 00:00:00
SE87096200	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	150	<UNK>	<UNK>	20/10/2022 00:00:00
SE87097303	9.133	7.14	6.85	S	CO	C	375	<UNK>	151.41	31/12/1899 00:00:00
SE87095901	7.762	6.4	5.65	F	VC	C	150	<UNK>	108.24	31/12/1899 00:00:00
SE87086709	7.8	5.68	5.02	F	VC	C	225	<UNK>	111.55	31/12/1899 00:00:00
SE88080901	36.75	33.66	29.491	F	VC	C	<UNK>	<UNK>	8.7	31/12/1899 00:00:00
SE87098301	13.17	11.04	7.65	F	VC	C	225	<UNK>	26.28	31/12/1899 00:00:00
SE87085504	7.1599	5.19	4.85	F	VC	C	225	<UNK>	266.38	31/12/1899 00:00:00
SE88081704	40.096	38.15	37.72	S	VC	C	225	<UNK>	94.09	31/12/1899 00:00:00
SE88081700	<UNK>	<UNK>	<UNK>	F	U	U	100	<UNK>	<UNK>	31/12/1899 00:00:00
SE87105009	8.93	7.51	6.88	F	VC	C	150	<UNK>	73.05	31/12/1899 00:00:00
SE87096901	8.9619	7.43	6.41	F	VC	C	225	<UNK>	98.33	31/12/1899 00:00:00
SE87084804	<UNK>	<UNK>	2.45	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SE87085905	5.517	3.88	3.499	S	CO	C	600	<UNK>	134.61	31/12/1899 00:00:00

**LEGEND**

- Operational Site
- Waste Water Pump
- Transfered Asset
- S04
- S104
- S102
- Null Private
- Null
- None
- Highway Drain
- Adopted Sewer
- Storage
- DS
- 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
- Transfered 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 Unserved Pipe
- Foul Unserved Pipe
- Transfered Surface Water Sewer
- Transfered Combined Sewer
- Transfered Foul Sewer
- Disposal Pipe
- Overflow Pipe
- Culverted Water Course
- Waste Internal 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
- 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
- Transfered Surface Water Lateral Drain
- Transfered Combined Lateral Drain
- Transfered Foul Lateral Drain
- S104 Surface Water Siphon
- S104 Combined Siphon
- S104 Foul Siphon
- Surface Water Unserved Pipe
- Surface Water Unserved Pipe
- Foul Unserved Pipe
- Disposal Pipe
- Service Pipe
- Surface Water Lateral Drain
- Combined Lateral Drain
- Lampwork
- 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
- Print1000mLine
- Ancillary
- Balancing Lagoon
- Grease Trap
- Interceptor
- Screen
- Chamber
- Flushing Chamber
- Scalaway
- Overflow
- Fitting
- Blind Shaft
- Facility Connector
- Head Node

**MATERIALS**

- NONE
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- C - COMBINED
- E - FINAL EFFLUENT
- F - FOUL
- L - SLUDGE
- S - SURFACE WATER

SEVERN TRENT

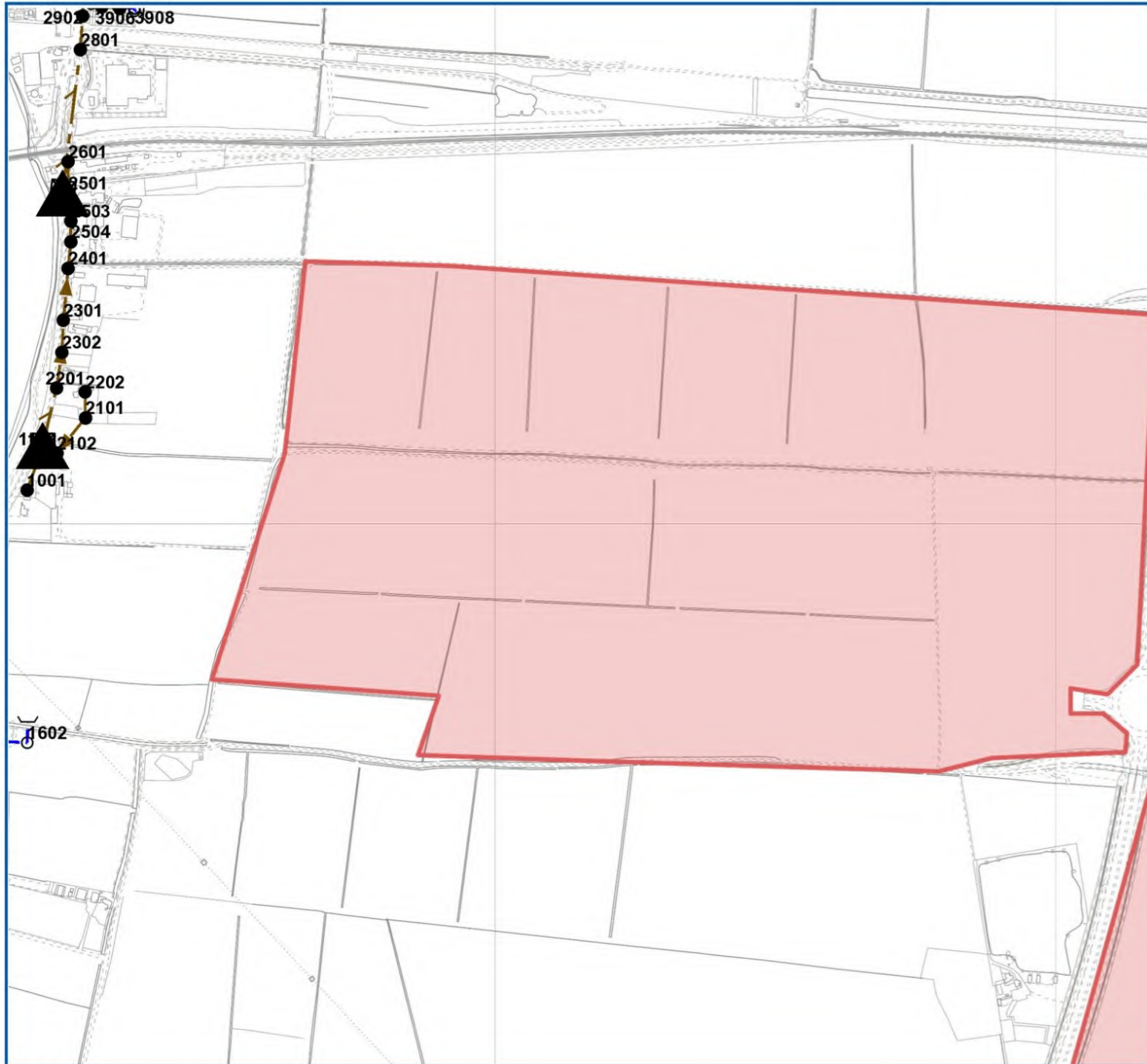
Severn Trent Water Limited  
 Asset Data Management  
 PO Box 5344  
 Coventry  
 CV3 9FT  
 Telephone: 0345 601 6616

## SEWER RECORD (Tabular)

O/S Map Scale: 1:10,000  
 This map is centred upon:  
 Date of Issue: 13-07-23  
 X: 487250.28 Y: 409430.31

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Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SE84102904	<UNK>	2.46	2.054	S	VC	C	<UNK>	<UNK>	51.27	31/12/1899 00:00:00
SE84102101	2.83	1.27	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SE84102401	3.16	1.26	1.12	F	VC	C	<UNK>	<UNK>	351.79	31/12/1899 00:00:00
SE84103907	2.69	1.864	1.86	S	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SE84091602	2.44	0.43	0.03	S	U	C	<UNK>	<UNK>	58.83	31/12/1899 00:00:00
SE84102302	3.09	1.9	1.66	F	VC	C	<UNK>	<UNK>	237.83	31/12/1899 00:00:00
SE84102902	3.98	2.42	2.01	F	VC	C	<UNK>	<UNK>	151.24	31/12/1899 00:00:00
SE84103904	3.09	2.054	1.975	S	VC	C	<UNK>	<UNK>	322.5	31/12/1899 00:00:00
SE84102301	3.46	1.64	1.28	F	VC	C	<UNK>	<UNK>	253.75	31/12/1899 00:00:00
SE84101001	<UNK>	<UNK>	0.71	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SE84102503	3.3	0.98	0.74	F	VC	C	<UNK>	<UNK>	217.29	31/12/1899 00:00:00
SE84102201	3.13	2.18	1.92	F	VC	C	<UNK>	<UNK>	249.15	31/12/1899 00:00:00
SE84102504	3.39	1.1	1	F	VC	C	<UNK>	<UNK>	350.1	31/12/1899 00:00:00
SE84102501	3.24	0.72	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SE84101102	2.89	0.69	<UNK>	F	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SE84103905	2.86	1.975	1.864	S	VC	C	<UNK>	<UNK>	269.64	31/12/1899 00:00:00
SE84103906	2.824	2.216	2.21	F	VC	C	<UNK>	<UNK>	3114	31/12/1899 00:00:00
SE84102601	3.14	1.74	0.74	F	VC	C	<UNK>	<UNK>	56.01	31/12/1899 00:00:00
SE84102903	3.113	2.016	1.94	F	VC	C	<UNK>	<UNK>	176.75	31/12/1899 00:00:00
SE84102202	2.66	1.6	1.29	F	VC	C	<UNK>	<UNK>	148.39	31/12/1899 00:00:00
SE84103908	<UNK>	1.86	1.85	S	VC	C	<UNK>	<UNK>	300	31/12/1899 00:00:00
SE84102102	<UNK>	<UNK>	0.71	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SE84102801	4.32	2.92	2.44	F	VC	C	<UNK>	<UNK>	125.15	31/12/1899 00:00:00

### LEGEND

Operational Site	Combined Effluxion Manhole	Combined Unsurveyed Pipe	Combined Vacuum Sewer	Foul Lateral Drain	Lamp Hole
Waste Water Pump	Surface Water Effluxion Manhole	Foul Unsurveyed Pipe	S104 Surface Water Vacuum Sewer	S104 Surface Water Lateral Drain	Sewerage Air Valve
Transfered Asset	Dual Manhole	Transfered Surface Water Sewer	S104 Combined Vacuum Sewer	S104 Combined Lateral Drain	Sewerage Chemical Injection Point
S04	Foul Single Manhole	Transfered Combined Sewer	S104 Foul Vacuum Sewer	S104 Foul Lateral Drain	Sewerage Hatch Box
S104	Combined Single Manhole	Transfered Foul Sewer	Private Surface Water Vacuum Sewer	Private Surface Water Lateral Drain	Sewerage Pressure Washout
S102	Surface Water Single Manhole	Disposal Pipe	Private Combined Vacuum Sewer	Private Combined Lateral Drain	Vent Column
Null Private	Twin Manhole	Overflow Pipe	Private Foul Vacuum Sewer	Private Foul Lateral Drain	Waste Water Outfall
Null	Foul Adopted Manhole	Culverted Water Course	Surface Water Siphon	Transfered Surface Water Lateral Dia	Control Valve
None	Combined Adopted Manhole	Waste Internal Site Pipe	Combined Siphon	Transfered Combined Lateral Drain	Hydrobrake
Highway Drain	Surface Adopted Manhole	Sewer Service Connection	Foul Siphon	Transfered Foul Lateral Drain	Penstock
Adopted Sewer	Transfered Manhole	Gravity Sewer Others	Private Surface Water Siphon	Private Combined Siphon	Sewerage Isolation Valve
Storage	Unsurveyed Manhole	Pressure Sewer Pipe	Private Foul Siphon	S104 Surface Water Siphon	Sewerage Non Return Valve
DS Disposal Site	Gravity Sewer Pipe	Surface Water Pressure Sewer	S104 Surface Water Siphon	S104 Combined Siphon	Print1000mLine
Off-Line Waste Water Storage	Foul Gravity Sewer	Combined Pressure Sewer	S104 Surface Water Pressure Sewer	S104 Foul Siphon	
On-Line Waste Water Storage	Combined Gravity Sewer	Foul Pressure Sewer	S104 Combined Pressure Sewer	Surface Water Unsurveyed Pipe	
Wet Well	Surface Water Gravity Sewer	S104 Foul Pressure Sewer	S104 Foul Pressure Sewer	Combined Unsurveyed Pipe	
Waste Water Process Structure	S104 Surface Water Gravity Sewer	Private Surface Water Pressure Sewer	Foul Unsurveyed Pipe	Disposal Pipe	
Sewage Treatment Point	S104 Combined Gravity Sewer	Private Combined Pressure Sewer	Private Surface Water Pressure Sewer	Service Pipe	
Sewage Treatment Structure	S104 Foul Gravity Sewer	Private Foul Pressure Sewer	Surface Water Vacuum Sewer	Surface Water Lateral Drain	
Sludge Treatment Point	Private Surface Water Gravity Sewer	Surface Water Vacuum Sewer	Surface Water Lateral Drain		
Sludge Treatment Structure	Private Combined Gravity Sewer	Surface Water Lateral Drain			
Manhole	Surface Water Unsurveyed Pipe	Foul Vacuum Sewer	Combined Lateral Drain		

### MATERIALS

- NONE
- AC - ASBESTOS CEME
- BR - BRICK
- CC - CONCRETE BOX CULVERT
- CI - CAST IRON
- CO - CONCRETE
- CSB - CONCRETE SEGMENTS (BOLTED)
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- S104 - SECTION 104

### SHAPE

- C - CIRCULAR
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### PURPOSE

- C - COMBINED
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Severn Trent Water Limited  
 Asset Data Management  
 PO Box 5344  
 Coventry  
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 Telephone: 0345 601 6616

## SEWER RECORD (Tabular)

**O/S Map Scale:** 1:10,000      **This map is centred upon:**

**Date of Issue:** 13-07-23      **X:** 485149.49      **Y:** 409977.99

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**Appendix 4: Greenfield Run-Off Rates**

Calculated by: Ariya Shademani

Site name: Lincolnshire Lakes

Site location:

## Site Details

Latitude: 53.57685° N

Longitude: 0.6949° W

Reference: 1470026326

Date: Dec 23 2024 13:05

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.

