CONSULTING ENGINEERS LTD

FLOOD RISK ASSESSMENT

LEE LANE, ROYSTON

On Behalf of

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1.0 INTRODUCTION

1.1 Bellway Homes Limited (Yorkshire) is proposing to develop a large parcel of land located off Lee Lane, Royston with new residential dwellings. As part of the viability of the site and to supplement a planning application, it was decided that a Flood Risk Assessment Report should be undertaken.

1.2 It is within the general development strategy of the country for development in areas where there is a risk of flooding to be assessed to avoid unnecessary increase in the requirement for flood defence. Under the National Planning Policy Framework (NPPF) and the Planning Practice Guidance (PPG), consultation is required with the Environment Agency, Water Authority, Lead Local Flood Authority and Internal Drainage Board and a Flood Risk Assessment Report should be prepared considering the development proposals and make recommendations for any flood mitigation measures.

1.3 OEC Consulting Engineers Ltd (OEC) has been appointed to carry out an assessment of the site, implement appropriate consultations and prepare a Flood Risk Assessment Report, in accordance with NPPF, to satisfy the requirements of the Planning Authority.

1.4 The consultations and walkover survey have been undertaken in September and October 2018. The report was updated in January 2022 to incorporate the current planning layout and consultation responses from the regulatory authorities.

1.5 This report is based on the interpretation and assessment of data provided by third parties. Whilst every effort has been taken to ensure this information is accurate and up-to-date, OEC cannot guarantee the accuracy of third party data and the findings of this report may change if the data is amended or updated after the date of consultation.

2.0 EXISTING SITE

General

2.1 The site is an 'L' shaped piece of land equating to an area of approximately 8.7ha. The site is located on the western edge of Royston and is situated at Ordnance Survey Grid Reference SE 348 111.

2.2 A site location plan is presented in Appendix A.

Current Use

2.3 The site is greenfield, used as agricultural farm land for the growing of crops.

Boundaries

2.4 The site is bounded primarily by hedge rows and several barbed wire fences adjacent to undeveloped farm land. Following the full extent of the north western boundary is Lee Lane, with Lee Lane farm located beyond with a mix of agricultural farm land and paddocks. The same land types surround the site in all other directions, with the outskirts of Athersley North located approximately 500m in a southerly direction, from the site boundary at its nearest location.

Topography and Vegetation

2.5 The site has a prominent fall in a northerly direction with levels in the southern corner of approximately 84.40m A.O.D, dropping to approximately 72.30m A.O.D. in the northern corner. This low point would be the most suitable location for proposed on-site attenuation.

2.6 Vegetation on the site is minimal and is purely crops, with the occasional sporadically located tree. However, extensive mature vegetation in the form of mature hedgerows, trees and bushes form the boundary edges.

2.7 A topographical survey is presented in Appendix B.

Existing Drainage

2.7 There is no obvious positive drainage system on the site, although land drainage may be present. Surface water run-off clearly discharges in a northerly direction and ultimately into a pond, located just beyond the site boundary.

2.8 An unnamed watercourse is located approximately 40m in a northerly direction, from the site boundary at its nearest location. The watercourse flows in a northerly direction before converging with a more substantial, unnamed watercourse, that flows in an easterly direction.

2.9 The nearest river to the site is the River Dearne, located approximately 2.4km in a south westerly direction.

Geology and Hydrogeology

2.10 The Geological Survey Maps of Great Britain available on the BGS website indicates that the site is underlain by the Oaks Rock - Sandstone Formation. The superficial deposits on site consist of Till, Mid Pleistocene – Diamicton.

2.11 The Environment Agency website designates the bedrock under the site as a Secondary A Aquifer. This is a permeable strata capable of supporting water supplies at a local rather than strategic scale and in some cases forming an important source of base flow to rivers.

2.12 The Environment Agency website shows that the site does not lie within a Groundwater Source Protection Zone.

3.0 ENVIRONMENT AGENCY CONSULTATION

3.1 A consultation was requested from the Environment Agency (EA) and a copy of their response, reference 99617 dated 12th October 2018, is presented in Appendix C for reference purposes.

3.2 The Environment Agency Flood Map, which shows area of land that could flood from rivers or the sea and are shaded blue are provided. These areas do not take into account defences as water can overtop or can fail in extreme conditions. The EA flood zone classifications are defined as:-

3.2.1 Flood Zone 1 - 'Low Probability' is assessed as having a less than 1 in 1,000 annual probability of river or sea flooding in any year (less than 0.1%).

3.2.2 Flood Zone 2 - 'Medium Probability' is assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding in any year (1% - 0.1%) and between a 1 in 200 and 1 in 1,000 annual probability of flooding from the sea (0.5% - 0.1%).

3.2.3 Flood Zone 3 - 'High Probability' is assessed as having a 1 in 100 or greater annual probability of river flooding in any year (greater than 1%) and a 1 in 200 chance or greater annual probability of flooding from the sea (less than 0.5%).

3.3 The EA flood map for planning shows the site is located within Flood Zone 1 and the site, therefore, has a low risk of fluvial flooding.

3.4 The flood map for surface water, which shows areas where surface water only would be expected to flow or pond in England & Wales, is also available. All land in England and Wales will be within 'one' of a possible 'four' categories. The four categories shown on the map are:-

3.4.1 High - This area has a chance of flooding greater than 1 in 30 in any given year (annual probability of flooding 3.3%).

3.4.2 Medium - This area has a chance of flooding between 1 in 100 (1%) and 1 in 30 (3.3%) in any given year.

3.4.3 Low - This area has a chance of flooding between 1 in 1000 (0.1%) and 1 in 100 (1%) in any given year.

3.4.4 Very low - This area has a chance of flooding of less than 1 in 1000 (0.1%) in any given year.

3.5 The proposed development is shown to be within a very low risk area for surface water flooding.

3.6 The EA confirmed that to the best of their knowledge there is no known flood history for this site.

4.0 WATER AUTHORITY CONSULTATION

4.1 A consultation was requested from Yorkshire Water (YW), who are the Water Authority for this area, and a copy of their response, reference R928381, dated 16th April 2018, is presented in Appendix D for reference purposes.

4.2 No existing public sewers are recorded crossing the site, however, as of October 2011 and the private to public sewer transfer, there are many unchartered Yorkshire Water assets currently not shown on their records.

4.3 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.

4.4 The site is remote from the public sewer network with the nearest public foul sewer being a 225mm diameter public foul water sewer recorded in Lee Lane, at a point approximately 290 metres from the site. However, subject to other new developments within the localised area there is limited capacity in this public sewer, and therefore, there is no capacity for the domestic foul flows from the development.

4.5 The nearest suitably sized sewer to accept the foul water discharge from the site is recorded in High Street, at a point approximately 680 metres from the site. From the information supplied, it is not possible to determine if the whole site will drain by gravity to the public sewer network. If the site, or part of it, will not drain by gravity, then it is likely that a sewerage pumping station will be required to facilitate connection to the public sewer network. If sewage pumping is required, foul water discharge must not exceed four (4) litres per second.

4.6 In respect of surface water, reference is made to Requirement H3 of Building Regulations 2000 and Sustainable Drainage Systems. This establishes a hierarchy of surface water disposal. Consideration should firstly be given to discharge to soakaways, infiltration and watercourse, in that priority order, before connection to sewer will be considered.

4.7 It is understood that a watercourse is located to the north and west of the site. This appears to be the obvious place for surface water disposal (if SuDS are not viable).

4.8 Restrictions on surface water disposal from the site may be imposed by other parties. It is strongly advised to seek advice/comments from the Environment Agency/Land Drainage Authority, with regards to surface water disposal from the site.

4.9 If satisfactory evidence was provided showing that the site was unable to discharge to a watercourse, YW would look at allowing a maximum surface water discharge of 5l/s into the 450mm surface water sewer in Applehaigh View, recorded approximately 450 metres to the north east of the site.

4.10 Due to the impracticalities of connecting into the public sewer recorded 680 metres from the site, further consultation has been undertaken with Yorkshire Water. The response dated 24 December 2021, presented in Appendix D, confirms that foul water can discharge into the 225mm diameter public foul sewer located to the north in Parkhead Close at the junction of Applehaigh View.

5.0 LEAD LOCAL FLOOD AUTHORITY CONSULTATION

5.1 A consultation was requested from Barnsley Metropolitan Borough Council (BMBC) who are the Lead Local Flood Authority (LLFA) for this area, and a copy of their response, dated 29th August 2018 is presented in Appendix E.

5.2 The LLFA confirmed that if the developer is to carry out works within or in the proximity of any watercourse he must gain the relevant permissions from the Lead Local Flood Authority by contacting highwaydrainage@barnsley.gov.uk.

5.3 It was confirmed that there were no objections in principle to a discharge rate of 37.2l/s into the watercourse recorded to the north of the site.

5.4 There should be no increase in surface water runoff from the new development. PPS25 recognises that the management of flood risk is not simply restricted to flood plains and that a catchment-wide approach should be employed.

5.5 Any balancing facility should be designed to accommodate a 1 in 30 year flow from the site below ground and a 1 in 100 year flow retained within the site (including an allowance of 30% for climate chanage), without causing any flooding to buildings.

5.6 There are alternatives to conventional storage for the control of surface water run-off that are favoured by the authority where ground conditions are suitable. Sustainable Urban Drainage Techniques (SuDS) tackle surface water run-off problems at source using features such as soakaways, permeable pavements, grassed swales, infiltration trenches, ponds and wetlands to attenuate flood peak flows, produce water quality improvements and environmental enhancements.

5.7 The authority seeks to promote the use of SuDS techniques to this site and the authority expects the developer of the site to submit detailed investigations such that the use of SuDS has been fully explored.

5.8 The LLFA has recently been contacted to confirm that the previously agreed discharge rate and connection point were still acceptable. A copy of the response is presented in Appendix E and confirms that the previous agreements are still acceptable.

5.9 Furthermore, the site was subject to a previous planning application that was dismissed at appeal. The application was detailed (Full) and feasibility engineering designs were provided at the time. The principles behind the engineering scheme remain unchanged, and as drainage was not a reason for refusal, and discussions with the LLFA, Yorkshire Water and the Environment Agency were all concluded positively at the time, it is believed that this scheme can also be supported in the same manner.

