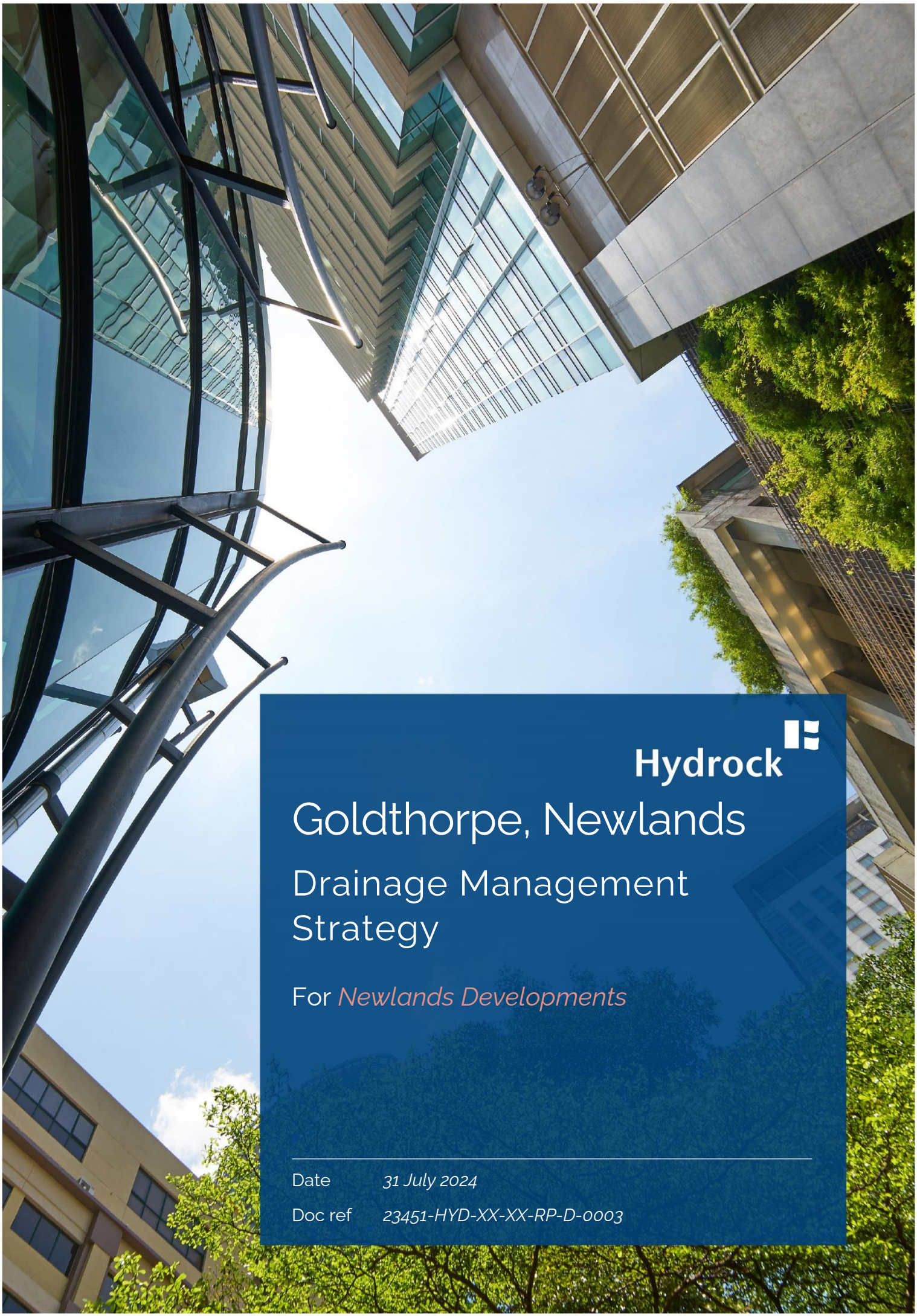

Hydrock

Goldthorpe, Newlands

Drainage Management Strategy

For *Newlands Developments*

Date	*31 July 2024*
Doc ref	*23451-HYD-XX-XX-RP-D-0003*

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Executive Summary

This report should be read in conjunction with the Hydrock Flood Risk Assessment 23451-HYD-XX-XX-RP-FR-0002.

The proposal is to construct a new multiple warehouse development with associated offices, HGV loading bays, car parking and associated infrastructure and access road.

The surface water drainage hierarchy has been considered and the preferred drainage solution for disposal of surface water is to discharge to the Carr Dike and its tributary via below ground gravity networks, where flows will discharge to attenuation ponds before entering the watercourse at a restricted flow rate of 1.4l/s/ha. The total site area is approximately 85.32 hectares, with 44.02 hectares of developed area.

The use of Sustainable Drainage Systems (SuDS) has been considered. Pollution prevention and site control methods will be utilised prior to outfall.

Pollution treatment measures will be provided in the form of Class 1 oil separators at car parks and SuDS structures (i.e. ponds, etc). Silt traps on drainage elements will be provided which will filter and trap silts and debris and mitigate against the risk of pollution entering the sewer network. All separators will be alarmed and remotely monitored at all times to ensure reliability.

The SuDS and other drainage elements will be regularly maintained by a nominated management company on behalf of the client/occupier.

It is envisaged that diversion of a Yorkshire Water's critical asset (combined sewer) is required.

Foul flows will outfall at a maximum rate of 4.75 l/s to the diverted public foul sewer to the north east of the site. An agreement in principle will be sought from Yorkshire Water at detailed design stage including diversion layout, when more site-specific information is required.

1. Introduction

1.1 Development Context

1.1.1 This report has been prepared by Hydrock Consultants Limited (Hydrock) on behalf of Newlands Development to support the planning application to construct a new multiple warehouse development with associated offices, HGV loading bays, car parking and associated infrastructure and access road (see Appendix A).

1.1.2 The site is currently undeveloped and is considered to be 'greenfield'.

1.1.3 This report should be read in conjunction with the Hydrock Flood Risk Assessment 23451-HYD-XX-XX-RP-FR-0002.

1.2 Flood Risk

1.2.1 The Flood Risk Assessment *23451-HYD-XX-XX-RP-FR-0002* considers the flood risk posed to the site from all sources, in accordance with the NPPF and the local Strategic Flood Risk Assessment (SFRA). The majority of the site is within Flood Zone 1 (Low Risk) however, mapping identifies a large extent of Flood Zone 2 (Medium Risk) and 3 (High Risk), extending within the site originating from Carr Dike.

2. Development Description and Location

2.1 Site Location

2.1.1 This site is referenced in Table 1, and a location plan is provided in Figure 1.

Site Referencing Information	
Site Name	Goldthorpe, Newlands
Site Address & Location	Dearne Valley Parkway, Billingley, Bolton upon Dearne, Barnsley, South Yorkshire
Council Area	Barnsley Metropolitan Borough Council
Approximate Grid Reference	444239E, 403783N
Site Area	The total site area is 85.32ha, of which 44.02ha will be developed area.
Boundaries & Surrounding Land	The site is located south of A625 Barnsley Road and west of Aldi Goldthorpe RDC.
Existing Land Use and Access	The site is currently undeveloped greenfield.
Elevation and Topography	A topographical survey has been undertaken and indicates that the Carr Dike and its estuary are where the low points on site are situated. The site generally falls towards these low points from the north and south site boundaries with high points of approximately 35.4 mAOD and 44mAOD respectively. See Appendix B for the full topographical survey.
Development Proposals	The proposed development is for the construction of multiple new warehouses with associated offices, HGV loading bays, car parking and associated infrastructure and access road.
Vehicular access	The main vehicular access to the site will be from the new Barnsley Council roundabout at A625 Barnsley Road to south.

Table 1: Site referencing information

Figure 1: Site location

3. Drainage Strategy

3.1 Proposed surface water runoff

3.1.1 The surface water drainage discharge rate shall follow the requirement from Yorkshire & Humber Technical Guidance for Developers, Relevant Powers & Standing Advice for Local Planning Authorities, where it states '**1.4 l/s/ha is the generic standard greenfield runoff rate adopted by most flood risk management authorities. YHDB accept this greenfield runoff rate.**'

3.1.2 The total site area is approximately 85.32 hectares, with a total post-development impermeable area of approximately 44.02 hectares, this includes the surface area of the proposed SuDS structures.

3.1.3 It is intended to discharge surface water runoffs from the post-development site not exceeding the rates shown below in Table 2.

Catchment Reference	Total Impermeable Area (Ha)	Proposed Discharge Rate (l/s)
Plot 1	10.838	15.1
Plot 2 and central infrastructure road	7.156	10
Plot 3 northern & western yard	4.603	6.4
Plot 3 southern yard, carpark and roof, Plot 4 & Infrastructure Road South	17.809	24.9
Infrastructure Road North	1.491	2

Table 2: Proposed Discharge Rate

The infrastructure road referenced above is defined by its location relative to the Carr Dike. A post-development catchment plan is included in Appendix C.

3.2 Drainage Discharge Hierarchy

3.2.1 In accordance with C753 SuDS manual, surface water should be managed following below discharge hierarchy:

(1) Infiltration to the maximum extent that is practical;

(2) Discharge to surface water body;

(3) Discharge to surface water sewer;

(4) Attenuated discharge to a combined sewer.

3.2.2 Discharge via Infiltration

Feasibility of infiltration is subject to further ground investigation and infiltration testing.

The British Geological Survey (BGS) has been reviewed with regard to the underlying ground conditions of the site. The assessment revealed that the north of the site is a backfilled opencast site and south of this area (to the north of Carr Dike) is Alluvium which is expected to be highly saturated exhibiting a high groundwater level. The land south of Carr Dike is expected to be predominantly underlain by sandstone bedrock directly beneath the topsoil, however this area will be subject to large scale earthworks which will alter the ground permeability. On this basis infiltration is unlikely to be feasible.

3.2.3 Discharge to a surface water body

Drainage hierarchy option 2 is the preferred method, whereby it is intended to discharge surface water from the development into the Carr Dike and its tributary located on site.

3.2.4 Discharge to surface water

Not applicable.

3.2.5 Discharge to a combined sewer

Not appliable.

3.3 Sustainable Drainage Systems (SuDS)

3.3.1 Sustainable drainage developed in line with the ideals of sustainable development is collectively referred to as Sustainable Drainage Systems (SuDS). At a particular site, these systems are designed to manage both the environmental risks resulting from the urban runoff and to contribute, wherever possible, to environmental enhancement. Therefore, SuDS objectives are to minimise the impacts from the development on the quantity and quality of the runoff and maximise amenity and biodiversity opportunities (CIRIA C753, 2015).

3.3.2 SuDS help to mimic the natural flow of water ensuring that both the quantity and quality of the surface water is dealt with before feeding it into the drainage network. SuDS features usually come with added maintenance, however the benefits they reap are considered to outweigh this. The selection of the most appropriate SuDS features should consider constraints, requirements and maintenance of the site. It should be remembered that Local Planning Authorities expect SuDS to be investigated on construction projects. The implementation of SuDS features can assist in achieving the drainage requirements set out in the National Planning Policy Framework.

3.3.3 A strong design theme is essential if maximum aesthetic benefits are to be gained from the SuDS approach. At a more local scale SuDS should link with the individual plot structure, planting and amenity areas, gaining multiple benefits from a limited area of land.

3.3.4 The 'Management Train Approach' should be central to the surface water drainage strategy of a proposed site. The main objective is the treatment and control of runoff as near to source as possible, thus protecting downstream habitats and further enhancing the amenity value of the site. This concept uses a hierarchy of drainage techniques to incrementally reduce pollution, flow rates and volumes of storm water discharge from the site, and is as follows:

- Prevention - The use of good site design and housekeeping measures to prevent runoff and pollution (e.g. rainwater re-use).
- Source Control - Control of runoff at source or as close to source as possible (e.g. soakaways, green roofs, pervious pavements).
- Site Control - Management of water in a local area (e.g. ground storage/attenuation, detention ponds/basins).
- Regional Control - Management of water from a site or various sites (e.g. wetlands, balancing ponds).

3.3.5 The SuDS philosophy for a development site is the promotion of Pollution Prevention and Site Control Techniques. The following design philosophy is proposed:

- Surface water treatment using the 'Management Train' approach to remove and isolate contamination at all SuDS facilities prior to conveyance.
- Surface water discharge into the watercourse via attenuation ponds.
- Site Control features (attenuation) to accommodate the additional surface water runoff generated by the development site before discharging into the watercourse.
- Prevention measures in the form of rainwater re-use systems (tbc).
- Provision of suitable oil separators (where applicable).
- Aim to limit, where possible, the impermeable fraction of development.

3.3.6 It is proposed that the development site has two levels of treatment. Prevention is considered as the first level of treatment and the site control as the second.

3.3.7 A review of the possible SuDS solutions that are feasible include:

- Rainwater harvesting tanks
- Below ground storage
- Pond
- Permeable paving
- Oil separators
- Swales
- Filter drains

3.4 Prevention and Source Control - Principles and Objectives

3.4.1 The main objective of prevention and source control is the treatment and control of runoff as near to source as possible. Application of these techniques will require reduction of impermeable areas and techniques to restrict the runoff rates.

3.4.2 Prevention measures to be considered, where possible, as part of the overall approach to the management train at this site include rainwater harvesting. Typical examples are given in the SuDS Manual (Ciria C697) and are briefly described in Table 3 below. It must be noted that the effectiveness of each system is dependent on the final design as well as the actual site conditions.

SuDS Group	Technique	Image	Description	Advantages	Disadvantages	Suitable for us on site?
Retention	Balancing Pond/Swale		Provides both storm water attenuation and treatment. Run-off from each rain event is detained and treated in the pool. The retention time promotes pollutant removal through sedimentation.	Good removal of pollutants, can be used where groundwater is vulnerable, good community acceptability, high ecological, and amenity benefits.	No reduction in run-off volume, land take may limit use in high density sites.	Attenuation ponds have been included in the wider surface water drainage network.
	Sub-Surface Attenuation		Oversized pipes, tank systems and modular geo-cellular systems that can be used to create a below ground storage structure.	Modular and flexible, dual usage (infiltration/storage, high void ratios), can be installed beneath trafficked and soft landscaped areas.	No water quality treatment.	Sub-surface storage can be used.
Infiltration	Infiltration Trench Infiltration Basin Soakaway		Surface water run-off can be discharged directly to ground for infiltration by soakaways, basins, or trenches. A prerequisite is that both groundwater and ground conditions are appropriate to receive the quality and quantity of water generated.	Reduces the volume of run-off, effective at pollutant removal, contributes to groundwater recharge, simple and cost effective, easy performance observation.	Requires appropriate pre-treatment, basins require a large flat area, offset from foundations.	Infiltration subject to further investigation and soakaway testing.

	Porous Paving Permeable Paving		Block or porous paving allows run-off to infiltrate through to sub base layer. Water can then be infiltrated into ground or conveyed into storage or drainage systems.	Reduces the volume of run-off and if designed for infiltration contributes towards groundwater recharge. Easy to install and retrofit. Simple to manage. If lined can be used where groundwater is sensitive.	Not suitable for heavily trafficked areas or adoptable roads. Requires regular sweeping to prevent clogging with dirt.	Permeable paving with a liner may be used which will be conveyed into the proposed drainage system.
Detention	Detention Basin		Surface storage basins that provide flow control through attenuation. Normally dry and in certain situations the land may also function as a recreational facility.	Cater for a wide range of rainfall events, can be used where groundwater is vulnerable, potential for dual land use, easy to maintain.	Land take, little reduction in run-off volume, detention depths constrained by levels.	A detention basin can be included.
	Enhanced Dry Swale Enhanced Wet Swale		Swales are linear vegetated drainage features in which surface water can be stored or conveyed. They can be designed to allow infiltration, where appropriate.	Incorporate into landscaping, good removal of pollutants, reduces run-off rates and volumes, low cost.	Not suitable for steep areas, significant land take, not suitable in areas with roadside parking.	Enhanced dry /wet swales can be included.

Source Control	Green/Brown Roof		Multi-layered system that covers the roof of a building with vegetation cover/landscaping over a drainage layer. Designed to intercept and retain precipitation, reducing the volume of run-off and attenuating peak flows.	Mimics greenfield state of building footprint for high density developments, good removal of pollutants, ecological benefits, insulates buildings, sound absorption.	Additional weight, not appropriate for steep roofs, maintenance of roof vegetation.	Unsuitable for lightweight structure.
	Rainwater Harvesting		Similar to the use of water butts this prevention method stores rainwater runoff from roofs and external areas in below ground tanks. The water can then be used for irrigation purposes to the soft landscaping areas or alternatively pumped to an internal storage tank where the 'Grey' water can be used for WC's and washing machines.	Harvested grey water will collect and automatically be used for various systems, such as toilet flushing, outside taps etc. The result will be less water usage and cheaper bills and a greener building or commercial premises.	Rainfall is hard to predict and sometimes little or no rainfall can limit the supply of rainwater. It also should have a "mains water" top up to ensure that you don't run out of water.	Rainwater Harvesting can be used.
Filtration	Surface Sand Filter Sub-surface Sand Filter Perimeter Sand Filter		Structures designed to treat surface water run-off through filtration using a sand bed filter medium. The filters can be designed with or without infiltration. Temporary storage of run-off is achieved through ponding above the filter layer. They are used where particularly high pollutant removal is required.	Flexibility of design, efficient in removing pollutants, suitable for retrofits and in tightly constrained urban locations.	Not for high sediment content, detention times can support algae growth, minimum hydraulic head of 1.2m required, possible odour problems, high capital and maintenance cost.	There is no requirement for high pollution reduction at this site.

	Bioretention/ filter swale		Vegetated strips of land designed to accept run-off as overland sheet flow between a hard-surfaced area and a receiving system.	Landscaping features, effective in removing pollutants, flexible layout to fit into landscape, suited for highly impervious areas, good retrofit, capability, effective pre-treatment option.	Requires landscaping and management, large land required, not suitable for steep sites; no significant attenuation or reduction of flows.	Rain water garden can be used.
	Filter trench/drain		Shallow excavations filled with rubble or stone that create temporary subsurface storage for filtration of storm water run-off. Receive lateral inflow from an adjacent impermeable surface.	Hydraulic benefits achieved with filter trenches, trenches can be incorporated into site landscaping and fit well beside roads and car parks.	High clogging potential without effective pre-treatment, limited to small catchments, high cost of replacing filter material.	Filter drains can be used.
Conveyance	Conveyance Swales		Formal linear drainage features in which surface water can be stored or conveyed. They can be incorporated with water features such as ponds or waterfalls where appropriate.	Negate the need for underground pipework. Can provide some attenuation. Possible reduction in run-off volume via plant uptake and infiltration.	Potential trip/wheel hazard, disabled access issues.	Conveyance swales can be included.
	Rills					

Wetland	Shallow Wetland Extended Detention Wetland Pond Wetland Pocket Wetland Submerged Gravel Wetland Wetland Channel		Wetlands provide storm water attenuation and treatment. They comprise shallow ponds and marshy areas, covered in aquatic vegetation. Wetlands detail flows for an extended period to allow sediments to settle and to remove contaminants. They can provide significant ecological benefits.	Good pollutant removal and if lined can be used where groundwater is vulnerable. Good community acceptability, ecological and amenity benefits.	Land take is high, requires base flow, little reduction in run-off volume, not suitable for steep sites.	Wetland areas are not possible on this site due to the high land take required.

Table 3: SuDS considerations

3.5 Surface Water Drainage Strategy

3.5.1 Surface water runoff from roofs and external areas will be directed to the below ground gravity network, where it will join the wider private drainage network of carrier drains and will be attenuated prior to outfall, where it will discharge at a restricted rate of 1.4l/s/ha into the Carr Dike and its tributary (see Appendix C for Hydrock Proposed Drainage Layout).

3.5.2 A hydraulic model has been created using drainage software as part of the preliminary drainage design, which defines pipe sizes located under infrastructure road and SuDS attenuation volumes. Hydraulic calculations have been provided in Appendix D. It is noted that these rates and volumes are preliminary and may change at detailed design stage when more specific information is available.

