

LAND OFF CROSS KEYS LANE AND SHEFFIELD ROAD, HOYLAND, BARNLEY,
SOUTH YORKSHIRE, S74 0PY

FLOOD RISK AND DRAINAGE ASSESSMENT

Final Report v1.0
January 2022

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Prepared by	Rebecca Murphy BSc (Hons) <i>Associate Director</i> Michael Darby MEng (Hons) GradCIWEM GMICE <i>Assistant Engineer</i>
Checked by	Tim Brook BSc (Hons) <i>Principal Engineer</i>
Approved by	Kevin Tilford BSc MSc PhD MBA CEnv CWEM FCIWEM <i>Managing Director</i>

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1 INTRODUCTION

1.1 Purpose of Report

Weetwood Services Ltd ('Weetwood') has been instructed by Lidl Great Britain Ltd to prepare a Flood Risk and Drainage Assessment (FRDA) report to accompany a full planning application for the proposed development of land off Cross Keys Lane and Sheffield Road, Hoyland, Barnsley, South Yorkshire ("the site") as a foodstore for retail use.

The assessment has been undertaken in accordance with the requirements of the revised National Planning Policy Framework (NPPF) updated on 27 July 2021 and the Planning Practice Guidance (PPG) updated on 24 June 2021.

1.2 Structure of the Report

The report is structured as follows:

- Section 1** Introduction and report structure
- Section 2** Provides background information relating to the development site
- Section 3** Presents national and local flood risk and drainage planning policy
- Section 4** Assesses the potential risk of flooding to the application site
- Section 5** Presents an illustrative surface water drainage scheme
- Section 6** Presents an illustrative foul water drainage scheme
- Section 7** Presents a summary of key findings and the recommendations

1.3 Relevant Documents

The assessment has been informed by the following documents:

- Level 1 Strategic Flood Risk Assessment, Barnsley Metropolitan Borough Council, September 2010
- Preliminary Flood Risk Assessment, Barnsley Metropolitan Borough Council, July 2011

2 SITE DETAILS AND PROPOSED DEVELOPMENT

2.1 Site Location

The approximately 0.89 hectare (ha) greenfield site is located to the west of Cross Keys Lane and north of Sheffield Road at Ordnance Survey National Grid Reference SE 351 004, as shown in **Figure 1**.

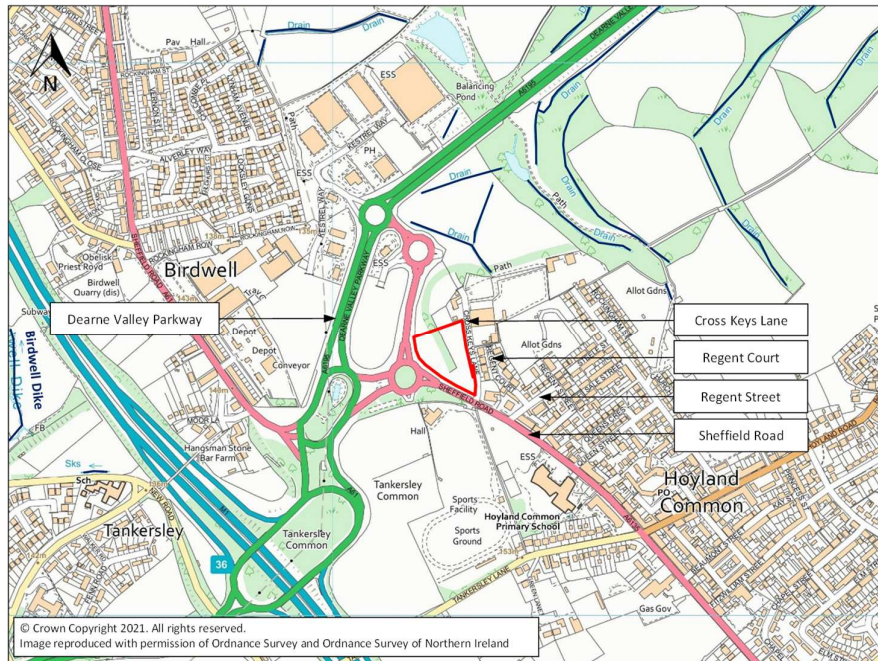


Figure 1: Site Location and Location of Surface Waterbodies

2.2 Existing and Proposed Development

The site is currently undeveloped/greenfield.

The proposed development comprises of the following: a 1,900 sq m gross internal area/1,267 sq m net (sales) Lidl foodstore in the north-eastern/eastern part of the site; circa 107 car parking spaces, vehicular access from Cross Keys Lane, to the south-east; a servicing area to the northern side of the store; and landscaping across the site. The proposed site plan is provided in **Appendix A**.

The PPG classifies retail development as Less Vulnerable to flood risk.

2.3 Surface Waterbodies in the Vicinity of the Site

Birdwell Dike flows in an easterly and then north-westerly direction approximately 700 m to the west of the site. A number of land drains are also located to the north of the site as illustrated in **Figure 1**. These are classified as ordinary watercourses.

2.4 Ground Conditions

A Phase 2 geo-environmental assessment of the site was undertaken by Curtins in December 2021¹. The site investigation comprised seven window sample boreholes and ten trial pits to depths of 0.3 - 3.5 m bgl.

The assessment reported ground conditions to comprise made ground (topsoil) across the whole of the site, typically comprising sandy gravelly clay. The western half of the site (former opencast area) is infilled with

¹ Phase 2 Ground Investigation Report; Proposed Lidl, Cross Keys Lane, Hoyland, Curtins, Report: 078794-CUR-00-XX-RP-GE-001-V01, December 2021

spoil/overburden. This area of the site subsequently comprised made ground (colliery spoil), comprising sandy gravel of shale to a variable thickness of 0.05 to > 4.7 m bgl underlain by clayey gravel of siltstone, sandstone and mudstone. The base of the made ground (colliery spoil) was not identified during the site investigation.

On the eastern side of the site the made ground (topsoil) was underlain by gravelly clay between 0.3 - 2.0 m bgl, and Pennine Middle Coal Measures (Cohesive Natural Deposits) between 1.0 - 29.3 m bgl. The base of the coal measures was again not identified during the site investigation.

Perched water levels across the site were variable. Within the former opencast area shallow groundwater strikes were between 0.3 and 0.9 m bgl, and between 0.8 - 3.1 m bgl across the remainder of the site. Groundwater was not encountered in the shallow monitoring wells installed on the east of the site.

According to the Soilscape soils dataset produced by the Cranfield Soil and AgriFood Institute², soil conditions at the site and within the surrounding area are described as slowly permeable seasonally wet acid loamy and clayey soils.

British Geological Survey mapping of surface geology³ indicates the underlying bedrock formation comprises Pennine Middle Coal Measures Formation – Mudstone, Siltstone and Sandstone in the west of the site and Pennine Middle Coal Measures Formation – Sandstone running through the centre and east of the site from north to south. No superficial deposits are identified.

According to the MAGIC website⁴ the underlying bedrock is classified as a Secondary A aquifer. The site is not shown to be located within a designated groundwater source protection zone.

2.5 Site Levels

A topographic survey of the site has been undertaken by Landform Surveys and is provided in **Appendix B**. This indicates that site levels in the north of the site are in region of 142.2 - 142.8 m AOD rising to 147.3 m AOD in the south. LiDAR data has been used to develop a digital terrain model of the site and surrounding area as illustrated in **Figure 2**.

2.6 Access and Egress

Access and egress to the site will be provided via Cross Keys Lane to the east leading to Sheffield Road (**Figure 1**). Levels on Cross Keys Lane are shown to be in the region of 146.3 - 147.2 m AOD at the location of the proposed vehicular access to the site, rising to 147.5 m AOD on Sheffield Road.

² www.landis.org.uk/soilscape/

³ <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

⁴ <https://magic.defra.gov.uk/MagicMap.aspx>

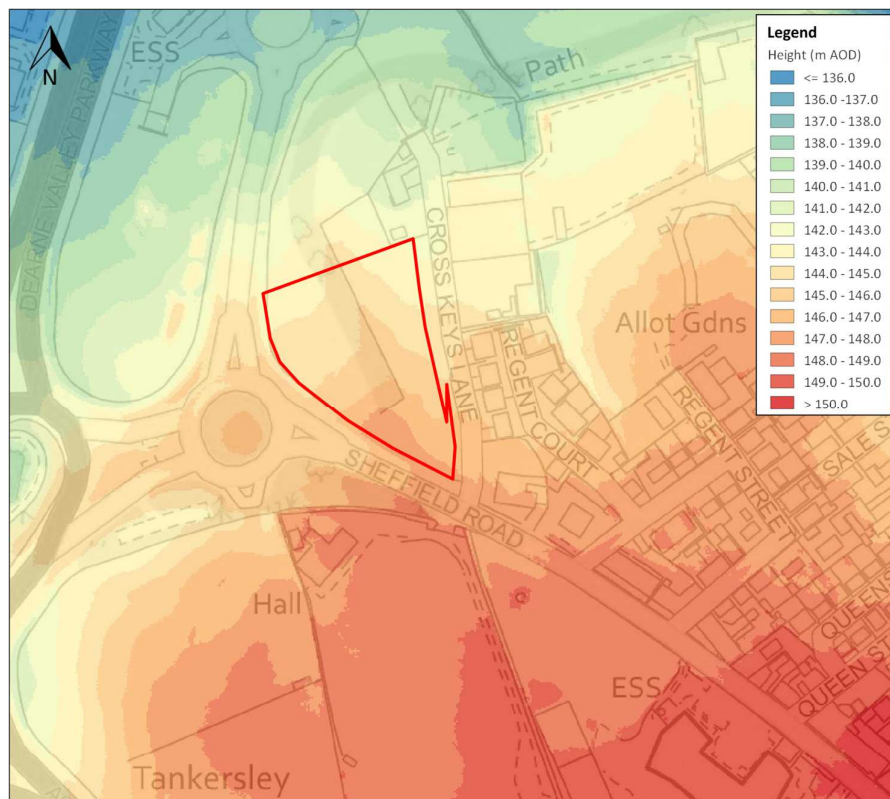


Figure 2: Digital Terrain Model from LiDAR Data

3 PLANNING POLICY AND GUIDANCE

3.1 National Planning Policy and Policy Guidance

The thrust of national planning policy, as articulated in the NPPF is that inappropriate development in areas at risk of flooding should be avoided where possible, as summarised below:

- Inappropriate development in areas at risk of flooding should be avoided and that development should be directed away from areas at highest risk (whether existing or future), but where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere (NPPF para. 159).
- The policy of seeking to steer development to areas with the lowest risk of flooding, from any source, is implemented through the application of the flood risk sequential test. Development should not be allocated or permitted if there are reasonably available sites, appropriate for the proposed development in areas with a lower risk of flooding. The sequential approach should be used in areas known to be at risk now or in the future from any form of flooding (NPPF para. 162).
- If it is not possible for development to be located in zones with a lower risk of flooding (taking into account wider sustainable development objectives) the exception test may have to be applied. The need for the test will depend on the potential vulnerability of the site and of the vulnerability of the development proposed (as set out in Annex 3 of NPPF; also PPG Table 2 and Table 3) (NPPF para. 163). For example, the exception test need not be applied for less vulnerable development in any flood zone, or for more vulnerable development in flood zones 1 or 2.
- Where the exception test must be applied, application of the test for development proposals at the application stage should be informed by a site-specific flood risk assessment. For the test to be passed it should be demonstrated that: (a) the development would provide wider sustainability benefits to the community that outweigh the flood risk; (b) and the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall (NPPF para. 164). Both elements of the test should be satisfied for the development to be permitted (NPPF para. 165).
- Development should not increase flood risk elsewhere (NPPF para. 167).
- Where appropriate, planning applications should be supported by a site-specific flood risk assessment, and development should only be allowed in areas at risk of flooding where the flood risk assessment (and the sequential and exception tests, as required), demonstrate that: a) within the site, the most vulnerable development is located in areas of lowest flood risk (unless there are overriding reasons to prefer a different location); b) the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment; c) the development incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate; d) any residual (flood) risk can be safely managed; and e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan (NPPF para.167).
- NPPF para. 167 references Footnote 55. The footnote states that a site-specific flood risk assessment should be provided for all development in flood zones 2 and 3 [whilst] in flood zone 1, an assessment should accompany all proposals involving: sites of 1 ha or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use (NPPF para. 167).
- Applications for some minor development and changes of use should not be subject to the sequential or exception tests (NPPF para. 168). The exceptions are stated in Footnote 56.
- Major development should incorporate sustainable drainage systems (SuDS) unless there is clear evidence that this would be inappropriate. The systems should: a) take account of advice from the lead local flood authority; b) have appropriate proposed minimum operational standards; c) have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and d) where possible, provide multifunctional benefits (NPPF para. 169).

