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**FLOOD RISK ASSESSMENT AND DRAINAGE STRATEGY REPORT
FOR A PROPOSED DEVELOPMENT ON LAND AT NEW ROAD, TANKERSLEY**

**Prepared for
ROUSE HOMES**



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A	Yorkshire Water Pre-Development Reply
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DRAINAGE STRATEGY REPORT
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1 INTRODUCTION

- 1.1 iD Civils Design Ltd (iD), have been appointed by Rouse Homes (RH) to prepare a Flood Risk Assessment (FRA) and Surface Water Drainage/SUDS strategy report for the proposed residential development on brownfield land at New Road, Tankersley.
- 1.2 The report will be undertaken in accordance with Environment Agency, Barnsley Metropolitan Borough Council (BMBC), and Yorkshire Water (YW) development control policies and will focus on:
- Site Use and Current Drainage regime, Flooding History, Ground Conditions and use of SUDS, Impact of development and proposed drainage strategy, pluvial flooding routes and the overall impact of development on the site and surrounds.
- 1.3 The report is for the sole use of RH and presents comments and conclusions based on information available at the time of writing. iD Civils reserve the right to amend conclusions if further information is made available.

2 BACKGROUND

- 2.1 RH is seeking planning consent to develop land to the west of New Road, Tankersley. It is proposed that the site is developed to provide 29 new residential dwellings with associated access road and sewers.
- 2.2 This Flood Risk Assessment has been undertaken with reference to the following reports and documents/agencies:
- Environment Agency Flood Zone Maps (EA website)
 - Environment Agency Surface Water Flooding Maps (EA website)
 - Environment Agency Flood Warning Plans (EA website)
 - Barnsley MBC Strategic Flood Risk Assessment
 - Barnsley MBC Development Control Guidance
 - National Planning Policy Framework (NPPF)
 - Technical Guidance to NPPF
 - Sewers for Adoption 7th edition

- Public Sewer Records (YW)
- Proposed Site Layout (Rouse Homes)
- Phase 2 site investigation report (Eastwood and Partners)
- CCTV Sewer Survey of site produced by EDS
- SuDS Manual (Ciria C753)
- EA Technical Guidance

2.3 In addition, iD Civils has reviewed commercially available information including aerial photographs and historic ordnance survey maps of the area during the preparation of the report.

2.4 **Site Walkover:** A site visit was undertaken in July 2018. During the site walkover, overland flood routes onto and from the site were inspected in order to assess the risk of flooding from external sources. An inspection was made of the watercourse to the north and woodland area to the west of the site to identify land forms where the EA plans show a surface water flood route.

3 REGULATORY GUIDANCE

3.1 National Planning Policy Framework (NPPF), along with the Technical Guidance to NPPF provides the regulatory framework and guidance for planning authorities in relation to Flood Issues for new developments. Any application submitted to a local planning authority will be considered in conjunction with this guidance and local development control policies, and dependant on the nature and location of the application, the planning authority may request a Flood Risk Assessment as part of the planning application submission.

3.2 The Environment Agency is a statutory consultee to the Planning Authority in relation to flood risk issues.

3.3 Barnsley Metropolitan Borough Council (BMBC) is the Planning Authority, and has their own internal Flood Management/Drainage Department which would advise on drainage issues and work with the EA on strategic issues within the area.

3.4 BMBC are also the Local Lead Flood Authority (LLFA) and are a statutory consultee to the planning process.

- 3.5 The Environment Agency has, in April 2015, provided guidance for local planning authorities regarding the relevant consultees to the planning process in terms of flood risk. In summary, this advises that the Lead Local Flood Authority should be consulted for major developments in all flood zones, with the Environment Agency also consulted if the development is within 20 metres of a main river. If the site is more distant to a main river then the Environment Agency should only be consulted for Flood Zone 2 and 3 developments, with the exception of water compatible developments in Flood Zone 2 where consultation is not needed.
- 3.6 The Environment Agency has undertaken a national study of flood risk across England and published flood maps covering the country. The maps can be viewed on the agency web site at www.gov.uk/government/organisations/environment-agency. Specific locations can be studied by searching either using postcode or address.
- 3.7 The EA flood maps identify 3 zones.

Flood Zone 1: This zone comprises land with a less than 1 in 1000 annual probability of river or sea flooding in any one year (<0.1%)

Flood Zone 2: This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1%-0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5%-0.1%) in any year. This flood zone is denoted by light blue shading on the EA flood zone maps.

Flood Zone 3: The zone comprises land assessed as having a 1 in 100 year or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year. This flood zone is denoted by dark blue shading on the EA flood zone maps.

- 3.8 Flood risk should be assessed from the following sources;

- Tidal and river
- Surface water overland flow
- Groundwater
- Sewers (Pluvial Flooding)
- Artificial sources e.g. canals, reservoirs water mains.

- 3.9 Flood zone plans reflect the undefended flood scenario for a particular area. Many flood areas are defended with flood defences of varying types and design life. Areas benefiting from flood protection are shown hatched on the EA plans. The EA have also published additional flood risk mapping, the Risk of Flooding from Rivers and the Sea, which shows the defended scenario.

- 3.10 The EA have published a series of Surface Water Flood Maps which demonstrate overland flood routes on the basis of a 100-year storm event assuming that the natural drainage system is blocked or at capacity (pluvial flooding). Whilst this premise may be a low risk, the plans assist designers in identifying areas at risk so that the necessary flood mitigation measures can be designed to produce a safe development. The plans are a 'starting point' and should be verified by survey or visual inspection as they are based on wide scale aerial survey data.
- 3.11 The level of detail and complexity of a Flood Risk Assessment can vary considerably, dependant on the scale, nature and location of the planned development. EA guidance sets out the criteria for the level of information which should be included within the FRA.
- 3.12 The developed site is shown to lie within **Flood Zone 1** on the Environment Agency's 'Flood Map for Planning and on the Risk of Flooding from Rivers and the Sea plan'. Flood Zone 1 is the lowest risk flood zone.
- 3.13 The site is not within or adjacent to an EA flood warning area.
- 3.14 The Planning Practice Guidance to the NPPF refers to vulnerability classifications, which are based on the sensitivity of different forms of development. In accordance with the guidance (Table 2) the residential end use planned for this development is classed as '*More Vulnerable*'.
- 3.15 Table 3 in the NPPF technical guidance provides information in relation to the appropriate vulnerability classes within each of the flood risk zones. The table is presented below:

Table 4759.1 – Flood Risk Vulnerability and Flood Zone compatibility

Flood Risk Vulnerability Classification (Table 2 NPPF)	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	✓	Exception Test Required	✓	✓
Zone 3a	Exception Test Required	✓	x	Exception Test Required	✓
Zone 3b	Exception Test Required	✓	x	x	x

- 3.16 Based on the above table it can be seen that the intended use of the development is consistent with NPPF guidance for residential development.
- 3.17 **The Sequential Test:** In accordance with NPPF, LPA's allocating land for development should apply the Sequential Test, to demonstrate that there are no available sites in the area with a lower risk of flooding. As the site is in Flood Zone 1 a Sequential Test is not needed.
- 3.18 **The Exception Test:** The exception test is relevant if, following the application of the sequential test; it is not possible for the development to be allocated in zones of lower probability of flooding. The test provides a method of managing flood risk while still allowing necessary development to occur. The development is within Flood Zone 1; thus, the Exception Test will not be required.
- 3.19 Yorkshire Water work within the framework of 'Sewers for Adoption', which sets the standard for adoptable surface water and foul waters sewers. They also apply development control standards which are consistent with current best practice and Building Regulations. Yorkshire Water are currently working to the 7th edition of SFA.
- 3.20 Developers are encouraged to make 'predevelopment' enquiries to YW to ensure that there is sufficient time for the company to fully assess the capacity of their network and treatment works. This process also ensures that drainage strategies are acceptable in principle, prior to planning permission and helps avoid any objections from YW during the planning process. The response to the predevelopment enquiry is included in appendix A of this report.
- 3.21 BMBC, as Lead Local Flood Authority, is a statutory consultee to the Local Planning Authority regarding SuDS matters on major developments. At the present time, there is no obligation for local authorities of LLFA's to adopt SuDS features. ID Civils have liaised with BMBC Flood Management Department and their response is included in appendix F of this report
- 3.22 It is understood that the current position of BMBC is that they will not adopt SUDS features which serve development sites but seek assurance in terms of the long-term maintenance of SUDS features in order to protect the development and surrounding areas in perpetuity.

4 SITE DESCRIPTION AND HISTORY

- 4.1 A site location plan is included as Drawing No. 4759-FRA01. Site details are summarised in the Table below.

Table 4759.2 - Site Location Summary

Detail	Remarks
Location	West of New Road, Tadcaster
NGR	SE 342001. (434285,400170)
Area	1.24 Ha
Current Use	Brownfield – Factory unit and Car Parking

- 4.2 **Topography and Surrounding Land Uses:** The site is an irregular polygon in shape, comprising a single industrial premise with a large central shed and ancillary offices. The boundaries of the site are principally hedgerows and fences from existing properties to the south and mesh fencing to the north and west.
- 4.3 To the north of the site there is an established woodland sloping down to the watercourse to the north from the edge of the site.
- 4.4 To the east of the site is New Road which falls steeply to the north down to a bridge over the watercourse then turns west running along the edge of the woodland area north of the site.
- 4.5 To the west of the site is an established woodland which is consistent in level with the western boundary.
- 4.6 To the south of the site is existing residential development around Thorncliff Way which is set at a lower level than the sites southern boundary.
- 4.7 There is an existing access to the site formed by a tarmac road with kerbs which falls steeply out of the site towards New Road. Adjacent to this access road the eastern edge of the site is steep wooded land.
- 4.8 The site is no longer operational but at the time of the walkover all buildings and hardstanding were in situ. Holes in the western and northern boundary allowed access to the adjacent woodland.
- 4.9 **Existing Hardstanding:** There are no hardstanding areas within the site and the site appears to be undrained.