3.5.3 A climate change allowance of 40% has been applied.

3.5.4 The proposed drainage layout is designed in accordance with Design and Construction Guidance. No above ground flooding for the 1 in 30-year storm event should occur. An assessment of extreme storm event, the 100-year event plus 40% climate change has been carried out. The storm-water volumes generated by this event are classed as exceedance flooding and will be safely contained on site and directed away from the buildings, where they will sit in the car parking and landscape area, and drain into the surface water infrastructure as water levels recede.

3.5.5 As part of the drainage strategy, the following is proposed:

- The proposed drainage system will be a managed gravity system with a flow control set at a permissible discharge rate of 1.4l/s/ha into the Carr Dike and its tributary.
- The car parking and yard catchment areas will be developed at the detailed design stage. It is envisaged that surface water runoffs from this catchment will be drained via drainage channels, kerb drains and filter drains and then discharge into the new private surface water network. Surface runoff from the roof will also discharge to the new private surface water network.
- Pollution treatment measures will be provided in the form of Class 1 oil separators for the car park and yard areas, and silt traps on drainage elements which will filter and trap silts and debris and mitigate against the risk of pollution. All separators will be alarmed and remotely monitored at all times to ensure reliability.
- SuDS structures, including ponds are proposed to provide water quality enhancement, prior to discharging to the final receiving waterbody.

3.6 Water Quality

3.6.1 The primary pollution control measure for the infrastructure elements will be in the form of the proposed SuDS features for the wider private surface water network. This includes attenuation ponds, which will provide pollution control through filtration and settlement.

3.6.2 The site mainly comprises of commercial/industry roof, commercial yard, access roads, and parking, which have pollution hazard levels ranging from low to high in accordance with CIRIA C753 table 26.2 as below.

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways[1]	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways[1]	High	0.8[2]	0.8[2]	0.9[2]

3.6.3 Below CIRIA C753 table 26.3 as below provides treatment capacity for different SuDS structures

	Mitigation indices[1]		
Type of SuDS component	**TSS**	**Metals**	**Hydrocarbons**
Filter strip	0.4	0.4	0.5
Filter drain	0.4[2]	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond[4]	0.7[3]	0.7	0.5
Wetland	0.8[3]	0.8	0.8
Proprietary treatment systems[5,6]	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

3.6.4 In line with C753 where two or more components in series, the total SuDS mitigation index can be calculated as:

Total SuDS mitigation index = mitigation index$_1$ + 0.5 (mitigation index$_2$)

Where:

mitigation Index$_n$ = mitigation index for component n

A factor of 0.5 is used to account for the reduced performance of secondary or tertiary components associated with already reduced inflow concentrations.

3.6.5 In line with the above, Table 4 below summarises the total treatment indices achieved for each plot:

Reference	SuDS Component(s)	Indices mitigated		
Plot 1	Pond	0.7	0.7	0.5
Plot 2	Pond x2	1.05	1.05	0.75
Plot 3	Pond x2	1.05	1.05	0.75
Plot 4	Pond x2	1.05	1.05	0.75

Table 4: Proposed Development Mitigation Indices

It is therefore considered that the proposed SuDS systems will provide ample treatment capacity for plot 2, 3 and 4. In terms of plot 1, it is envisaged that providing catchpit and oil interceptor (proprietary treatment system) will effectively mitigate and remove the residual pollutant.

3.7 Foul Drainage Strategy

3.7.1 It is envisaged that a diversion of the existing combined public sewer is required. A high-level diversion proposal is included in Appendix C, and is subject to S185 technical acceptance with Yorkshire Water. Correspondence from Yorkshire Water (Appendix E) has confirmed that the sewer intended to be diverted is a critical asset and it is not viable to carry out a feasibility assessment at this stage.

3.7.2 A pre-development application has been made to Yorkshire Water who have responded (correspondence in Appendix E) confirming that foul flows are to outfall at a maximum rate of 4.75 l/s to the proposed public foul sewer diversion to the north east of the site (see Appendix C). An agreement in principle will be sought from Yorkshire Water at detailed design stage, when more site-specific information is required.

3.7.3 A map showing the location of the existing Yorkshire Water public sewer is included in Appendix F.

3.8 Management, Maintenance and Residual Risk

3.8.1 The proposed drainage layout will be designed in accordance with building regulations, Design and construction guidance, and Ciria C753 for SuDS structures.

3.8.2 Run-off from roofs is considered to be generally clean with limited contamination, and will be discharged directly to the proposed drainage infrastructure and new SuDS Facilities.

Silt is to be prevented from entering the drainage system by the use of trapped gullies, interceptors or by the use of sustainable drainage techniques.

3.8.3 Run-off from car park and loading areas will be treated via proprietary treatment system of a full-retention oil interceptor.

3.8.4 A private management company will maintain the drainage infrastructure as part of a site-wide management and maintenance schedule as shown in Table 5 below.

3.8.5 Access and egress arrangements to and from the new development, should exceedance flooding occur, will be via the new access road and roundabout to the north of site. It is anticipated that the flooded water from a 1 in 100 year + 40% climate change storm will be maintained within the proposed development.

3.8.6 Flood risk to people and property can be managed but it can never be completely removed. Residual risk remains after flood management or mitigation measures have been put in place. This relates to a rainfall event beyond what can be fully quantified.

Item	Maintenance	Frequency per year
Gullies	Removal of silt accumulation from mud bucket. Gratings checked for operation/damage – replaced if required.	2
Foul Water Manholes	Manhole covers checked for operation/damage – seating's re-greased or replaced as required. Check for blockages and or damage to invert channel/inlets – jetting pipe runs if blocked, any damage to be repaired. All access ladders & other associated ironworks to be checked for corrosion & fixings to be checked for deterioration. To be repaired or replaced dependant of extent of damage.	1
Surface Water Manholes, Flow Controls	As Above. All catch pits/Vortex Separators to have silt/solid accumulation removed & base jetted clean.	1
Drainage Channels/Kerb Drains	All catch/access pits to have silt/solid accumulation removed. Channel run to be jetted through between access points. Any channel grates to be inspected for damage & replaced as necessary.	2
Ponds	Remove litter and debris, Cut Grass – for access routes and around basin, manage other vegetation and nuisance plants. Inspect inlets and outlets for blockages – clear if required. Inspect banksides, structures, pipework for evidence of physical damage. Inspect inlets and facility surface for silt accumulation.	12
Cascading Ponds	As Above.	12

Table 5: Drainage Maintenance

Appendix A - Site Plans

- Dimensions are in millimeters, unless stated otherwise.
- Scaling of this drawing is not recommended.
- It is the recipients responsibility to print this document to the correct scale.
- All relevant drawings and specifications should be read in conjunction with this drawing.

N

Key

Planning Application Boundary — 210.81 ac — 85.31 ha

Parameters Key

- Development Plot Boundary
- Green and Blue infrastructure
- Strategic Landscape screening
- Estate Road infrastructure
- Indicative access points (subject to reserved matters)
- Safeguarded land

Roundabout delivered under a separate planning application [Ref. No. 2021/1511]

Flood Compensation Area

Flood Compensation Area

Plot 1

Plot 2

Plot 3

Plot 4

Hollygrove Roundabout

A635 Barnsley Road

Dudley Drive

Rose Valley

Woodbine Cottage

Billingley Green

Aldi Goldthorpe RDC

Heather Garth Primary School

Carr Head Lane

Lacewood Primary School

Carr Dike

50m SCALE 1:2500

Development Schedule

Zone	Plot Size NDA (ha)	Maximum GIA Floor Space (m^2)	Plateau Height(in meters above ordnance datum)	Maximum Finished Floor Level (in meters above ordnance datum) [+1.000m above proposed plateau]	Maximum Building Height Measured to roof ridge / highest point (in meters above ordnance datum)	Ridge Height (above F.F.L. level)
Zone 1	11.35	**204,000m²** Total Area distributed across Zones 1,2, 3 & 4	24.50	25.50	43.50	18.00
Zone 2	8.46		25.00	26.00	44.00	18.00
Zone 3	17.92		33.70	34.70	52.70	18.00
Zone 4	6.29		33.70	34.70	52.70	18.00
Total	44.02					

The use class applied for within each zone is primarily Class B8 with up to 30% of the floorspace being for Class B2 together with ancillary office space

For the avoidance of doubt, the information shown within the development plots is indicative only, and will be subject to subsequent Reserved Matters Applications

PLANNING
THIS DRAWING IS FOR PLANNING CONSIDERATION ONLY AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE

rev	amendments	by	ckd	date

Barnsley Road, Goldthorpe

Parameters Plan

newlands developments

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Drawn / Checked:	SS /SM
Date:	07/11/2023
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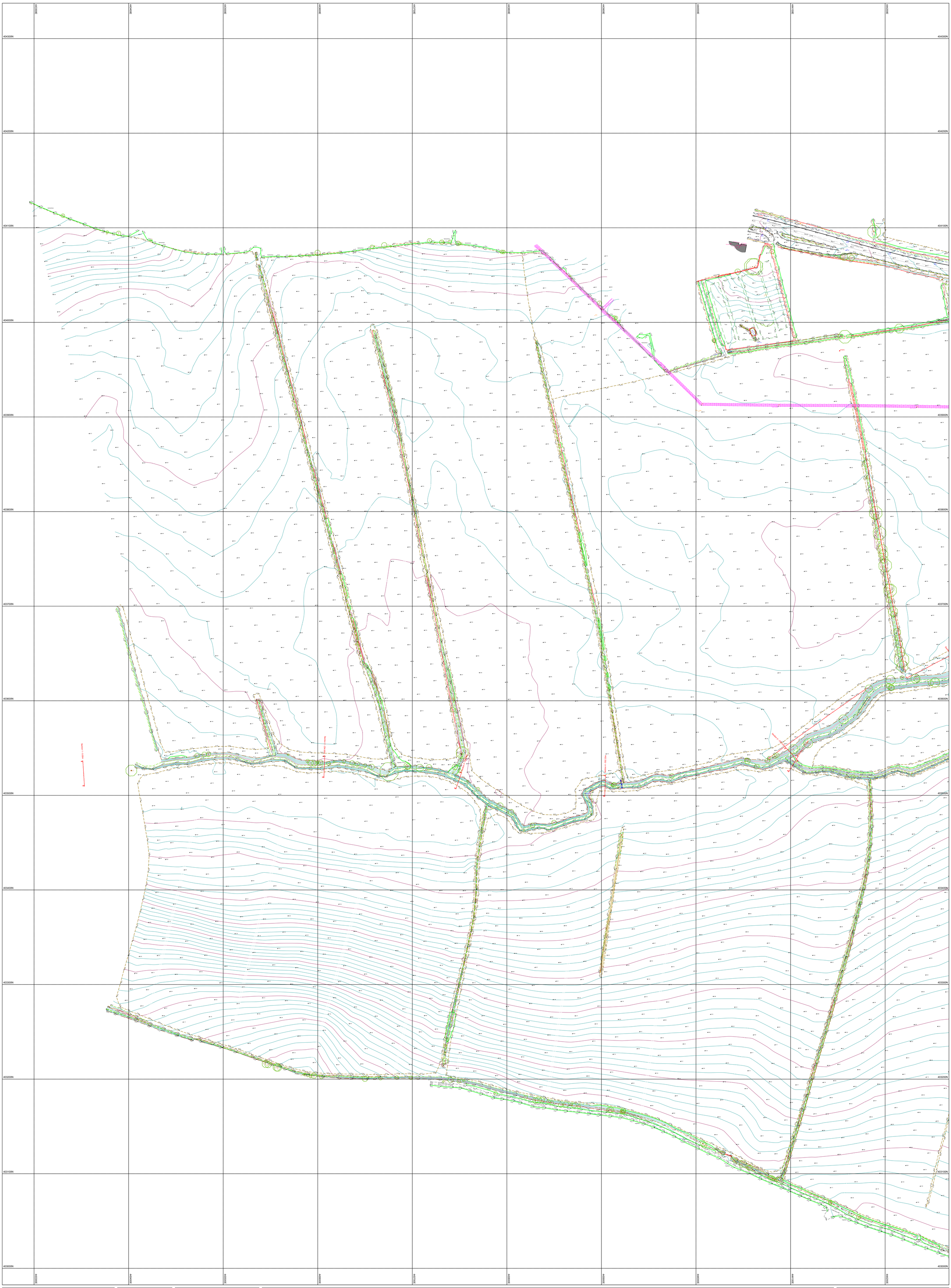
22081 P0520	E

Appendix B - Topographical Survey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403300N
403200N
403100N
403000N
Section 1 - 1 SCALE 1:1000
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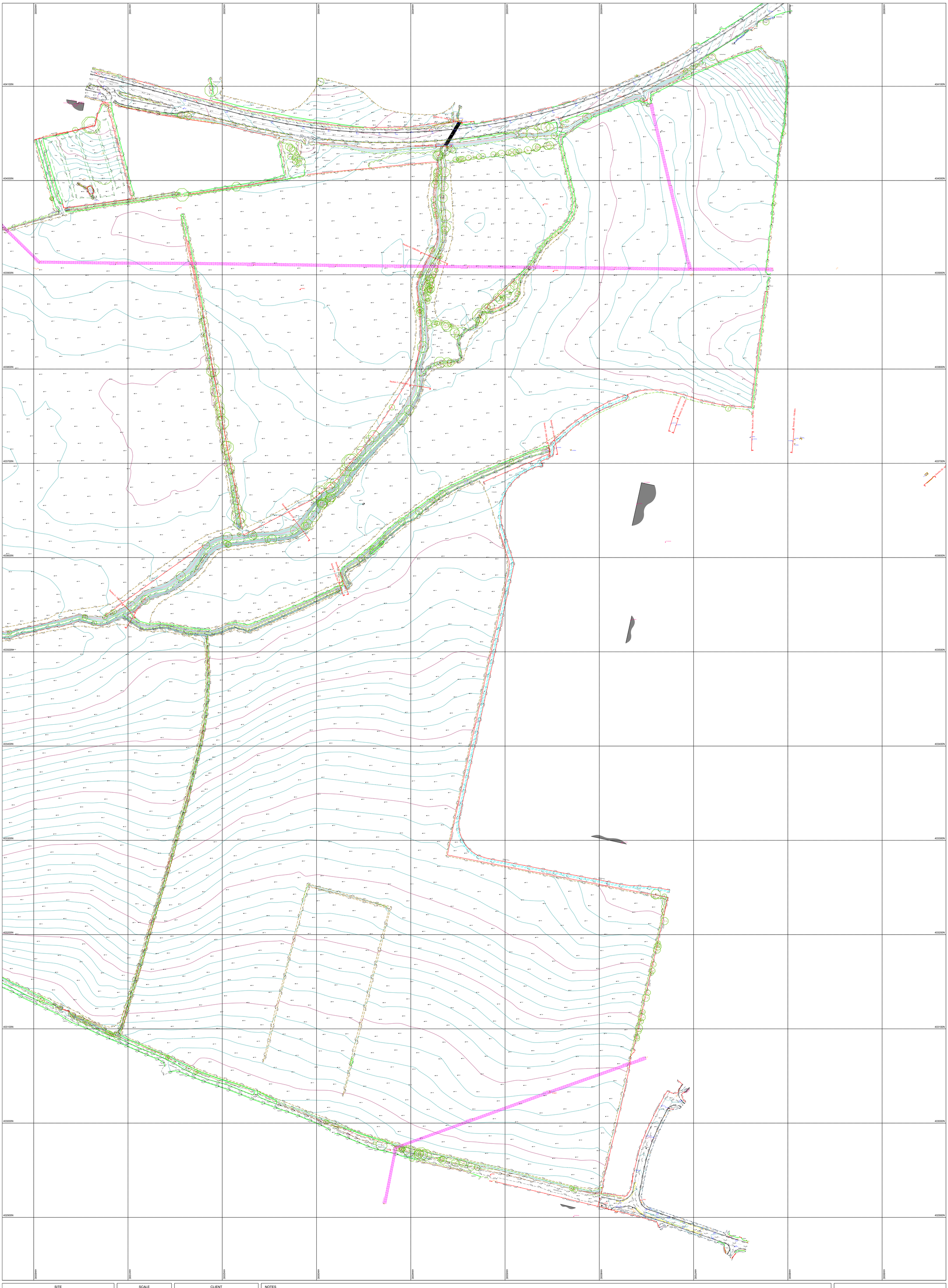
Section 3 - 3 SCALE 1:1000
Section 4 - 4 SCALE 1:1000
Section 5 - 5 SCALE 1:1000
Section 6 - 6 SCALE 1:1000
Section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403800N
403700N
403600N
403500N
403400N
403300N
403200N
403100N
403000N
402900N
Section 10 - 14.4m wide
Section 7 - 14.4m wide
Section 1 - 14.4m wide
Section 22 - 7.6m wide
Section 23 - 14.4m wide
Section 24 - 7.6m wide
Section 25 - 7.6m wide
Section 26 - 7.6m wide
Section 27 - 7.6m wide
Section 28 - 7.6m wide
Section 29 - 7.6m wide
Section 30 - 7.6m wide
Section 31 - 7.6m wide
Section

SITE A635 Barnsley Road Goldthorpe	SCALE 1:1250 @ A0 DATE 02/09/2022	CLIENT newlands developments
PROJECT Topographical Survey	DRAWING No. 12506	

NOTES

Boundaries surveyed are physical features and may not necessarily represent the legally conveyed ownership.

Tree Spreads, Girths and Heights are approximate, any tree species identified should not be relied upon and checked by a specialist if critical

Underground drainage depths, pipe sizes and runs have been recorded from the surface and may have been estimated or assumed

Features surveyed off site such as buildings and trees may have been recorded remotely and may not be shown in full detail due to access / sighting restrictions

CO-ORDINATES & DATUM DERRIVED USING GEOID MODEL OSGM15(GB) & HORIZONTAL TRANSFORMATION OSTN15

THIS SURVEY IS ORIENTATED TO ORDNANCE SURVEY GRID NORTH WITH A TRUE OSGM15 CO-ORDINATE NEAR THE CENTRE OF THE SURVEY.

