FLOOD RISK CONSULTANCY LIMITED

Level 2 Flood Risk & Drainage Impact Assessment

Trub Road, Manchester Road Castleton

Client: North West HA Projects Ltd

Report No: 20054-A

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APPRAISING, MANAGING & REDUCING FLOOD RISK

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Contract

This report describes work commissioned by Cedric Ulett Nortth West HA Projects Ltd. Donna Metcalf of Flood Risk Consultancy Limited (FRC) carried out the work.

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Disclaimer

This document has been prepared solely as a Flood Risk Assessment for North West HA Projects Ltd. Flood Risk Consultancy Limited accepts no responsibility or liability for any use that is made of this document other than by the Clients for the purposes for which it was originally commissioned and prepared.

Executive Summary

Flood Risk Consultancy Ltd has been appointed by North West HA Projects Ltd to provide a detailed flood risk and drainage impact assessment to support development of a site on the corner of Trub Road and Manchester Road, Castleton, to provide residential development.

Proposals involve the construction of 1 No. new-build dwelling to provide a total of 17no apartments:

The proposed development area covers 0.107 Hectares and is shown to lie within fluvial Flood Zone 1.

An initial review indicates that the primary sources of flood risk to the proposed development are:

An initial assessment indicates that the primary source of flood risk to the site is:

- Fluvial – culverted watercourse i.e. Trub Brook
- Pluvial – surface water flooding

Sequential Test

The development area is concluded to have a low risk of flooding from all sources; and therefore, the site passes the Sequential Test.

Fluvial: River flooding

Trub Brook is shown to start at a series of reservoirs located to the rear of Trows Lane and flows in a westerly direction. As the brook flows under Manchester Road it appears to be culverted and therefore the flood mechanisms associated with the watercourse relate to insufficient capacity of the culvert to convey flows; or impairment of capacity resulting from structural collapse or blockage.

The watercourse is classified as Ordinary Watercourse; and flood risk management associated with Trub Brook lies with the Lead Local Flood Authority i.e. Rochdale Borough Council.

Due to the rural nature of the watercourse, there are no modelled levels for associated with flooding at the location of the development.

Long-term mapping indicates flood risk associated with surface water; and also, smaller watercourses, which may not be included within the fluvial flood map.

Therefore, evaluation of flood risk from Trub Brook is continued within the assessment for pluvial flooding.

Pluvial: Surface Water Flooding

Mapping indicates that the areas surrounding the site are subject to low, medium and high-risk of flooding; however, the application site itself is not affected.

In conclusion, the risk from both fluvial and pluvial flooding at the application site is low.

Pluvial: Management of Surface Water Runoff

Additional roof and hardstanding areas within the site will result in an increase in surface water runoff.

Building Regulations and the NPPF require surface water runoff to be managed sustainably, utilising the hierarchy i.e. infiltration, watercourse, sewer.

A desk-top assessment concluded that dissipation to ground using infiltration methods may be feasible and therefore it is recommended that percolation testing in accordance with BRE Digest 365 is undertaken at the site.

Minimum development control standards for flood risk (Leeds City Council) requires that runoff to sewer or watercourse from brownfield development is restricted to 140l/s/ha for connected, drained areas only; otherwise greenfield runoff rates will apply.

Assessment of the drained areas within the Manor House Farm site results in a greenfield runoff rate of 1.4l/s. A betterment of 30% is required, which reduces outflow to1l/s.

With application of 40% climate change allowance, it is considered that on-site attenuation of surface water runoff will be required.

Evaluation of various SUDS features indicates that permeable paving be considered for inclusion within the drainage strategy.

Consideration should be given to green roof or rainwater harvesting solutions, which offer to reduce the surface water runoff volume leaving the development.

Outflow to an existing 300mm diameter combined sewer traversing the site will need to be regulated using a Hydrobrake or similar device; and is subject to approval from United Utilities.

Foul Flows

Foul drainage from the development will be conveyed to an existing 300mm diameter public combined sewer located in proximity to the site in Montrose Street.