Guidance on application of the sequential and exception test is provided in the PPG. For example:

- This general approach is designed to ensure that areas at little or no risk of flooding from any source are developed in preference to areas at higher risk. The aim should be to keep development out of medium and high flood risk areas (flood zones 2 and 3) and other areas affected by other sources of flooding where possible (PPG para. 18).
- Where there are no reasonably available sites in flood zone 1, local planning authorities in their decision making should take into account the flood risk vulnerability of land uses and consider reasonably available sites in flood zone 2 (areas with a medium probability of river or sea flooding), applying the Exception Test if required. Only where there are no reasonably available sites in flood zones 1 or 2 should the suitability of sites in flood zone 3 (areas with a high probability of river or sea flooding) be considered, taking into account the flood risk vulnerability of land uses and applying the exception test if required. Within each flood zone, surface water and other sources of flooding also need to be taken into account in applying the sequential approach to the location of development (PPG para. 19).
- The sequential test does not need to be applied for individual developments on sites which have been allocated in development plans through the sequential test, or for applications for minor development or change of use (except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site) (PPG para. 33)
- It should not normally be necessary to apply the sequential test to development proposals in flood zone 1, unless the Strategic Flood Risk Assessment for the area, or other more recent information, indicates there may be flooding issues now or in the future (for example, through the impact of climate change) (PPG para. 33).
- For individual planning applications where there has been no sequential testing of the allocations in the development plan, or where the use of the site being proposed is not in accordance with the development plan, the area to apply the sequential test across will be defined by local circumstances relating to the catchment area for the type of development proposed. For some developments this may be clear, for example, the catchment area for a school. In other cases it may be identified from other Local Plan policies, such as the need for affordable housing within a town centre, or a specific area identified for regeneration. For example, where there are large areas in flood zones 2 and 3 (medium to high probability of flooding) and development is needed in those areas to sustain the existing community, sites outside them are unlikely to provide reasonable alternatives (PPG para. 33).
- When applying the Sequential Test, a pragmatic approach on the availability of alternatives should be taken. For example, in considering planning applications for extensions to existing business premises it might be impractical to suggest that there are more suitable alternative locations for that development elsewhere. For nationally or regionally important infrastructure the area of search to which the Sequential Test could be applied will be wider than the local planning authority boundary.
- Any development proposal should take into account the likelihood of flooding from other sources, as well as from rivers and the sea. The sequential approach to locating development in areas at lower flood risk should be applied to all sources of flooding, including development in an area which has critical drainage problems, as notified to the local planning authority by the Environment Agency, and where the proposed location of the development would increase flood risk elsewhere (PPG para. 33).

3.2 Local Planning Policy and Technical Guidance

The Barnsley Local Plan was adopted by Barnsley Metropolitan Borough Council in January 2019. The following policies are relevant in respect of flood risk and drainage:

Policy CC1; Climate Change

We will seek to reduce the causes of and adapt to the future impacts of climate change by:

- *Giving preference to development of previously developed land in sustainable locations;*
- *Promoting the reduction of greenhouse gas emissions through sustainable design and construction techniques;*

- *Locating and designing development to reduce the risk of flooding;*
- *Promoting the use of [SuDS];*
- *Promoting and supporting the delivery of renewable and low carbon energy; and*
- *Promoting investment in Green Infrastructure to promote and encourage biodiversity gain*

Policy CC3; Flood Risk

The extent and impact of flooding will be reduced by:

- *Not permitting new development where it would be at an unacceptable risk of flooding from any sources of flooding, or would give rise to flooding elsewhere;*
- *Ensuring that in the Functional Floodplain (Flood Zone 3b), only water compatible development or essential infrastructure (subject to the flood risk exception test) will be allowed. In either case it must be demonstrated that there would not be a harmful effect on the ability of this land to store floodwater;*
- *Requiring developers with proposals in Flood Zones 2 and 3 to provide evidence of the sequential test and exception test where appropriate;*
- *Requiring site-specific Flood Risk Assessments for proposals over 1 [ha] in Flood Zone 1 and all proposals in Flood Zones 2 and 3;*
- *Expecting proposals over 1000 sq.m floor space or 0.4 [ha] in Flood Zone 1 to demonstrate how the proposal will make a positive contribution to reducing or managing flood risk;*
- *Expecting all development proposals on brownfield sites to reduce surface water run-off by at least 30% and development on greenfield sites to maintain or reduce existing run-off rates requiring development proposals to use [SuDS] in accordance with policy CC4; and*
- *Using flood resilient design in areas of high flood risk.*

Policy CC4; Sustainable Drainage Systems (SuDS)

All major development will be expected to use [SuDS] to manage surface water drainage, unless it can be demonstrated that all types of SuDS are inappropriate.

The Council will also promote the use of SuDS on minor development.

To enable the Council to determine the suitability of a proposed SuDS scheme:

- *Outline Planning applications must be supported by a conceptual drainage plan and SuDS design statement; and*
- *Detailed Planning applications must be supported by a detailed drainage plan and SuDS design statement, which should contain information on how the SuDS will operate, be managed and maintained for the lifetime of the development.*

3.3 Legislation Originating from the European Union

The Water Framework Directive (WFD) provides a legal framework for the protection, improvement and sustainable use of inland surface waters, groundwater, transitional waters, and coastal waters across England, and seeks to:

- Prevent deterioration in the status of aquatic ecosystems, protect them and improve the ecological condition of waters
- Achieve at least 'good' status for all waterbodies by 2015
- Promote the sustainable use of water as a natural resource
- Conserve habitats and species that depend directly on water
- Progressively reduce or phase out the release of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment
- Progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants; and
- Contribute to mitigating the effects of floods and droughts.

The WFD applies to any proposed development which has the potential to impact on a waterbody. Where this is the case, the Environment Agency may require evidence demonstrating that the proposed development does not compromise the aims of the WFD.

3.4 Environmental Permitting and Land Drainage Consent

Under the Environmental Permitting (England and Wales) Regulations 2016 an Environmental Permit for Flood Risk Activities⁵ is required from the Environment Agency for any permanent or temporary works, including works:

- In, over or under a designated main river
- Within 8 m of the top of bank of a designated main river or of the landward toe of a flood defence (16 m if it is a tidal main river or a sea defence).

In addition, any permanent or temporary works within the floodplain of a designated main river may also require an Environmental Permit for Flood Risk Activities. A permit is separate to and in addition to any planning permission granted.

Land drainage consent may be required from the lead local flood authority or drainage board for work to an ordinary watercourse.

Undertaking activities controlled by local byelaws also requires the relevant consent.

⁵ <https://www.gov.uk/guidance/flood-risk-activities-environmental-permits>

4 REVIEW OF FLOOD RISK

4.1 Historical Records of Flooding

The Environment Agency historic flood map⁶ and Map 2: Historical Flood Events of the 2010 Strategic Flood Risk Assessment do not provide any records of flooding at or within the immediate vicinity of the site.

4.2 Flood Risk from Rivers (and the Sea)

The Environment Agency Flood Map for Planning (Rivers and Sea)⁷ (**Figure 3**) indicates the site to be located in flood zone 1. This is reiterated on Map A-2: Proposed Development Sites and Flood Zones of the 2010 Strategic Flood Risk Assessment. Table 1 of the PPG defines flood zones as follows⁸:

- Flood zone 1: Low Probability. Land having a less than 1 in 1,000 annual probability of river or sea flooding
- Flood zone 2: Medium Probability. Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding
- Flood zone 3a: High Probability. Land having a 1 in 100 or greater annual probability of river flooding or a 1 in 200 or greater annual probability of sea flooding
- Flood zone 3b: Functional Floodplain. Land where water has to flow or be stored in times of flood.

Recognising the above, it is concluded that the site is not at risk of flooding from rivers (or the sea).

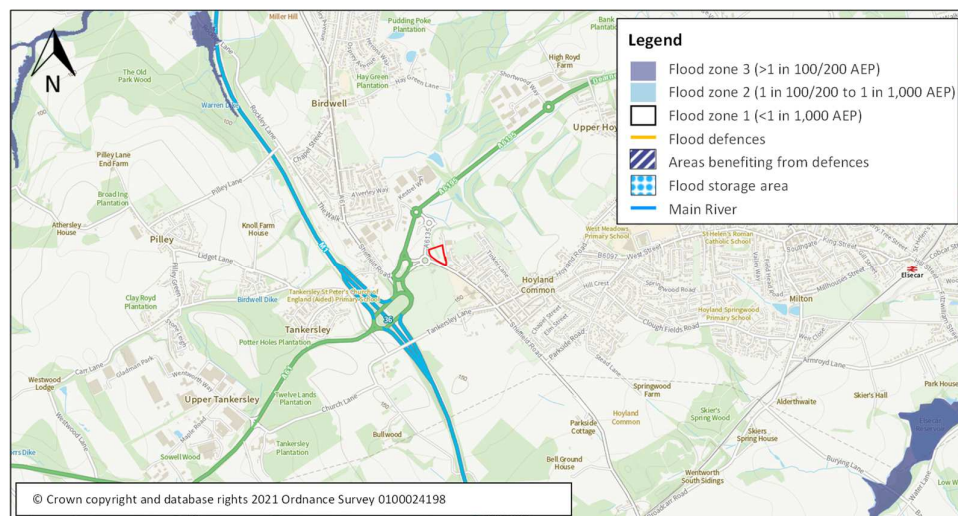


Figure 3: Flood Map for Planning

Source: gov.uk website; Accessed: December 2021

4.3 Flood Risk from Small Watercourses

As detailed in **Section 2.3**, Birdwell Dike is located approximately 700 m to the west of the site, with a number of land drains also located to the north of the site. No modelled information is available for these watercourses. In such instances, the Flood Risk from Surface Water map (**Figure 4**) may be utilised to assess the risk of flooding from these sources.

Based upon this information, it is concluded that the site is not at risk of flooding from small watercourses.

⁶ <https://data.gov.uk/dataset/76292bec-7d8b-43e8-9c98-02734fd89c81/historic-flood-map>

⁷ <https://flood-map-for-planning.service.gov.uk/>

⁸ <https://www.gov.uk/guidance/flood-risk-and-coastal-change#flood-zone-and-flood-risk-tables>

4.4 Flood Risk from Surface Water

Map C-2: Pluvial Flooding Caused by 100 Year Rainstorm of the 2010 Strategic Flood Risk Assessment indicates that the site is not a risk of flooding from surface water.

The Flood Risk from Surface Water map (**Figure 4**) indicates that the site is predominately at 'Very Low' risk of flooding from surface water. However, there is an extremely small area in the north-east of the site (where there is a slight depression in the site topography) that is shown to be at 'Low' risk; however, depths and velocities are below 0.30 m and 0.25 m/s respectively (refer to **Figure 5**).