THE SURVEY IS PLOTTED TO A FLAT PLANE GRID. HORIZONTAL MEASUREMENTS TAKEN FROM THIS SURVEY WILL BE TRUE DISTANCES

REFER TO SURVEY CONTROL STATION LISTING FOR RE-ESTABLISHING CONTROL ON SITE

SURVEY STATIONS

Name	Easting	Northing	Height
STNA	444758.935	404161.559	33.274
STNB	444558.726	404066.137	27.078
STNC	444419.715	404053.500	25.053
STND	444310.088	404054.883	25.302
STNE	444172.903	404084.074	27.875
STNF	444066.407	404113.499	27.572
STNFA	444540.558	403974.198	23.485
STNFB	444551.288	403903.619	23.886
STNFC	444282.698	403884.393	22.938
STNFD	444151.895	403969.943	22.545
STNG	444604.836	402914.118	44.733
STNH	444484.653	402945.090	44.656
STNI	444378.405	402971.357	44.332
STNJ	444644.105	402918.347	44.229
STNRA	444625.250	404089.202	28.343

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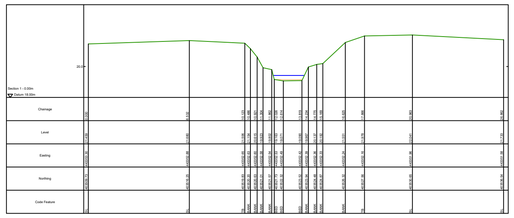
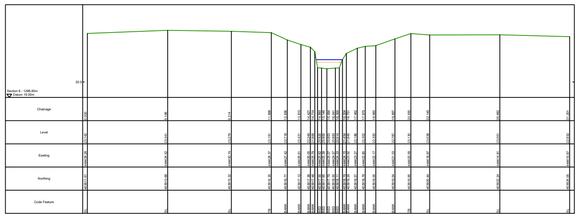
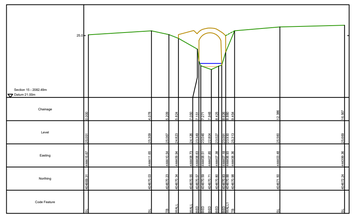
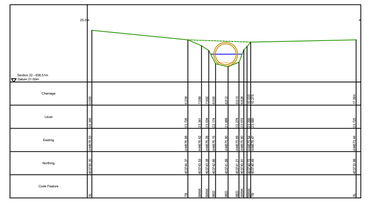
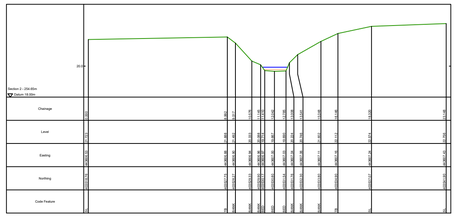
www.stafsurv.com
Vernon Courtyard, Main Road, Sudbury, Derbyshire, DE6 5HS
T 01283 584800 · F 01284 584844 · E info@stafsurv.com

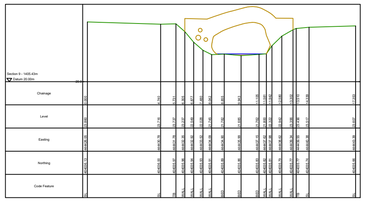


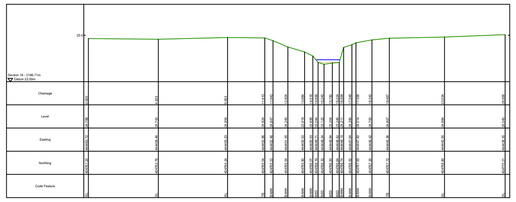


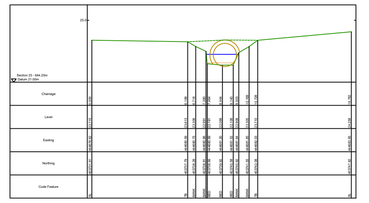


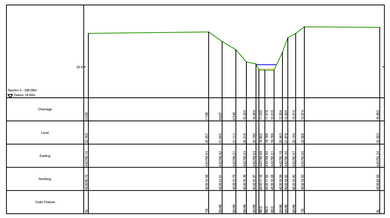


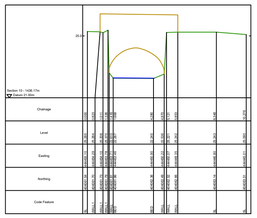


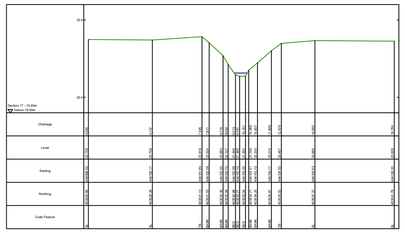


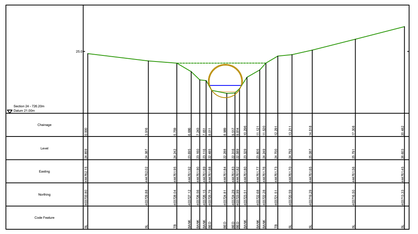


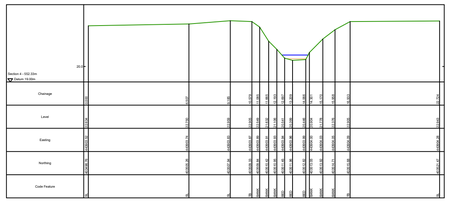


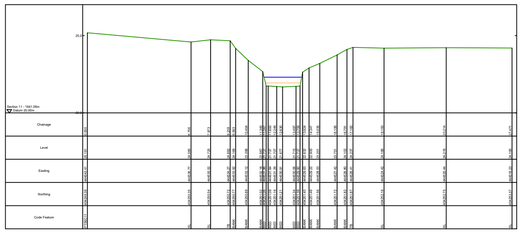


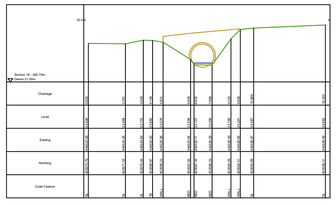


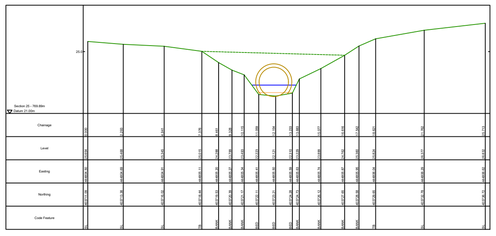


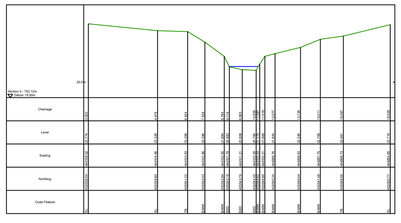


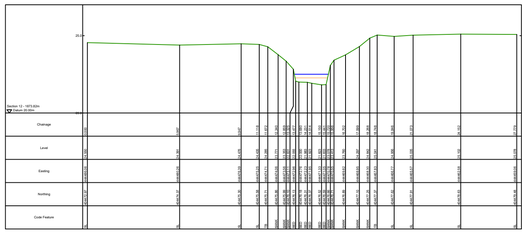


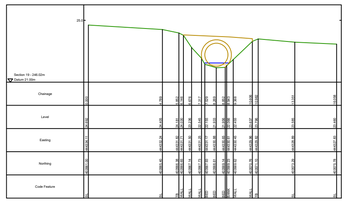


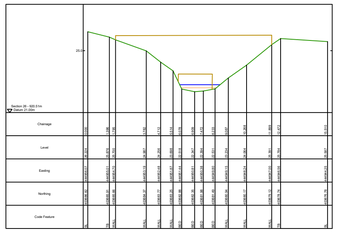


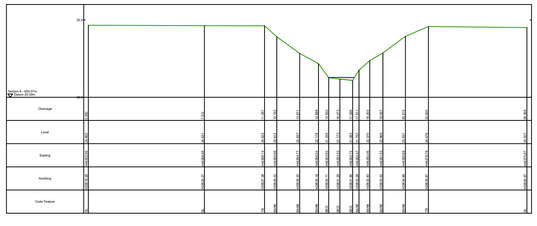


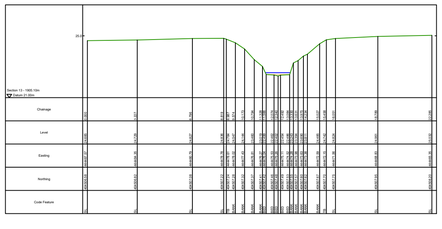


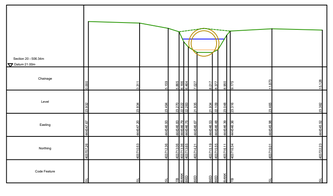


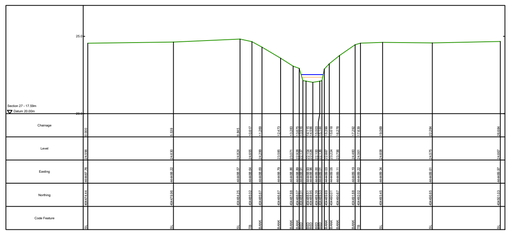


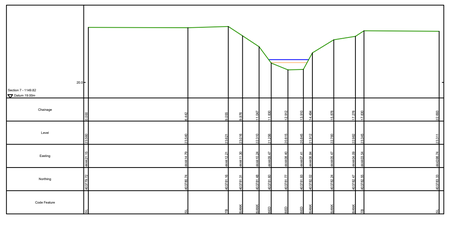


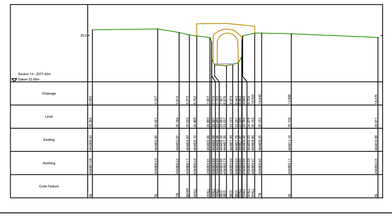


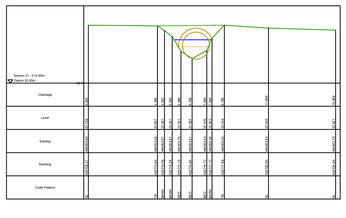


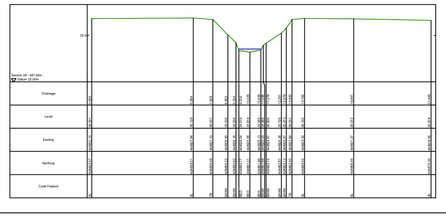












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T 01283 584800 · F 01284 584844 · E info@stafsurv.com

NOTES

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CLIENT

newlands developments

SITE

A635 Barnsley Road
Goldthorpe

PROJECT

Watercourse
Sections

SCALE

1:200 @ A1

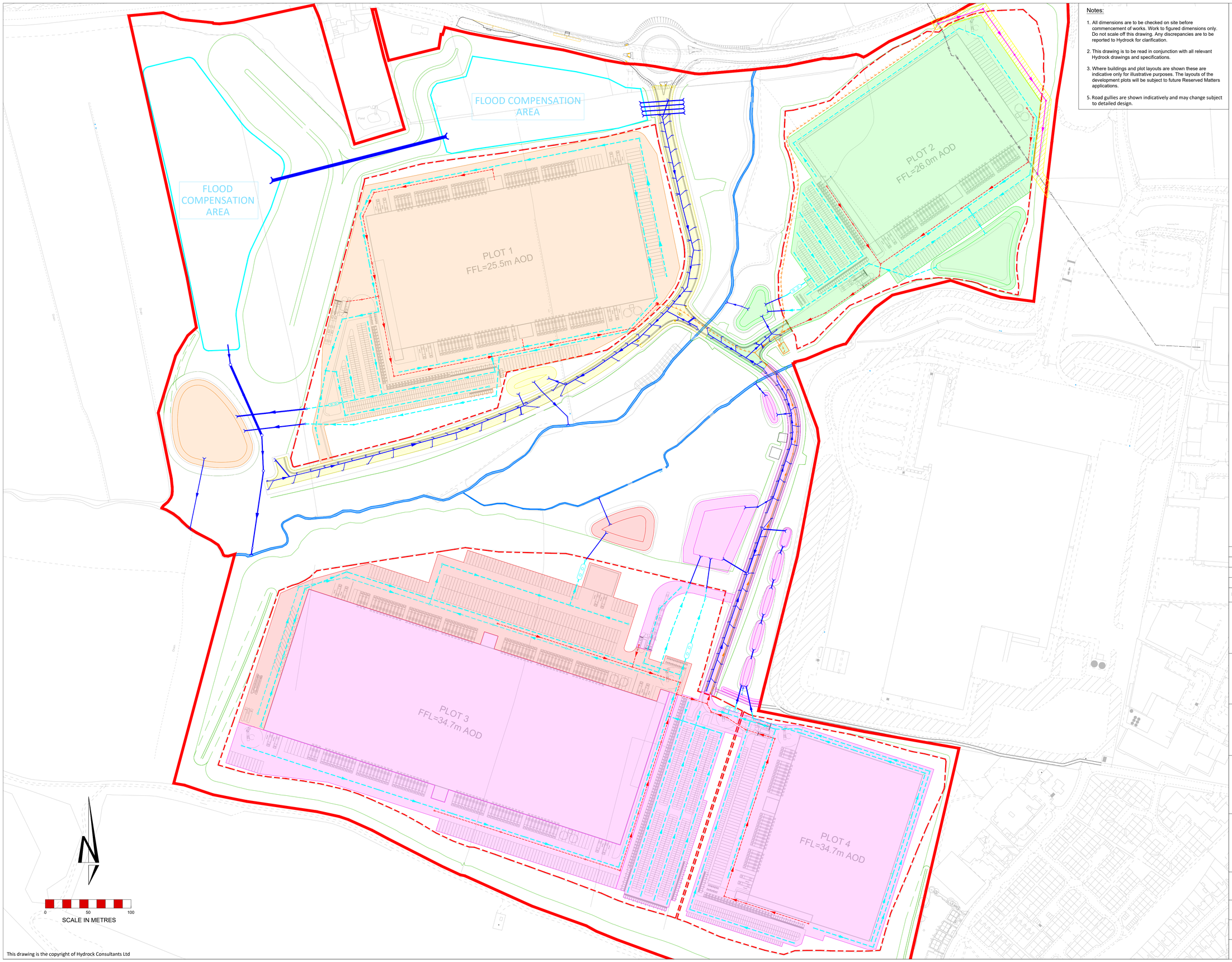
DATE

02/09/202

DRAWING No.

12506

Appendix C - Hydrock Drawings



Notes:

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2. This drawing is to be read in conjunction with all relevant Hydrock drawings and specifications.
3. Where buildings and plot layouts are shown these are indicative only for illustrative purposes. The layouts of the development plots will be subject to future Reserved Matters applications.
5. Road gullies are shown indicatively and may change subject to detailed design.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING

CONSTRUCTION

MAINTENANCE / CLEANING

DECOMMISSIONING / DEMOLITION

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT

Key:

- PLANNING APPLICATION BOUNDARY
- DEVELOPMENT PLOT BOUNDARY
- PROPOSED INFRASTRUCTURE SURFACE WATER
- PROPOSED INFRASTRUCTURE FOUL SEWER
- PROPOSED FOUL SEWER RISING MAIN
- INDICATIVE ON-PLOT SURFACE WATER
- INDICATIVE ON-PLOT FOUL SEWER
- INDICATIVE ON-PLOT OIL INTERCEPTOR
- PROPOSED YW PUBLIC SEWER DIVERSION
- FW&SW — EXISTING YW PUBLIC COMBINED SEWER TO REMAIN
- FW&SW — EXISTING YW PUBLIC COMBINED SEWER TO BE REMOVED
- 6m YW PUBLIC SEWER EASEMENT
- PROPOSED INFRASTRUCTURE FILTER DRAIN
- RG — PROPOSED ROAD GULLY
- PLOT 1 CATCHMENT AREA
- PLOT 2 & CENTRAL INFRASTRUCTURE ROAD CATCHMENT AREA
- PLOT 3 NORTHERN & WESTERN YARD CATCHMENT AREA
- PLOT 3 SOUTHERN YARD, CARPARK & ROOF, PLOT 4 & INFRASTRUCTURE ROAD SOUTH CATCHMENT AREA
- INFRASTRUCTURE ROAD NORTH CATCHMENT AREA

SEWER DIVERSION NOTE

YORKSHIRE WATER PUBLIC SEWER DIVERSION LAYOUT IS INDICATIVE ONLY, SUBJECT TO YORKSHIRE WATER S185 TECHNICAL ACCEPTANCE AND S185 AGREEMENT.

NOTE: FOR THE AVOIDANCE OF DOUBT, THE INFORMATION SHOWN WITHIN THE DEVELOPMENT PLOTS IS INDICATIVE ONLY, AND WILL BE SUBJECT TO SUBSEQUENT RESERVED MATTERS APPLICATIONS

Rev	Date	Description	By	Ckd
P4	31.07.2024	Architect layout updated	JM	NB
P3	24.11.2023	Updated in line with client comments	SJ	NB
P2	31.05.2023	Ditch added south of cascading ponds	SJ	NB
P1	06.04.2023	First issue	SJ	NB

Architect: umc architects

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Hydrock Consultants Ltd
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239 Ashley Road
Hale, Cheshire
WA15 9NE
T +44 (0)161 233 0746
manchester@hydrock.com
www.hydrock.com

Client: newlands developments

Project Title:

BARNSLEY ROAD
GOLDTHORPE

Drawing Title:

DRAINAGE
POST-DEVELOPMENT CATCHMENT PLAN

Drawing Status: PLANNING

Hydrock Job No: C23451

Drawn	Checked	Scale @ A1	Date	Issue Date
SJ	NB	1:2000	06.04.2023	06.04.2023

Drawing Number: 23451-HYD-XX-XX-DR-D-0514

Revision: P4

This drawing is the copyright of Hydrock Consultants Ltd

SCALE IN METRES

0 50 100

DRAINAGE LAYOUT
SHEET 1 OF 5

DRAINAGE LAYOUT
SHEET 2 OF 5

DRAINAGE LAYOUT
SHEET 3 OF 5

DRAINAGE LAYOUT
SHEET 4 OF 5

DRAINAGE LAYOUT
SHEET 5 OF 5

FLOOD COMPENSATION AREA

FLOOD COMPENSATION AREA

Carr Dike

Carr Head

Notes:

1. All dimensions are to be checked on site before commencement of works. Work to figured dimensions only. Do not scale off this drawing. Any discrepancies are to be reported to Hydrock for clarification.
2. This drawing is to be read in conjunction with all relevant Hydrock drawings and specifications.
3. Where buildings and plot layouts are shown these are indicative only for illustrative purposes. The layouts of the development plots will be subject to future Reserved Matters applications.
4. Proposed drainage shown is based on the hydraulic calculations contained with the Drainage Strategy 23451-HYD-XX-XX-RP-D-0003. During construction it may be necessary to adjust cover and/or invert levels to suit site constraints. Any alterations will not adversely affect the performance of the proposed surface water drainage system.
5. Road gullies are shown indicatively and may change subject to detailed design.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

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CONSTRUCTION

MAINTENANCE / CLEANING

DECOMMISSIONING / DEMOLITION

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT

Key:

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- FW&SW — EXISTING YW PUBLIC COMBINED SEWER TO REMAIN
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- RG — PROPOSED ROAD GULLY

SEWER DIVERSION NOTE

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Rev	Date	Description	By	Ckd
P5	30.07.2024	Architect layout updated	SJ	NB
P4	24.11.2023	Updated in line with client comments	SJ	NB
P3	31.05.2023	Ditch added south of cascading ponds	SJ	NB
P2	06.04.2023	Updated in line with client comments	JY	NB
P1	21.02.2023	First issue	JY	NB

Architect: umc architects

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Client : newlands developments

Project Title:
BARNSLEY ROAD
GOLDTHORPE

Drawing Title:
DRAINAGE LAYOUT
OVERVIEW

Drawing Status:
PLANNING

Hydrock Job No: C23451

Drawn	Checked	Scale @ A1	Date	Issue Date
JY	NB	1:2500	21.02.2023	21.02.2023

Drawing Number: 23451-HYD-XX-XX-DR-D-0500

Revision: P5

This drawing is the copyright of Hydrock Consultants Ltd

0 50 100
SCALE IN METRES

FLOOD COMPENSATION AREA

FLOOD COMPENSATION AREA

Pond

Pond

Drain

IL:21.100

1.8m DIA CULVERT

IL:20.946

IL:21.200

IL:22.730

SWMH01
Ø1350
CL:24.265
IL:22.600

SWMH02
Ø1350
CL:25.400
IL:22.375

SWMH03
Ø1350
CL:25.170
IL:22.225

SWMH04
Ø1350
CL:24.630
IL:22.125

SWMH05
Ø1500
CL:24.300
IL:21.953

SWMH06
Ø1500
CL:24.715
IL:21.863

SWMH07
Ø1500
CL:25.200
IL:21.733

SWMH08
Ø1500
CL:24.950
IL:21.658

SWMH09
Ø1500
CL:24.500
IL:22.300

SWMH10
Ø1350
CL:25.240
IL:22.539

SWMH11
Ø1350
CL:25.350
IL:22.763

SWMH14
Ø1200
CL: 24.400
IL: 21.245

SWMH15
Ø2100
CL:24.510
IL: 21.775

SWMH16
Ø1800
CL:24.510
IL: 21.800

SWMH13
FLOW CONTROL MANHOLE
Ø1800
CL: 25.00
IL: 21.412
DESIGN RATE: 2.0 l/s

OUTFALL 4
WITH NON-RETURN FLAP VALVE
INSTALLED AT HEADWALL
IL: 21.208

PROPOSED PLOT 1
PUMPING STATION

PROPOSED POND
VOLUME : 13,300m3
IL: 21.450

PROPOSED POND
VOLUME : 1950m3
IL: 21.430

IL:21.500

IL:21.430

IL:21.500

IL:21.640

IL:21.658

IL:21.450

IL:20.900

FCMH01
Ø3000
CL:22.620
IL: 20.853

FCMH02
Ø3000
CL:22.78
IL: 20.669

FCMH03

Ø900mm @ 1 in 500

Ø450mm TRIPLE PIPE @ 1 in 400

Ø1200mm @ 1 in 600

Ø900mm @ 1 in 500

Ø450mm @ 1 in 400

Ø525mm @ 1 in 500

Ø300mm @ 1 in 250

Ø450mm @ 1 in 400

Ø525mm @ 1 in 500

Ø450mm @ 1 in 400

Ø300mm @ 1 in 225

Ø450mm @ 1 in 400

Ø450mm @ 1 in 400

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- INDICATIVE ON-PLOT OIL INTERCEPTOR
- PROPOSED PRIVATE SURFACE WATER ATTENUATION
- RG PROPOSED ROAD GULLY

