JNP GROUP
CONSULTING ENGINEERS

TECHNICAL NOTE

Job name: Hay Green Barn, Hay Green Lane, Birdwell, Barnsley

Job No: S12716-JNP-XX-XX-RP-C-1001 P01

Date: 08/05/2025

Subject: Drainage Statement

1. Introduction

1.1 JNP Group was instructed by JR Planning Consultants to develop a drainage strategy for:

Hay Green Barn,

Hay Green Lane,

Birdwell,

Barnsley,

S70 5XQ

hereinafter referred to as 'the site'.

1.2 The development comprises a single lodge type dwelling, driveway and associated landscaped area.

1.3 This document summarises the rationale supporting the drainage strategy.

1.4 The site is located off Hay Green Lane approximately 4.5 km south of Barnsley town centre. The centre of the site is located at National Grid Reference 435105, 401634. The site covers an area of approximately 0.31 hectares (Appendix A).

1.5 The site has had a caravan on site, with surface water assumed to discharge onto the ground adjacent to the caravan and foul water directed to a septic tank to the east of barns adjacent to the site (Appendix B).

2. Existing Drainage

2.1 The development site contains an existing caravan but is assumed to not benefit from a formal surface water drainage system. Surface water runoff generated within the site is expected to infiltrate into the ground or flow overland towards the north.

2.2 Greenfield runoff rates are indicated below. The runoff calculations are provided in Appendix C.

Table 2.1 Greenfield Run-off Rates (IH124 method)

Return Period	Flow Rate (l/s/ha)
Q1	1.7
Q_{BAR}	2.0
Q30	3.5
Q100	4.1

3. Hierarchy for Surface Water Disposal

3.1 The National Standards for Sustainable Drainage Systems (Defra, 2011) state that the following options must be considered in accordance with the hierarchy for surface water disposal:

Discharge to Ground (Infiltration)

3.2 The site is underlain by a sandstone unit which is part of the Pennine Middle Coal Measures.

3.3 There are no boreholes nearby.

3.4 The site is located towards the top of a hill with levels falling to the north, south and east. Groundwater levels below the site are not known, but given this upland location, a shallow water table is not anticipated to be present.

3.5 Based on the available geologic and hydrogeological information summarised above, infiltration drainage is deemed feasible at the development site. Infiltration testing has not been possible at the site so a low rate typical of a sandstone has been used for the drainage design, which should be confirmed once site access can be gained.

3.6 The development is only small and there is room around the property to accommodate larger drainage structures if required.

Discharge to Surface Water Body

3.7 There is a pond to the north of the site. However, there is no outlet for the pond and it is assumed to be man-made.

3.8 As discharge to ground is considered feasible and considering the above, discharge of surface water to the pond is not considered further.

Discharge to Sewer

3.9 As discharge to ground is proposed, discharge to sewer is not considered further.

4. Proposed Drainage Strategy

4.1 The proposed surface water drainage strategy has been designed in accordance with *Building Regulations Part H* and in compliance with the *NPPF*, local requirements and current best practices, to collect, convey and attenuate runoff from all impermeable areas (134 m^2). Refer to the drawing in Appendix D.

4.2 The proposed drainage strategy intends to collect runoff via rainwater pipes before discharging into an infiltration basin.

4.3 An infiltration rate of 1×10^{-6} has been assumed.

4.4 The driveway will remain permeable and infiltrating to ground.

4.5 The proposed drainage strategy has been designed so that:

- Flooding does not occur on any part of the site for all events up to 1.0% AEP (1 in 100 years) + 40% climate change allowance.

4.6 The performance of the proposed surface water drainage strategy has been tested for storm events with 100.0% AEP, 3.3% AEP and 1.0% AEP + 40% climate change and durations of 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960 and 1440 minutes.

4.7 The results of the simulations are included in Appendix D and demonstrate how the proposed surface water drainage strategy can manage surface water flood risk at the development site without increasing flood risk elsewhere for storm events up to the 1.0% AEP + 40% climate change allowance.

5. Sustainable Drainage Systems (SuDS)

5.1 In accordance with the *NPPF*, (major) developments should incorporate sustainable drainage systems (SuDS) unless there is clear evidence that this would be inappropriate. In addition to water quantity control, SuDS should consider opportunities to provide water quality and amenity / biodiversity benefits (i.e. multifunctionality approach).

5.2 The proposed drainage strategy is reliant on an infiltration basin to manage runoff quantity. The table below shortlists other SuDS deemed compatible with the site's characteristics and which inclusion in the proposed development must be continuously assessed as the design progresses.

5.3 It is important to note the need to remove silt from runoff prior to discharge into SuDS features. SuDS such as filter drains, swales, bioretention systems and pervious pavements are sustainable alternatives to proprietary treatment systems otherwise required to manage silt.

Table 5.1: Sustainable Drainage Systems (SuDS)

SuDS Component	Description and Opportunities
Green / Blue Roofs	Green roofs are areas of living vegetation installed on the top of buildings for a range of reasons including visual benefit, ecological value, enhanced building performance and reduction of surface water runoff. A blue roof is a roof designed explicitly to store water for use within the building (rainwater harvesting) or controlled discharge. Green roofs that include reservoir storage zones beneath the growing medium could also be considered blue roofs. Green roofs can improve the thermal performance of buildings, help combat the urban heat island effect and contribute to improved air quality. Through evapotranspiration, green roofs can reduce peak flow rates to a site drainage system (principally for small and medium-sized events) but are unlikely to a have a significant impact on downstream attenuation storage requirements. Blue roofs can be designed to provide significant attenuation (and evapotranspiration). Should flat roofs be included in the design, green roofs could be considered for these.

SuDS Component	Description and Opportunities
Pervious Pavements	Pervious pavements provide a pavement suitable for pedestrian and / or vehicular traffic, while allowing rainwater to infiltrate through the surface and into the underlying structural layers. The water is temporarily stored beneath the overlying surface before use, infiltration to the ground or controlled discharge downstream. Pervious pavements help reduce flow rates from a site by providing attenuation storage. A flow control structure is required to constrain the rate of water discharged from the sub-base via an outlet pipe. Pervious pavement drainage has been shown to have decreased concentrations of a range of surface water pollutants, including heavy metals, oil and grease, sediment and some nutrients. Pervious pavements are typically built as an alternative to impermeable surfaces and therefore require no extra development space for their construction..
Bioretention Systems Tree Pits	Bioretention systems (including rain gardens) are shallow landscaped depressions that can reduce runoff rates and volumes and treat pollution. They also provide attractive landscape features and biodiversity. Bioretention systems can help reduce flow rates from a site by promoting infiltration / evapotranspiration and providing some attenuation storage. Bioretention systems can also provide very effective treatment functionality. Bioretention systems are a very flexible surface water management component that can be integrated into a wide variety of developments / densities using different shapes, materials, planting and dimensions.
Rainwater Harvesting Tanks.	The collection, filtration and storage of rainwater from the roof. The water can then be re-used for toilets, washing machines and general garden use. Below ground tanks assists in keeping the water cool, eliminating bacterial growth, and keeping a high quality of water.

6. Exceedance Events

6.1 In the event of a storm event greater than the 1.0% AEP + 40% climate change, or a failure of the drainage system, exceedance flows may be generated from the drainage network. Exceedance flows will flow to Hay Green Lane to the north and then along the lane to the north east, as currently occurs, thus not increasing flood risk from the pre-development conditions.

7. Water Quality Management

7.1 The suitability of the proposed drainage strategy to manage the development's pollution risk has been assessed using the simple index approach in *The SuDS Manual* (2015), as summarised in the table below.

Table 7.1: Water Quality Management (Simple Index Approach)

Runoff Route / Treatment Train				
Land Use / SuDS	Hazard Level	TSS	Metals	Hydrocarbons
Pollution Hazard Indices				
Residential roofs	Very Low	0.2	0.2	0.05
SuDS Mitigation Indices				
Infiltration trench / basin		0.6	0.4	0.4
Total SuDS Mitigation Index ≥ Pollution Hazard Index (for each contaminant type)				

8. Operation and Maintenance

8.1 The function of the surface water drainage system must be understood by those responsible for maintenance, regardless of whether individual components are below ground or on the surface. In any system properly designed, monitored and maintained, performance deterioration can usually be minimised.

8.2 The long-term operation and maintenance of the proposed surface water drainage strategy will be the responsibility of entities, as detailed in the table below. Appropriate legal agreements defining maintenance responsibilities and access rights over the lifetime of the proposed development must be established prior to construction.

Table 8.1: Entities Responsible for SuDS Maintenance

SuDS Component	Location	Function	Responsible Entity
Infiltration basin	Landscape area	Store & treat runoff	Owner or private management company

8.3 Where the user / benefiter of a system is not responsible for maintenance, then it is important to ensure that they know when the SuDS is not functioning correctly and who to contact if any issue arises.

8.4 Maintenance plans are often required to clearly identify who is responsible for maintaining proposed SuDS as well as the maintenance regime to be applied. Maintenance plans can also form a useful tool for public engagement with SuDS and understanding their wider benefits. The maintenance requirements of the proposed surface water drainage strategy are summarised in the table below.

