

PROPOSED DRAINAGE STRATEGY

135-VDG-00-ZZ-RP-C-5000 RevP1

THE CROFT
DENBY LANE
HUDDERSFIELD



CONTROL SHEET

Document Number		128-VDG-XX-XX-RP-C-5000			
Document Title		Proposed Drainage Strategy			
Status	Revision	Date of Issue	Author	Checked	Reviewed
First Issue	P1	29.11.2024	LP	MW	MW
Second Issue	P2	09.12.2024	LP	MW	MW
Third Issue- Updated site plan	P3	19.12.2024	LP	MW	MW

Report Limitation

All comments and proposals contained in this report are based on information available to VDG during recent investigations.

This report has been prepared for the sole use of RICHARD SUMMERS. No other third parties may rely upon or reproduce the contents of this report without the written permission of VDG

Table of Contents

1	INTRODUCTION	6
1.1	SOURCES OF DATA.....	6
2	LOCATION & DESCRIPTION.....	7
2.1	SITE LOCATION.....	7
2.2	EXISTING DEVELOPMENT.....	8
2.3	PROPOSED DEVELOPMENT.....	8
2.4	TOPOGRAPHY.....	8
2.5	CATCHMENT HYDROLOGY / DRAINAGE	8
2.6	GROUND CONDITIONS.....	9
3	DRAINAGE REQUIREMENTS.....	10
3.1	NATIONAL PLANNING POLICY FRAMEWORK GUIDANCE.....	10
3.2	STATUTORY UNDERTAKER'S REQUIREMENTS	10
3.3	USE OF SUDS	10
3.4	THE NON-STATUTORY TECHNICAL STANDARDS FOR SUDS.....	11
3.5	NORTHWEST SUDS PRO-FORMA.....	11
3.6	SITE ASSESSMENT FOR SUDS.....	13
4	PROPOSED DRAINAGE STRATEGY.....	14
4.1	EXISTING DRAINAGE.....	14
4.2	SURFACE WATER MANAGEMENT.....	15
4.3	METHODS OF SURFACE WATER MANAGERMENTS	16
4.4	ATTENUATION REQUIREMENTS.....	16
4.5	SUSTAINABLE DRAINAGE SYSTEMS	17
4.6	RESIDUAL RISK AND DESIGNING FOR EXCEEDANCE	18
4.7	MAINTENANCE.....	18
4.8	WATER QUALITY	19
4.9	MANAGEMENT AND MAINTENANCE PLAN	20
4.10	FOUL WATER DRAINAGE STRATEGY.....	25
5	SUMMARY AND CONCLUSION.....	26
5.1	RISK MANAGEMENT	26
5.2	OFFSITE IMPACTS	26
5.3	RESIDUAL RISK	26
5.4	POST PLANNING CONSENTS.....	26
5.5	DRAINAGE STRATEGY.....	26

5.6 CONCLUSION 27

APPENDICES

A-ARCHITECTURAL DRAWINGS

B-YORKSHIRE WATER DRAINAGE MAPS

C-DRAINAGE STRATEGY DRAWING AND CALCULATIONS

GLOSSORY

Term	Definition
AP	Annual Probability is the probability of a rainfall or tidal event occurring within any one year. For example, an event of a 1 in 100 year return period has an AP of 1:100 or 1%.
Flood Defences	Artificial structures maintained to a set operational level designed to protect land people and property from tidal and fluvial flood sources to an established chance of happening in any year threshold.
Flood Source: Fluvial (River)	When flows within watercourses exceed the capacity of the watercourse causing out of bank flows.
Flood Source: Groundwater	Groundwater flooding is usually the result of prolonged wet weather causing groundwater levels to rise sufficiently to either emerge at surface or to cause flooding of below ground infrastructure, such as basements.
Flood Source: Surface Water	When rainfall causes overland flows which exceed the capacity of the drainage network, causing flooding to land that is normally dry.
Flood Source: Tidal	When high tide events overtop the shoreline to cause flooding to land behind.
Flood Zone 1	Low Probability. Land having a less than 0.1% annual probability of river or sea flooding
Flood Zone 2	Medium Probability. Land having between a 1.0% and 0.1% annual probability of river flooding; or land having between a 0.5% and 0.1% annual probability of sea flooding.
Flood Zone 3 (A)	High Probability. Land having a 1.0% or greater annual probability of river flooding; or Land having a 0.5% or greater annual probability of sea.
Flood Zone 3 (B)	Functional Floodplain. According to the Planning Practice Guidance (2022) this zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: <ul style="list-style-type: none"> land having a 3.3% or greater annual probability of flooding, with any existing floodrisk management infrastructure operating effectively; or land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding).
Flood Zone Map	The Environment Agency has produced a mapping data set which covers England and provides the general extents of Flood Zones 1, 2, and 3. However the national data set available online does not differentiate between Flood Zone 3 (A) and 3 (B).

Freeboard	In flood risk management Freeboard is a term used to identify the vertical difference between the design flood level, and the design height of any flood mitigation measures. For instance, if a pond had bank heights of 9.0m and the water level was at 8.6m the freeboard would be 0.4m (9.0-8.6). For river flooding, a freeboard of 0.3m is usually applied, for tidal 0.6m, and for surface water 0.15m.
LiDAR	Light Detection and Ranging (LIDAR) is an airborne mapping technique, which uses a laser to measure the distance between the aircraft and the ground. Up to 500,000 measurements per second are made of the ground, allowing highly detailed terrain models to be generated at spatial resolutions of between 25cm and 2 metres.
FWEP	Flood Warning and Emergency Plan. This is a document that should set out the steps that shall be taken by those on site, to arrive at a point safe from flood risk.
Term	Definition
Non-Major Development	'Non major development' is any development falling below the above thresholds but excluding minor development. For example, a planning application for 8 dwellings an office building creating 750 square metres of floor space, or a development with a site area of 0.4 hectares.
Major Development	<p>Means development involving any one or more of the following:</p> <ul style="list-style-type: none"> a) the winning and working of minerals or the use of land for mineral-working deposits b) waste development c) the provision of dwellinghouses where – <ul style="list-style-type: none"> i. the number of dwellinghouses to be provided is 10 or more; or ii. the development is to be carried out on a site having an area of 0.5 hectares or more and it is not known whether the development falls within sub- paragraph (c) (i) d) the provision of a building or buildings where the floor space to be created by the development is 1,000 square metres or more; or e) development carried out on a site having an area of 1 hectare or more. <p>As defined by the Town and Country Planning (Development Management Procedure) (England) Order 2015 (Article 2)</p> <p>https://www.legislation.gov.uk/uksi/2015/595/article/2/made</p>
Main River	Defined on the Main River map and relate to rivers where the Environment Agency has the powers to carry out flood defence works.

Minor Development	<p>Minor development means:</p> <ul style="list-style-type: none"> • minor non-residential extensions (industrial/commercial/leisure etc): extensions with a floorspace not more than 250 square metres. • alterations: development that does not increase the size of buildings, e.g. alterations to external appearance. • householder development: for example, sheds, garages, games rooms etc. within the curtilage of the existing dwelling, in addition to physical extensions to the existing dwelling itself. This definition excludes any proposed development that would create a separate dwelling within the curtilage of the existing dwelling (e.g. subdivision of houses into flats) or any other development with a purpose not incidental to the enjoyment of the dwelling. <p>Paragraph: 051 Reference ID: 7-051-20220825 Revision date: 25 08 2022 https://www.gov.uk/guidance/flood-risk-and-coastal-change</p>
m AOD	Metres Above Ordnance Datum
OS	Ordnance Survey
Ordinary Watercourse	A watercourse which does not form part of a Main River. Works on Ordinary Watercourses usually require consent from either the Lead Local Flood Authority or the Internal Drainage Board.
QBAR	QBAR is the mean annual maximum flow rate, for a catchment which has an equivalent return period of 1 in 2.3 years
Return Period	The return period of a flood might be 100 years; otherwise expressed as its probability of occurring being 1 in 100, or 1% in any one year. If a flood with such a return period occurs, then this does not mean the next will occur in about one hundred years' time - instead, it means that, in any given year, there is a 1% chance that it will happen, regardless of when the last similar event was. Or, put differently, it is 10 times less likely to occur than a flood with a return period of 10 years (or a probability of 10%).
SuDS	Sustainable Drainage Systems, which are designed to manage surface water flows and mimic the Greenfield runoff from an undeveloped site.
Urban Creep	Urban creep is the conversion of permeable surfaces to impermeable over time e.g. surfacing of front gardens to provide additional parking spaces, extensions to existing buildings, creation of large patio areas.

1 INTRODUCTION

This report has been prepared by VDG Limited on behalf of Richard Summers to support a full planning application for 2 detached houses with associated gardens and driveways with an access Road.

This Sustainable Drainage Statement sets out the principles of the drainage design for the proposed development and summarises the reasoning behind the chosen design. This includes justification of specific flow rates, volumes of attenuation and the level of treatment provided to run-off.

1.1 Sources of Data

In accordance with the PPS25 practice guide, the report is based on the following information:

- Site Layout Plan.
- Architectural floor plans.
- OS Explorer Series mapping.
- Site visit undertaken by VDG.
- British Geological Survey Drift & Geology Maps.
- Topographic survey within Architect drawing.
- Yorkshire water Drainage maps.

2 LOCATION & DESCRIPTION

2.1 Site Location

The site is situated along Denby lane, Upper Denby, Huddersfield HD8 8UN.



Figure 1-Site Location

2.2 Existing Development

The site holds an existing dwelling with a current driveway up to the existing property. The externals are overgrown. The plot is a rectangular shape measuring approximately 55 by 41 meters and covering around 0.229 hectares. The terrain is relatively flat.

A site summary and summary of the local agencies is found in the below table:

Site Name	The Croft
Location	Huddersfield HD8 8UN.
Application Site Area	0.229 ha
Development	Residential
Lead Local Flood Authority	Kirklees Council
Local Planning Authority	Kirklees Council
Water Authority	Yorkshire water

2.3 Proposed Development

The Client plans to construct two detached houses with associated gardens and driveways with an access Road following demolition of the existing house. The proposed residential development can be found in Appendix A.

2.4 Topography

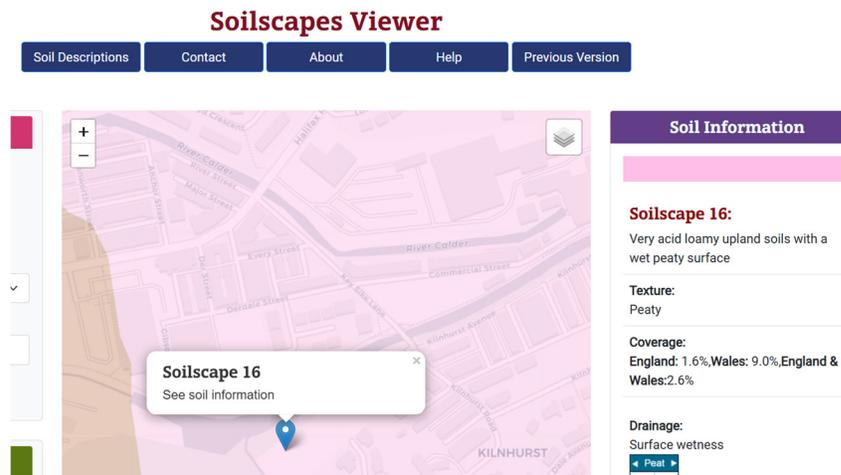
The site is currently relatively flat, with the access road level is 248.8AOD and around the existing house is 249.0AOD. The externals have overgrown vegetation, the site currently has a driveway to an existing house and garage.

2.5 Catchment Hydrology / Drainage

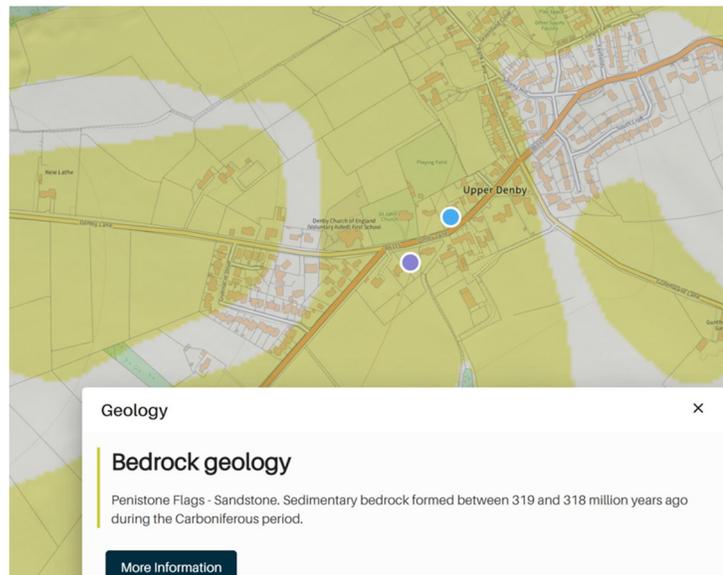
In appendix B the Yorkshire Water plans indicates a combined sewer running along Denby Lane. An internal manhole, located beside the existing house, collects both rainwater and foul drainage, flowing south towards the public sewer. The contractor must determine the precise location where this sewer crosses the site boundary to establish a new connection point to the public sewer. The existing dwelling, which currently benefits from positive drainage, will be demolished to make way for the construction of two new houses.

2.6 Ground Conditions

Soil Scapes show slowly permeable seasonally wet acid loamy and clayey soils. The drainage shows impeded drainage.



The BGS Maps show the bedrock geology to be Penistone flags- sandstone.



Currently no site investigation has been undertaken.

3 DRAINAGE REQUIREMENTS

3.1 National Planning Policy Framework Guidance

National Planning Policy Framework Guidance states 'Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable:

1. into the ground (infiltration);
2. to a surface water body;
3. to a surface water sewer;
4. to another drainage system;
5. to a combined sewer.

Particular types of sustainable drainage systems may not be practicable in all locations.

3.2 Statutory undertaker's requirements

The statutory undertaker for the area is United Utilities, who state the following:

- Only foul sewerage will be permitted to be discharged into the public foul sewer.
- A connection agreement will be required prior to installation of the private drainage network and connection into a sewerage network.
- Surface water from new developments should not, unless there is no other option be connected to the public combined sewerage system.
- All options for SuDS must be explored prior to any application to connect to a public sewerage system.
- SuDS have the potential to be adopted.

There is no legal duty to accept highway drainage from new developments into the public sewerage system. However, in some cases highway drainage will be considered as part of the overall attenuated surface water drainage strategy.

3.3 Use of SuDS

The SuDS philosophy for any development site is the promotion of prevention and source control techniques.

It would therefore be beneficial to implement wider green space/Public Open Space area(s) in one or more locations within site, where SuDS features could be implemented. Opportunities should also be taken to provide soft landscaping where at all possible on site to assist in minimising surface water run-off.

Promoting SuDS to deal with surface water at the source, will limit the required attenuation and in turn reduce the volume of surface water in the nearby watercourse. There may be the potential

to utilise some SuDS features for conveyance/attenuation of surface water flows within the proposed drainage strategy measures including a pond/basin will be included to assist with the attenuation, opposed to the traditional below ground storage methods. Detailed design should confirm whether this site would be suitable for incorporation of SuDS following more detailed analysis of levels, ground conditions and attenuation requirements.

3.4 The Non-Statutory Technical Standards for SuDS

It is best practice to develop drainage strategies to the DEFRA document 'The Non-Statutory Technical Standards for SuDS'.

The DEFRA document advises the following with respect to 'Peak Flow Control' and 'Volume Control':

S3 For developments which were previously developed, the peak runoff rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event must be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment for that event.

- **S5** Where reasonably practicable, for developments which have been previously developed, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event, but should never exceed the runoff volume for the development site prior to redevelopment for that event.

3.5 North West SuDS Pro-Forma

The North West SuDS Pro-forma, endorsed and recommended for use by North West Regional Flood and Coastal Committee and United Utilities has been reviewed. This document states that the capacity of SuDS must provide effective drainage for the development taking account of the likely impacts of climate change.