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P2	06.04.2023	Updated in line with client comments	JY	NB
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Architect: umc architects

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Client : newlands developments

Project Title:
BARNSLEY ROAD
GOLDTHORPE

Drawing Title:
DRAINAGE LAYOUT
SHEET 1 OF 5

Drawing Status:
PLANNING

Hydrock Job No:
C23451

Drawn	Checked	Scale @ A1	Date	Issue Date
JY	NB	1:1000	21.02.2023	21.02.2023

Drawing Number: 23451-HYD-XX-XX-DR-D-0501
Revision: P5

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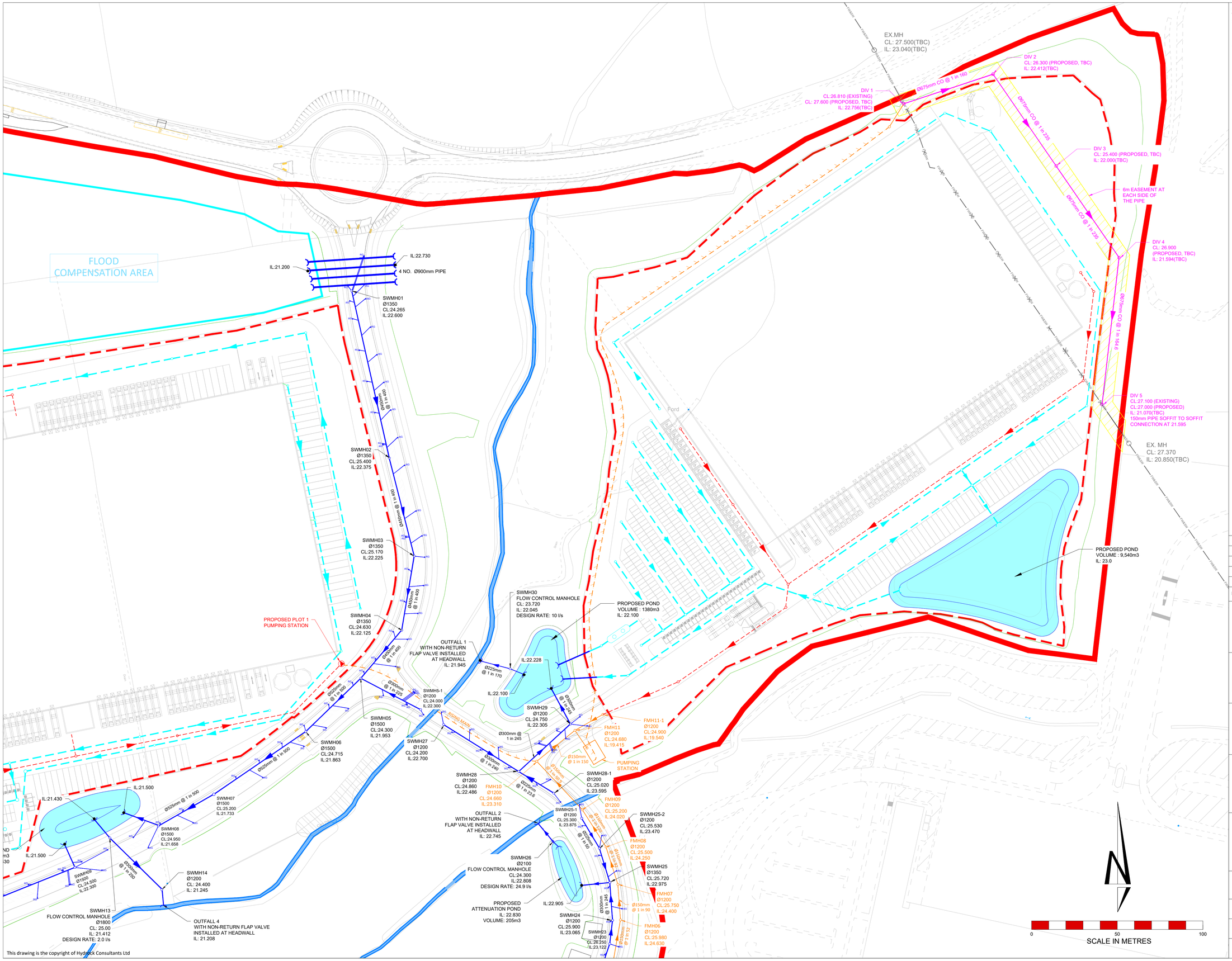

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- INDICATIVE ON-PLOT FOUL SEWER
- INDICATIVE ON-PLOT OIL INTERCEPTOR
- PROPOSED PRIVATE SURFACE WATER ATTENUATION
- PROPOSED YW PUBLIC SEWER DIVERSION
- FW&SW — EXISTING YW PUBLIC COMBINED SEWER TO REMAIN
- FW&SW — EXISTING YW PUBLIC COMBINED SEWER TO BE REMOVED
- 6m YW PUBLIC SEWER EASEMENT
- PROPOSED INFRASTRUCTURE FILTER DRAIN
- RG — PROPOSED ROAD GULLY

SEWER DIVERSION NOTE

YORKSHIRE WATER PUBLIC SEWER DIVERSION LAYOUT IS INDICATIVE ONLY, SUBJECT TO YORKSHIRE WATER S185 TECHNICAL ACCEPTANCE AND S185 AGREEMENT.

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Project Title:

BARNSLEY ROAD
GOLDTHORPE

Drawing Title:

DRAINAGE LAYOUT
SHEET 2 OF 5

Drawing Status:

PLANNING

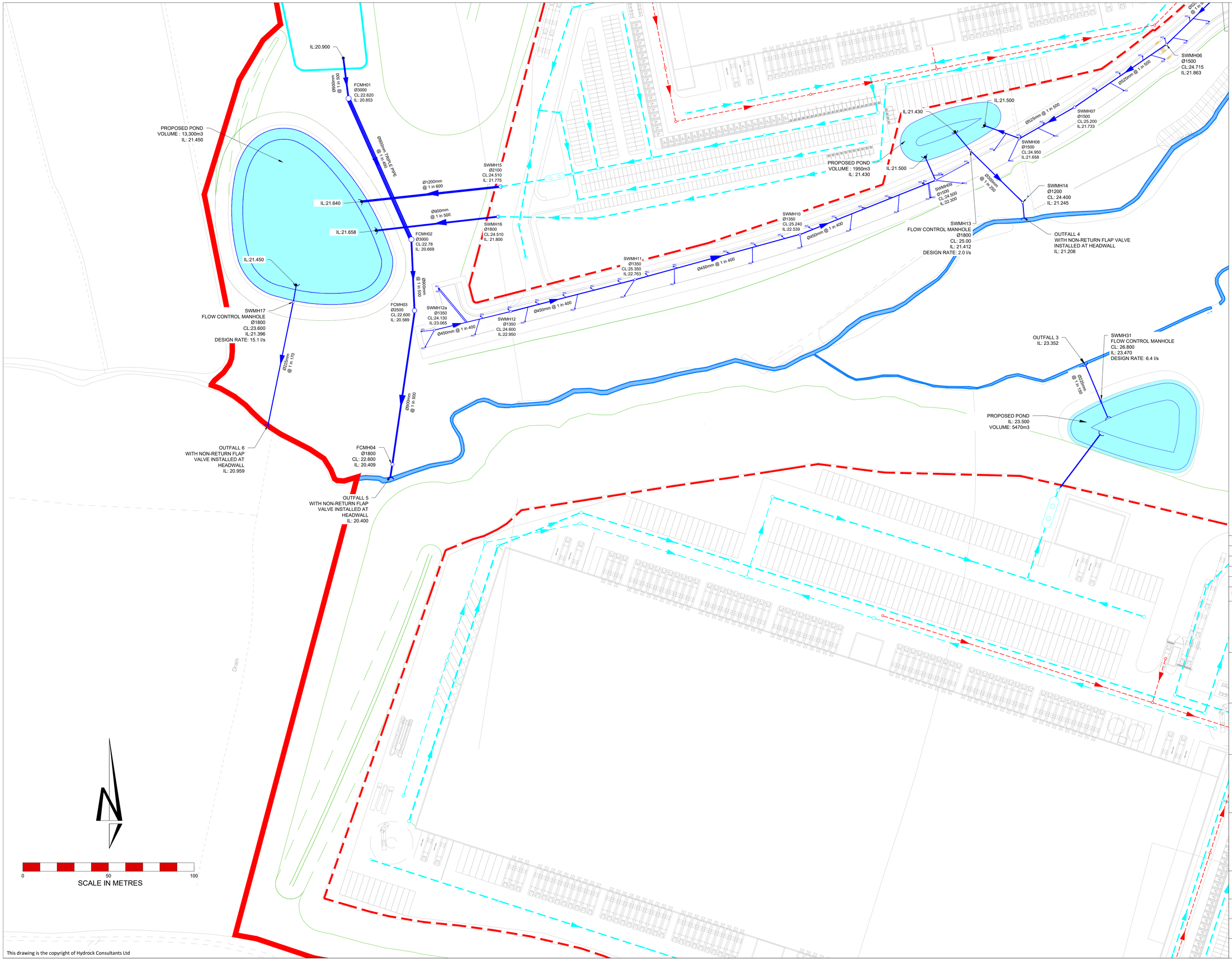
Hydrock Job No:

C23451

Drawn	Checked	Scale @ A1	Date	Issue Date
JY	NB	1:1000	21.02.2023	21.02.2023

Drawing Number: 23451-HYD-XX-XX-DR-D-0502

Revision: P5



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Client : newlands developments

Project Title:
BARNSLEY ROAD
GOLDTHORPE

Drawing Title:
DRAINAGE LAYOUT
SHEET 3 OF 5

Drawing Status:
PLANNING

Hydrock Job No:
C23451

Drawn	Checked	Scale @ A1	Date	Issue Date
JY	NB	1:1000	21.02.2023	21.02.2023

Drawing Number: 23451-HYD-XX-XX-DR-D-0503
Revision: P5

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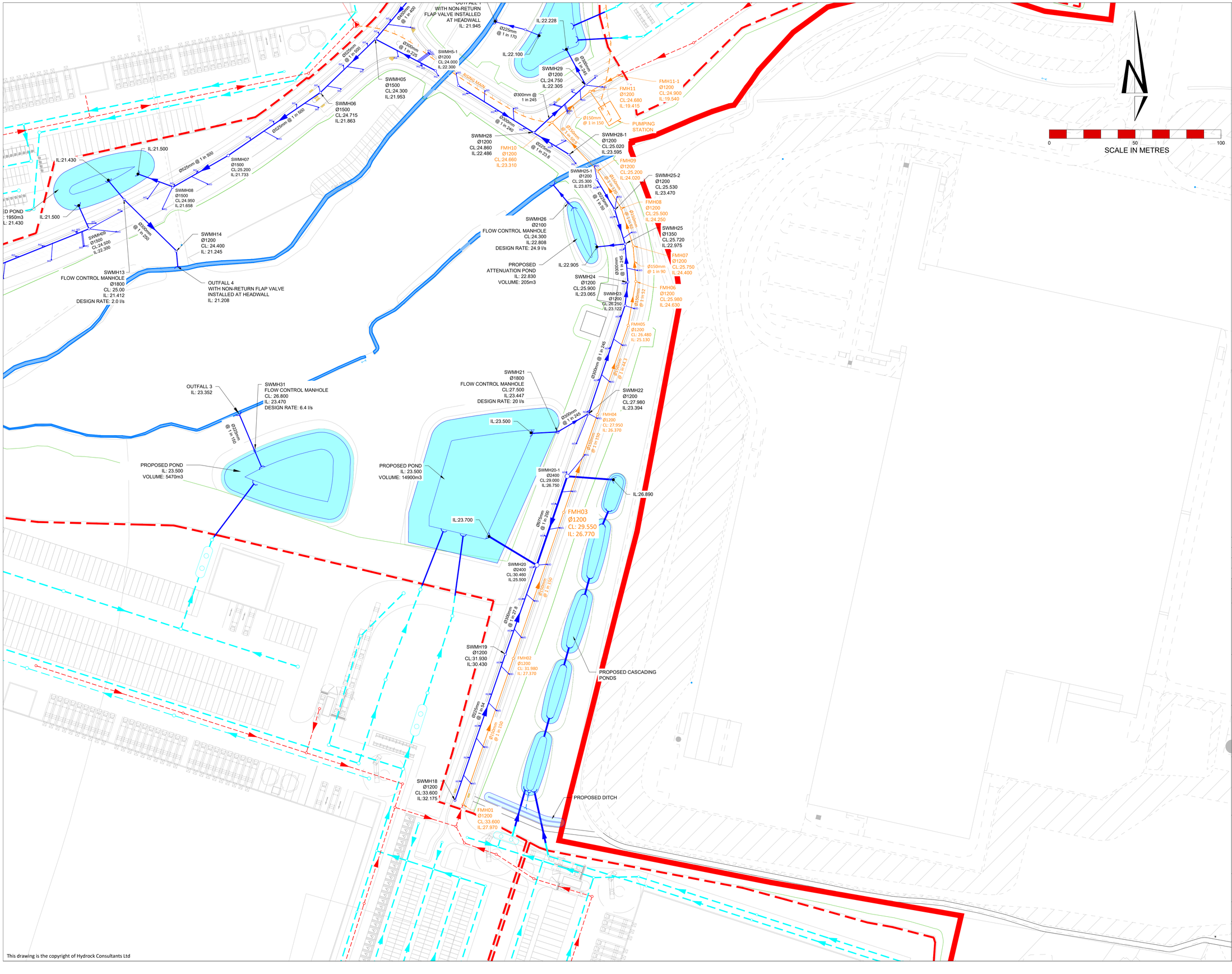

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Project Title:

BARNSLEY ROAD
GOLDTHORPE

Drawing Title:

DRAINAGE LAYOUT
SHEET 4 OF 5

Drawing Status: PLANNING

Hydrock Job No: C23451

Drawn	Checked	Scale @ A1	Date	Issue Date
JY	NB	1:1000	21.02.2023	21.02.2023

Drawing Number: 23451-HYD-XX-XX-DR-D-0504

Revision: P5

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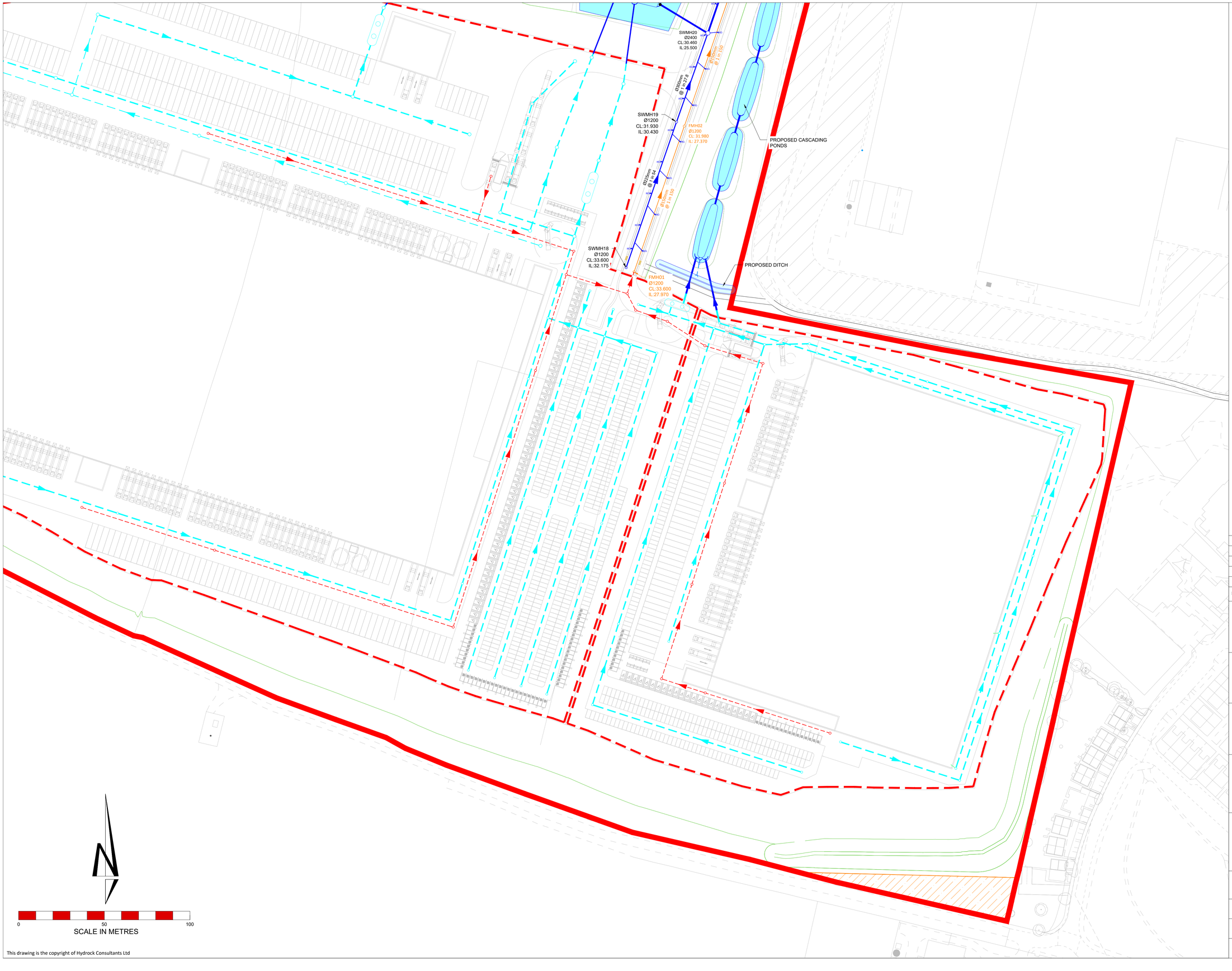

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BARNSLEY ROAD
GOLDTHORPE

Drawing Title:

DRAINAGE LAYOUT
SHEET 5 OF 5

Drawing Status:

PLANNING

Hydrock Job No:

C23451

Drawn	Checked	Scale @ A1	Date	Issue Date
JY	NB	1:1000	21.02.2023	21.02.2023

Drawing Number: 23451-HYD-XX-XX-DR-D-0505

Revision: P5

Appendix D - Hydrological Calculations

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type
S3.000	74.888	0.187	400.0	0.195	5.00	0.0	0.600		o	450	Pipe/Conduit
S3.001	89.362	0.223	400.0	0.132	5.00	0.0	0.600		o	450	Pipe/Conduit
S3.002	95.709	0.239	400.0	0.134	0.00	0.0	0.600		o	450	Pipe/Conduit
S3.003	14.537	0.036	400.0	0.077	0.00	0.0	0.600		o	450	Pipe/Conduit
S3.004	27.966	0.070	399.5	0.000	0.00	0.0		0.045	3 \=/	300	1:3 Swale
S4.000	89.970	0.225	400.0	0.240	5.00	0.0	0.600		o	450	Pipe/Conduit
S4.001	59.963	0.150	400.0	0.125	0.00	0.0	0.600		o	450	Pipe/Conduit
S4.002	40.045	0.100	400.0	0.083	0.00	0.0	0.600		o	450	Pipe/Conduit
S4.003	38.641	0.097	400.0	0.028	0.00	0.0	0.600		o	450	Pipe/Conduit
S5.000	27.456	0.122	225.0	0.082	5.00	0.0	0.600		o	300	Pipe/Conduit
S4.004	44.917	0.090	500.0	0.099	0.00	0.0	0.600		o	525	Pipe/Conduit
S4.005	64.931	0.130	500.0	0.091	0.00	0.0	0.600		o	525	Pipe/Conduit
S4.006	37.321	0.075	500.0	0.053	0.00	0.0	0.600		o	525	Pipe/Conduit
S4.007	11.534	0.023	500.0	0.000	0.00	0.0	0.600		o	525	Pipe/Conduit
S4.008	24.547	0.070	350.7	0.000	0.00	0.0		0.045	3 \=/	300	1:3 Swale
S3.005	7.047	0.018	399.7	0.153	0.00	0.0	0.600		o	450	Pipe/Conduit
S3.006	41.803	0.167	250.0	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit
S3.007	9.138	0.037	247.0	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
S3.000	22.950	0.195	0.0	1.01	160.7
S3.001	22.763	0.327	0.0	1.01	160.7
S3.002	22.539	0.461	0.0	1.01	160.7
S3.003	22.300	0.537	0.0	1.01	160.7
S3.004	21.500	0.537	0.0	1.42	39693.5
S4.000	22.600	0.240	0.0	1.01	160.7
S4.001	22.375	0.365	0.0	1.01	160.7
S4.002	22.225	0.448	0.0	1.01	160.7
S4.003	22.125	0.476	0.0	1.01	160.7
S5.000	22.300	0.082	0.0	1.04	73.8
S4.004	21.953	0.657	0.0	0.99	215.4
S4.005	21.863	0.748	0.0	0.99	215.4
S4.006	21.733	0.801	0.0	0.99	215.4
S4.007	21.658	0.801	0.0	0.99	215.4
S4.008	21.500	0.801	0.0	1.52	42367.7
S3.005	21.430	1.491	0.0	1.01	160.7
S3.006	21.412	1.491	0.0	0.99	70.0
S3.007	21.245	1.491	0.0	1.00	70.4

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Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type
S6.000	95.323	0.159	600.0	4.623	5.00	0.0	0.600		o	1200	Pipe/Conduit
S6.001	64.639	0.100	646.4	0.000	0.00	0.0		0.045	3 \=/	600	1:3 Swale
S7.000	80.870	0.162	500.0	5.090	5.00	0.0	0.600		o	900	Pipe/Conduit
S7.001	59.391	0.148	401.3	0.000	0.00	0.0		0.045	3 \=/	300	1:3 Swale
S6.002	9.152	0.054	170.0	1.124	5.00	0.0	0.600		o	225	Pipe/Conduit
S6.003	62.209	0.365	170.4	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit
S6.004	12.301	0.072	170.0	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit
S8.000	9.264	0.037	250.0	5.808	5.00	0.0	0.600		o	300	Pipe/Conduit
S8.001	52.832	0.211	250.0	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit
S8.002	25.335	0.047	540.0	0.000	0.00	0.0	0.600		o	600	Pipe/Conduit
S8.003	72.493	0.134	540.0	0.112	0.00	0.0	0.600		o	600	Pipe/Conduit
S8.004	33.753	0.063	540.0	0.000	0.00	0.0	0.600		o	600	Pipe/Conduit
S8.005	31.989	0.059	540.0	0.069	0.00	0.0	0.600		o	600	Pipe/Conduit
S8.006	27.308	0.049	557.3	0.000	0.00	0.0		0.045	3 \=/	300	1:3 Swale
S9.000	51.405	0.214	240.0	0.064	5.00	0.0	0.600		o	300	Pipe/Conduit
S10.000	24.373	1.034	23.6	0.032	5.00	0.0	0.600		o	225	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
S6.000	21.775	4.623	0.0	1.52	1719.0
S6.001	21.550	4.623	0.0	0.89	12256.0
S7.000	21.800	5.090	0.0	1.39	887.1
S7.001	21.598	5.090	0.0	1.09	13760.9
S6.002	21.450	10.838	0.0	1.00	39.8
S6.003	21.396	10.838	0.0	1.00	39.7
S6.004	21.031	10.838	0.0	1.00	39.8
S8.000	23.000	5.808	0.0	0.99	70.0
S8.001	22.963	5.808	0.0	0.99	70.0
S8.002	22.452	5.808	0.0	1.04	294.3
S8.003	22.405	5.920	0.0	1.04	294.3
S8.004	22.271	5.920	0.0	1.04	294.3
S8.005	22.208	5.989	0.0	1.04	294.3
S8.006	22.149	5.989	0.0	0.75	5069.5
S9.000	22.700	0.064	0.0	1.01	71.4
S10.000	23.595	0.032	0.0	2.71	107.6

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Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type
S9.001	44.380	0.181	245.0	0.095	0.00	0.0	0.600		o	300	Pipe/Conduit
S9.002	18.858	0.077	245.0	0.041	0.00	0.0	0.600		o	300	Pipe/Conduit
S9.003	26.581	0.128	207.7	0.000	0.00	0.0		0.045	3 \=/	300	1:3 Swale
S8.007	3.382	0.023	150.0	0.934	0.00	0.0	0.600		o	225	Pipe/Conduit
S8.008	18.265	0.122	150.0	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit
S11.000	32.747	0.060	545.8	0.000	5.00	0.0		0.045	3 \=/	375	1:3 Swale
S11.001	3.578	0.024	149.1	4.603	0.00	0.0	0.600		o	225	Pipe/Conduit
S11.002	18.539	0.124	149.5	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit
S12.000	90.096	1.670	53.9	0.133	5.00	0.0	0.600		o	225	Pipe/Conduit
S12.001	55.038	1.980	27.8	0.079	0.00	0.0	0.600		o	300	Pipe/Conduit
S13.000	60.829	0.304	200.1	5.045	5.00	0.0	0.600		o	975	Pipe/Conduit
S12.002	32.427	0.108	300.2	0.086	0.00	0.0	0.600		o	975	Pipe/Conduit
S12.003	82.688	0.200	413.4	0.000	0.00	0.0		0.045	3 \=/	300	1:3 Swale
S12.004	7.487	0.053	141.3	12.136	0.00	0.0	0.600		o	300	Pipe/Conduit
S12.005	12.956	0.053	245.0	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit
S12.006	66.555	0.272	244.7	0.142	0.00	0.0	0.600		o	300	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
S9.001	22.486	0.192	0.0	1.00	70.7
S9.002	22.305	0.233	0.0	1.00	70.7
S9.003	22.228	0.233	0.0	1.19	7188.7
S8.007	22.100	7.156	0.0	1.07	42.4
S8.008	22.077	7.156	0.0	1.07	42.4
S11.000	23.560	0.000	0.0	1.28	41982.0
S11.001	23.500	4.603	0.0	1.07	42.5
S11.002	23.476	4.603	0.0	1.07	42.4
S12.000	32.175	0.133	0.0	1.78	71.0
S12.001	30.430	0.212	0.0	2.99	211.6
S13.000	26.750	5.045	0.0	2.32	1735.0
S12.002	25.500	5.344	0.0	1.89	1414.6
S12.003	23.700	5.344	0.0	1.63	72621.3
S12.004	23.500	17.480	0.0	1.32	93.4
S12.005	23.447	17.480	0.0	1.00	70.7
S12.006	23.394	17.622	0.0	1.00	70.7

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Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type
S12.007	13.856	0.057	245.0	0.020	0.00	0.0	0.600		o	300	Pipe/Conduit
S12.008	22.131	0.090	245.9	0.032	0.00	0.0	0.600		o	300	Pipe/Conduit
S14.000	20.231	0.405	50.0	0.041	5.00	0.0	0.600		o	225	Pipe/Conduit
S14.001	20.897	0.420	49.8	0.030	0.00	0.0	0.600		o	225	Pipe/Conduit
S12.009	17.148	0.070	245.0	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit
S12.010	32.063	0.064	500.0	0.000	0.00	0.0		0.045	3 \=/	300	1:3 Swale
S12.011	3.674	0.022	170.0	0.063	0.00	0.0	0.600		o	225	Pipe/Conduit
S12.012	10.670	0.063	170.0	0.000	0.00	0.0	0.600		o	225	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
S12.007	23.122	17.642	0.0	1.00	70.7
S12.008	23.065	17.674	0.0	1.00	70.6
S14.000	23.875	0.041	0.0	1.85	73.7
S14.001	23.470	0.071	0.0	1.86	73.9
S12.009	22.975	17.745	0.0	1.00	70.7
S12.010	22.905	17.745	0.0	0.66	2597.6
S12.011	22.830	17.809	0.0	1.00	39.8
S12.012	22.808	17.809	0.0	1.00	39.8

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Ba
S12	24.600	1.650	Open Manhole	1350	S3.000	22.950	450				
S11	25.350	2.587	Open Manhole	1350	S3.001	22.763	450	S3.000	22.763	450	
S10	25.240	2.701	Open Manhole	1350	S3.002	22.539	450	S3.001	22.540	450	
S9	24.500	2.200	Open Manhole	1500	S3.003	22.300	450	S3.002	22.300	450	
S9-O	24.500	3.000	Junction		S3.004	21.500	300	S3.003	22.264	450	
S1	24.300	1.700	Open Manhole	1350	S4.000	22.600	450				
S2	25.400	3.025	Open Manhole	1350	S4.001	22.375	450	S4.000	22.375	450	
S3	25.120	2.895	Open Manhole	1350	S4.002	22.225	450	S4.001	22.225	450	
S4	24.650	2.525	Open Manhole	1350	S4.003	22.125	450	S4.002	22.125	450	
S5-1	24.000	1.700	Open Manhole	1200	S5.000	22.300	300				
S5	24.300	2.347	Open Manhole	1500	S4.004	21.953	525	S4.003	22.028	450	
								S5.000	22.178	300	
S6	24.715	2.852	Open Manhole	1500	S4.005	21.863	525	S4.004	21.863	525	
S7	25.200	3.467	Open Manhole	1500	S4.006	21.733	525	S4.005	21.733	525	
S8	24.950	3.292	Open Manhole	1500	S4.007	21.658	525	S4.006	21.658	525	
S8-O	24.500	3.000	Junction		S4.008	21.500	300	S4.007	21.635	525	
SROAD 1 POND	24.400	2.970	Open Manhole	1800	S3.005	21.430	450	S3.004	21.430	300	
								S4.008	21.430	300	
S13	25.000	3.588	Open Manhole	1200	S3.006	21.412	300	S3.005	21.412	450	
S14	23.900	2.655	Open Manhole	1200	S3.007	21.245	300	S3.006	21.245	300	
S	23.400	2.192	Open Manhole	0		OUTFALL		S3.007	21.208	300	
S15	24.510	2.735	Open Manhole	2100	S6.000	21.775	1200				
S15-O	23.600	2.050	Junction		S6.001	21.550	600	S6.000	21.616	1200	
S16	24.510	2.710	Open Manhole	1800	S7.000	21.800	900				
S16-O	23.600	2.002	Junction		S7.001	21.598	300	S7.000	21.638	900	
SPOND 1	23.600	2.150	Junction		S6.002	21.450	225	S6.001	21.450	600	
								S7.001	21.450	300	
S17	23.600	2.204	Open Manhole	1800	S6.003	21.396	225	S6.002	21.396	225	
S17-O	24.460	3.429	Open Manhole	1200	S6.004	21.031	225	S6.003	21.031	225	
S	21.800	0.841	Open Manhole	0		OUTFALL		S6.004	20.959	225	
SPOND 2B	24.900	1.900	Junction		S8.000	23.000	300				
S01-POND 2B	24.900	1.937	Open Manhole	1500	S8.001	22.963	300	S8.000	22.963	300	
S02-POND 2B	24.800	2.348	Open Manhole	1500	S8.002	22.452	600	S8.001	22.752	300	
S03-POND 2B	25.000	2.595	Open Manhole	1500	S8.003	22.405	600	S8.002	22.405	600	
S04-POND 2B	25.000	2.729	Open Manhole	1500	S8.004	22.271	600	S8.003	22.271	600	
S05-POND 2B	23.800	1.592	Open Manhole	1500	S8.005	22.208	600	S8.004	22.208	600	
S05-POND 3B-O	23.600	1.451	Junction		S8.006	22.149	300	S8.005	22.149	600	
S27	24.200	1.500	Open Manhole	1200	S9.000	22.700	300				

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)
S28-1	25.020	1.425	Open Manhole	1200	S10.000	23.595	225			
S28	24.860	2.374	Open Manhole	1200	S9.001	22.486	300	S9.000	22.486	300
								S10.000	22.561	225
S29	24.730	2.425	Open Manhole	1200	S9.002	22.305	300	S9.001	22.305	300
S29-O	23.600	1.372	Junction		S9.003	22.228	300	S9.002	22.228	300
SPOND 2A	23.600	1.500	Junction		S8.007	22.100	225	S8.006	22.100	300
								S9.003	22.100	300
S30	23.400	1.323	Open Manhole	1500	S8.008	22.077	225	S8.007	22.077	225
S	23.500	1.545	Open Manhole	0		OUTFALL		S8.008	21.955	225
S01-POND 3A	26.800	3.240	Open Manhole	1800	S11.000	23.560	375			
SPOND 3A	26.800	3.300	Junction		S11.001	23.500	225	S11.000	23.500	375
S31	26.800	3.324	Open Manhole	1800	S11.002	23.476	225	S11.001	23.476	225
S	24.000	0.648	Open Manhole	0		OUTFALL		S11.002	23.352	225
S18	33.600	1.425	Open Manhole	1200	S12.000	32.175	225			
S19	31.930	1.500	Open Manhole	1200	S12.001	30.430	300	S12.000	30.505	225
S20-1	29.000	2.250	Open Manhole	2400	S13.000	26.750	975			
S20	30.460	4.960	Open Manhole	2400	S12.002	25.500	975	S12.001	28.450	300
								S13.000	26.446	975
S20-O	27.500	3.800	Junction		S12.003	23.700	300	S12.002	25.392	975
SPOND 3B	27.500	4.000	Open Manhole	1800	S12.004	23.500	300	S12.003	23.500	300
S21	27.740	4.293	Open Manhole	1200	S12.005	23.447	300	S12.004	23.447	300
S22	27.980	4.586	Open Manhole	1200	S12.006	23.394	300	S12.005	23.394	300
S23	26.250	3.128	Open Manhole	1200	S12.007	23.122	300	S12.006	23.122	300
S24	25.900	2.835	Open Manhole	1200	S12.008	23.065	300	S12.007	23.065	300
S25-1	25.300	1.425	Open Manhole	1200	S14.000	23.875	225			
S25-2	25.530	2.060	Open Manhole	1200	S14.001	23.470	225	S14.000	23.470	225
S25	25.720	2.745	Open Manhole	1200	S12.009	22.975	300	S12.008	22.975	300
								S14.001	23.050	225
S25-O	24.000	1.095	Junction		S12.010	22.905	300	S12.009	22.905	300
SROAD 2 POND	24.000	1.170	Junction		S12.011	22.830	225	S12.010	22.841	300
S26	24.000	1.192	Open Manhole	1200	S12.012	22.808	225	S12.011	22.808	225
S12	24.000	1.255	Open Manhole	0		OUTFALL		S12.012	22.745	225

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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S12	443916.747	403564.231	443916.747	403564.231	Required	
S11	443989.279	403582.864	443989.279	403582.864	Required	
S10	444075.428	403606.612	444075.428	403606.612	Required	
S9	444164.813	403640.827	444164.813	403640.827	Required	
S9-O	444158.972	403654.139			No Entry	
S1	444327.630	403967.382	444327.630	403967.382	Required	
S2	444348.341	403879.828	444348.341	403879.828	Required	
S3	444361.325	403821.288	444361.325	403821.288	Required	
S4	444355.922	403781.609	444355.922	403781.609	Required	
S5-1	444355.841	403738.059	444355.841	403738.059	Required	
S5	444331.839	403751.391	444331.839	403751.391	Required	
S6	444299.543	403720.174	444299.543	403720.174	Required	
S7	444245.922	403683.554	444245.922	403683.554	Required	
S8	444213.494	403665.081	444213.494	403665.081	Required	
S8-O	444207.253	403674.781			No Entry	

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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SROAD 1 POND	444184.540	403665.469	444184.540	403665.469	Required	
S13	444188.058	403659.363	444188.058	403659.363	Required	
S14	444215.539	403627.861	444215.539	403627.861	Required	
S	444216.507	403618.775			No Entry	
S15	443926.922	403646.675	443926.922	403646.675	Required	
S15-O	443833.214	403629.202			No Entry	
S16	443921.846	403621.799	443921.846	403621.799	Required	
S16-O	443841.611	403611.685			No Entry	
SPOND 1	443791.476	403579.845			No Entry	
S17	443789.921	403570.826	443789.921	403570.826	Required	
S17-O	443777.493	403509.871	443777.493	403509.871	Required	
S	443775.028	403497.819			No Entry	
SPOND 2B	444651.548	403804.583			No Entry	
S01-POND 2B	444642.613	403802.134	444642.613	403802.134	Required	
S02-POND 2B	444590.535	403793.237	444590.535	403793.237	Required	

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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S03-POND 2B	444569.349	403807.130	444569.349	403807.130	Required	
S04-POND 2B	444509.537	403766.171	444509.537	403766.171	Required	
S05-POND 2B	444481.137	403747.930	444481.137	403747.930	Required	
S05-POND 3B-O	444449.275	403750.771			No Entry	
S27	444380.041	403724.262	444380.041	403724.262	Required	
S28-1	444444.365	403684.228	444444.365	403684.228	Required	
S28	444423.316	403696.517	444423.316	403696.517	Required	
S29	444455.213	403727.374	444455.213	403727.374	Required	
S29-O	444446.048	403743.856			No Entry	
SPOND 2A	444422.515	403756.216			No Entry	
S30	444419.159	403756.636	444419.159	403756.636	Required	
S	444401.543	403761.459			No Entry	
S01-POND 3A	444264.848	403480.492	444264.848	403480.492	Required	
SPOND 3A	444261.111	403513.026			No Entry	
S31	444259.374	403516.153	444259.374	403516.153	Required	

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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S	444252.053	403533.186			No Entry	
S18	444378.102	403308.058	444378.102	403308.058	Required	
S19	444407.397	403393.258	444407.397	403393.258	Required	
S20-1	444445.195	403502.787	444445.195	403502.787	Required	
S20	444425.347	403445.287	444425.347	403445.287	Required	
S20-O	444397.335	403461.623			No Entry	
SPOND 3B	444435.402	403535.027	444435.402	403535.027	Required	
S21	444442.890	403535.025	444442.890	403535.025	Required	
S22	444455.717	403533.208	444455.717	403533.208	Required	
S23	444477.044	403596.254	444477.044	403596.254	Required	
S24	444478.710	403610.009	444478.710	403610.009	Required	
S25-1	444460.685	403669.471	444460.685	403669.471	Required	
S25-2	444471.037	403652.089	444471.037	403652.089	Required	
S25	444477.058	403632.078	444477.058	403632.078	Required	
S25-O	444460.453	403627.796			No Entry	

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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SROAD 2 POND	444445.057	403655.920			No Entry	
S26	444442.204	403658.234	444442.204	403658.234	Required	
S12	444435.354	403666.415			No Entry	