Table 8.2: Typical Operation and Maintenance Requirements

Operation and Maintenance Activity	SuDS Component
	Infiltration basin
Inspection	■
Litter and debris removal	■
Grass cutting	■
Weed and invasive plant control	□
Shrub management (including pruning)	□
Sediment management	■
Shoreline vegetation management	□
Aquatic vegetation management	□
Vegetation replacement	□
Structure rehabilitation/repair	□
Key: ■ Will be required □ May be required	

9. Drainage During Construction

9.1 A plan for managing surface water during the construction phase is provided in Appendix F.

9.2 Drainage is typically an early activity in the construction of a development, taking form during the earthworks phase as it is the responsibility of the contractor to manage all construction runoff rates and water quality. However, the connection of piped drainage system to SuDS components should not take place until the end of construction works, unless a robust strategy for silt removal prior to occupation of the site is implemented.

9.3 Silt-laden runoff from construction sites represents a common form of waterborne pollution and cannot enter SuDS components not specifically designed to manage this, as it can overwhelm the system and pollute receiving water features. Any gullies and piped systems should be capped off during construction and fully jetted and cleaned prior to connection to SuDS components.

9.4 The three principal aspects of drainage during construction are conveying runoff, controlling runoff and trapping sediments:

- Conveyance of runoff can be achieved through small ditches / swales, channels and drains. Runoff control measures should be implemented to ensure that runoff does not overwhelm the temporary drainage system causing flooding on site or elsewhere.
- Control of runoff can be achieved through perimeter ditches or appropriate grading to ensure that any runoff from the construction site stays on site.

- Construction runoff should be directed to dedicated settlement basins with adequate upstream sediment and pollution control such as sediment basins, silt fences and straw bales prior to infiltration or off-site discharge.

9.5 Additional conveyance, control and treatment measures should be installed as needed during grading. Slope stability needs to be considered when using open water features to convey, control and treat runoff across the site. Any necessary surface stabilisation measures should be applied immediately on all disturbed areas where construction work is either delayed or incomplete.

9.6 Maintenance inspections should be performed weekly, and maintenance repairs should be made immediately after periods of rainfall.

9.7 All drainage infrastructure (namely underground features) must be protected from damage by construction traffic and heavy machinery through the implementation of measures such as protective barriers and storing construction materials away from the drainage infrastructure.

10. Foul Water Drainage Strategy

10.1 The existing site discharges foul water to a septic tank to the west of barns neighbouring the site. This area is within the same ownership as the development site.

10.2 In accordance with records obtained from Yorkshire Water (Appendix F), a public foul sewer is located within a small development of houses to the south west of the site. This connects to a combined sewer in Birdwell to the west via a pumped sewer. However, access to the gravity drainage section of the sewer would need access through third party land. Connection to the sewer is therefore not proposed.

10.3 It is proposed to discharge foul water from the site into the septic tank to the east of the site (Appendix E). Details of the size and condition of the septic tank, and the sewer connecting the site to the septic tank, will need to be obtained to ensure they are suitable for continued use. If not large enough or in poor condition, a replacement package treatment plant will need to be provided re-using the current outfall, which may require an EA Permit.

Document Issue Record

Technical Note No	Rev	Date	Prepared	Reviewed	Approved
B26074-JNP-XX-XX-RP-C-1002	P01	16/04/2025	SLL	SH	SH

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Appendix D **Proposed Drainage Strategy**

Appendix E **Drainage Calculations**

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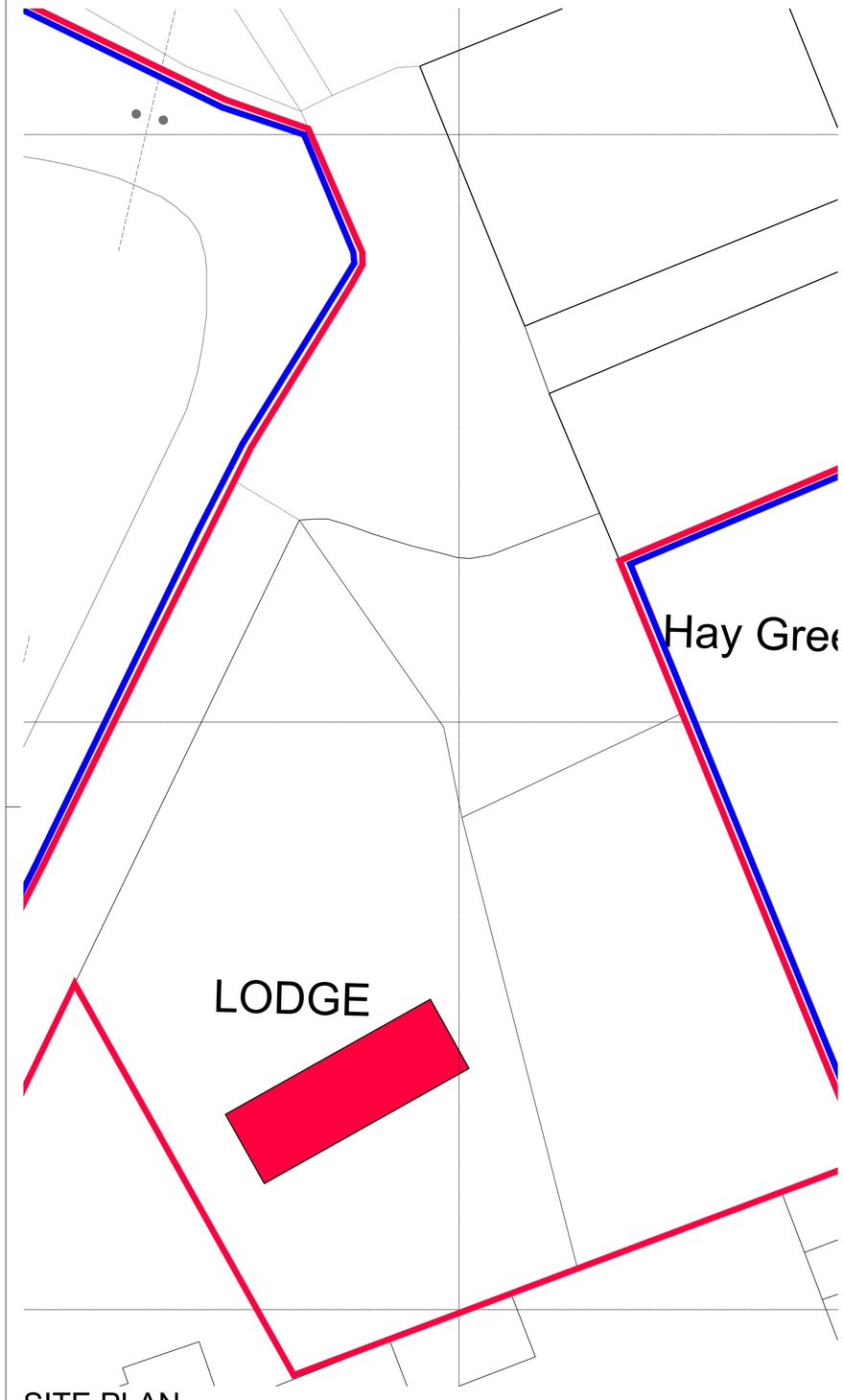
Any comments given within this report are based on the understanding that the proposed works to be undertaken will be as described in the introduction. The information referred to and provided by others and will be assumed to be correct and will not have been checked by JNP Group, JNP Group will not accept any liability or responsibility for any inaccuracy in such information.

Any deviation from the recommendations or conclusions contained in this report should be referred to JNP Group in writing for comment and JNP Group reserve the right to reconsider their recommendations and conclusions contained within. JNP Group will not accept any liability or responsibility for any changes or deviations from the recommendations noted in this report without prior consultation and our full approval.