- 4.10 **Hydrology:** A topographical survey of the site is presented in appendix D. The survey shows the distribution of buildings, access road, parking areas and soft landscape/woodland. The site is drained by a network of road gullies and ACO channels which can be seen on the topographical survey.
- 4.11 There is a watercourse approximately 60m to the north of the site flowing east through the edge of the woodland and eventually below New Road to the north east of the site. The watercourse is approximately 3m below New Road and in a well-defined channel.
- 4.12 A shallow ditch flowing north through the woodland is located approximately 30m to the west of the site. The OS plans show the ditch 'going to ground' to the west of the site. From the walkover the ditch appears to continue on north and flows down towards the watercourse north of the site in a channel approximately 1m in depth.
- 4.13 **Groundwater:** A phase 2 investigation has also been undertaken and no groundwater was encountered during the investigation.
- 4.14 **Existing Drainage:** A detailed survey of the site was undertaken to establish the connectivity of the site to the watercourse or adjacent sewers. This survey is included in appendix C.
- 4.15 **Ground Conditions:** The phase 2 site investigation indicates that there is a veneer of made ground across the site varying in depth from 0.8m to 4.7m. Below the made ground natural strata comprises stiff sandy clay with gravel of mudstone and rare coal fragments.
- 4.16 The site investigation confirms that infiltration drainage is not a suitable means of draining surface water.

5 EXISTING SITE DRAINAGE

- 5.1 iD has obtained a copy of Yorkshire Waters Sewer Record plans for the area. A summary is presented below, and a copy of the sewer record is included within Appendix A:

Table 4759.3 – Existing Drainage Summary

Sewer Type	Comment
Surface Water Sewers	YW records show that there are no surface water sewers within the site. There is a surface water sewer in New Road adjacent to the site entrance which is 225mm diameter and appears to have been built to serve the development to the south. The sewer drains to the watercourse adjacent to Station House.
Combined Water	YW plans do not indicate any combined sewers crossing the site. There is a combined sewer running within New Road to the east of the site which flows north west and turns north east once past the bridge.
Foul Sewers	The record plans show that there are no foul water sewers crossing the site. There is a foul sewer network within the estate to the south which connects to the combined sewer in New Road.
Highway Drainage	iD Civils do not have any highway drainage records for the area. New Road is drained by a series of gullies which are significantly older than the surface water sewer. Inspection of the watercourse reveals two outlet pipes to the east of the bridge, one of which will be the SW sewer and the other which is likely to be a highway drain. It is considered likely that there is an unmapped highway drain in New Road.
Land Drainage	iD Civils do not have records of any existing on-site land drainage system.
Culverted Watercourse	There are no known culverts running through the site.
Private Drains	A cctv survey has been undertaken of the private 'on site' drainage, which indicates that the drains serving the site are combined and discharge to the combined sewer in New Road.

- 5.2 The proposed development site is brownfield. By review of the topographical survey and drainage survey it can be seen that a significant portion of the site (0.205Ha) drains out of the site onto New Road without being intercepted by the private drainage system. This area is shown on the plan within appendix E.
- 5.3 The area draining onto New Road would have been conveyed to the watercourse via the highway drainage system. This area, during a 50mm/hr storm event, would have discharged 28.5 l/s flow rate to the watercourse.

- 5.4 The area intercepted by the private drainage system is 0.43 ha which would generate 59.8 l/s during a 50mm/hr storm event. This flow is direct to the combined sewer network.
- 5.5 BMBC development control guidance states that a greenfield Qbar rate of 5 l/s should be assumed across the borough.
- 5.6 In terms of greenfield flows, 0.61 Ha of the site is currently 'green' i.e. woodland or grassed verges etc. BMBC guidance applies a rate of 5 l/s/ha for greenfield flows, therefore the greenfield rate from the site is 3.05 Ha.
- 5.7 The existing site drainage can therefore be summarised as below;

Table 4759.4 – Existing Drainage Rates

Catchment	Rate (l/s) in 50mm/hr event
Hardstanding Areas drained to combined sewer.	59.8
Hardstanding Areas drained to highway drain in New Road	28.5
Soft Landscape Areas	3
TOTAL	91.3 l/s

6 PROPOSED DEVELOPMENT

- 6.1 It is proposed that the site is developed to provide 29 dwellings accessed from a new junction with New Road in the same location as the existing access.
- 6.2 The roads within the site will be designed to BMBC Highway guidance and adopted by BMBC under a section 38 agreement. The verge to the southern side of the access road will be maintained by a site management company.
- 6.3 Foul and Surface water sewers within the site will be adopted by Yorkshire Water under a section 104 agreement.
- 6.4 An accurate assessment of the detailed surface water site catchment areas is outside of the scope of this report and will be undertaken as part of the detailed section 104 design. The drainage strategy for the development is thus based on an impermeable fraction of 55% of the 1.24 Ha net developed area. On this basis, the total design catchment is 0.68 Ha and that figure has been used in all storage calculations in this report.

7 FLOOD HISTORY AND SITE VULNERABILITY

- 7.1 Flooding can occur from a variety of sources, including tidal, rivers, watercourses, overland run-off, sewers and culverts. NPPF and BMBC guidance requires flood risk from all sources to be evaluated and suitable mitigation provided where required.
- 7.2 Environment Agency mapping shows that the site is located within Flood Zone 1. Therefore, the overall risk to the development from flooding is considered low.
- 7.3 **Climate Change:** NPPF provides guidance with respect to the implications of climate change and suggests appropriate additional allowances for climate change with respect to rainfall intensities.
- 7.4 Subsequent to the NPPF the Environment Agency have, in February 2016, provided updated guidance on climate change allowance

In terms of peak rainfall allowance the guidance, which applies across all areas of England, gives central and upper end allowances. For flood risk assessment and strategic flood risk assessments both allowances should be assessed to understand the range of impact.

Table 4554.5 – Peak Rainfall Allowances

Scenario	2010-2039	2040-2059	2060-2115
Upper End	+10%	+20%	+40%
Central	+5%	+10%	+20%

- 7.5 The technical guide to NPPF recommends that residential development should be regarded as having a design life of 100 years. Allowances of 20% and 40% should therefore be considered when assessing attenuation features on this development. Designers should assess which of the allowances is appropriate depending on individual site constraints and risks.
- 7.6 BMBC development control policy requires a climate change factor of 30%. This factor has been used in this report for the purposes of evaluating the surface water strategy.

8 FLOOD IMPACT AND MITIGATION MEASURES

- 8.1 NPPF guidance requires the risk from a range of potential sources to be evaluated. The range of flood sources identified in NPPF is reviewed below:

8.2 **Flood Risk General:** Based on the site walkover survey, a review of Ordnance Survey level data and EA surface water flood maps, the risk of flooding to the development is considered to be **low**.

8.3 **Flood Risk from Rivers/Watercourses or the Sea – Fluvial Flooding:** Environment Agency mapping shows that the proposed site is located within Flood Zone 1 and is therefore low risk.

Mitigation: None Required other than standard development practice of lifting floor levels 150mm above ground level.

8.4 **Flooding from Overland Surface Water:** The Environment Agency's risk of flooding from surface water plans shows that there is a potential low risk of surface water flooding in the centre of the site flowing into the site from the western boundary. This

8.5 flood map was derived from LiDAR ground level data.

8.6 During the walkover this area to the west of the site was inspected, and it is apparent that there is a ditch crossing the route of the flood risk area shown on the EA plan. This ditch effectively means that the modelled route would be inaccurate as flows would be conveyed to the north down to the watercourse prior to reaching the site.

Mitigation: None required.

8.7 **Flooding from Sewers:** YW Water record plans show that there are no surface water sewers within or adjacent to the site. There are surface water sewers and combined water sewers in New Road which is below the site to the east. Due to topography these sewers pose no risk to the site.

Mitigation: None required.

8.8 **Flooding from Artificial or Other Sources:** Environment Agency mapping shows that the site is not at risk from reservoir flooding. There are no known large water mains within the site or adjacent to the site.

Mitigation: None required

8.9 **Groundwater:** The intrusive site investigation did not encounter any groundwater.

Mitigation: None required

9 SUDS

- 9.1 Building Regulations (Part H), the National Planning Policy Framework, YW and BMBC development control policies and Environment Agency advice notes, require the consideration of sustainable drainage techniques for new developments.
- 9.2 Surface Water drainage should be considered in accordance with a prescribed hierarchy aimed at minimising the impact of development. Surface Water flows should be designed to discharge to:
1. Infiltration based or sustainable drainage systems
 2. Watercourses
 3. Surface water Sewers
 4. Combined water sewers

Guidance on SUDS techniques can be found in the SUDS Manual (Ciria 2015). There are various forms of technique available as summarised below:

Table 4759.6 – Forms of SuDS Drainage

Technique	Description
Trenches	Shallow excavations filled with rubble or stone that create temporary storage and either filter into the ground or convey water to an outlet. Known as 'French drains'
Swales	Shallow linear vegetated drain ditches which can either convey flows to an outlet or infiltrate via a granular sub base to the sub strata.
Pervious Pavements	Material which allows water to permeate into underlying sub strata – best utilised on flat sites with permeable sub strata. Permeable paving can be used on clay sub strata but will require a piped drainage outlet from the sub base to a positive system.
Geocellular Systems/Tank systems	Modular plastic geocellular systems which have a high void ratio and allow water to be storage below ground. Large diameter pipework or purpose designed tanks to allow below ground storage.
Infiltration Basins	Vegetated depressions which allow water storage and slow infiltration into the ground.
Detention Basins	Surface water storage basins which remain dry when not in use and allow flood water to collect and discharge to a design flow rate.

Technique	Description
Ponds	Ponds can provide both attenuation and treatment, together with landscape and ecology value. Run off through storms is attenuated in an upper level above ambient pond depth.