Runoff estimation approach

## Site characteristics

Total site area (ha):

## Methodology

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

SPR estimation method: Calculate from SOIL type

## 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.

## Soil characteristics

	Default	Edited
SOIL type:	2	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.3	0.3

(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.

## Hydrological characteristics

	Default	Edited
SAAR (mm):	605	605
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

(3) Is  $SPR/SPRHOST \leq 0.3$ ?

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

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Default Edited

<b>Q<sub>BAR</sub> (l/s):</b>	1.54	1.54
<b>1 in 1 year (l/s):</b>	1.28	1.28
<b>1 in 30 years (l/s):</b>	3.07	3.07
<b>1 in 100 year (l/s):</b>	3.95	3.95
<b>1 in 200 years (l/s):</b>	4.67	4.67

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at [www.uksuds.com](http://www.uksuds.com). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at [www.uksuds.com/terms-and-conditions.htm](http://www.uksuds.com/terms-and-conditions.htm). The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

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**Appendix 5: Existing Run-Off Volume**

**Simulation Settings**

Rainfall Methodology	FSR	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	18.400	Additional Storage (m <sup>3</sup> /ha)	20.0
Ratio-R	0.401	Check Discharge Rate(s)	x
Summer CV	0.750	Check Discharge Volume	✓
Winter CV	0.840	100 year 360 minute (m <sup>3</sup> )	2124
Analysis Speed	Normal		

**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 %)
100	40	0	0

**Pre-development Discharge Volume**

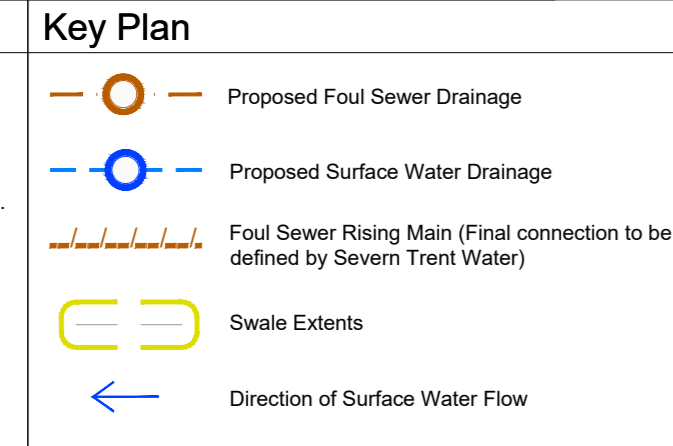
Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)	14.750	Storm Duration (mins)	360
Soil Index	2	Betterment (%)	0
SPR	0.30	PR	0.248
CWI	90.370	Runoff Volume (m <sup>3</sup> )	2124

**Appendix 6: Outline Drainage Strategy**



**Notes**

- Do not scale this drawing. All dimensions must be checked/verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
- Any discrepancies noted on site are to be reported to the engineer immediately.
- Any Surface Water Drainage pipes not specified are to be assumed as 150mm diameter.
- Refer to BMB Drawing LIN-BWB-CIV-XX-DR-C-0501 LIN-BWB-CIV-XX-DR-C-0502
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**ALL COVER AND INVERT LEVELS ARE SHOWN INDICATIVELY. LEVELS TO BE UPDATED AS PART OF DETAILED DESIGN.**

**ISSUES & REVISIONS**

Rev	Date	Details of issue / revision	Drawn	Rev
P03	24.12.24	For details of previous issue / revisions, refer to revision P02	AB	CB
P04	06.08.25	Revised Planning Issue - Downstream Defender added	AB	SCS
P05	06.08.25	Issue to IDB	AB	SCS
P06	02.09.25	Updated to suit IDB comments on headwalls	AB	SCS



**Hargreaves Land Ltd.**

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 www.bwbconsulting.com

**Phase 1, Lincolnshire Lakes, Scunthorpe**

Project Title

**For Planning**

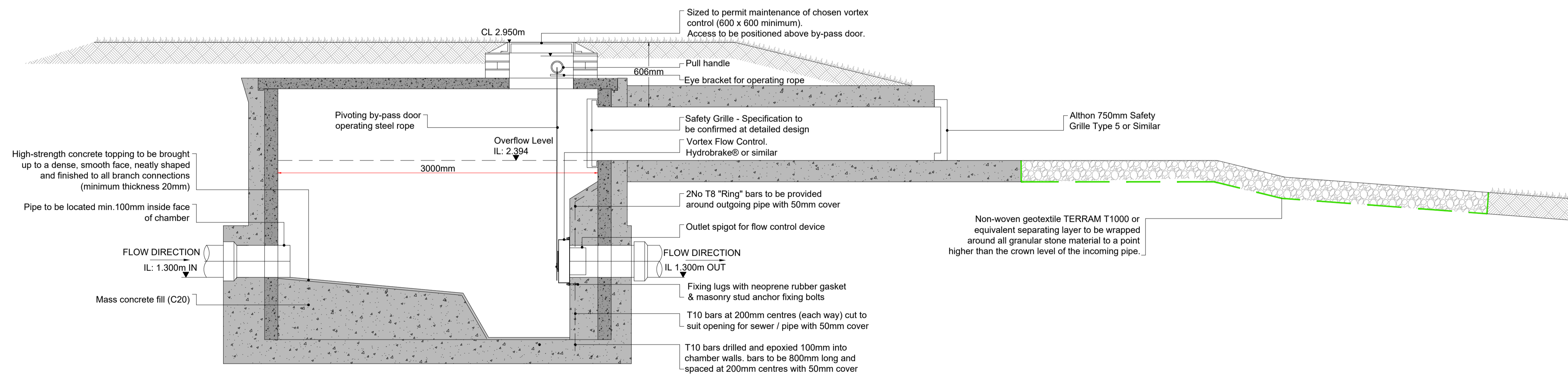
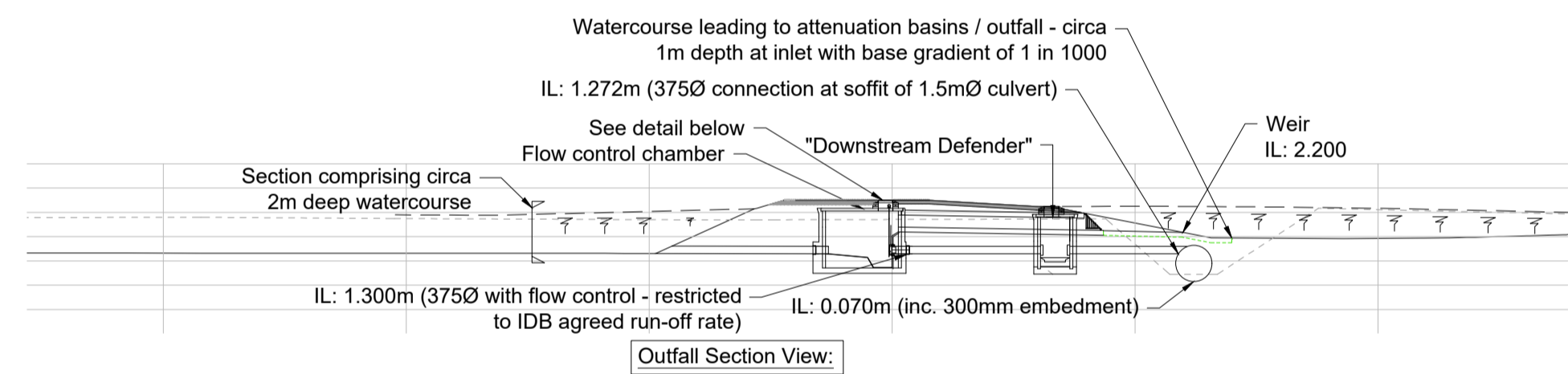
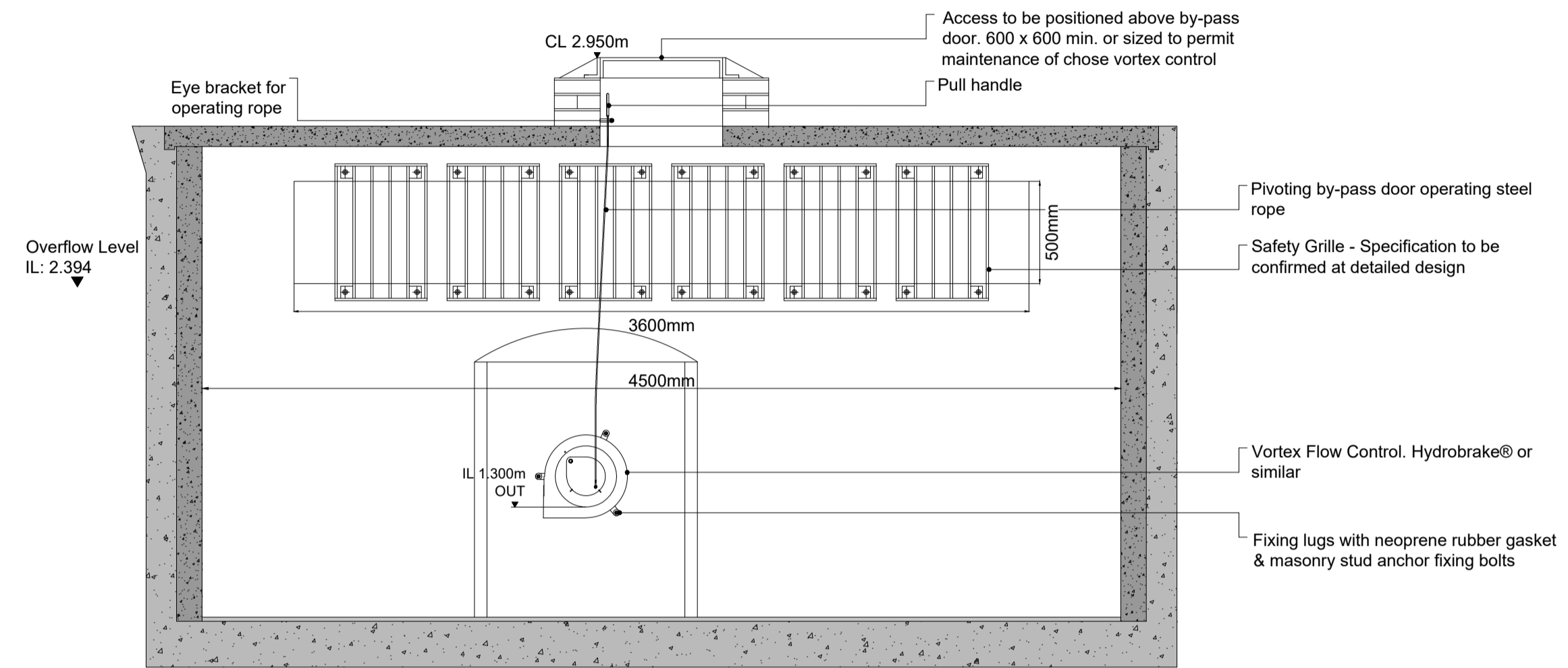
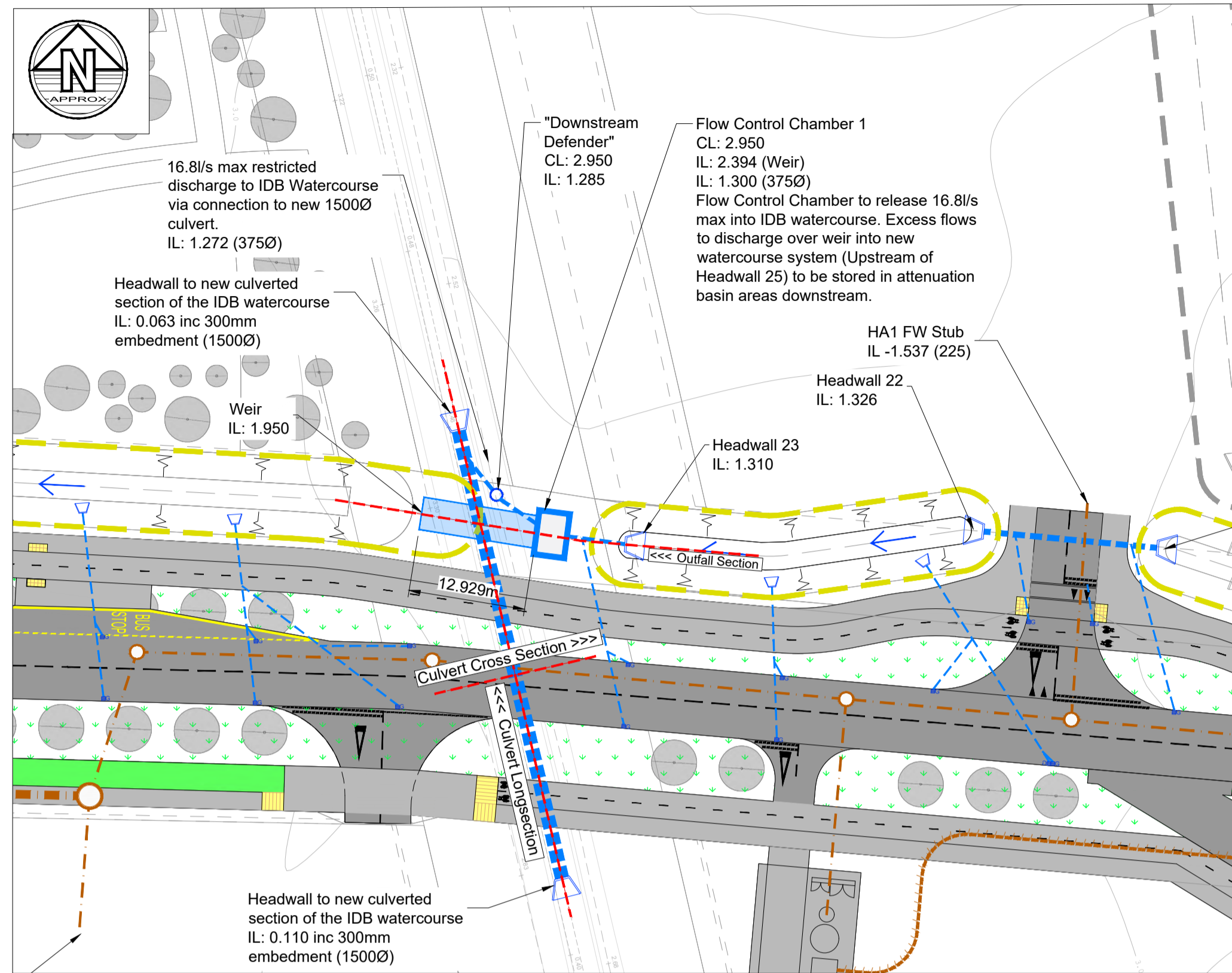
Drawing Status