Easements:

- 6m either side of the culverted watercourse
- 3m either side of the public sewer

New Connections:

- New connections or works within the statutory easement for the culverted watercourse will require Land Drainage Consent from the LLFA i.e. Rochdale Borough Council.
- Any new connections to the public combined, foul or surface water sewer are subject to a section 106 agreement with United Utilities in accordance with the Water industry Act 1991.

Management & Maintenance:

The management and maintenance responsibilities will be retained under private ownership:

- Management Company should be set up to maintain drainage assets within the communal areas of the site

Mitigation Measures:

- FFL's to be set a minimum of 0.15m above external ground levels

Recommendations:

- Percolation testing in accordance with BRE Digest 365 is undertaken

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1.0 Introduction

1.1 Terms of Reference

Flood Risk Consultancy Ltd has been appointed by North West HA Projects Ltd to provide a Flood Risk & Drainage Impact Assessment in support of proposals for redevelopment at their site at Trub Road, Manchester Road, Castleton, OL1 12T, for residential use.

The red-line site boundary covers a gross area 0.1077 Hectares; and is shown to be located within Flood Zone 1; and therefore, initially it is considered that the application site has a low risk of flooding associated with fluvial sources.

It is highlighted that the site is in close proximity to Trub Brook, which runs from a group of reservoirs located to the east across the south of the site to the west. As such there is a perceived flood risk associated with this source which will require assessment.

Long-term mapping, indicates that there is a low risk of pluvial flooding (surface water); within the site development boundary; however, there is some risk associated with this source of flooding near to the south boundary of the site.

Definitions of the different Flood Zones are provided within Section 2.2.2 of this report.

Development within Flood Zones 2 or 3; commercial development in excess of 1.0 Hectare; or residential development with proposals for more than 10no dwellings, or an area greater than 0.5 Hectares; are required to have a flood risk assessment.

1.2 Objectives

The objective of this assessment is to evaluate the following issues in regard to flood risk at the application site.

- Suitability of the proposed development in accordance with current planning policy.
- Identify the risk to both the proposed development and people from all forms of flooding.
- Recommendation of appropriate measures to mitigate against flooding both within the proposed development, and neighbouring land and property.

1.3 Data Sources

This assessment is based on desk-top study of information from the following sources:

- National Planning Policy Framework (Updated 24th July 2018)
- Planning Practice Guidance at www.gov.uk (March 2014)
- Building Regulations Approved Document H
- Environment Agency Flood Mapping
- Rochdale Borough's Strategy for Flood Risk Assessment (2014)
- North West River Basin District – Flood Risk Management Plan 2015 – 2021 – Part B – Sub areas in the North West River Basin District (2016)
- Rochdale Adopted Core Strategy (October 2016)
- British Geological Society – Historic Borehole Logs
- Cranfield University's Soilscape Viewer
- CIRIA C697 The SUDS Manual

- Internet search
- Flood Map for Planning
- MicroDrainage Windes
- Long Term Flood Risk Maps
- www.data.gov.uk

2.0 Planning Policy Context

2.1 Approach to the Assessment

Development plans for Trub Road is construction of a new 3 storey building housing 17No. apartments.

The Level 2 Flood Risk Assessment has been prepared to investigate the risk of flooding from all sources at the application site.

A Level 2 Scoping Study is designed to provide a quantitative; and qualitative appraisal of flood risk both within the application site and any potential impact that the development will have on flood risk elsewhere; and provide recommendations for mitigation measures which may be included within the design of the development to reduce the overall risk of flooding.

An initial assessment indicates that the primary source of flood risk to the site is:

- Fluvial – culverted watercourse i.e. Trub Brook
- Pluvial – surface water flooding

Consideration has also been given to the site flooding from secondary sources such as groundwater; artificial water bodies; infrastructure failure; overland flow and ponding.

2.2 National Planning Policy Framework (NPPF Updated 2018)

The requirements for undertaking site specific flood risk assessments are generally as set out in NPPF Guidance – Flood Risk & Coastal Change (www.gov.uk).

The information provided in the flood risk assessment should be credible and fit for purpose.