6.0 INTERNAL DRAINAGE BOARD CONSULTATION

6.1 The proposed development site is not located within an Internal Drainage Board catchment.

7.0 MATERIAL CONSIDERATION IN RESPECT OF NPPF AND PPG

Flood Classification

7.1 The consultation with the Environment Agency has identified that the site falls within land assessed as having less than a 1 in 1,000 annual probability of river or sea flooding in any year (less than 0.1%). In accordance with Table 1 of the PPG, the site falls within Flood Zone 1 "low probability".

7.2 Therefore, all uses of the land are appropriate within this zone, but an assessment of the effect of surface water run-off will need to be incorporated in any Flood Risk Assessment.

End Use

7.3 The development proposal is for the construction of residential development on the site, and a copy of the planning layout is presented in Appendix F for reference purposes.

7.4 When applying Table 2 of the PPG, the flood risk vulnerability classification shows that the proposed end use will fall into a "more vulnerable" classification.

Sequential & Exception Test

7.5 As set out in the NPPF, the aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding (Zone 1).

7.6 When the development site is evaluated in accordance with Table 3 of the PPG, the development shows that the Sequential Test is satisfied.

7.7 As the Sequential Test is satisfied it is not a requirement for an exception test to be provided.

Flood Sources

7.8 The risk of flooding to the site from all current and future potential sources of flooding has been assessed as follows:-

7.9 Flooding from Rivers (Fluvial)

The nearest river to the site is the River Dearne, which is located approximately 2.4km in a southerly direction, from the site boundary at its nearest location. Due to the distance from the site and the topography of the site being elevated substantially above the River, flooding from this source is considered low risk. This is evident from the Environment Agency Flood Maps.

7.10 Flooding from Local Watercourses (Fluvial)

An unnamed watercourse is located approximately 40m in a northerly direction, from the site boundary at its nearest location. However, due to the topography of the site, flooding from this source is considered highly unlikely.

7.11 Flooding from the Sea (Tidal/Coastal)

The site is not located near enough to the sea to cause a problem of flooding from this source.

7.12 Flooding from Land (Surface Water)

The EA surface water flood maps shows the site to have a very low risk of surface water flooding, with no flood routes through the proposed development. Therefore, although flooding from this source is considered low risk, it should still be considered as part of the proposed development.

7.13 Flooding from Groundwater

The Geological Survey Maps of Great Britain available on the BGS website indicates that the site is underlain by the Oaks Rock - Sandstone Formation. The superficial deposits on site consist of Till, Mid Pleistocene – Diamicton. Considering the geology beneath the site, it is anticipated that the site is impermeable and, therefore, in conjunction with the topography, flooding from this source is considered to be low risk.

7.14 Flooding from Sewer

There will be a new drainage system introduced for the proposed development. It is possible that any blockage of these sewers will result in flooding from the lowest cover level of manholes or gullies and this will need to be considered as part of any proposed development. Flooding from this source is considered to be medium risk.

7.15 Flooding from Reservoirs, Canals or Artificial Sources

The Environment Agency produce maps which show the expected inundation area should a reservoir fail and release its capacity. It should be noted, however, that reservoir flooding is extremely unlikely to happen and there has been no loss of life in the UK from reservoir flooding since 1925. The proposed development site is shown to be outside of the maximum extent of reservoir flooding.

7.16 There are no canals or other artificial sources within the vicinity of the proposed development site that would pose a risk of flooding on site, therefore, the risk from this source is deemed to be negligible.

7.17 Table 1.0 below, summarises the findings of the detailed assessment and explanations of the flood risk issues on the site.

Table 1.0 – Degree of risk from each source of flooding

FLOOD SOURCE	RISK
River (Fluvial)	**Low**
Watercourse (Fluvial)	**Low**
Sea (Tidal/Coastal)	**Negligible**
Land (Surface Water)	**Low**
Groundwater	**Low**
Sewer	**Low**
Other – Reservoir	**Negligible**
Other - Canals	**Negligible**

Climate Change

7.18 The NPPF and PPG has indicated that the Global sea level will continue to rise, depending on greenhouse gas emissions, and the sensitivity of the climate system and there will be an increase in rainfall across the country.

7.19 United Kingdom climate change guidance was revised in February 2016 for peak river flows and peak rainfall intensities. With regards to peak river flows, a regionalised approach has now been adopted to climate change impacts based upon the river basin district of the proposed development site, the flood risk vulnerability of the proposed development and the present day Flood Zone classification.

7.20 The proposed development site is situated within the River Humber river basin district, which, based on an "upper end" climate change scenario, could see peak river flows increase by 50% by 2115. As the site is situated entirely within Flood Zone 1, an increase of 50% in river flows is deemed unlikely to affect the proposed development site.

7.21 In accordance with the revised climate change data, the published figures show that, for an expected life of greater than 50 years for any new development, the anticipated increase in rainfall could be up to 40%, subject to the location within the country and the drainage system should be designed in accordance with this requirement. However, the Barnsley Metropolitan Borough Council flood risk requirements for managing on/off-site flood risk from fluvial flooding is to assess the development using a 30% allowance for climate change for the 1 in 100 year event.

7.22 Due to the topography of the land and surrounding area, overland run-off from adjoining land is unlikely to be an issue. Therefore, any run-off from outside the site will be insignificant and, on this basis, only rainfall falling within the site boundaries will need to be considered in respect of climate change.

Flood Mitigation

7.23 As the site falls within Flood Zone 1, flood mitigation measures are only required in the event of a catastrophic storm or blockage of the proposed drainage system. The following precautionary flood mitigation measures are, therefore, recommended:-

7.23.1 The finished flood levels (FFL) to the properties shall be raised above external levels by a minimum of 150mm, wherever possible.

7.23.2 Properties shall be designed without any basements and ground floors shall comprise solid concrete slabs or beam and block with screed construction.

7.23.3 Incoming electricity supplies shall be raised above ground floor level and ground floor electric sockets shall be served by loops from upper level.

7.23.4 In the unlikely event of flooding of the site, it would be appropriate to design external levels with falls to non-critical areas, such as landscape, where the water can pond without causing flooding to buildings.

7.23.5 If any water issues are found on the site or boundary levels result in flow of water into the site, these shall be accommodated by introducing "cut-off" drains to direct the flow around the development.

Emergency Egress During Times of Flood

7.24 It is a requirement under the PPG that occupants should be able to egress any building during times of flood, without being trapped by flood conditions.

7.25 As the site falls within Flood Zone 1, no special mitigation measures are required for emergency egress during times of flood.

8.0 EXISTING AND PROPOSED DRAINAGE

Sustainable Drainage

8.1 In order to comply with the requirements of NPPF, it will be necessary to consider aspects of Sustainable Drainage techniques for the new development. The Geological Survey Maps of Great Britain available on the BGS website indicates that the site is underlain by the Oaks Rock - Sandstone Formation. The superficial deposits on site consist of Till, Mid Pleistocene – Diamicton. Considering the geology beneath the site, it is anticipated that the site is impermeable and, therefore, unsuitable for the disposal of surface water using infiltration techniques. It will be necessary to carry out appropriate infiltration tests in accordance with BRE Digest 365 'Soakaway Design' prior to construction on site and the results presented in a report for the approval of the Planning Authority. However, for the purpose of this report, a positive drainage system to watercourse or sewer will be required for surface water drainage.

Drainage

8.2 It is a requirement to ensure that surface water run-off from any proposed development has negligible consequence on downstream areas either in sewer capacity or discharge to watercourse.

Existing Surface Water Run-Off

8.3 The site is greenfield and, therefore, in accordance with BMDC guidelines and Regulations, surface water calculations have been undertaken using the 5l/s/ha method of calculating greenfield run-off rates.

8.4 For the proposed developed area of 7.43ha, the existing greenfield run-off rate has been calculated as 37.2l/s. (7.43ha x 5l/s).

Proposed Surface Water Drainage

8.5 Consideration of the proposed drainage should firstly be given to infiltration techniques (to ground). However, as the use of infiltration techniques are considered unviable, subject to infiltration testing being carried out, it will be necessary to provide a positive drainage system to watercourse or sewer.

8.6 The planning layout, presented in Appendix F, has been assessed as having an impermeable area of approximately 4ha for semi-detached and detached properties. Indicative calculations have been carried out using the WinDES Source Control Computer Program. The proposed surface water sewer system should be designed to accommodate the 1 in 30 year storm event without flooding and a 1 in 100 year storm plus climate change event should be retained within the site in an area that does cause flooding to properties or third parties.

8.7 Restricting the discharge rate to no greater than 33.5/s (10% reduction to comply with YW's requirements when utilising a pumping station), on site storage of 1118.9m³ will need to be provided for a 1 in 30 year storm. This can be achieved by several methods, including oversized pipes and underground tanks. The drainage system will also need to accommodate the 1 in 100 year plus 30% climate change event without causing flooding or property or third-party land. In the event that levels dictate that the 1 in 100 year plus climate change flood water will flow off site, an additional or larger storage facility will be required. Therefore, on site storage would increase to 2160m³. The indicative surface water calculations are presented in Appendix G. However, detailed calculations and proposals will need to be prepared and submitted to the Planning Authority for approval prior to construction.

8.8 Due to the topography of the site, it would be prudent to locate the on-site attenuation at the lowest point of the site, this being the northern corner. To locate it in an alternative location would be impractical, as drainage depths would become deeper, resulting in an un-economical drainage design. Also, from a H & S perspective drainage depth should be kept to a minimum for construction and future maintenance requirements.

Watercourse Conditions

8.9 The discharge of surface water to watercourse and/or the introduction of headwalls or works to the watercourse will require the consent of the LLFA by submitting an Application for Consent to Work Within a Watercourse.

8.10 There will be a requirement for a 9m strip to be provided from the top of the banking where no development can take place, and access arrangements will need to be agreed for future improvements or maintenance.

Proposed Foul Water Drainage

8.11 Foul water domestic waste shall discharge into the 225mm diameter public foul sewer located to the north in Parkhead Close or Applehaigh View at the junction of Parkhead Close. A maximum pump rate of 6 l/s will be required.

9.0 CONCLUSION

9.1 The site falls within Flood Zone 1 and the Sequential Test is satisfied. However, in order to accommodate the possibilities of flood from a catastrophic storm or blockage of the proposed drainage system, the following precautionary flood mitigation measures are recommended:-

9.1.1 The finished flood levels (FFL) to the properties shall be raised above external levels by a minimum of 150mm, wherever possible.

9.1.2 Properties shall be designed without any basements and ground floors shall comprise solid concrete slabs or beam and block with screed construction.

9.1.3 Incoming electricity supplies shall be raised above ground floor level and ground floor electric sockets shall be served by loops from upper level.