The lifetime expectancy of the development is 100 years. Table 2 of 'Flood risk assessments: climate change allowances' indicates the following recommendations for climate change allowance:

Maximum lifetime of the development	Climate change allowance to be applied
2050s (2040 – 2069)	40%

2070s (2070-2115)	40%
Don & Rother Management Catchment 1% annual exceedance event to prevent flooding offsite and to manage surface water flooding	

3.6 Site assessment for SuDS

Current policy and best practice encourage the use of SuDS and in particular, infiltration systems. SuDS techniques are not suitable for all sites; therefore, an assessment of the site is required so that SuDS limitations can be determined. Green SuDS are particularly favoured by Local Authorities.

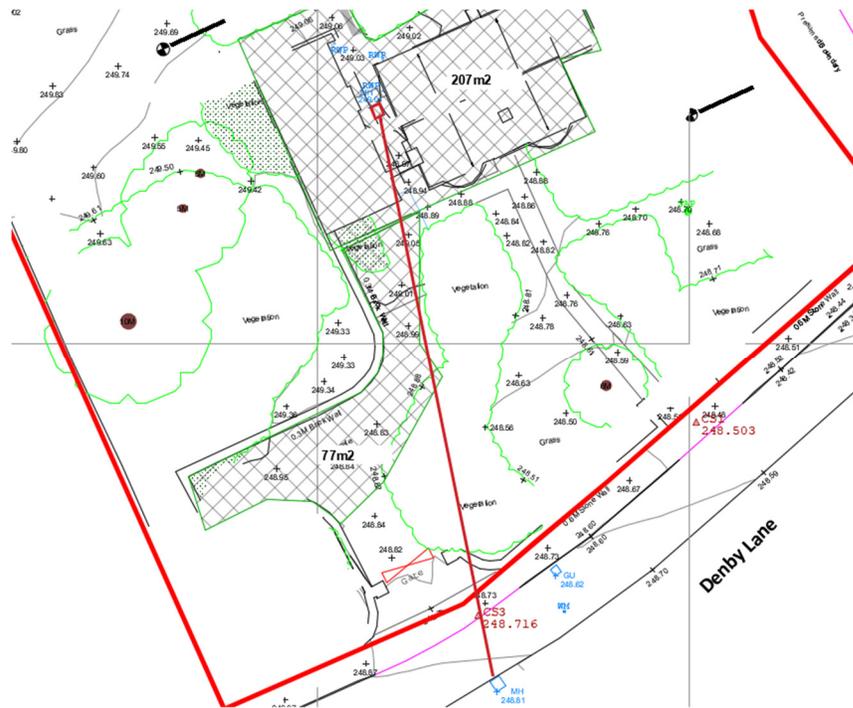
Consideration of SuDS within the constraints of a dense urban environment	
Element	Viability
Green roofs rather than standard roof construction.	Within the scope of the scheme, the use of green roofs is deemed not suitable due to the architectural design of the roofs and to reduce the overall construction costs.
Runoff harvesting in tanks for non-potable use.	External water butts have been provided for garden use.
Landscape irrigation and urban horticulture.	NA
Use of permeable surfaces and/or sub-bases.	Permeable driveway to be used. Subject to SI and contamination. Permeable paving to be lined or perforated pipes within subbase to discharge any perched water due to impermeable ground.
Use of bioretention systems, open water amenity features and tree pits.	No space on site to provide.
Soakaway options to enable the runoff to infiltrate to the underlying sub strata	A localised direct discharge point for a soakaway is not feasible due to the on-site ground conditions. Soilscape maps indicate underlying clay strata with poor drainage capacity, making this option unsuitable.
Flow control devices and attenuation measures included to store water and/or provide treatment in confined spaces.	An option is to provide a flow control and attenuation tank which outfalls to the combined sewer which discharges into at a restricted run off rate 2.5l/s. Flows will also be further limited by using water butts.

4 PROPOSED DRAINAGE STRATEGY

4.1 Existing Drainage

The existing surface water and foul drainage for the existing house discharges to the combined Yorkshire Water sewer in Denby Lane. The Yorkshire water sewer location is shown on the Yorkshire sewer maps within Appendix B.

Invert levels and feed into site to be established by contractor to confirm and finalised hydraulic design.



Existing Sewers on site

4.2 Surface Water Management

The existing hardstanding site area (0.0284ha) has been modelled to derive the run-off rates from the existing site.

The results are as follows.

- 5.1 l/s for the 1 in 1 year event;
- 12.4 l/s for the 1 in 30 year event; and
- 18.5 l/s for the 1 in 100 year event.

The proposed flow rates will be restricted to 50% of the pre-development flow rates with a climate change allowance of 40% for the proposed 100 year event.

Therefore, in accordance with the SFRA, the proposed flow rates are as follows

- 2.5 l/s.

Given that the above flow rate is negligible, we propose to restrict all storm events to the 1 in 100 year plus climate change rate of 2.5 l/s, using a flow control hydrobrake.

The flow rates currently modelled are less than the maximum recommended and therefore comply with both the SFRA and Yorkshire water guidance.

4.3 Methods of Surface Water Managements

There are four methods that have been reviewed for the management and discharge of surface water which are detailed below; these may be applied individually or collectively to form a complete strategy. They should be applied in the order of priority as listed;

- Infiltration via soakaways
- Watercourse
- Surface Water Sewer
- Combined Water Sewer

The site's ground conditions, as identified by Soilsclapes, consist of very acidic clayey loamy soils with poor drainage. Due to the cohesive nature of the upper strata, infiltration is unlikely to be a viable drainage solution for the entire development. However, surface infiltration has been incorporated for driveways and paths, with any perched water collected via perforated pipes and discharged into the overarching drainage system.

There are no watercourses or surface water sewers in close proximity to the site.

The drainage strategy prioritises limiting the surface water discharge rate from the site by incorporating an on-site storage solution. This includes a below-ground attenuation tank and a flow control mechanism to restrict the discharge to 2.5 l/s into the combined sewer on Denby Lane. This represents a reduction of over 100% compared to the existing discharge from the current house.

To address SUDS constraints, the design integrates above-ground SUDS features such as water butts.

Further details can be found in the drainage strategy drawing included in Appendix C.

4.4 Attenuation Requirements

The restricted discharge rates outlined above, combined with runoff generated from proposed impermeable roof and hardstanding areas, necessitate adequate storage to manage intense rainfall events.

The primary attenuation solution for the site is a cellular storage tank. An infra-drainage model has been developed for the entire site to ensure accurate sizing of below-ground pipework and attenuation volumes.

To further enhance on-site storage capacity, raised planters have been incorporated to help restrict runoff while also promoting biodiversity. Additionally, water butts have been installed at the rear of the properties to store water for garden use.

Detailed infra-drainage calculations are provided in Appendix C.

4.5 Sustainable Drainage Systems

As discussed earlier in this document, infiltration-based drainage is considered unsuitable due to the nature of the ground conditions.

It is therefore proposed that non-infiltration-based SUDS solutions alongside traditional drainage measures will be employed across the site, these include:

- Pervious paving (Based on type C or perforated pipes below)
- Restricted run off.
- Water Butts
- Silt traps & Catchpits.
- Attenuation tank

4.6 Residual Risk and Designing for Exceedance

In the event that the capacity of the attenuation is exceeded, flood water will be retained on site. The Infradrainage Model highlights for the 100 year event + 40% allowance for climate change that no exceedance occurs and all storage is within the network.

Beyond this storm event exceedance will be safely directed away from buildings and allowed to leave the site where it will follow natural flow paths. All FFL will be 150mm above external levels.

4.7 Maintenance

Requirements for ongoing maintenance of the drainage network will form part of the Operation and Maintenance manual for the site and will be undertaken by the building management. Any specialist or proprietary products that are specified at detailed design will have a manufacturer specific maintenance regime which will be included within the document.

All drainage features should be located in open areas which are accessible. All surface water arrangements outlined above are subject to detailed design.

4.8 Water Quality

In line with CIRIA Suds Manual C753, the following areas have been assigned pollution hazard levels:

Land Use	Pollution Hazard Level	Total Suspended Solids	Metals	Hydrocarbons
Residential Roof	Low	0.3	0.2	0.05
Individual property driveways	Low	0.5	0.4	0.4
Low traffic road	Low	0.5	0.4	0.4

Pollution Hazard indices for different land use classification

We have classified the site to be low risk for a residential development.

With the use of the following SUDS features, we can achieve the below mitigation indices:

Land Use	Total Suspended Solids	Metals	Hydrocarbons
Bioretention system	0.8	0.8	0.8
Permeable paving	0.7	0.6	0.7
FP Mccann Storm clenser	0.5	0.4	0.8

Indicative Suds Mitigation Indices for discharges to groundwater

Catchment Pit manholes will be used to all surface water manholes.

4.9 Management and Maintenance Plan

Based on Chapter 32 on the CIRIA report C753 The SuDS Manual and manufacturer recommendations a maintenance strategy has been outlined below.

The responsibility for maintenance will reside with the owner of the site until a facilities management company has been duly appointed which the cost will be shared between the house holders.

The development owner and planning applicants contact is stated below:

Richard and Kathryn Summers

Redacted

THE CROFT

System	Maintenance Type	Action	Frequency	
General Drainage Systems: -Surface water drainage -Surface water Manhole -Gully -Channel train -Sprinkler tank drain down position -Rain water pipe connection	Routine Maintenance	Remove debris from catchment surface – any debris entering system may cause risks to performance.	Monthly or as required by inspection.	
		Inspect sediment and silt accumulation rates.	Six monthly.	
		Clearing catchpits.	Annually or as required by inspection.	
			Clearing of drainage channels, gullies and their outlets.	Annually or as required by inspection.
	Remedial Actions	Repair pipework and manholes.	As required from inspection.	
	Monitoring	CCTV survey of drainage system in full.	As required by inspection	

Maintenance Frequency:General Drainage System

System	Maintenance Type	Action	Frequency
Pervious Paving	Occasional maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	As required
		Stabilise and mow contributing and adjacent areas	As required
		Removal of weeds or management using glyphosate applied directly	As required
		Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
		Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
		Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)

Maintenance frequency: Pervious Paving

System	Maintenance Type	Action	Frequency
Attenuation Tank	Routine maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial actions.	Monthly for 3 months then annually.
		Remove debris from the catchment surface	Monthly
		Removal of Litter and Debris. Inspect chambers provided each end of tank for sediment, silt, oil and grease levels.	Six monthly and after every major storm event.
		Access pipe for catchpit.	As required based on inspection or following significant spill.
	Monitoring	Inspect for evidence of poor operation.	Six monthly and after every major storm event.
		Inspect sediment and silt accumulation rates and establish appropriate replacement frequencies based on usage and observations.	Monthly during initial use until a robust replacement regime can be established.

Maintenance frequency: Cellular storage tank

4.10 FOUL WATER DRAINAGE STRATEGY

It is proposed to install a new foul drainage system to serve the proposed development.

The foul water system will be designed and constructed in accordance with the current Building Regulations, BS EN:752 'Drainage and Sewer Systems Outside Buildings', the Local Authority Building Control specifications and requirements, Sewerage Sector Guidance (Appendix C) and the Civil Engineering Specification for the Water Industry.

The new foul drainage system from the houses is to discharge into the public foul sewer on site which connects into the main sewer on Eldon Street.

The following appliances has been taken into account:

APPLIANCE PER SITE	Total of 9 Houses
TOILET	5+7
SINK	12
KITCHEN SINK	4
DISHWASHER	4
WASHING MACHINE	4
BATH	4
SHOWER	4+5
FLOOR GULLY	4

APPLIANCE	DU [l/s]	Qty
Wash basin	0.30	12
Bidet	0.30	
Shower without plug	0.40	9
Shower with plug	1.30	
Single urinal with cistern	0.40	
Urinal with flushing valve	N.D.	
Slab urinal (per person)	0.20	
Bath	1.30	4
Kitchen sink	1.30	4
Dishwasher (household)	0.20	4
Washing machine (< 6 kg)	0.60	
Washing machine (< 12 kg)	1.20	4
WC with 4.0 l cistern	N/A	
WC with 6.0 l cistern	1.70	
WC with 7.5 l cistern	1.80	
WC with 9.0 l cistern	2.00	12
Floor gully DN 50	N.D.	
Floor gully DN 70	N.D.	
Floor gully DN 100	N.D.	4
Total ΣDU [l/s] =	47.20	
Flow rate per STACK 'Q_{ww}' [l/s] =	3.44	

The peak design flow discharge rate for proposed apartments is 3.44 l/s.

The proposed foul network is presented on the drainage general arrangement drawings located in Appendix C.

5 SUMMARY AND CONCLUSION

5.1 Risk Management

The proposed surface water system will be designed to incorporate SuDS principles and techniques to limit or prevent an increase in surface water discharge from the site.

For 'more vulnerable' development located within Flood Zone 1. It is typical to set the Finished Floor Levels (FFL) of residential dwellings to a minimum of 150mm above the existing ground levels.

5.2 Offsite Impacts

The new development does not impair the hydraulic continuity of any watercourse and the current "local hydraulics" of distributing watercourses / outfalls. The Development footprint does not cross or cover any existing or declared future catchment flood defences. Consequently, the applicant does not propose to augment or compromise the current catchment defences.

Surface water runoff will mimic the predevelopment regime and utilises Suds solutions to satisfy the site constraints.

5.3 Residual Risk

With careful design of the drainage elements as described above there will be no residual flood related risks that will remain after the development has been completed.

Flood risk to people and property can be managed but it can never be completely removed; a residual risk remains after flood management or mitigation measures have been put in place.

5.4 Post Planning Consents

Following Planning Consent, several Post Planning Consents may be required, which are likely to be informed by the findings of this document.

Sewer Connection

Any new sewer connection to the public sewer should be agreed with Yorkshire water prior to starting work on site.

5.5 Drainage Strategy

To ensure the proposals do not increase flood risk to others, a principle focus of this assessment is on the appropriate management of surface water run-off in accordance with national and local planning policy.

Surface water run-off management options have been assessed in accordance with the sustainable drainage hierarchy.

The surface water run-off generated by the proposed development is therefore proposed to mimic the existing situation and discharge surface water generated to the combined sewer.

The proposals are to restrict surface water run-off to mimic a pre-development greenfield situation.

5.6 Conclusion

1. This statement and supporting appendices demonstrate that the drainage design for the development will meet the discharge requirements of the LLFA.
2. Infiltration systems and storage has been provided where practical. On receipt of phase 2 SI this can be reviewed further.
3. The site will connect foul sewerage to the existing Yorkshire water drain. A section 106 application will need to be undertaken.
4. A pre-development enquiry has been sent to Yorkshire Water and we await on their response.

APPENDIX A – Architectural Drawings

© The copyright in this drawing is vested in CodaStudios and no license or assignment of any kind has been, or is, granted to any third party whether by provision of copies or originals or otherwise unless agreed in writing.

DO NOT SCALE FROM THIS DRAWING

The contractor shall check and verify all dimensions on site and report any discrepancies in writing to CodaStudios before proceeding work

FOR ELECTRONIC DATA ISSUE

Electronic Data / drawings are issued as "read only" and should not be interrogated for measurement. All dimensions and levels should read, only from those values stated on the drawing. Coda Studios Ltd is not responsible for discrepancies caused by the overlay of other parties BIM/IFC models. These are overlaid purely as reference.

Revision	Date	Drawn	Checked
----------	------	-------	---------



Location Plan

Scale: 1 : 1250



CODA Studios Ltd. Sellers Wheel, 151 Arundel St, Sheffield, S1 2NU.
T: 0114 279 6003 E: information@codastudios.co.uk

Client
Richard Summers

Project
The Croft

Drawn	Checked	Date	Scale @ A3
RB	DB	12/01/2024	1 : 1250

Title
Location Plan

Suitability Code Purpose for issue
PROPOSAL

Drawing No
3245 - CDA - 00 - XX - DR - A - 0400

Project Originator: Volume: Level: Type: Role: Number: Revision:

© The copyright in this drawing is vested in CodaStudios and no license or assignment of any kind has been, or is, granted to any third party whether by provision of copies or originals or otherwise unless agreed in writing.