Site-specific flood risk assessments should always be proportionate to the degree of flood risk and make optimum use of information already available, including information in a Strategic Flood Risk Assessment for the area, and the interactive flood risk maps available on the Environment Agency's website.

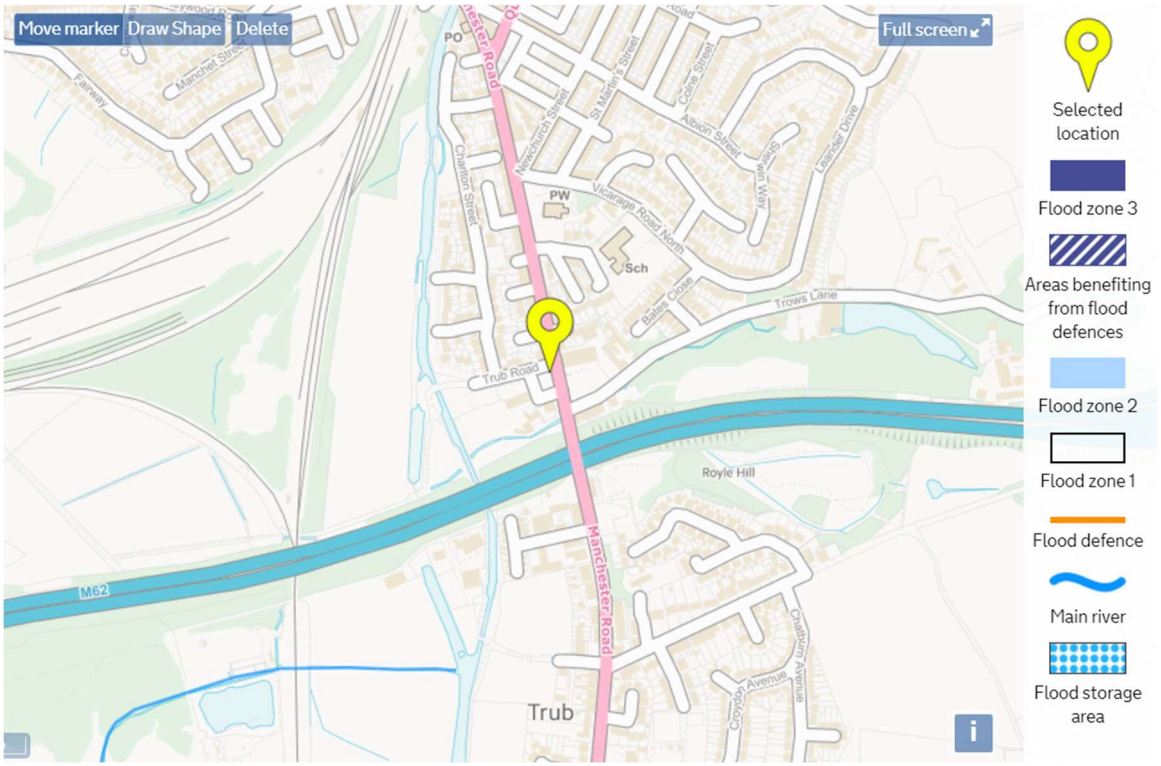
A flood risk assessment should also be appropriate to the scale, nature and location of the development.

2.2.1 Sources of Flooding

- **Rivers (fluvial):** Flooding occurs when flow within river channels exceeds capacity; and the type of flood event experienced e.g. flash flooding; depends upon the characteristics of the river catchment.
- **The Sea (tidal):** Flooding at low lying coastline and tidal estuaries is caused by storm surges and high tides; with overtopping and breach failure of sea defences possible during extreme storm events.
- **Pluvial (surface flooding or overland flows):** Heavy rainfall, which is unable to soak away via infiltration or enter drainage systems can flow overland, resulting in localised flooding. Topography generally influences the direction and depth of flooding caused by this mechanism.
- **Groundwater:** Caused when ground water levels rise to the surface; and is most likely to occur in low lying areas underlain by aquifers.