It is concluded that the site is at a low risk of flooding from surface water.

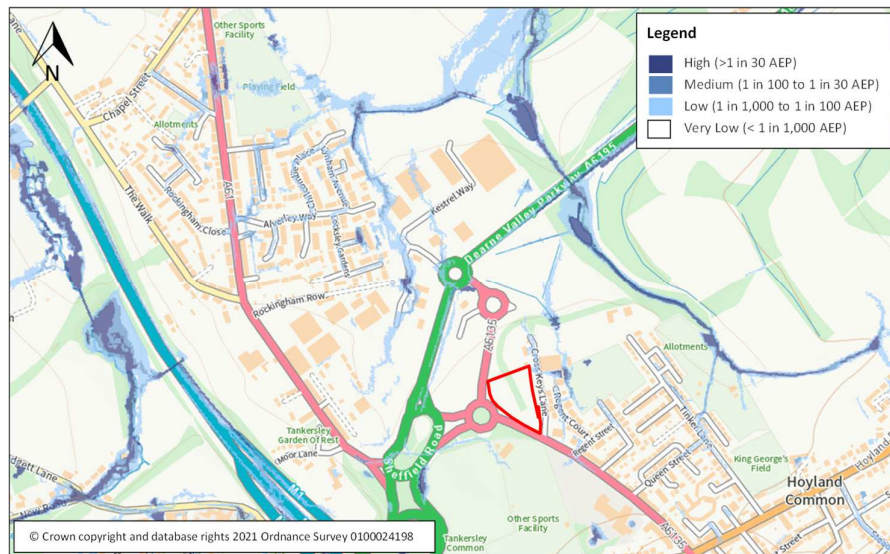


Figure 4: Flood Risk from Surface Water

Source: gov.uk website; Accessed: December 2021

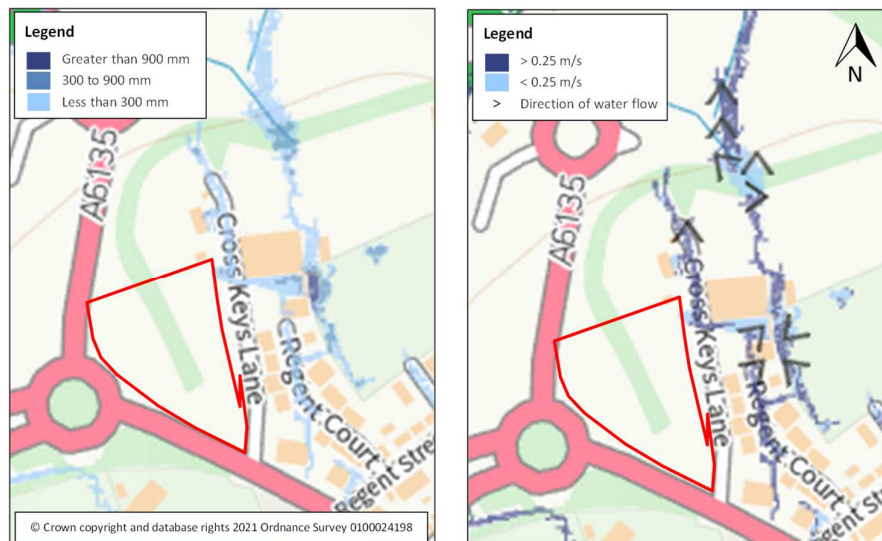


Figure 5: Flood Risk from Surface Water – 'Low' Risk

Source: gov.uk website; Accessed: December 2021

*appropriate for the proposed development in areas with a **lower risk of flooding**. The strategic flood risk assessment will provide the basis for applying this test. The sequential approach should be used in areas known to be at risk now or in the future from any form of flooding." (our emphasis added)*

The approach presented within this report is to assess the risk of flooding from all identified sources to determine whether a flood sequential test is required - i.e. the site has been assessed to establish whether it is an area with a low risk of flooding from any source.

A summary of the risk assessment from all potential sources of flooding using a low, medium and high risk classification is presented in **Table 1**.

It is concluded that the proposals satisfy the requirements of the flood risk sequential test and that no sequential assessment of potential alternative sites is required.

Table 1: Site Summary of Flood Risk from All Sources

Source	Risk Level					Source
	None/Negligible	Very Low	Low	Medium	High	
Sea	✓					a, b
Rivers	✓					a, b
Small watercourses	✓					a, b, c, f
Surface water (pluvial)			✓			b, c
Reservoirs	✓					b, d, f
Canals	✓					b, f
Other water impounding structures	✓					b, f
Groundwater			✓			b, e

Notes - Sources of information: (a) Environment Agency Flood Map for Planning (Rivers and Sea); (b) Strategic Flood Risk Assessment (September 2010); (c) Environment Agency Flood Risk from Surface Water; (d) Environment Agency Flood Risk from Reservoirs; (e) JBA Groundwater Flood Risk Indicator Map; (f) Ordnance Survey mapping.

5 SURFACE WATER MANAGEMENT

5.1 Surface Water Drainage at the Existing Site

A detailed utilities survey was undertaken by Centara Ltd in May 2021 (**Appendix C**). This indicates that there are no existing drainage assets within the vicinity of the site with the exception of highway drainage in Sheffield Road to the west and south of the site.

Yorkshire Water public sewer records (**Appendix D**) were obtained as part of a development enquiry in November 2021. These indicate no public sewers are present within the site boundary. There is a 900 mm diameter public surface water sewer flowing in a northerly direction in Regent Court to the east of the site. This is shown to discharge to an unmarked culvert and/or watercourse approximately 60 m east of the site.

There are also two public combined sewers within the vicinity of the site; one in Regent Court serving residential properties and the head of a 300 mm diameter combined sewer at the intersection of Regent Street and Regent Court flowing in a north-easterly direction.

5.1.1 Existing Runoff Rates

The site has a total area of 0.89 ha; however, for the purposes of this assessment the proposed developable area is taken as approximately 0.695 ha. This excludes all landscaped areas, which are expected to continue to drain as existing.

The greenfield surface water runoff rates for the site, calculated using the ICP SUDS method within MicroDrainage are presented in **Table 2**. Details of the input parameters and the output results are provided in **Appendix E**.

Table 2: Greenfield Runoff Rate

AEP of Rainfall Event	Greenfield Runoff Rate (l/s/ha)	Greenfield Runoff Rate for 0.695 ha Site (l/s)
1 in 1	4.2	2.9
QBAR	4.9	3.4
1 in 30	8.6	6.0
1 in 100	10.2	7.1

5.2 Surface Water Drainage at the Developed Site

5.2.1 Disposal of Surface Water

In accordance with the PPG⁹, surface water runoff should be disposed of according to the following hierarchy: Into the ground (infiltration); To a surface water body; To a surface water sewer, highway drain, or another drainage system; To a combined sewer.

There are no watercourses within the vicinity of the site to which surface water could be disposed. As detailed in **Section 2.4**, ground conditions at the site are of low permeability and preclude the use of soakaways for surface water disposal.

A development enquiry response from Yorkshire Water (**Appendix F**) and further correspondence with its engineering team (**Appendix G**) confirmed that a connection to the 900 mm diameter surface water sewer within Regent Court could be made.

5.2.2 Post Development Impermeable Area

The area of impermeable surfaces within the proposed development has been calculated to be 0.695 ha, based on the proposals within **Appendix A**.

⁹ Paragraph 080, Reference ID: 7-080-20150323

5.2.3 Peak Flow Control

It is proposed to restrict surface water runoff to the existing greenfield QBAR rate of 3.4 l/s post development, as outlined in **Table 2**.

Yorkshire Water has advised (**Appendix G**) that a maximum discharge rate of 3.5 l/s can be accommodated within the 900 mm surface water sewer within Regent Court.

5.2.4 Volume Control

Where reasonably practicable, for greenfield sites, the runoff volume from the proposed development to any highway drain, sewer or surface water body in the 1 in 100 AEP, 6 hour rainfall event should not exceed the greenfield runoff volume for the same event.

The proposed discharge rate will be restricted to the QBAR rate of 3.4 l/s for all events up to and including the 1 in 100 AEP plus climate change event. As such, there will be a reduction in runoff volume during the 1 in 30 AEP and 1 in 100 AEP event from the site and will not exceed the existing greenfield runoff rates.

5.2.5 Attenuation Storage

Attenuation storage will be provided to restrict surface water runoff generated across roofs and hardstanding.

The attenuation storage facility has been modelled using the Network module of MicroDrainage (**Appendix H**). The required storage volume has been sized to store the 1 in 100 AEP rainfall event including a 40% increase in rainfall intensity to allow for climate change in accordance with Environment Agency guidance¹⁰.

Assuming a peak discharge rate of 3.4 l/s a total storage volume of 523.7 m³ would be required. The storage volume will be predominantly accommodated within a geocellular storage structure beneath the car park, with an area of 240.5 m² and a depth of 2.0 m.

A preliminary surface water drainage layout is provided in **Appendix I** and shows the site will discharge to the public surface water sewer at manhole reference 2401.

5.2.6 Exceedance Routes

Flows resulting from rainfall in excess of the 1 in 100 AEP rainfall event including an allowance for climate change will be managed in exceedance routes. It is assumed that as the development proposals progress, the design of the site would ensure flood flows are directed towards carriageways, with the site being profiled to ensure that flood flows are directed away from built development.

5.2.7 Pollution Control

There is limited potential for SuDS at the site. Therefore, the surface water drainage system will pass through a Class 1 bypass separator prior to discharge to the public surface water sewer within Regent Court.

5.2.8 Adoption and Maintenance of SuDS

The pipe network, designed in accordance with the Design and Construction Guidance¹¹, within the public highway would be offered for adoption by Yorkshire Water.

The pipe network and storage structure within the site may be maintained by a private management company. An indicative maintenance schedule is presented in **Table 3**.

¹⁰ Flood Risk Assessments: climate change allowances (<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>)

¹¹ Design and Construction Guidance for foul and surface water sewers offered for adoption under the Code for adoption agreements for water and sewerage companies operating wholly or mainly in England ("the Code"), Approved Version 2.0, 10 March 2020

Table 3: Maintenance Requirements

Schedule	Required action	Frequency
Geo-cellular attenuation storage tank		
Regular maintenance	Inspect and identify any areas that are not operating correctly	Monthly for 3 months, then annually
	Remove debris from the catchment surface	Monthly
	Remove sediment from internal forebays	Annually, or as required
Remedial action	Repair inlet/outlet and vents	As required
Monitoring	Inspect catchpit manholes and note rate of sediment accumulation	Monthly in the first year and then annually
	Inspect inlet/outlet and vents to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years, or as required
Flow Control Unit		
Routine maintenance	Remove litter and debris and inspect for sediment accumulation	Six Monthly
	Remove sediment from sump	As necessary - Indicated by system inspections
Remedial actions	Replace malfunctioning parts or structures	As required
Monitoring	Inspect for evidence of poor operation	Six Monthly
	Inspect flow control unit and establish appropriate replacement frequencies	Six Monthly
	Inspect sediment accumulation rates and establish appropriate removal frequencies	Monthly during first year of operation, then every six months

6 FOUL WATER MANAGEMENT

6.1 Existing Assets

Yorkshire Water public sewer records (**Appendix D**) indicate that the following wastewater assets are present within the vicinity of the site:

- A 100 mm diameter combined sewer originating within the curtilage of residential properties along Regent Court to the east of the site.
- The head of a 300 mm public combined sewer at the intersection of Regent Street and Regent Court approximately 100 m to the south-east of the site.

The utilities survey (**Appendix C**) confirms that there are no existing foul water sewers within or adjacent to the site.

6.2 New Connections

Yorkshire Water has advised (refer to **Appendix F**) that there is sufficient capacity in the public sewer network to accept foul water from the proposed development. Foul water is to be directed the 300 mm diameter combined sewer within Regent Street.