**Outline Drainage Strategy**

Drawing Title

Project - Originator - Zone - Level - Type - Rose - Number  
**LIN-BWB-CIV-XX-D-C-0500**

Status Rev  
**S8 P06**



**Culvert Longsection:**

Chainage	Proposed Levels	Existing Levels
0.000		
10.000	3.880	0.419
20.000	3.685	0.433
30.000	3.525	0.447
40.000		0.461
50.000	3.244	0.474
60.000		0.498
63.146		

**Culvert Cross Section:**

Chainage	Proposed Levels	Existing Levels
02.500	3.525	3.011
05.000	3.555	2.671
07.500	3.544	0.875
10.000	3.522	1.165
12.500	3.496	2.689
15.000	3.466	2.680
17.500	3.559	2.692

- Notes**
- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
  - This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
  - All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
  - Any discrepancies noted on site are to be reported to the engineer immediately.
  - This drawing is to be read in conjunction with the latest drainage layout drawing.
  - Unless noted otherwise, all clauses relate to Sewer Sector Guidance Notes or Building Regulations Part H.
  - To be read in conjunction with BWB drawing LIN-BWB-CIV-XX-D-C-0500\_Outline Drainage Strategy LIN-BWB-CIV-XX-D-C-0561\_Drainage Standard Details Sheet 1 LIN-BWB-CIV-XX-D-C-0562\_Drainage Standard Details Sheet 2 LIN-BWB-CIV-XX-D-C-0563\_Drainage Standard Details Sheet 3

- Legend**
- Drainage Outfall Plan View:**
- Proposed Foul Sewer Drainage
  - Proposed Surface Water Drainage
  - Proposed Flow Control Chamber
  - Proposed Headwall
  - Proposed Weir Arrangement
  - Swale Extents
  - Section Extents
- Outfall Section View, Longsection & Cross Section :**
- Proposed Ground Profile
  - Existing Ground Profile

PO2	08.08.25	Issue to IDB	AB	SCS
PO1	06.08.25	Planning Issue	AB	SCS
Rev	Date	Details of issue / revision	Dw	Rev

**Issues & Revisions**

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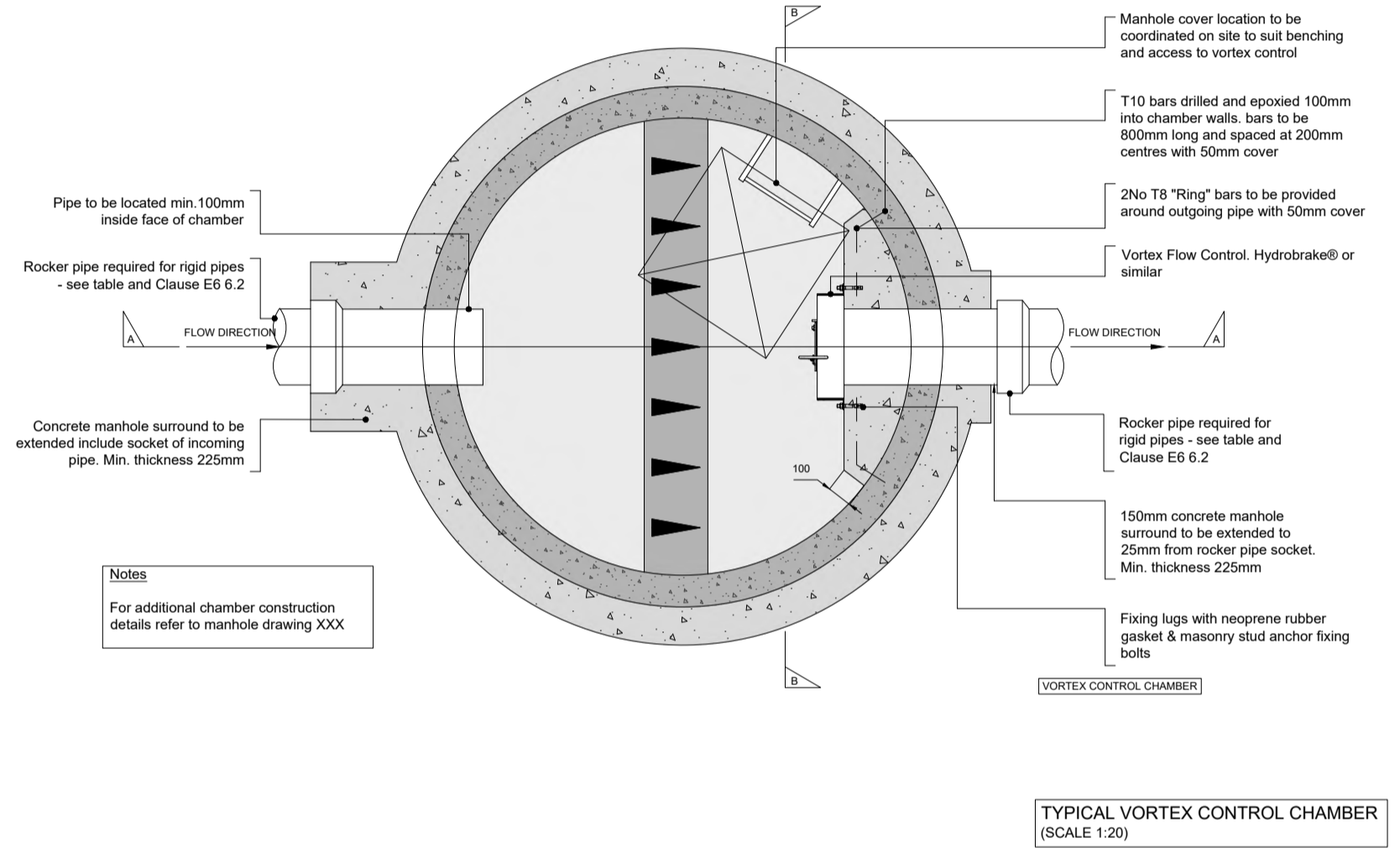
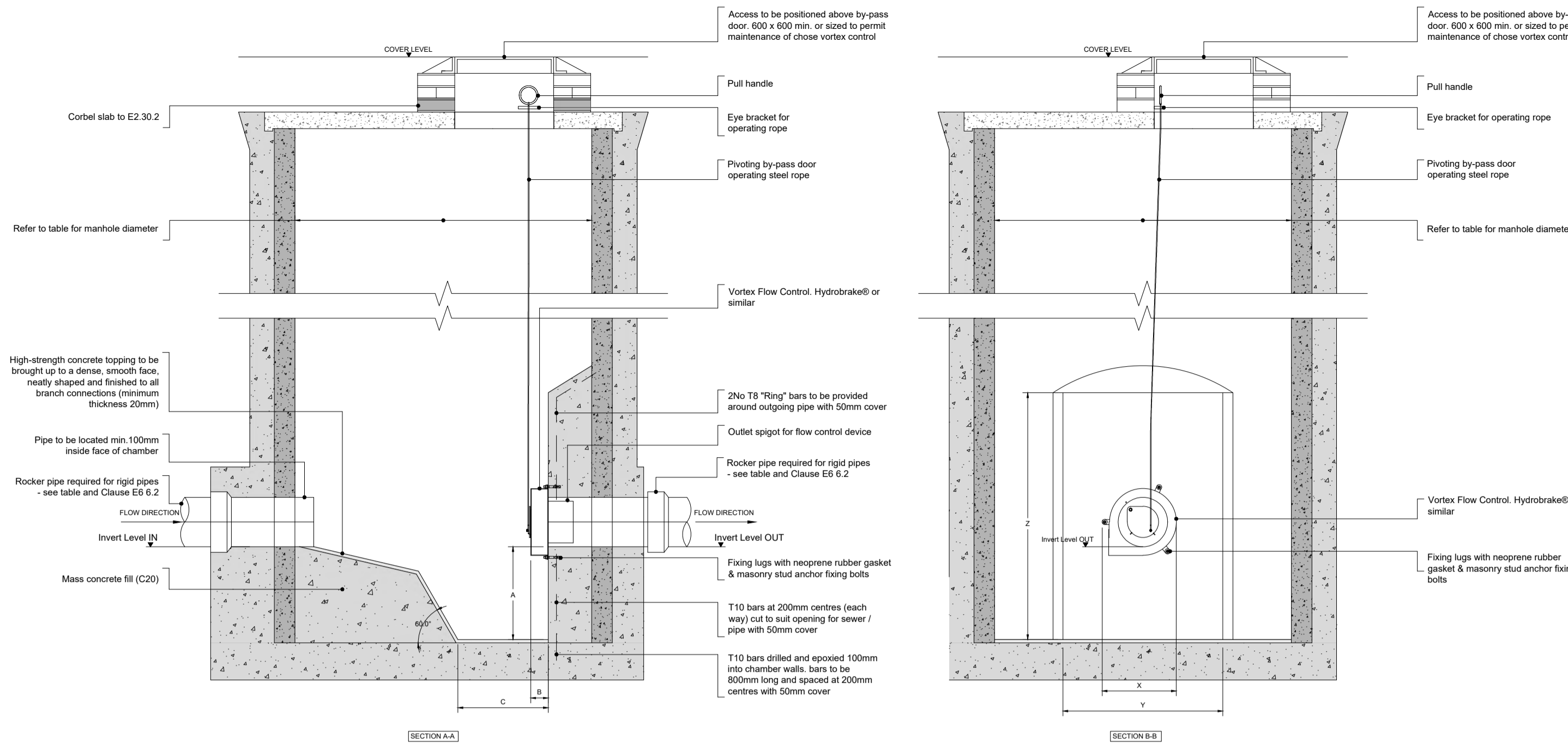
Project Title  
**Lincolnshire Lakes, Scunthorpe**

Drawing Title  
**Proposed Drainage Culvert/Outfall Details**

Drawn:	A. Biag	Reviewed:	S. Stanley
BWB Ref:	221638	Date:	Jan '25
Scale:	@A1:	NTS	