9.1.4 In the unlikely event of flooding of the site, it would be appropriate to design external levels with falls to non-critical areas, such as landscape, where the water can pond without causing flooding to buildings.

9.1.5 If any water issues are found on the site or boundary levels result in flow of water into the site, these shall be accommodated by introducing "cut-off" drains to direct the flow around the development.

9.2 A 30% increase in rainfall shall be incorporated into any new positive drainage system to satisfy the requirements of climate change.

9.3 Sustainable Drainage Systems of infiltration techniques have been assumed to be unsuitable on this particular site, for the purpose of the report. It will be necessary to carry out appropriate infiltration tests in accordance with BRE Digest 365 'Soakaway Design' prior to construction on site and the results presented in a report for the approval of the Planning Authority.

9.4 The proposed surface water drainage system shall be restricted to the agreed discharge rate with appropriate attenuation for a 1 in 100 year storm plus climate change incorporated into the design, prior to discharge into the watercourse. The detailed design and calculations shall be submitted to the Planning Authority for approval prior to construction on the development site.

9.5 Due to the topography of the site, it would be prudent to locate the on-site attenuation at the lowest point of the site, this being the northern corner. To locate it in an alternative location would be impractical, as drainage depths would become deeper, resulting in an un-economical drainage design. Also, from a H & S perspective drainage depth should be kept to a minimum for construction and future maintenance requirements.

9.6 The discharge of surface water to watercourse and/or the introduction of headwalls or works to the watercourse will require the consent of the LLFA by submitting an Application for Consent to Work Within a Watercourse.

9.7 There will be a requirement for a 9m strip to be provided from the top of the banking where no development can take place, and access arrangements will need to be agreed for future improvements or maintenance.

9.8 Foul water domestic waste shall discharge into the 225mm diameter public foul sewer located to the north in Parkhead Close or Applehaigh View at the junction of Parkhead Close. A maximum pump rate of 6 l/s will be required.

9.9 No special mitigation measures are required for emergency egress during times of flood.

9.10 Subject to compliance with the above, the proposed development can satisfy the requirements of the National Planning Policy Framework and the Planning Practice Guidance in relation to flood risk.

A P P E N D I X A: SITE LOCATION PLAN

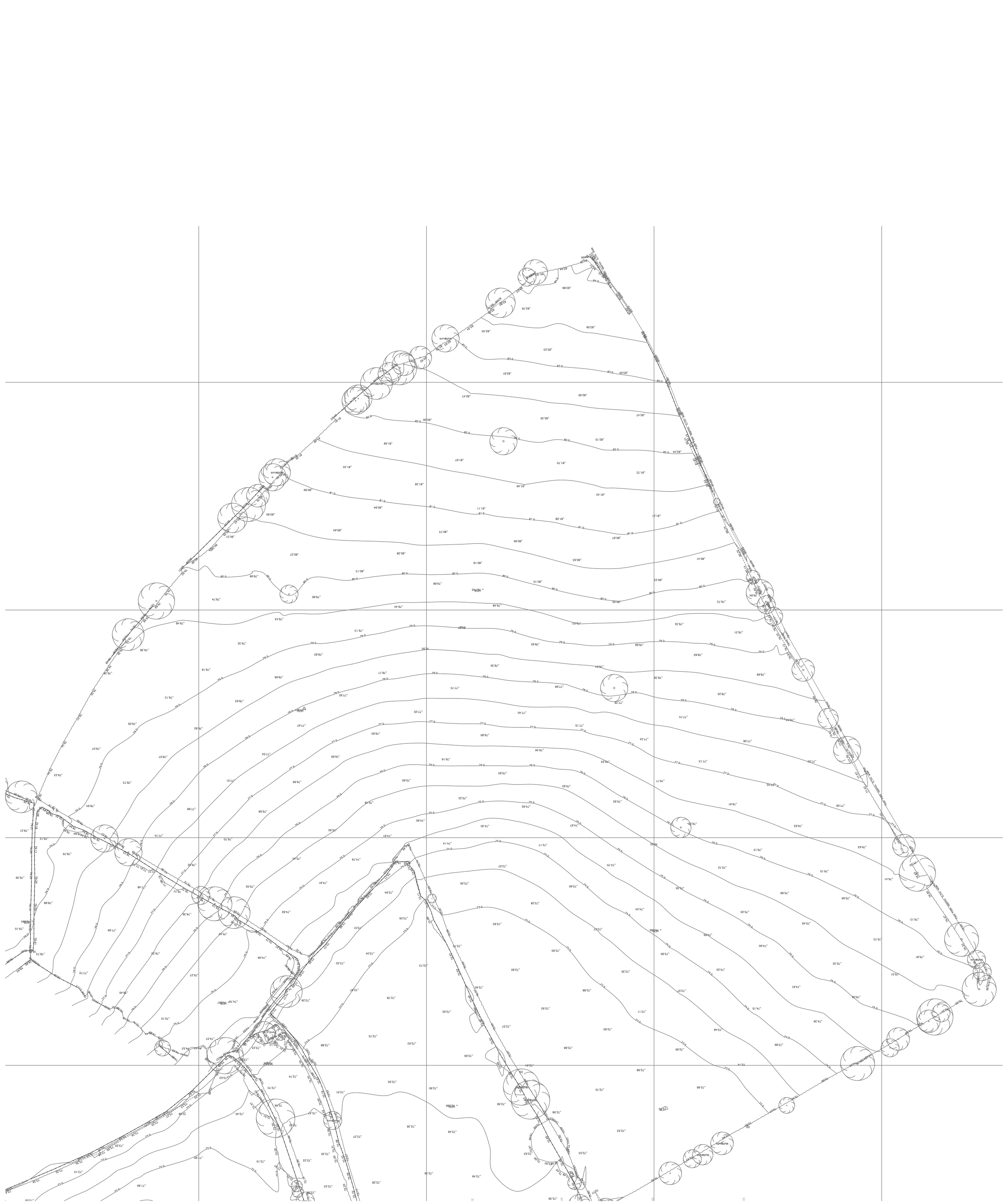
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LEE LANE, ROYSTON

SITE LOCATION PLAN



A P P E N D I X B: TOPOGRAPHICAL SURVEY



A P P E N D I X C: ENVIRONMENT AGENCY CONSULTATION

Ref:	*99617*	Completed by:	*SP*	Date due:	*12/10/2018*

The Flood Map for Planning

The Environment Agency provides the Flood Map (see enclosed extract).

What is the Flood Map for Planning?

The Flood Map for Planning provides information on flooding from rivers and the sea for England and Wales. The Flood Map also has information on flood defences and the areas benefiting from those flood defences.

The Flood Map for Planning shows the following:

1. Flood Zone 3 (dark blue area on the enclosed map): natural flood plain area that could be affected by flooding from rivers and/or the sea – not taking into account the presence of any flood defences
   - For flooding from rivers the map indicates the extent of a flood with a 1% (1 in 100) chance of happening each year;
   - For flooding from the sea the map shows the extent of a flood with a 0.5% (1 in 200) chance of happening each year.

2. Flood Zone 2 (light blue area): natural flood plain area that could be affected by flooding from rivers and/or the sea – not taking into account the presence of any flood defences. Flood Zone 2:
   - indicates the extent of a flood with a 0.1% (1 in 1000) chance of happening each year.
   - and/or indicates the greatest recorded historic flood, whichever is greater.

3. Flood defences built in the last five years to protect against river floods with a 1% (1 in 100) chance of happening each year, together with some natural or constructed entities which retain, store or channel water and which may protect against smaller floods.

4. Areas benefiting from flood defences - areas that benefit from the flood defences shown, in the event of a river flood with a 1% (1 in 100) chance of happening each year, or a flood from the sea with a 0.5% (1 in 200) chance of happening each year. If the defences were not there, these areas would flood.

Flood History

Flood History

To the best of our knowledge there is no known flood history for this site. The extent of flooding, and/or flood level information is only shown for those watercourses surveyed after the flood. Other flooding may have occurred which is not shown. This is the best information currently available. For local drainage information please contact your water utility company and your local council.

Water causing flooding can come from different places, for example from rivers or the sea; surface water (i.e. rainwater flowing over or accumulating on the ground before it is able to enter rivers or the drainage system); overflowing or backing up of sewers or drainage systems which have been overwhelmed or from groundwater rising up from underground aquifers.

Currently the Environment Agency can only supply flood risk data relating to the risk of flooding from rivers or the sea. However you should be aware that in recent years, there has been an increase in flood damage caused by surface water flooding or drainage systems that have been overwhelmed. Local Authorities and/or Water Companies may be able to provide some knowledge on the risk of flooding from sources other than rivers and the sea and we are working with these organisations to improve knowledge and understanding of surface water flooding.

Assets

There are no flood defences helping to reduce flood risk in your area of interest.

Modelling

Modelling Information

We do not have any modelling information at this location.

Bespoke Flood Risk Assessment (FRA) advice:

If the pre-application advice is required with regards the preparation of a site-specific Flood Risk Assessment, this can be requested via the Yorkshire Sustainable Places team (email: sp-yorkshire@environment-agency.gov.uk). Charges may apply for any advice that is provided, this currently stands at £100 per hour per person. The .gov.uk pages provide a good starting point on what to include within a site-specific Flood Risk Assessment and can be accessed via https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications. A site-specific Flood Risk Assessment will need to consider flood risks from all sources, including those associated with defence failure (e.g. breach) and accounting for the predicted impacts as a result of climate change. Please contact the Sustainable Places team if you require advice on how to include these within a Flood Risk Assessment.

River

Non Main River

The watercourse at this location is **not designated as Main River**. It is classed as an Ordinary Watercourse. The local authority holds responsibility for the maintenance of this river. The Environment Agency does not have any more information available in regard to past flooding issues or current flood risk. For any information on any past flooding and for any record of the impact of local drainage on that watercourse we suggest you speak to your City Council Drainage Section and to Yorkshire Water.

Other

Surface Water Map

In partnership with Local Authorities, we publish Risk of flooding from surface water maps. These were updated in December 2013. If you would like a copy of the map for your area, please contact us again. Otherwise the map can be viewed online at : https://flood-warning-information.service.gov.uk/long-term-flood-risk/#x=438988&y=406600&scale=2

Surface Water Drainage

The Lead Local Flood Authority is the statutory consultee for planning matters relating to surface water drainage, therefore it is recommended they should be consulted separately regarding this.

Surface water discharge from new development should ideally ‘mimic’ the pre-development situation using a sustainable drainage system so that the flow and volume of water in watercourses is not increased.