Appendix A

Proposed Site Layout



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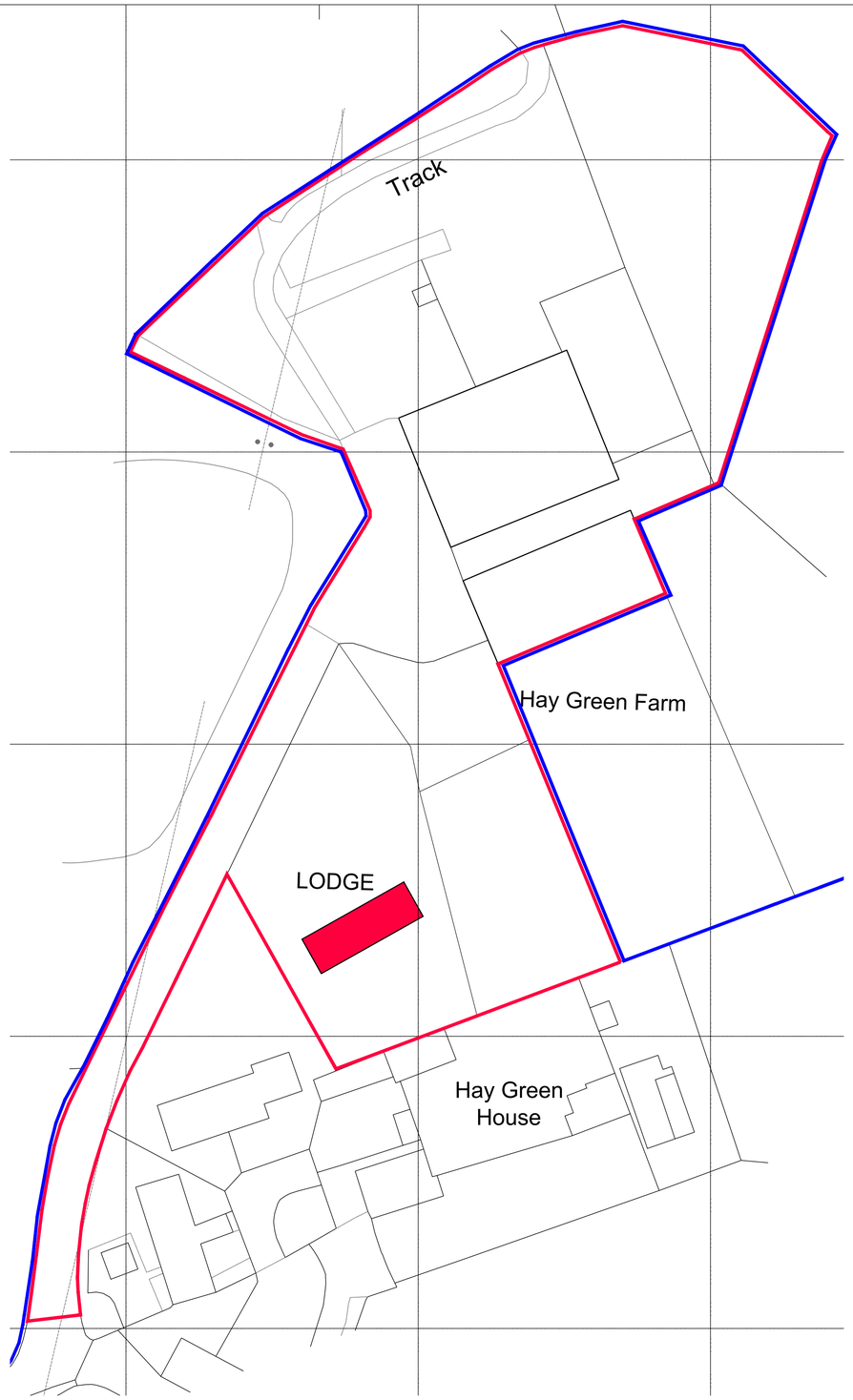
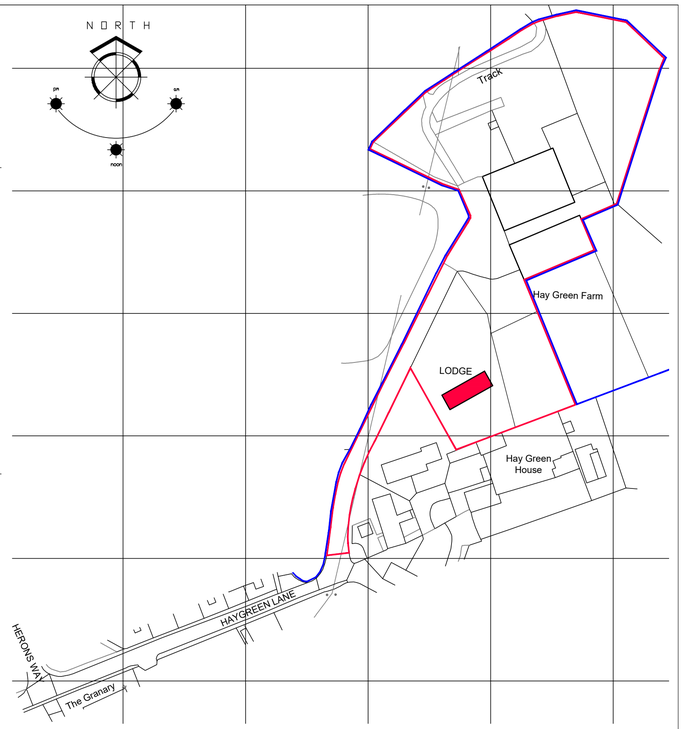


BLOCK PLAN SCALE 1:500



LOCATION PLAN
SCALE 1:1250

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Notes.

Revisions.

Date	Suffix	Description	Date	Suffix	Description

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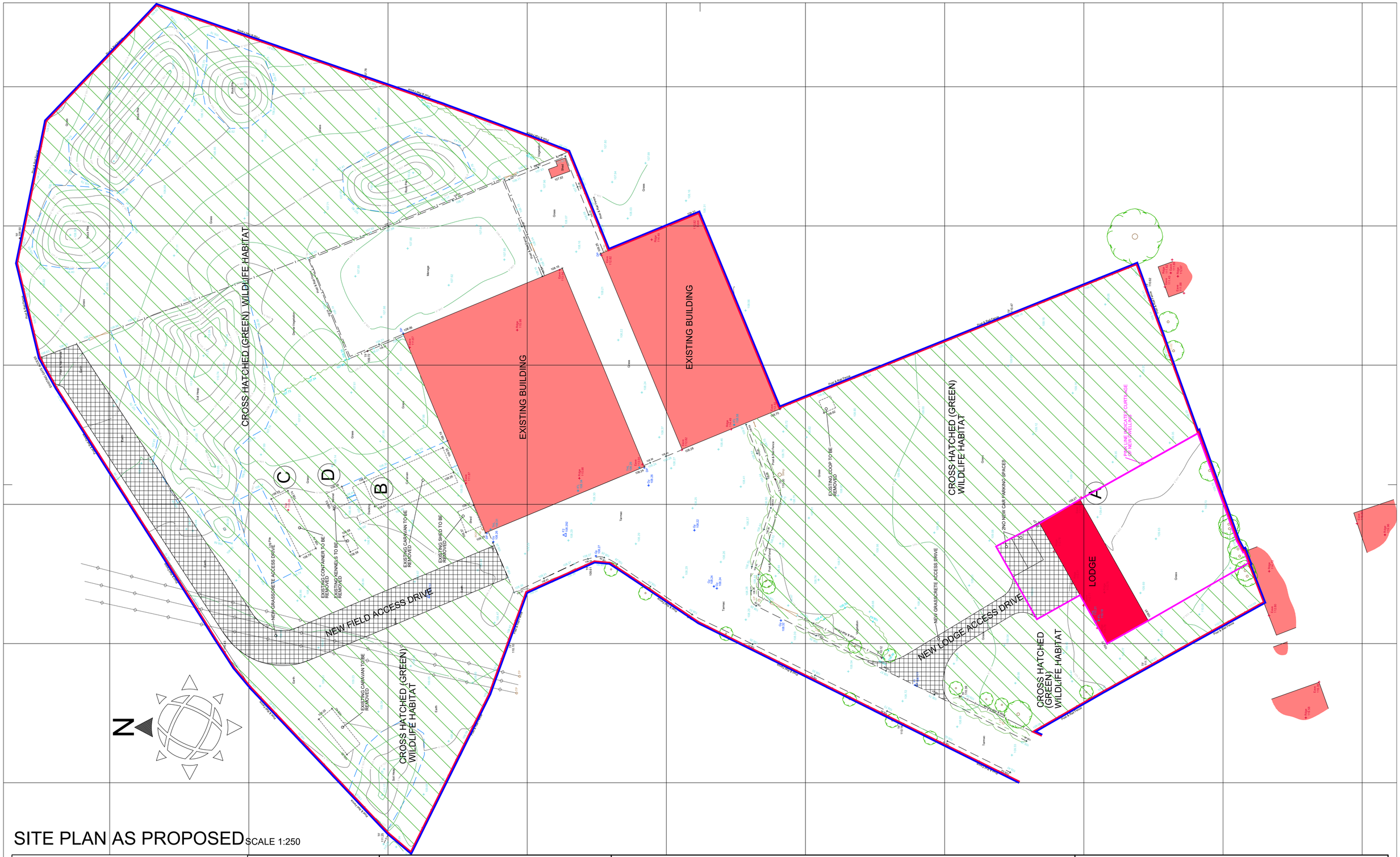
Project. NEW DWELLING AT HAYGREEN FARM , HAYGREEN LANE, BIRDWELL BARNSLEY, S70-5XA		Client. MR S. EATON	
Drawing Title. SITE & LOCATION PLANS		Date. NOV 2023	Scale. AS INDICATED
	Ref. 104-98	Dwg. No. 01	Rev. A

SHEET SIZE A1



SITE PLAN AS PROPOSED SCALE 1:250

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Date	Suffix	Description	Date	Suffix	Description