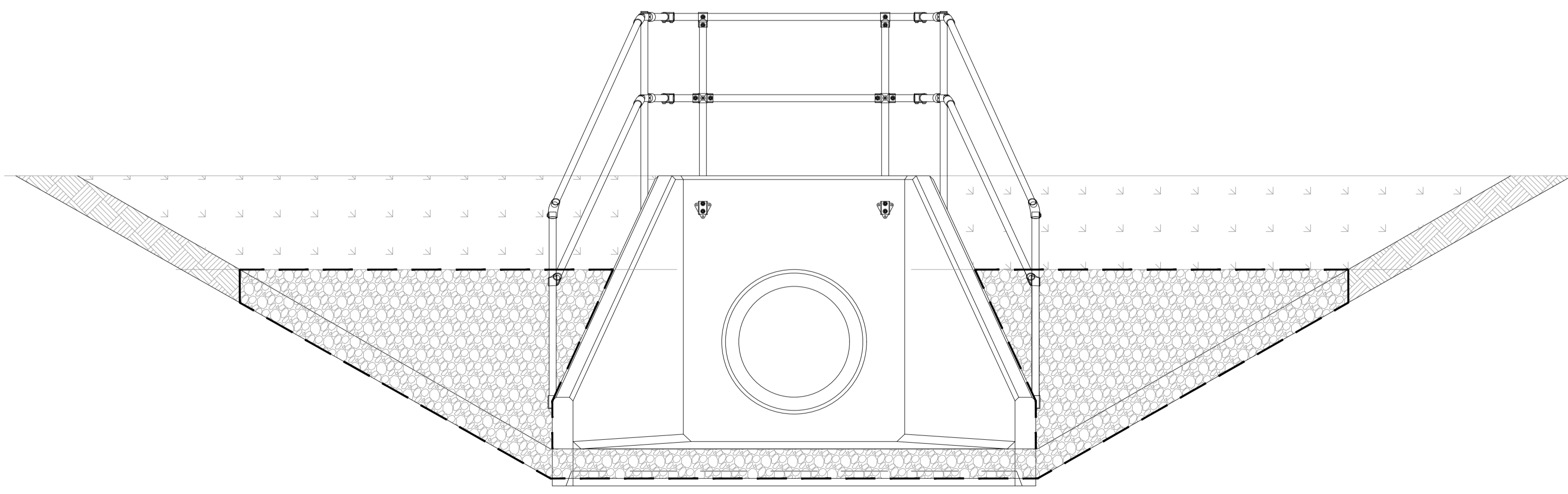
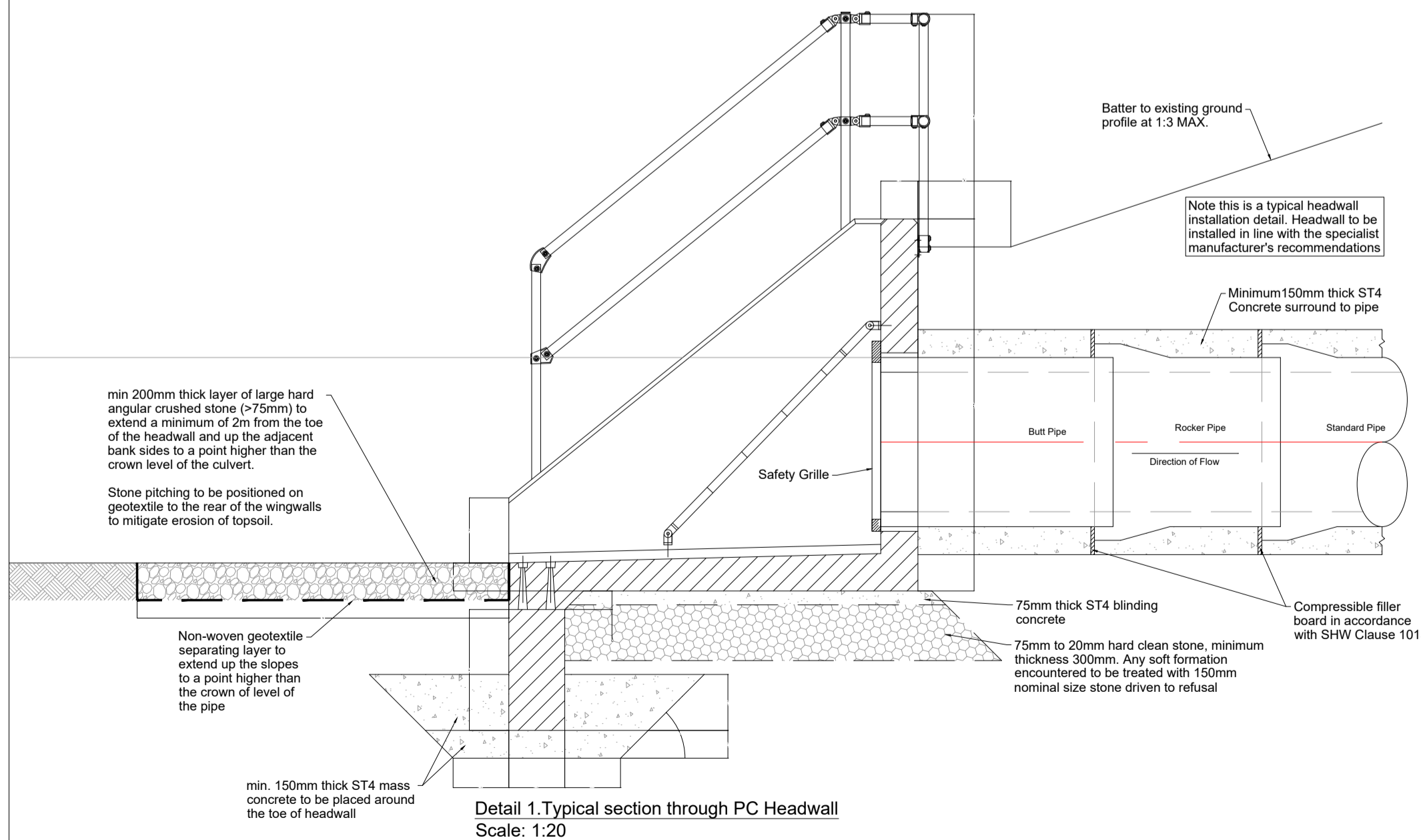
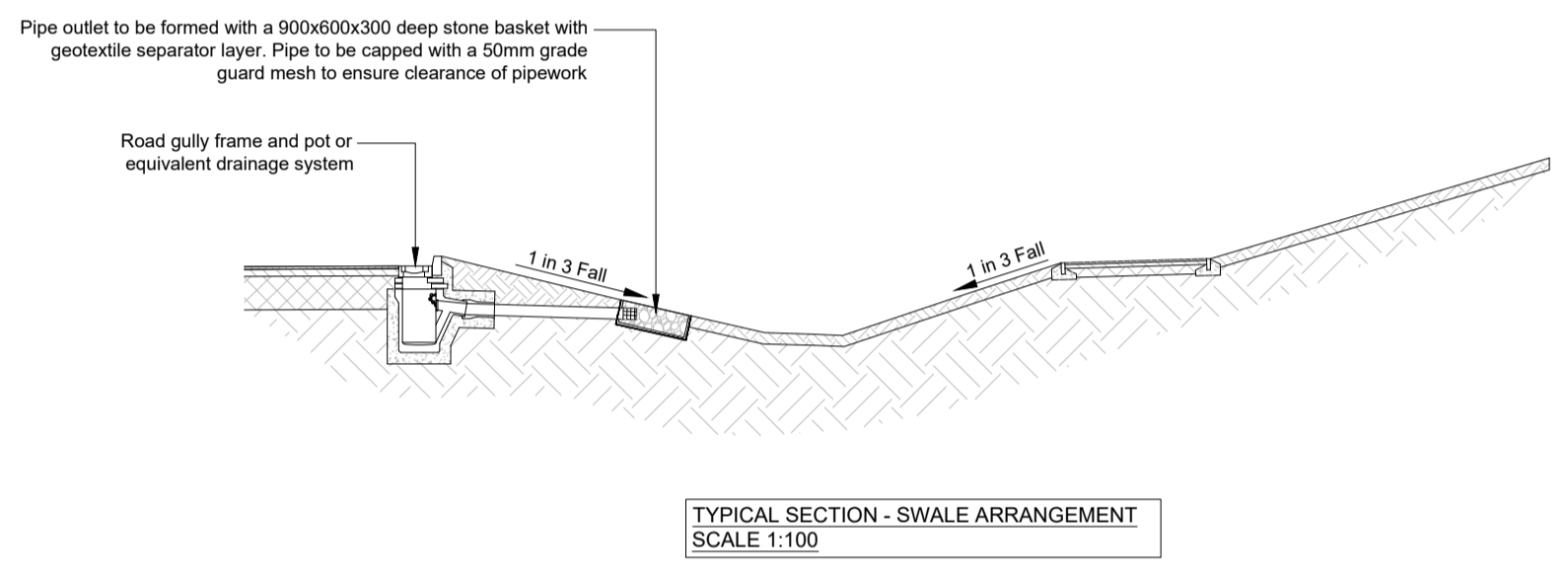
**For Planning**

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
<b>LIN-BWB-DDG-XX-DR-D-0560</b>	<b>S8</b>	<b>P02</b>



**WATER AUTHORITY WARNING NOTES**

- Warning signs are to be 40mm high red lettering on a white plastic base. The plastic base dimensions are to be approx. 300mm x 300mm x 6mm.
- The base is to be resistant to attack by sewage environment.
- The warning sign is to be mounted on a removable safety grid available from cover manufacturer.
- The sign in this manhole must read "Caution - Vortex Control located here".
- A sign must be fitted in the upstream MH to read "Caution - Vortex Control down stream".
- A sign must be fitted in the downstream stream MH to read "Caution - Vortex Control up stream".



- Notes**
- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
  - This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
  - All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
  - Any discrepancies noted on site are to be reported to the engineer immediately.
  - This drawing is to be read in conjunction with the latest drainage layout drawing.
  - Unless noted otherwise, all clauses relate to Sewer Sector Guidance Notes or Building Regulations Part H.
  - To be read in conjunction with BWB drawing LIN-BWB-CIV-XX-D-C-0500\_Outline Drainage Strategy; LIN-BWB-DDG-XX-DR-D-0560\_Drainage Outfall Detail; LIN-BWB-DDG-XX-DR-D-0561\_Drainage Standard Details Sheet 1; LIN-BWB-DDG-XX-DR-D-0562\_Drainage Standard Details Sheet 2

P02	08.08.25	Issue to IDB	AB	SCS
P01	21.01.25	Planning Issue	US	KMJ
Rev	Date	Details of issue / revision	Drw	Rev

**Issues & Revisions**

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Client  
**Hargreaves Land Ltd.**

Project Title  
**Lincolnshire Lakes, Scunthorpe**

Drawing Title  
**Drainage Standard Details Sheet 3**

Drawn:	U. Shahzad	Reviewed:	K. Jones
BWB Ref:	221638	Date:	Jan '25
Scale:	@A1:	NTS	

**For Planning**

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
LIN-BWB-DDG-XX-DR-D-0563	S8	P02

**Appendix 7: Quick Storage Estimate**

Project Number: 221638	Page 1
Project Name: Lincolnshire Lakes, Scunthorpe	Rev: P1
Plot Reference / Zone: Site Wide	Stage Due Diligence
Client: Hargreaves Land Ltd	Date 16.01.2024
File Ref: LIN-BWB-DDG-XX-CA-D-0001-SW Assessment	Prepared by KMJ
Document Title: Surface Water Drainage Design	Authorised by 00/01/1900

## Attenuation Requirements

Utilising a 1.4 l/s QBAR discharge rate for a hectare of impermeable area in line with the requirements of the local land drainage authority the Quick Storage Estimate module within Microdrainage has been used to calculate the likely attenuation requirements for a 1 in 100 year plus climate change event return period. The output from this can be seen below.

Quick Storage Estimate

Micro Drainage

Variables

FSR Rainfall

Return Period (years) 100

Region England and Wales

Map M5-60 (mm) 18.400

Ratio R 0.401

Cv (Summer) 0.750

Cv (Winter) 0.840

Impermeable Area (ha) 1.000

Maximum Allowable Discharge (l/s) 1.4

Infiltration Coefficient (m/hr) 0.00000

Safety Factor 2.0

Climate Change (%) 40

Analyse OK Cancel Help

Enter Infiltration Coefficient between 0.00000 and 100000.00000

Quick Storage Estimate

Micro Drainage

Results

Global Variables require approximate storage of between 805 m³ and 1063 m³.

These values are estimates only and should not be used for design purposes.

Analyse OK Cancel Help

Enter Infiltration Coefficient between 0.00000 and 100000.00000

Using this output the following results will be used to assess the discharge restrictions for the site based on the actual area of the development:

Attenuation volume	Design Imp. Area (ha)	Discharge rate (l/s)	Attenuation range (m³)	
			Lower	Upper
Per hectare	1.000	1.4	805	1063
Phase 1 Total	14.253	20.0	11,474	15,151
Future Phase Total	28.808	40.3	23,190	30,622
<b>Site-Wide Total</b>	<b>43.061</b>	<b>60.3</b>	<b>34,664</b>	<b>45,773</b>

Project Number: 221638	Page 2
Project Name: Lincolnshire Lakes, Scunthorpe	Rev: P1
Plot Reference / Zone: Site Wide	Stage: Due Diligence
Client: Hargreaves Land Ltd	Date: 16.01.2024
File Ref: LIN-BWB-DDG-XX-CA-D-0001-SW Assessment	Prepared by: KMJ
Document Title: Surface Water Drainage Design	Authorised by: 00/01/1900

## Attenuation Requirements

Using this output the attenuation requirements for the individual parcels has been calculated:

Parcel Reference	Area (ha)	Discharge rate (l/s)	Attenuation range		Attenuation location
			Lower (m <sup>3</sup> )	Upper (m <sup>3</sup> )	
HA1	4.816	6.7	3,877	5,119	BG1/AB1
HA2	3.688	5.2	2,969	3,921	BG1/AB1
HA3	2.314	3.2	1,863	2,460	BG1/AB1
LC1	0.947	1.3	762	1,007	BG2
Brumby Common Ln	0.500	0.7	403	532	BG1/AB1
LC2	0.983	1.4	792	1,045	BG1/AB1
Access Road Phase 1	0.663	0.9	534	705	BG1/AB1
Access Road Phase 2	0.841	1.2	677	894	BG1/AB1
<b>Phase 1 Total</b>	<b>14.753</b>	<b>20.7</b>	<b>11,876</b>	<b>15,682</b>	
HA4	3.711	5.2	2,987	3,945	BG3
HA5	1.331	1.9	1,072	1,415	BG3
HA6	3.569	5.0	2,873	3,794	BG4/AB3
HA7	4.447	6.2	3,580	4,728	BG4/AB3
HA8	4.051	5.7	3,261	4,306	BG4/AB3
HA9	4.079	5.7	3,284	4,336	BG3
NHA1	2.266	3.2	1,824	2,409	BG4/AB3
UA1	1.020	1.4	821	1,084	BG3
E1	2.513	3.5	2,023	2,671	BG4/AB3
Future Access Roads EW	0.737	1.0	593	783	BG4/AB3
Future Access Roads NS	1.083	1.5	871	1,151	BG4/AB3
<b>Future Phase Total</b>	<b>28.808</b>	<b>40.3</b>	<b>23,190</b>	<b>30,622</b>	
<b>Site-Wide Total</b>	<b>43.561</b>	<b>61.0</b>	<b>35,066</b>	<b>46,305</b>	

Using this output against the conveyance strategy the combined attenuation requirements for the allocated attenuation areas has been summarised:

Attenuation Reference	Catchment Area (ha)	Discharge rate (l/s)	Attenuation range	
			Lower (m <sup>3</sup> )	Upper (m <sup>3</sup> )
BG1	13.806	19.3	11,114	14,676
BG2	0.947	1.3	762	1,007
BG3	9.858	13.8	7,936	10,479
BG4	18.666	26.1	15,026	19,842

Project Number: <b>Site Wide</b>	Page # <b>VALUE!</b>
Project Name: <b>Hargreaves Land Ltd</b>	Rev. <b>16.01.2024</b>
Plot Reference / Zone: <b>LIN-BWB-DDG-XX-CA-D-0001-SW Assessment</b>	Stage <b>KMJ</b>
Client: <b>Surface Water Drainage Design</b>	Date <b>00/01/1900</b>
File Ref: <b>0</b>	Prepared by <b>0</b>
Document Title: <b>0</b>	Authorised by <b>00/01/1900</b>