A permit may be required, under the Environmental Permitting Regulations 2010 from the Environment Agency for any proposed works or structures in, under, over or within eight metres of a 'main river' (e.g. a new outfall). A permit is separate to and in addition to any planning permission granted. Further details and guidance are available on the GOV.UK website: https://www.gov.uk/guidance/flood-risk-activities-environmental-permits

Risk of Flooding from Reservoirs Map

Outlines and simplified depth and velocity maps can be viewed on our website: https://flood-warning-information.service.gov.uk/long-term-flood-risk/#x=438988&y=406600&scale=2

Please, zoom into the location of interest, and then click on the inundated location for details. As a result a list of reservoirs will be provided with supporting information and a links to other data, such as estimated depths and speed of flooding, at the bottom of the result page.

A map of showing the outlines can also be provided on request.

Flood Warning

The site is not covered by a Flood Warning. (if not flood warnings in the area)

LIDAR Data

Please note that our LiDAR data is now available free of charge (Open Data) from http://environment.data.gov.uk/ds/survey/index.jsp#/survey (once zoomed to the relevant location the available LiDAR products will be listed below the map).

Two LIDAR products are available:

1. Tiled LIDAR data - The full tiled dataset consists of historic LIDAR data which has been gathered since 1998. For some areas we have carried out repeat surveys and data is available in a range of resolutions.
2. Composite LIDAR data - The composite dataset is derived from a combination of our full tiled dataset which has been merged and re-sampled to give the best possible spatial coverage.

Light Detection and Ranging (LIDAR) is an airborne mapping technique, which uses a laser to measure the distance between the aircraft and the ground. This technique results in the production of an accurate, cost-effective terrain model suitable for assessing flood risk and other environmental applications.

The Environment Agency owns two LIDAR systems, which are installed in a survey aircraft along with its other operational remote sensing instruments.

The aircraft is positioned and navigated using Global Positioning System (GPS) corrected to known ground reference points. The aircraft typically flies at a height of about 800 metres above ground level and a scanning mirror allows a swath width of about 600 metres to be surveyed during a flight.

The Rights & Responsibilities of a Riverside Owner

The owner of property adjacent to a watercourse is usually deemed to be the riparian owner and, as such, has both riparian rights and responsibilities with regard to the watercourse within their ownership.

For more information on Rights and Responsibilities of a riverside owner, you can visit our website at:

https://www.gov.uk/guidance/owning-a-watercourse

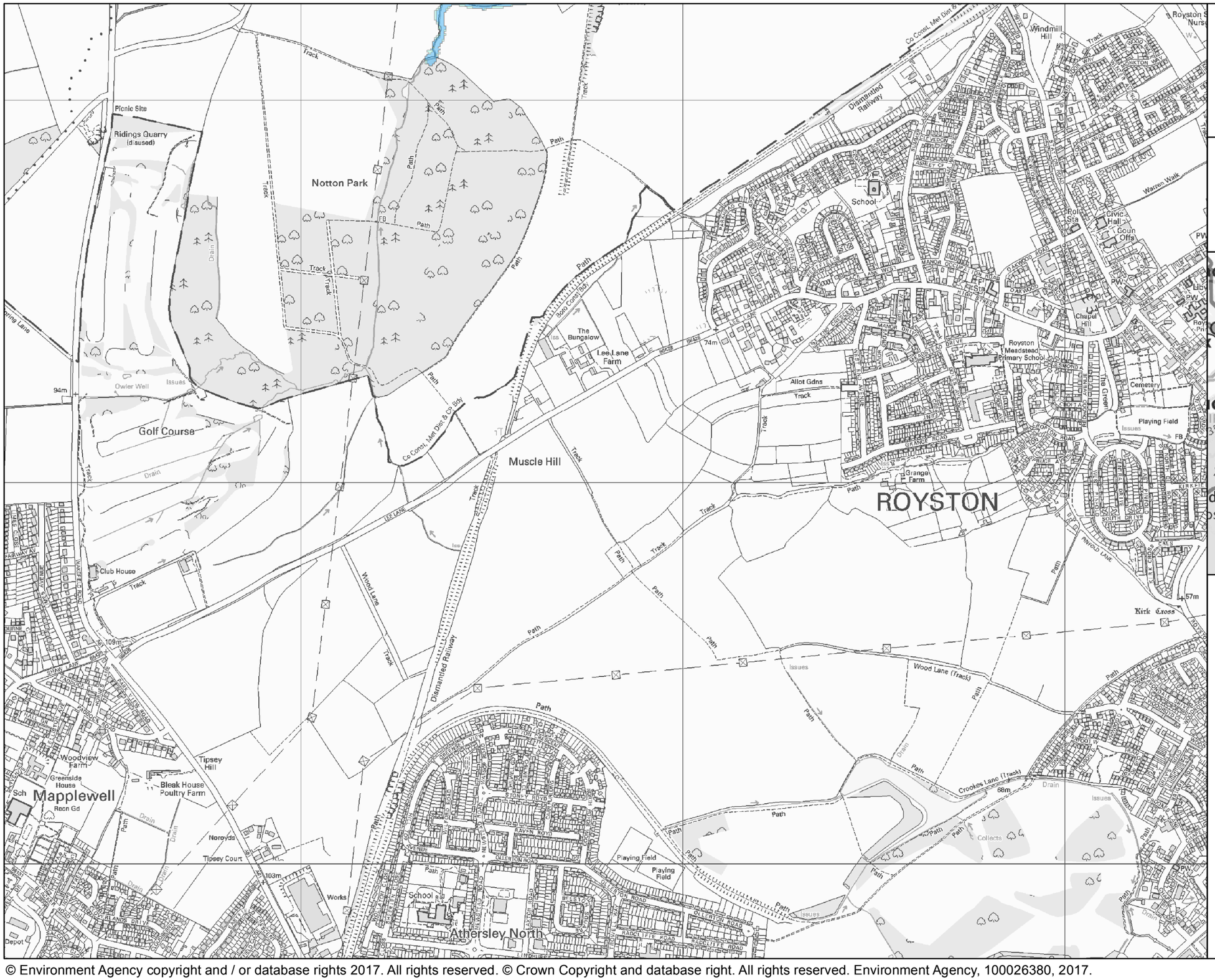
Ordnance Survey Data

Under the terms of our licence agreement with the Ordnance Survey, we are unable to supply the OS data. Under this agreement we can only supply OS data to consultants/contractors carrying out work on our behalf.

Flood Portal

It's a new 'one-stop shop' web portal providing guidance and information on flood risk management in the UK. Arup have written and designed the site, in conjunction with CIRIA, the Local Government Association, the EA and Defra, primarily as a resource for local authority officers, flood risk management professionals, and others with an interest in flood risk. It's a part of the Capacity Building Strategy.http://www.local.gov.uk/floodportal

RFI/2018/99617 Flood Map for Planning centred on NGR SE 348 110
Date Created: 03/10/18



Environment Agency

www.environment-agency.gov.uk

Scale: 1:10,000

N W E S

when reproduced @ A3



LEGEND

- Main River
- Flood Map Flood Defences
- Areas Benefitting From Flood Defences
- Flood Storage Areas
- Flood Zone 3 (FZ3)
- Flood Zone 2 (FZ2)

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Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Detailed River Network Map

Environment Agency

Legend

- Statutory Main Rivers
- Detailed River Network
  - Primary River
  - Secondary River
  - Tertiary River
  - Lake / Reservoir
  - Canal
  - Canal Tunnel
  - Extended Culvert
  - Multiple Channel Culvert
  - Underground River (potential sewer)
  - Underground River (inferred)
  - Underground River (local knowledge)
  - Undefined
- Offline Drainage features



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Planning advice for developers – FAQs

Introduction

Local planning authorities (LPAs) across Yorkshire are required to consult us on certain planning applications which affect flood risk, groundwater, waste, or water quality.

If your development falls into one of these categories, we'll be invited to comment on your planning application. Your LPA, when considering your application, will take our comments into account.

We've produced this guidance to summarise the environmental issues we're responsible for. The guidance forms part of our free advice service; if you require site-specific or face-to-face advice, we'll need to recover our costs through our charged advice service. Engaging with us early can help you identify the big issues, reduce the chances of subsequent delays and help you design a more sustainable and attractive development.

Development and flood risk

Is my development proposal at risk of flooding?

The flood map for planning shows where flooding from rivers and the sea may occur. Whilst this map isn't suitable for a detailed flood risk assessment, it'll show which flood zone your development is located within and therefore will indicate whether further assessment is needed. You should also refer to your LPA's strategic flood risk assessment which will provide additional local information on flood risk, including the location of functional floodplain and areas which are susceptible to other sources of flooding such as from surface water or reservoirs.

Will my application need to pass the sequential and exception tests?

Local planning authorities apply the sequential test to steer development towards areas at the lowest risk of flooding. If your proposal is located within flood zones 2 or 3, you should contact your LPA to discuss the sequential test **before** submitting your application. The LPA may require you to submit information with your application in support of the sequential test.

If the LPA confirm that the sequential test has ruled out steering the development to lower risk sites, the development may also need to pass the exception test by demonstrating that its sustainability benefits outweigh flood risk and that it can be made safe for its lifetime, through the production of a site-specific flood risk assessment. Planning practice guidance advises when an exception test will be required, which will depend on the vulnerability of the development and the flood zone it lies within.

Do I need to submit a flood risk assessment with my planning application?

You'll need to submit a flood risk assessment if your application lies within flood zones 2 or 3 or is over 1 hectare within flood zone 1. You'll also need to submit an assessment if your proposal could be affected by sources of flooding other than from rivers or the sea. For certain lower risk applications, we've provided 'flood risk standing advice' which enables local planning authorities to assess flood risk assessments without the need to consult us.

What information should I include in my flood risk assessment?

We recommend that you refer to the checklist for a site-specific flood risk assessment for detailed advice on what to include in your flood risk assessment. Alongside referring to your LPA's strategic flood risk assessment, you should contact your LPA to find out whether there are any development guidelines which are specific to your locality.

Can I undertake my own flood risk assessment?

Your FRA must be appropriate to the scale, nature and location of the development whilst being credible and fit-for-purpose. Whilst it's possible to undertake your own assessment, most applicants employ suitably experienced professionals. We're not able to recommend specific consultants, but a simple web search should help you source a competent individual or company.

Do I need to consider how climate change will affect my proposal's flood risk?