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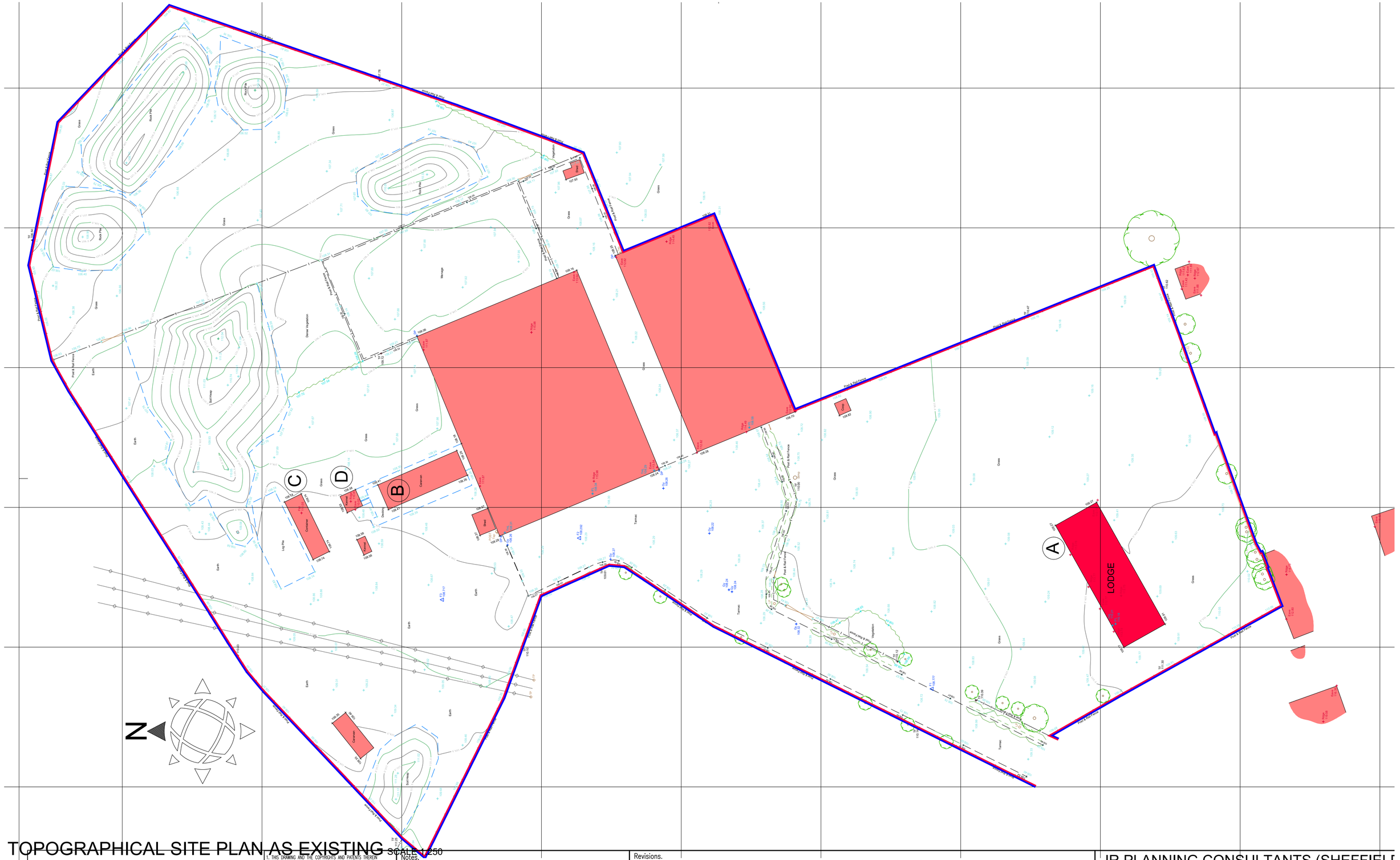
Project. NEW DWELLING AT HAYGREEN FARM , HAYGREEN LANE, BIRDWELL BARNSLEY, S70-5XA		Client. MR S. EATON	
Drawing Title. PLANNING DRAWING SITE PLAN AS PROPOSED		Date. NOV 2023	Scale. AS INDICATED
	Ref. 104-98	Dwg. No. 04	Rev. A

SHEET SIZE A1

Appendix B

Existing Site Layout


A
LODGE
B
Caravan
C
Caravan
D
Caravan
Shed
Shed
Shed
Garage
Gate
Gate
Gate

Appendix C

Existing Runoff Rates

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.300
Area (ha)	1.000	Urban	0.000
SAAR (mm)	751	Region Number	Region 3

Results l/s

QBAR Rural	2.0
QBAR Urban	2.0
Q100 years	4.1
Q1 year	1.7
Q30 years	3.5
Q100 years	4.1

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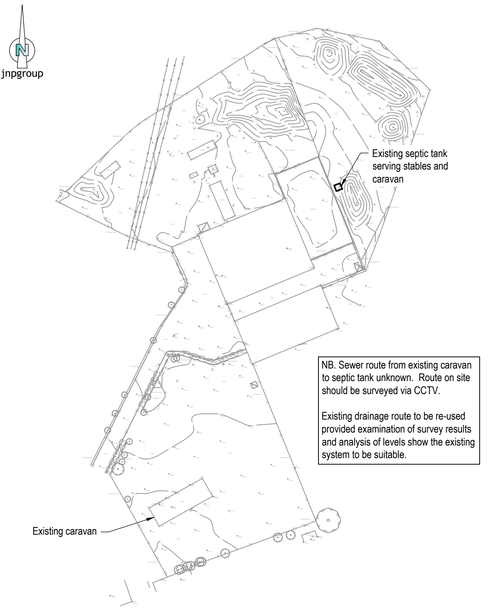
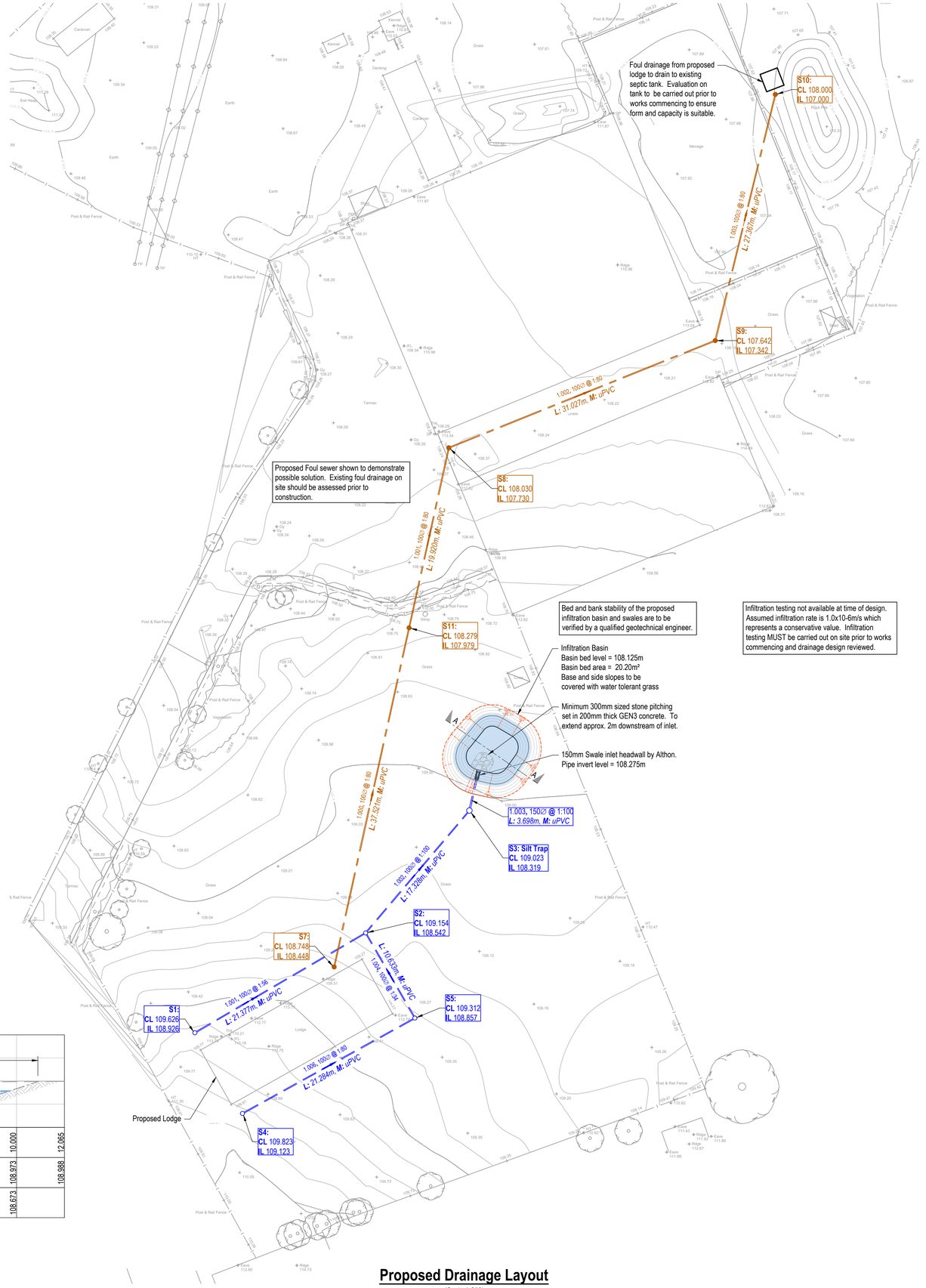
Appendix D

Proposed Drainage Strategy



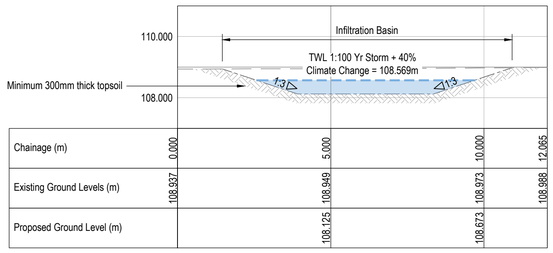
Existing Site Layout

(Scale 1:1000)



Proposed Drainage Layout

(Scale 1:250)



Chainage (m)	0.000	5.000	10.000	12.065
Existing Ground Levels (m)	108.937	108.949	108.973	108.988
Proposed Ground Level (m)		108.125	108.673	

Infiltration Basin Section A-A

(Scale 1:100)

Private Drainage Notes

1. This drawing is to be read in conjunction with and checked against all other drawings, engineering details, specification and any structural, geotechnical or other specialist documents provided.