DO NOT SCALE FROM THIS DRAWING

The contractor shall check and verify all dimensions on site and report any discrepancies in writing to CodaStudios before proceeding work

FOR ELECTRONIC DATA ISSUE

Electronic Data / drawings are issued as "read only" and should not be interrogated for measurement. All dimensions and levels should read, only from those values stated on the drawing. Coda Studios Ltd is not responsible for discrepancies caused by the overlay of other parties BIM/IFC models. These are overlaid purely as reference.

Revision	Date	Drawn	Checked
----------	------	-------	---------



Proposed Site Plan

Scale: 1 : 500



CODA Studios Ltd. Sellers Wheel, 151 Arundel St, Sheffield, S1 2NU.
T: 0114 279 6003 E: information@codastudios.co.uk

Client
Richard Summers

Project
The Croft

Drawn	Checked	Date	Scale @ A3
RB	DB	12/01/2024	1 : 500

Title
Proposed Site Plan

Suitability Code Purpose for issue
PROPOSAL

Drawing No
3245 - CDA - 00 - ZZ - DR - A - 0401

Project Originator: Volume: Level: Type: Role: Number: Revision:

© The copyright in this drawing is vested in CodaStudios and no license or assignment of any kind has been, or is, granted to any third party whether by provision of copies or originals or otherwise unless agreed in writing.

DO NOT SCALE FROM THIS DRAWING

The contractor shall check and verify all dimensions on site and report any discrepancies in writing to CodaStudios before proceeding work

FOR ELECTRONIC DATA ISSUE

Electronic Data / drawings are issued as "read only" and should not be interrogated for measurement. All dimensions and levels should read, only from those values stated on the drawing. Coda Studios Ltd is not responsible for discrepancies caused by the overlay of other parties BIM/IFC models. These are overlaid purely as reference.

Revision	Date	Drawn	Checked
----------	------	-------	---------



Street Scene

Scale: 1 : 200

Graphical Scale 1:200



Site Plan

Scale: 1 : 1250

Graphical Scale 1:1250



**CODA
Bespoke**



CODA Studios Ltd. Sellers Wheel, 151 Arundel St, Sheffield, S1 2NU.
T: 0114 279 6003 E: information@codastudios.co.uk

Client
Richard Summers

Project
The Croft

Drawn	Checked	Date	Scale @ A3
CT	DB	05/11/24	As indicated

Title
Street Scene

Suitability Code Purpose for issue
PROPOSAL

Drawing No
3245 - CDA - 00 - XX - DR - A - 0402

Project Originator: Volume: Level: Type: Role: Number: Revision:

© The copyright in this drawing is vested in CodaStudios and no license or assignment of any kind has been, or is, granted to any third party whether by provision of copies or originals or otherwise unless agreed in writing.

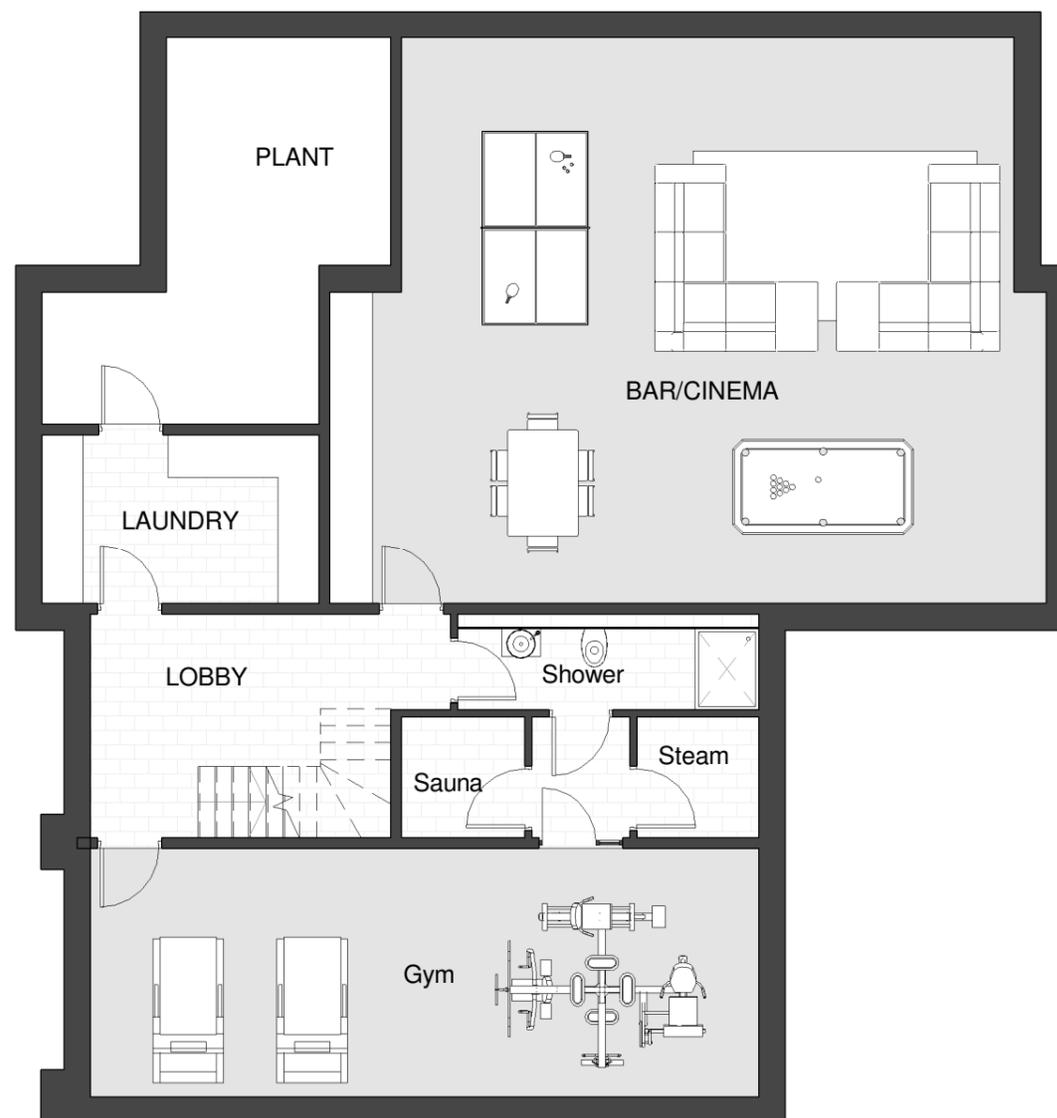
DO NOT SCALE FROM THIS DRAWING

The contractor shall check and verify all dimensions on site and report any discrepancies in writing to CodaStudios before proceeding work

FOR ELECTRONIC DATA ISSUE

Electronic Data / drawings are issued as "read only" and should not be interrogated for measurement. All dimensions and levels should read, only from those values stated on the drawing. Coda Studios Ltd is not responsible for discrepancies caused by the overlay of other parties BIM/IFC models. These are overlaid purely as reference.

Revision	Date	Drawn	Checked
----------	------	-------	---------



Basement

Scale: 1 : 100



CODA Studios Ltd. Sellers Wheel, 151 Arundel St, Sheffield, S1 2NU.
T: 0114 279 6003 E: information@codastudios.co.uk

Client
Richard Summers

Project
The Croft

Drawn	Checked	Date	Scale @ A3
RB	DB	21/11/2023	1 : 100

Title
HT1 - Proposed Plans Sheet 1 of 2

Suitability Code Purpose for issue
PROPOSAL

Drawing No
3245 - CDA - 00 - XX - DR - A - 0403

Project Originator: Volume: Level: Type: Role: Number: Revision:

© The copyright in this drawing is vested in CodaStudios and no license or assignment of any kind has been, or is, granted to any third party whether by provision of copies or originals or otherwise unless agreed in writing.

DO NOT SCALE FROM THIS DRAWING

The contractor shall check and verify all dimensions on site and report any discrepancies in writing to CodaStudios before proceeding work

FOR ELECTRONIC DATA ISSUE

Electronic Data / drawings are issued as "read only" and should not be interrogated for measurement. All dimensions and levels should read, only from those values stated on the drawing. Coda Studios Ltd is not responsible for discrepancies caused by the overlay of other parties BIM/IFC models. These are overlaid purely as reference.

Revision	Date	Drawn	Checked
----------	------	-------	---------



CODA Studios Ltd. Sellers Wheel, 151 Arundel St, Sheffield, S1 2NU.
T: 0114 279 6003 E: information@codastudios.co.uk

Client
Richard Summers

Project
The Croft

Drawn	Checked	Date	Scale @ A3
RB	DB	11/02/23	1 : 100

Title
HT1 - Proposed Plans Sheet 2 of 2

Suitability Code Purpose for issue

Drawing No
3245 - CDA - 00 - ZZ - DR - A - 0404

Project Originator: Volume: Level: Type: Role: Number: Revision:



Ground Floor Plan
Scale: 1 : 100



First Floor Plan
Scale: 1 : 100



© The copyright in this drawing is vested in CodaStudios and no license or assignment of any kind has been, or is, granted to any third party whether by provision of copies or originals or otherwise unless agreed in writing.

DO NOT SCALE FROM THIS DRAWING

The contractor shall check and verify all dimensions on site and report any discrepancies in writing to CodaStudios before proceeding work

FOR ELECTRONIC DATA ISSUE

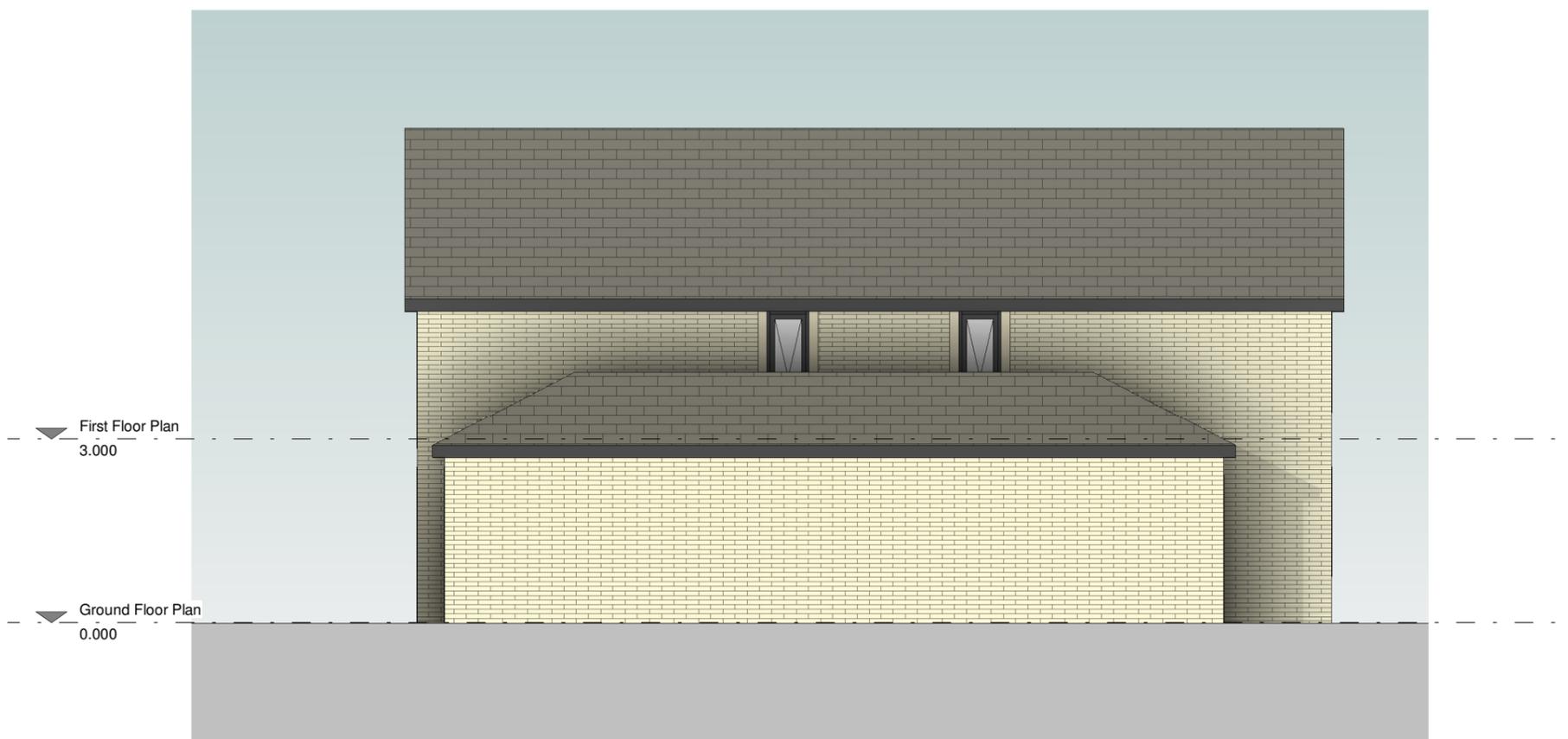
Electronic Data / drawings are issued as "read only" and should not be interrogated for measurement. All dimensions and levels should read, only from those values stated on the drawing. Coda Studios Ltd is not responsible for discrepancies caused by the overlay of other parties BIM/IFC models. These are overlaid purely as reference.

Revision	Date	Drawn	Checked
----------	------	-------	---------



North Elevation

Scale: 1 : 100



South Elevation

Scale: 1 : 100

Graphical Scale 1:100



CODA Studios Ltd. Sellers Wheel, 151 Arundel St, Sheffield, S1 2NU.
T: 0114 279 6003 E: information@codastudios.co.uk

Client
Richard Summers

Project
The Croft

Drawn	Checked	Date	Scale @ A3
RB	DB	21/11/2023	1 : 100

Title
HT1 - Proposed Elevations Sheet 1 of 2

Suitability Code Purpose for issue
PROPOSAL

Drawing No
3245 - CDA - 00 - ZZ - DR - A - 0405

Project Originator: Volume: Level: Type: Role: Number: Revision:

© The copyright in this drawing is vested in CodaStudios and no license or assignment of any kind has been, or is, granted to any third party whether by provision of copies or originals or otherwise unless agreed in writing.

DO NOT SCALE FROM THIS DRAWING

The contractor shall check and verify all dimensions on site and report any discrepancies in writing to CodaStudios before proceeding work

FOR ELECTRONIC DATA ISSUE

Electronic Data / drawings are issued as "read only" and should not be interrogated for measurement. All dimensions and levels should read, only from those values stated on the drawing. Coda Studios Ltd is not responsible for discrepancies caused by the overlay of other parties BIM/IFC models. These are overlaid purely as reference.

Revision	Date	Drawn	Checked
----------	------	-------	---------



East Elevation

Scale: 1 : 100



West Elevation

Scale: 1 : 100

Graphical Scale 1:100



CODA Studios Ltd. Sellers Wheel, 151 Arundel St, Sheffield, S1 2NU.
T: 0114 279 6003 E: information@codastudios.co.uk

Client
Richard Summers

Project
The Croft

Drawn	Checked	Date	Scale @ A3
RB	DB	21/11/2023	1 : 100

Title
HT1 - Proposed Elevations Sheet 2 of 2

Suitability Code Purpose for issue
PROPOSAL

Drawing No
3245 - CDA - 00 - ZZ - DR - A - 0406

Project Originator: Volume: Level: Type: Role: Number: Revision:

© The copyright in this drawing is vested in CodaStudios and no license or assignment of any kind has been, or is, granted to any third party whether by provision of copies or originals or otherwise unless agreed in writing.

DO NOT SCALE FROM THIS DRAWING

The contractor shall check and verify all dimensions on site and report any discrepancies in writing to CodaStudios before proceeding work

FOR ELECTRONIC DATA ISSUE

Electronic Data / drawings are issued as "read only" and should not be interrogated for measurement. All dimensions and levels should read, only from those values stated on the drawing. Coda Studios Ltd is not responsible for discrepancies caused by the overlay of other parties BIM/IFC models. These are overlaid purely as reference.