6.3 Preliminary Drainage Layout

A preliminary foul water drainage layout is provided in **Appendix I**.

7 SUMMARY AND RECOMMENDATIONS

This report has been prepared on behalf of Lidl Great Britain Ltd and relates to the proposed development of land off Cross Keys Lane and Sheffield Road, Hoyland, Barnsley, South Yorkshire as a foodstore for retail use.

The site is located in flood zone 1 and is less than 1.0 ha. As such, the planning application need not be accompanied by a Flood Risk Assessment report. Notwithstanding this, the July 2021 revision to the National Planning Policy Framework states that the flood sequential test is intended to be applied to all sources of flood risk, and not just river/sea flooding.

An assessment of flood risk from all identified potential sources of flooding has therefore been undertaken using best available information to determine whether a flood sequential test is required. A summary of the risk assessment using a low, medium and high risk classification is presented below. It is concluded that the proposals satisfy the requirements of the flood risk sequential test and that no sequential assessment of potential alternative sites is required.

Source	Risk Level				
	None/Negligible	Very Low	Low	Medium	High
Sea	✓				
Rivers	✓				
Small watercourses	✓				
Surface water (pluvial)			✓		
Reservoirs	✓				
Canals	✓				
Other water impounding structures	✓				
Groundwater			✓		

Based on the assessment of flood risk, it is concluded that no specific measures need be implemented to mitigate flood risk, although finished floor levels of the foodstore should be at least 0.15 m above adjacent ground levels with ground levels sloping down from the store unit, in accordance with best practice.

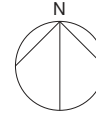
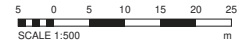
A surface and foul water drainage scheme has been developed:

- Surface water: In accordance with the drainage hierarchy, surface water will discharge to the public surface water sewer within Regent Court at a restricted rate of 3.4 l/s.
- Foul water: Foul water from the developed site will discharge to the existing public combined sewer in Regent Street, an approach formally accepted by Yorkshire Water.

In conclusion, this report demonstrates that the proposed development may be completed in accordance with the requirements of planning policy.

APPENDIX A

Proposed Site Plan



Do not scale this drawing.
Architects are to be notified of any discrepancies.
Contractors must check all dimensions on site.
This drawing is subject to copyright laws and is for use on this project only.
This drawing is to be used solely for the information as titled only.
For other information refer to the latest revision of any cross referenced drawings.
To be read in conjunction with relevant design standards/protocols.

This is a colour drawing. In order to ensure any subsequent reproduction is viewed correctly it should be printed in full colour.

SITE AREA		
	ACRES	HECTARES
SITE APPLICATION BOUNDARY	2.19	0.89

PARKING SCHEDULE

LIDL ACCESSIBLE SPACES	6
LIDL EVC SPACES	2
LIDL PARENT & TODDLER SPACES	9
LIDL STANDARD SPACES	90
GRAND TOTAL	107

KEY:

RETAINING WALL

P2	DRAFT PLANNING ISSUE	19.11.21	MS	JM
P1	DRAFT ISSUE	08.11.21	DM	JM
Rev	Description	Date	Dm	Cld

Status

PLANNING

SMR

SMALLEY MARSEY RISPIN

ARCHITECTS

Floor 2 The Exchange Station Parade Harrogate HG1 1TS
01423 707 757
admin@smrarchitects.co.uk

Project

HOYLAND, CROSS KEYS LANE

Client



Drawing Title

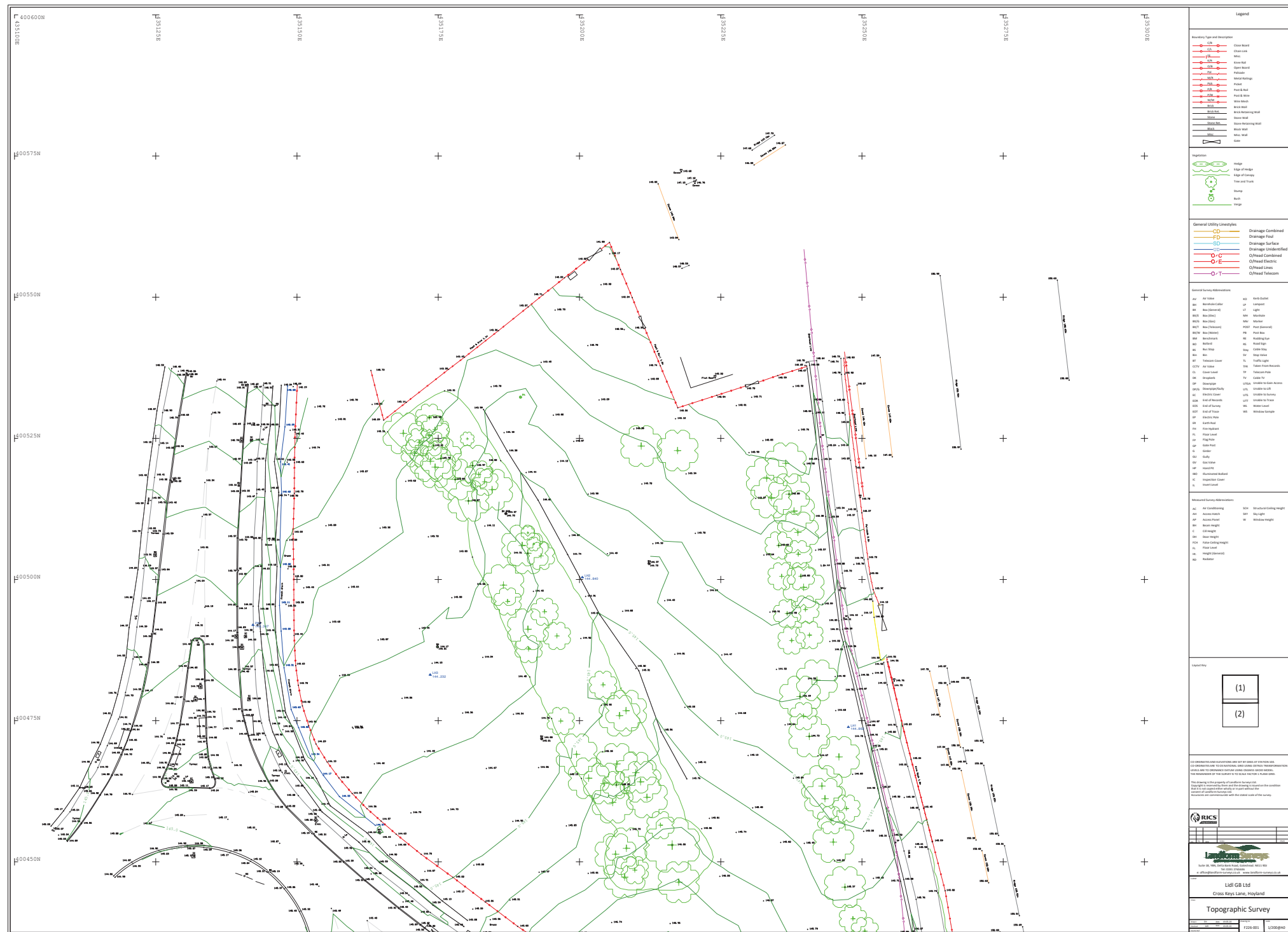
PROPOSED SITE PLAN

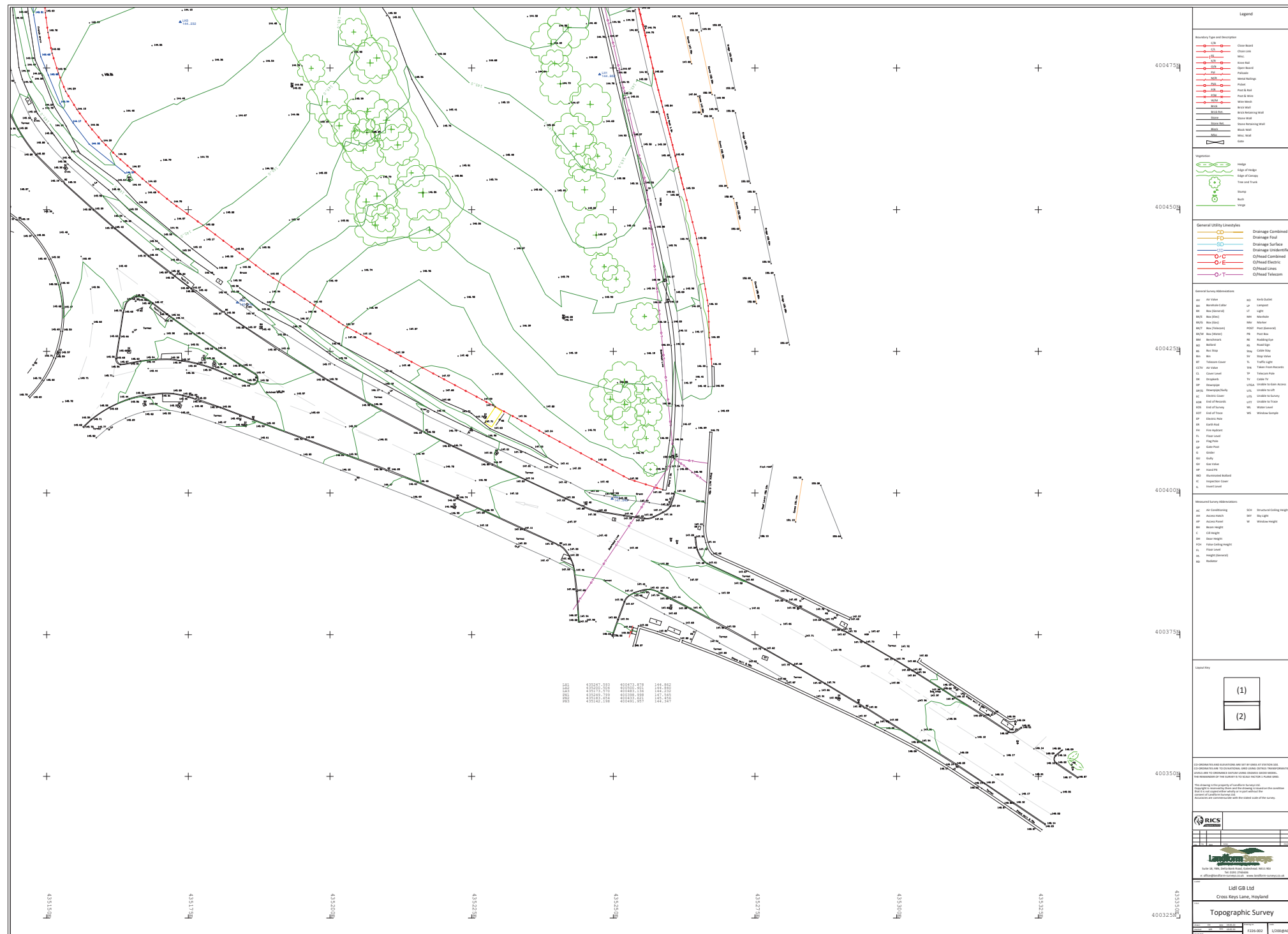
Proj Ref	Origin	Zone	Level	Type	Role	Num	Status	Rev
-- 7579 -	SMR	00	ZZ	DR	A	2003	S3	P2
SMR Job Ref	Sheet	Scale	Drawn					
7200-00-2003	A2	NOTED	BC					