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S3.000	o	450	S12	24.600	22.950	1.200	Open Manhole	1350
S3.001	o	450	S11	25.350	22.763	2.137	Open Manhole	1350
S3.002	o	450	S10	25.240	22.539	2.251	Open Manhole	1350
S3.003	o	450	S9	24.500	22.300	1.750	Open Manhole	1500
S3.004	3 \=/	300	S9-O	24.500	21.500	2.850	Junction	
S4.000	o	450	S1	24.300	22.600	1.250	Open Manhole	1350
S4.001	o	450	S2	25.400	22.375	2.575	Open Manhole	1350
S4.002	o	450	S3	25.120	22.225	2.445	Open Manhole	1350
S4.003	o	450	S4	24.650	22.125	2.075	Open Manhole	1350
S5.000	o	300	S5-1	24.000	22.300	1.400	Open Manhole	1200
S4.004	o	525	S5	24.300	21.953	1.822	Open Manhole	1500
S4.005	o	525	S6	24.715	21.863	2.327	Open Manhole	1500
S4.006	o	525	S7	25.200	21.733	2.942	Open Manhole	1500
S4.007	o	525	S8	24.950	21.658	2.767	Open Manhole	1500
S4.008	3 \=/	300	S8-O	24.500	21.500	2.850	Junction	
S3.005	o	450	SROAD 1 POND	24.400	21.430	2.520	Open Manhole	1800
S3.006	o	300	S13	25.000	21.412	3.288	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S3.000	74.888	400.0	S11	25.350	22.763	2.137	Open Manhole	1350
S3.001	89.362	400.0	S10	25.240	22.540	2.250	Open Manhole	1350
S3.002	95.709	400.0	S9	24.500	22.300	1.750	Open Manhole	1500
S3.003	14.537	400.0	S9-O	24.500	22.264	1.786	Junction	
S3.004	27.966	399.5	SROAD 1 POND	24.400	21.430	2.820	Open Manhole	1800
S4.000	89.970	400.0	S2	25.400	22.375	2.575	Open Manhole	1350
S4.001	59.963	400.0	S3	25.120	22.225	2.445	Open Manhole	1350
S4.002	40.045	400.0	S4	24.650	22.125	2.075	Open Manhole	1350
S4.003	38.641	400.0	S5	24.300	22.028	1.822	Open Manhole	1500
S5.000	27.456	225.0	S5	24.300	22.178	1.822	Open Manhole	1500
S4.004	44.917	500.0	S6	24.715	21.863	2.327	Open Manhole	1500
S4.005	64.931	500.0	S7	25.200	21.733	2.942	Open Manhole	1500
S4.006	37.321	500.0	S8	24.950	21.658	2.767	Open Manhole	1500
S4.007	11.534	500.0	S8-O	24.500	21.635	2.340	Junction	
S4.008	24.547	350.7	SROAD 1 POND	24.400	21.430	2.820	Open Manhole	1800
S3.005	7.047	399.7	S13	25.000	21.412	3.138	Open Manhole	1200
S3.006	41.803	250.0	S14	23.900	21.245	2.355	Open Manhole	1200

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S3.007	o	300	S14	23.900	21.245	2.355	Open Manhole	1200
S6.000	o	1200	S15	24.510	21.775	1.535	Open Manhole	2100
S6.001	3 \=/	600	S15-O	23.600	21.550	1.900	Junction	
S7.000	o	900	S16	24.510	21.800	1.810	Open Manhole	1800
S7.001	3 \=/	300	S16-O	23.600	21.598	1.852	Junction	
S6.002	o	225	SPOND 1	23.600	21.450	1.925	Junction	
S6.003	o	225	S17	23.600	21.396	1.979	Open Manhole	1800
S6.004	o	225	S17-O	24.460	21.031	3.204	Open Manhole	1200
S8.000	o	300	SPOND 2B	24.900	23.000	1.600	Junction	
S8.001	o	300	S01-POND 2B	24.900	22.963	1.637	Open Manhole	1500
S8.002	o	600	S02-POND 2B	24.800	22.452	1.748	Open Manhole	1500
S8.003	o	600	S03-POND 2B	25.000	22.405	1.995	Open Manhole	1500
S8.004	o	600	S04-POND 2B	25.000	22.271	2.129	Open Manhole	1500
S8.005	o	600	S05-POND 2B	23.800	22.208	0.992	Open Manhole	1500
S8.006	3 \=/	300	S05-POND 3B-O	23.600	22.149	1.301	Junction	
S9.000	o	300	S27	24.200	22.700	1.200	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S3.007	9.138	247.0	S	23.400	21.208	1.892	Open Manhole	0
S6.000	95.323	600.0	S15-O	23.600	21.616	0.784	Junction	
S6.001	64.639	646.4	SPOND 1	23.600	21.450	2.000	Junction	
S7.000	80.870	500.0	S16-O	23.600	21.638	1.062	Junction	
S7.001	59.391	401.3	SPOND 1	23.600	21.450	2.000	Junction	
S6.002	9.152	170.0	S17	23.600	21.396	1.979	Open Manhole	1800
S6.003	62.209	170.4	S17-O	24.460	21.031	3.204	Open Manhole	1200
S6.004	12.301	170.0	S	21.800	20.959	0.616	Open Manhole	0
S8.000	9.264	250.0	S01-POND 2B	24.900	22.963	1.637	Open Manhole	1500
S8.001	52.832	250.0	S02-POND 2B	24.800	22.752	1.748	Open Manhole	1500
S8.002	25.335	540.0	S03-POND 2B	25.000	22.405	1.995	Open Manhole	1500
S8.003	72.493	540.0	S04-POND 2B	25.000	22.271	2.129	Open Manhole	1500
S8.004	33.753	540.0	S05-POND 2B	23.800	22.208	0.992	Open Manhole	1500
S8.005	31.989	540.0	S05-POND 3B-O	23.600	22.149	0.851	Junction	
S8.006	27.308	557.3	SPOND 2A	23.600	22.100	1.350	Junction	
S9.000	51.405	240.0	S28	24.860	22.486	2.074	Open Manhole	1200

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S10.000	o	225	S28-1	25.020	23.595	1.200	Open Manhole	1200
S9.001	o	300	S28	24.860	22.486	2.074	Open Manhole	1200
S9.002	o	300	S29	24.730	22.305	2.125	Open Manhole	1200
S9.003	3 \=/	300	S29-O	23.600	22.228	1.222	Junction	
S8.007	o	225	SPOND 2A	23.600	22.100	1.275	Junction	
S8.008	o	225	S30	23.400	22.077	1.098	Open Manhole	1500
S11.000	3 \=/	375	S01-POND 3A	26.800	23.560	3.090	Open Manhole	1800
S11.001	o	225	SPOND 3A	26.800	23.500	3.075	Junction	
S11.002	o	225	S31	26.800	23.476	3.099	Open Manhole	1800
S12.000	o	225	S18	33.600	32.175	1.200	Open Manhole	1200
S12.001	o	300	S19	31.930	30.430	1.200	Open Manhole	1200
S13.000	o	975	S20-1	29.000	26.750	1.275	Open Manhole	2400
S12.002	o	975	S20	30.460	25.500	3.985	Open Manhole	2400
S12.003	3 \=/	300	S20-O	27.500	23.700	3.650	Junction	

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S10.000	24.373	23.6	S28	24.860	22.561	2.074	Open Manhole	1200
S9.001	44.380	245.0	S29	24.730	22.305	2.125	Open Manhole	1200
S9.002	18.858	245.0	S29-O	23.600	22.228	1.072	Junction	
S9.003	26.581	207.7	SPOND 2A	23.600	22.100	1.350	Junction	
S8.007	3.382	150.0	S30	23.400	22.077	1.098	Open Manhole	1500
S8.008	18.265	150.0	S	23.500	21.955	1.320	Open Manhole	0
S11.000	32.747	545.8	SPOND 3A	26.800	23.500	3.150	Junction	
S11.001	3.578	149.1	S31	26.800	23.476	3.099	Open Manhole	1800
S11.002	18.539	149.5	S	24.000	23.352	0.423	Open Manhole	0
S12.000	90.096	53.9	S19	31.930	30.505	1.200	Open Manhole	1200
S12.001	55.038	27.8	S20	30.460	28.450	1.710	Open Manhole	2400
S13.000	60.829	200.1	S20	30.460	26.446	3.039	Open Manhole	2400
S12.002	32.427	300.2	S20-O	27.500	25.392	1.133	Junction	
S12.003	82.688	413.4	SPOND 3B	27.500	23.500	3.850	Open Manhole	1800

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S12.004	o	300	SPOND 3B	27.500	23.500	3.700	Open Manhole	1800
S12.005	o	300	S21	27.740	23.447	3.993	Open Manhole	1200
S12.006	o	300	S22	27.980	23.394	4.286	Open Manhole	1200
S12.007	o	300	S23	26.250	23.122	2.828	Open Manhole	1200
S12.008	o	300	S24	25.900	23.065	2.535	Open Manhole	1200
S14.000	o	225	S25-1	25.300	23.875	1.200	Open Manhole	1200
S14.001	o	225	S25-2	25.530	23.470	1.835	Open Manhole	1200
S12.009	o	300	S25	25.720	22.975	2.445	Open Manhole	1200
S12.010	3 \=/	300	S25-O	24.000	22.905	0.945	Junction	
S12.011	o	225	SROAD 2 POND	24.000	22.830	0.945	Junction	
S12.012	o	225	S26	24.000	22.808	0.967	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S12.004	7.487	141.3	S21	27.740	23.447	3.993	Open Manhole	1200
S12.005	12.956	245.0	S22	27.980	23.394	4.286	Open Manhole	1200
S12.006	66.555	244.7	S23	26.250	23.122	2.828	Open Manhole	1200
S12.007	13.856	245.0	S24	25.900	23.065	2.535	Open Manhole	1200
S12.008	22.131	245.9	S25	25.720	22.975	2.445	Open Manhole	1200
S14.000	20.231	50.0	S25-2	25.530	23.470	1.835	Open Manhole	1200
S14.001	20.897	49.8	S25	25.720	23.050	2.445	Open Manhole	1200
S12.009	17.148	245.0	S25-O	24.000	22.905	0.795	Junction	
S12.010	32.063	500.0	SROAD 2 POND	24.000	22.841	1.009	Junction	
S12.011	3.674	170.0	S26	24.000	22.808	0.967	Open Manhole	1200
S12.012	10.670	170.0	S12	24.000	22.745	1.030	Open Manhole	0

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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
3.000	User	-	100	0.195	0.195	0.195
3.001	User	-	100	0.132	0.132	0.132
3.002	User	-	100	0.134	0.134	0.134
3.003	User	-	100	0.077	0.077	0.077
3.004	-	-	100	0.000	0.000	0.000
4.000	User	-	100	0.240	0.240	0.240
4.001	User	-	100	0.125	0.125	0.125
4.002	User	-	100	0.083	0.083	0.083
4.003	User	-	100	0.028	0.028	0.028
5.000	User	-	100	0.082	0.082	0.082
4.004	User	-	100	0.099	0.099	0.099
4.005	User	-	100	0.091	0.091	0.091
4.006	User	-	100	0.053	0.053	0.053
4.007	-	-	100	0.000	0.000	0.000
4.008	-	-	100	0.000	0.000	0.000
3.005	User	-	100	0.153	0.153	0.153
3.006	-	-	100	0.000	0.000	0.000
3.007	-	-	100	0.000	0.000	0.000
6.000	User	-	100	4.623	4.623	4.623
6.001	-	-	100	0.000	0.000	0.000
7.000	User	-	100	5.090	5.090	5.090
7.001	-	-	100	0.000	0.000	0.000
6.002	User	-	100	1.124	1.124	1.124
6.003	-	-	100	0.000	0.000	0.000
6.004	-	-	100	0.000	0.000	0.000
8.000	User	-	100	0.488	0.488	0.488
	User	-	100	5.320	5.320	5.808
8.001	-	-	100	0.000	0.000	0.000
8.002	-	-	100	0.000	0.000	0.000
8.003	User	-	100	0.112	0.112	0.112
8.004	-	-	100	0.000	0.000	0.000
8.005	User	-	100	0.069	0.069	0.069
8.006	-	-	100	0.000	0.000	0.000
9.000	User	-	100	0.064	0.064	0.064
10.000	User	-	100	0.032	0.032	0.032
9.001	User	-	100	0.095	0.095	0.095
9.002	User	-	100	0.041	0.041	0.041
9.003	-	-	100	0.000	0.000	0.000
8.007	User	-	100	0.766	0.766	0.766
	User	-	100	0.168	0.168	0.934
8.008	-	-	100	0.000	0.000	0.000
11.000	-	-	100	0.000	0.000	0.000
11.001	User	-	100	3.196	3.196	3.196
	User	-	100	0.350	0.350	3.546
	User	-	100	1.056	1.056	4.603
11.002	-	-	100	0.000	0.000	0.000
12.000	User	-	100	0.133	0.133	0.133
12.001	User	-	100	0.079	0.079	0.079
13.000	User	-	100	0.039	0.039	0.039
	User	-	100	0.166	0.166	0.205
	User	-	100	4.840	4.840	5.045

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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
12.002	User	-	100	0.086	0.086	0.086
12.003	-	-	100	0.000	0.000	0.000
12.004	User	-	100	8.193	8.193	8.193
	User	-	100	3.161	3.161	11.355
	User	-	100	0.781	0.781	12.136
12.005	-	-	100	0.000	0.000	0.000
12.006	User	-	100	0.142	0.142	0.142
12.007	User	-	100	0.020	0.020	0.020
12.008	User	-	100	0.032	0.032	0.032
14.000	User	-	100	0.041	0.041	0.041
14.001	User	-	100	0.030	0.030	0.030
12.009	-	-	100	0.000	0.000	0.000
12.010	-	-	100	0.000	0.000	0.000
12.011	User	-	100	0.063	0.063	0.063
12.012	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				41.896	41.896	41.896

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S3.007	S	23.400	21.208	0.000	0	0

Surcharged Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S6.004	S	21.800	20.959	0.000	0	0

Datum (m) 0.000 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
60	22.000	540	22.000	1020	22.000	1500	22.000	1980	22.000	2460	22.000
120	22.000	600	22.000	1080	22.000	1560	22.000	2040	22.000	2520	22.000
180	22.000	660	22.000	1140	22.000	1620	22.000	2100	22.000	2580	22.000
240	22.000	720	22.000	1200	22.000	1680	22.000	2160	22.000	2640	22.000
300	22.000	780	22.000	1260	22.000	1740	22.000	2220	22.000	2700	22.000
360	22.000	840	22.000	1320	22.000	1800	22.000	2280	22.000	2760	22.000
420	22.000	900	22.000	1380	22.000	1860	22.000	2340	22.000	2820	22.000
480	22.000	960	22.000	1440	22.000	1920	22.000	2400	22.000	2880	22.000

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Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S8.008	S	23.500	21.955	0.000	0	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S11.002	S	24.000	23.352	0.000	0	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S12.012	S12	24.000	22.745	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	7
Number of Online Controls	8	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	5	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Storm Duration (mins)	30
Ratio R	0.377		

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: S13, DS/PN: S3.006, Volume (m³): 4.9

Unit Reference	MD-SHE-0052-2000-2800-2000
Design Head (m)	2.800
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	52
Invert Level (m)	21.412
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.800	2.0
Flush-Flo™	0.231	1.1
Kick-Flo®	0.472	0.9
Mean Flow over Head Range	-	1.4

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.0	1.200	1.4	3.000	2.1	7.000	3.0
0.200	1.1	1.400	1.5	3.500	2.2	7.500	3.1
0.300	1.1	1.600	1.5	4.000	2.4	8.000	3.2
0.400	1.0	1.800	1.6	4.500	2.5	8.500	3.3
0.500	0.9	2.000	1.7	5.000	2.6	9.000	3.4
0.600	1.0	2.200	1.8	5.500	2.7	9.500	3.5
0.800	1.1	2.400	1.9	6.000	2.8		
1.000	1.3	2.600	1.9	6.500	2.9		

Hydro-Brake® Optimum Manhole: S17, DS/PN: S6.003, Volume (m³): 5.9

Unit Reference	MD-SHE-0161-1510-2000-1510
Design Head (m)	2.000
Design Flow (l/s)	15.1
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	161
Invert Level (m)	21.396
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

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Hydro-Brake® Optimum Manhole: S17, DS/PN: S6.003, Volume (m³): 5.9

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.000	15.1
Flush-Flo™	0.584	15.1
Kick-Flo®	1.222	12.0
Mean Flow over Head Range	-	13.2

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	5.8	1.200	12.3	3.000	18.3	7.000	27.5
0.200	12.6	1.400	12.8	3.500	19.7	7.500	28.4
0.300	14.0	1.600	13.6	4.000	21.0	8.000	29.3
0.400	14.7	1.800	14.4	4.500	22.2	8.500	30.2
0.500	15.0	2.000	15.1	5.000	23.4	9.000	31.0
0.600	15.1	2.200	15.8	5.500	24.5	9.500	31.9
0.800	14.8	2.400	16.5	6.000	25.5		
1.000	14.1	2.600	17.1	6.500	26.5		

Non Return Valve Manhole: S17-O, DS/PN: S6.004, Volume (m³): 6.3

Hydro-Brake® Optimum Manhole: S01-POND 2B, DS/PN: S8.001, Volume (m³): 4.0

Unit Reference	MD-SHE-0070-2500-1400-2500
Design Head (m)	1.400
Design Flow (l/s)	2.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	70
Invert Level (m)	22.963
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.400	2.5
Flush-Flo™	0.307	2.1
Kick-Flo®	0.621	1.7
Mean Flow over Head Range	-	2.0

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

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Hydro-Brake® Optimum Manhole: S01-POND 2B, DS/PN: S8.001, Volume (m³): 4.0

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.8	1.200	2.3	3.000	3.5	7.000	5.3
0.200	2.1	1.400	2.5	3.500	3.8	7.500	5.4
0.300	2.1	1.600	2.7	4.000	4.1	8.000	5.6
0.400	2.1	1.800	2.8	4.500	4.3	8.500	5.8
0.500	2.0	2.000	2.9	5.000	4.5	9.000	5.9
0.600	1.8	2.200	3.1	5.500	4.7	9.500	6.1
0.800	1.9	2.400	3.2	6.000	4.9		
1.000	2.1	2.600	3.3	6.500	5.1		

Hydro-Brake® Optimum Manhole: S30, DS/PN: S8.008, Volume (m³): 2.4

Unit Reference	MD-SHE-0141-1000-1300-1000
Design Head (m)	1.300
Design Flow (l/s)	10.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	141
Invert Level (m)	22.077
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.300	10.0
Flush-Flo™	0.385	10.0
Kick-Flo®	0.829	8.1
Mean Flow over Head Range	-	8.7

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	5.1	1.200	9.6	3.000	14.9	7.000	22.3
0.200	9.3	1.400	10.4	3.500	16.0	7.500	23.0
0.300	9.9	1.600	11.0	4.000	17.0	8.000	23.8
0.400	10.0	1.800	11.7	4.500	18.0	8.500	24.5
0.500	9.9	2.000	12.3	5.000	19.0	9.000	25.1
0.600	9.7	2.200	12.8	5.500	19.8	9.500	25.8
0.800	8.5	2.400	13.4	6.000	20.7		
1.000	8.8	2.600	13.9	6.500	21.5		

Hydro-Brake® Optimum Manhole: S31, DS/PN: S11.002, Volume (m³): 8.6

Unit Reference	MD-SHE-0094-6400-3000-6400
Design Head (m)	3.000

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Hydro-Brake® Optimum Manhole: S31, DS/PN: S11.002, Volume (m³): 8.6

Design Flow (l/s)	6.4
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	94
Invert Level (m)	23.476
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	3.000	6.4
Flush-Flo™	0.409	4.5
Kick-Flo®	0.842	3.5
Mean Flow over Head Range	-	4.8

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	3.0	1.200	4.2	3.000	6.4	7.000	9.6
0.200	4.1	1.400	4.5	3.500	6.9	7.500	9.9
0.300	4.4	1.600	4.8	4.000	7.3	8.000	10.2
0.400	4.5	1.800	5.0	4.500	7.7	8.500	10.5
0.500	4.4	2.000	5.3	5.000	8.1	9.000	10.8
0.600	4.3	2.200	5.5	5.500	8.5	9.500	11.0
0.800	3.8	2.400	5.8	6.000	8.9		
1.000	3.8	2.600	6.0	6.500	9.2		

Hydro-Brake® Optimum Manhole: S21, DS/PN: S12.005, Volume (m³): 5.3

Unit Reference	MD-SHE-0169-2000-3000-2000
Design Head (m)	3.000
Design Flow (l/s)	20.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	169
Invert Level (m)	23.447
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	3.000	20.0
Flush-Flo™	0.739	18.4
Kick-Flo®	1.515	14.4
Mean Flow over Head Range	-	16.6