Revision	Date	Drawn	Checked
----------	------	-------	---------



Basement
Scale: 1 : 100

Graphical Scale 1:100



CODA Studios Ltd. Sellers Wheel, 151 Arundel St, Sheffield, S1 2NU.
T: 0114 279 6003 E: information@codastudios.co.uk

Client
Richard Summers

Project
The Croft

Drawn	Checked	Date	Scale @ A3
RB	DB	12/01/2024	1 : 100

Title
HT2 - Basement Floor Plan

Suitability Code Purpose for issue
PROPOSAL

Drawing No
3245 - CDA - 00 - XX - DR - A - 0407

Project Originator: Volume: Level: Type: Role: Number: Revision:

© The copyright in this drawing is vested in CodaStudios and no license or assignment of any kind has been, or is, granted to any third party whether by provision of copies or originals or otherwise unless agreed in writing.

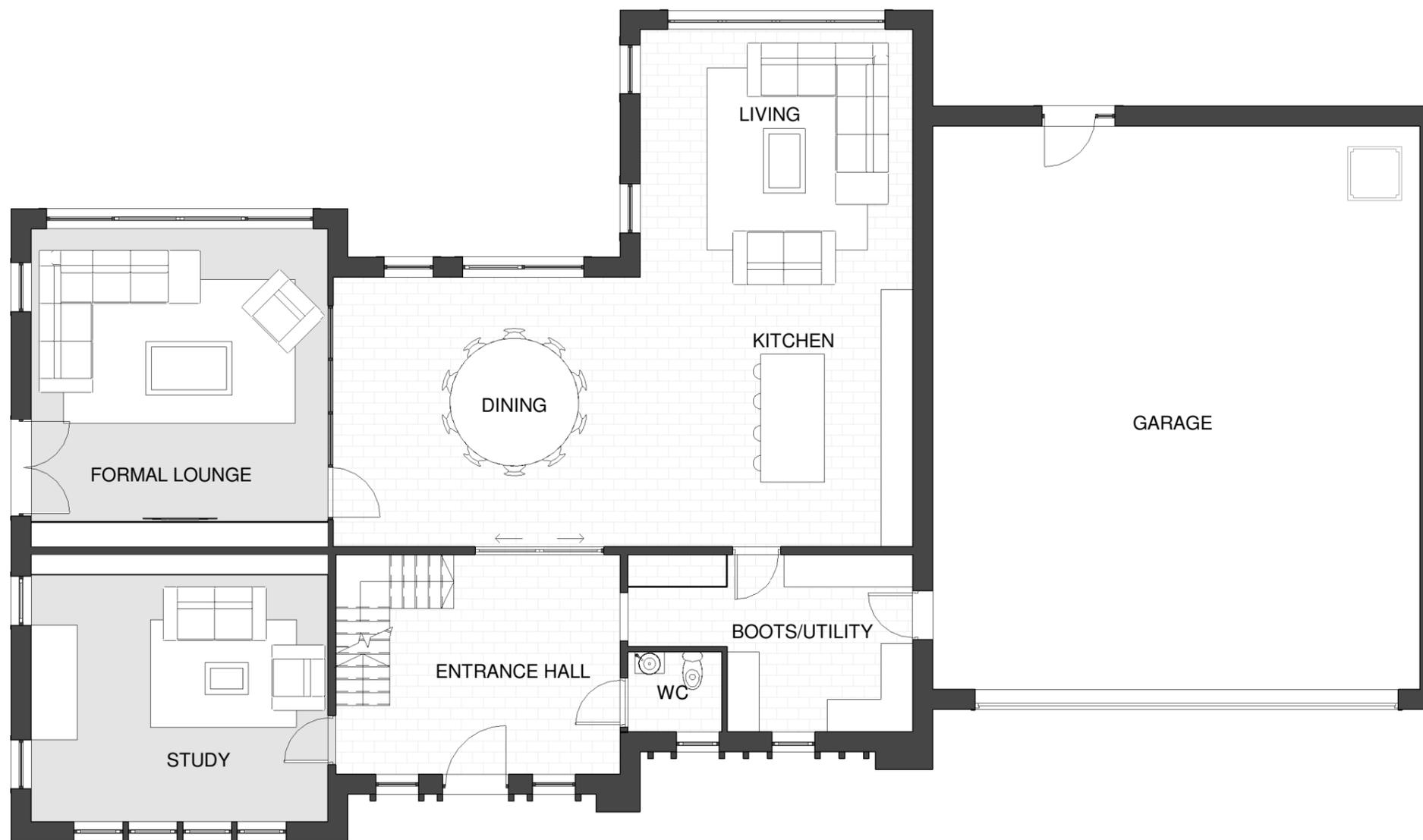
DO NOT SCALE FROM THIS DRAWING

The contractor shall check and verify all dimensions on site and report any discrepancies in writing to CodaStudios before proceeding work

FOR ELECTRONIC DATA ISSUE

Electronic Data / drawings are issued as "read only" and should not be interrogated for measurement. All dimensions and levels should read, only from those values stated on the drawing. Coda Studios Ltd is not responsible for discrepancies caused by the overlay of other parties BIM/IFC models. These are overlaid purely as reference.

Revision	Date	Drawn	Checked
----------	------	-------	---------



Ground Floor Plan

Scale: 1 : 100

Graphical Scale 1:100



CODA Studios Ltd. Sellers Wheel, 151 Arundel St, Sheffield, S1 2NU.
T: 0114 279 6003 E: information@codastudios.co.uk

Client
Richard Summers

Project
The Croft

Drawn	Checked	Date	Scale @ A3
RB	DB	21/11/2023	1 : 100

Title
HT02 - Ground Floor Plan

Suitability Code Purpose for issue
PROPOSAL

Drawing No
3245 - CDA - 00 - ZZ - DR - A - 0408

Project Originator: Volume: Level: Type: Role: Number: Revision:

© The copyright in this drawing is vested in CodaStudios and no license or assignment of any kind has been, or is, granted to any third party whether by provision of copies or originals or otherwise unless agreed in writing.

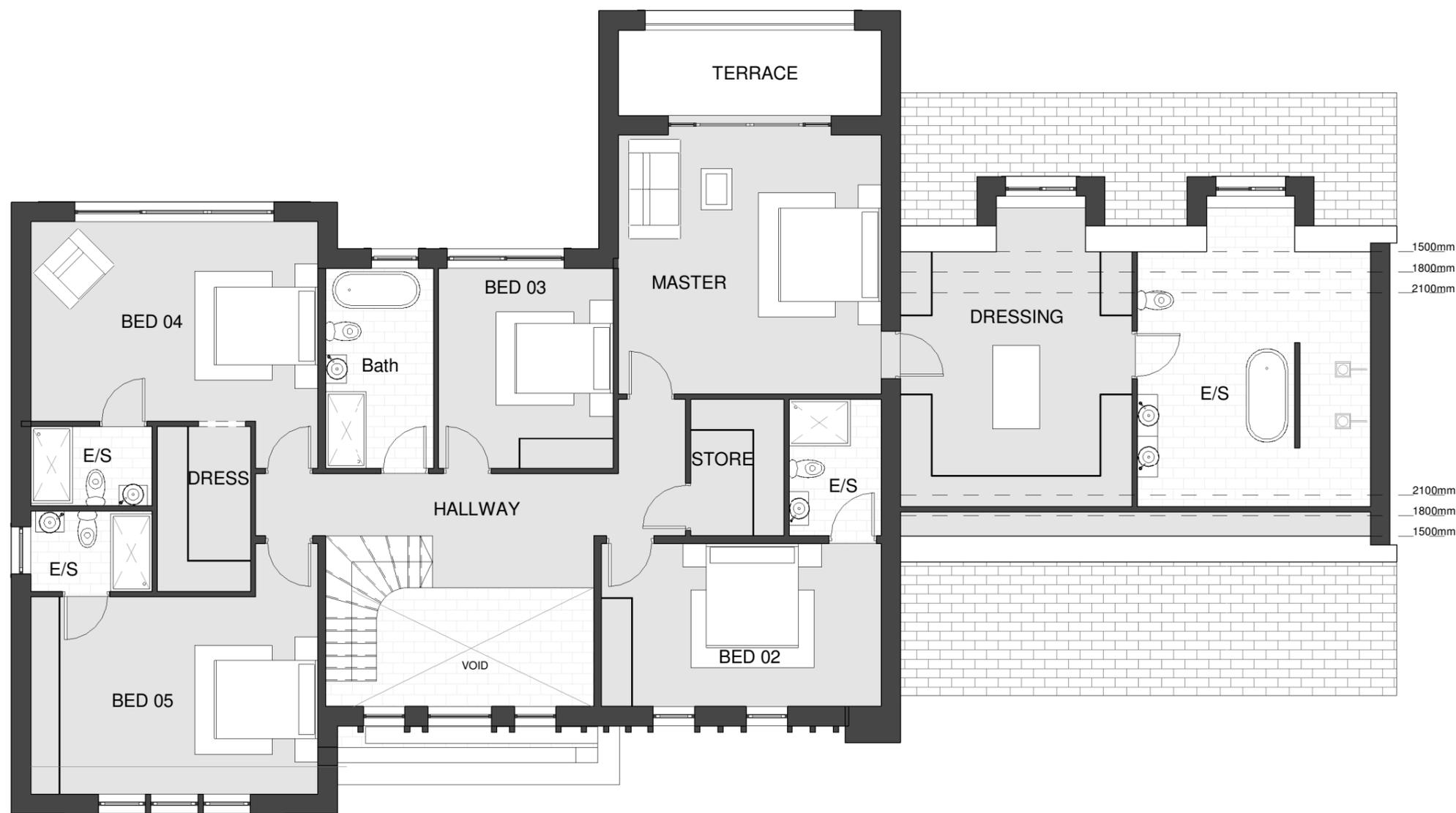
DO NOT SCALE FROM THIS DRAWING

The contractor shall check and verify all dimensions on site and report any discrepancies in writing to CodaStudios before proceeding work

FOR ELECTRONIC DATA ISSUE

Electronic Data / drawings are issued as "read only" and should not be interrogated for measurement. All dimensions and levels should read, only from those values stated on the drawing. Coda Studios Ltd is not responsible for discrepancies caused by the overlay of other parties BIM/IFC models. These are overlaid purely as reference.

Revision	Date	Drawn	Checked
----------	------	-------	---------



First Floor Plan

Scale: 1 : 100

Graphical Scale 1:100



CODA Studios Ltd. Sellers Wheel, 151 Arundel St, Sheffield, S1 2NU.
T: 0114 279 6003 E: information@codastudios.co.uk

Client
Richard Summers

Project
The Croft

Drawn	Checked	Date	Scale @ A3
RB	DB	21/11/2023	1 : 100

Title
HT02 - First Floor Plan

Suitability Code Purpose for issue
PROPOSAL

Drawing No
3245 - CDA - 00 - ZZ - DR - A - 0409

Project Originator: Volume: Level: Type: Role: Number: Revision:

© The copyright in this drawing is vested in CodaStudios and no license or assignment of any kind has been, or is, granted to any third party whether by provision of copies or originals or otherwise unless agreed in writing.

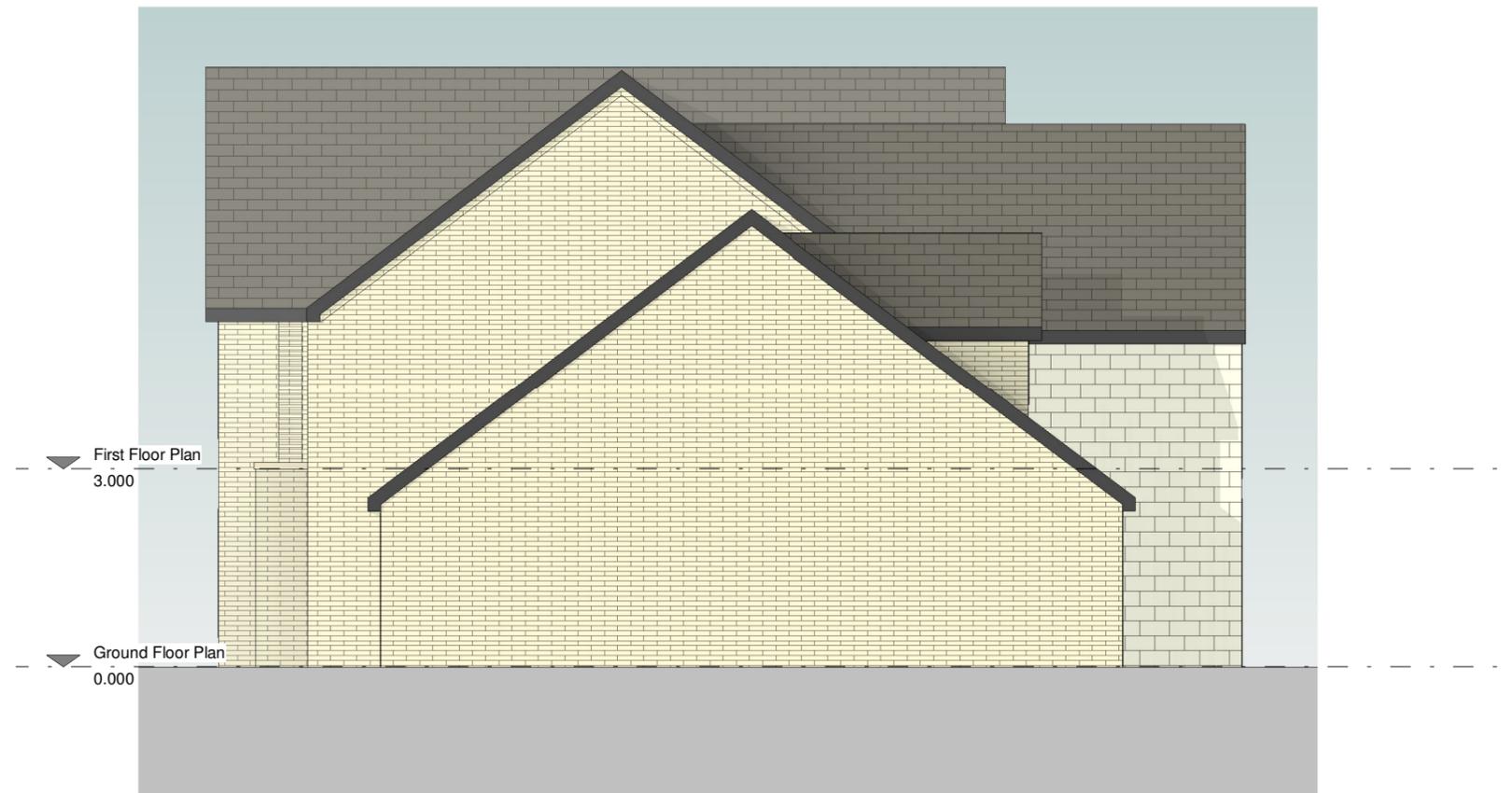
DO NOT SCALE FROM THIS DRAWING

The contractor shall check and verify all dimensions on site and report any discrepancies in writing to CodaStudios before proceeding work

FOR ELECTRONIC DATA ISSUE

Electronic Data / drawings are issued as "read only" and should not be interrogated for measurement. All dimensions and levels should read, only from those values stated on the drawing. Coda Studios Ltd is not responsible for discrepancies caused by the overlay of other parties BIM/IFC models. These are overlaid purely as reference.

Revision	Date	Drawn	Checked
----------	------	-------	---------



East Elevation

Scale: 1 : 100



West Elevation

Scale: 1 : 100

Graphical Scale 1:100



CODA Studios Ltd. Sellers Wheel, 151 Arundel St, Sheffield, S1 2NU.
T: 0114 279 6003 E: information@codastudios.co.uk

Client
Richard Summers

Project
The Croft

Drawn	Checked	Date	Scale @ A3
RB	DB	21/11/2023	1 : 100

Title
HT02 - Elevations Sheet 1 of 2

Suitability Code Purpose for issue
PROPOSAL

Drawing No
3245 - CDA - 00 - ZZ - DR - A - 0410

Project Originator: Volume: Level: Type: Role: Number: Revision:

© The copyright in this drawing is vested in CodaStudios and no license or assignment of any kind has been, or is, granted to any third party whether by provision of copies or originals or otherwise unless agreed in writing.