APPENDIX B

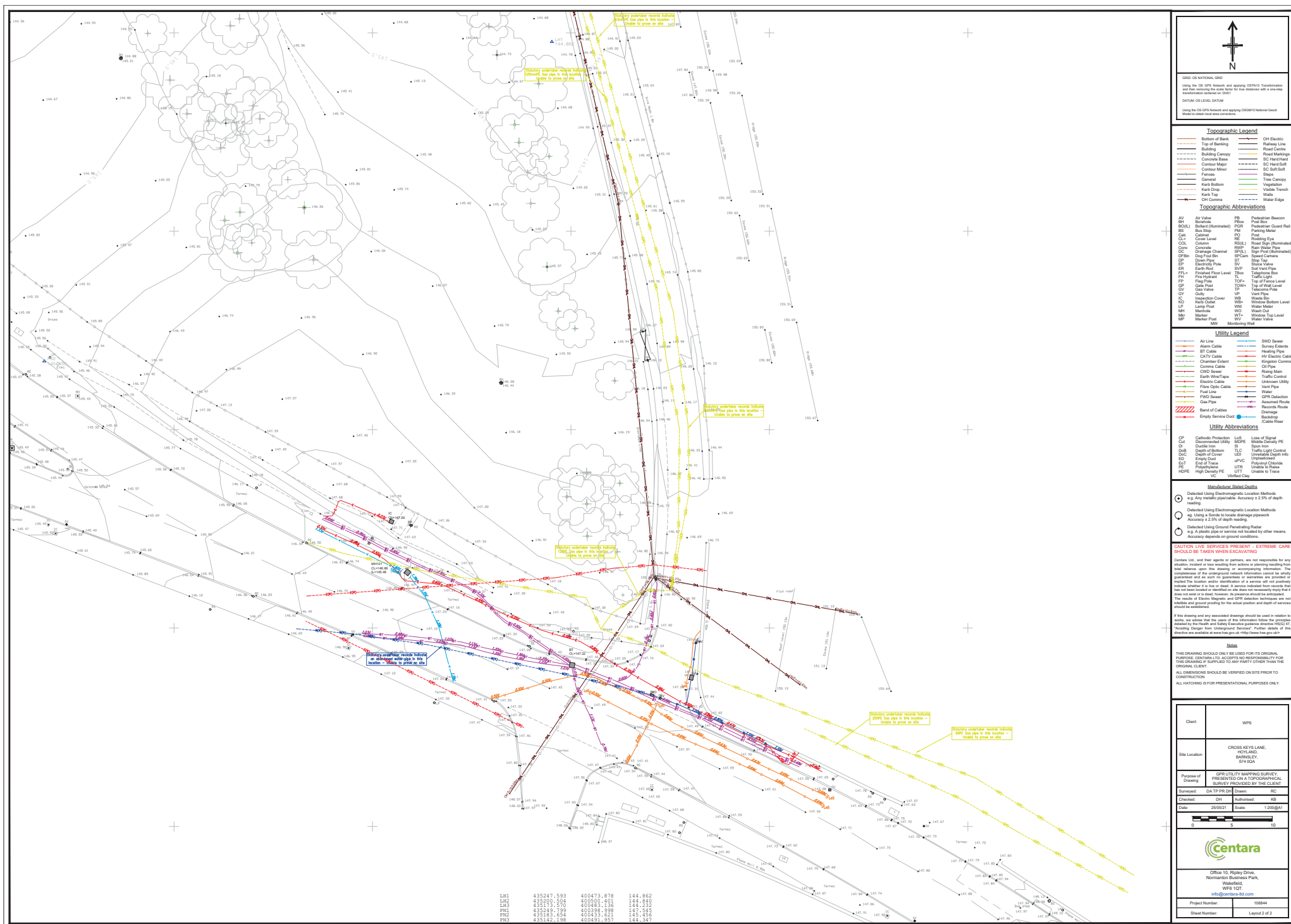
Topographic Survey





APPENDIX C

Utilities Survey



GRID: OS NATIONAL GRID
Using the OS GPS Network and applying OSTN15 Transformation and then removing the scale factor for true distances with a one-step transformation centered on: DHD1

DATUM: OS LEVEL DATUM
Using the OS GPS Network and applying OSGM15 National Geoid Model to obtain local area corrections.

Topographic Legend

Bottom of Bank	OH Electric
Top of Banking	Railway Line
Building	Road Centre
Building Canopy	Road Markings
Concrete Base	SC Hard Hand
Contour Major	SC Hard Soft
Contour Minor	SC Soft Soft
Fences	Shops
General	Town Canopy
Kerb Bottom	Vegetation
Kerb Drop	Visible Trench
OH Corers	Walls
	Water Edge

[illegible]

Utility Legend

	Air Line		SWD Sewer
	Alarm Cable		Survey Extents
	BT Cable		Heating Pipes
	CATV Cable		HV Electric Cable
	Chamber Extent		Kingdom Commens
	Comms Cable		Oil Pipe
	CWD Sewer		Rising Main
	Earth Wire/Tape		Traffic Control
	Electric Cable		Unknown Utility
	Fibre Optic Cable		Vent Pipes
	Fuel Line		Water
	FWD Sewer		GPR Detection
	Gas Pipe		Assumed Route
	Band of Cables		Random Route
	Empty Service Duct		Drainage
			Backdrop
			Cable Riser

CP	Cathodic Protection	LoS	Loss of Signal
Cut	Disconnected Utility	MDPE	Middle Density PE
DI	Ductile Iron	SI	Span Iron
DoB	Depth of Bottom	TLC	Traffic Light Control
DoC	Depth of Cover	UDI	Unavoidable Depth Info Unplacified
ED	Empty Duct	pWVC	Polyvinyl Chloride
EoT	End of Trace	UTR	Unable to Raise
PE	Polyethylene	UTT	Unable to Trace
HDPE	High Density PE		

Manufacturer Stated Depth

- Detected Using Electromagnetic Location Methods
e.g. Any metallic pipe/cable. Accuracy $\pm 2.5\%$ of depth reading.
- Detected Using Electromagnetic Location Methods
e.g. Using a Sonde to locate drainage pipework. Accuracy $\pm 2.5\%$ of depth reading.
- Detected Using Ground Penetrating Radar
e.g. A plastic pipe or service not located by other means. Accuracy depends on ground conditions.

CAUTION LIVE SERVICES PRESENT - EXTREME CARE SHOULD BE TAKEN WHEN EXCAVATING

Centers Ltd., and their agents or partners, are not responsible for any situation, incident or loss resulting from actions or planning resulting from the use of this information. The drawing or actual information and the completeness of the underground network information cannot be wholly guaranteed and as such no guarantees or warranties are provided or implied. The location and/or identification of a service will not positively indicate whether it is live or dead. A service indicated from records that has not been located or identified on site does not necessarily imply that it does not exist or is dead, however, its presence should be anticipated.

Ground Profiling and Ground Mapping for actual position and depth of services is not infallible and ground probing for the location and depth of services should be established.

If this drawing and any associated drawings should be used in relation to works, we advise that the users of this information follow the principles of the 'Avoiding Danger from Underground Services'. Further details of this directive are available at www.hse.gov.uk/au/ <http://www.hse.gov.uk/au/>

Notes

THIS DRAWING SHOULD ONLY BE USED FOR ITS ORIGINAL PURPOSE. CENTARA LTD. ACCEPTS NO RESPONSIBILITY FOR THIS DRAWING IF SUPPLIED TO ANY PARTY OTHER THAN THE ORIGINAL CLIENT.

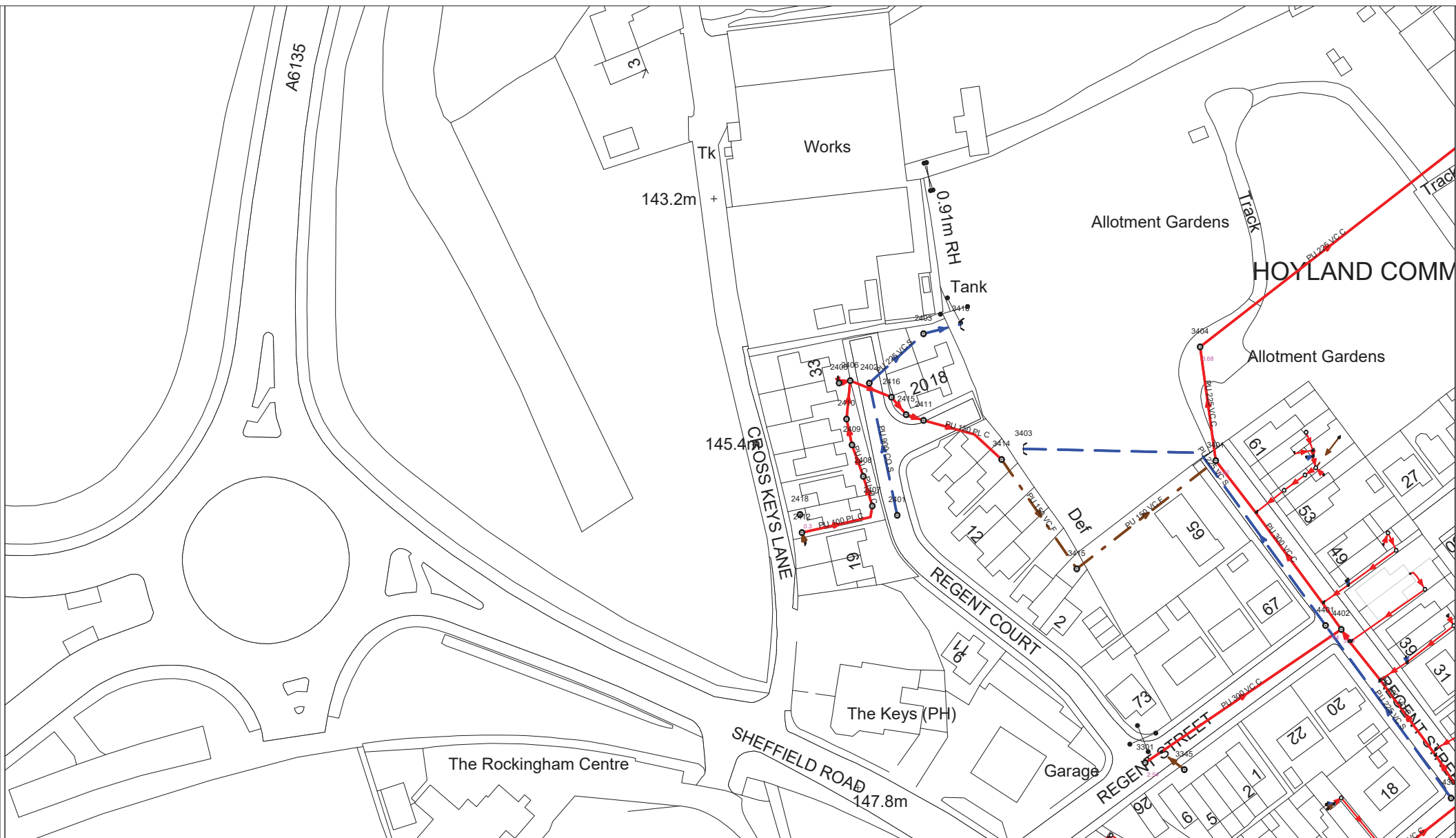
ALL DIMENSIONS SHOULD BE VERIFIED ON SITE PRIOR TO CONSTRUCTION.

ALL HATCHING IS FOR PRESENTATIONAL PURPOSES ONLY.