2. All pipes to be vitrified clay or UPVC and shall be 100mmØ laid to a fall of 1:80 unless noted otherwise or indicated by size and invert levels. All connections when laid shall be plugged, protected as necessary and marked with a stake for future use.

3. Building drainage shall comply with BS 8301 1985, BS EN 752 and Building Regulations Part H. Inspection chambers located within garages to have double seal bolt down covers.

4. Gully top and manhole cover specification to be in accordance with BS EN 124 and located in accordance with the intended use and loading classification as described within groups 1-6-

5. This drawing is schematic for clarity only, positions of pipe runs and manholes may vary on site due to site conditions.

6. Connections to pre-formed inspection chamber bases should ensure the main channel is used in all cases. High velocity discharges (e.g. from SVP's) should use the main channel where practicable.

7. Cover and invert levels are indicative and may vary on site. In any case the following minimum cover to depth of cover to the crown of pipes without protection shall be as follows:

a. Domestic gardens and pathways without any possibility of vehicular access - 0.35m

b. Domestic driveways, parking areas and yards with height restrictions to prevent entry by vehicles with a gross weight in excess of 7.5 tonnes - 0.5m

c. Domestic driveways, parking areas and narrow streets without footways (e.g Mews developments) with limited access for vehicles with a gross weight in excess of 7.5 tonnes - 0.9m

d. Agricultural land and public open space - 0.9m

e. Other highways and parking areas with unrestricted access to vehicles with a gross weight in excess of 7.5 tonnes - 1.2m

Note: any protection required where drainage does not comply with a-e above shall be as follows:-

a) Vitrified clay pipes - provide a 100 mm min. thick concrete bed and surround (instead of class 'S' bedding) and a 13 mm thick compressible filler at each joint.

b) UPVC pipes - provide a concrete bridging (in addition to class 'S' bedding) in accordance with appendix A15, Building Regulations part 'H'.

Note: in-situ concrete used in connection with a) and b) above shall be standard mix GEN3 in accordance with BS 5328.

8. Where pipes pass under buildings, unless beam & block floors are used, they are to be surrounded in concrete.

9. All branch drains, or connections, are to discharge to the collectors obliquely, and in the direction of the main flow.

10. Finished floor levels (FFL's), assumed to be typically a minimum of 150mm above finished ground level outside. refer to architects drawing for details.

11. All new private shallow 225mm diameter surface water and foul inspection chambers and rodding eyes shown without cover levels (CL) shall be assumed to be at external ground level, and invert levels (IL) are to be typically between 450 and 600mm below CL, subject to the length of the internal house connections.

12. All low spots on hardstanding areas to have double gullies.

13. Prior to topsoiling of rear gardens, the gardens should be reworked, rotovated or decompacted to a depth of 600mm. Once this is carried out, no plant is to access these areas, any further consolidation of subsoil to be reworked as necessary. Before reworking or rotovating the Contractor is to mark all drain runs in the area.

14. Pipe bedding to be Class 'S' bedding (100mm granular bed and surround).

15. Excavations for manholes, pipe runs etc located within a 45 degree load distribution splay from any adjoining existing foundations, are to be adequately supported for the duration of the works and building drainage protected.

16. Foundations adjacent to pipe runs or manholes are to have their formation level set above the invert level no higher than the equivalent of the horizontal distance between the pipe/excavation trench and the foundation, minus 500 mm.

17. Where excavations for pipe runs are parallel and in close proximity to each other and/or other service trenches, the contractor shall ensure that adequate safety measures, including temporary shoring, are provided in line with current health & safety Legislation and good practice. Particular attention is to be paid to adjacent trenches of differing invert levels.

18. All existing drainage found on site during the works shall be investigated, its operational status confirmed, and the following applied:-

a) Inoperative drainage shall be cut back and pipe runs filled with concrete grout.

b) 'Live' drainage shall be temporarily re-routed to allow the new drainage to be constructed.

19. Where existing drainage is to be re-used including road, building and external drainage systems, the contractor shall ensure that all chambers and drainage runs are cleaned, de-silted and made good.

20. Covers to existing chambers to be re-used shall be replaced where necessary to suit proposed development loading class, see note 5. Chamber covers shall also be adjusted to suit final ground levels as necessary.

21. Where necessary, existing chambers shall be re-benched to suit new pipework arrangement.

22. The Contractor shall consider and take adequate measures to ensure surface water runoff during construction is managed to prevent pollution of surface water receptors and increased flood risk.

General Notes

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2. All dimensions are millimetres (mm), and levels are in metres (m) unless noted otherwise and should be checked on site prior to construction/fabrication.

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Health & Safety Note

The details on this drawing have been prepared on the assumption that a competent contractor will be carrying out the works. If the contractor(s) considers that there is insufficient Health and Safety information on this drawing, this should immediately be brought to the attention of the designer.

HAZARD IDENTIFICATION BOX

This table is provided to assist the Principal Contractor to fulfil their obligations under the CDM Regulations 2015

Hazard Ref	Hazard Type (Construction/Maintenance/ Cleaning/Demolition/Adaptation)	Hazard Description	Mitigation Measures/ Residual Risk
1			

Important Drainage Notes:

Prior to progressing groundworks the contractor shall:

1. Confirm line and level of all outfall manholes. Where the depths of these manholes are insufficiently deep for any new connection from the site, the engineer shall be informed immediately.

2. Ensure all relevant consents for sewer connections are in place :
- Building Control - For Septic Tank use
- Local Planning Authority - For Infiltration of Surface Water via Infiltration Basin

3. Confirm line and level of existing drainage outfalls. Level of connection subject to confirmation that no clashing occurs with any of the existing sewers or services, contractor to re-level if necessary. Where clashing occurs, the engineer shall be informed immediately.

Rev.	Date	Description	Drn / Chk'd / App'd
P01	07/05/2025	First Issue	CY / SH / SL

Suitability: S4 - Suitable for Stage Approval

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Client: Mr S. Eaton

Job: New Dwelling at Hay Green Farm, Hay Green Lane, Birdwell, Barnsley, S70 5XA

Title: Drainage Plan

Classification: FI_60_20

Scale @ A1: As Shown

Project - Originator - Volume/System - Level/Location - Type - Discipline - Number: S12716 - JNP - 92 - XX - DR - C - 2000 (Document/Drawing Number)

Revision: P01

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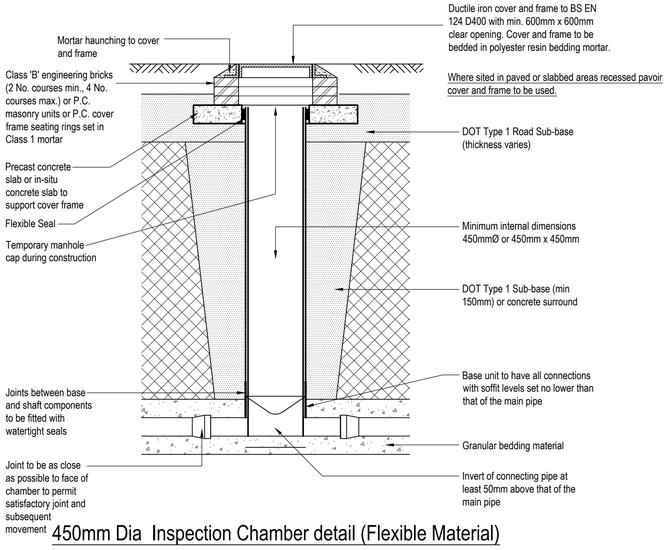
JNP Group Internal Project Number: S12716

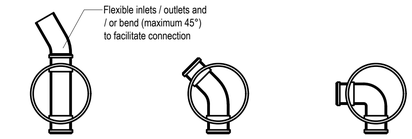


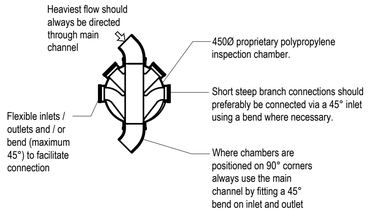
450mm Dia Inspection Chamber detail (Flexible Material) in areas subject to vehicle loading

Scale 1:25

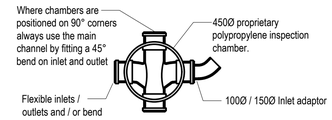
Maximum depth from cover level to soffit of pipe in areas subject to vehicular loading 3m, non entry

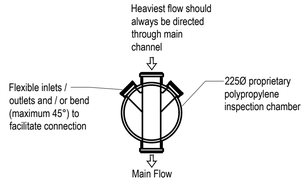
Note- Plastic chambers and rings shall comply with BS EN 13598-1 and BS EN 13598-2 or have equivalent independent approval



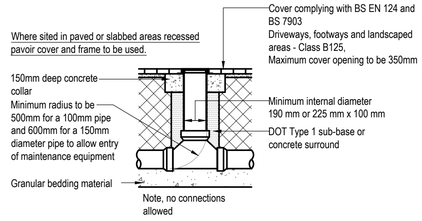


Alternative Base Layouts For 450mm Chambers

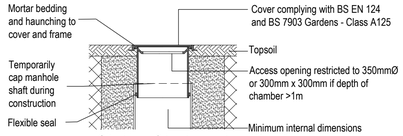




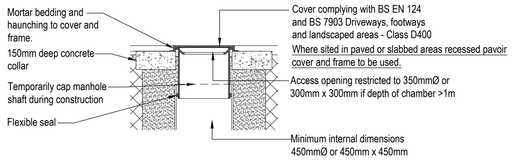
Typical Base Layout For 225mm Chambers



225mm Dia Inspection Chamber Detail (Alternative Construction Detail)