Yes, you should demonstrate how flood risk will be managed now and over the development's lifetime, taking climate change into account. Please refer to the following guidance when undertaking your flood risk assessment. In some cases we'll hold the climate change flood data you need. In others you'll need to undertake your own analysis to understand the impacts.

Where can I get modelled or historic flood levels from?

Email our Customers and Engagement team (neyorkshire@environment-agency.gov.uk) to find out whether we have any modelled or historic flood levels available for your development site. A list of the packages of information we're able to provide can be found under the 'get information to complete an assessment' section of the planning practice guidance. They'll aim to provide this information within 20 days. We no longer charge for providing this information.

The risk portrayed by your flood map doesn't seem to reflect the site's actual risk. How do I 'challenge' your flood map?

If you have evidence suggesting that our flood map is inaccurate, please contact our Customers and Engagement team (neyorkshire@environment-agency.gov.uk) who will provide you with any existing data we hold. To formally contest our flood zones, you'll need to submit supporting evidence, such as digital copies of a topographic survey or modelling for quality assurance purposes. Digital files of the proposed new flood zones in ArcMap or MapInfo format should also be supplied. Any new outline data you submit must conform to our flood zones policy, copies of which are available on request.

Whilst we'll usually be happy to review any topographical survey or model prior to the application being submitted, we would have to recover our costs for this work. In some cases where work to review and update our existing models is already underway, we may decline to consider a challenge.

As we have to be certain that the data which informs our flood map is fit-for-purpose, any revisions will need to meet stringent quality checks.

SURFACE WATER AND DRAINAGE

Who's responsible for managing surface water?

Lead local flood authorities are responsible for providing advice on the management of surface water resulting from new major development. Internal drainage boards, where established, have permissive powers to manage water levels within their drainage districts, so also play a key role in managing surface water.

Will I need to provide surface water storage and limit the discharge rate?

You should contact your lead local flood authority to discuss surface water discharge rates and storage requirements. Typically, they'll ask that your development does not increase run-off and limits the discharge to the existing greenfield run-off rate (usually 1.4l/s/ha if not calculated).

Do I need to install sustainable drainage systems?

Sustainable Drainage Systems (SuDS) should always be carefully considered in discussion with your lead local flood authority. A SuDS scheme can reduce flood risk, improve water quality, create better habitats for wildlife, and produce pleasant, more amenable places for people.

Infiltration drainage must not, however, pose a risk to groundwater quality. All infiltration SuDS must:

- Meet the groundwater protection criteria set out on GOV.UK
- Not be constructed in ground affected by contamination

Who should I contact about connecting my development to the mains sewer?

Talk to your water company about connecting to their sewerage system. Here are some contact details for water companies operating in the Yorkshire Environment Agency area:

Yorkshire Water	planningconsultation@yorkshirewater.co.uk
Northumbrian Water	developmentenquiries@nwl.co.uk
Severn Trent Water	new.connections@severntrent.co.uk

My development is a long way from the mains sewer. Can I install a 'non-mains' drainage system, such as a package treatment plant?

New development should connect to the public mains sewer wherever possible. Individual treatment plants can deteriorate local water quality and are more challenging to monitor and regulate. If you can't connect to the mains sewer, your planning submission should outline how you will deal with foul drainage discharge. You should include evidence as to why it is not possible to connect to the mains system, including details of any prohibitive costs. Please note that some 'non-mains' foul water drainage systems will require an environmental permit, irrespective of any planning approval.

OTHER ENVIRONMENTAL CONSIDERATIONS

What other environmental issues will you consider with my planning application?

Your planning application will need to demonstrate that any environmental risks can be managed, through design and construction, for the development's lifetime. Alongside flood risk, the key environmental risks we'll consider are:

- **Land Contamination**
  We're mainly interested in those sites where there is a risk of pollution to controlled waters. You should investigate any contamination to see whether the environmental risk or cost of clean-up (remediation) would hinder your proposal. If contamination is known or suspected, a desktop study, investigation, remediation and other works may be required to enable safe development. Our model procedures for the management of land contamination provide further information.

- **Pollution prevention**
  Your application should demonstrate how you'll minimise the risk of pollution from all aspects of your development, including construction and

operation phases. Groundwater can be vulnerable to pollution, as well as rivers and streams. Some areas (source protection zones and aquifers) are especially sensitive to pollutants as they typically supply public drinking water. To find out whether your development is located in an area sensitive to groundwater pollution, visit our interactive maps. Advice on groundwater protection can be found on GOV.UK

- **Fisheries, biodiversity, geomorphology and protected species**
  If your proposal is likely to affect the ecology of a main river, you'll need to carry out a risk assessment. This assessment should show that your development can proceed without demonstrable harm, and should propose mitigation, compensation or enhancements where required. A survey should be carried out if any protected species are thought to be nearby. If this survey confirms the presence of protected species or their habitat, measures should be taken to manage the development's risks. Natural England are the statutory consultee for other biodiversity-related matters. Further information on their remit can be found on GOV.UK

- **Water framework directive**
  If your proposal affects ground or surface waterbodies, you'll need to consider the Water Framework Directive (WFD) and the actions set out in the Humber River Basin Management Plan. You'll also need to submit a WFD Assessment demonstrating how the development will prevent deterioration and improve the waterbody's ecological status.

- **River buffer zone**
  Your development should ensure that an 8m strip of land (planted with locally appropriate, native species) is left undisturbed next to the bank of any main river. This 'river corridor' will improve habitat connectivity and will ensure we're able to access the bank for any future flood defence construction and maintenance.

- **Culverting**
  We're opposed to culverting. Culverts degrade watercourses' ecology and prevent the movement of wildlife and fish. As culverts can easily become blocked, they increase flood risk. They're also difficult to inspect and maintain. We may object to any planning applications involving culverting on a main river and may refuse to grant an environmental permit. Existing culverts should be removed and the river channel and bankside habitat reinstated to restore the ecological continuity of the river channel and its corridor.

Will I need any other Environment Agency permits for my development?

You might need an environmental permit if your development manages or produces waste or emissions that pollute the air, water or land or is work that affects a main river or a sea defence. The lead local flood authority is responsible for any consents relating to ordinary watercourses.

The Environmental Permitting Regulations (England and Wales) 2015 cover water discharges, groundwater activities, flood risk activities, radioactive substances, waste, mining waste and installations. They also include provision for a number of directives including batteries. Further information, including contact details for further permitting related enquiries, can be found here.

As planning and permitting decisions are often closely linked, we have issued detailed guidance for developments requiring planning permission and environmental permits. This guidance explains how, when responding to planning consultations that require environmental permits, we will advise of three possible positions:

- No major permitting concerns
- More detailed consideration is required and parallel tracking is recommended
- Don't proceed – unlikely to grant a permit.

PRE-APPLICATION ADVICE

Can you provide site-specific advice, review a submission document, or attend a site meeting before I submit my planning application?

We encourage you to seek pre-application advice as it can help you solve key environmental issues early, reduce the chance of an objection and help you design a more sustainable development. If you'd like to take advantage of this service, please email our Sustainable Places team so that we can provide further details and estimated costs.

Please note that any pre-application guidance we provide doesn't represent our final view in relation to any future planning application. We recommend that you seek your own expert advice prior to submitting your application.

Who should I contact for further information?

Yorkshire planning enquiries: sp-yorkshire@environment-agency.gov.uk

General enquiries: 03708 506 506

Environment Agency, Lateral, 8 City Walk, Leeds LS11 9AT
https://www.gov.uk/government/organisations/environment-agency

A P P E N D I X D: WATER AUTHORITY CONSULTATION

YorkshireWater

Mr W Walker
Walker Ingram Associates Ltd
Office G4
Monckton Road
Wakefield
WF2 7AS

Yorkshire Water Services
Developer Services
Sewerage Technical Team
PO BOX 52
Bradford
BD3 7AY

For telephone enquiries ring:
Becca Khan on 0345 120 8482

Your Ref: WIA005
Our Ref: U005389

16th April 2018

Dear Mr Walker,

Lee Lane Royston S71 4RT - Pre Planning Sewerage Enquiry On R928381

Thank you for your recent enquiry. Our charge of £153.00 (plus VAT) will be added to your account with us, reference WIA005. You will receive an invoice for your account in due course.

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

The site is remote from the public sewer network.

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.

The nearest public foul sewer is the 225mm diameter public foul water sewer recorded in Lee Lane at a point approximately 290 metres from the site.

However subject to other new developments within the localised area there is limited capacity in this public sewer, and therefore is currently there is no capacity for the domestic foul flows from the development.

Currently the nearest suitable sized sewer to accept the foul water discharge is recorded in High Street at a point approximately 680 metres from the site.

From the information supplied, it is not possible to determine if the whole site will drain by gravity to the public sewer network. If the site, or part of it, will not drain by gravity, then it is likely that a sewage pumping station will be required to facilitate connection to the public sewer

INVESTING IN VOLUNTEERS FOR EMPLOYERS
CUSTOMER SERVICE EXCELLENCE CSE

network. If sewage pumping is required foul water discharge must not exceed four (4) litres per second.

An off-site foul water sewer may be required. This may be provided by the developer and considered for adoption by means of a sewer adoption agreement under Section 104 of the Water Industry Act 1991. 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.

Surface Water

The developer's attention is drawn to Requirement H3 of the Building Regulations 2000. This establishes a preferred hierarchy for surface water disposal. Consideration should firstly be given to discharge to soakaway, infiltration system and watercourse in that priority order.

Sustainable Drainage Systems (SuDS), for example the use of soakaways and/or permeable hardstanding etc, may be a suitable solution for surface water disposal appropriate in this situation. You are advised to seek comments on the suitability of SuDS in this instance from the appropriate authorities.

It is understood that a watercourse is located to the north and west of the site. This appears to be the obvious place for surface water disposal (if SuDS are not viable).

If we received satisfactory evidence that you were unable to discharge to a watercourse we would look at allowing your site a maximum surface water discharge of 5 l/s to the 450 mm surface water sewer in Applehaigh View approximately 450 metres to the north east of the site.

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, with regard to surface water disposal from the site.