DO NOT SCALE FROM THIS DRAWING

The contractor shall check and verify all dimensions on site and report any discrepancies in writing to CodaStudios before proceeding work

FOR ELECTRONIC DATA ISSUE

Electronic Data / drawings are issued as "read only" and should not be interrogated for measurement. All dimensions and levels should read, only from those values stated on the drawing. Coda Studios Ltd is not responsible for discrepancies caused by the overlay of other parties BIM/IFC models. These are overlaid purely as reference.

Revision	Date	Drawn	Checked
----------	------	-------	---------



North Elevation

Scale: 1 : 100



South Elevation

Scale: 1 : 100

Graphical Scale 1:100



CODA Studios Ltd. Sellers Wheel, 151 Arundel St, Sheffield, S1 2NU.
T: 0114 279 6003 E: information@codastudios.co.uk

Client
Richard Summers

Project
The Croft

Drawn	Checked	Date	Scale @ A3
RB	DB	21/11/2023	1 : 100

Title
HT02 - Elevations Sheet 2 of 2

Suitability Code Purpose for issue
PROPOSAL

Drawing No
3245 - CDA - 00 - ZZ - DR - A - 0411

Project Originator: Volume: Level: Type: Role: Number: Revision:



View 01



View 02



View 03



View 04



View 05



View 06

© The copyright in this drawing is vested in CodaStudios and no license or assignment of any kind has been, or is, granted to any third party whether by provision of copies or originals or otherwise unless agreed in writing.

DO NOT SCALE FROM THIS DRAWING

The contractor shall check and verify all dimensions on site and report any discrepancies in writing to CodaStudios before proceeding work

FOR ELECTRONIC DATA ISSUE

Electronic Data / drawings are issued as "read only" and should not be interrogated for measurement. All dimensions and levels should read, only from those values stated on the drawing. Coda Studios Ltd is not responsible for discrepancies caused by the overlay of other parties BIM/IFC models. These are overlaid purely as reference.

Revision	Date	Drawn	Checked
----------	------	-------	---------



CODA Studios Ltd. Sellers Wheel, 151 Arundel St, Sheffield, S1 2NU.
T: 0114 279 6003 E: information@codastudios.co.uk

Client
Richard Summers

Project
The Croft

Drawn	Checked	Date	Scale @ A3
RB	DB	21/11/23	

Title
Site Visuals

Suitability Code Purpose for issue
PROPOSAL

Drawing No
3245 - CDA - 00 - ZZ - DR - A - 0403

Project Originator: Volume: Level: Type: Role: Number: Revision:

APPENDIX B – Yorkshire water Drainage Maps

YORKSHIRE WATER PROTECTION OF MAINS AND SERVICES

1. The position of Yorkshire Water Services Ltd (YWS) apparatus shown on the existing mains record drawing(s) indicates the **general** position and nature of our apparatus and the accuracy of this information cannot be guaranteed. Any damage to YWS apparatus as a result of your works may have serious consequences and you will be held responsible for all costs incurred. Prior to commencing major works, the exact location of apparatus must be determined on site, if necessary by excavating trial holes. The actual position of such apparatus and that of service pipes which have not been indicated must be established on site by contacting the Customer Helpline on 0845 124 24 24 for both water and sewerage.
2. The public sewer and water network is lawfully retained in its existing position and the sewerage and water undertaker is entitled to have it remain so without any disturbance. The provisions of section 159 of the Water Industry Act 1991 provides that the undertaker may "inspect, maintain, adjust, repair or alter" the network. Those rights are given to enable the undertaker to perform its statutory duties. Any development of the land or any other action that unacceptably hindered the exercise of those rights would be unlawful. The provisions contained in Section 185 of the Water Industry Act 1991 state that where it is reasonable to do so, a person may require the water supply undertaker to alter or remove a pipe where it is necessary to enable that person to carry out a proposed change of use of the land. The provisions contained in Section 185 also require the person making the request to pay the full cost of carrying out the necessary works.
3. Ground levels over existing YWS apparatus are to be maintained. Sewers in highways will **generally** be laid to give 1200mm of cover from finished ground level working to kerb races, other permanent identification of the limits of the road or to an agreed line and level. Substantial increases or decreases to this 1200mm depth of cover will result in the sewer being re-laid at your expense. Water mains and services will **generally** be laid with a minimum of 750mm depth of cover however some mains and services usually those installed over 50 years ago may have less ground cover.
4. If surface levels are to be decreased / increased significantly the effects on existing water supply apparatus will be carefully considered and if any alterations are necessary, the costs of the alterations will be recharged to you in full. Outlets on fire hydrants must be no more than 300mm below the new levels and all surface boxes must be adjusted as part of the scheme.
5. To enable future repair works to be carried out without hindrance; any pipe, cable, duct, etc. installed parallel to a water main or service pipe should not be installed directly over or within 300mm of a water main or service pipe or 1000mm of a waste water asset. Where a pipe, cable, duct, etc. crosses a main or service it should preferably cross perpendicular or at an angle of no less than 45° and with a minimum clearance of 150mm. These requirements apply to activities within an existing highway and are relevant to the installation of pipes, cables, ducts, etc. up to and including 250mm in diameter (*see illustration below*). Necessary protection measures for installations greater than 250mm in diameter and/or in private land will need to be agreed on an individual basis. Installations within a new development site must comply with the National Joint Utilities Group publication Volume 2: NJUG Guidelines On The Positioning Of Underground Utilities Apparatus For New Development Sites.
6. All excavation works near to YW apparatus should be by hand digging only.
7. Backfilling with a suitable material to a minimum 300mm above YW apparatus is required.
8. Adequate support must be provided where any works pass under YW apparatus.
9. Jointing chambers, lighting columns and other structures must be installed in such a way that future repair or maintenance works to YW apparatus will not be hindered.
10. Apparatus such as; railings, sign posts, etc. must not be placed in such a way that they prevent access to or full operation of controlling valves, hydrants or similar apparatus. YWS surface boxes must not be covered or buried. Any adjustment, alteration or replacement of manhole covers must be agreed on site prior to the commencement of the works with a YWS Inspector who may be contacted via our Call Centre on 0845 124 24 24.
11. Explosives shall not be used within 100 metres of any Yorkshire Water Services apparatus or installations.
12. Vibrating plant should not be used directly over any apparatus. Movement or operation by vehicles or heavy plant is not to be permitted in the immediate vicinity of YWS plant or apparatus unless there has been prior consultation and, if necessary, adequate protection provided without cost to YWS.
13. **Under no circumstances** should thrust boring or similar trenchless techniques commence until the actual position of the Company's mains/services along the proposed route have been confirmed by trial holes.
14. Any alterations to the highway should be notified following the procedures outlined in the New Road and Street Works Act 1991 Code of Practice; Measures Necessary Where Apparatus Is Affected By Major Works (Diversionary Works).
15. You will be held responsible for any damage or loss to YWS apparatus during and after completion of work, caused by yourselves, your servant or agent. Any damage caused or observed to YWS plant or apparatus should be immediately reported to YWS. Should YW incur any costs as a result of non-compliance with the above, all costs will be rechargeable in full.
16. You should ensure that nothing is done on the site to prejudice the safety or operation of YWS employees, plant or apparatus.
17. In accordance with the New Roads and Street Works Act 1991, Chapter 22, Part 3, Section 80. The location of any identified YW asset "*which is not marked, or is wrongly marked, on the records made available*" should be communicated back to Yorkshire Water. The location of the apparatus should be identified on copies of the supplied plans which should be returned to Yorkshire Water (Asset Records Team) with photographic supporting evidence where possible.
18. The Government has decided that responsibility for private sewers serving two or more properties and lateral drains (the section of pipe beyond the boundary of a single property, connecting it to the public sewer) will be transferred to the water companies on Oct 1 2011.

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

19. Please note that the information supplied on the enclosed plans is reproduced from Ordnance Survey material with the permission of the Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office, © Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Licence Number 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 trial holes by hand. YW requires a minimum of two working days' written notice of the intention to excavate any trial holes before any excavation can be undertaken. If there are any queries in this respect please contact Yorkshire Water on 0845 124 24 24.

Property Identifier



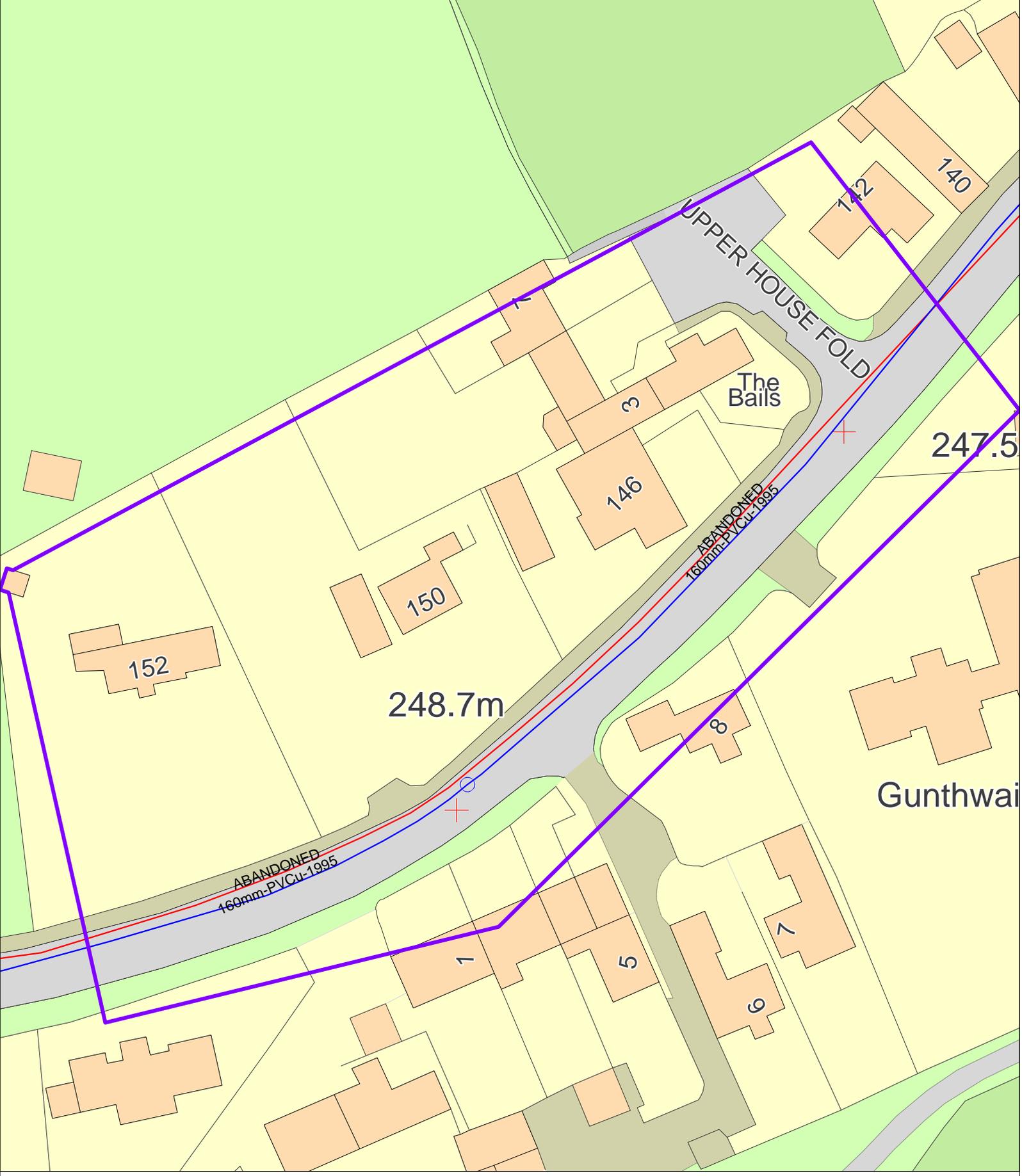
Sewer Legend

	Combined Sewer		S24 Combined Sewer
	Surface Water Sewer		S24 Surface Water Sewer
	Foul Sewer		S24 Foul Sewer
	Section 104 Sewer		Rising Main
	Overflow Sewer		Abandoned Sewer
	Manhole		Syphone Sewer & Vacuum Sewer
	Pumping Station		Public Sewer Treatment Works

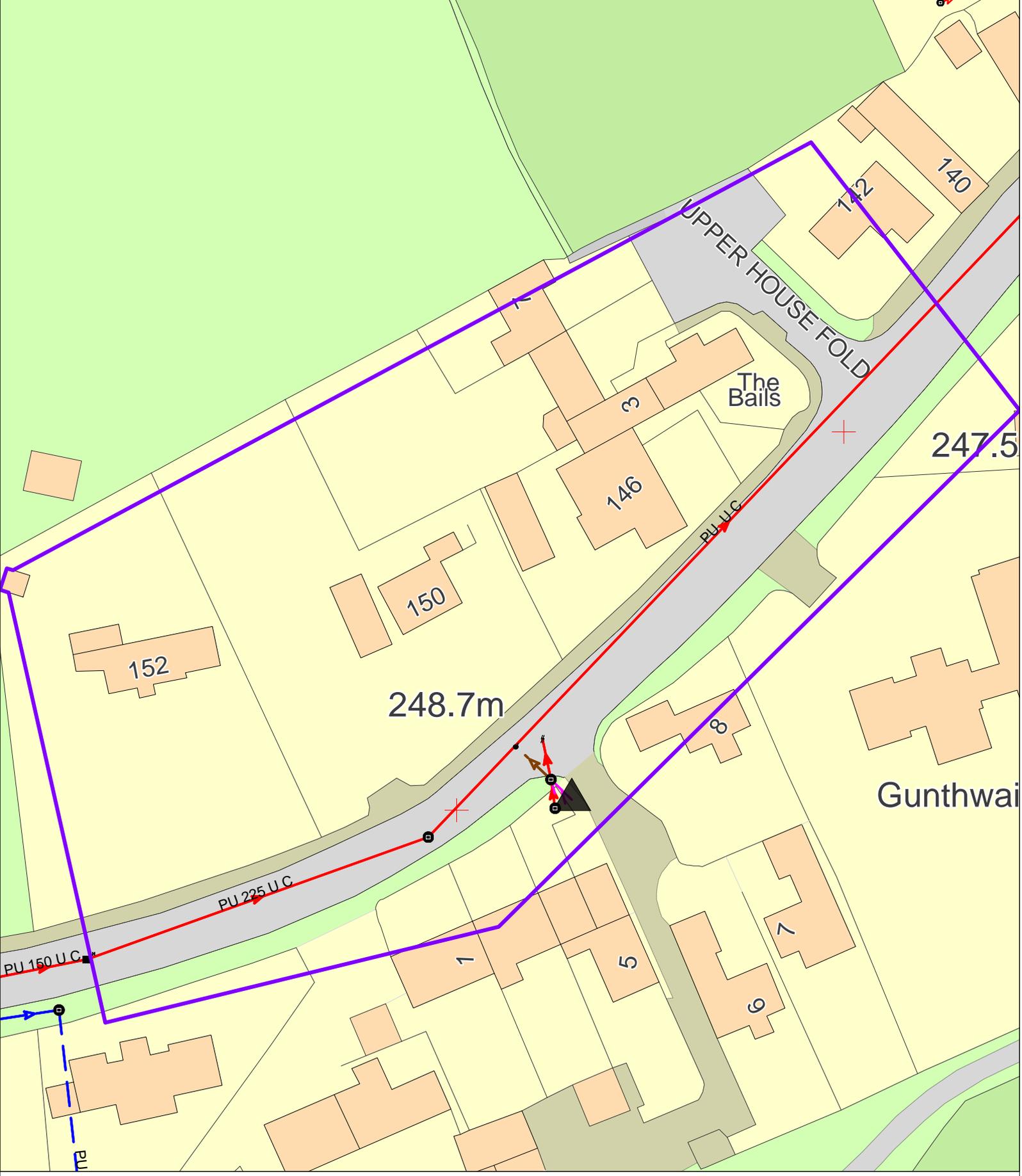
Please note that the direction of flow arrows may not always appear depending on the scale of the map.