Client	WPS
Site Location	CROSBY KEYS LANE, HAYLAND, BARNESLYE, S74 0QA
Purpose of Drawing	GPR UTILITY MAPPING SURVEY. PRESENTED ON A TOPOGRAPHICAL SURVEY PROVIDED BY THE CLIENT
Surveyed	DA TP PR DH
Drawn	RC
Checked	DA
Authorised	KGB
Date	29/05/21
Scale	1:200 @A1
	
	
Office 10, Ripley Drive, Normanston Business Park, Wakefield, WF6 1QT. info@centara-hd.com	
Project Number	108844
Sheet Number	1 of 2 of 2

APPENDIX D

Public Sewer Record



435080 : 400369		Map Name : SE3500SW	Title	Partial Key	
		Yorkshire Water, PO Box 500, Halifax Road, Bradford BD6 2LZ Contact Name : YorMap Advisor C ROBERTS Contact Tel : 87 2582	Notes	Foul Sewer = F Combined Sewer = C Surface Water Sewer = SW Trade Sewer = TD Partially Separate = PS	
			(Ody) COPYRIGHT STATEMENTS: Reproduced by permission of Ordnance Survey on behalf of HMSO © Crown copyright and database 2014. All rights reserved Ordnance Survey Licence number 100022432	This plan is furnished as a general guide only and no warranty as to its correctness is given or implied. This plan must not be relied upon in the event of excavations or other works made in the vicinity of public sewers. No house or property connections are shown.	
Date Req : 11/11/2021, 09:27:43		Date Gen : 11/11/2021, 09:28:06		Source : Sewer Network Enquiry	

APPENDIX E

Greenfield Runoff Calculations

Weetwood		Page 1
Joseph's Well		
Hanover Walk		
Leeds, LS3 1AB		
Date 18/11/2021 14:25	Designed by MichaelDarby	
File	Checked by	
XP Solutions	Source Control 2020.1	
<u>ICP SUDS Mean Annual Flood</u> Input Return Period (years) 100 Soil 0.450 Area (ha) 1.000 Urban 0.000 SAAR (mm) 767 Region Number Region 3 Results 1/s QBAR Rural 4.9 QBAR Urban 4.9 Q100 years 10.2 Q1 year 4.2 Q30 years 8.6 Q100 years 10.2		
©1982-2020 Innovyze		

APPENDIX F

Development Sewer Enquiry Response



YorkshireWater

Mr T Brook
Weetwood Services Ltd
22C Josephs Well
Hanover Walk
Leeds
LS3 1AB
tim.brook@weetwood.net

Yorkshire Water Services
Developer Services
Pre-Development Team
PO BOX 52
Bradford
BD3 7AY

Tel: 0345 120 8482

Fax:

Your Ref:
Our Ref: X020330

Email:
technical.sewerage@yorkshirewater.co.uk

For telephone enquiries ring:
Chris Roberts on 0345 120 8482

11th November 2021

Dear Mr Brook,

Cross Keys Lane, Hoyland, Barnsley, S74 0QA – Pre-Planning Sewerage Enquiry U445589 (COMMERCIAL)

Thank you for your recent enquiry and remittance. Our official VAT receipt has been sent to you under separate cover. Please find enclosed a complimentary extract from the Statutory Sewer Map which indicates the recorded position of the public sewers. Please note that as of October 2011 and the private to public sewer transfer, there are many uncharted Yorkshire Water assets currently not shown on our records.

The following comments reflect our view, with regard to the public sewer network only, based on a 'desk top' study of the site and are valid for a maximum period of twelve months:



Foul Water

Development of the site should take place with separate systems for foul and surface water drainage. The separate systems should extend to the points of discharge to be agreed.

Foul water domestic waste can discharge to the 300 mm diameter public foul sewer recorded in Regent Street, at a point to the south east of the site.

Foul water from kitchens and/or food preparation areas of any restaurants and/or canteens etc. must pass through a fat and grease trap of adequate design before any discharge to the public sewer network.

Surface Water

It is accepted that soakaways will not be a viable option for surface water drainage at this location.

It is understood that a watercourse is located to the north and east of the site. This appears to be the obvious place for surface water disposal.

Please note Yorkshire Water cannot provide plans of culverted watercourses or highway drains. To obtain plans please contact the Lead Local Flood Authority for more details.

Please note further restrictions on surface water disposal from the site may be imposed by other parties. You are strongly advised to seek advice/comments from the Environment Agency/Land Drainage Authority/Internal Drainage Board, with regard to surface water disposal from the site.

Surface water run-off from communal parking (greater than 800 sq metres or more than 50 car parking spaces) and hardstanding must pass through an oil, petrol and grit interceptor/separator of adequate design before any discharge to the public sewer network. Roof water should not pass through the traditional 'stage' or full retention type of interceptor/separator.



YorkshireWater

It is good drainage practice for any interceptor/separator to be located upstream of any on-site balancing, storage or other means of flow attenuation that may be required.

Other Observations

Any new connection to an existing public sewer will require the prior approval of Yorkshire Water. You may apply on line or obtain an application form from our website (www.yorkshirewater.com) or by telephoning 0345 120 84 82.

An off-site foul and surface water sewer may be required which may be provided by the developer and considered for adoption under Section 104 of the Water Industry Act 1991. Please telephone 0345 120 84 82 for advice on sewer adoptions. Alternatively, the developer may in certain circumstances be able to requisition off-site sewers under Section 98 of the Water Industry Act 1991 for which an application must be made in writing. For further information, please telephone 0345 120 84 82.

Yorkshire Water's Trade Effluent team must be consulted in respect of any proposed trade effluent discharge to the public sewer.

All the above comments are based upon the information and records available at the present time and is subject to formal planning approval agreement. The information contained in this letter together with that shown on any extract from the Statutory Sewer Map that may be enclosed is believed to be correct and is supplied in good faith.



YorkshireWater

Please note that capacity in the public sewer network is not reserved for specific future development. It is used up on a 'first come, first served' basis. You should visit the site and establish the line and level of any public sewers affecting your proposals before the commencement of any design work.

Yours sincerely

Chris Roberts
Development Services Technician

APPENDIX G

Yorkshire Water Correspondence

Michael Darby

From: Chris.Roberts@yorkshirewater.co.uk on behalf of technical.sewerage@yorkshirewater.co.uk
Sent: 05 December 2021 14:47
To: Michael Darby
Subject: RE: Cross Keys Lane, Hoyland, Barnsley, S74 0QA - Pre-Planning Sewerage Enquiry U445589 (COMMERCIAL)
Attachments: pic10322.gif; pic18651.jpg; image002.png; image003.png; pic10021.jpg; image002.png; image003.png; 2021-11-23 5395 Site Location and PoC.jpg; 2021-11-25 5395 Surface Water PoC Enquiry.jpg; 7200-SMR-30-ZZ-DR-A-8006-S3-P2.pdf

Hi Michael,

Thank you for the additional information.

I will agree to 3.5 l/s maximum for surface water to the 900 mm public surface water sewer in Regents Court.

Kind Regards

(Embedded image moved to file: pic10322.gif)

|----->
| From: |
|----->
>-----|
| Michael Darby <Michael.Darby@weetwood.net> |
>-----|
|----->
| To: |
|----->
>-----|
| Technical Sewerage@NotesMail |
>-----|
|----->
| Cc: |
|----->
>-----|
| Tim Brook <Tim.Brook@weetwood.net> |
>-----|
|----->
| Date: |
|----->
>-----|
| 25/11/2021 16:06 |
>-----|
|----->
| Subject: |
|----->
>-----|
| RE: Cross Keys Lane, Hoyland, Barnsley, S74 0QA - Pre-Planning Sewerage Enquiry U445589 (COMMERCIAL) |
|
>-----|

VR 514105610020000

DATED 25/11/2021

EXTERNAL SOURCE - THINK BEFORE YOU CLICK

Dear Chris

Thank you for your response regarding the pre-development enquiry for the proposed Lidl foodstore at land of Cross Keys land, Hoyland. We have reviewed your response and have further queries regarding the surface water drainage.

Following the drainage hierarchy;

- The ground investigation report undertaken by Curtin's indicates high groundwater levels which precludes disposal of surface water via infiltration (report Attached). This has therefore been discounted.
- The nearest watercourse is a private drain approximately 150-200 m to the north, beyond Cross Keys Lane, and passes through 3rd party land.
We note this 3rd party land is currently subject to an undetermined planning application for 3 industrial units (ref: 2021/0479). In addition, it appears there are two Yorkshire Water outfalls into a drain or culvert upstream of this site, which again we cannot directly connect to due to 3rd party land. We have assumed this is an unviable option for us.
- The nearest available surface water sewer is in Regent Court, a 900 mm diameter sewer, which would require going through 3rd party land (The Keys PH car park) or via public highway for a direct connection.
Could this be a feasible option?
- There are highway drains located in Sheffield Road adjacent to the site. Barnsley's Highway Department refused a connection to this asset even though we initially proposed to restrict to greenfield runoff rate (QBAR). Email attached.
- The nearest combined sewer which will have any potential capacity is the 300 mm diameter sewer in Regent Street.
Would this be a feasible option for surface water disposal, given we are proposing to take foul water to this location already?

Given the above, we believe we only have two options for the disposal of surface water from the proposed development, which are A) discharge to the 900Ø surface water sewer in Regents Court or B) discharge to the 300Ø combined sewer in Regents Street?

Please can you confirm the following;

The preferred and most feasible point of connection for surface water runoff from the proposed site?

An allowable peak discharge rate (5.0 l/s) to the preferred point of connection?

If you have any further queries, please do not hesitate to get in touch.

Kind Regards

Michael

Michael Darby

Assistant Engineer

michael.darby@weetwood.net

We're recruiting! For more information, please have a look at our vacancies

(Embedded image moved to file: pic18651.jpg)

Suite C22 Joseph's Well, Hanover Walk, Leeds, LS3 1AB

T 0113 244 1377 DD 0113 524 0107 W www.weetwood.net

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Park House, Ffordd Byrnwr Gwair, Mold, CH7 1FQ (T 01352 700045)

Description: pngkey Description: linked+linkedin+logo+social
+icon-1320191784782940875_256smaller

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-----Original Message-----

From: Chris.Roberts@yorkshirewater.co.uk

<Chris.Roberts@yorkshirewater.co.uk> On Behalf Of technical.sewerage@yorkshirewater.co.uk

Sent: 11 November 2021 10:48

To: Tim Brook <Tim.Brook@weetwood.net>

Subject: Cross Keys Lane, Hoyland, Barnsley, S74 0QA - Pre-Planning Sewerage Enquiry U445589 (COMMERCIAL)

Dear Mr Brooks,

Please find my response below.

(See attached file: Cross Keys Lane, Hoyland, Barnsley, S74 0QA - Pre-Planning Sewerage Enquiry U445589 (COMMERCIAL).pdf)(See attached file:

roberts4_radA5104.PDF)(See attached file: roberts4_rad2A2BE.PDF)

Kind Regards

(Embedded image moved to file: pic15457.gif)

*** Please note, all correspondence must be sent to technical.sewerage@yorkshirewater.co.uk and will be responded to within 10 working days ***

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Save money on your utility bills and help conserve water by requesting a free water saving pack <https://www.yorkshirewater.com/savewater>

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APPENDIX H

Surface Water Attenuation - Storage Volume Calculations

Page 2

Suite 1 Park House
Broncoed Bus Park
Wrexham Rd Mold

Date 07/01/2022 10:01
File 5395 SW Drainage Networ...