Parcel Reference	Typical approach feasible?	Notes
HA1	N	EBWD between parcel and BG1
HA3	N	EBWD between parcel and BG1
AB2 (for use as housing)	N	EBWD between parcel and BG1
HA4	N	EBWD between parcel and BG1
Access Roads 1	Y	Swale alongside road, before outfall into EBWD
LC1	N	VIA BG2
LC2	Y	EBWD between parcel and BG2
HA8	Y	VIA existing drain, diverted into BG3
HA9	Y	VIA existing drain, diverted into BG3
HA10	Y	VIA existing drain, diverted into BG3
HA11	Y	VIA existing drain, diverted into BG3
NHA 1	Y	VIA existing drain, diverted into BG3
E1	Y	VIA BG3
Access Roads 2	Y	VIA BG3
HA5	Y	VIA BG4
HA6	Y	VIA BG4
HA7	Y	VIA BG4
UA1	Y	VIA BG4

**Appendix 8: Drainage Model**

BWB Consulting Ltd		Page 1
5th Floor, Waterfront House 35 Station Street Nottingham, NG2 3DQ		Lincolnshire Lakes Phase 1
Date 12/08/2025 16:10 File LIN-BWB-XX-XX-DR-C-0500...		Designed by Amaad Biag Checked by Kristen Jones
Innovyze		Network 2020.1



STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	1	PIMP (%)	100
M5-60 (mm)	18.300	Add Flow / Climate Change (%)	0
Ratio R	0.401	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	5	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

# - Indicates pipe length does not match coordinates  
« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
3.000	150.000#	0.131	1145.0	0.000	6.00	0.0	0.600	2 \_ /	500	1:2 Ditch	🔒
3.001	12.207#	0.024	508.6	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	🔒
3.002	11.343#	0.023	493.2	0.000	0.00	0.0	0.600	2 \_ /	500	1:2 Ditch	🔒
3.003	100.000#	0.107	934.6	0.000	0.00	0.0	0.600	2 \_ /	500	1:2 Ditch	🔒
4.000	58.079	0.061	952.1	0.000	5.00	0.0	0.600	2 \_ /	500	1:2 Ditch	🔒
5.000	19.529	0.561	34.8	0.277	5.00	0.0	0.600	o	300	Pipe/Conduit	🔒
4.001	37.552	0.037	1014.9	0.000	0.00	0.0	0.600	2 \_ /	500	1:2 Ditch	🔒

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
3.000	5.00	9.14	1.716	0.000	0.0	0.0	0.0	0.80	262.5	0.0
3.001	5.00	9.33	1.585	0.000	0.0	0.0	0.0	1.07	303.4	0.0
3.002	5.00	9.49	1.561	0.000	0.0	0.0	0.0	1.22	402.0	0.0
3.003	5.00	11.38	1.538	0.000	0.0	0.0	0.0	0.88	291.0	0.0
4.000	5.00	6.11	1.700	0.000	0.0	0.0	0.0	0.87	288.2	0.0
5.000	5.00	5.12	2.200	0.277	0.0	0.0	0.0	2.67	189.0	3.8
4.001	5.00	6.85	1.639	0.277	0.0	0.0	0.0	0.85	279.0	3.8



Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design
4.002	26.829	0.042	638.8	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		
6.000	15.036	0.026	578.3	3.688	5.00	0.0	0.600	o	900	Pipe/Conduit		
4.003	70.594	0.076	928.9	0.000	0.00	0.0	0.600	2 \_ /	500	1:2 Ditch		
7.000	19.547	1.008	19.4	0.315	5.00	0.0	0.600	o	300	Pipe/Conduit		
4.004	119.472	0.123	971.3	0.000	0.00	0.0	0.600	2 \_ /	500	1:2 Ditch		
8.000	28.747	0.046	624.9	0.432	5.00	0.0	0.600	o	375	Pipe/Conduit		
8.001	22.258	0.026	856.1	0.000	0.00	0.0	0.600	2 \_ /	500	1:2 Ditch		
8.002	19.957	0.040	498.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		
8.003	10.376	0.005	2075.2	0.983	0.00	0.0	0.600	2 \_ /	500	1:2 Ditch		
9.000	34.286	0.138	248.4	2.314	5.00	0.0	0.600	o	450	Pipe/Conduit		
8.004	62.378	0.043	1450.7	0.000	0.00	0.0	0.600	2 \_ /	500	1:2 Ditch		
10.000	30.871	0.647	47.7	0.348	5.00	0.0	0.600	o	300	Pipe/Conduit		
8.005	62.915	0.204	308.4	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	I.Area (ha)	Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
4.002	5.00	7.32	1.602	0.277	0.0	0.0	0.0	0.96	270.3	3.8
6.000	5.00	5.19	1.586	3.688	0.0	0.0	0.0	1.30	824.3	49.9
4.003	5.00	8.65	1.560	3.965	0.0	0.0	0.0	0.88	291.9	53.7
7.000	5.00	5.09	2.492	0.315	0.0	0.0	0.0	3.59	253.5	4.3
4.004	5.00	10.95	1.484	4.280	0.0	0.0	0.0	0.86	285.3	58.0
8.000	5.00	5.67	1.800	0.432	0.0	0.0	0.0	0.72	79.2	5.8
8.001	5.00	6.07	1.679	0.432	0.0	0.0	0.0	0.92	304.2	5.8
8.002	5.00	6.55	1.653	0.432	0.0	0.0	0.0	0.70	49.3	5.8
8.003	5.00	6.84	1.608	1.415	0.0	0.0	0.0	0.59	194.0	19.2
9.000	5.00	5.44	1.746	2.314	0.0	0.0	0.0	1.29	204.4	31.3
8.004	5.00	8.32	1.608	3.729	0.0	0.0	0.0	0.71	232.8	50.5
10.000	5.00	5.23	2.212	0.348	0.0	0.0	0.0	2.28	161.3	4.7
8.005	5.00	9.07	1.565	4.077	0.0	0.0	0.0	1.38	390.6	55.2

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design
11.000	14.514	0.019	763.9	4.816	5.00	0.0	0.600	o	525	Pipe/Conduit		🔒
12.000	49.350	1.142	43.2	0.169	5.00	0.0	0.600	o	225	Pipe/Conduit		🔒
4.005	28.618	0.031	923.2	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit		🔒
13.000	24.629	0.270	91.2	0.165	5.00	0.0	0.600	o	225	Pipe/Conduit		🔒
4.006	32.062	0.020	1603.1	0.000	0.00	0.0	0.600	2 \_ /	500	1:2 Ditch		🔒
4.007	11.121	0.010	1112.1	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit		🔒
3.004	35.000#	0.031	1129.0	0.000	0.00	0.0	0.600	o	750	Pipe/Conduit		🔒
14.000	400.000	0.580	689.7	0.663	6.00	0.0	0.600	2 \_ /	500	1:2 Ditch		🔒
14.001	10.000	0.050	200.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit		🔒

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
11.000	5.00	5.30	1.380	4.816	0.0	0.0	0.0	0.80	173.7	65.2
12.000	5.00	5.41	2.503	0.169	0.0	0.0	0.0	2.00	79.3	2.3
4.005	5.00	11.55	1.361	13.342	0.0	0.0	0.0	0.79	224.3	180.7
13.000	5.00	5.30	1.600	0.165	0.0	0.0	0.0	1.37	54.5	2.2
4.006	5.00	12.35	1.330	13.507	0.0	0.0	0.0	0.67	221.2	182.9
4.007	5.00	12.69	1.310	13.507	0.0	0.0	0.0	0.53	59.1«	182.9
3.004	5.00	13.40	1.431	13.507	0.0	0.0	0.0	0.82	364.1	182.9
14.000	5.00	12.48	1.615	0.663	0.0	0.0	0.0	1.03	339.4	9.0
14.001	5.00	12.63	1.035	0.663	0.0	0.0	0.0	1.11	78.3	9.0



Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backs (mm)
HW 4	2.950	1.234	Junction		3.000	1.716	500				
11	2.950	1.365	Open Manhole	10000	3.001	1.585	600	3.000	1.585	500	
14	2.950	1.389	Open Manhole	10000	3.002	1.561	500	3.001	1.561	600	
15	2.950	1.412	Junction		3.003	1.538	500	3.002	1.538	500	
HW 6	3.136	1.436	Junction		4.000	1.700	500				
Gully 4	3.643	1.443	Open Manhole	1200	5.000	2.200	300				
Jnctn 2	3.200	1.561	Junction		4.001	1.639	500	4.000	1.639	500	
								5.000	1.639	300	
HW 7	3.100	1.498	Open Manhole	10000	4.002	1.602	600	4.001	1.602	500	
HW 9	3.100	1.514	Open Manhole	1800	6.000	1.586	900				
HW 8	3.050	1.490	Open Manhole	10000	4.003	1.560	500	4.002	1.560	600	
								6.000	1.560	900	
Gully 3	3.492	1.000	Open Manhole	1200	7.000	2.492	300				
Jnctn	2.950	1.466	Junction		4.004	1.484	500	4.003	1.484	500	
								7.000	1.484	300	
MH	2.886	1.086	Open Manhole	1350	8.000	1.800	375				
HW 13	3.000	1.321	Open Manhole	10000	8.001	1.679	500	8.000	1.754	375	
HW 14	3.000	1.347	Open Manhole	10000	8.002	1.653	300	8.001	1.653	500	
HW 15	3.000	1.392	Open Manhole	10000	8.003	1.608	500	8.002	1.613	300	
HA3 Stub	3.100	1.354	Open Manhole	1350	9.000	1.746	450				
HW 16	3.100	1.497	Open Manhole	10000	8.004	1.608	500	8.003	1.603	500	
								9.000	1.608	450	
Gully 5	3.212	1.000	Open Manhole	1200	10.000	2.212	300				
HW 17	2.950	1.385	Open Manhole	10000	8.005	1.565	600	8.004	1.565	500	
								10.000	1.565	300	
HW 19	3.100	1.720	Open Manhole	1500	11.000	1.380	525				
Gully 2	3.503	1.000	Open Manhole	1200	12.000	2.503	225				
HW 21	3.000	1.639	Open Manhole	10000	4.005	1.361	600	4.004	1.361	500	
								8.005	1.361	600	
								11.000	1.361	525	
								12.000	1.361	225	
Gully 1	3.073	1.473	Open Manhole	1200	13.000	1.600	225				
HW 22	3.000	1.670	Open Manhole	10000	4.006	1.330	500	4.005	1.330	600	
								13.000	1.330	225	
HW 23	3.300	1.990	Open Manhole	10000	4.007	1.310	375	4.006	1.310	500	
MH2 - Flow	2.950	1.650	Open Manhole	1800	3.004	1.431	750	3.003	1.431	500	
								4.007	1.300	375	
23	2.950	1.550	Open Manhole	1800		OUTFALL		3.004	1.400	750	



Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
HW24	2.500	0.885	Junction		14.000	1.615	500				
FC2	2.500	1.465	Junction		14.001	1.035	300	14.000	1.035	500	
	2.300	1.315	Open Manhole	0		OUTFALL		14.001	0.985	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
HW 4	486495.591	409834.522			No Entry	
HW 6	486798.638	409609.651			No Entry	
Gully 4	486745.155	409620.169	486745.155	409620.169	Required	
Jnctn 2	486748.736	409639.367			No Entry	
HW 7	486714.929	409655.716	486714.929	409655.716	Required	
HW 9	486694.504	409673.368	486694.504	409673.368	Required	
HW 8	486688.388	409659.631	486688.388	409659.631	Required	
Gully 3	486621.723	409645.357	486621.723	409645.357	Required	
Jnctn	486617.965	409664.539			No Entry	
MH	486572.161	409510.289	486572.161	409510.289	Required	
HW 13	486543.894	409515.518	486543.894	409515.518	Required	
HW 14	486543.227	409537.766	486543.227	409537.766	Required	

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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
HW 15	486542.945	409557.722	486542.945	409557.722	Required	
HA3 Stub	486579.950	409565.783	486579.950	409565.783	Required	
HW 16	486545.719	409567.720	486545.719	409567.720	Required	
Gully 5	486555.360	409602.186	486555.360	409602.186	Required	
HW 17	486541.930	409629.983	486541.930	409629.983	Required	
HW 19	486504.538	409689.453	486504.538	409689.453	Required	
Gully 2	486542.328	409652.309	486542.328	409652.309	Required	
HW 21	486499.046	409676.018	486499.046	409676.018	Required	
Gully 1	486483.322	409657.461	486483.322	409657.461	Required	
HW 22	486470.537	409678.512	486470.537	409678.512	Required	
HW 23	486438.597	409681.306	486438.597	409681.306	Required	
MH2 - Flow	486427.559	409682.670	486427.559	409682.670	Required	
23	486418.738	409690.976			No Entry	

PIPELINE SCHEDULES for Storm

Upstream Manhole

# - Indicates pipe length does not match coordinates

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
3.000	2 \_/\	500	HW 4	2.950	1.716	0.934	Junction	
3.001	o	600	11	2.950	1.585	0.765	Open Manhole	10000
3.002	2 \_/\	500	14	2.950	1.561	1.089	Open Manhole	10000
3.003	2 \_/\	500	15	2.950	1.538	1.112	Junction	
4.000	2 \_/\	500	HW 6	3.136	1.700	1.136	Junction	
5.000	o	300	Gully 4	3.643	2.200	1.143	Open Manhole	1200
4.001	2 \_/\	500	Jnctn 2	3.200	1.639	1.261	Junction	
4.002	o	600	HW 7	3.100	1.602	0.898	Open Manhole	10000
6.000	o	900	HW 9	3.100	1.586	0.614	Open Manhole	1800
4.003	2 \_/\	500	HW 8	3.050	1.560	1.190	Open Manhole	10000
7.000	o	300	Gully 3	3.492	2.492	0.700	Open Manhole	1200
4.004	2 \_/\	500	Jnctn	2.950	1.484	1.166	Junction	