Sited in soft landscaped areas



450mm Dia Inspection Chamber detail (Flexible Material) for light vehicle loading and landscaped areas

Scale 1:25

Maximum depth from cover level to soffit of pipe in areas subject to vehicular loading 3m, non entry

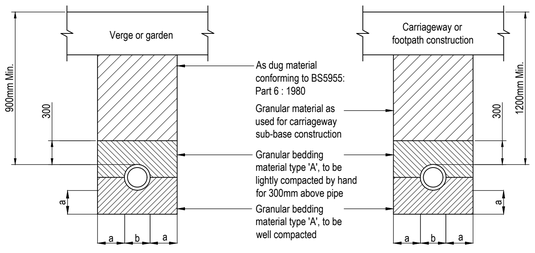
Note- Plastic chambers and rings shall comply with BS EN 13598-1 and BS EN 13598-2 or have equivalent independent approval

Sited in landscaped areas
Scale 1:25

225mm Dia Inspection Chamber detail (Flexible Material Only)

Maximum depth from cover level to soffit of pipe 0.6m, non entry

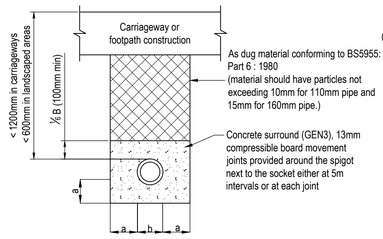
Sited in paved areas
Scale 1:25



Under Verge or Garden
(Bedding Class 'B')

Under Carriageway or Footway
(Bedding Class 'S')

Note:
a= $\frac{1}{3}$ but with a min. of 200mm around the barrels and a min. of 150mm around the sockets



Shallow Pipe Bedding Detail
(Under Carriageway or Footway)
(Bedding Class 'A')

Pipe Bedding Material Details

1. Material designated type 'A' shall consist of angular gravel or crushed rock graded in accordance with BS EN 12620:2002 or air cooled blast furnace slag to A1:2008, or sintered pulverised fuel ash to BS EN 130511:2002, selected according to pipe size as follows:-

Nominal Size of Pipes (mm)	Maximum Particle Size (mm)	Imported Granular Materials
100	10	10mm nominal single-size
Over 100 to 150	15	10 or 14mm nominal single-size or 14mm to 5mm graded
Over 150 to 300	20	10, 14 or 20mm nominal single-size or 14mm to 5mm graded or 20mm to 5mm graded
Over 300 to 600	20	14 or 20mm nominal single-size or 14mm to 5mm graded or 20mm to 5mm graded
Over 600	40	14, 20 or 40mm single-size or 14mm to 5mm graded or 20mm to 5mm graded or 40mm to 5mm graded

2. Material designated type 'B' used under gardens and verges shall consist of uniform readily compactable material, free from tree roots, vegetable matter, building rubbish and frozen soil, and excluding clay lumps retained on a 75mm sieve and stones larger than 37mm. Bedding to be compacted in 225mm layers.
3. Material designated type 'B' used under roads and footpaths shall consist of granular material as used for carriageway sub-base construction.

Note:
At each flexible pipe joint a joint filler (e.g. fibreboard or polystyrene) shall be used (see Table 2), and shall extend through the full thickness of any concrete in contact with the pipe. The concrete bed shall be cut away at each joint to give a clearance of at least 50mm, so that the joint does not bear on the bed.

Table 1 - Rocker Pipe Length

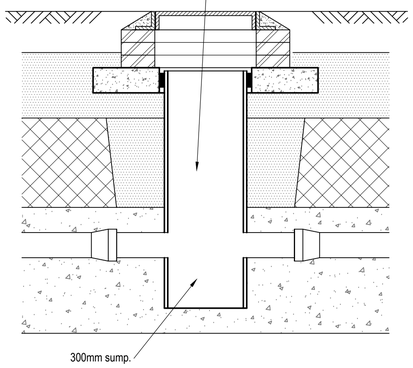
Nominal Diameter of Pipe (mm)	Effective Length (m)
150 to 600	0.6
600 to 750	1.0
700 and over	1.25

Table 2 - Compressible Filler and Packing for Pipelines

Nominal Diameter of Pipe (mm)	Thickness of Compressible Filler (mm)
Less than 450	18
450 - 1200	36
Exceeding 1200	54

Pipe Bedding Details

Scale: 1:25



600mm Dia Inspection Chamber / Sump Chamber - Silt trap

Scale 1:20

Health & Safety Note

The details on this drawing have been prepared on the assumption that a competent contractor will be carrying out the works. If the contractor(s) considers that there is insufficient Health and Safety information on this drawing, this should immediately be brought to the attention of the designer.

General Notes

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Rev.	Date	Description	Drn / Chk'd / App'd
P01	07/05/2025	First Issue	CY / SH / SL

Suitability:
S4 - Suitable for Stage Approval

JNP GROUP
CONSULTING ENGINEERS
Chesham ● Brighouse ● Bristol ● Glasgow ● Hartlepool ● Leamington Spa ● Sheffield
www.jnpgroup.co.uk

Client:
Mr S. Eaton

Job:
New Dwelling at Hay Green Farm,
Hay Green Lane, Birdwell, Barnsley, S70 5XA

Title:
Drainage Construction Details

Classification: FI_60_20
Scale @ A1: As Shown

Project - Originator - Volume/System - Level/Location - Type - Discipline - Number
S12716 - JNP - 92 - XX - DR - C - 3000
Document/Drawing Number

Revision: P02

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JNP Group Internal Project Number: S12716

Appendix E

Drainage Calculations

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	19.000	Add Flow / Climate Change (%)	0
Ratio R	0.353	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

- Indicates pipe length does not match coordinates

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	21.284	0.266	80.0	0.007	4.00	0.0	0.600	o	100	Pipe/Conduit	
1.001	10.633	0.315	33.8	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
2.000	21.377	0.384	55.7	0.007	4.00	0.0	0.600	o	100	Pipe/Conduit	
1.002	17.328	0.173	100.2	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.003	3.698	0.045	82.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.004	2.000#	0.010	200.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	4.41	109.123	0.007	0.0	0.0	0.0	0.86	6.8	0.9
1.001	50.00	4.55	108.857	0.007	0.0	0.0	0.0	1.33	10.5	0.9
2.000	50.00	4.34	108.926	0.007	0.0	0.0	0.0	1.03	8.1	0.9
1.002	50.00	4.92	108.542	0.014	0.0	0.0	0.0	0.77	6.0	1.9
1.003	50.00	4.98	108.319	0.014	0.0	0.0	0.0	1.11	19.6	1.9
1.004	50.00	5.02	108.125	0.014	0.0	0.0	0.0	0.71	12.5	1.9

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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.007	0.007	0.007
1.001	-	-	100	0.000	0.000	0.000
2.000	-	-	100	0.007	0.007	0.007
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.014	0.014	0.014

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Online Controls for Storm

Pump Manhole: 6, DS/PN: 1.004, Volume (m^3): 0.2

Invert Level (m) 108.125

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Storage Structures for Storm

Infiltration Basin Manhole: 6, DS/PN: 1.004

Invert Level (m) 108.125 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00360 Porosity 1.00
Infiltration Coefficient Side (m/hr) 0.00360

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	20.2	0.400	44.3	0.800	70.4
0.200	31.1	0.600	59.7		

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 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	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.353
Region	England and Wales	Cv (Summer)	1.000
M5-60 (mm)	19.000	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

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

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.
1.000	1	15 minute 1 year Summer I+0%	109.823	109.153	-0.070	0.000	0.19
1.001	2	15 minute 1 year Summer I+0%	109.312	108.881	-0.076	0.000	0.13
2.000	3	15 minute 1 year Summer I+0%	109.626	108.953	-0.073	0.000	0.16
1.002	3	15 minute 1 year Summer I+0%	109.154	108.588	-0.054	0.000	0.43
1.003	4	15 minute 1 year Summer I+0%	109.023	108.363	-0.106	0.000	0.19
1.004	6	1440 minute 1 year Winter I+0%	109.000	108.278	0.003	0.000	0.00

PN	US/MH Name	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1		1.3	OK
1.001	2		1.3	OK
2.000	3		1.3	OK
1.002	3		2.5	OK
1.003	4		2.5	OK
1.004	6		0.0	SURCHARGED

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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	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.353
Region	England and Wales	Cv (Summer)	1.000
M5-60 (mm)	19.000	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

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

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.
1.000	1	15 minute 30 year Summer I+0%	109.823	109.171	-0.052	0.000	0.47
1.001	2	15 minute 30 year Summer I+0%	109.312	108.896	-0.061	0.000	0.31
2.000	3	15 minute 30 year Summer I+0%	109.626	108.970	-0.056	0.000	0.39
1.002	3	15 minute 30 year Summer I+0%	109.154	108.654	0.012	0.000	1.04
1.003	4	1440 minute 30 year Winter I+0%	109.023	108.410	-0.059	0.000	0.02
1.004	6	1440 minute 30 year Winter I+0%	109.000	108.410	0.135	0.000	0.00