- 9.3 The use of SUDS techniques is designed to mitigate the impact of development on receiving watercourses or sewers by mimicking pre-development conditions as far as possible. New development should not worsen flooding downstream and should attempt to improve flooding wherever practical.
- 9.4 Sustainable Drainage can take many forms dependant on site use, ground conditions and topography. In terms of the hierarchy of sustainable options, infiltration-based systems should be considered in the first instance i.e. soakaways/infiltration swales/basins etc. The use of infiltration systems will be subject to the infiltration characteristics of the natural ground below the site and any environmental constraints which may apply i.e. sensitivity of the groundwater or risk of increasing water flow through the ground. In this instance the site is not suitable to infiltration drainage due to the very low percolation rates.
- 9.5 In areas with cohesive sub soils it is unlikely that sufficient percolation can be provided to allow the implementation of infiltration techniques.
- 9.6 Sustainable Drainage in areas of cohesive sub soils can be provided by a range of flow attenuation devices to suit the proposed development, policies of adopting authorities and planning authority requirements. Attenuation ponds and swales can provide ecological benefits by the creation of wetland habitats and also improve the quality of water by adding a treatment element to the drainage process.
- 9.7 It is understood that BMBC do not adopt SUDS at this time. It is essential that SUDS features have a long-term maintenance plan so that the attenuating properties are maintained throughout the development lifetime.
- 9.8 An assessment of the available SUDS source control, pre-treatment and components mentioned in the SUDS Manual has been completed and is summarised in the table below:

Table 4759.7 – Site Specific SuDS Consideration

Source Control Feature	Included Y/N	Comment
Green Roof	N	Not appropriate to the form of development which is traditional steep pitched roofs. Householders are not appropriate to maintain this specialist form of roof covering
Soakaways	N	Soakaway drainage is unlikely to work given the ground conditions below the site.
Water Butts	Y	Can be included in the development as part of the builder's standard specification.
Rainwater Harvesting	N	High capital cost and high maintenance and running costs make this form of SuDS inappropriate for this development. The development can be served by new water mains so there is not restriction to supply in this area. Harvesting tanks need to be on an individual property basis therefore it is unlikely that householders will be sufficiently aware of their ongoing maintenance obligations and it is considered that in the long term they will be less effective.
Pre-Treatment Feature		
Silt Traps/Sumps	Y	Plot drainage and driveway drainage will feature trapped gullies and sumps which will collect silts and sediments as a pre-treatment feature. Householders will need to maintain the system within their property curtilage.
Vortex Separator	N	The form of development is low risk and there is no requirement under EA Pollution Prevention Guidance to install such features on a plot basis. Separators would not be adopted by any of the regulators or water authority.
Filtration System	N	The form of development is low risk and there is no requirement under EA Pollution Prevention Guidance to install such features on a plot basis. Filtration systems would not be adopted by any of the regulators or water authority.
Oil Separators	N	The form of development is low risk and there is no requirement under EA Pollution Prevention Guidance to install such features on a plot basis. Separators would not be adopted by any of the regulators or water authority.
SuDS Component		
Filter Strips	N	Not appropriate to the form of development and layout as these systems deal with sheet runoff and require large areas to accommodate. Mainly used for car parking and large hardstanding areas.

Trenches	N	Not appropriate in a residential setting. Their use would be limited as runoff from driveways tends to be towards the footway or plot and gravel filled trenches could not be accommodated in these locations. Not appropriate for adopted estate roads.
Swales	N	Not appropriate for the development as swales should be laid at nominal gradient and both YW and BMBC will not adopt them as part of the system.
Bio retention	N	Unsuitable for this form of residential layout. There are very few opportunities within the layout to create this form of SuDS component.
Permeable Paving	N	BMBC do not adopt permeable paving in public highways. Given the sloping nature of the site road and driveway gradients will not be suitable for permeable paving which should be laid at nominal gradient to maximise storage.
Geocellular Systems	Y/N	YW will not adopt geocellular drainage systems. They can however be utilised for parts of the network which are not adopted.
Infiltration Basin	N	Infiltration basins would not be suitable due to the underlying soils.
Detention Basin	N	YW will not adopt detention basins. Given the topography of the site there is no opportunity to utilise a storage basin due to the earthworks involved in creating such a basin.
Ponds	N	YW or BMBC will not adopt ponds as part of the drainage network. Given the topography of the site there is no opportunity to utilise a storage pond due to the earthworks involved in creating such a basin.
Wetlands	N	Gradients across the site are not conducive to creating wetlands and neither YW or BMBC would adopt a wetland area.
Tanks/Oversized Pipes	Y	A tank or oversized pipe could be utilised as the storage for the development and would be adopted by YW as part of the public sewer system for storm volumes up to the 1 in 30-year event. It is considered that this option is the most suitable for the site. Volume between the 1 in 30 year and the 1 in 100 year plus climate changes should be stored on site in a safe manner and not leave the site.

10 PROPOSED DRAINAGE STRATEGY

- 10.1 The development will require new drainage systems designed to suit the final approved layouts, and in compliance with current Building Regulations and Sewers for Adoption.
- 10.2 A predevelopment enquiry was submitted to YW which has provided detail of connection points for the foul and surface water systems.
- 10.3 **Foul Water:** YW have confirmed that the foul sewer serving the site can be discharged to the existing 225mm diameter combined sewer to the west in New Road.
- 10.4 The point of connection is in the site access and connection can be achieved by gravity.
- 10.5 **Surface Water:** In accordance with the hierarchy contained within Part H of the building regulations, NPPF and the SuDS guidance, the surface water strategy should be considered in order of the sustainable hierarchy. The hierarchy and ability of the site to support the particular elements of the hierarchy are discussed below:
- 10.6 **Discharge to infiltration drainage/soakaway:** The ability of any development to discharge to infiltration drainage is wholly reliant on the ground conditions across the site. The phase 2 site investigation states that the site will be underlain by a significant thickness of made ground and below that natural strata comprising stiff sandy clay. The site investigation included soakaway testing which proved unsuccessful. The report states that infiltration drainage would not be considered an option for surface water disposal.
- 10.7 **Discharge to Watercourse:** There is a watercourse to the north of the site. The watercourse is in riparian ownership (third party ownership), and the applicant has no rights to lay new sewers through third party land without consent.
- 10.8 A connection could be attempted to the section of watercourse which flows below the bridge as this would be in highways ownership, however this would involve major structural work for the bridge abutment which would require closure of the road. In addition, the route along New Road to this point already has 3 sewers within the carriageway and there will be insufficient space to install an additional sewer.
- 10.9 The only option would be to utilise the existing surface water sewer to convey flows down to the watercourse. YW has been consulted with regards to this principle and have confirmed that they would allow 5 l/s into the surface water sewer.
- 10.10 **Connection to Surface Water Sewer:** A connection to a public surface water sewer has been discussed with YW who have confirmed that this is acceptable if restricted to 5 l/s.

- 10.11 **Discharge Rate:** Although the existing site discharges 91 l/s to the combined sewer and the highway drain in New Road, these outfalls are not suitable when considering the drainage hierarchy and new development control guidance. New developments should be drained by separate systems wherever possible, and there is opportunity via connection to the surface water sewer in New Road, to provide a totally separate system. The net result is that less water is treated at the local treatment works.
- 10.12 The site currently discharges 28.5 l/s into the watercourse via the highway drain, however, a connection to the highway drain would be difficult as the drain is unmapped and in unknown condition. Adoption of upstream sewers would not be possible in these circumstances.
- 10.13 A discharge of 5 l/s to the surface water sewer means an effective reduction of 95% in the rate of discharge from the site and a reduction of 80% in the rate going to the local watercourse.
- 10.14 **Storage Required for New Development:** If new surface water flows from the site were unrestricted then, based on a 50mm per hour design flow, the rate of surface water runoff would be in the order of 95 litres/second in a 1 in 1-year event. An assessment of the volume of storage required to attenuate flows from the site has been based on a flow restriction of 5 litres/second and an estimated impermeable area of 0.68 Ha.

Table 4759.8 – Storage requirement for varying storm events

Storm Return Period (years)	Volume of Storage (m ³)
2	102
30	203
100 + 30% climate change	438

- 10.15 **Method of Storage:** In order to comply with YW adoption requirements, storage up to the 1 in 30-year event must be contained within the adopted system in tanks or oversized pipework. YW will adopt systems which contain storage in excess of this minimum requirement. Given the layout and levels of the site storage should be located in the entrance road where it can be controlled to the agreed rate into the existing sewer. The hydrobrake control manhole has therefore been located in the access road at such a location that storage linked to this manhole has sufficient cover to the finished road level. This arrangement is subject to detailed design and approval by YW under a section 104 agreement.
- 10.16 A small area of road in the access bellmouth will continue to flow to New Road as gullies cannot be installed below the top water level of the storage tanks.

- 10.17 The box culvert storage will accommodate 290m³ of the overall requirement for the 1 in 100 year plus climate change volume. The additional storage will be provided offline in private storage crates in the locations shown on the strategy plan. This design is subject to detailed design and modelling once the layout is approved.

Overland Exceedance Flows

- 10.18 The drainage strategy plan indicates overland flows in the event of the system being blocked or subject to a storm of greater intensity than the design storm. Flows are identical to previous exceedance route prior to redevelopment of the site.

Development Levels

- 10.19 In order to facilitate an acceptable development platform with acceptable road gradients the site will need recontouring. Plots should be designed above the adjacent road levels to provide safe exceedance routing. Final levels to be agreed at detailed design stage.