- **Sewers and drains:** Generally, occurs in more urban areas; where sewers and drains are overwhelmed by heavy rainfall or blocked pipes and gullies.
- **Artificial Sources (reservoirs, canals, lakes and ponds):** Reservoir and canal flooding may occur as a result of capacity exceedance or structural failure.

Figure 2.1: Flood Map for Planning



https://flood-map-for-planning.service.gov.uk/

2.2.2 Flood Zones

- **Flood Zone 1:** Low probability (less than 1 in 1000 year (<0.1% AEP) annual probability of river or sea flooding in any year.
- **Flood Zone 2:** Medium probability (between 1 in 100 year (1.0% AEP) and 1 in 1000 year (0.1% AEP) annual probability of river flooding; or between 1 in 200 year (0.2% AEP) and 1 in 1000 year (0.1% AEP) annual probability of sea flooding in any year).
- **Flood Zone 3a:** High probability (1 in 100 year (1.0% AEP) or greater annual probability of river flooding in any year or 1 in 200 year (0.5% AEP) or greater annual probability of sea flooding in any year).
- **Flood Zone 3b:** This zone comprises land where water has to flow or be stored in times of flood. Land which would flood with an annual probability of 1 in 20 (5% AEP), or is designed to flood in an extreme flood (0.1%) should provide a starting point for discussions to identify functional floodplain.

2.2.3 Vulnerability of Different Development Types

- **Essential Infrastructure:** Transport infrastructure (railways and motorways etc…); utility infrastructure (primary sub-stations, water treatment facilities; power stations; and wind turbines).

- **Water Compatible Development:** Flood control infrastructure; water and sewage infrastructure; navigation facilities; outdoor recreational facilities.
- **Highly Vulnerable:** Emergency services; basement dwellings; mobile home parks; industrial or other facilities requiring hazardous substance consent.
- **More Vulnerable:** Hospitals; **residential dwellings**; educational facilities; landfill sites caravan and camping sites.
- **Less Vulnerable:** Commercial premises; emergency services not required during a flood; agricultural land.

2.2.4 Sequential & Exceptions Test

As set out in the National Planning Policy Framework, the aim of the Sequential Test is to steer new development to areas at the lowest probability of flooding.

The Flood Zones are the starting point for the sequential approach.

The Flood Map shows the development site to be located within Flood Zone 1; and as such the Sequential Test does not need to be applied.

2.2.5 Climate Change

The NPPF requires the application of climate change over the lifetime of a development.

Castleton is located within the North West District. The climate change allowances for this district are therefore tabulated below:

Table 1: North West Climate Change Allowances[1]

Parameter	Allowance Category	2015 - 2039	2040 - 2069	2070 - 2115
Peak Rainfall Intensity	Upper end	+ 10%	+ 20%	**+ 40%**
	Central	+ 5%	+ 10%	+ 20%
Peak River Flow	H++	+ 25%	+ 45%	+ 95%
	Upper end	+ 20%	+ 35%	**+ 70%**
	Higher Central	+ 20%	+ 30%	**+ 35%**
	Central	+ 15%	+ 25%	+ 30%

The selection of climate change allowance should be chosen appropriate to the flood zoning, type, vulnerability and expected lifespan of the proposed development.

For assessment purposes, residential development is anticipated to have a design life of 100-years; and; and as such an additional 40% should be applied to peak rainfall intensities to assess the range of impact for this development.

Furthermore for 'more vulnerable' types of development, the latest guidance indicates that the higher central and upper end allowances should be applied to peak river flows, to assess the impact of climate change at the development site over its lifetime i.e. 35% and 70%.

[1] Extracted from Tables 1-4 of the Technical Guidance for flood risk assessments: Climate change allowances Document (February 2016)

2.2.6 Sustainable Urban Drainage Systems (SUDS)

The key planning objectives in the NPPF are to appraise, manage and where possible, reduce flood risk.

For commercial or industrial development of gross area >1.0Hectare, or residential development of 10+ dwellings or within an area >0.5 Hectares; considered as 'major development', the details of how surface water runoff from the site will be sustainably managed must be provided within the details of the planning application.