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
3.000	150.000#	1145.0	11	2.950	1.585	1.065	Open Manhole	10000
3.001	12.207#	508.6	14	2.950	1.561	0.789	Open Manhole	10000
3.002	11.343#	493.2	15	2.950	1.538	1.112	Junction	
3.003	100.000#	934.6	MH2 - Flow	2.950	1.431	1.219	Open Manhole	1800
4.000	58.079	952.1	Jnctn 2	3.200	1.639	1.261	Junction	
5.000	19.529	34.8	Jnctn 2	3.200	1.639	1.261	Junction	
4.001	37.552	1014.9	HW 7	3.100	1.602	1.198	Open Manhole	10000
4.002	26.829	638.8	HW 8	3.050	1.560	0.890	Open Manhole	10000
6.000	15.036	578.3	HW 8	3.050	1.560	0.590	Open Manhole	10000
4.003	70.594	928.9	Jnctn	2.950	1.484	1.166	Junction	
7.000	19.547	19.4	Jnctn	2.950	1.484	1.166	Junction	
4.004	119.472	971.3	HW 21	3.000	1.361	1.339	Open Manhole	10000



PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
8.000	o	375	MH	2.886	1.800	0.711	Open Manhole	1350
8.001	2 \_ /	500	HW 13	3.000	1.679	1.021	Open Manhole	10000
8.002	o	300	HW 14	3.000	1.653	1.047	Open Manhole	10000
8.003	2 \_ /	500	HW 15	3.000	1.608	1.092	Open Manhole	10000
9.000	o	450	HA3 Stub	3.100	1.746	0.904	Open Manhole	1350
8.004	2 \_ /	500	HW 16	3.100	1.608	1.192	Open Manhole	10000
10.000	o	300	Gully 5	3.212	2.212	0.700	Open Manhole	1200
8.005	o	600	HW 17	2.950	1.565	0.785	Open Manhole	10000
11.000	o	525	HW 19	3.100	1.380	1.195	Open Manhole	1500
12.000	o	225	Gully 2	3.503	2.503	0.775	Open Manhole	1200
4.005	o	600	HW 21	3.000	1.361	1.039	Open Manhole	10000
13.000	o	225	Gully 1	3.073	1.600	1.248	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
8.000	28.747	624.9	HW 13	3.000	1.754	0.871	Open Manhole	10000
8.001	22.258	856.1	HW 14	3.000	1.653	1.047	Open Manhole	10000
8.002	19.957	498.9	HW 15	3.000	1.613	1.087	Open Manhole	10000
8.003	10.376	2075.2	HW 16	3.100	1.603	1.197	Open Manhole	10000
9.000	34.286	248.4	HW 16	3.100	1.608	1.042	Open Manhole	10000
8.004	62.378	1450.7	HW 17	2.950	1.565	1.085	Open Manhole	10000
10.000	30.871	47.7	HW 17	2.950	1.565	1.085	Open Manhole	10000
8.005	62.915	308.4	HW 21	3.000	1.361	1.039	Open Manhole	10000
11.000	14.514	763.9	HW 21	3.000	1.361	1.114	Open Manhole	10000
12.000	49.350	43.2	HW 21	3.000	1.361	1.414	Open Manhole	10000
4.005	28.618	923.2	HW 22	3.000	1.330	1.070	Open Manhole	10000
13.000	24.629	91.2	HW 22	3.000	1.330	1.445	Open Manhole	10000

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
4.006	2 \_ /	500	HW 22	3.000	1.330	1.370	Open Manhole	10000
4.007	o	375	HW 23	3.300	1.310	1.615	Open Manhole	10000
3.004	o	750	MH2 - Flow	2.950	1.431	0.769	Open Manhole	1800
14.000	2 \_ /	500	HW24	2.500	1.615	0.585	Junction	
14.001	o	300	FC2	2.500	1.035	1.165	Junction	

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
4.006	32.062	1603.1	HW 23	3.300	1.310	1.690	Open Manhole	10000
4.007	11.121	1112.1	MH2 - Flow	2.950	1.300	1.275	Open Manhole	1800
3.004	35.000#	1129.0	23	2.950	1.400	0.800	Open Manhole	1800
14.000	400.000	689.7	FC2	2.500	1.035	1.165	Junction	
14.001	10.000	200.0		2.300	0.985	1.015	Open Manhole	0

Free Flowing Outfall Details for Storm


Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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3.004	23	2.950	1.400	0.000	1800	0
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Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
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14.001		2.300	0.985	0.000	0	0
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Online Controls for Storm

Hydro-Brake® Optimum Manhole: MH2 - Flow, DS/PN: 3.004, Volume (m³): 469.6

Unit Reference	MD-SHE-0181-1680-1200-1680
Design Head (m)	1.200
Design Flow (l/s)	16.8
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	181
Invert Level (m)	1.431
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	16.8
Flush-Flo™	0.369	16.8
Kick-Flo®	0.814	14.0
Mean Flow over Head Range	-	14.4

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.4	1.200	16.8	3.000	26.0	7.000	39.1
0.200	15.8	1.400	18.1	3.500	28.0	7.500	40.5
0.300	16.6	1.600	19.3	4.000	29.9	8.000	41.7
0.400	16.8	1.800	20.4	4.500	31.6	8.500	43.0
0.500	16.5	2.000	21.4	5.000	33.3	9.000	44.2
0.600	16.2	2.200	22.4	5.500	34.8	9.500	45.4
0.800	14.3	2.400	23.4	6.000	36.3		
1.000	15.4	2.600	24.3	6.500	37.8		

Hydro-Brake® Optimum Manhole: FC2, DS/PN: 14.001, Volume (m³): 803.6

Unit Reference	MD-SHE-0075-2500-1000-2500
Design Head (m)	1.000
Design Flow (l/s)	2.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	75
Invert Level (m)	1.035
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

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Hydro-Brake® Optimum Manhole: FC2, DS/PN: 14.001, Volume (m³): 803.6

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	2.5
Flush-Flo™	0.307	2.5
Kick-Flo®	0.627	2.0
Mean Flow over Head Range	-	2.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.1	1.200	2.7	3.000	4.1	7.000	6.2
0.200	2.4	1.400	2.9	3.500	4.5	7.500	6.4
0.300	2.5	1.600	3.1	4.000	4.7	8.000	6.6
0.400	2.5	1.800	3.3	4.500	5.0	8.500	6.8
0.500	2.4	2.000	3.4	5.000	5.3	9.000	7.0
0.600	2.1	2.200	3.6	5.500	5.5	9.500	7.1
0.800	2.3	2.400	3.7	6.000	5.7		
1.000	2.5	2.600	3.9	6.500	6.0		

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Storage Structures for Storm

Tank or Pond Manhole: HW 9, DS/PN: 6.000

Invert Level (m) 1.600

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	200.0	0.400	500.0	0.800	800.0	1.200	1100.0
0.100	275.0	0.500	575.0	0.900	875.0	1.300	1175.0
0.200	350.0	0.600	650.0	1.000	950.0	1.400	1250.0
0.300	425.0	0.700	725.0	1.100	1025.0	1.500	1325.0

Tank or Pond Manhole: MH, DS/PN: 8.000

Invert Level (m) 1.800

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	100.0	0.200	320.0	0.400	540.0
0.100	210.0	0.300	430.0		

Tank or Pond Manhole: HA3 Stub, DS/PN: 9.000

Invert Level (m) 1.746

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	50.0	0.400	250.0	0.800	450.0	1.200	650.0
0.100	100.0	0.500	300.0	0.900	500.0	1.300	700.0
0.200	150.0	0.600	350.0	1.000	550.0	1.400	700.0
0.300	200.0	0.700	400.0	1.100	600.0	1.500	700.0

Tank or Pond Manhole: HW 19, DS/PN: 11.000

Invert Level (m) 1.380

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	100.0	0.400	600.0	0.800	1100.0	1.200	1600.0
0.100	225.0	0.500	725.0	0.900	1225.0	1.300	1725.0
0.200	350.0	0.600	850.0	1.000	1350.0	1.400	1850.0
0.300	475.0	0.700	975.0	1.100	1475.0	1.500	1975.0

Tank or Pond Manhole: FC2, DS/PN: 14.001

Invert Level (m) 1.035


Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.000	0.0	0.200	7490.0	0.400	11002.0	0.600	12436.0
0.100	2770.0	0.300	9915.0	0.500	11710.0	0.700	13164.0

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Tank or Pond Manhole: FC2, DS/PN: 14.001

Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )	Depth (m)	Area (m <sup>2</sup> )
0.800	13949.0	0.900	14879.0	1.000	15595.0		

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Storm

Simulation Criteria

Areal Reduction Factor 1.000      Additional Flow - % of Total Flow 0.000  
Hot Start (mins)                      0                      MADD Factor \* 10m<sup>3</sup>/ha Storage 0.000  
Hot Start Level (mm)                      0                      Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500      Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0      Number of Storage Structures 5  
Number of Online Controls 2      Number of Time/Area Diagrams 0  
Number of Offline Controls 1      Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model                      FSR                      Ratio R 0.401  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm)                      18.400 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm)                      300.0  
Analysis Timestep 2.5 Second Increment (Extended)  
DTS Status                      OFF  
DVD Status                      ON  
Inertia Status                      ON

Profile(s)                      Summer and Winter  
Duration(s) (mins)                      15, 30, 60, 120, 180, 240, 360, 480, 600,  
720, 960, 1440  
Return Period(s) (years)                      1, 30, 100  
Climate Change (%)                      0, 35, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
3.000	HW 4	960 Winter	1	+0%				
3.001	11	960 Winter	1	+0%	30/60 Summer			
3.002	14	960 Winter	1	+0%				
3.003	15	960 Winter	1	+0%				
4.000	HW 6	960 Winter	1	+0%				
5.000	Gully 4	15 Winter	1	+0%	30/30 Winter			
4.001	Jnctn 2	960 Winter	1	+0%				
4.002	HW 7	960 Winter	1	+0%	30/15 Summer			
6.000	HW 9	960 Winter	1	+0%	30/30 Winter			
4.003	HW 8	960 Winter	1	+0%	100/600 Winter	100/180 Winter		
7.000	Gully 3	15 Winter	1	+0%	100/60 Winter			
4.004	Jnctn	960 Winter	1	+0%		100/180 Winter		
8.000	MH	960 Winter	1	+0%	30/15 Winter	100/180 Winter		
8.001	HW 13	960 Winter	1	+0%				
8.002	HW 14	960 Winter	1	+0%	1/30 Winter			
8.003	HW 15	960 Winter	1	+0%				
9.000	HA3 Stub	720 Winter	1	+0%	30/15 Summer			
8.004	HW 16	960 Winter	1	+0%				



1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
3.000	HW 4	2.139	-0.811	0.000	0.00		0.0	OK
3.001	11	2.139	-0.046	0.000	0.03		4.3	OK
3.002	14	2.139	-0.811	0.000	0.00		5.5	OK
3.003	15	2.139	-0.811	0.000	0.00		5.7	OK
4.000	HW 6	2.174	-0.962	0.000	0.00		0.0	OK
5.000	Gully 4	2.295	-0.205	0.000	0.22		35.4	OK
4.001	Jnctn 2	2.174	-1.026	0.000	0.00		1.3	OK
4.002	HW 7	2.174	-0.028	0.000	0.01		1.4	OK
6.000	HW 9	2.175	-0.311	0.000	0.07		24.6	OK
4.003	HW 8	2.174	-0.876	0.000	0.00		20.8	OK
7.000	Gully 3	2.579	-0.213	0.000	0.18		40.3	OK
4.004	Jnctn	2.171	-0.779	0.000	0.00		21.2	OK
8.000	MH	2.175	0.000	0.000	0.04		2.4	OK
8.001	HW 13	2.173	-0.827	0.000	0.00		2.8	OK
8.002	HW 14	2.173	0.220	0.000	0.08		3.2	SURCHARGED
8.003	HW 15	2.173	-0.827	0.000	0.00		3.7	OK
9.000	HA3 Stub	2.196	0.000	0.000	0.11		20.5	OK
8.004	HW 16	2.173	-0.927	0.000	0.00		15.1	OK

PN	US/MH Name	Level Exceeded
3.000	HW 4	
3.001	11	
3.002	14	
3.003	15	
4.000	HW 6	
5.000	Gully 4	
4.001	Jnctn 2	
4.002	HW 7	
6.000	HW 9	
4.003	HW 8	1
7.000	Gully 3	
4.004	Jnctn	
8.000	MH	4
8.001	HW 13	
8.002	HW 14	
8.003	HW 15	
9.000	HA3 Stub	
8.004	HW 16	




1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
10.000	Gully 5	15 Winter	1	+0%	30/15 Summer	100/15 Winter	
8.005	HW 17	960 Winter	1	+0%	1/480 Winter		
11.000	HW 19	960 Winter	1	+0%	1/15 Winter		
12.000	Gully 2	15 Winter	1	+0%	30/15 Winter	100/15 Winter	
4.005	HW 21	960 Winter	1	+0%	1/60 Summer		
13.000	Gully 1	960 Winter	1	+0%	1/15 Summer		
4.006	HW 22	960 Winter	1	+0%			
4.007	HW 23	960 Winter	1	+0%	1/15 Summer		
3.004	MH2 - Flow	960 Winter	1	+0%	30/60 Summer		1/240 Winter
14.000	HW24	15 Winter	1	+0%			
14.001	FC2	960 Winter	1	+0%	30/120 Summer		

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
10.000	Gully 5		2.325	-0.187	0.000	0.30			44.5
8.005	HW 17		2.172	0.007	0.000	0.04			13.5
11.000	HW 19		2.172	0.267	0.000	0.50			41.4
12.000	Gully 2		2.585	-0.143	0.000	0.28			21.2
4.005	HW 21		2.169	0.208	0.000	0.52			73.8
13.000	Gully 1		2.163	0.338	0.000	0.03			1.5
4.006	HW 22		2.162	-0.838	0.000	0.01			65.9
4.007	HW 23		2.154	0.469	0.000	1.14			53.0
3.004	MH2 - Flow	60	2.139	-0.042	0.000	0.06	18.2		16.7
14.000	HW24		1.753	-0.747	0.000	0.02			78.3
14.001	FC2		1.193	-0.142	0.000	0.04			2.3