Water Legend

	Water Main 4" and below
	Water Main 4" and above
	Raw Water Main
	Private Water Main
	Fire Hydrant
	Pumping Station
	The assets in this area are the responsibility of another Water Undertaker

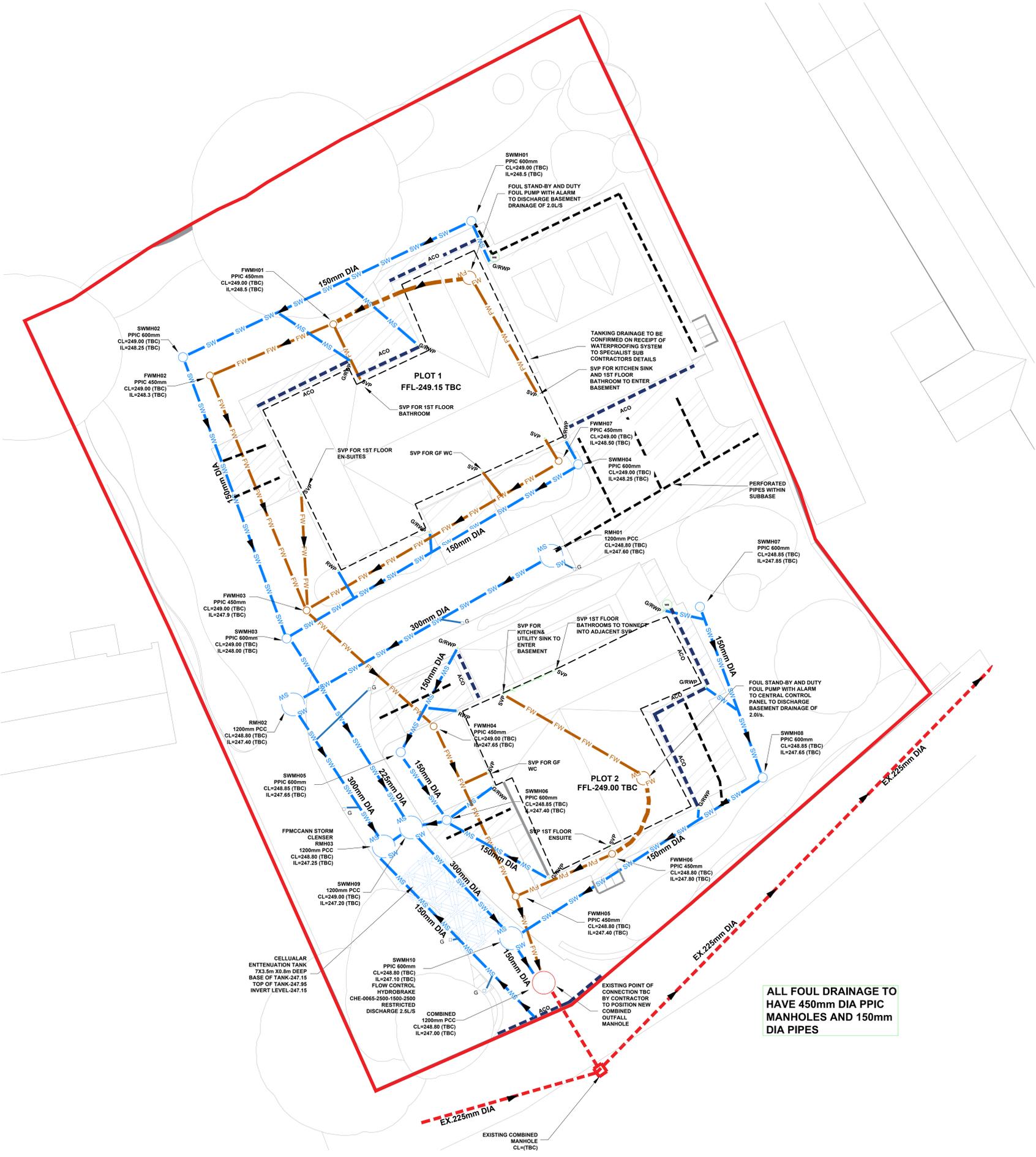


Public Clean Water Network 20/11/2024 10:59:13 OS Grid Coordinates: 422652 : 407094 Map Name : SE2207SE svcGISSafeMovePD



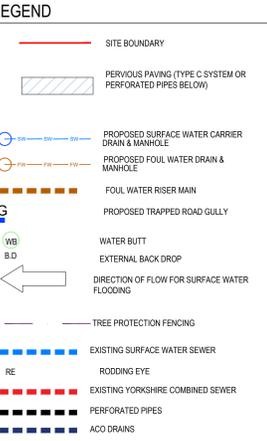
Public Waste Water Network 20/11/2024 10:59:14 OS Grid Coordinates: 422652 : 407094 Map Name : SE2207SE svcGISSafeMovePD

APPENDIX C – DRAINAGE STRATEGY AND CALCULATIONS



© COPYRIGHT, ALL RIGHTS RESERVED
THIS WORK IS COPYRIGHT AND CANNOT BE REPRODUCED OR COPIED IN ANY FORM OR BY ANY OTHER MEANS (GRAPHIC, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPIING) WITHOUT THE WRITTEN PERMISSION OF POPULOUS AND LICENSE, EXPRESS OR IMPLIED. TO USE THIS DOCUMENT FOR ANY PURPOSE WHATSOEVER IS RESTRICTED TO THE TERMS OF THE AGREEMENT OR IMPLIED AGREEMENT OR IMPLIED AGREEMENT BETWEEN POPULOUS AND THE INSTRUCTING PARTY.
USE FIGURED DIMENSIONS, DO NOT SCALE. CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION OR SETTING OUT.

- GENERAL NOTES**
- DO NOT SCALE.
 - THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS.
 - SHOULD THERE BE ANY DISCREPANCY BETWEEN DETAILS INDICATED ON THIS DRAWING AND THOSE INDICATED ON OTHER DRAWINGS THE ENGINEER SHOULD BE INFORMED PRIOR TO CONSTRUCTION ON SITE.
 - UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT AUTHORITIES IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ISSUED ARE PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR START SITE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT HIS OWN RISK.
 - ALL DIMENSIONS SHOWN ARE IN METERS UNLESS NOTED OTHERWISE.
 - ALL SURVEY INFORMATION IS PROVIDED BY THE SURVEYING COMPANY AND VDG LIMITED CANNOT ACCEPT ANY LIABILITY FOR ANY DISCREPANCIES THEREIN. ALL SURVEY INFORMATION TO BE VERIFIED ON SITE BY CONTRACTOR. SHOULD DISCREPANCIES BE IDENTIFIED, VDG LIMITED IS TO BE NOTIFIED IMMEDIATELY.



- DRAINAGE NOTES**
- NON PERMEABLE AREA=0.1HA
 - HIERARCHY OF SUDS AS FOLLOWED:
 - THE LOCAL GROUND CONDITIONS BGS INDICATE THE UNDERLYING STRATA DRAINAGE IS IMPEDED.
 - THE SURFACE WATER IS TO CONNECT INTO THE COMBINED SEWER PLEASE REFER TO DRAINAGE STRATEGY REPORT 135-VDG-00-ZZ-RP-C-5000 - THE SITE IS CURRENTLY PRESENTED AS A GREENFIELD FROM A SURFACE WATER RUN-OFF PERSPECTIVE.
 - AN INFODRAINAGE DRAINAGE MODEL HAS BEEN PRODUCED TO MEASURE THE AREA OF IMPERMEABLE SURFACES ON THE SITE AND PERFORM A CELLULAR STORAGE CALCULATION.
 - ALL PIPES HAVE BEEN DESIGN NOT TO FLOOD IN A 1 IN 30 STORM.
 - ALL PIPES HAVE BEEN DESIGNED NOT TO BE SURCHARGED IN A 1 IN 1 STORM
 - ALL PIPES TO BE PLASTIC
 - MINIMUM GRADIENT FOR FOUL DRAINAGE 1:40
 - WATER QUALITY IN LINE WITH CURIA SUDS MANUAL C753.
 - THE FOUL WATER SYSTEM WILL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE CURRENT BUILDING REGULATIONS, BS EN 752 DRAINAGE AND SEWER SYSTEMS OUTSIDE BUILDINGS, THE LOCAL AUTHORITY BUILDING CONTROL SPECIFICATIONS AND REQUIREMENTS, SEWERAGE SECTOR GUIDANCE (APPENDIX C) AND THE CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY.

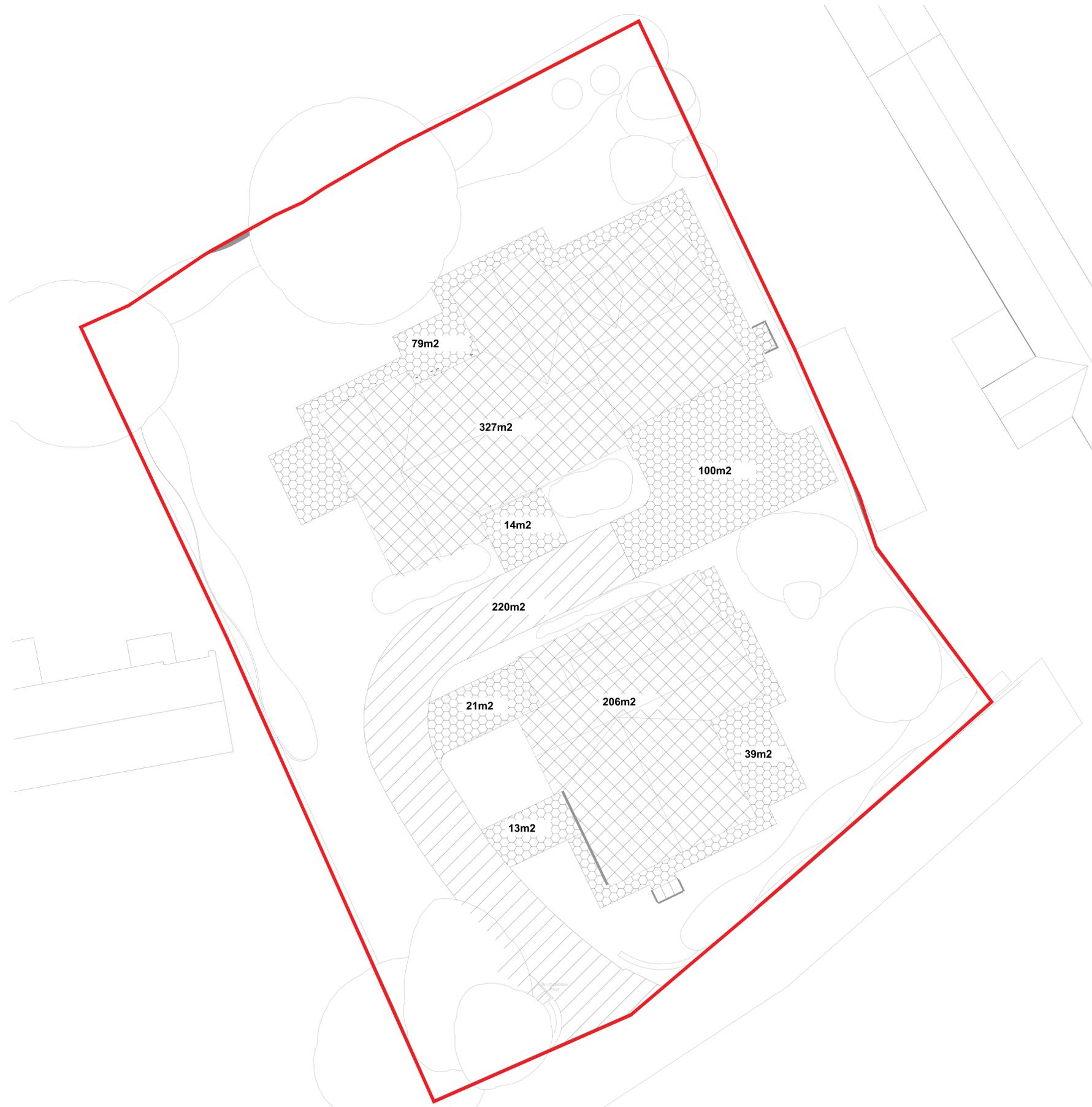
Rev	Date	By	Description
P03	19.12.24	PS	THIRD ISSUE
P02	09.12.24	PS	SECOND ISSUE
P01	29.11.24	PS	INITIAL ISSUE

Client
RICHARD SUMMERS

Project Name
THE CROFT

Drawing Title
PROPOSED DRAINAGE STRATEGY

Drawing Status		Project No
Drawn	Approved	135
PS	MW	1:200
Job No	Contract	Zone
135	VDG XX	XX
Level	Type	Role
DR	C	5000
Scale	Issue	Page
1:200	FIRST ISSUE	A0



LEGEND

-  SITE BOUNDARY
-  DRIVEWAYS
-  HOUSE PLOTS

DRAINAGE NOTES

- NON PERMEABLE AREA=0.1HA
- SITE AREA=0.229HA

© COPYRIGHT, ALL RIGHTS RESERVED

THIS WORK IS COPYRIGHT AND CANNOT BE REPRODUCED OR COPIED IN ANY FORM OR BY ANY OTHER MEANS (GRAPHIC, ELECTRONIC OR MECHANICAL INCLUDING PHOTOCOPIING) WITHOUT THE WRITTEN PERMISSION OF POPULOUS AND LICENSE, EXPRESS OR IMPLIED. TO USE THIS DOCUMENT FOR ANY PURPOSE WHATSOEVER IS RESTRICTED TO THE TERMS OF THE AGREEMENT OR IMPLIED AGREEMENT OR WRITTEN AGREEMENT BETWEEN POPULOUS AND THE INSTRUCTING PARTY.

USE FIGURED DIMENSIONS, DO NOT SCALE. CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION OR SETTING OUT.

GENERAL NOTES

1. DO NOT SCALE.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS.
3. SHOULD THERE BE ANY DISCREPANCY BETWEEN DETAILS INDICATED ON THIS DRAWING AND THOSE INDICATED ON OTHER DRAWINGS THE ENGINEER SHOULD BE INFORMED PRIOR TO CONSTRUCTION ON SITE.
4. UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT AUTHORITIES IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ISSUED ARE PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR START SITE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT HIS OWN RISK.
5. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS NOTED OTHERWISE.

Rev	Date	By	Description
P02	19.12.24	PS	SECOND ISSUE
P01	29.11.24	PS	INITIAL ISSUE

REVISIONS

Client
RICHARD SUMMERS

Project Name
THE CROFT

Drawing Title
NON-PERMEABLE SURFACE PLAN

Drawn	Approved	Scale	First Issue	Size
PS	MW	1:200	FIRST ISSUE	A0



LEGEND

- SITE BOUNDARY
- DRIVEWAYS
- HOUSE PLOTS

DRAINAGE NOTES

- NON PERMEABLE AREA=0.2105HA
- SITE AREA=0.5680HA

© COPYRIGHT, ALL RIGHTS RESERVED
THIS WORK IS COPYRIGHT AND CANNOT BE REPRODUCED OR COPIED IN ANY FORM OR BY ANY OTHER MEANS (GRAPHIC, ELECTRONIC OR MECHANICAL INCLUDING PHOTOCOPIING) WITHOUT THE WRITTEN PERMISSION OF POPULOUS AND LICENSE, EXPRESS OR IMPLIED. TO USE THIS DOCUMENT FOR ANY PURPOSE WHATSOEVER IS RESTRICTED TO THE TERMS OF THE AGREEMENT OR IMPLIED AGREEMENT OR WRITTEN AGREEMENT BETWEEN POPULOUS AND THE INSTRUCTING PARTY.

USE FIGURED DIMENSIONS, DO NOT SCALE. CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION OR SETTING OUT.