PN	US/MH Name	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1		3.1	OK
1.001	2		3.1	OK
2.000	3		3.1	OK
1.002	3		6.0	SURCHARGED
1.003	4		0.3	OK
1.004	6		0.0	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	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.353
Region	England and Wales	Cv (Summer)	1.000
M5-60 (mm)	19.000	Cv (Winter)	1.000

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

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

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.
1.000	1	15 minute 100 year Summer I+40%	109.823	109.195	-0.028	0.000	0.86
1.001	2	15 minute 100 year Summer I+40%	109.312	109.021	0.064	0.000	0.50
2.000	3	15 minute 100 year Summer I+40%	109.626	109.095	0.069	0.000	0.65
1.002	3	15 minute 100 year Summer I+40%	109.154	108.943	0.301	0.000	1.65
1.003	4	1440 minute 100 year Winter I+40%	109.023	108.568	0.099	0.000	0.04
1.004	6	1440 minute 100 year Winter I+40%	109.000	108.569	0.294	0.000	0.00

PN	US/MH Name	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000	1		5.6	OK
1.001	2		4.9	FLOOD RISK
2.000	3		5.1	SURCHARGED
1.002	3		9.5	FLOOD RISK
1.003	4		0.5	SURCHARGED
1.004	6		0.0	SURCHARGED

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Appendix F

Yorkshire Water Sewer Records

YORKSHIRE WATER
PROTECTION OF MAINS AND SERVICES

1. The position of Yorkshire Water Services Ltd (YWS) apparatus shown on the existing mains record drawing(s) indicates the ***general*** position and nature of our apparatus and the accuracy of this information cannot be guaranteed. Any damage to YWS apparatus as a result of your works may have serious consequences and you will be held responsible for all costs incurred. Prior to commencing major works, the exact location of apparatus must be determined on site, if necessary by excavating trial holes. The actual position of such apparatus and that of service pipes which have not been indicated must be established on site by contacting the Customer Helpline on 0345 124 24 24 for both water and sewerage.

2. The public sewer and water network is lawfully retained in its existing position and the sewerage and water undertaker is entitled to have it remain so without any disturbance. The provisions of section 159 of the Water Industry Act 1991 provides that the undertaker may "inspect, maintain, adjust, repair or alter" the network. Those rights are given to enable the undertaker to perform its statutory duties. Any development of the land or any other action that unacceptably hindered the exercise of those rights would be unlawful. The provisions contained in Section 185 of the Water Industry Act 1991 state that where it is reasonable to do so, a person may require the water supply undertaker to alter or remove a pipe where it is necessary to enable that person to carry out a proposed change of use of the land. The provisions contained in Section 185 also require the person making the request to pay the full cost of carrying out the necessary works.

3. Ground levels over existing YWS apparatus are to be maintained. Sewers in highways will ***generally*** be laid to give 1200mm of cover from finished ground level working to kerb races, other permanent identification of the limits of the road or to an agreed line and level. Substantial increases or decreases to this 1200mm depth of cover will result in the sewer being re-laid at your expense. Water mains and services will ***generally*** be laid with a minimum of 750mm depth of cover however some mains and services usually those installed over 50 years ago may have less ground cover.

4. If surface levels are to be decreased / increased significantly the effects on existing water supply apparatus will be carefully considered and if any alterations are necessary, the costs of the alterations will be recharged to you in full. Outlets on fire hydrants must be no more than 300mm below the new levels and all surface boxes must be adjusted as part of the scheme.

5. To enable future repair works to be carried out without hindrance; any pipe, cable, duct, etc. installed parallel to a water main or service pipe should not be installed directly over or within 300mm of a water main or service pipe or 1000mm of a waste water asset. Where a pipe, cable, duct, etc. crosses a main or service it should preferably cross perpendicular or at an angle of no less than 45o and with a minimum clearance of 150mm. These requirements apply to activities within an existing highway and are relevant to the installation of pipes, cables, ducts, etc. up to and including 250mm in diameter *(see illustration below)*. Necessary protection measures for installations greater than 250mm in diameter and/or in private land will need to be agreed on an individual basis. Installations within a new development site must comply with the National Joint Utilities Group publication Volume 2: NJUG Guidelines On The Positioning Of Underground Utilities Apparatus For New Development Sites.

6. All excavation works near to YW apparatus should be by hand digging only.

7. Backfilling with a suitable material to a minimum 300mm above YW apparatus is required.

8. Adequate support must be provided where any works pass under YW apparatus.

9. Jointing chambers, lighting columns and other structures must be installed in such a way that future repair or maintenance works to YW apparatus will not be hindered.

10. Apparatus such as; railings, sign posts, etc. must not be placed in such a way that they prevent access to or full operation of controlling valves, hydrants or similar apparatus. YWS surface boxes must not be covered or buried. Any adjustment, alteration or replacement of manhole covers must be agreed on site prior to the commencement of the works with a YWS Inspector who may be contacted via our Call Centre on 0345 124 24 24.

11. Explosives shall not be used within 100 metres of any Yorkshire Water Services apparatus or installations.

12. Vibrating plant should not be used directly over any apparatus. Movement or operation by vehicles or heavy plant is not to be permitted in the immediate vicinity of YWS plant or apparatus unless there has been prior consultation and, if necessary, adequate protection provided without cost to YWS.

13. ***Under no circumstances*** should thrust boring or similar trenchless techniques commence until the actual position of the Company's mains/services along the proposed route have been confirmed by trial holes.

14. Any alterations to the highway should be notified following the procedures outlined in the New Road and Street Works Act 1991 Code of Practice; Measures Necessary Where Apparatus Is Affected By Major Works (Diversionary Works).

15. You will be held responsible for any damage or loss to YWS apparatus during and after completion of work, caused by yourselves, your servant or agent. Any damage caused or observed to YWS plant or apparatus should be immediately reported to YWS. Should YW incur any costs as a result of non-compliance with the above, all costs will be rechargeable in full.

16. You should ensure that nothing is done on the site to prejudice the safety or operation of YWS employees, plant or apparatus.

17. In accordance with the New Roads and Street Works Act 1991, Chapter 22, Part 3, Section 80. The location of any identified YW asset "*which is not marked, or is wrongly marked, on the records made available*" should be communicated back to Yorkshire Water. The location of the apparatus should be identified on copies of the supplied plans which should be returned to Yorkshire Water (Asset Records Team) with photographic supporting evidence where possible.

18. The Government has decided that responsibility for private sewers serving two or more properties and lateral drains (the section of pipe beyond the boundary of a single property, connecting it to the public sewer) will be transferred to the water companies on Oct 1 2011.

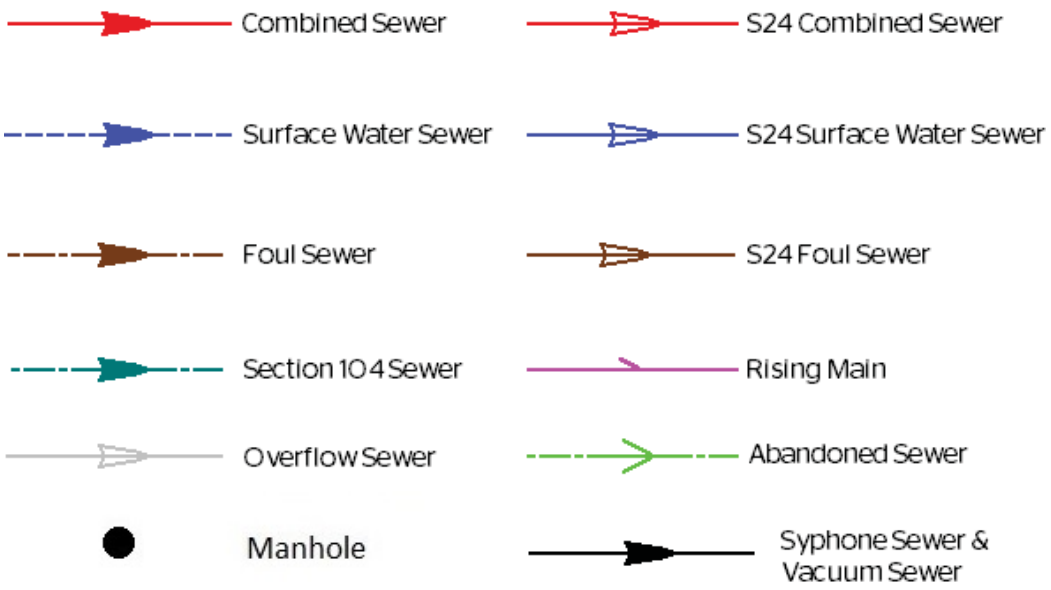
Private pumping stations will also transfer during the period 1 October 2011 – 1 Oct 2016. Records of these assets may not yet be shown on the existing mains record drawing(s). If you encounter any of these assets you must inform Yorkshire Water Services Ltd (YWS).

19. Please note that the information supplied on the enclosed plans is reproduced from Ordnance Survey material with the permission of the Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office, © Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Licence Number AC0000857457.