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Hydro-Brake® Optimum Manhole: S21, DS/PN: S12.005, Volume (m³): 5.3

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.0	1.200	17.3	3.000	20.0	7.000	30.0
0.200	14.2	1.400	15.8	3.500	21.5	7.500	31.0
0.300	16.1	1.600	14.8	4.000	22.9	8.000	32.0
0.400	17.2	1.800	15.7	4.500	24.3	8.500	33.0
0.500	17.9	2.000	16.5	5.000	25.5	9.000	33.9
0.600	18.2	2.200	17.2	5.500	26.7	9.500	34.8
0.800	18.3	2.400	18.0	6.000	27.9		
1.000	18.0	2.600	18.7	6.500	29.0		

Hydro-Brake® Optimum Manhole: S26, DS/PN: S12.012, Volume (m³): 1.5

Unit Reference	MD-SHE-0216-2490-1200-2490
Design Head (m)	1.200
Design Flow (l/s)	24.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	216
Invert Level (m)	22.808
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	24.9
Flush-Flo™	0.390	24.9
Kick-Flo®	0.845	21.1
Mean Flow over Head Range	-	21.1

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	7.3	1.200	24.9	3.000	38.6	7.000	58.2
0.200	21.1	1.400	26.8	3.500	41.6	7.500	60.2
0.300	24.6	1.600	28.6	4.000	44.4	8.000	62.1
0.400	24.9	1.800	30.2	4.500	47.0	8.500	64.0
0.500	24.7	2.000	31.8	5.000	49.4	9.000	65.8
0.600	24.2	2.200	33.3	5.500	51.8	9.500	67.5
0.800	22.2	2.400	34.7	6.000	54.0		
1.000	22.8	2.600	36.1	6.500	56.2		

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Storage Structures for Storm

Tank or Pond Manhole: SROAD 1 POND , DS/PN: S3.005

Invert Level (m) 21.430

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	300.0	2.970	1096.5

Tank or Pond Manhole: SPOND 1, DS/PN: S6.002

Invert Level (m) 21.450

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	5300.0	2.150	7095.3

Tank or Pond Manhole: SPOND 2B, DS/PN: S8.000

Invert Level (m) 23.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	4320.0	1.900	5750.1

Tank or Pond Manhole: SPOND 2A, DS/PN: S8.007

Invert Level (m) 22.100

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	660.0	1.500	1133.4

Tank or Pond Manhole: SPOND 3A, DS/PN: S11.001

Invert Level (m) 23.500

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	1000.0	3.300	2417.7

Tank or Pond Manhole: SPOND 3B, DS/PN: S12.004

Invert Level (m) 23.500

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	2500.0	4.000	5079.3

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Tank or Pond Manhole: SROAD 2 POND, DS/PN: S12.011

Invert Level (m) 22.830

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	100.0	1.170	263.1

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	7
Number of Online Controls	8	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.374
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	30, 100
Climate Change (%)	0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S3.000	S12	15 Winter	30	+0%			
S3.001	S11	15 Winter	30	+0%	100/15 Winter		
S3.002	S10	15 Winter	30	+0%	100/15 Summer		
S3.003	S9	2880 Winter	30	+0%	100/15 Summer		
S3.004	S9-O	2880 Winter	30	+0%			
S4.000	S1	15 Winter	30	+0%	100/15 Winter		
S4.001	S2	2880 Winter	30	+0%	100/15 Summer		
S4.002	S3	2880 Winter	30	+0%	100/15 Summer		
S4.003	S4	2880 Winter	30	+0%	30/960 Winter		
S5.000	S5-1	2880 Winter	30	+0%	30/1440 Winter		
S4.004	S5	2880 Winter	30	+0%	30/480 Winter		
S4.005	S6	2880 Winter	30	+0%	30/240 Winter		
S4.006	S7	2880 Winter	30	+0%	30/120 Winter		
S4.007	S8	2880 Winter	30	+0%	30/60 Winter		
S4.008	S8-O	2880 Winter	30	+0%			
S3.005	SROAD 1 POND	2880 Winter	30	+0%	30/15 Summer		
S3.006	S13	2880 Winter	30	+0%	30/15 Summer		

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

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S3.000	S12		23.151	-0.249	0.000	0.38			57.0
S3.001	S11		23.020	-0.193	0.000	0.57			86.2
S3.002	S10		22.824	-0.165	0.000	0.68			103.2
S3.003	S9		22.663	-0.087	0.000	0.05			5.1
S3.004	S9-O		22.663	-1.837	0.000	0.00			5.1
S4.000	S1		22.827	-0.223	0.000	0.45			68.1
S4.001	S2		22.663	-0.162	0.000	0.02			3.4
S4.002	S3		22.663	-0.012	0.000	0.03			4.2
S4.003	S4		22.663	0.088	0.000	0.03			4.5
S5.000	S5-1		22.663	0.063	0.000	0.01			0.8
S4.004	S5		22.663	0.185	0.000	0.03			6.2
S4.005	S6		22.663	0.275	0.000	0.04			7.0
S4.006	S7		22.663	0.405	0.000	0.04			7.5
S4.007	S8		22.663	0.480	0.000	0.06			7.4
S4.008	S8-O		22.663	-1.837	0.000	0.00			7.4
S3.005	SROAD 1 POND		22.663	0.783	0.000	0.03			2.7
S3.006	S13		22.712	1.000	0.000	0.02			1.4

PN	US/MH Name	Status	Level Exceeded
S3.000	S12	OK	
S3.001	S11	OK	
S3.002	S10	OK	
S3.003	S9	OK	
S3.004	S9-O	OK	
S4.000	S1	OK	
S4.001	S2	OK	
S4.002	S3	OK	
S4.003	S4	SURCHARGED	
S5.000	S5-1	SURCHARGED	
S4.004	S5	SURCHARGED	
S4.005	S6	SURCHARGED	
S4.006	S7	SURCHARGED	
S4.007	S8	SURCHARGED	
S4.008	S8-O	OK	
S3.005	SROAD 1 POND	SURCHARGED	
S3.006	S13	SURCHARGED	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S3.007	S14	2880 Winter	30	+0%			
S6.000	S15	15 Winter	30	+0%	100/15 Summer		
S6.001	S15-O	5760 Winter	30	+0%			
S7.000	S16	15 Winter	30	+0%	30/15 Summer	100/15 Winter	
S7.001	S16-O	5760 Winter	30	+0%			
S6.002	SPOND 1	5760 Winter	30	+0%	30/15 Summer		
S6.003	S17	5760 Winter	30	+0%	30/15 Summer		
S6.004	S17-O	60 Winter	30	+0%	30/15 Summer		
S8.000	SPOND 2B	10080 Winter	30	+0%	30/60 Winter		
S8.001	S01-POND 2B	10080 Winter	30	+0%	30/60 Summer		
S8.002	S02-POND 2B	360 Winter	30	+0%			
S8.003	S03-POND 2B	360 Winter	30	+0%			
S8.004	S04-POND 2B	360 Winter	30	+0%	100/180 Winter		
S8.005	S05-POND 2B	360 Winter	30	+0%	100/120 Winter		
S8.006	S05-POND 3B-O	360 Winter	30	+0%			
S9.000	S27	15 Winter	30	+0%	100/15 Summer		
S10.000	S28-1	15 Winter	30	+0%			
S9.001	S28	15 Winter	30	+0%	100/15 Summer		
S9.002	S29	15 Winter	30	+0%	100/15 Summer		
S9.003	S29-O	360 Winter	30	+0%			
S8.007	SPOND 2A	360 Winter	30	+0%	30/15 Summer		
S8.008	S30	360 Winter	30	+0%	30/15 Summer		
S11.000	S01-POND 3A	2880 Winter	30	+0%			
S11.001	SPOND 3A	2880 Winter	30	+0%	30/15 Summer		
S11.002	S31	2880 Winter	30	+0%	30/15 Summer		
S12.000	S18	15 Winter	30	+0%	100/15 Summer		
S12.001	S19	15 Winter	30	+0%			
S13.000	S20-1	15 Winter	30	+0%	30/15 Winter		
S12.002	S20	15 Winter	30	+0%	30/15 Summer		
S12.003	S20-O	2880 Winter	30	+0%			
S12.004	SPOND 3B	2880 Winter	30	+0%	30/15 Summer		
S12.005	S21	2880 Winter	30	+0%	30/15 Summer		
S12.006	S22	15 Winter	30	+0%	100/15 Summer		
S12.007	S23	120 Winter	30	+0%	30/15 Summer		
S12.008	S24	120 Winter	30	+0%	30/15 Winter		
S14.000	S25-1	15 Winter	30	+0%			
S14.001	S25-2	15 Winter	30	+0%			
S12.009	S25	120 Winter	30	+0%	30/15 Summer		
S12.010	S25-O	180 Winter	30	+0%			
S12.011	SROAD 2 POND	180 Winter	30	+0%	30/15 Summer		
S12.012	S26	120 Winter	30	+0%	30/15 Summer		

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)
S3.007	S14		21.277	-0.268	0.000	0.03		

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

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)
S6.000	S15		22.741	-0.234	0.000	0.92		
S6.001	S15-O		22.444	-1.156	0.000	0.00		
S7.000	S16		23.182	0.482	0.000	1.93		
S7.001	S16-O		22.444	-1.156	0.000	0.00		
S6.002	SPOND 1		22.443	0.768	0.000	0.46		
S6.003	S17		22.429	0.808	0.000	0.39		
S6.004	S17-O		22.043	0.787	0.000	0.44		
S8.000	SPOND 2B		23.831	0.531	0.000	0.04		
S8.001	S01-POND 2B		23.834	0.571	0.000	0.03		
S8.002	S02-POND 2B		22.589	-0.463	0.000	0.01		
S8.003	S03-POND 2B		22.589	-0.416	0.000	0.03		
S8.004	S04-POND 2B		22.588	-0.283	0.000	0.03		
S8.005	S05-POND 2B		22.588	-0.220	0.000	0.04		
S8.006	S05-POND 3B-O		22.587	-1.013	0.000	0.00		
S9.000	S27		22.813	-0.187	0.000	0.29		
S10.000	S28-1		23.643	-0.177	0.000	0.10		
S9.001	S28		22.711	-0.075	0.000	0.86		
S9.002	S29		22.602	-0.003	0.000	1.00		
S9.003	S29-O		22.587	-1.013	0.000	0.00		
S8.007	SPOND 2A		22.587	0.262	0.000	0.37		
S8.008	S30		22.592	0.290	0.000	0.26		
S11.000	S01-POND 3A		25.093	-1.707	0.000	0.00		
S11.001	SPOND 3A		25.093	1.368	0.000	0.17		
S11.002	S31		25.091	1.390	0.000	0.13		
S12.000	S18		32.303	-0.097	0.000	0.59		
S12.001	S19		30.550	-0.180	0.000	0.32		
S13.000	S20-1		27.739	0.014	0.000	1.04		
S12.002	S20		26.687	0.212	0.000	1.53		
S12.003	S20-O		25.847	-1.653	0.000	0.00		
S12.004	SPOND 3B		25.847	2.047	0.000	0.33		
S12.005	S21		25.842	2.095	0.000	0.32		
S12.006	S22		23.603	-0.091	0.000	0.76		
S12.007	S23		23.478	0.056	0.000	0.60		
S12.008	S24		23.407	0.042	0.000	0.61		
S14.000	S25-1		23.942	-0.158	0.000	0.19		
S14.001	S25-2		23.561	-0.134	0.000	0.34		
S12.009	S25		23.333	0.058	0.000	0.74		
S12.010	S25-O		23.257	-0.743	0.000	0.01		
S12.011	SROAD 2 POND		23.250	0.195	0.000	0.85		
S12.012	S26		23.221	0.188	0.000	0.74		

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
S3.007	S14	1.4	OK	
S6.000	S15	1353.6	OK	

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

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
S6.001	S15-O	24.4	OK	
S7.000	S16	1492.9	SURCHARGED	1
S7.001	S16-O	27.1	OK	
S6.002	SPOND 1	15.1	SURCHARGED*	
S6.003	S17	15.1	SURCHARGED	
S6.004	S17-O	15.0	SURCHARGED	
S8.000	SPOND 2B	2.6	SURCHARGED*	
S8.001	S01-POND 2B	2.1	SURCHARGED	
S8.002	S02-POND 2B	2.1	OK	
S8.003	S03-POND 2B	7.3	OK	
S8.004	S04-POND 2B	6.6	OK	
S8.005	S05-POND 2B	8.9	OK	
S8.006	S05-POND 3B-O	8.1	OK	
S9.000	S27	19.6	OK	
S10.000	S28-1	10.3	OK	
S9.001	S28	56.7	OK	
S9.002	S29	61.2	OK	
S9.003	S29-O	10.2	OK	
S8.007	SPOND 2A	11.1	SURCHARGED*	
S8.008	S30	10.0	SURCHARGED	
S11.000	S01-POND 3A	0.0	OK	
S11.001	SPOND 3A	5.1	SURCHARGED*	
S11.002	S31	4.8	SURCHARGED	
S12.000	S18	40.7	OK	
S12.001	S19	64.9	OK	
S13.000	S20-1	1499.4	SURCHARGED	
S12.002	S20	1592.4	SURCHARGED	
S12.003	S20-O	50.4	OK	
S12.004	SPOND 3B	20.3	SURCHARGED	
S12.005	S21	18.3	SURCHARGED	
S12.006	S22	51.1	OK	
S12.007	S23	35.0	SURCHARGED	
S12.008	S24	38.0	SURCHARGED	
S14.000	S25-1	12.9	OK	
S14.001	S25-2	23.0	OK	
S12.009	S25	44.7	SURCHARGED	
S12.010	S25-O	37.4	OK	
S12.011	SROAD 2 POND	25.3	SURCHARGED*	
S12.012	S26	24.9	SURCHARGED	

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	7
Number of Online Controls	8	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.374
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	30, 100
Climate Change (%)	0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S3.000	S12	15 Winter	100	+40%			
S3.001	S11	4320 Winter	100	+40%	100/15 Winter		
S3.002	S10	4320 Winter	100	+40%	100/15 Summer		
S3.003	S9	4320 Winter	100	+40%	100/15 Summer		
S3.004	S9-O	4320 Winter	100	+40%			
S4.000	S1	4320 Winter	100	+40%	100/15 Winter		
S4.001	S2	4320 Winter	100	+40%	100/15 Summer		
S4.002	S3	4320 Winter	100	+40%	100/15 Summer		
S4.003	S4	4320 Winter	100	+40%	30/960 Winter		
S5.000	S5-1	4320 Winter	100	+40%	30/1440 Winter		
S4.004	S5	4320 Winter	100	+40%	30/480 Winter		
S4.005	S6	4320 Winter	100	+40%	30/240 Winter		
S4.006	S7	4320 Winter	100	+40%	30/120 Winter		
S4.007	S8	4320 Winter	100	+40%	30/60 Winter		
S4.008	S8-O	4320 Winter	100	+40%			
S3.005	SROAD 1 POND	4320 Winter	100	+40%	30/15 Summer		
S3.006	S13	5760 Winter	100	+40%	30/15 Summer		

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

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)
S3.000	S12		23.325	-0.075	0.000	0.68			102.1
S3.001	S11		23.292	0.079	0.000	0.03			3.9
S3.002	S10		23.292	0.303	0.000	0.04			5.4
S3.003	S9		23.292	0.542	0.000	0.06			6.4
S3.004	S9-O		23.292	-1.208	0.000	0.00			6.3
S4.000	S1		23.291	0.241	0.000	0.02			2.9
S4.001	S2		23.291	0.466	0.000	0.03			4.4
S4.002	S3		23.292	0.617	0.000	0.04			5.4
S4.003	S4		23.292	0.717	0.000	0.04			5.7
S5.000	S5-1		23.292	0.692	0.000	0.01			1.0
S4.004	S5		23.292	0.814	0.000	0.04			7.7
S4.005	S6		23.292	0.904	0.000	0.04			8.8
S4.006	S7		23.292	1.034	0.000	0.05			9.4
S4.007	S8		23.292	1.109	0.000	0.08			9.3
S4.008	S8-O		23.292	-1.208	0.000	0.00			9.3
S3.005	SROAD 1 POND		23.292	1.412	0.000	0.02			1.9
S3.006	S13		23.337	1.625	0.000	0.03			1.7

PN	US/MH Name	Status	Level Exceeded
S3.000	S12	OK	
S3.001	S11	SURCHARGED	
S3.002	S10	SURCHARGED	
S3.003	S9	SURCHARGED	
S3.004	S9-O	OK	
S4.000	S1	SURCHARGED	
S4.001	S2	SURCHARGED	
S4.002	S3	SURCHARGED	
S4.003	S4	SURCHARGED	
S5.000	S5-1	SURCHARGED	
S4.004	S5	SURCHARGED	
S4.005	S6	SURCHARGED	
S4.006	S7	SURCHARGED	
S4.007	S8	SURCHARGED	
S4.008	S8-O	OK	
S3.005	SROAD 1 POND	SURCHARGED	
S3.006	S13	SURCHARGED	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow
S3.007	S14	120 Winter	100	+40%			
S6.000	S15	15 Winter	100	+40%	100/15 Summer		
S6.001	S15-O	5760 Winter	100	+40%			
S7.000	S16	15 Winter	100	+40%	30/15 Summer	100/15 Winter	
S7.001	S16-O	5760 Winter	100	+40%			
S6.002	SPOND 1	5760 Winter	100	+40%	30/15 Summer		
S6.003	S17	5760 Winter	100	+40%	30/15 Summer		
S6.004	S17-O	60 Summer	100	+40%	30/15 Summer		
S8.000	SPOND 2B	10080 Winter	100	+40%	30/60 Winter		
S8.001	S01-POND 2B	10080 Winter	100	+40%	30/60 Summer		
S8.002	S02-POND 2B	960 Winter	100	+40%			
S8.003	S03-POND 2B	720 Winter	100	+40%			
S8.004	S04-POND 2B	720 Winter	100	+40%	100/180 Winter		
S8.005	S05-POND 2B	720 Winter	100	+40%	100/120 Winter		
S8.006	S05-POND 3B-O	720 Winter	100	+40%			
S9.000	S27	15 Winter	100	+40%	100/15 Summer		
S10.000	S28-1	15 Winter	100	+40%			
S9.001	S28	15 Winter	100	+40%	100/15 Summer		
S9.002	S29	720 Winter	100	+40%	100/15 Summer		
S9.003	S29-O	720 Winter	100	+40%			
S8.007	SPOND 2A	720 Winter	100	+40%	30/15 Summer		
S8.008	S30	720 Winter	100	+40%	30/15 Summer		
S11.000	S01-POND 3A	4320 Winter	100	+40%			
S11.001	SPOND 3A	4320 Winter	100	+40%	30/15 Summer		
S11.002	S31	4320 Winter	100	+40%	30/15 Summer		
S12.000	S18	15 Winter	100	+40%	100/15 Summer		
S12.001	S19	15 Winter	100	+40%			
S13.000	S20-1	15 Winter	100	+40%	30/15 Winter		
S12.002	S20	15 Winter	100	+40%	30/15 Summer		
S12.003	S20-O	4320 Winter	100	+40%			
S12.004	SPOND 3B	4320 Winter	100	+40%	30/15 Summer		
S12.005	S21	4320 Winter	100	+40%	30/15 Summer		
S12.006	S22	15 Winter	100	+40%	100/15 Summer		
S12.007	S23	15 Winter	100	+40%	30/15 Summer		
S12.008	S24	15 Winter	100	+40%	30/15 Winter		
S14.000	S25-1	15 Winter	100	+40%			
S14.001	S25-2	15 Winter	100	+40%			
S12.009	S25	180 Winter	100	+40%	30/15 Summer		
S12.010	S25-O	180 Winter	100	+40%			
S12.011	SROAD 2 POND	180 Winter	100	+40%	30/15 Summer		
S12.012	S26	180 Winter	100	+40%	30/15 Summer		