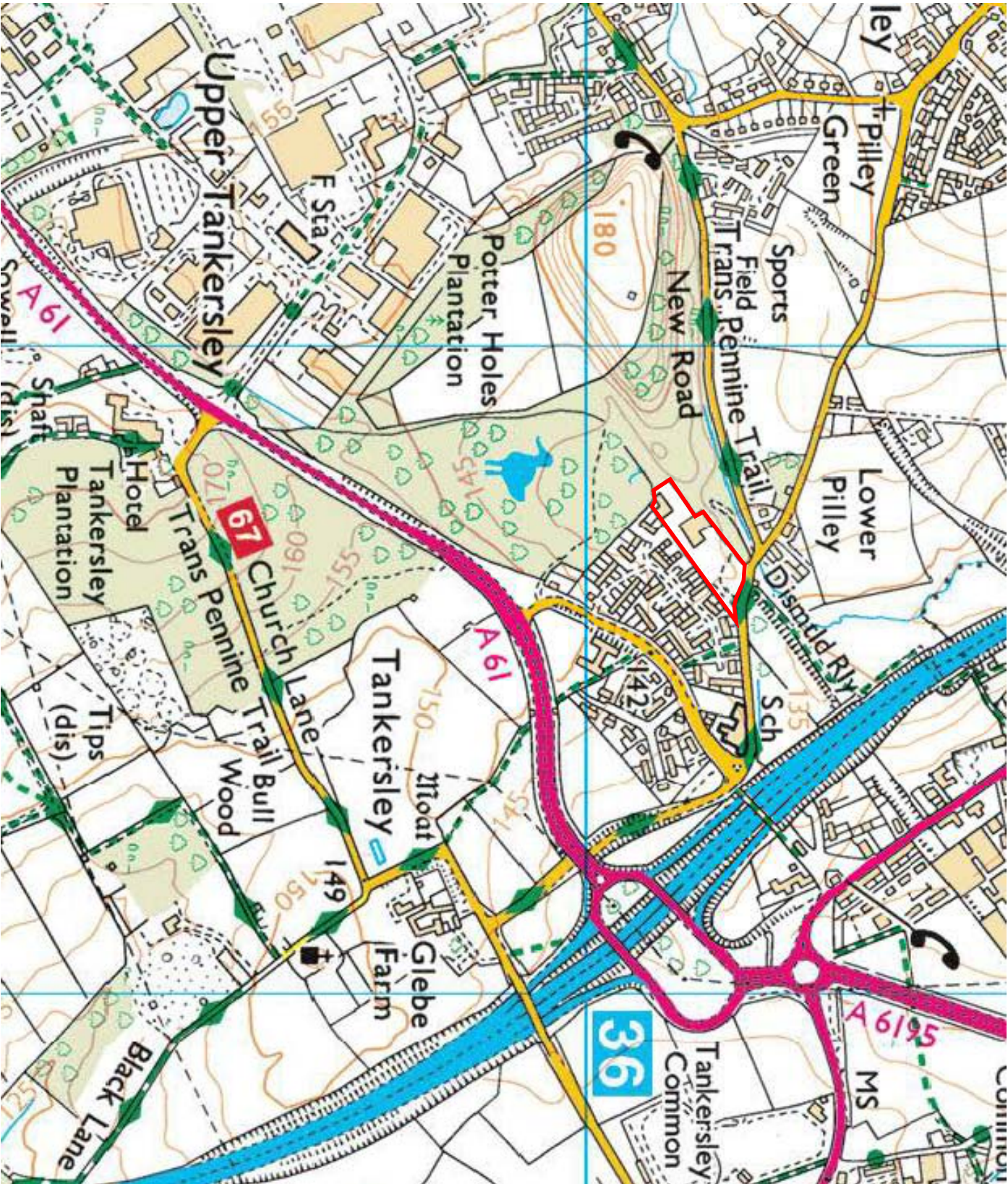
11 IMPACT OF DEVELOPMENT AND RESIDUAL RISK

- 11.1 A detailed Flood Risk Assessment and outline drainage management plan has been undertaken with respect to the planned development on land at New road Tankersley.
- 11.2 The FRA has been undertaken in accordance with Environment Agency, YW and BMBC development control guidance, and considers the setting of the development and likely impact on surrounding areas. A surface water and foul water drainage strategy has been outlined in the report which will manage flows from the site and not pose an increased risk of flooding to downstream properties. By virtue of the advocated strategy flows in the local watercourse will be reduced by cc 80% from the development.
- 11.3 It has been established that the developed area of the site is located within fluvial Flood Zone 1 and there is a low risk of flooding.
- 11.4 NPPF guidance states that development should contribute towards a reduction in flood risk wherever possible. The construction of the site will significantly reduce flows to the local watercourse and thereby reduce the risk of flooding downstream.
- 11.5 The assessment has identified the current site drainage characteristics and also established the current level of risk from flooding. A summary of the risks and mitigation identified is presented below:

Table 4759.9 - Summary of Main Issues

Issue	Summary	Residual Risk
Flood Zone	The proposed site is located within Flood Zone 1.	Low
Fluvial Flooding	The development is not located in an area at risk of fluvial flooding and there is no tidal flood risk due to the site's inland location.	Low
Pluvial Flooding	Environment Agency mapping shows that there is a low risk pluvial flood route across the site. Review of ground levels to the west indicates that the EA maps are incorrect and flows would be conveyed north away from the site.	Low
Artificial Sources	There are considered to be no significant flood risks from artificial sources.	Low
Groundwater	The groundwater level is expected to be at depth beneath the site and as such does not provide a flood risk.	Low
Surface Water Management	The site is not suitable for infiltration drainage. The hierarchy in Building Regulations has been reviewed and a connection to the adjacent watercourse has been recommended via the existing surface water sewer. The connection outfall rate has been recommended as 5 l/s which reflects a 95% reduction on the pre-development rate from the site.	Low

	Storage for up to the 1 in 100-year storm event plus 30% climate change factor will be provided on site.	
--	--	--



Site Area : 1.24 Ha
Postcode: S75 3DX
OS Ref: SE 342001
OS Co Ords: 434285,400170



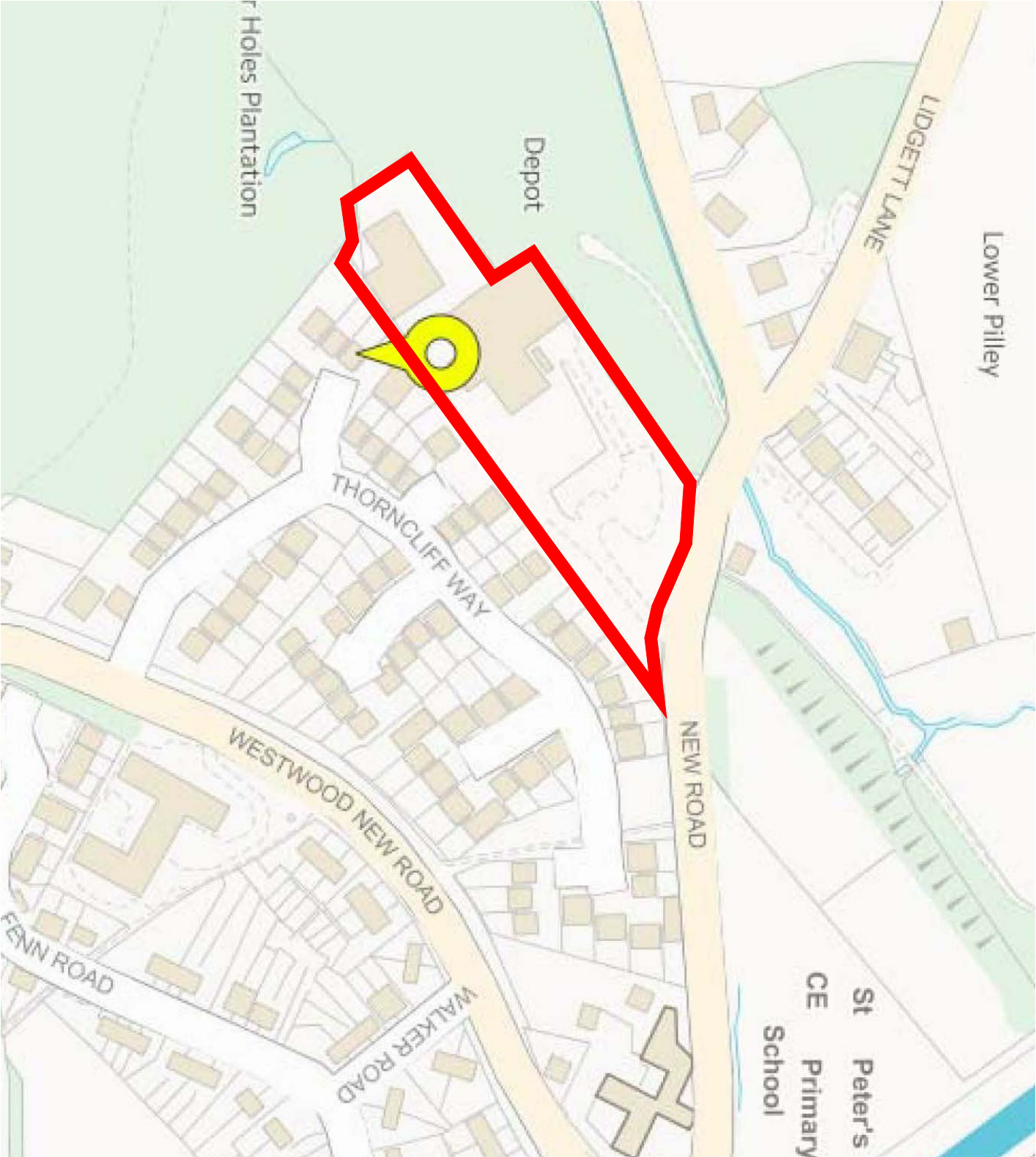
Geo Structures
Civils

North East & Yorkshire:
Aske Stables, Aske, Richmond,
North Yorkshire, DL10 5HG
T: 01748 889015
F: 01565 740263

North West & Midlands:
Caledonian House,
Tatton Street, Knutsford,
Cheshire, WA16 6AG
T: 01565 755557
F: 01565 740263

Rev	Description	By	Date
Scale			
NTS @ A3		Oct 2018	

Client:		Drawing Title:	
Rouse Homes		Location Plan	
Project Title:		Drawing No	
New Road, Tankersley		Revision	Status
		4758-FRA-01	0 Final



Site Area : 1.24 Ha
Postcode: S75 3DX
OS Ref: SE 342001
OS Co Ords: 434285,400170