PN	US/MH Name	Status	Level Exceeded
10.000	Gully 5	OK	1
8.005	HW 17	SURCHARGED	
11.000	HW 19	SURCHARGED	
12.000	Gully 2	OK	1
4.005	HW 21	SURCHARGED	
13.000	Gully 1	SURCHARGED	
4.006	HW 22	OK	
4.007	HW 23	SURCHARGED	
3.004	MH2 - Flow	OK	
14.000	HW24	OK	
14.001	FC2	OK*	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Storm

Simulation Criteria

Areal Reduction Factor 1.000      Additional Flow - % of Total Flow 0.000  
Hot Start (mins)                      0                      MADD Factor \* 10m<sup>3</sup>/ha Storage 0.000  
Hot Start Level (mm)                      0                      Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500      Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0      Number of Storage Structures 5  
Number of Online Controls 2      Number of Time/Area Diagrams 0  
Number of Offline Controls 1      Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model                      FSR                      Ratio R 0.401  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm)                      18.400 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm)                      300.0  
Analysis Timestep 2.5 Second Increment (Extended)  
DTS Status                      OFF  
DVD Status                      ON  
Inertia Status                      ON

Profile(s)                      Summer and Winter  
Duration(s) (mins)                      15, 30, 60, 120, 180, 240, 360, 480, 600,  
720, 960, 1440  
Return Period(s) (years)                      1, 30, 100  
Climate Change (%)                      0, 35, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
3.000	HW 4	240 Winter	30	+35%				
3.001	11	240 Winter	30	+35%	30/60 Summer			
3.002	14	240 Winter	30	+35%				
3.003	15	240 Winter	30	+35%				
4.000	HW 6	360 Winter	30	+35%				
5.000	Gully 4	360 Winter	30	+35%	30/30 Winter			
4.001	Jnctn 2	360 Winter	30	+35%				
4.002	HW 7	360 Winter	30	+35%	30/15 Summer			
6.000	HW 9	360 Winter	30	+35%	30/30 Winter			
4.003	HW 8	360 Winter	30	+35%	100/600 Winter	100/180 Winter		
7.000	Gully 3	360 Winter	30	+35%	100/60 Winter			
4.004	Jnctn	360 Winter	30	+35%		100/180 Winter		
8.000	MH	360 Winter	30	+35%	30/15 Winter	100/180 Winter		
8.001	HW 13	360 Winter	30	+35%				
8.002	HW 14	360 Winter	30	+35%	1/30 Winter			
8.003	HW 15	240 Winter	30	+35%				
9.000	HA3 Stub	240 Winter	30	+35%	30/15 Summer			
8.004	HW 16	240 Winter	30	+35%				



30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Storm

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m <sup>3</sup> )	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
3.000	HW 4	2.209	-0.741	0.000	0.00		0.0	OK
3.001	11	2.209	0.024	0.000	0.02		3.3	SURCHARGED
3.002	14	2.209	-0.741	0.000	0.00		3.9	OK
3.003	15	2.209	-0.741	0.000	0.00		4.0	OK
4.000	HW 6	2.787	-0.349	0.000	0.00		0.1	OK
5.000	Gully 4	2.791	0.291	0.000	0.10		16.2	SURCHARGED
4.001	Jnctn 2	2.787	-0.413	0.000	0.00		15.3	OK
4.002	HW 7	2.786	0.584	0.000	0.14		28.6	SURCHARGED
6.000	HW 9	2.790	0.304	0.000	0.43		154.7	SURCHARGED
4.003	HW 8	2.786	-0.264	0.000	0.01		90.0	FLOOD RISK
7.000	Gully 3	2.723	-0.069	0.000	0.08		18.7	OK
4.004	Jnctn	2.718	-0.232	0.000	0.01		89.6	FLOOD RISK*
8.000	MH	2.674	0.499	0.000	0.19		12.7	FLOOD RISK
8.001	HW 13	2.671	-0.329	0.000	0.01		14.6	OK
8.002	HW 14	2.671	0.718	0.000	0.44		17.0	SURCHARGED
8.003	HW 15	2.676	-0.324	0.000	0.01		18.6	OK
9.000	HA3 Stub	2.738	0.542	0.000	0.62		111.3	SURCHARGED
8.004	HW 16	2.676	-0.424	0.000	0.02		111.6	OK

PN	US/MH Name	Level Exceeded
3.000	HW 4	
3.001	11	
3.002	14	
3.003	15	
4.000	HW 6	
5.000	Gully 4	
4.001	Jnctn 2	
4.002	HW 7	
6.000	HW 9	
4.003	HW 8	1
7.000	Gully 3	
4.004	Jnctn	
8.000	MH	4
8.001	HW 13	
8.002	HW 14	
8.003	HW 15	
9.000	HA3 Stub	
8.004	HW 16	



30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)  
for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
10.000	Gully 5	240	Winter	30	+35%	30/15 Summer	100/15 Winter
8.005	HW 17	240	Winter	30	+35%	1/480	Winter
11.000	HW 19	240	Winter	30	+35%	1/15	Winter
12.000	Gully 2	15	Winter	30	+35%	30/15 Winter	100/15 Winter
4.005	HW 21	240	Winter	30	+35%	1/60	Summer
13.000	Gully 1	240	Winter	30	+35%	1/15	Summer
4.006	HW 22	240	Winter	30	+35%		
4.007	HW 23	240	Winter	30	+35%	1/15	Summer
3.004	MH2 - Flow	240	Winter	30	+35%	30/60	Summer
14.000	HW24	15	Winter	30	+35%		1/240 Winter
14.001	FC2	1440	Winter	30	+35%	30/120	Summer

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
10.000	Gully 5		2.647	0.135	0.000	0.19			27.7
8.005	HW 17		2.635	0.470	0.000	0.30			103.9
11.000	HW 19		2.649	0.744	0.000	1.76			147.3
12.000	Gully 2		2.831	0.103	0.000	0.89			67.9
4.005	HW 21		2.619	0.658	0.000	1.61			230.6
13.000	Gully 1		2.580	0.755	0.000	0.26			13.1
4.006	HW 22		2.570	-0.430	0.000	0.05			234.4
4.007	HW 23		2.560	0.875	0.000	4.98			232.0
3.004	MH2 - Flow	60	2.209	0.028	0.000	0.06	215.2		16.7
14.000	HW24		1.877	-0.623	0.000	0.07			250.8
14.001	FC2		1.726	0.391	0.000	0.04			2.5

PN	US/MH Name	Status	Level Exceeded
10.000	Gully 5	SURCHARGED	1
8.005	HW 17	SURCHARGED	
11.000	HW 19	SURCHARGED	
12.000	Gully 2	SURCHARGED	1
4.005	HW 21	SURCHARGED	
13.000	Gully 1	SURCHARGED	
4.006	HW 22	OK	
4.007	HW 23	SURCHARGED	
3.004	MH2 - Flow	SURCHARGED	
14.000	HW24	OK	
14.001	FC2	SURCHARGED*	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000      Additional Flow - % of Total Flow 0.000  
Hot Start (mins)                      0                      MADD Factor \* 10m<sup>3</sup>/ha Storage 0.000  
Hot Start Level (mm)                      0                      Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500      Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0      Number of Storage Structures 5  
Number of Online Controls 2      Number of Time/Area Diagrams 0  
Number of Offline Controls 1      Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model                      FSR                      Ratio R 0.401  
Region England and Wales Cv (Summer) 0.750  
M5-60 (mm)                      18.400 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm)                      300.0  
Analysis Timestep 2.5 Second Increment (Extended)  
DTS Status                      OFF  
DVD Status                      ON  
Inertia Status                      ON

Profile(s)                      Summer and Winter  
Duration(s) (mins)                      15, 30, 60, 120, 180, 240, 360, 480, 600,  
720, 960, 1440  
Return Period(s) (years)                      1, 30, 100  
Climate Change (%)                      0, 35, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
3.000	HW 4	1440 Winter	100	+40%			
3.001	11	1440 Winter	100	+40%	30/60 Summer		
3.002	14	1440 Winter	100	+40%			
3.003	15	1440 Winter	100	+40%			
4.000	HW 6	360 Winter	100	+40%			
5.000	Gully 4	360 Winter	100	+40%	30/30 Winter		
4.001	Jnctn 2	360 Winter	100	+40%			
4.002	HW 7	360 Winter	100	+40%	30/15 Summer		
6.000	HW 9	360 Winter	100	+40%	30/30 Winter		
4.003	HW 8	600 Winter	100	+40%	100/600 Winter	100/180 Winter	
7.000	Gully 3	240 Winter	100	+40%	100/60 Winter		
4.004	Jnctn	180 Winter	100	+40%		100/180 Winter	
8.000	MH	360 Winter	100	+40%	30/15 Winter	100/180 Winter	
8.001	HW 13	360 Winter	100	+40%			
8.002	HW 14	360 Winter	100	+40%	1/30 Winter		
8.003	HW 15	240 Winter	100	+40%			
9.000	HA3 Stub	180 Winter	100	+40%	30/15 Summer		
8.004	HW 16	240 Winter	100	+40%			



100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap. (l/s)	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
3.000	HW 4		2.234	-0.716	0.000	0.00			0.0
3.001	11		2.234	0.049	0.000	0.03			4.3
3.002	14		2.234	-0.716	0.000	0.00			6.0
3.003	15		2.235	-0.715	0.000	0.00			5.7
4.000	HW 6		3.053	-0.083	0.000	0.00			0.1
5.000	Gully 4		3.061	0.561	0.000	0.13			21.9
4.001	Jnctn 2		3.053	-0.147	0.000	0.00			17.1
4.002	HW 7		3.051	0.849	0.000	0.16			30.8
6.000	HW 9		3.059	0.573	0.000	0.44			159.6
4.003	HW 8		3.050	0.000	0.000	0.02			105.6
7.000	Gully 3		2.961	0.169	0.000	0.16			34.2
4.004	Jnctn		2.950	0.000	0.002	0.01			108.5
8.000	MH		2.943	0.768	31.010	0.30			19.8
8.001	HW 13		2.940	-0.060	0.000	0.01			22.7
8.002	HW 14		2.939	0.986	0.000	0.71			27.2
8.003	HW 15		2.947	-0.053	0.000	0.01			31.0
9.000	HA3 Stub		3.013	0.817	0.000	0.87			155.5
8.004	HW 16		2.946	-0.154	0.000	0.02			117.2

PN	US/MH Name	Status	Level Exceeded
3.000	HW 4	OK	
3.001	11	SURCHARGED	
3.002	14	OK	
3.003	15	OK	
4.000	HW 6	FLOOD RISK*	
5.000	Gully 4	SURCHARGED	
4.001	Jnctn 2	FLOOD RISK*	
4.002	HW 7	FLOOD RISK	
6.000	HW 9	FLOOD RISK	
4.003	HW 8	FLOOD	1
7.000	Gully 3	SURCHARGED	
4.004	Jnctn	FLOOD	
8.000	MH	FLOOD	4
8.001	HW 13	FLOOD RISK	
8.002	HW 14	FLOOD RISK	
8.003	HW 15	FLOOD RISK	
9.000	HA3 Stub	FLOOD RISK	
8.004	HW 16	FLOOD RISK	



100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
10.000	Gully 5	15 Winter	100	+40%	30/15 Summer	100/15 Winter	
8.005	HW 17	240 Winter	100	+40%	1/480 Winter		
11.000	HW 19	180 Winter	100	+40%	1/15 Winter		
12.000	Gully 2	15 Winter	100	+40%	30/15 Winter	100/15 Winter	
4.005	HW 21	240 Winter	100	+40%	1/60 Summer		
13.000	Gully 1	240 Winter	100	+40%	1/15 Summer		
4.006	HW 22	240 Winter	100	+40%			
4.007	HW 23	240 Winter	100	+40%	1/15 Summer		
3.004	MH2 - Flow	1440 Winter	100	+40%	30/60 Summer		1/240 Winter
14.000	HW24	1440 Winter	100	+40%			
14.001	FC2	1440 Winter	100	+40%	30/120 Summer		

PN	US/MH Name	Overflow Act.	Water Surcharged Flooded			Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
			Level (m)	Depth (m)	Volume (m³)				
10.000	Gully 5		3.212	0.700	0.086	1.29		189.3	
8.005	HW 17		2.869	0.704	0.000	0.30		106.2	
11.000	HW 19		2.882	0.977	0.000	2.58		215.4	
12.000	Gully 2		3.503	0.775	0.306	1.14		86.7	
4.005	HW 21		2.854	0.893	0.000	2.03		290.5	
13.000	Gully 1		2.787	0.962	0.000	0.36		17.8	
4.006	HW 22		2.778	-0.222	0.000	0.06		292.0	
4.007	HW 23		2.763	1.078	0.000	6.15		286.6	
3.004	MH2 - Flow	60	2.235	0.054	0.000	0.06	216.9	16.7	
14.000	HW24		2.209	-0.291	0.000	0.06		229.3	
14.001	FC2		1.928	0.593	0.000	0.04		2.5	

PN	US/MH Name	Status	Level Exceeded
10.000	Gully 5	FLOOD	1
8.005	HW 17	FLOOD RISK	
11.000	HW 19	FLOOD RISK	
12.000	Gully 2	FLOOD	1
4.005	HW 21	FLOOD RISK	
13.000	Gully 1	FLOOD RISK	
4.006	HW 22	FLOOD RISK	
4.007	HW 23	SURCHARGED	
3.004	MH2 - Flow	SURCHARGED	
14.000	HW24	FLOOD RISK*	
14.001	FC2	SURCHARGED*	

**Appendix 9: STW Pre-development Enquiry**

# WONDERFUL ON TAP



BWB Consulting Ltd,  
Whitehall Waterfront,  
2 Riverside Way,  
Leeds,  
LS1 4EH.