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)
S3.007	S14		21.357	-0.188	0.000	0.22		

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

PN	US/MH Name	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)
S6.000	S15		23.288	0.313	0.000	1.68		
S6.001	S15-O		23.148	-0.452	0.000	0.00		
S7.000	S16		24.524	1.824	14.143	3.34		
S7.001	S16-O		23.148	-0.452	0.000	0.00		
S6.002	SPOND 1		23.145	1.470	0.000	0.45		
S6.003	S17		23.131	1.510	0.000	0.38		
S6.004	S17-O		22.074	0.818	0.000	0.44		
S8.000	SPOND 2B		24.453	1.153	0.000	0.05		
S8.001	S01-POND 2B		24.457	1.194	0.000	0.04		
S8.002	S02-POND 2B		23.006	-0.046	0.000	0.01		
S8.003	S03-POND 2B		23.005	0.000	0.000	0.02		
S8.004	S04-POND 2B		22.997	0.126	0.000	0.02		
S8.005	S05-POND 2B		22.997	0.189	0.000	0.03		
S8.006	S05-POND 3B-O		22.997	-0.603	0.000	0.00		
S9.000	S27		23.274	0.274	0.000	0.48		
S10.000	S28-1		23.661	-0.159	0.000	0.19		
S9.001	S28		23.189	0.403	0.000	1.43		
S9.002	S29		22.998	0.393	0.000	0.19		
S9.003	S29-O		22.996	-0.604	0.000	0.00		
S8.007	SPOND 2A		22.996	0.671	0.000	0.38		
S8.008	S30		22.999	0.697	0.000	0.26		
S11.000	S01-POND 3A		26.064	-0.736	0.000	0.00		
S11.001	SPOND 3A		26.064	2.339	0.000	0.20		
S11.002	S31		26.059	2.358	0.000	0.16		
S12.000	S18		32.529	0.129	0.000	1.03		
S12.001	S19		30.595	-0.135	0.000	0.57		
S13.000	S20-1		28.579	0.854	0.000	1.91		
S12.002	S20		27.505	1.030	0.000	2.76		
S12.003	S20-O		27.252	-0.248	0.000	0.00		
S12.004	SPOND 3B		27.248	3.448	0.000	0.39		
S12.005	S21		27.236	3.489	0.000	0.38		
S12.006	S22		24.148	0.454	0.000	1.07		
S12.007	S23		23.868	0.446	0.000	1.38		
S12.008	S24		23.764	0.399	0.000	1.50		
S14.000	S25-1		23.967	-0.133	0.000	0.35		
S14.001	S25-2		23.666	-0.029	0.000	0.62		
S12.009	S25		23.619	0.344	0.000	0.87		
S12.010	S25-O		23.549	-0.451	0.000	0.02		
S12.011	SROAD 2 POND		23.537	0.482	0.000	0.87		
S12.012	S26		23.502	0.469	0.000	0.74		

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
S3.007	S14	11.8	OK	
S6.000	S15	2468.9	SURCHARGED	

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

PN	US/MH Name	Pipe Flow (l/s)	Status	Level Exceeded
S6.001	S15-O	42.0	OK	
S7.000	S16	2585.1	FLOOD	1
S7.001	S16-O	47.9	OK	
S6.002	SPOND 1	14.7	SURCHARGED*	
S6.003	S17	14.7	SURCHARGED	
S6.004	S17-O	15.1	SURCHARGED	
S8.000	SPOND 2B	2.9	SURCHARGED*	
S8.001	S01-POND 2B	2.6	SURCHARGED	
S8.002	S02-POND 2B	2.3	OK	
S8.003	S03-POND 2B	6.6	OK	
S8.004	S04-POND 2B	5.7	SURCHARGED	
S8.005	S05-POND 2B	8.3	SURCHARGED	
S8.006	S05-POND 3B-O	8.0	OK	
S9.000	S27	32.7	SURCHARGED	
S10.000	S28-1	18.6	OK	
S9.001	S28	94.3	SURCHARGED	
S9.002	S29	11.3	SURCHARGED	
S9.003	S29-O	11.2	OK	
S8.007	SPOND 2A	11.3	SURCHARGED*	
S8.008	S30	10.0	SURCHARGED	
S11.000	S01-POND 3A	0.0	OK	
S11.001	SPOND 3A	6.1	SURCHARGED*	
S11.002	S31	6.0	SURCHARGED	
S12.000	S18	71.1	SURCHARGED	
S12.001	S19	113.9	OK	
S13.000	S20-1	2752.5	SURCHARGED	
S12.002	S20	2867.8	SURCHARGED	
S12.003	S20-O	62.6	FLOOD RISK*	
S12.004	SPOND 3B	23.7	FLOOD RISK	
S12.005	S21	22.1	SURCHARGED	
S12.006	S22	72.0	SURCHARGED	
S12.007	S23	80.9	SURCHARGED	
S12.008	S24	93.3	SURCHARGED	
S14.000	S25-1	23.5	OK	
S14.001	S25-2	41.3	OK	
S12.009	S25	52.5	SURCHARGED	
S12.010	S25-O	52.2	OK	
S12.011	SROAD 2 POND	25.9	SURCHARGED*	
S12.012	S26	24.8	SURCHARGED	

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Appendix E - Yorkshire Water Correspondence

Sophie Jones

From: Jingchao Yang
Sent: 22 March 2023 15:52
To: Sophie Jones
Subject: FW: [Hydrock: 23451-DIST] RE: U799004 - Land south of A635, Billingley Green, Goldthorpe, S72 0JE

Categories: Scanned by Gekko

From: Chris COOKE <Christopher.J.Cooke@yorkshirewater.co.uk>
Sent: 31 January 2023 09:57
To: Jingchao Yang <JingchaoYang@hydrock.com>
Cc: Neil Byrne <NeilByrne@hydrock.com>; Hollie Hansell <hollie.hansell@yorkshirewater.co.uk>; Jess Birch <Jessica.Birch@yorkshirewater.co.uk>
Subject: RE: [Hydrock: 23451-DIST] RE: U799004 - Land south of A635, Billingley Green, Goldthorpe, S72 0JE

CAUTION: This email originated from outside of Hydrock. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Hi Jingchao,

As it's our contract partners who will design & build the diversion, we cannot carry out any initial assessments. Whilst we would try follow your preferred diversion route, ultimately the design of the diversion is completed via our contract partners.

You can instruct us to commence with a feasibility study at this stage, which would determine whether the proposals are considered feasible or not.

Hope this helps.

Thanks,

Chris

YorkshireWater

Chris Cooke
Sewer Diversion & Requisition Senior E
Developer Services (Customer Experie

07790 615043
yorkshirewater.com/developers

From: Jingchao Yang <JingchaoYang@hydrock.com>
Sent: 31 January 2023 09:46
To: Chris COOKE <Christopher.J.Cooke@yorkshirewater.co.uk>
Cc: Neil Byrne <NeilByrne@hydrock.com>; Hollie Hansell <hollie.hansell@yorkshirewater.co.uk>; Jess Birch <Jessica.Birch@yorkshirewater.co.uk>
Subject: RE: [Hydrock: 23451-DIST] RE: U799004 - Land south of A635, Billingley Green, Goldthorpe, S72 0JE

Good morning Chris,

Many thanks for getting back to us. Understood that this is York Water's critical asset.

Meanwhile, prior to submitting a formal S185 application, would Yorkshire Water be able to carry out an initial assessment and provide any comment on our current proposed diversion design?

Best regards,

Jingchao Yang MCIWEM C.WEM

Senior Drainage Engineer

5221 Mob: 07767 162 165

Hydrock
St. Baldred's Hall, 239 Ashley Road, Hale, Cheshire, WA15 9NE
Tel: (0161) 233 0746
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From: Chris COOKE <Christopher.J.Cooke@yorkshirewater.co.uk>
Sent: 31 January 2023 09:00
To: Jingchao Yang <JingchaoYang@hydrock.com>
Cc: Neil Byrne <NeilByrne@hydrock.com>; Hollie Hansell <hollie.hansell@yorkshirewater.co.uk>; Jess Birch <Jessica.Birch@yorkshirewater.co.uk>
Subject: FW: [Hydrock: 23451-DIST] RE: U799004 - Land south of A635, Billingley Green, Goldthorpe, S72 0JE

CAUTION: This email originated from outside of Hydrock. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Hi Jingchao,

Thanks for your email.

With regards to the sewer diversion, Yorkshire Water would want to undertake the works, owing to the size & criticality of the sewer in question. We cannot take the risk of a third party contractor working on this sewer, due to the risks involved.

Please submit the attached application form at your earliest convenience to proceed with the works.

Kindly note that our planning colleagues will reply in due course in relation to any discharge points & rates – this does not fall part of my teams remit.

If you wish to discuss the process further, please don't hesitate to contact me.

Thanks,

Chris

Sophie Jones

From: Jingchao Yang
Sent: 22 March 2023 15:15
To: Sophie Jones
Subject: FW: [Hydrock: 23451-DIST] RE: U799004 - Land south of A635, Billingley Green, Goldthorpe, S72 0JE

Categories: Scanned by Gekko

From: Technical Sewerage <technical.sewerage@yorkshirewater.co.uk>
Sent: 31 January 2023 14:05
To: Jingchao Yang <JingchaoYang@hydrock.com>
Subject: RE: [Hydrock: 23451-DIST] RE: U799004 - Land south of A635, Billingley Green, Goldthorpe, S72 0JE

CAUTION: This email originated from outside of Hydrock. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Good Afternoon Jingchao,

Thanks for the update regarding the sites drainage, I understand my colleague Chris Cooke has already responded to your questions regarding the diversion – I will provide a response for your planning conditions.

Regarding your proposed point of discharge for the sites foul drainage, I have no issue with the site discharging into the 675mm combined crossing your site as indicated in plan 23451-HYD-XX-XX-SK-D-0502-02.

Regarding the foul discharge rate, the quoted 4.75 litres/second discharge rate is only for a pumped discharge, this rate would not apply to a gravity system. Your plan 23451-HYD-XX-XX-SK-D-0502-02 shows pumping stations and a rising main communicating with the 675mm combined sewer, I would expect these pumping stations to pump at a maximum rate of 4.75 l/s.

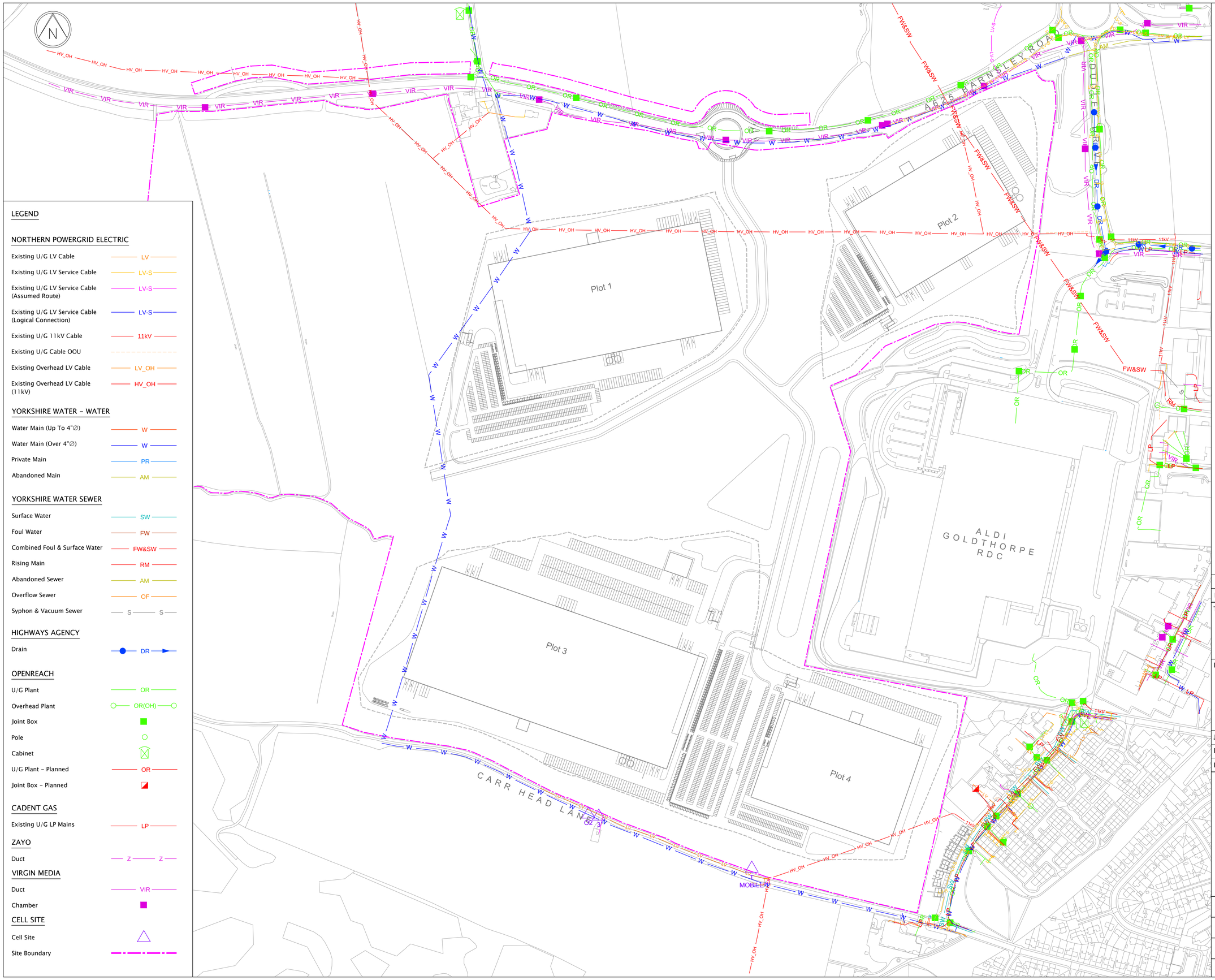
Kind Regards

YorkshireWater

George Mullaney
Pre Development Technician
Developer Services
0345 120 8482
yorkshirewater.com/developers

From: Jingchao Yang <JingchaoYang@hydrock.com>
Sent: 27 January 2023 13:21

Appendix F - Yorkshire Water Sewer Map



ISSUE	DATE	REVISION DETAILS	DRN	CHK'D
1st	25.07.22	1st Issue	SJH	-

Title

NEWLANDS, BARNSLEY ROAD, GOLDTHORPE

Drawing

UTILITY COMPOSITE DRAWING

Job No.	ATS/UC22019	Date	JULY 2022
Drawn	SJH	Checked	-
Design		Appd	

utilityconnections

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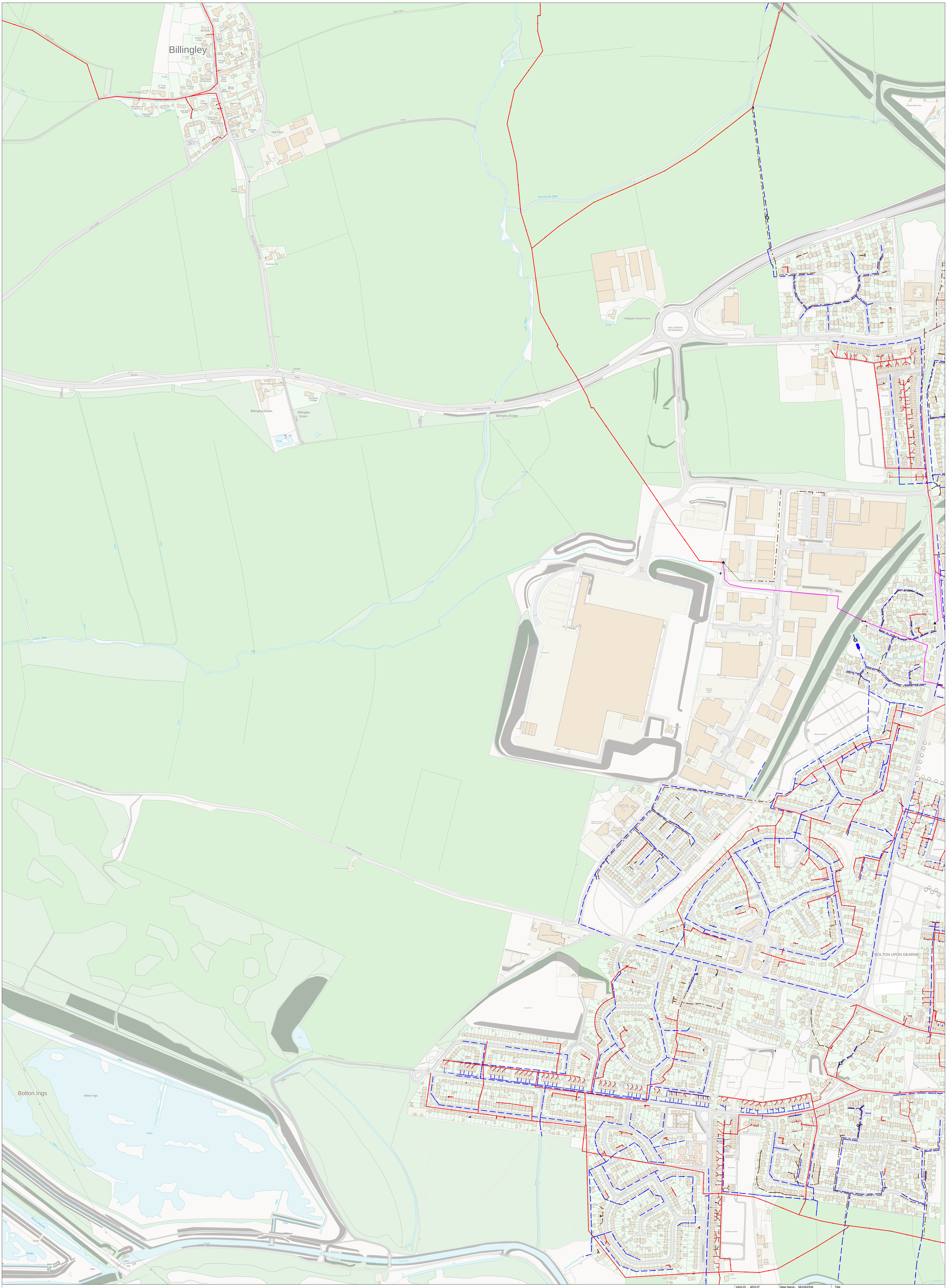
CLIENT	-
SCALE	1:2500 @ A1
DRAWING No.	UC22019-01
STATUS	-


Billingley
Path (um)
Path (crd)
Drain
Beech House
The Croft
Keepers Lodge
Barn Owl Cottage
Rose Cottage
The Croft Farm
Orange Farm
Pond
Old Home House Farm
Fir Tree Cottage
Cedar Cottage
Poplar Farm
Rock Farm House
Manor House
War Memorial
Hirst Cottage
Willow Cottage
Manor Foot
Billingley Chapel
Wentworth House
Old Well House
The Barn
Cherry Tree Cottage
Dove House
Billingley Hall
Hall Dove
WELL LANE
Track
Hall Farm
Pond House
47.5m
48.6m
Primrose Hill
BILLINGLEY MOOR
50.3m
50.9m
FLAT LANE
Thurnscoe Dike
Cart Dike
Highgate House Farm
Pond
HOLLYGROVE ROUNDABOUT
ESSO
Thurnscoe Junction
Rifle Range
Path (um)
Lay-by
GP
Shelter
29.9m
A635
32.3m
31.2m
Lay-by
Trees
30.0m
Rose Valley
Woodbine Cottage
Billingley Green
Billingley Green
Off
FB
Pond
26.6m
BARNSLEY ROAD
Billingley Bridge
Trees
Ford
Cart Dike
Drain
Drain
Drain
Drain
Drain
Cart Dike
FB
CARR HEAD LANE (TRACK)
Track
CARR HEAD LANE
Weir
Drain
Bolton Ings
Bolton Ings
Water
Drain
Drain
Drain
River Dearne
Sluice
Water
Weir
OW
Weir
FB
DW
Outfall
Sluice
Outfall
Road
Track
Pond
Track
Track
Track