Geo Structures

Civils

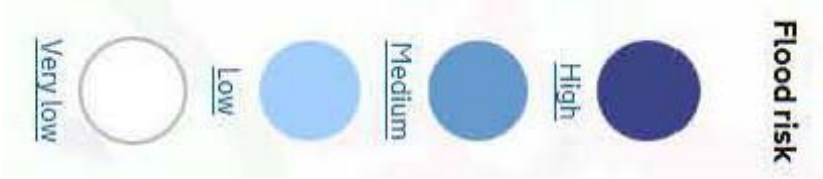
North East & Yorkshire:

Aske Stables, Aske, Richmond,
North Yorkshire, DL10 5HG
T: 01748 889015
F: 01565 740263

North West & Midlands:

Caledonian House,
Tatton Street, Knutsford,
Cheshire, WA16 6AG
T: 01565 755557
F: 01565 740263

		Client:			
		Rouse Homes			
Rev		Description		By Date	
Scale		Date			
NTS @ A3		Oct 2018			
		Project Title:			
		New Road, Tankersley			
		Drawing Title:			
		Flood Zone Plan			
Drawing No		Revision		Status	
4758-FRA-02		0		Final	



Site Area : 1.24 Ha
Postcode: S75 3DX
OS Ref: SE 342001
OS Co Ords: 434285,400170



Geo Structures
Civils

North East & Yorkshire:

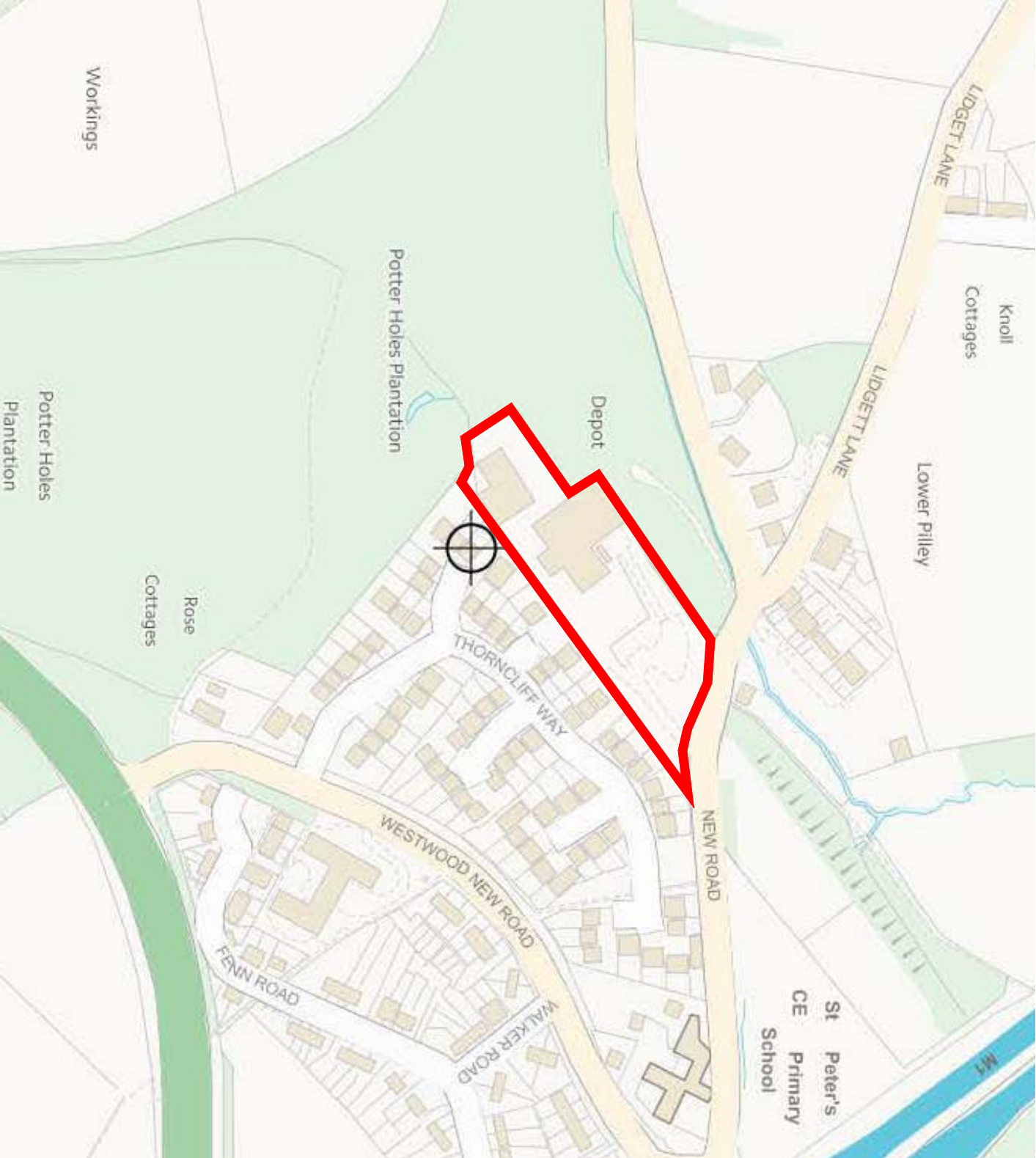
Aske Stables, Aske, Richmond,
North Yorkshire, DL10 5HG
T: 01748 889015
F: 01565 740263

North West & Midlands:

Caledonian House,
Tatton Street, Knutsford,
Cheshire, WA16 6AG
T: 01565 755557
F: 01565 740263

Rev	Description	By	Date
Scale			
NTS @ A3		Oct 2018	

Client:		Drawing Title:	
Rouse Homes		Surface Water Flood Risk Plan	
Project Title:		Drawing No	Revision
New Road, Tankersley		4758-FRA-03	0
			Status
			Final



Site Area : 1.24 Ha
Postcode: S75 3DX
OS Ref: SE 342001
OS Co Ords: 434285,400170



Geo Structures
Civils

ID Civils Design Consulting Engineers

North East & Yorkshire:
Aske Stables, Aske, Richmond,
North Yorkshire, DL10 5HG
T: 01748 889015
F: 01565 740263

North West & Midlands:
Caledonian House,
Tatton Street, Knutsford,
Cheshire, WA16 6AG
T: 01565 755557
F: 01565 740263

Rev	Description	By	Date
Scale			
NTS @ A3		Oct 2018	

Client:	
Rouse Homes	
Project Title:	
New Road, Tankersley	

Drawing Title:			
Reservoir Flood Risk Plan			
Drawing No	Revision	Status	
4758-FRA-04	0	Final	

Appendix A



YorkshireWater

Mr D Linklater
ID Civil Design Ltd
5 The Stables
Askehall
Richmond
North Yorkshire
DL10 5HG

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

Tel: 0345 120 8482
Fax: (01274) 372 834

Your Ref:
Our Ref: U009065

Email:
Technical.Sewerage@yorkshirewater.co.uk

For telephone enquiries ring:
Chris Roberts on 0345 120 8482

11th June 2018

Dear Mr Linklater,

New Road, Tankersley. S75 3DN - Pre Planning Sewerage Enquiry - Residential - T010231.

Thank you for your recent enquiry. Our charge of £158.93 (plus VAT) will be added to your account with us, reference MMi096. 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.

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

Foul water domestic waste should discharge to the 225 mm diameter public combined sewer recorded in New Road, at a point to east of the site.

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.

Your drainage survey shows show surface water from the western part of the site discharging to a 150 mm surface water drain possibly then to watercourse. Has this been considered for surface water disposal. There is also a watercourse recorded to the north of the site. Your drainage plan shows connections to the public combined sewer. Given the other means of surface water disposal available a discharge to public combined sewer is unlikely.



YorkshireWater

However, your brownfield calculations cannot be applied to a new discharge to either watercourse or public surface water sewer. I would be able to offer 5 l/s maximum surface water discharge into the 225 mm public surface water sewer.

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.

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.

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.

The public sewer network is for domestic sewage purposes. This generally means foul water for domestic purposes and, where a suitable surface water or combined sewer is available, surface water from the roofs of buildings together with surface water from paved areas of land appurtenant to those buildings. Land and highway drainage have no automatic right of connection to the public sewer network. No land drainage to be connected/discharged to public sewer.

As a last resort, highway drainage may be accepted under certain circumstances. If it can be demonstrated, through satisfactory evidence, that SUDS are not a viable option, there are no watercourses or highway drains available and if capacity is available within the public sewer network, highway drainage discharges to the public sewer network may be permitted. In this event, the developer may be required to enter into a formal agreement with Yorkshire Water Services under Section 115 Water Industry Act 1991 to discharge non-domestic flows into the public sewer network.

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

Chris Roberts
Sewerage Technician
Developer Services

Appendix B

CHECKED

Atkins
The Hub
500, Park Avenue, Aztec West
Almondsbury
Bristol
BS32 4RZ

Safe-Move
PO Box 99
Bradford
BD3 7YB
Tel: 0800 1 385 385

Your Ref: LM 51051
Our Ref: LNX1-AGEDMW

7 December 2016

Dear Sirs,

Thank you for your request dated 7 December 2016 .

Please find enclosed the results of your Asset Record Search . If you need to discuss anything please do not hesitate to contact us.

Safe-Move enquiry completed for:

VAT Regn. No. 500 5557 80

Payment Exc. VAT	£25.00
VAT 20% on £25.00	£5.00
Total Inc. VAT	£30.00

We thank you for your enquiry and hope we can be of assistance in the future.