It is highlighted that development at Trub Road comprises the development of a building to create a total of 17no residential dwellings within the red-line development boundary covering 0.07 Hectares.

Statutory Consultees, the NPPF and Building Regulations Approved Document Part H direct developers towards the use of SUDS wherever possible; and The Floods and Water Management Act 2010 also reinforces the requirements for SUDS to be implemented where practicable.

Part H of the Building Regulations requires that surface water should be discharged from new development in accordance with the following hierarchy in order of preference:

- By infiltration to the ground via soakaway or other infiltration device
- To a watercourse
- To a public surface water sewer

2.2.7 Planning Policy

The Core Strategy sets out the spatial planning framework for the District. Central to its preparation has been the development of an approach which seeks to manage growth in a sustainable way, in balancing the overall, scale, distribution and phasing of development.

The Core strategy was originally adopted in 2016. Relevant policies from the Core Strategy have been extracted from the document and are presented for reference below:

Policy G8: Managing Water Resources and Flood Risk:

We will ensure that new development (including flood risk mitigation measures) does not lead to any form of increased flooding locally or further downstream, does not impede natural water and flood risk management, is not detrimental to existing or potential flood storage areas, contributes where possible to alleviating existing flood risk, is itself well protected from flood risk and ensures prudent use of water resources. We will require:

a. Compliance with a 'sequential' approach to new development and flood risk, directing development away from areas of high risk, in accordance with the National Planning Policy Framework;
b. Full regard to and compliance with the advice of the Environment Agency (or equivalent agency) and the objectives and priorities for flood risk management set out in the Local Flood Risk Management Strategy, including any mitigation measures recommended for particular sites;
c. Full regard to the published evidence of local flood risk and its significance as included in Strategic Flood Risk Assessments, Surface Water Management Plans and other recognised sources of flood risk data and the production of additional Flood Risk Assessments (FRAs) as appropriate;

d. Incorporation of appropriate measures for the management of surface water and flood water, including flood storage areas, Sustainable Urban Drainage Systems (SUDS) and the protection of 'overland flow paths';
e. Compliance with any Surface Water Management Plan or drainage strategies produced, such as for the identified critical drainage areas of Littleborough and Heywood;
f. The avoidance of culverting, and support the opening up of existing culverts wherever possible
g. The incorporation of measures for the conservation of water to minimise potable water consumption, including rainwater collection measures, which should be integral to the design of buildings and spaces;
h. Development that does not directly or indirectly lead to the pollution of existing water resources such as watercourses and groundwater or the derogation of the quality of groundwater;
i. The incorporation of measures to improve water quality; and
j. The taking of opportunities to improve the habitat value of watercourses and water bodies.

In addition, we will identify additional flood storage areas which will be protected from development.