Other Observations

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

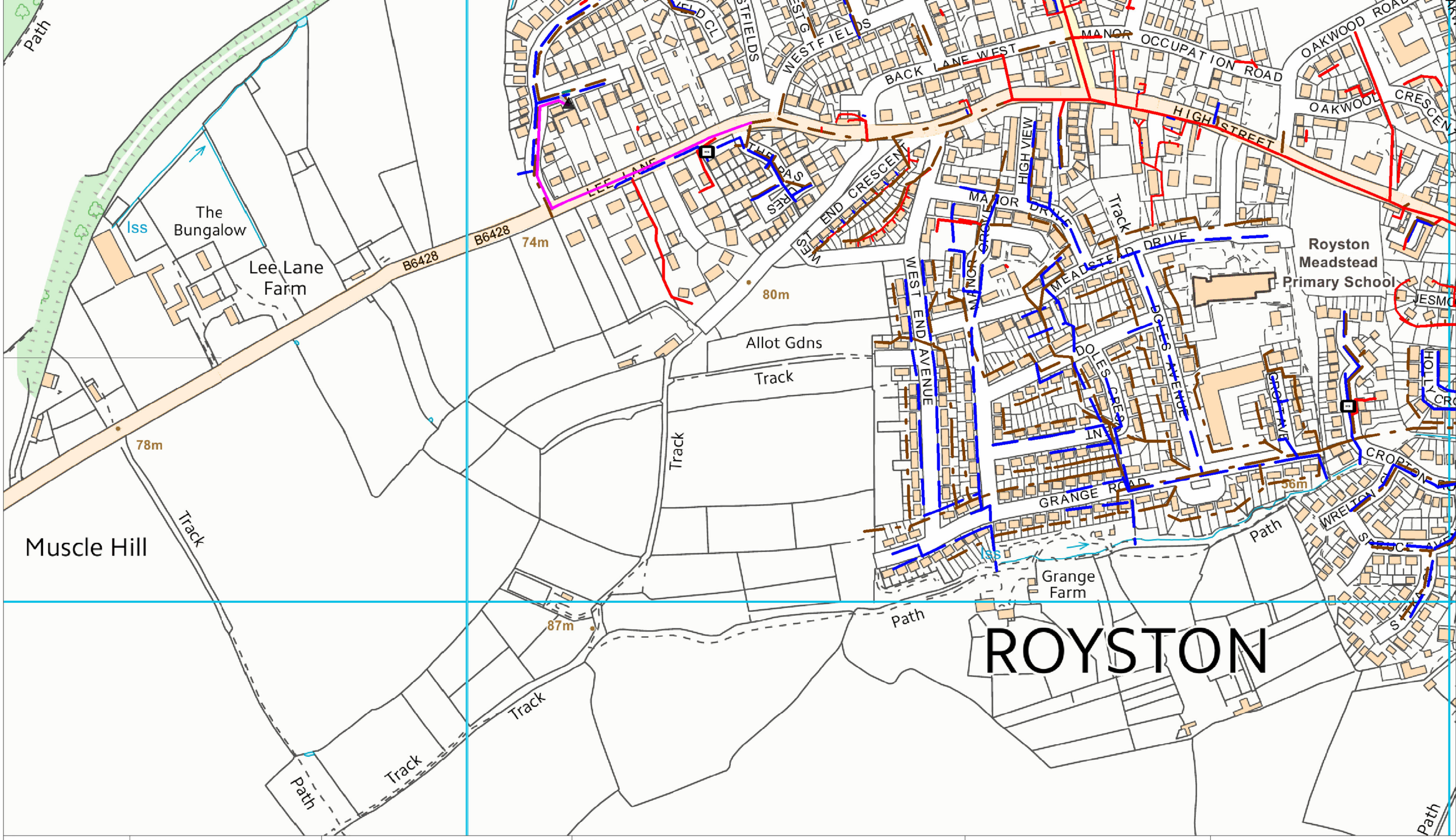
Prospectively adoptable sewers and pumping stations must be designed and constructed in accordance with the WRc publication "Sewers for Adoption - a design and construction guide for developers" 6th Edition as supplemented by Yorkshire Water's requirements, pursuant to an agreement under Section 104 of the Water Industry Act 1991. An application to enter into a Section 104 agreement must be made in writing prior to any works commencing on site. Please contact our Developer Services Team (telephone 0345 120 84 82) for further information.

All the above comments are based upon the information and records available at the present time. 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. 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

Becca Khan
Sewerage Technical Team
Developer Services



434392 : 410686	Map Name : SE3410NE	Title	Partial Key
Yorkshire Water, PO Box 500, Halifax Road, Bradford BD6 2LZ Contact Name : r khan Contact Tel :	Notes	Foul Sewer = F Combined Sewer = C Surface Water Sewer = SW Trade Sewer = TD Partially Separate = PS	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.
	(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	Date Req : 16/04/2018, 15:31:52	Date Gen : 16/04/2018, 15:31:58
		Source : Sewer Network Enquiry	

UPN: Undefined Originator: r khan, loop,

Wayne Walker

From: Chris.Roberts@yorkshirewater.co.uk on behalf of technical.sewerage@yorkshirewater.co.uk
Sent: 24 December 2021 10:46
To: Wayne Walker
Subject: Re: 106.002 - R928381/V003849 Lee Lane, Royston - PPSE
Attachments: pic25734.gif; roberts4_rad9CF1A.PDF; image001.png; NEW LAYOUT SK01, LEE LANE, ROYSTON - NOV 21.pdf; App A - Site Location Plan.pdf; 105.002 - Lee Lane, Royston - PPSE - signed.pdf

Hi Wayne,

In line with my earlier comments and the subsequent Formal Planning Comments made on 2019/0239 / YW - V003849, Foul can discharge to the 225 mm to the north in Park Head View or Applehaigh View via the now mapped 225 mm foul public sewers at a maximum pumped rate of 6 l/s.

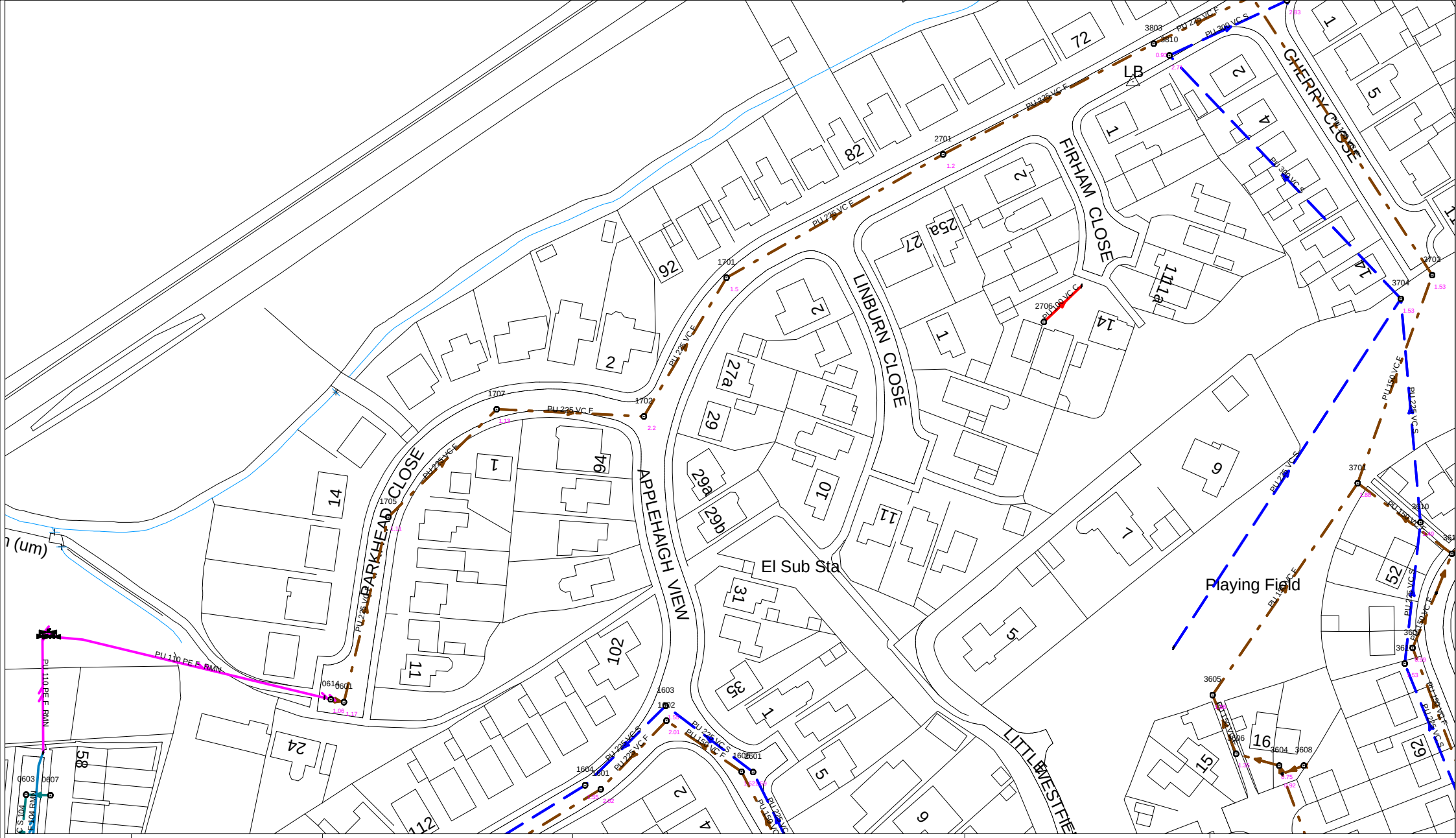
Please note only the foul network that comes from Parkhead Close and enters Applehaigh View adjacent 94 Applehaigh View must be used for any foul discharge.

Kind Regards

(Embedded image moved to file: pic25734.gif)
*** Please note, all correspondence must be sent to technical.sewerage@yorkshirewater.co.uk and will be responded to within 10 working days ***

(See attached file: roberts4_rad9CF1A.PDF)

|---------->
| From: |
|---------->
>-------|
|Wayne Walker <wayne@oecconsult.co.uk>
|
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| To: |
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>-------|
|Technical Sewerage@NotesMail, Chris Roberts/Water Business Unit/YWS/Yorkshire Water@O365
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|---------->
| Cc: |
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>-------|
|Liam Clarke <Liam.Clarke@bellway.co.uk>
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| Date: |
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|03/12/2021 07:49 |



435023 : 411624	Map Name : SE3511NW	Title	Partial Key Foul Sewer = F Combined Sewer = C Surface Water Sewer = SW Trade Sewer = TD Partially Separate = PS
Yorkshire Water, PO Box 500, Halifax Road, Bradford BD6 2LZ Contact Name : YorMap Advisor C ROBERTS Contact Tel : 87 2582		Notes	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.
		(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	Date Req : 24/12/2021, 10:29:47 Source : Sewer Network Enquiry
			Date Gen : 24/12/2021, 10:30:12

UPN: Undefined Originator: C ROBERTS, YorMap, 87 2582

A P P E N D I X E: LEAD LOCAL FLOOD AUTHORITY CONSULTATION

Wayne Walker

From: Atkins , Wayne <WayneAtkins@barnsley.gov.uk>
Sent: 29 August 2018 09:01
To: Wayne Walker
Cc: Ben Tidmarsh
Subject: RE: 105.002 Lee Lane, Royston - Discharge Rate & Connection Approval

Hi Wayne,

Apologies for the delay in responding.