Yours faithfully,

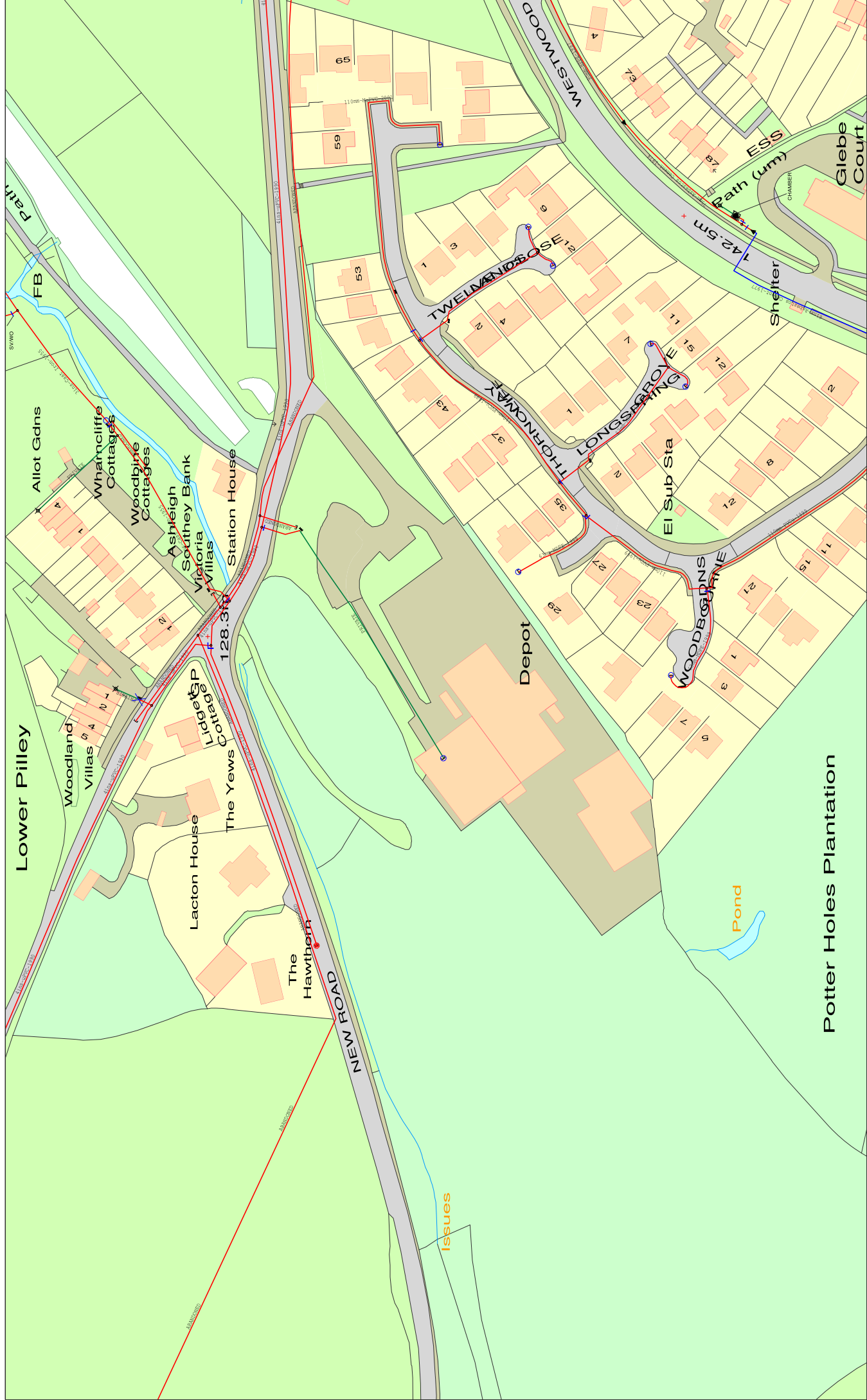


Heather Webster
SafeMove Advisor

YORKSHIRE WATER PROTECTION OF MAINS AND SERVICES

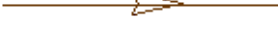
1. The position of Yorkshire Water Services Ltd (YWS) apparatus shown on the existing mains record drawing(s) indicates the **general** position and nature of our apparatus and the accuracy of this information cannot be guaranteed. Any damage to YWS apparatus as a result of your works may have serious consequences and you will be held responsible for all costs incurred. Prior to commencing major works, the exact location of apparatus must be determined on site, if necessary by excavating trial holes. The actual position of such apparatus and that of service pipes which have not been indicated must be established on site by contacting the Customer Helpline on 0845 124 24 24 for both water and sewerage.
2. The public sewer and water network is lawfully retained in its existing position and the sewerage and water undertaker is entitled to have it remain so without any disturbance. The provisions of section 159 of the Water Industry Act 1991 provides that the undertaker may "inspect, maintain, adjust, repair or alter" the network. Those rights are given to enable the undertaker to perform its statutory duties. Any development of the land or any other action that unacceptably hindered the exercise of those rights would be unlawful. The provisions contained in Section 185 of the Water Industry Act 1991 state that where it is reasonable to do so, a person may require the water supply undertaker to alter or remove a pipe where it is necessary to enable that person to carry out a proposed change of use of the land. The provisions contained in Section 185 also require the person making the request to pay the full cost of carrying out the necessary works.
3. Ground levels over existing YWS apparatus are to be maintained. Sewers in highways will **generally** be laid to give 1200mm of cover from finished ground level working to kerb races, other permanent identification of the limits of the road or to an agreed line and level. Substantial increases or decreases to this 1200mm depth of cover will result in the sewer being re-laid at your expense. Water mains and services will **generally** be laid with a minimum of 750mm depth of cover however some mains and services usually those installed over 50 years ago may have less ground cover.
4. If surface levels are to be decreased / increased significantly the effects on existing water supply apparatus will be carefully considered and if any alterations are necessary, the costs of the alterations will be recharged to you in full. Outlets on fire hydrants must be no more than 300mm below the new levels and all surface boxes must be adjusted as part of the scheme.
5. To enable future repair works to be carried out without hindrance; any pipe, cable, duct, etc. installed parallel to a water main or service pipe should not be installed directly over or within 300mm of a water main or service pipe or 1000mm of a waste water asset. Where a pipe, cable, duct, etc. crosses a main or service it should preferably cross perpendicular or at an angle of no less than 45° and with a minimum clearance of 150mm. These requirements apply to activities within an existing highway and are relevant to the installation of pipes, cables, ducts, etc. up to and including 250mm in diameter (*see illustration below*). Necessary protection measures for installations greater than 250mm in diameter and/or in private land will need to be agreed on an individual basis. Installations within a new development site must comply with the National Joint Utilities Group publication Volume 2: NJUG Guidelines On The Positioning Of Underground Utilities Apparatus For New Development Sites.
6. All excavation works near to YW apparatus should be by hand digging only.
7. Backfilling with a suitable material to a minimum 300mm above YW apparatus is required.
8. Adequate support must be provided where any works pass under YW apparatus.
9. Jointing chambers, lighting columns and other structures must be installed in such a way that future repair or maintenance works to YW apparatus will not be hindered.
10. Apparatus such as; railings, sign posts, etc. must not be placed in such a way that they prevent access to or full operation of controlling valves, hydrants or similar apparatus. YWS surface boxes must not be covered or buried. Any adjustment, alteration or replacement of manhole covers must be agreed on site prior to the commencement of the works with a YWS Inspector who may be contacted via our Call Centre on 0845 124 24 24.
11. Explosives shall not be used within 100 metres of any Yorkshire Water Services apparatus or installations.
12. Vibrating plant should not be used directly over any apparatus. Movement or operation by vehicles or heavy plant is not to be permitted in the immediate vicinity of YWS plant or apparatus unless there has been prior consultation and, if necessary, adequate protection provided without cost to YWS.
13. **Under no circumstances** should thrust boring or similar trenchless techniques commence until the actual position of the Company's mains/services along the proposed route have been confirmed by trial holes.
14. Any alterations to the highway should be notified following the procedures outlined in the New Road and Street Works Act 1991 Code of Practice; Measures Necessary Where Apparatus Is Affected By Major Works (Diversionary Works).

15. You will be held responsible for any damage or loss to YWS apparatus during and after completion of work, caused by yourselves, your servant or agent. Any damage caused or observed to YWS plant or apparatus should be immediately reported to YWS. Should YW incur any costs as a result of non-compliance with the above, all costs will be rechargeable in full.
16. You should ensure that nothing is done on the site to prejudice the safety or operation of YWS employees, plant or apparatus.
17. In accordance with the New Roads and Street Works Act 1991, Chapter 22, Part 3, Section 80. The location of any identified YW asset "*which is not marked, or is wrongly marked, on the records made available*" should be communicated back to Yorkshire Water. The location of the apparatus should be identified on copies of the supplied plans which should be returned to Yorkshire Water (Asset Records Team) with photographic supporting evidence where possible.
18. The Government has decided that responsibility for private sewers serving two or more properties and lateral drains (the section of pipe beyond the boundary of a single property, connecting it to the public sewer) will be transferred to the water companies on Oct 1 2011. Private pumping stations will also transfer during the period 1 October 2011 – 1 Oct 2016. Records of these assets may not yet be shown on the existing mains record drawing(s). If you encounter any of these assets you must inform Yorkshire Water Services Ltd (YWS).
19. Please note that the information supplied on the enclosed plans is reproduced from Ordnance Survey material with the permission of the Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office, © Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Licence Number 1000019559.
20. This information is for guidance only and the position and depth of any YW apparatus is approximate only. Likewise, the nature and condition of any YW apparatus cannot be guaranteed. YW has no responsibility for recording the locations of privately owned apparatus. As of 1 October 2011, there may be some lateral drains and/or public sewers which are not documented on YW records but may still be present. For the avoidance of doubt, this information is not a substitute for appropriate professional and/or legal advice. YW accepts no responsibility for any inaccuracy or omissions in this information. The actual position of YW apparatus must be determined on site by excavating trial holes by hand. YW requires a minimum of two working days' written notice of the intention to excavate any trial holes before any excavation can be undertaken. If there are any queries in this respect please contact Yorkshire Water on 0845 124 24 24.