GENERAL NOTES

1. DO NOT SCALE.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS.
3. SHOULD THERE BE ANY DISCREPANCY BETWEEN DETAILS INDICATED ON THIS DRAWING AND THOSE INDICATED ON OTHER DRAWINGS THE ENGINEER SHOULD BE INFORMED PRIOR TO CONSTRUCTION ON SITE.
4. UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT AUTHORITIES IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ISSUED ARE PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR START SITE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT HIS OWN RISK.
5. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS NOTED OTHERWISE.

Rev	Date	By	Description
P01	23.11.24	PS	INITIAL ISSUE

REVISIONS

Client
RICHARD SUMMERS

Project Name
THE CROFT

Drawing Title
EXISTING HARD STANDING

Drawing Status		Project No
Drawn	Approved	135
PS	MW	
Scale	First Issue	Size
1:200	FIRST ISSUE	A0

Job No	Company	Zone	Level	Type	Role	Discipline	Revision
135	VDG	XX	XX	DR	C	5001	P01

THE CROFT:	Date: 06/07/2022		
	Designed by: mark0	Checked by:	Approved By:
Report Details: Type: Junctions Storm Phase: Phase (1)	Company Address:		



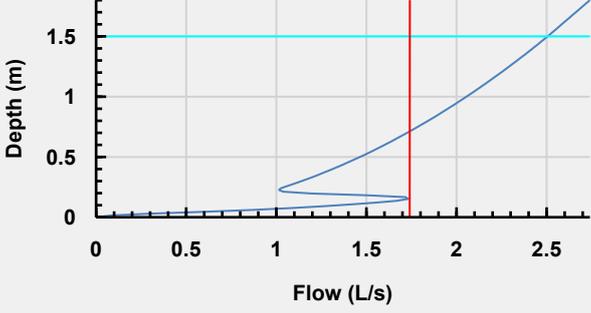
Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
SWMH10	Manhole	453.327	36.717	248.800	1.700	247.100	Circular	1.200
SWMH09	Manhole	447.208	42.746	248.800	1.600	247.200	Circular	1.200
RMH03	Manhole	445.466	41.454	248.800	1.550	247.250	Circular	1.200
SWMH03	Manhole	438.269	56.715	249.000	1.000	248.000	Circular	0.600
RM02	Manhole	439.455	52.820	248.800	1.400	247.400	Circular	1.200
RMH01	Manhole	455.691	62.173	248.800	1.200	247.600	Circular	1.200
SWMH04	Manhole	457.419	68.174	249.000	0.750	248.250	Circular	0.600
SWMH01	Manhole	450.627	84.153	249.000	0.500	248.500	Circular	0.600
SWMH02	Manhole	431.072	76.335	249.000	0.750	248.250	Circular	0.600
SWMH07	Manhole	465.422	58.823	248.850	1.000	247.850	Circular	0.600
SWMH08	Manhole	469.571	47.599	248.850	1.200	247.650	Circular	0.600
COMBINED	Manhole	455.274	34.013	248.800	1.800	247.000	Circular	1.200
SWMH05	Manhole	445.784	49.159	248.850	1.200	247.650	Circular	0.600
SWMH06	Manhole	449.376	43.872	248.850	1.450	247.400	Circular	0.600

Name	Lock
SWMH10	None
SWMH09	None
RMH03	None
SWMH03	None
RM02	None
RMH01	None
SWMH04	None
SWMH01	None
SWMH02	None
SWMH07	None
SWMH08	None
COMBINED	None
SWMH05	None
SWMH06	None



THE CROFT:	Date: 06/07/2022		
	Designed by: mark0	Checked by:	
Report Details: Type: Junctions Storm Phase: Phase (1)	Company Address:		

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type	
SWMH10	Outlet	Pipe (5)	Hydro-Brake®	
	Invert Level (m)		247.100	
	Design Depth (m)		1.500	
	Design Flow (L/s)		2.5	
	Objective	Minimise Upstream Storage Requirements		
	Application	Surface Water Only		
	Sump Available	<input type="checkbox"/>		
	Unit Reference	CHE-0065-2500-1500-2500		
				
	SWMH09	Outlet	Pipe (4)	Free Discharge
RMH03	Outlet	Pipe (12)	Free Discharge	
SWMH03	Outlet	Pipe (3)	Free Discharge	
RM02	Outlet	Pipe (11)	Free Discharge	
RMH01	Outlet	Pipe (10)	Free Discharge	
SWMH04	Outlet	Pipe (2)	Free Discharge	
SWMH01	Outlet	Pipe	Free Discharge	
SWMH02	Outlet	Pipe (1)	Free Discharge	
SWMH07	Outlet	Pipe (8)	Free Discharge	
SWMH08	Outlet	Pipe (9)	Free Discharge	
SWMH05	Outlet	Pipe (6)	Free Discharge	
SWMH06	Outlet	Pipe (7)	Free Discharge	

THE CROFT:	Date: 06/07/2022			
	Designed by: mark0	Checked by:	Approved By:	
Report Details: Type: Stormwater Controls Storm Phase: Phase (1)	Company Address:			



Cellular Storage

Type : Cellular Storage

Dimensions

Exceedance Level (m)	248.800
Depth (m)	0.800
Base Level (m)	247.150
Number of Crates Long	7
Number of Crates Wide	7
Number of Crates High	2
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m ³)	19.470

THE CROFT:	Date: 06/07/2022		
	Designed by: mark0	Checked by:	Approved By:
Report Details: Type: Connections Storm Phase: Phase (1)	Company Address:		



Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)	Upstream Invert Level (m)
Pipe	21.059	Pipe	84.237		0.6	150	249.000	248.500
Pipe (1)	20.898	Pipe	83.594		0.6	150	249.000	248.250
Pipe (2)	22.316	Pipe	89.266		0.6	150	249.000	248.250
Pipe (3)	16.584	Pipe	20.730		0.6	225	249.000	248.000
Pipe (5)	3.332	Pipe	33.316		0.6	150	248.800	247.100
Pipe (6)	6.392	Pipe	25.568		0.6	150	248.850	247.650
Pipe (7)	2.443	Pipe	12.214		0.6	150	248.850	247.400
Pipe (8)	11.967	Pipe	59.833		0.6	150	248.850	247.850
Pipe (9)	19.552	Pipe	35.550		0.6	150	248.850	247.650
Pipe (10)	18.737	Pipe	93.687		0.6	300	248.800	247.600
Pipe (11)	12.857	Pipe	85.716		0.6	300	248.800	247.400
Pipe (12)	2.169	Pipe	43.378		0.6	300	248.800	247.250
Pipe (4)	2.638	Pipe	52.752		0.6	300	248.800	247.200
Pipe (13)	2.557	Pipe	51.130		0.6	150	248.800	247.150

Name	Downstream Cover Level (m)	Downstream Invert Level (m)	Part Family	Lock	Flow Restriction (L/s)
Pipe	249.000	248.250		None	
Pipe (1)	249.000	248.000		None	
Pipe (2)	249.000	248.000		None	
Pipe (3)	248.800	247.200		None	
Pipe (5)	248.800	247.000		None	2.7
Pipe (6)	248.850	247.400		None	
Pipe (7)	248.800	247.200		None	
Pipe (8)	248.850	247.650		None	
Pipe (9)	248.800	247.100		None	
Pipe (10)	248.800	247.400		None	
Pipe (11)	248.800	247.250		None	
Pipe (12)	248.800	247.200		None	
Pipe (4)	248.800	247.150		None	
Pipe (13)	248.800	247.100		None	

THE CROFT:	Date: 06/07/2022		
	Designed by: mark0	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase (1)	Company Address:		



1 IN 100 40%: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWMH10	1 IN 100 40%: 100 years: +40 %: 120 mins: Winter	248.800	247.100	248.469	1.369	2.9	1.548	0.000	2.4	25.687	Surcharged
SWMH09	1 IN 100 40%: 100 years: +40 %: 120 mins: Winter	248.800	247.200	248.470	1.270	10.6	1.436	0.000	10.1	35.805	Surcharged
RMH03	1 IN 100 40%: 100 years: +40 %: 120 mins: Winter	248.800	247.250	248.470	1.220	4.6	1.379	0.000	4.2	15.281	Surcharged
SWMH03	1 IN 100 40%: 100 years: +40 %: 120 mins: Winter	249.000	248.000	248.470	0.470	5.8	0.133	0.000	5.8	17.064	Surcharged
RM02	1 IN 100 40%: 100 years: +40 %: 120 mins: Winter	248.800	247.400	248.470	1.070	3.9	1.210	0.000	2.9	10.844	Surcharged
RMH01	1 IN 100 40%: 100 years: +40 %: 120 mins: Winter	248.800	247.600	248.470	0.870	3.0	0.984	0.000	2.6	8.067	Surcharged
SWMH04	1 IN 100 40%: 100 years: +40 %: 120 mins: Winter	249.000	248.250	248.470	0.220	1.3	0.062	0.000	1.3	3.830	Surcharged
SWMH01	1 IN 100 40%: 100 years: +40 %: 15 mins: Winter	249.000	248.500	248.551	0.051	4.8	0.014	0.000	4.7	2.234	OK
SWMH02	1 IN 100 40%: 100 years: +40 %: 120 mins: Winter	249.000	248.250	248.470	0.220	3.3	0.062	0.000	3.3	9.601	Surcharged
SWMH07	1 IN 100 40%: 100 years: +40 %: 120 mins: Winter	248.850	247.850	248.469	0.619	1.2	0.175	0.000	1.2	3.575	Surcharged
SWMH08	1 IN 100 40%: 100 years: +40 %: 120 mins: Winter	248.850	247.650	248.469	0.819	1.9	0.232	0.000	1.9	5.509	Surcharged
COMBINED	1 IN 100 40%: 100 years: +40 %: 120 mins: Winter	248.800	247.000	247.028	0.028	2.4	0.000	0.000	2.4	25.536	OK
SWMH05	1 IN 100 40%: 100 years: +40 %: 120 mins: Winter	248.850	247.650	248.470	0.820	1.1	0.232	0.000	1.1	3.174	Surcharged
SWMH06	1 IN 100 40%: 100 years: +40 %: 120 mins: Winter	248.850	247.400	248.470	1.070	1.8	0.303	0.000	1.3	4.869	Surcharged

THE CROFT:	Date: 06/07/2022		
	Designed by: mark0	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase (1)	Company Address:		



1 IN 1: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWMH10	1 IN 1: 1 years: +0 %: 60 mins: Winter	248.800	247.100	247.317	0.217	2.0	0.245	0.000	1.7	7.988	Surcharged
SWMH09	1 IN 1: 1 years: +0 %: 60 mins: Winter	248.800	247.200	247.317	0.117	4.8	0.132	0.000	4.5	7.392	OK
RMH03	1 IN 1: 1 years: +0 %: 60 mins: Winter	248.800	247.250	247.317	0.067	2.2	0.076	0.000	2.2	3.366	OK
SWMH03	1 IN 1: 1 years: +0 %: 15 mins: Winter	249.000	248.000	248.027	0.027	3.7	0.008	0.000	3.6	1.821	OK
RM02	1 IN 1: 1 years: +0 %: 15 mins: Winter	248.800	247.400	247.431	0.031	2.9	0.035	0.000	2.7	1.377	OK
RMH01	1 IN 1: 1 years: +0 %: 15 mins: Winter	248.800	247.600	247.627	0.027	2.0	0.030	0.000	1.9	0.914	OK
SWMH04	1 IN 1: 1 years: +0 %: 15 mins: Winter	249.000	248.250	248.272	0.022	0.9	0.006	0.000	0.8	0.406	OK
SWMH01	1 IN 1: 1 years: +0 %: 15 mins: Winter	249.000	248.500	248.524	0.024	1.1	0.007	0.000	1.1	0.508	OK
SWMH02	1 IN 1: 1 years: +0 %: 15 mins: Winter	249.000	248.250	248.284	0.034	2.2	0.010	0.000	2.0	1.021	OK
SWMH07	1 IN 1: 1 years: +0 %: 15 mins: Winter	248.850	247.850	247.869	0.019	0.8	0.005	0.000	0.8	0.376	OK
SWMH08	1 IN 1: 1 years: +0 %: 15 mins: Winter	248.850	247.650	247.669	0.019	1.2	0.006	0.000	1.2	0.594	OK
COMBINED	1 IN 1: 1 years: +0 %: 15 mins: Winter	248.800	247.000	247.024	0.024	1.7	0.000	0.000	1.7	2.135	OK
SWMH05	1 IN 1: 1 years: +0 %: 15 mins: Winter	248.850	247.650	247.665	0.015	0.8	0.004	0.000	0.7	0.347	OK
SWMH06	1 IN 1: 1 years: +0 %: 15 mins: Winter	248.850	247.400	247.415	0.015	1.2	0.004	0.000	1.2	0.555	OK

THE CROFT:	Date: 06/07/2022		
	Designed by: mark0	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase (1)	Company Address:		



1 IN 30: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWMH10	1 IN 30: 30 years: +0 %: 120 mins: Winter	248.800	247.100	247.660	0.560	2.0	0.634	0.000	1.7	17.810	Surcharged
SWMH09	1 IN 30: 30 years: +0 %: 120 mins: Winter	248.800	247.200	247.661	0.461	6.7	0.521	0.000	6.0	21.201	Surcharged
RMH03	1 IN 30: 30 years: +0 %: 120 mins: Winter	248.800	247.250	247.661	0.411	3.4	0.465	0.000	2.6	9.720	Surcharged
SWMH03	1 IN 30: 30 years: +0 %: 15 mins: Winter	249.000	248.000	248.042	0.042	9.2	0.012	0.000	9.0	4.454	OK
RM02	1 IN 30: 30 years: +0 %: 120 mins: Winter	248.800	247.400	247.661	0.261	2.4	0.295	0.000	2.4	7.067	OK
RMH01	1 IN 30: 30 years: +0 %: 120 mins: Winter	248.800	247.600	247.661	0.061	1.6	0.069	0.000	1.6	4.703	OK
SWMH04	1 IN 30: 30 years: +0 %: 15 mins: Winter	249.000	248.250	248.284	0.034	2.2	0.010	0.000	2.1	0.994	OK
SWMH01	1 IN 30: 30 years: +0 %: 15 mins: Winter	249.000	248.500	248.537	0.037	2.7	0.011	0.000	2.6	1.234	OK
SWMH02	1 IN 30: 30 years: +0 %: 15 mins: Winter	249.000	248.250	248.305	0.055	5.3	0.016	0.000	5.1	2.499	OK
SWMH07	1 IN 30: 30 years: +0 %: 15 mins: Winter	248.850	247.850	247.880	0.030	2.0	0.009	0.000	2.0	0.925	OK
SWMH08	1 IN 30: 30 years: +0 %: 15 mins: Winter	248.850	247.650	247.681	0.031	3.1	0.009	0.000	3.0	1.438	OK
COMBINED	1 IN 30: 30 years: +0 %: 360 mins: Summer	248.800	247.000	247.024	0.024	1.7	0.000	0.000	1.7	30.187	OK
SWMH05	1 IN 30: 30 years: +0 %: 15 mins: Winter	248.850	247.650	247.674	0.024	1.8	0.007	0.000	1.8	0.853	OK
SWMH06	1 IN 30: 30 years: +0 %: 120 mins: Winter	248.850	247.400	247.661	0.261	1.0	0.074	0.000	1.0	2.865	Surcharged

THE CROFT:	Date: 06/07/2022		
	Designed by: mark0	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase (1)	Company Address:		



1 IN 100 40%: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank
By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residant Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	1 IN 100 40%: 100 years: +40 %: 120 mins: Winter	248.470	248.470	1.320	1.320	10.1	19.122	0.000	0.000	2.9	21.271	1.786	OK

THE CROFT:	Date: 06/07/2022		
	Designed by: mark0	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase (1)	Company Address:		



1 IN 1: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residant Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	1 IN 1: 1 years: +0 %: 60 mins: Winter	247.317	247.317	0.167	0.167	4.5	3.888	0.000	0.000	1.6	7.110	80.028	OK