If the developer is to carry out works within or in the proximity of any watercourse he must gain the relevant permissions from the Lead Local Flood Authority – Contact highwaydrainage@barnsley.gov.uk

I have no objections in principal to a discharge rate of 37.2ltr/sec into the watercourse to the north of the site.

There should be no increase in surface water runoff from the new development. PPS25 recognises that the management of flood risk is not simply restricted to flood plains and that a catchment-wide approach should be employed.

Any balancing facility should be designed to accommodate a 1 in 30 year flow from the site below ground and a 1 in 100 year flow retained within the site (including an allowance of 30% for climate change), without causing any flooding to buildings.

There are alternatives to conventional storage for the control of surface water run-off that are favoured by the authority where ground conditions are suitable. Sustainable Urban Drainage techniques (SUD's) tackle surface water run-off problems at source using features such as soakaways, permeable pavements, grassed swales, infiltration trenches, ponds and wetlands to attenuate flood peak flows, produce water quality improvements and environmental enhancements.

The authority seeks to promote the use of SUD's techniques to this site and the authority expects the developer of the site to submit detailed investigations such that the use of SUD's has been fully explored.

If you require any further information please let me know.

Regards

Wayne Atkins
Principal Engineer – Drainage
Environment & Transport
Place Directorate
Barnsley Metropolitan Borough Council

Telephone: 01226 772182
E-mail: wayneatkins@barnsley.gov.uk

From: Wayne Walker [mailto:wayne@walkeringram.co.uk]
Sent: 15 August 2018 08:59
To: Atkins , Wayne
Cc: Ben Tidmarsh
Subject: 105.002 Lee Lane, Royston - Discharge Rate & Connection Approval

Morning Wayne,

Wayne Walker

From: Atkins , Wayne (SENIOR ENGINEER) <WayneAtkins@barnsley.gov.uk>
Sent: 19 October 2021 07:28
To: Wayne Walker
Cc: Grayson , Ian (SENIOR ENGINEER - ASSETS)
Subject: FW: 105.002 - Lee Lane, Royston - Bellway Development - Consultation
Attachments: RE: 105.002 Lee Lane, Royston - Discharge Rate & Connection Approval; Outfall Proposals.pdf; Location Plan.pdf

Good Morning Wayne,

Unfortunately I have changed roles within the Authority and no longer deal with Drainage matters. All Drainage enquiries should be directed to Ian Wilson in the first instance on ianwilson@barnsley.gov.uk

However with regard to this site as I have dealt with it previously my comments would be that a discharge rate of 37.2l/s as previously agreed is still acceptable and there are no changes to the design criteria sent previously. The watercourse clearance works would require consent under the Land Drainage Act from BMBC as LLFA as well as the installation of an Outfall structure in the watercourse.

Hope this helps.

Regards

Wayne Atkins F.I.H.E.
Senior Engineer, Highway Design
Transport
Place Directorate
Barnsley Metropolitan Borough Council

E-mail: wayneatkins@barnsley.gov.uk
Mail : PO Box 601, Barnsley S70 9FA

From: Wayne Walker <wayne@oecconsult.co.uk>
Sent: 15 October 2021 13:54
To: Atkins , Wayne (SENIOR ENGINEER) <WayneAtkins@barnsley.gov.uk>
Subject: 105.002 - Lee Lane, Royston - Bellway Development - Consultation

Afternoon Wayne,

I hope your well.

It's been a while since we looked at the above project as the council put things on hold whilst the Masterplan Framework was finalised, however, things are starting to move again. Therefore, we wish to reconfirm previous agreements please.

- Discharge Rate:- 37.2l/s (previous agreement email attached). If you can confirm any changes to the design criteria noted in this email it would be appreciated.
- Connection Point:- Watercourse north of the site.
    - The masterplan framework has accommodated the ditch that runs north from Lee Lane towards the dismantled railway/PROW (see screen shot below). Therefore, we would propose cleaning out this ditch and re-grading at a minimum gradient of 1:500 to the north. I have attached a PDF layout showing the outfall proposals.

We look forward to your response in due course.



Thank you,

Regards

Wayne Walker
Director

T: 01924 792312
M: 07901 680224
E: wayne@oecconsult.co.uk

We Have Relocated

Our new address is: Clarke Hall Farm, Aberford Road, Wakefield, WF1 4AL

OEC Consulting Engineers Ltd

www.oecconsult.co.uk

Clarke Hall Farm, Aberford Road, Wakefield, WF1 4AL

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A P P E N D I X F: PLANNING LAYOUT

Scaled @ 1:500

0 10m 20m 50m

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All Dimensions are to be verified on site before any work commences. If any discrepancies, errors or emissions are noted, these are to be reported to STEN Architecture immediately.

If any other drawings are referenced within this layout, please refer to the specific detailed drawing for design, materials and specific working practices.

LEE LANE

LEE LANE

Lee Lane Farm

Existing track outside of site ownership, shown indicatively due to lack of survey information

Existing track outside of site ownership, shown indicatively due to lack of survey information

Existing track within site ownership, shown indicatively due to lack of survey information

Existing track within site ownership, shown indicatively due to lack of survey information

Indicative SUDs basin design

Indicative pump station location

Indicative underground tank location

LEAP 400m²

20m standoff to habitable rooms

20m standoff to habitable rooms

PLANNING LAYOUT KEY

Boundary treatments

- 1.8m Boundary screen wall
- 1.8m Boundary screen fence
- 0.45m Knee railing
- 0.9m Estate railings
- 0.6m Low frontage wall
- Brick pillar detail
- 1.8m timber gate

General

- Title Boundary
- Bin collection point (bin collection day only)
- Block paving
- Tree/vegetation to be retained.
- Root protection Zone.
- Tree/vegetation to be removed.
- Reinforced tarmac to accomodate fire vehicle turn. (Area to be tracked and confirmed for compliance by highway consultant or

ACCOMMODATION SCHEDULE

Reference	Beds	Storeys	Total
Joiner	2	2	7
Tailor	3	2	12
Turner	3	2	40
Thespian Semi	3	2	4
Thespian Det	3	2	13
Baxter	3	2	26
Farrier	4	2	25
Scrivner	4	2	22
Cartwright	4	2.5	16
Cutler	4	2	26
Bowyer	4	2	22
Forester	4	2	11
Goldsmith	4	2	12
Lorimer	4	2	13
Grand-Total			**249**

REV:	DESCRIPTION:	BY:	DATE:
G	East to west footway link increased to 3m, Plots 74-76, 105-107, 162-169, 181-184 & 190-198 repositioned to suit. Schedule updated to suit plot substitutions on 76, 105 & 181	TS	13.04.22
F	Footway connection adjacent plot 151 repositioned. Substation position amended and footway connection to the north amended. Adoptable connection shown opposite plot 40. 3m cycle way shown through central POS.	TS	01.04.22
E	Footway connection shown adjacent plot 151	TS	23.03.22
D	Additional walling added to plots 19-40, 41-63, 64, 84, 87, 98, 105, 148-161, 151, 159-160, 175, 176 & 206	TS	15.03.22
C	low frontage walls & Brick piers indicated on plan. Plots 173-175 repositioned to allow for visibility splay to be incorporated into the design.	TS	08.03.22
B	Layout generally updated to highway consultant information. Junction design updated, visibility splays shown. widening to road adjacent plot 203/204 to accommodate bus maneuver. Bus stop location amended. indicative engineering information shown.	TS	01.03.22
A	Substation added. Road adjacent plot 73 amended to tie in with potential development to the east.	TS	01.02.22

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Linkedin: Sten Architecture

CLIENT: Bellway

SITE: Lee Lane Royston

TITLE: Planning Layout

SCALE AT A0:	DATE:	DRAWN:	CHECKED:
1:500	18.01.22	TS	--

PROJECT NO:	DRAWING NO:	REVISION:
2202	2202.01	G

A P P E N D I X G: INDICATIVE SURFACE WATER DRAINAGE CALCULATIONS

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	100.578	0.578	33.2	499.9	O K
30 min Summer	100.751	0.751	33.5	649.4	O K
60 min Summer	100.918	0.918	33.5	793.7	O K
120 min Summer	101.055	1.055	33.5	912.7	O K
180 min Summer	101.104	1.104	33.5	954.7	O K
240 min Summer	101.114	1.114	33.5	963.7	O K
360 min Summer	101.110	1.110	33.5	959.8	O K
480 min Summer	101.092	1.092	33.5	944.6	O K
600 min Summer	101.066	1.066	33.5	922.5	O K
720 min Summer	101.036	1.036	33.5	896.3	O K
960 min Summer	100.970	0.970	33.5	839.0	O K
1440 min Summer	100.836	0.836	33.5	723.3	O K
2160 min Summer	100.660	0.660	33.4	571.2	O K
2880 min Summer	100.524	0.524	32.9	453.4	O K
4320 min Summer	100.350	0.350	30.7	302.4	O K
5760 min Summer	100.259	0.259	28.4	224.0	O K
7200 min Summer	100.222	0.222	25.3	191.8	O K
8640 min Summer	100.199	0.199	22.4	171.8	O K
10080 min Summer	100.182	0.182	20.1	157.6	O K
15 min Winter	100.650	0.650	33.4	561.9	O K
30 min Winter	100.845	0.845	33.5	731.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	69.560	0.0	510.6	18
30 min Summer	46.077	0.0	679.2	33
60 min Summer	29.238	0.0	871.6	62
120 min Summer	18.017	0.0	1075.2	122
180 min Summer	13.426	0.0	1202.3	180
240 min Summer	10.845	0.0	1295.2	224
360 min Summer	8.002	0.0	1433.8	284
480 min Summer	6.447	0.0	1540.4	346
600 min Summer	5.449	0.0	1627.5	414
720 min Summer	4.747	0.0	1701.6	484
960 min Summer	3.817	0.0	1824.1	616
1440 min Summer	2.803	0.0	2008.7	880
2160 min Summer	2.056	0.0	2216.4	1256
2880 min Summer	1.648	0.0	2369.1	1616
4320 min Summer	1.206	0.0	2596.9	2296
5760 min Summer	0.966	0.0	2779.0	2992
7200 min Summer	0.812	0.0	2921.6	3680
8640 min Summer	0.705	0.0	3041.9	4408
10080 min Summer	0.626	0.0	3147.3	5136
15 min Winter	69.560	0.0	572.9	18
30 min Winter	46.077	0.0	761.7	32