434076 : 40054		Map Name : SE3400SW Yorkshire Water, PO Box 500, Hallifax Road, Bradford BD6 2LZ Contact Name : Ms H Webster Contact Tel :		Title Notes	Partial Key Water mains up to 4" in diameter Water mains over 4" in diameter Raw water mains Private water mains	The position and depths of apparatus shown on this plan are approximate only. The exact positions and depths should be obtained by excavation test holes.
©Crown Copyright and database 2014. All rights reserved Ordnance Survey Licence number 10002432			Scale : 1:1250 Mains No : Date Recd : 07/12/2016, 11:43:20 Date Gen : 07/12/2016, 11:43:31 Source : Water Network Enquiry			

Sewer Legend

	Combined Sewer		S24 Combined Sewer
	Surface Water Sewer		S24 Surface Water Sewer
	Foul Sewer		S24 Foul Sewer
	Section 104 Sewer		Public Rising Main
	Pumping Station		Abandoned Sewer
	Public Sewage Treatment Works		Syphon Sewer & Vacuum Sewer
		+	Property Identifier

Water Legend

	Water Main 4" and below
	Water Main 4" and above
	Raw Water Main
	Private Water Main
	Fire Hydrant
	Pumping Station

Appendix C



environmental
drainage solutions ltd

DRAINAGE INVESTIGATION REPORT

CLIENT ROUSE HOMES

SITE NEW ROAD, TANKERSLEY

DATE 14/05/2018 JOB No. 6991

- **Comprehensive Site Surveys**
- **Drainage Rehabilitation**
- **Pipeline and Ancillary Installation**
- **Maintenance Programme
Appraisal & implementation**

CORUS MILLS, SHEFFIELD RD, S60 IBN
Telephone 0845 2300 939 Facsimile : 0845 2300 949
email: cctv@eds.uk.net www.eds.uk.net

MANHOLE RECORD CARD



JOB No. 6991 SHEET 1 OF 5

CLIENT:- ROUSE HOMES SITE:- NEW RD - TANKERSLEY

NODE REF	EDS1	
SURVEY DATE	14/05/18	
NODE TYPE	MH/IC/GULLY/OTHER	
STATUS	PU/PR	
FUNCTION	F/SW/C	
INVERT DEPTH(M)	1.00M	
CONSTRUCTION	BR/PCC/OTHER	
REMARKS (Photos etc)		

NODE REF	EDS2	
SURVEY DATE	14/05/18	
NODE TYPE	MH/IC/GULLY/OTHER	
STATUS	PU/PR	
FUNCTION	F/SW/C	
INVERT DEPTH(M)	1.34M	
CONSTRUCTION	BR/PCC/OTHER	
REMARKS (Photos etc)		

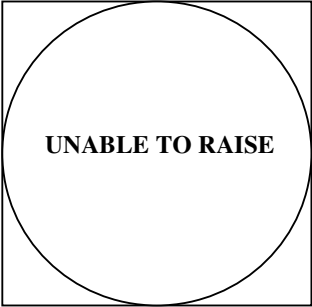
NODE REF	EDS3	
SURVEY DATE	14/05/18	
NODE TYPE	MH/IC/GULLY/OTHER	
STATUS	PU/PR	
FUNCTION	F/SW/C	
INVERT DEPTH(M)	2.95M	
CONSTRUCTION	BR/PCC/OTHER	
REMARKS (Photos etc)		

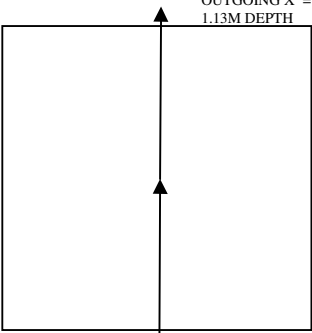
MANHOLE RECORD CARD

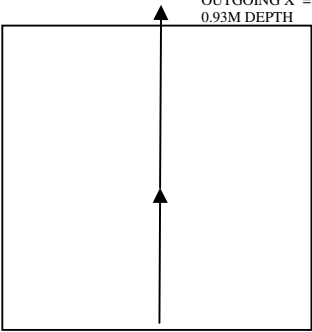


JOB No. 6991 SHEET 2 OF 5

CLIENT:- ROUSE HOMES SITE:- NEW RD - TANKERSLEY

NODE REF	EDS4	
SURVEY DATE	14/05/18	
NODE TYPE	MH/IC/GULLY/OTHER	
STATUS	PU/PR	
FUNCTION	F/SW/C	
INVERT DEPTH(M)		
CONSTRUCTION	BR/PCC/OTHER	
REMARKS (Photos etc)	NO OTHER INFORMATION - UNABLE TO RAISE SEE GENERAL PHOTOS - GP7 & GP8	

NODE REF	EDS5	
SURVEY DATE	14/05/18	
NODE TYPE	MH/IC/GULLY/OTHER	
STATUS	PU/PR	
FUNCTION	F/SW/C	
INVERT DEPTH(M)	1.13M	
CONSTRUCTION	BR/PCC/OTHER	
REMARKS (Photos etc)		

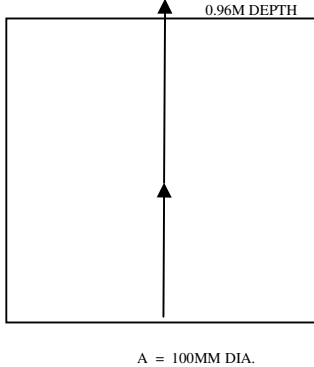
NODE REF	EDS6	
SURVEY DATE	14/05/18	
NODE TYPE	MH/IC/GULLY/OTHER	
STATUS	PU/PR	
FUNCTION	F/SW/C	
INVERT DEPTH(M)	0.93M	
CONSTRUCTION	BR/PCC/OTHER	
REMARKS (Photos etc)		

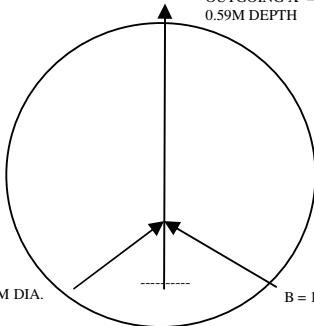
MANHOLE RECORD CARD

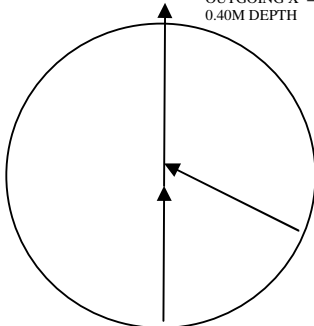


JOB No. 6991 SHEET 3 OF 5

CLIENT:- ROUSE HOMES SITE:- NEW RD - TANKERSLEY

NODE REF	EDS7	
SURVEY DATE	14/05/18	
NODE TYPE	MH/IC/GULLY/OTHER	
STATUS	PU/PR	
FUNCTION	F/SW/C	
INVERT DEPTH(M)	0.96M	
CONSTRUCTION	BR/PCC/OTHER	
REMARKS (Photos etc)		

NODE REF	EDS8	
SURVEY DATE	14/05/18	
NODE TYPE	MH/IC/GULLY/OTHER	
STATUS	PU/PR	
FUNCTION	F/SW/C	
INVERT DEPTH(M)	0.59M	
CONSTRUCTION	BR/PCC/OTHER	
REMARKS (Photos etc)	CONSTRUCTION - PVC	

NODE REF	EDS9	
SURVEY DATE	14/05/18	
NODE TYPE	MH/IC/GULLY/OTHER	
STATUS	PU/PR	
FUNCTION	F/SW/C	
INVERT DEPTH(M)	0.40M	
CONSTRUCTION	BR/PCC/OTHER	
REMARKS (Photos etc)	CONSTRUCTION - PVC	

MANHOLE RECORD CARD



JOB No. 6991 SHEET 4 OF 5

CLIENT:- ROUSE HOMES SITE:- NEW RD - TANKERSLEY

NODE REF	EDS10	
SURVEY DATE	14/05/18	
NODE TYPE	MH/IC/GULLY/OTHER	
STATUS	PU/PR	
FUNCTION	F/SW/C	
INVERT DEPTH(M)	1.28M	
CONSTRUCTION	BR/PCC/OTHER	
REMARKS (Photos etc)		

NODE REF	EDS11	
SURVEY DATE	14/05/18	
NODE TYPE	MH/IC/GULLY/OTHER	
STATUS	PU/PR	
FUNCTION	F/SW/C	
INVERT DEPTH(M)	0.53M	
CONSTRUCTION	BR/PCC/OTHER	
REMARKS (Photos etc)		

NODE REF	EDS12	
SURVEY DATE	14/05/18	
NODE TYPE	MH/IC/GULLY/OTHER	
STATUS	PU/PR	
FUNCTION	F/SW/C	
INVERT DEPTH(M)	0.69M	
CONSTRUCTION	BR/PCC/OTHER	
REMARKS (Photos etc)		

MANHOLE RECORD CARD



JOB No. SHEET OF

CLIENT:- SITE:-

NODE REF	EDS13	
SURVEY DATE	14/05/18	
NODE TYPE	MH/IC/GULLY/OTHER	
STATUS	PU/PR	
FUNCTION	F/SW/C	
INVERT DEPTH(M)	0.82M	
CONSTRUCTION	BR/PCC/OTHER	
REMARKS (Photos etc)		