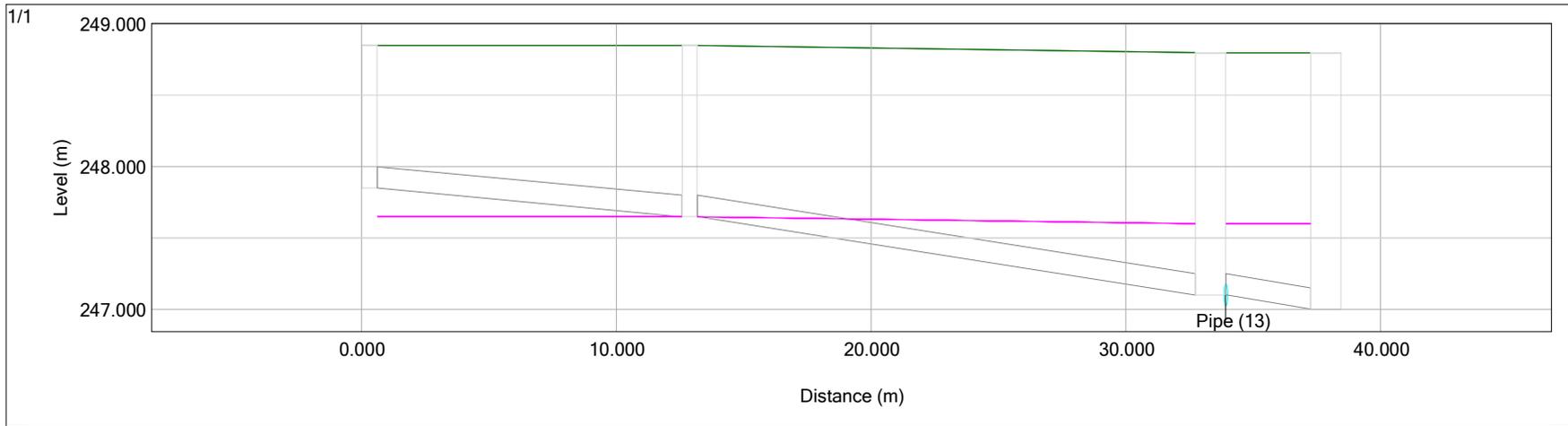
THE CROFT:	Date: 06/07/2022		
	Designed by: mark0	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase (1)	Company Address:		



1 IN 30: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residant Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	1 IN 30: 30 years: +0 %: 120 mins: Winter	247.661	247.661	0.511	0.511	6.0	11.886	0.000	0.000	1.4	15.421	38.951	OK

THE CROFT:	Company Address:	Page 1
Modified date 06/07/2022 File The croft.iddx	Designed by mark0 Checked by InfoDrainage 2024.5.1	
Profile - Flow Path (2)	Horizontal Scale 1:240, Vertical Scale 1:44	



Junction	SWMH07	SWMH08	SWMH10	COMBINED
Type	Manhole	Manhole	Manhole	Manhole
CL (m)	248.850	248.850	248.800	248.800
IL (m)	247.850	247.650	247.100	247.000
Connection		Pipe (8)	Pipe (9)	Pipe (5)
Type		Pipe	Pipe	Pipe
Curved		No	No	No
Length (m)		11.967	19.552	3.332
Diam (mm)		150	150	150
Height (mm)				
U/S IL (m)		247.850	247.650	247.100
D/S IL (m)		247.650	247.100	247.000
C. Splay (mm)				
SWC				
Type				
EL (m)				
BL (m)				



THE CROFT:

Company Address:

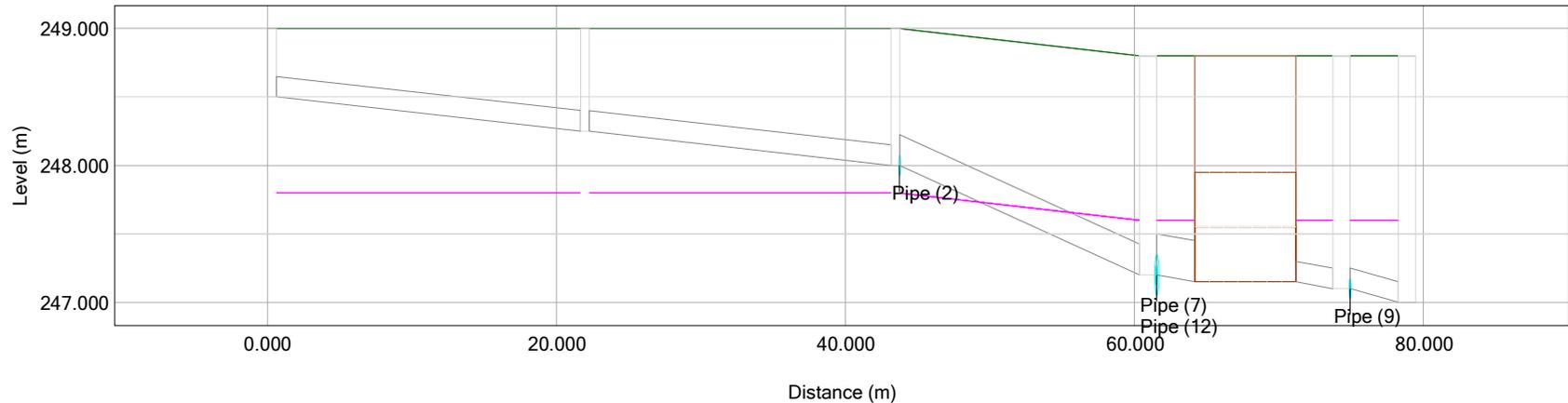
Modified date 06/07/2022
File The croft.iddx

Designed by mark0
Checked by
InfoDrainage 2024.5.1

Profile - Flow Path

Horizontal Scale 1:439, Vertical Scale 1:48

1/1



Junction	SWMH01	SWMH02	SWMH03	SWMH09	SWMH10
Type	Manhole	Manhole	Manhole	Manhole	Manhole
CL (m)	249.000	249.000	249.000	248.800	248.800
IL (m)	248.500	248.250	248.000	247.200	247.100
Connection	Pipe	Pipe (1)	Pipe (3)	Pipe (4)	Pipe (13)
Type	Pipe	Pipe	Pipe	Pipe	Pipe
Curved	No	No	No	No	No
Length (m)	21.059	20.898	16.584	2.638	2.557
Diam (mm)	150	150	225	300	150
Height (mm)					
U/S IL (m)	248.500	248.250	248.000	247.200	247.150
D/S IL (m)	248.250	248.000	247.200	247.150	247.100
C. Splay (mm)					
SWC				Cellular Storage	
Type				Cellular Storage	
EL (m)				248.800	
BL (m)				247.150	



THE CROFT:

Company Address:

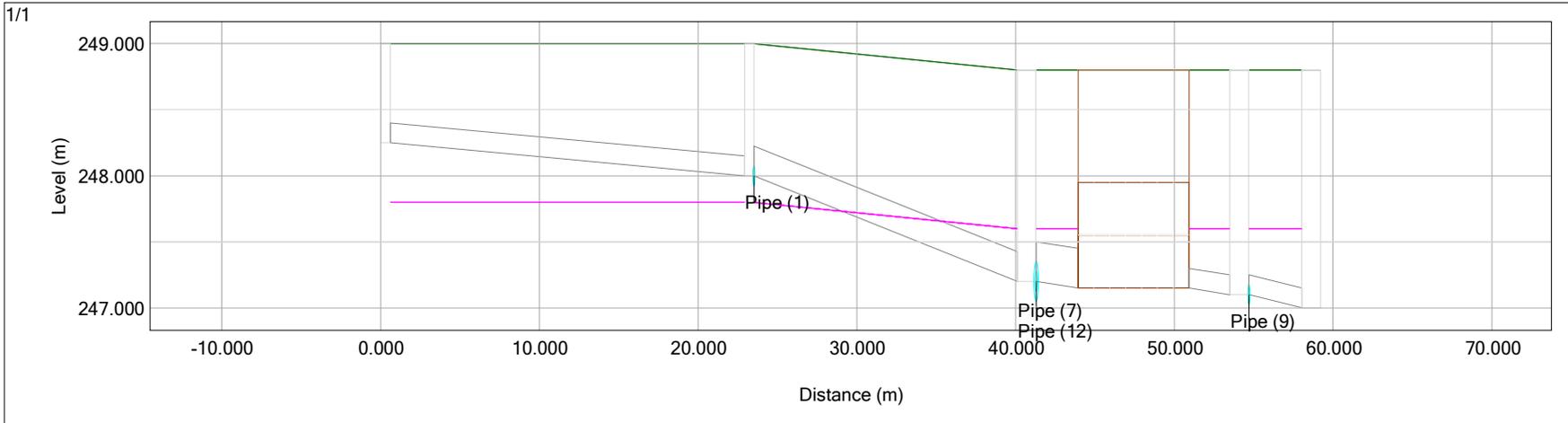
Modified date 06/07/2022
File The croft.iddx

Designed by mark0
Checked by

InfoDrainage 2024.5.1

Profile - Flow Path (1)

Horizontal Scale 1:386, Vertical Scale 1:48



Junction	SWMH04	SWMH03	SWMH09	SWMH10
Type	Manhole	Manhole	Manhole	Manhole
CL (m)	249.000	249.000	248.800	248.800
IL (m)	248.250	248.000	247.200	247.100
Connection	Pipe (2)	Pipe (3)	Pipe (4)	Pipe (13)
Type	Pipe	Pipe	Pipe	Pipe
Curved	No	No	No	No
Length (m)	22.316	16.584	2.638	2.557
Diam (mm)	150	225	300	150
Height (mm)				
U/S IL (m)	248.250	248.000	247.200	247.150
D/S IL (m)	248.000	247.200	247.150	247.100
C. Splay (mm)				
SWC			Cellular Storage	
Type			Cellular Storage	
EL (m)			248.800	
BL (m)			247.150	



THE CROFT:

Company Address:

Modified date 06/07/2022
File The croft.iddx

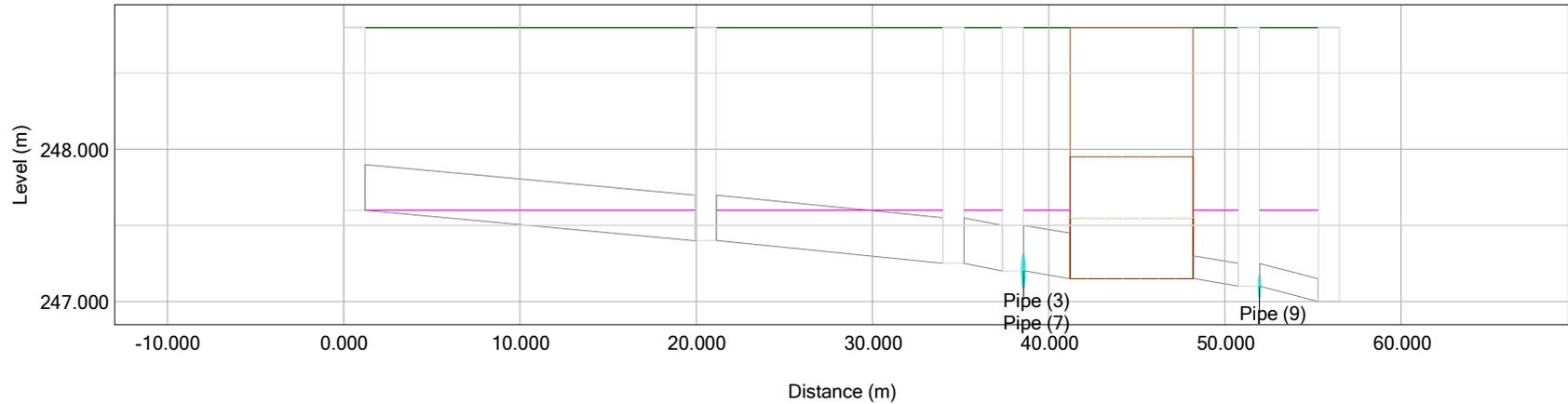
Designed by mark0
Checked by

InfoDrainage 2024.5.1

Profile - Flow Path (3)

Horizontal Scale 1:360, Vertical Scale 1:43

1/1



Junction	RMH01	RM02	RMH03	SWMH10
Type	Manhole	Manhole	Manhole	Manhole
CL (m)	248.800	248.800	248.800	248.800
IL (m)	247.600	247.400	247.250	247.100
Connection	Pipe (10)	Pipe (11)	Pipe (12)	Pipe (13)
Type	Pipe	Pipe	Pipe	Pipe
Curved	No	No	No	No
Length (m)	18.737	12.857	2.169	2.557
Diam (mm)	300	300	300	150
Height (mm)				
U/S IL (m)	247.600	247.400	247.250	247.150
D/S IL (m)	247.400	247.250	247.200	247.100
C. Splay (mm)				
SWC				Cellular Storage
Type				Cellular Storage
EL (m)				248.800
BL (m)				247.150



THE CROFT:

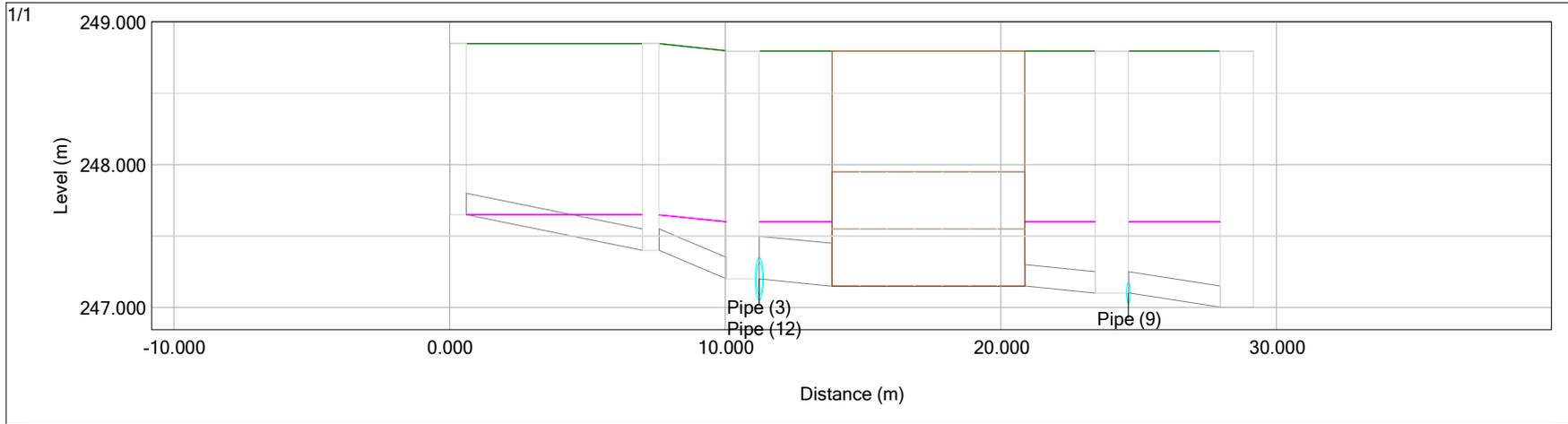
Company Address:

Modified date 06/07/2022
File The croft.iddx

Designed by mark0
Checked by
InfoDrainage 2024.5.1

Profile - Flow Path (4)

Horizontal Scale 1:222, Vertical Scale 1:44



Junction	SWMH05	SWMH06	SWMH09		SWMH10	COMBINED
Type	Manhole	Manhole	Manhole		Manhole	Manhole
CL (m)	248.850	248.850	248.800		248.800	248.800
IL (m)	247.650	247.400	247.200		247.100	247.000
Connection		Pipe (6)	Pipe (7)	Pipe (4)	Pipe (13)	Pipe (5)
Type		Pipe	Pipe	Pipe	Pipe	Pipe
Curved		No	No	No	No	No
Length (m)		6.392	2.443	2.638	2.557	3.332
Diam (mm)		150	150	300	150	150
Height (mm)						
U/S IL (m)		247.650	247.400	247.200	247.150	247.100
D/S IL (m)		247.400	247.200	247.150	247.100	247.000
C. Splay (mm)						
SWC					Cellular Storage	
Type					Cellular Storage	
EL (m)					248.800	
BL (m)					247.150	