FAO: Jairobi Arnold

13<sup>th</sup> July 2023

Dear Jairobi,

**Severn Trent Water Ltd**  
Leicester Water Centre  
Gorse Hill  
Anstey  
Leicester  
LE7 7GU

Contact: Emma Nowak  
Mob: 07970361864

Email:  
[Network.Solutions@SevernTrent.co.uk](mailto:Network.Solutions@SevernTrent.co.uk)

Our ref: 1088039

**Proposed Residential Development at: Lincolnshire Lakes,  
Phase 1, Burringham Road, Scunthorpe, DN17 1YH.**

**X: 486611 / Y: 409508**

I refer to your Development Enquiry Request submitted in respect of the above site. Please find enclosed the sewer records that are included in the fee together with the Supplementary Guidance Notes (SGN) referred to below.

**Public Sewers in Site – Required Protection**

There are no public sewers crossing the proposed development.

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 which are not shown on the statutory sewer records but are located in 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**

The proposed number of dwellings is not confirmed for this application. I have sent further correspondence via email and voicemail requesting this but have currently not received a response. Please confirm this information as soon as possible. Looking at the plans the development proposed looks to be substantial, approximately 2000-3000 dwellings.

There is substantial growth within the vicinity of the development site, and surrounding areas have had previous modelling

# WONDERFUL ON TAP



assessments to determine the impact on the receiving development. Additional development in the area triggered a 'High' flooding impact and 'High' Operation impact which has determined that network improvements are required to enable future development in the area.

It is not clear if the proposed development has been included within the model and this will need confirming from our Tactical Asset Planning team to determine whether this development is accommodated for a potential growth scheme. If this site has not been accommodated, further modelling will be required. I would therefore be grateful if you would forward as soon as possible the following details:

- Proposed submission of your Planning Application
- Proposed planned start and completion date.
- Proposed point of connection(s) on the public sewer
- Whether a pumped connection is needed and the proposed pump rate
- Planned occupation date

## **Surface Water Drainage**

Under the terms of Section H of the Building Regulations 2000, the disposal of surface water by means of soakaways should be considered as the primary method. If these are found to be unsuitable, satisfactory evidence will need to be submitted. The evidence should be either percolation test results or by the submission of a statement from the SI consultant (extract or a supplementary letter).

Note, STW will need to be fully satisfied that all sustainable options have been satisfied before discharge to network is considered, we expect all surface water from the development to be drained in a sustainable way to the nearest watercourse or land drainage channel.

Subject to the above, sewer records show drainage ditches and watercourses within the vicinity of the site. All surface water for the site should be able to gravitate to any of these with flow rates subject to LLFA approval.

Surface water is not proposed to enter the public network.

**New Connections**

For any new connections including the use, reuse and indirect to the public sewerage system, the developer will need to submit Section 106 application. Our Developer Services department are responsible for handling all such enquiries and applications. To contact them for an application form and associated guidance notes, please call 0800 707 6600, email [new.connections@severntrent.co.uk](mailto:new.connections@severntrent.co.uk) or download from [www.stwater.co.uk](http://www.stwater.co.uk)

Please quote the above reference number in any future correspondence (including e-mails) with STW Limited. Please send **all correspondence** to the [network.solutions@severntrent.co.uk](mailto:network.solutions@severntrent.co.uk) email inbox address, a response will be made within 15 days.

If you require a VAT receipt for the application fee please email [MISCINCOME.NC@SEVERNTRENT.CO.UK](mailto:MISCINCOME.NC@SEVERNTRENT.CO.UK) quoting the above Reference Number.

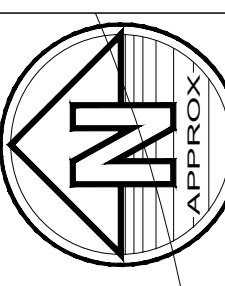
Please note that Developer Enquiry responses are only valid for 6 months from the date of this letter.

Yours sincerely,

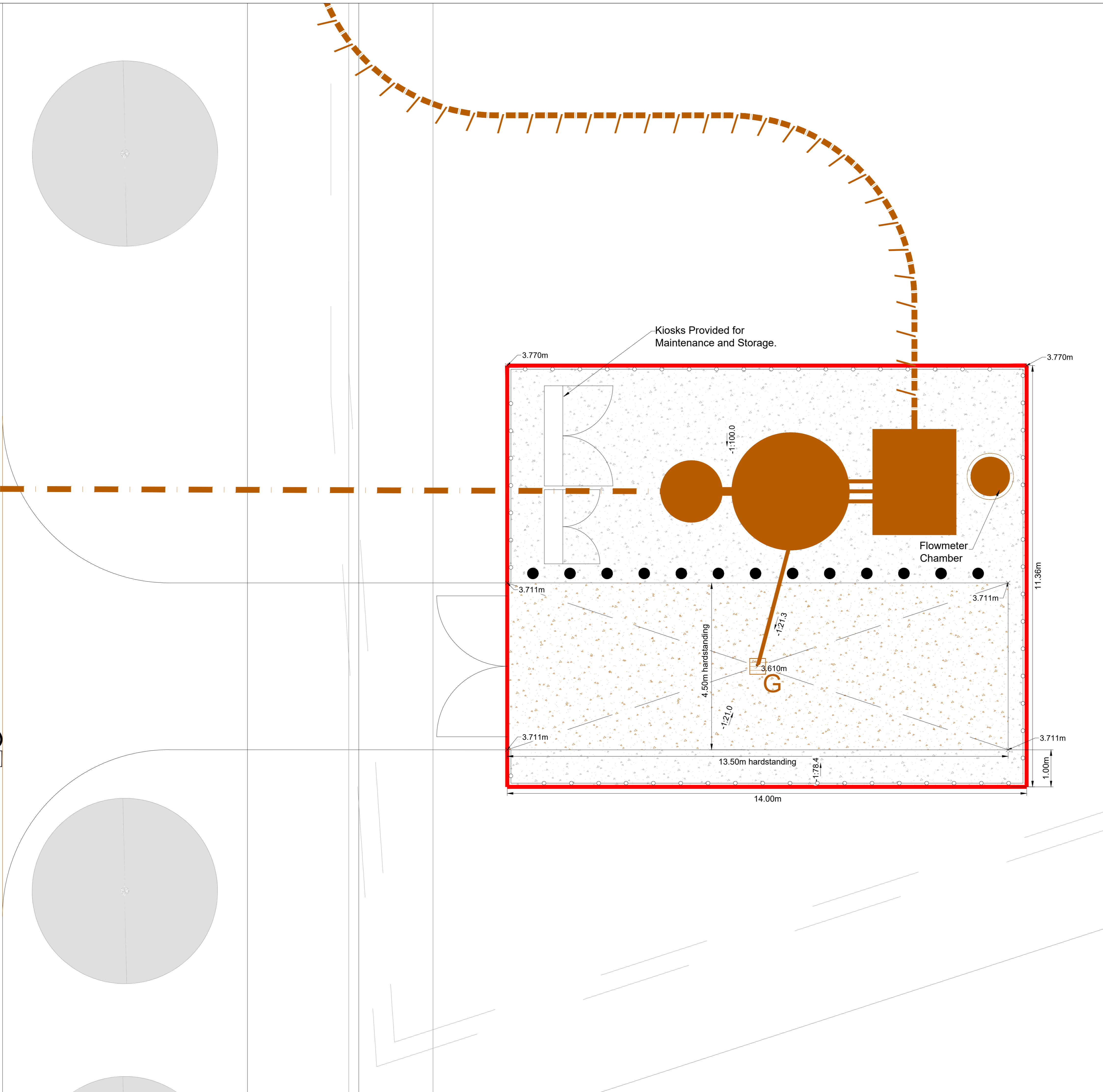
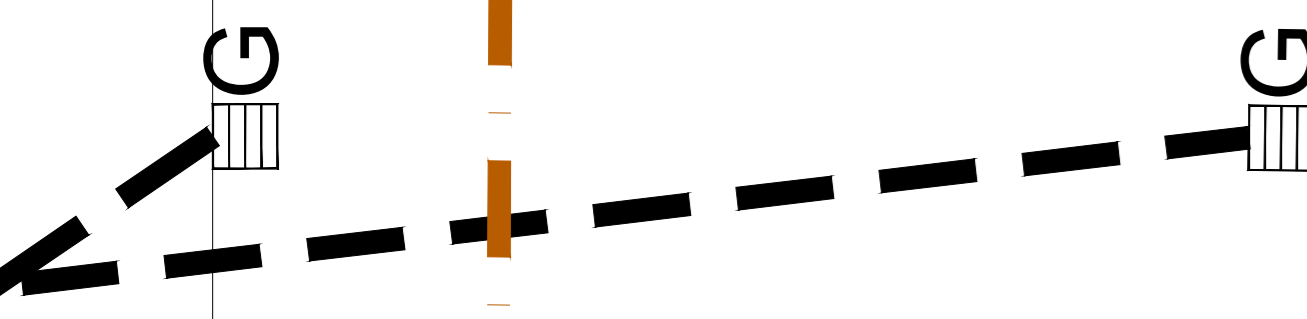


Emma Nowak.  
**Senior Evaluation Technician**  
**Network Solutions**  
**Developer Services**

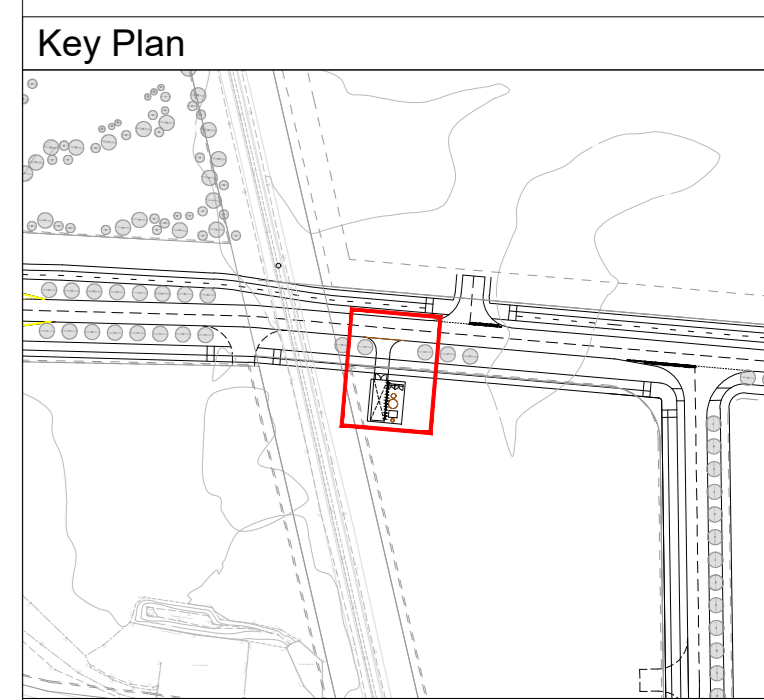
**Appendix 10: Proposed Foul Pumping Station Arrangement**



CL 3.259  
IL -1.757 (225)



- Notes**
- Do not scale this drawing. All dimensions must be checked verified on site, if in doubt ask.
  - This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
  - All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
  - Any discrepancies noted on site are to be reported to the engineer immediately.
  - Refer to drawing LIN-BWB-CIV-XX-D-C-0500 for Foul Drainage Gravity and Rising Main Layout.
  - Refer to drawing LIN-BWB-CDDG-XX-D-C-0561, 0562 and 0563 for Standard Details and Drainage Notes.
  - All adoptable sewer works and materials to be in accordance with Codes for Adoption, the relevant British / European and Severn Trent Water's standards / requirements / addendum to the mechanical and electrical specification and kitemarked.



- Legend**
- Trafficked Concrete Base Construction
  - Non-trafficked Concrete Base Construction
  - Proposed phase 2 foul water gravity drainage
  - Proposed phase 2 foul water raising main
  - Proposed fence/gate dictating boundary. Shown indicatively with specification by architect / landscape architect
  - Pre-cast concrete edging kerb & Pumping Station boundary
  - Proposed Pumping Station Gully
  - Proposed Concrete Bollard

**TABLE 1: Capping Layer and Sub-base Thickness**

Sub-Grade (CBR)	Capping + Sub-base (mm)	Sub-base Only (mm)
<2%	SUB GRADE IMPROVEMENT REQUIRED	
2%	600 + 150	-
2.5%	400 + 150	-
3%	350 + 150	300
4%	300 + 150	275
5%	250 + 150	225
8%	225 + 150	200
10%	175 + 150	175
15%+	-	150

- Notes**
- Capping/sub-base depth depends upon equilibrium CBR testing of sub-grade (the contractor is responsible for undertaking these tests and any subsequent in-situ tests to demonstrate validity of equilibrium testing). Capping/sub-base depths to be in accordance with Table 1.
  - The contractor is responsible for ensuring that the sub-grade is not exposed to inclement weather. Sub-grade only design shall only be used where there is adequate drainage and favourable weather at the time of construction.

Design/Specifications subject to change during detailed design and technical approval process ahead of approval provided by Water Authority.

Internal pipework for pump station and valve chamber shown indicatively. Detailed design of internal pumps, fittings and controls etc. to be designed by specialist designer.

PO1   23.01.25	Preliminary Issue	AB	KMJ
Rev	Date	Details of Issue / Revision	Dw   Rev

- Issues & Revisions**
- Birmingham | 0121 233 3322
  - Leeds | 0113 233 8000
  - London | 020 7407 3879
  - Manchester | 0161 233 4280
  - Nottingham | 0115 924 1100
  - www.bwbconsulting.com

**Client**  
Hargreaves Land Ltd.

**Project Title**  
Phase 1, Lincolnshire Lakes, Scunthorpe

**Drawing Title**  
IIW Information Pack  
Foul Water Pumping Station  
Compound Arrangement Plan

Drawn: A. Bag	Reviewed: K. Jones
BWB Ref: 221638	Date: Jan '25
Scale: A0	Varies
<b>Preliminary</b>	
Project - Originator - Zone - Level - Type - Role - Number	Status Rev
LIN-BWB-CIV-XX-D-C-0565	S1 P01