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Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	101.037	1.037	33.5	897.0	O K
120 min Winter	101.203	1.203	33.5	1040.5	O K
180 min Winter	101.270	1.270	33.5	1098.6	O K
240 min Winter	101.293	1.293	33.5	1118.9	O K
360 min Winter	101.282	1.282	33.5	1108.8	O K
480 min Winter	101.251	1.251	33.5	1082.1	O K
600 min Winter	101.212	1.212	33.5	1048.5	O K
720 min Winter	101.165	1.165	33.5	1007.7	O K
960 min Winter	101.060	1.060	33.5	917.0	O K
1440 min Winter	100.849	0.849	33.5	734.1	O K
2160 min Winter	100.588	0.588	33.2	508.9	O K
2880 min Winter	100.412	0.412	31.7	356.2	O K
4320 min Winter	100.242	0.242	27.6	209.3	O K
5760 min Winter	100.199	0.199	22.5	172.1	O K
7200 min Winter	100.175	0.175	19.1	151.4	O K
8640 min Winter	100.159	0.159	16.5	137.9	O K
10080 min Winter	100.148	0.148	14.7	127.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60 min Winter	29.238	0.0	976.7	62
120 min Winter	18.017	0.0	1204.7	120
180 min Winter	13.426	0.0	1347.1	176
240 min Winter	10.845	0.0	1451.1	232
360 min Winter	8.002	0.0	1606.3	336
480 min Winter	6.447	0.0	1725.8	378
600 min Winter	5.449	0.0	1823.3	452
720 min Winter	4.747	0.0	1906.3	528
960 min Winter	3.817	0.0	2043.5	674
1440 min Winter	2.803	0.0	2250.5	950
2160 min Winter	2.056	0.0	2482.8	1320
2880 min Winter	1.648	0.0	2653.9	1668
4320 min Winter	1.206	0.0	2909.8	2252
5760 min Winter	0.966	0.0	3112.7	2992
7200 min Winter	0.812	0.0	3272.6	3672
8640 min Winter	0.705	0.0	3407.6	4408
10080 min Winter	0.626	0.0	3526.5	5144

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Shortest Storm (mins)	15
Ratio R	0.361	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 4.000

Time (mins) From:	To:	Area (ha)
0	4	4.000

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Model Details

Storage is Online Cover Level (m) 105.000

Tank or Pond Structure

Invert Level (m) 100.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	865.0	0.700	865.0	1.400	865.0	2.100	865.0
0.100	865.0	0.800	865.0	1.500	865.0	2.200	865.0
0.200	865.0	0.900	865.0	1.600	865.0	2.300	865.0
0.300	865.0	1.000	865.0	1.700	865.0	2.400	865.0
0.400	865.0	1.100	865.0	1.800	865.0	2.500	865.0
0.500	865.0	1.200	865.0	1.900	865.0		
0.600	865.0	1.300	865.0	2.000	865.0		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0227-3350-2500-3350
Design Head (m)	2.500
Design Flow (l/s)	33.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	227
Invert Level (m)	100.000
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	2100

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.500	33.5
Flush-Flo™	0.720	33.5
Kick-Flo®	1.532	26.5
Mean Flow over Head Range	-	29.2

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	7.6	1.200	31.6	3.000	36.5	7.000	55.0
0.200	22.6	1.400	29.2	3.500	39.3	7.500	56.9
0.300	29.5	1.600	27.0	4.000	41.9	8.000	58.7
0.400	31.6	1.800	28.6	4.500	44.4	8.500	60.4
0.500	32.7	2.000	30.1	5.000	46.7	9.000	62.1
0.600	33.3	2.200	31.5	5.500	48.9	9.500	63.8
0.800	33.4	2.400	32.8	6.000	51.0		
1.000	32.8	2.600	34.1	6.500	53.0		

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	100.986	0.986	33.5	852.6	O K
30 min Summer	101.304	1.304	33.5	1127.8	O K
60 min Summer	101.632	1.632	33.5	1411.9	O K
120 min Summer	101.933	1.933	33.5	1672.2	O K
180 min Summer	102.070	2.070	33.5	1790.5	O K
240 min Summer	102.134	2.134	33.5	1846.3	O K
360 min Summer	102.172	2.172	33.5	1879.1	O K
480 min Summer	102.157	2.157	33.5	1865.8	O K
600 min Summer	102.129	2.129	33.5	1841.6	O K
720 min Summer	102.097	2.097	33.5	1813.9	O K
960 min Summer	102.027	2.027	33.5	1753.0	O K
1440 min Summer	101.880	1.880	33.5	1626.0	O K
2160 min Summer	101.653	1.653	33.5	1429.9	O K
2880 min Summer	101.387	1.387	33.5	1199.8	O K
4320 min Summer	100.960	0.960	33.5	830.3	O K
5760 min Summer	100.670	0.670	33.5	579.4	O K
7200 min Summer	100.483	0.483	32.6	417.9	O K
8640 min Summer	100.366	0.366	31.0	316.4	O K
10080 min Summer	100.291	0.291	29.3	251.8	O K
15 min Winter	101.107	1.107	33.5	957.2	O K
30 min Winter	101.467	1.467	33.5	1269.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	116.991	0.0	864.5	19
30 min Summer	78.239	0.0	1158.5	33
60 min Summer	49.937	0.0	1491.7	64
120 min Summer	30.795	0.0	1840.5	122
180 min Summer	22.881	0.0	2051.7	182
240 min Summer	18.409	0.0	2201.0	242
360 min Summer	13.491	0.0	2419.7	360
480 min Summer	10.822	0.0	2587.8	458
600 min Summer	9.113	0.0	2723.8	510
720 min Summer	7.915	0.0	2838.7	572
960 min Summer	6.331	0.0	3026.8	702
1440 min Summer	4.614	0.0	3305.4	980
2160 min Summer	3.355	0.0	3619.7	1404
2880 min Summer	2.673	0.0	3845.1	1784
4320 min Summer	1.938	0.0	4176.5	2504
5760 min Summer	1.540	0.0	4433.3	3176
7200 min Summer	1.288	0.0	4633.8	3824
8640 min Summer	1.112	0.0	4801.4	4504
10080 min Summer	0.984	0.0	4950.7	5240
15 min Winter	116.991	0.0	969.1	19
30 min Winter	78.239	0.0	1297.9	33

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	101.838	1.838	33.5	1590.1	O K
120 min Winter	102.183	2.183	33.5	1888.4	O K
180 min Winter	102.346	2.346	33.5	2029.4	O K
240 min Winter	102.429	2.429	33.5	2100.9	O K
360 min Winter	102.492	2.492	33.5	2155.6	O K
480 min Winter	102.494	2.494	33.5	2157.7	O K
600 min Winter	102.463	2.463	33.5	2130.1	O K
720 min Winter	102.413	2.413	33.5	2087.6	O K
960 min Winter	102.327	2.327	33.5	2013.0	O K
1440 min Winter	102.122	2.122	33.5	1835.4	O K
2160 min Winter	101.789	1.789	33.5	1547.5	O K
2880 min Winter	101.382	1.382	33.5	1195.8	O K
4320 min Winter	100.762	0.762	33.5	659.3	O K
5760 min Winter	100.437	0.437	32.1	378.0	O K
7200 min Winter	100.283	0.283	29.1	244.5	O K
8640 min Winter	100.228	0.228	26.1	197.3	O K
10080 min Winter	100.204	0.204	23.1	176.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
60 min Winter	49.937	0.0	1671.1	62
120 min Winter	30.795	0.0	2061.8	120
180 min Winter	22.881	0.0	2298.2	178
240 min Winter	18.409	0.0	2465.5	236
360 min Winter	13.491	0.0	2710.3	350
480 min Winter	10.822	0.0	2898.5	460
600 min Winter	9.113	0.0	3050.7	564
720 min Winter	7.915	0.0	3179.3	608
960 min Winter	6.331	0.0	3389.7	742
1440 min Winter	4.614	0.0	3700.7	1054
2160 min Winter	3.355	0.0	4054.4	1516
2880 min Winter	2.673	0.0	4307.0	1928
4320 min Winter	1.938	0.0	4679.1	2592
5760 min Winter	1.540	0.0	4965.6	3224
7200 min Winter	1.288	0.0	5190.3	3816
8640 min Winter	1.112	0.0	5378.3	4408
10080 min Winter	0.984	0.0	5546.4	5144

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Shortest Storm (mins)	15
Ratio R	0.361	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 4.000

Time (mins) From:	To:	Area (ha)
0	4	4.000

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Model Details

Storage is Online Cover Level (m) 105.000

Tank or Pond Structure

Invert Level (m) 100.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	865.0	0.700	865.0	1.400	865.0	2.100	865.0
0.100	865.0	0.800	865.0	1.500	865.0	2.200	865.0
0.200	865.0	0.900	865.0	1.600	865.0	2.300	865.0
0.300	865.0	1.000	865.0	1.700	865.0	2.400	865.0
0.400	865.0	1.100	865.0	1.800	865.0	2.500	865.0
0.500	865.0	1.200	865.0	1.900	865.0		
0.600	865.0	1.300	865.0	2.000	865.0		

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0227-3350-2500-3350
Design Head (m)	2.500
Design Flow (l/s)	33.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	227
Invert Level (m)	100.000
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	2100

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.500	33.5
Flush-Flo™	0.720	33.5
Kick-Flo®	1.532	26.5
Mean Flow over Head Range	-	29.2

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	7.6	1.200	31.6	3.000	36.5	7.000	55.0
0.200	22.6	1.400	29.2	3.500	39.3	7.500	56.9
0.300	29.5	1.600	27.0	4.000	41.9	8.000	58.7
0.400	31.6	1.800	28.6	4.500	44.4	8.500	60.4
0.500	32.7	2.000	30.1	5.000	46.7	9.000	62.1
0.600	33.3	2.200	31.5	5.500	48.9	9.500	63.8
0.800	33.4	2.400	32.8	6.000	51.0		
1.000	32.8	2.600	34.1	6.500	53.0		

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