20. This information is for guidance only and the position and depth of any YW apparatus is approximate only. Likewise, the nature and condition of any YW apparatus cannot be guaranteed. YW has no responsibility for recording the locations of privately owned apparatus. As of 1 October 2011, there may be some lateral drains and/or public sewers which are not documented on YW records but may still be present. For the avoidance of doubt, this information is not a substitute for appropriate professional and/or legal advice. YW accepts no responsibility for any inaccuracy or omissions in this information. The actual position of YW apparatus must be determined on site by excavating trail holes by hand. YW requires a minimum of two working days' written notice of the intention to excavate any trial holes before any excavation can be undertaken. If there are any queries in this respect please contact Yorkshire Water on 0345 124 24 24.

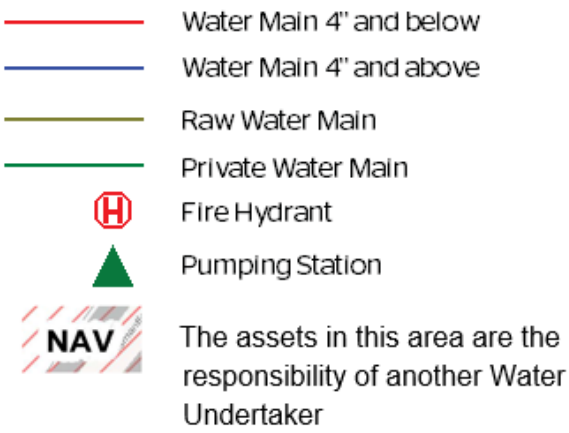
Property Identfier

Sewer Legend



Please note that the direction of flow arrows may not always appear depending on the scale of the map.

Water Legend



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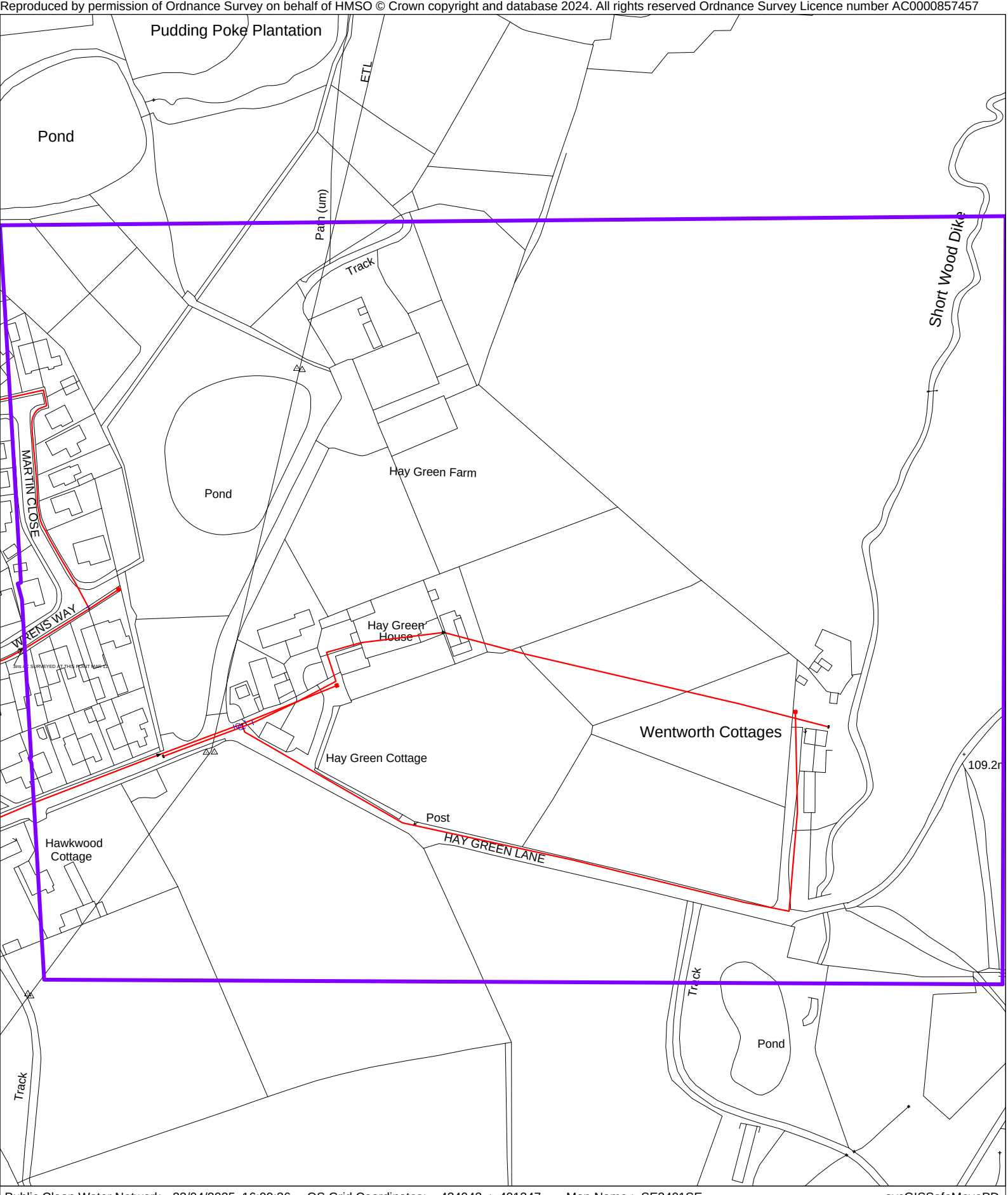

Public Clean Water Network 23/04/2025 16:09:36 OS Grid Coordinates: 434943 : 401347 Map Name : SE3401SE svcGISSafeMovePD

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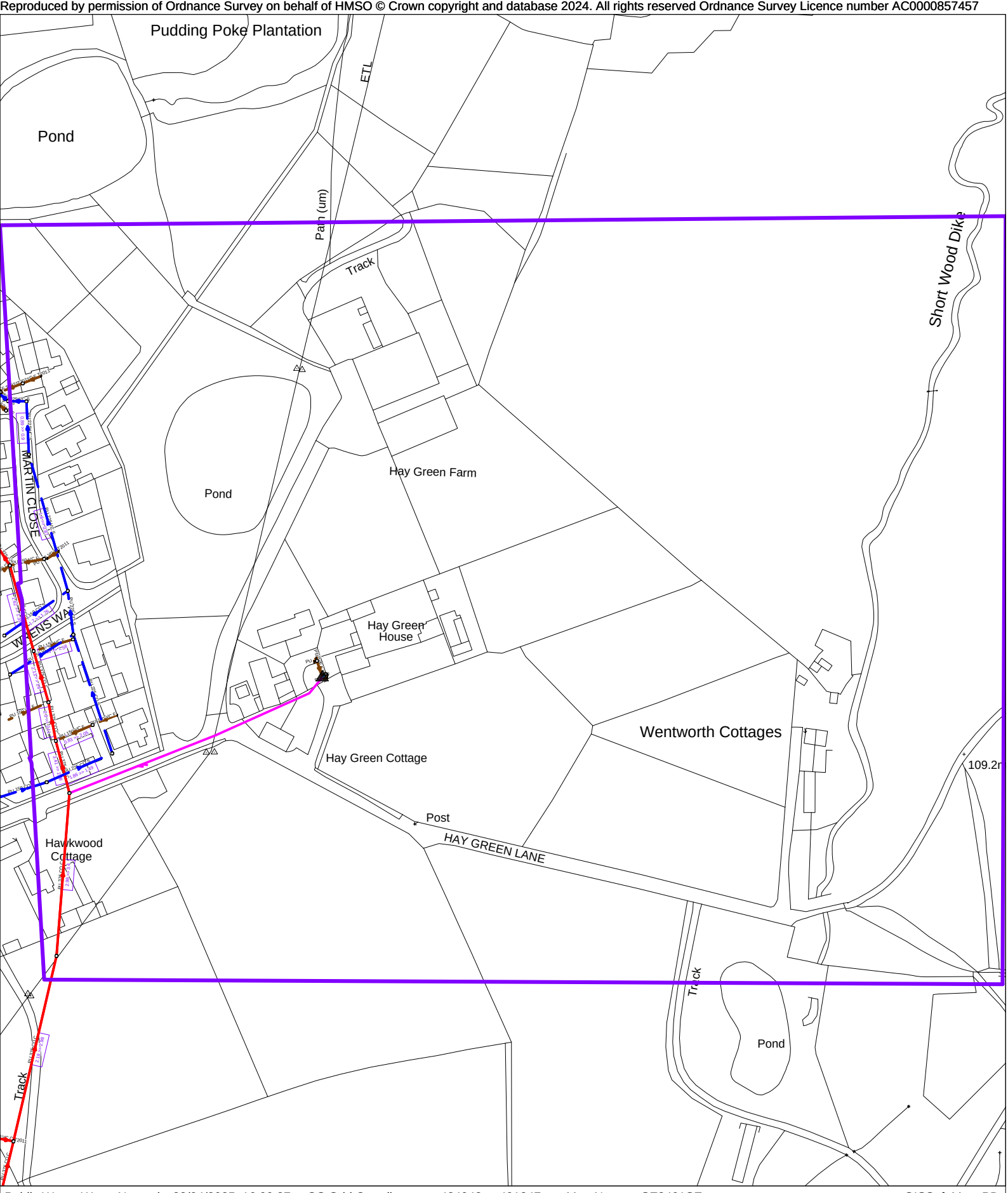

Public Waste Water Network 23/04/2025 16:09:37 OS Grid Coordinates: 434943 : 401347 Map Name : SE3401SE svcGISSafeMovePD

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