NEW ROAD



Title: GP1
Date: 14/5/18
Description: EDS1



Title: GP2
Date: 14/5/18
Description: EDS1 - LOCATION



Title: GP3
Date: 14/5/18
Description: EDS2



Title: GP4
Date: 14/5/18
Description: EDS2 - LOCATION

GENERAL PHOTOS

NEW ROAD



Title: GP5
Date: 14/5/18
Description: EDS3



Title: GP6
Date: 14/5/18
Description: EDS3 - LOCATION



Title: GP7
Date: 14/5/18
Description: EDS4 - UNABLE TO RAISE



Title: GP8
Date: 14/5/18
Description: EDS4 - LOCATION

GENERAL PHOTOS

NEW ROAD



Title: GP9
Date: 14/5/18
Description: EDS5



Title: GP10
Date: 14/5/18
Description: EDS5 - LOCATION



Title: GP11
Date: 14/5/18
Description: EDS6



Title: GP12
Date: 15/5/18
Description: EDS6 - LOCATION

GENERAL PHOTOS

NEW ROAD



Title: GP13
Date: 14/5/18
Description: EDS7



Title: GP14
Date: 14/5/18
Description: EDS7 - LOCATION



Title: GP15
Date: 14/5/18
Description: EDS8



Title: GP16
Date: 14/5/18
Description: EDS8 - LOCATION

GENERAL PHOTOS

NEW ROAD



Title: GP17
Date: 14/5/18
Description: EDS9



Title: GP18
Date: 14/5/18
Description: EDS9 - LOCATION



Title: GP19
Date: 14/5/18
Description: EDS10



Title: GP20
Date: 14/5/18
Description: EDS10 - LOCATION

GENERAL PHOTOS

NEW ROAD



Title: GP21
Date: 14/5/18
Description: EDS11



Title: GP22
Date: 14/5/18
Description: EDS11 - LOCATION



Title: GP23
Date: 14/5/18
Description: EDS12



Title: GP24
Date: 14/5/18
Description: EDS12 - LOCATION

GENERAL PHOTOS

NEW ROAD



Title: GP25

Date: 14/5/18

Description: EDS13



Title: GP26

Date: 14/5/18

Description: EDS13 - LOCATION

GENERAL PHOTOS

NEW ROAD



Title: GP27

Date: 14/5/18

Description: PIPE FROM SITE TO LAND -
THROUGH WALL



Title: GP28

Date: 14/5/18

Description: PIPE FROM SITE TO LAND -
THROUGH WALL



Title: GP29

Date: 14/5/18

Description: YARD GULLY No.1



Title: GP30

Date: 14/5/18

Description: YARD GULLY No.1 - LOCATION

GENERAL PHOTOS

NEW ROAD



Title: GP31
Date: 14/5/18
Description: YARD GULLY No.2



Title: GP32
Date: 14/5/18
Description: YARD GULLY No.2 - LOCATION



Title: GP33
Date: 14/5/18
Description: MANHOLE - UNDER WALL



Title: GP34
Date: 14/5/18
Description: MANHOLE UNDER WALL - LOCATION

GENERAL PHOTOS

NEW ROAD



Title: GP35

Date: 14/5/18

Description: MANHOLE UNDER WALL - DETAIL



Title: GP36

Date: 14/5/18

Description: CONCRETE BARRIERS - NO
VEHICLE ACCESS TO CCTV SURVEY

GENERAL PHOTOS

Public sewer data taken from statutory sewer records.
Manhole locations from topographical survey supplied
unless stated otherwise.
Sewer/drain lines shown dashed not surveyed.



Client

ROUSE HOMES

Title

NEW ROAD
TANKERSLEY

Drawn	KB	Checked	G
Date	14/05/18	Scale	N
Drawing No.	EDS/EAC/6991/01		

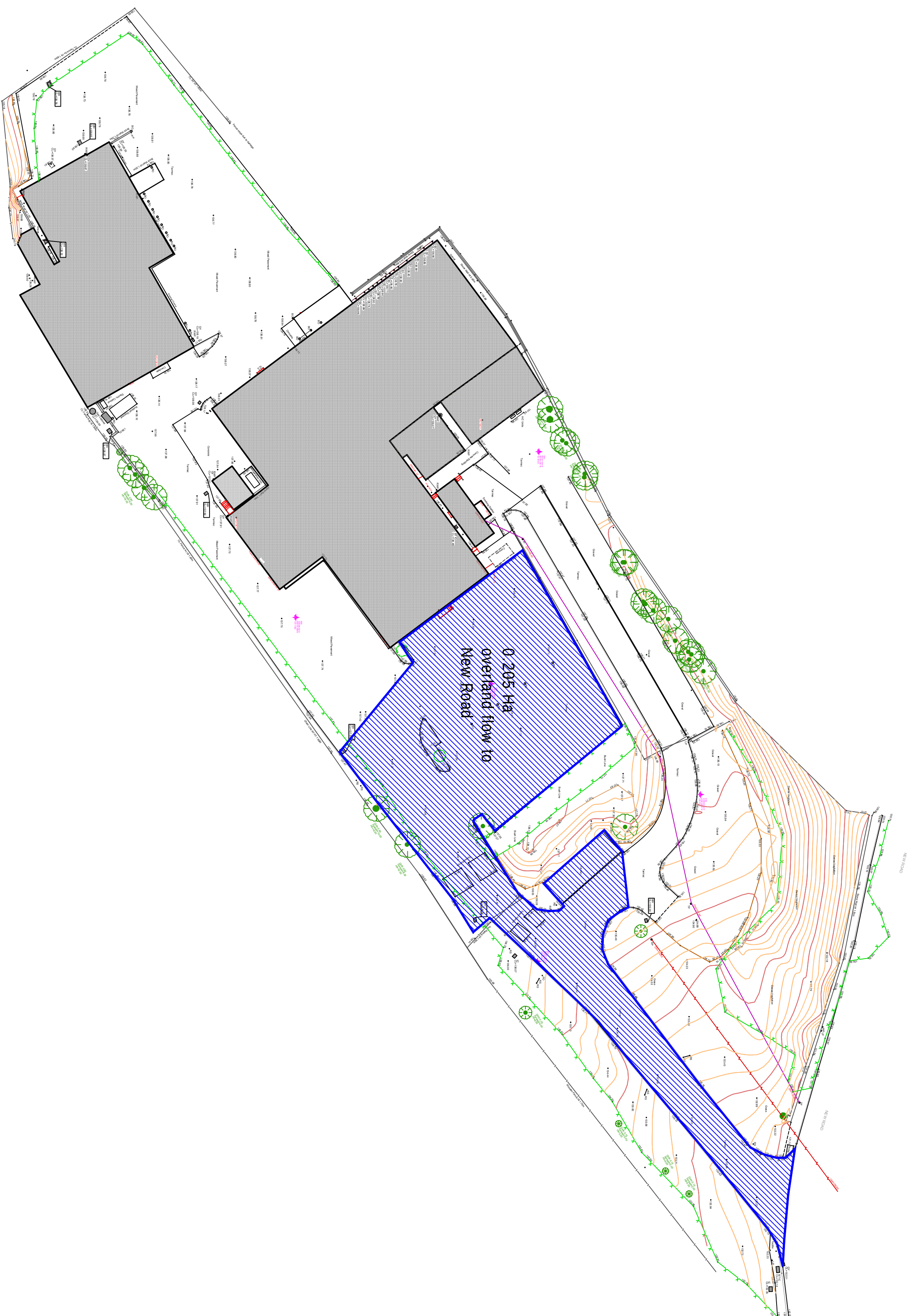
- Foul Drain/Sewer
- Surface Water Drain/Sewer
- Watercourse/culvert
- Combined Drain/Sewer

_____ Manhole (Colour denotes use) □ EDS1
 _____ Gully (Colour denotes use) ○ G
 _____ Rainwater Pipe / Gully ○ RWP RWG
 _____ Soil Vent Pipe ○ SVP

Appendix D



Appendix E



Appendix F

Darren Linklater

From: Atkins , Wayne <WayneAtkins@barnsley.gov.uk>
Sent: 04 June 2018 14:39
To: Darren Linklater
Cc: Andrew Spiers (Andrew.Spiers@rousehomes.co.uk)
Subject: [SPAM]RE: New Road, Tankersley - 29 dwellings

Hi Darren,

Please see comments below in red to answer your questions.

Any problems 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: Darren Linklater [mailto:darren.linklater@id-gsc.co.uk]
Sent: 25 May 2018 11:01
To: Atkins , Wayne
Cc: Andrew Spiers (Andrew.Spiers@rousehomes.co.uk)
Subject: New Road, Tankersley - 29 dwellings

Hi Wayne,

We are working for a developer who is about to submit an application for 29 dwellings on a current brownfield site at New road, Tankersley.

We are preparing a FRA/Drainage Strategy report for the application and would be very grateful if you could assist in terms of the surface water strategy and historical flooding. I set down below a list of questions and I would be very grateful if you reply to those queries.

1. Is the authority aware of any previous flooding of the site?
I am not aware of any previous flooding of the site. However, I am aware that a small part of the site appears in the medium risk from surface water flooding on the Environment Agency flood maps
2. If previous flooding is recorded, are the authority aware of the flood source/extents/depths.
N/A
3. Is the authority aware of any potential sources of flood risk i.e. overland flows, groundwater, reservoirs, land drainage systems, culverts etc
I am aware that a small part of the site appears in the medium risk from surface water flooding on the Environment Agency flood maps
4. Is the authority aware of any culverted watercourses crossing the site?
I am not aware of any culverted watercourses crossing the site

5. Is the authority aware of any flooding constraint to development?
No
6. Do the authority adopt a 30% climate change factor?
Yes
7. Do the authority apply a 10% urban creep factor?
Not at the moment

In terms of the existing site drainage, EDS has undertaken a drainage survey of the site and we also have a topo survey of the site which indicates that the site is drained to two receptors.

Firstly, the majority of the site is drained to the YW combined sewer in New Road (0.43Ha). A significant area of the site flows overland through the access road onto New Road and is drained to the watercourse via the highway drainage system. This area of overland flow is 0.205Ha and I attach a plan showing this area in blue hatch.

The area of site draining to the watercourse, via the highway drainage network, generates 28.5 l/s in a 50mm rainfall event. As the site is brownfield we propose to reduce this flow by 30% and propose a design flow of 20 l/s to the watercourse (or surface water sewer subject to YW permission). Storage on site would be to the 100 year event plus 30% climate change.

I would confirm that a discharge rate of 20l/s into the watercourse adjacent to the site is acceptable to BMBC as Lead Local Flood Authority. Please be aware that the informal arrangement of water discharging overland from the site into the Highway Drainage system is in contravention of the Highways Act 1980 and no flows from the proposed site will be allowed to discharge into the Highway Drainage network.

I would be grateful if you could confirm that this proposal for surface water is acceptable to BMBC.

Many Thanks for your time.

Darren Linklater
Director
For and on behalf of
iD Civils Design Ltd

Mobile: 07947 616534
E-mail: darrenlinklater@id-gsc.co.uk
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