Micro Drainage

Designed by ModellingMold
Checked by

Network 2020.1

Micro Drainage

Network Design Table for 5395 SW Drainage Network Pl

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
S1.002	20.803	0.100	208.0	0.082	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.003	11.286	0.050	225.7	0.043	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.004	5.000	0.050	100.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.005	10.335	0.150	68.9	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S3.000	64.707	0.800	80.9	0.228	5.00	0.0	0.600	o	300	Pipe/Conduit	
S3.001	3.100#	0.100	31.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.002	20.683	0.125	165.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.006	10.917	0.100	109.2	0.000	0.00	0.0	0.600	o	375	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)
S1.002	50.00	6.37	142.650	0.424	0.0	0.0	0.0	1.25	138.3	57.4
S1.003	50.00	6.53	142.550	0.467	0.0	0.0	0.0	1.20	132.7	63.2
S1.004	50.00	6.57	142.500	0.467	0.0	0.0	0.0	1.81	200.1	63.2
S1.005	50.00	6.65	142.350	0.467	0.0	0.0	0.0	2.19	241.4	63.2
S3.000	50.00	5.62	144.100	0.228	0.0	0.0	0.0	1.75	123.7	30.9
S3.001	50.00	5.63	143.300	0.228	0.0	0.0	0.0	2.83	200.3	30.9
S3.002	50.00	5.92	142.400	0.228	0.0	0.0	0.0	1.22	86.2	30.9
S1.006	50.00	6.76	142.200	0.695	0.0	0.0	0.0	1.73	191.5	94.1

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Weetwood		Page 3
Suite 1 Park House Broncoed Bus Park Wrexham Rd Mold		
Date 07/01/2022 10:01	Designed by ModellingMold	
File 5395 SW Drainage Networ...	Checked by	
Micro Drainage		Network 2020.1

Manhole Schedules for 5395 SW Drainage Network Pl

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S1	144.830	1.530	Open Manhole	1200	S1.000	143.300	300				
S2	144.900	1.875	Open Manhole	1200	S1.001	143.025	300	S1.000	143.025	300	
S3	144.760	1.360	Open Manhole	600	S2.000	143.400	300				
S4	145.100	1.875	Open Manhole	1200	S2.001	143.225	300	S2.000	143.225	300	
S5	145.400	2.750	Open Manhole	1500	S1.002	142.650	375	S1.001	142.725	300	
								S2.001	142.725	300	
S6	145.600	3.050	Open Manhole	1350	S1.003	142.550	375	S1.002	142.550	375	
S7	145.900	3.400	Open Manhole	1350	S1.004	142.500	375	S1.003	142.500	375	
S8	146.000	3.650	Open Manhole	1500	S1.005	142.350	375	S1.004	142.450	375	100
S9	145.600	1.500	Open Manhole	600	S3.000	144.100	300				
S10	145.600	2.300	Open Manhole	1500	S3.001	143.300	300	S3.000	143.300	300	
S11	145.900	3.500	Open Manhole	1500	S3.002	142.400	300	S3.001	143.200	300	800
S12	145.800	3.600	Open Manhole	1500	S1.006	142.200	375	S1.005	142.200	375	
								S3.002	142.275	300	
S2401	145.600	3.500	Open Manhole	1200		OUTFALL		S1.006	142.100	375	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	435160.748	400493.610	435160.748	400493.610	Required	
S2	435167.030	400466.933	435167.030	400466.933	Required	
S3	435197.231	400518.931	435197.231	400518.931	Required	
S4	435191.236	400508.548	435191.236	400508.548	Required	
S5	435208.578	400434.900	435208.578	400434.900	Required	
S6	435227.605	400426.489	435227.605	400426.489	Required	
S7	435235.886	400418.820	435235.886	400418.820	Required	

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Manhole Schedules for 5395 SW Drainage Network Pl

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S8	435240.641	400417.273	435240.641	400417.273	Required	
S9	435230.916	400511.800	435230.916	400511.800	Required	
S10	435245.747	400448.815	435245.747	400448.815	Required	
S11	435237.759	400430.394	435237.759	400430.394	Required	
S12	435250.468	400414.076	435250.468	400414.076	Required	
S2401	435260.849	400410.699			No Entry	

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PIPELINE SCHEDULES for 5395 SW Drainage Network P1

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)
S1.000	o	300	S1	144.830	143.300	1.230	Open Manhole	1200
S1.001	o	300	S2	144.900	143.025	1.575	Open Manhole	1200
S2.000	o	300	S3	144.760	143.400	1.060	Open Manhole	600
S2.001	o	300	S4	145.100	143.225	1.575	Open Manhole	1200
S1.002	o	375	S5	145.400	142.650	2.375	Open Manhole	1500
S1.003	o	375	S6	145.600	142.550	2.675	Open Manhole	1350
S1.004	o	375	S7	145.900	142.500	3.025	Open Manhole	1350
S1.005	o	375	S8	146.000	142.350	3.275	Open Manhole	1500
S3.000	o	300	S9	145.600	144.100	1.200	Open Manhole	600
S3.001	o	300	S10	145.600	143.300	2.000	Open Manhole	1500
S3.002	o	300	S11	145.900	142.400	3.200	Open Manhole	1500
S1.006	o	375	S12	145.800	142.200	3.225	Open Manhole	1500

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)
S1.000	27.407	99.7	S2	144.900	143.025	1.575	Open Manhole	1200
S1.001	52.463	174.9	S5	145.400	142.725	2.375	Open Manhole	1500
S2.000	11.990	68.5	S4	145.100	143.225	1.575	Open Manhole	1200
S2.001	75.662	151.3	S5	145.400	142.725	2.375	Open Manhole	1500
S1.002	20.803	208.0	S6	145.600	142.550	2.675	Open Manhole	1350
S1.003	11.286	225.7	S7	145.900	142.500	3.025	Open Manhole	1350
S1.004	5.000	100.0	S8	146.000	142.450	3.175	Open Manhole	1500
S1.005	10.335	68.9	S12	145.800	142.200	3.225	Open Manhole	1500
S3.000	64.707	80.9	S10	145.600	143.300	2.000	Open Manhole	1500
S3.001	3.100#	31.0	S11	145.900	143.200	2.400	Open Manhole	1500
S3.002	20.683	165.5	S12	145.800	142.275	3.225	Open Manhole	1500
S1.006	10.917	109.2	S2401	145.600	142.100	3.125	Open Manhole	1200

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Area Summary for 5395 SW Drainage Network P1

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.086	0.086	0.086
1.001	-	-	100	0.079	0.079	0.079
2.000	-	-	100	0.022	0.022	0.022
2.001	-	-	100	0.155	0.155	0.155
1.002	-	-	100	0.082	0.082	0.082
1.003	-	-	100	0.043	0.043	0.043
1.004	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.000	0.000	0.000
3.000	-	-	100	0.228	0.228	0.228
3.001	-	-	100	0.000	0.000	0.000
3.002	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.695	0.695	0.695

Free Flowing Outfall Details for 5395 SW Drainage Network P1

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.006	S2401	145.600	142.100	0.000	1200	0

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Online Controls for 5395 SW Drainage Network Pl

Pump Manhole: S12, DS/PN: S1.006, Volume (m³): 8.7

Invert Level (m) 142.200

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.200	3.4000	1.800	3.4000	3.400	3.4000	5.000	3.4000
0.400	3.4000	2.000	3.4000	3.600	3.4000	5.200	3.4000
0.600	3.4000	2.200	3.4000	3.800	3.4000	5.400	3.4000
0.800	3.4000	2.400	3.4000	4.000	3.4000	5.600	3.4000
1.000	3.4000	2.600	3.4000	4.200	3.4000	5.800	3.4000
1.200	3.4000	2.800	3.4000	4.400	3.4000	6.000	3.4000
1.400	3.4000	3.000	3.4000	4.600	3.4000		
1.600	3.4000	3.200	3.4000	4.800	3.4000		

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Micro Drainage	Network 2020.1	

Storage Structures for 5395 SW Drainage Network P1

Cellular Storage Manhole: S11, DS/PN: S3.002

Invert Level (m) 142.400 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	240.5	0.0	2.010	0.0	0.0
2.000	240.5	0.0	3.000	0.0	0.0

Volume Summary (Static)

Length Calculations based on True Length

Pipe Number	USMH Name	Manhole Volume (m³)	Pipe Volume (m³)	Storage Structure Volume (m³)	Total Volume (m³)
S1.000	S1	1.730	1.852	0.000	3.583
S1.001	S2	2.121	3.613	0.000	5.734
S2.000	S3	0.385	0.784	0.000	1.168
S2.001	S4	2.121	5.253	0.000	7.373
S1.002	S5	4.860	2.140	0.000	7.000
S1.003	S6	4.366	1.097	0.000	5.463
S1.004	S7	4.867	0.395	0.000	5.262
S1.005	S8	6.450	0.976	0.000	7.426
S3.000	S9	0.424	4.500	0.000	4.924
S3.001	S10	4.064	0.113	0.000	4.178
S3.002	S11	6.185	1.356	457.712	465.253
S1.006	S12	6.362	1.057	0.000	7.418
Total		43.934	23.136	457.712	524.781

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Broncoed Bus Park
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Micro Drainage

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for 5395 SW Drainage Network P1

Simulation Criteria

Areal Reduction Factor 1.000
Hot Start (mins) 0
Hot Start Level (mm) 0
Manhole Headloss Coeff (Global) 0.500
Foul Sewage per hectare (l/s) 0.000

Additional Flow - % of Total Flow 0.000
MADD Factor * 10m³/ha Storage 2.000
Inlet Coeffiecient 0.800
Flow per Person per Day (l/per/day) 0.000

Number of Input Hydrographs 0
Number of Online Controls 1
Number of Offline Controls 0

Number of Storage Structures 1
Number of Time/Area Diagrams 0
Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR
Region England and Wales Cv (Summer) 0.750
M5-60 (mm) 19.000 Cv (Winter) 0.840

Ratio R 0.350

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, 240, 360, 480, 960, 1440, 2880
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	Duration (mins)	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)
S1.000	S1	15 minute 1 year Winter I+0%	15	144.830	143.366	-0.234	0.000
S1.001	S2	15 minute 1 year Winter I+0%	15	144.900	143.125	-0.200	0.000
S2.000	S3	15 minute 1 year Winter I+0%	15	144.760	143.433	-0.267	0.000
S2.001	S4	15 minute 1 year Winter I+0%	15	145.100	143.321	-0.204	0.000
S1.002	S5	15 minute 1 year Winter I+0%	15	145.400	142.999	-0.026	0.000
S1.003	S6	15 minute 1 year Winter I+0%	15	145.600	142.939	0.014	0.000
S1.004	S7	15 minute 1 year Winter I+0%	15	145.900	142.863	-0.012	0.000
S1.005	S8	30 minute 1 year Winter I+0%	30	146.000	142.815	0.090	0.000
S3.000	S9	15 minute 1 year Winter I+0%	15	145.600	144.201	-0.199	0.000
S3.001	S10	15 minute 1 year Winter I+0%	15	145.600	143.424	-0.176	0.000
S3.002	S11	240 minute 1 year Winter I+0%	240	145.900	142.684	-0.016	0.000
S1.006	S12	30 minute 1 year Winter I+0%	30	145.800	142.767	0.192	0.000

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1 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for 5395 SW Drainage Network P1

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Maximum Vol (m³)	Maximum Velocity (m/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	S1	0.11		0.069	1.0		10.7	OK
S1.001	S2	0.24		0.186	0.9		18.8	OK
S2.000	S3	0.03		0.008	0.7		2.8	OK
S2.001	S4	0.22		0.153	1.0		18.7	OK
S1.002	S5	0.35		3.362	0.9		40.6	OK
S1.003	S6	0.38		2.509	0.8		37.8	SURCHARGED
S1.004	S7	0.28		1.479	0.9		30.5	OK
S1.005	S8	0.19		1.162	0.8		28.8	SURCHARGED
S3.000	S9	0.24		0.027	1.4		28.1	OK
S3.001	S10	0.36		0.331	1.0		28.3	OK
S3.002	S11	0.04		65.433	0.2	189	3.2	OK
S1.006	S12	0.03		3.324	0.1		3.4	SURCHARGED

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Micro Drainage		Network 2020.1

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for 5395 SW Drainage Network P1

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Maximum Vol (m³)	Maximum Velocity (m/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	S1	0.26		0.207	1.2		26.1	OK
S1.001	S2	0.51		2.126	1.1		40.3	SURCHARGED
S2.000	S3	0.06		0.030	0.9		6.6	OK
S2.001	S4	0.60		0.818	1.3		51.7	OK
S1.002	S5	0.88		9.764	1.0		103.0	SURCHARGED
S1.003	S6	0.39		3.169	0.7		39.2	SURCHARGED
S1.004	S7	0.20		2.150	0.6		21.6	SURCHARGED
S1.005	S8	0.14		1.958	0.7		21.4	SURCHARGED
S3.000	S9	0.58		0.046	1.7		68.9	OK
S3.001	S10	0.87		0.783	1.3		69.1	OK
S3.002	S11	0.04		193.098	0.1		3.1	SURCHARGED
S1.006	S12	0.03		4.158	0.1		3.4	SURCHARGED

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Micro Drainage	Network 2020.1	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 5395 SW Drainage Network P1

Simulation Criteria

Areal Reduction Factor 1.000	Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0	MADD Factor * 10m ³ /ha Storage 2.000
Hot Start Level (mm) 0	Inlet Coeffiecient 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 1
Number of Online Controls 1	Number of Time/Area Diagrams 0
Number of Offline Controls 0	Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R 0.350
Region England and Wales Cv (Summer)	0.750	
M5-60 (mm)	19.000 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, 240, 360, 480, 960, 1440, 2880
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Event	Duration (mins)	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)
S1.000	S1	15 minute 100 year Winter I+40%	15	144.830	144.670	1.070	0.000
S1.001	S2	15 minute 100 year Winter I+40%	15	144.900	144.544	1.219	0.000
S2.000	S3	15 minute 100 year Winter I+40%	15	144.760	144.725	1.025	0.000
S2.001	S4	15 minute 100 year Winter I+40%	15	145.100	144.718	1.193	0.000
S1.002	S5	15 minute 100 year Winter I+40%	15	145.400	144.340	1.315	0.000
S1.003	S6	960 minute 100 year Winter I+40%	960	145.600	144.204	1.279	0.000
S1.004	S7	960 minute 100 year Winter I+40%	960	145.900	144.203	1.328	0.000
S1.005	S8	960 minute 100 year Winter I+40%	960	146.000	144.202	1.477	0.000
S3.000	S9	15 minute 100 year Winter I+40%	15	145.600	144.574	0.174	0.000
S3.001	S10	960 minute 100 year Winter I+40%	960	145.600	144.202	0.602	0.000
S3.002	S11	960 minute 100 year Winter I+40%	960	145.900	144.202	1.502	0.000
S1.006	S12	960 minute 100 year Winter I+40%	960	145.800	144.201	1.626	0.000

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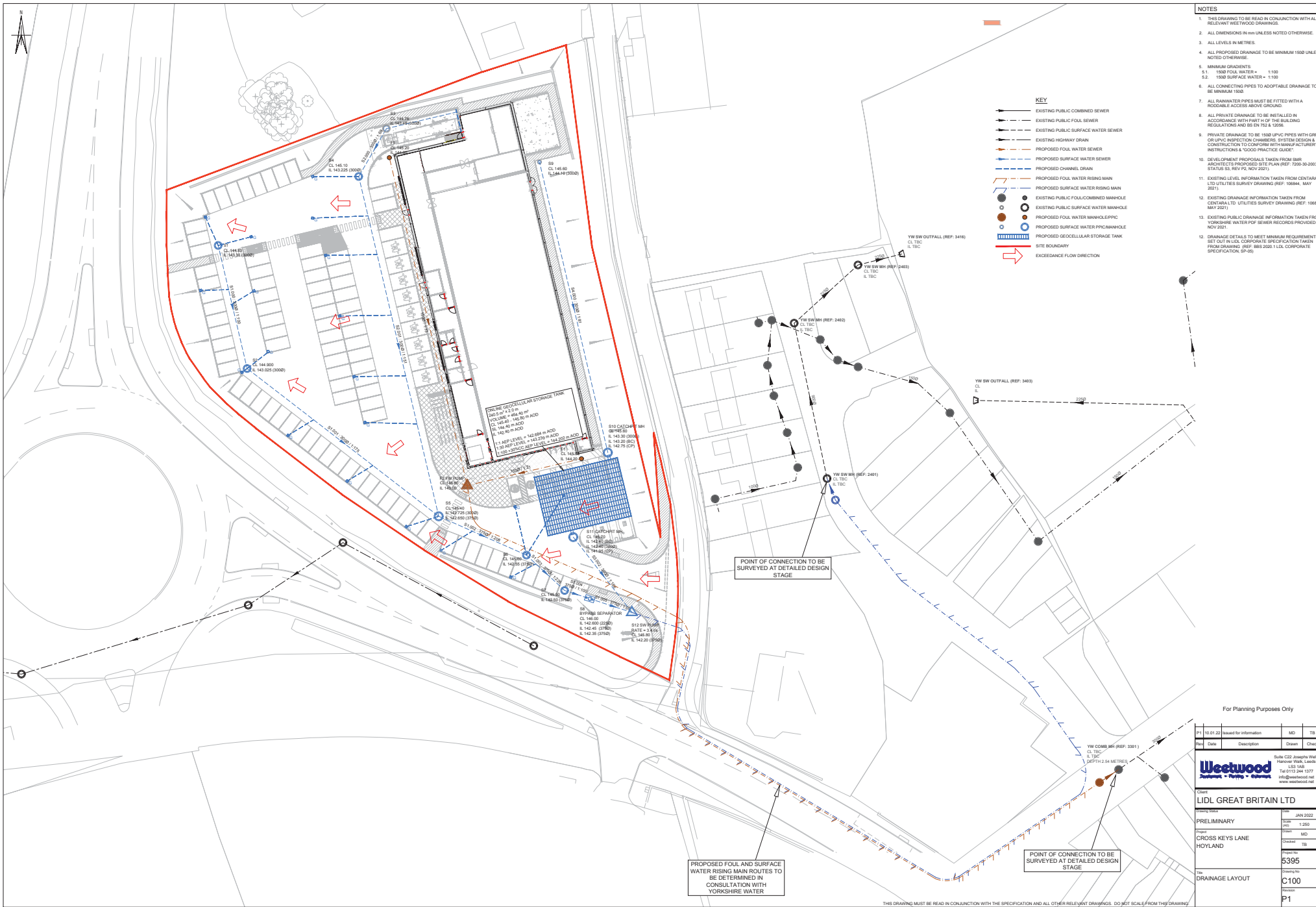
Weetwood		Page 14
Suite 1 Park House Broncoed Bus Park Wrexham Rd Mold		
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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 5395 SW Drainage Network P1

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Maximum Vol (m³)	Maximum Velocity (m/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	S1	0.36		1.543	1.2		36.4	FLOOD RISK
S1.001	S2	0.83		3.564	1.2		65.9	SURCHARGED
S2.000	S3	0.10		0.373	0.9		10.6	FLOOD RISK
S2.001	S4	0.89		2.467	1.3		77.5	SURCHARGED
S1.002	S5	1.49		11.843	1.6		173.7	SURCHARGED
S1.003	S6	0.17		4.500	0.5		16.8	SURCHARGED
S1.004	S7	0.16		3.527	0.6		16.7	SURCHARGED
S1.005	S8	0.11		3.659	0.7		16.5	SURCHARGED
S3.000	S9	1.02		0.133	1.9		120.6	SURCHARGED
S3.001	S10	0.12		5.716	0.8		9.3	SURCHARGED
S3.002	S11	0.04		414.933	0.2		3.2	SURCHARGED
S1.006	S12	0.03		5.859	0.1		3.4	SURCHARGED

APPENDIX I

Preliminary Drainage Layout



- NOTES**
1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT WESTWOOD DRAWINGS.
 2. ALL DIMENSIONS IN METRES.
 3. ALL LEVELS IN METRES.
 4. ALL PROPOSED DRAINAGE TO BE MINIMUM 1500 UNLESS NOTED OTHERWISE.
 5. MINIMUM GRADIENTS:
5.1. 1500 Foul Water = 1:100
5.2. 1500 Surface Water = 1:100
 6. ALL CONNECTING PIPES TO ADOPTABLE DRAINAGE TO BE MINIMUM 1500.
 7. ALL RAINWATER PIPES MUST BE FITTED WITH A ROADABLE ACCESS ABOVE GROUND.
 8. ALL PRIVATE DRAINAGE TO BE INSTALLED IN ACCORDANCE WITH PART IV OF THE BUILDING REGULATIONS AND BS EN 752 & 12058.
 9. PRIVATE DRAINAGE TO BE 1500 UPVC PIPES WITH GPP OR UPVC INSPECTION CHAMBERS. SYSTEM DESIGN & CONSTRUCTION TO CONFORM WITH MANUFACTURERS INSTRUCTIONS & "GOOD PRACTICE GUIDE".
 10. DEVELOPMENT PROPOSALS TAKEN FROM BMR ARCHITECTS PROPOSED SITE PLAN REF: 1000-30-2003, STATUS SA, REV P2, NOV 2021.
 11. EXISTING LEVEL INFORMATION TAKEN FROM CENTARA LTD UTILITIES SURVEY DRAWING (REF: 108844, MAY 2021).
 12. EXISTING DRAINAGE INFORMATION TAKEN FROM CENTARA LTD UTILITIES SURVEY DRAWING (REF: 108844, MAY 2021).
 13. EXISTING PUBLIC DRAINAGE INFORMATION TAKEN FROM YORKSHIRE WATER PDF SEWER RECORDS PROVIDED NOV 2021.
 14. DRAINAGE DETAILS TO MEET MINIMUM REQUIREMENTS SET OUT IN LIDL CORPORATE SPECIFICATION TAKEN FROM DRAWING (REF: 888-2005-1 LIDL CORPORATE SPECIFICATION, SP-06).

KEY

- EXISTING PUBLIC COMBINED SEWER
- EXISTING PUBLIC Foul SEWER
- EXISTING PUBLIC SURFACE WATER SEWER
- EXISTING HIGHWAY DRAIN
- PROPOSED Foul WATER SEWER
- PROPOSED SURFACE WATER SEWER
- PROPOSED CHANNEL DRAIN
- PROPOSED SURFACE WATER RISING MAIN
- EXISTING PUBLIC Foul COMBINED MANHOLE
- EXISTING PUBLIC SURFACE WATER MANHOLE
- PROPOSED Foul WATER MANHOLE/PPIC
- PROPOSED SURFACE WATER MANHOLE/PPIC
- PROPOSED GEOCELLULAR STORAGE TANK
- SITE BOUNDARY
- EXCEEDANCE FLOW DIRECTION

POINT OF CONNECTION TO BE SURVEYED AT DETAILED DESIGN STAGE

PROPOSED FOUL AND SURFACE WATER RISING MAIN ROUTES TO BE DETERMINED IN CONSULTATION WITH YORKSHIRE WATER

POINT OF CONNECTION TO BE SURVEYED AT DETAILED DESIGN STAGE

For Planning Purposes Only

P1 10.01.22		Issued for information	MD	TB
Rev	Date	Description	Drawn	Check
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Client LIDL GREAT BRITAIN LTD				
Drawing Title PRELIMINARY			Scale 1:250	Date JAN 2022
Project CROSS KEYS LANE HOYLAND			Drawn MD	Check TB
Drawing No 5395			Revision 1	
Title DRAINAGE LAYOUT			Scale C100	Drawing No P1

THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE SPECIFICATION AND ALL OTHER RELEVANT DRAWINGS. DO NOT SCALE FROM THIS DRAWING.

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Flood Risk Assessments
Flood Consequences Assessments
Surface Water Drainage
Foul Water Drainage
Environmental Impact Assessments
River Realignment and Restoration
Water Framework Directive Assessments
Environmental Permit and Land Drainage Applications
Sequential, Justification and Exception Tests
Utility Assessments
Expert Witness and Planning Appeals
Discharge of Planning Conditions

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