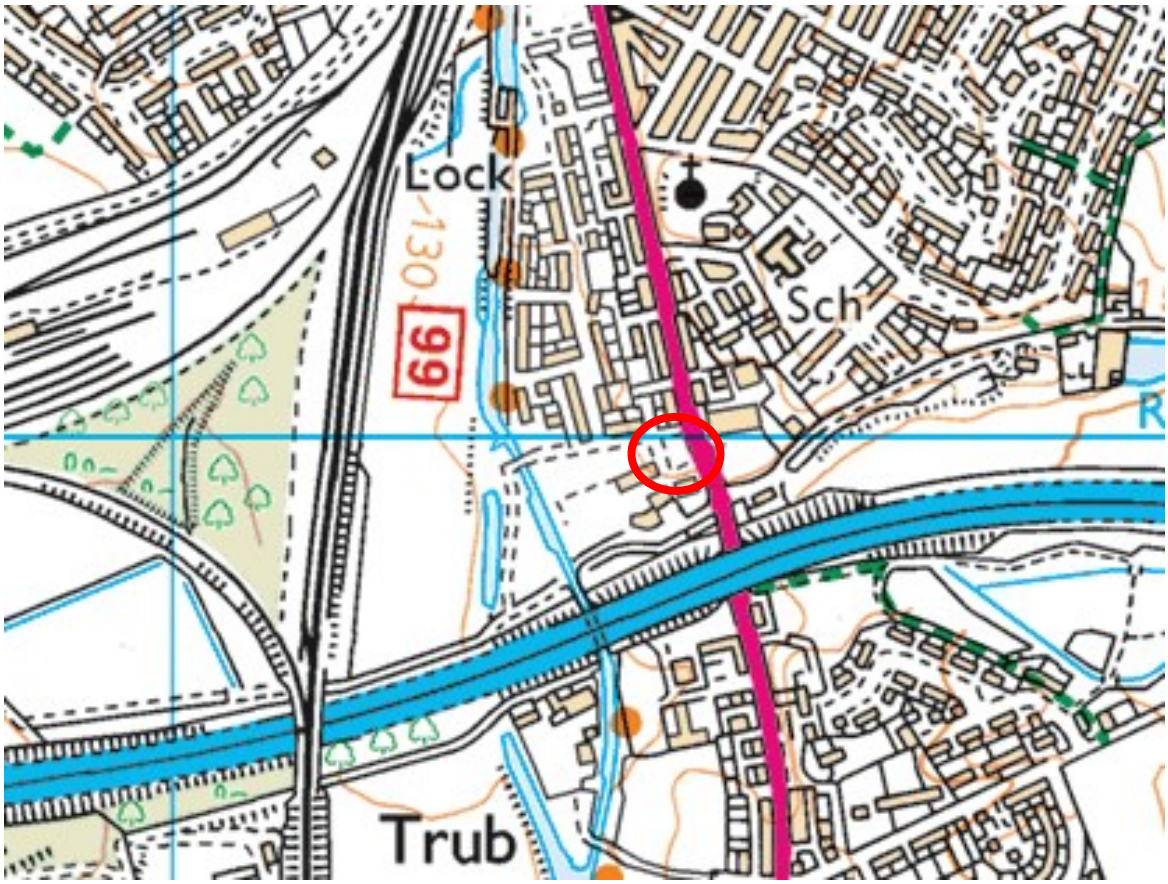
3.0 Details of the Site

3.1 Site Details

Table 2: Development Location

Site Name:	Trub Road, Castleton
Purpose of Development:	Development for Residential Use
Existing Land Use:	Greenfield
OS NGR:	SD 88 40 99
Country:	England
County:	Manchester
Lead Local Flood Authority	Rochdale Borough Council
Local Planning Authority:	Rochdale Borough Council
Critical Drainage Area:	No
Internal Drainage Board:	Not Applicable
Other Authority (e.g. British Waterways/ Harbour Authority)	Not Applicable

Location Plan:



Provided by www.streetmap.co.uk

3.2 Site Description

The site off Trub Road is situated to the north of the area of Castleton, Rochdale; a distance approximating 14km north-east of central Manchester. Topography of the site is relatively flat, although there is a slight slope from the north to the south.

The greenfield site is bounded to the north by Trub Road and to the east by Manchester Road, with OMC Ford Rochdale located to the east and Lomax Transport Services to the west of the application site.

Residential development by Barratt Homes referenced as St Martins View is located to the north side of Trub Road.

Figure 3.1: Existing Site - View from Junction of Manchester Road and Trub Road



Source: Google Maps

An aerial photograph of the site is provided below for reference.

Figure 3.2: Aerial Photograph of Proposed Site Viewed West



Source: Google Maps

3.3 Proposed Development Details

Proposals for the development of the site involve the construction of 1 No. new-build dwelling to provide a total of 17no apartments with an adjoining car park. Detailed development plans are provided within Appendix B of this report:

Figure 3.3: Extract from the Proposed Development Plan



Source: Hattrell Architects

4.0 Historic Flooding

4.1 Bury, Rochdale and Oldham SFRA (2009)

The SFRA document does not indicate any history of flooding within the Castleton area.

4.2 Open Data

The Recorded Flood Outlines and Historic Flood Maps, from the DEFRA Spatial Data Platform, presents no indication of recorded flood incidents within proximity to the application site.

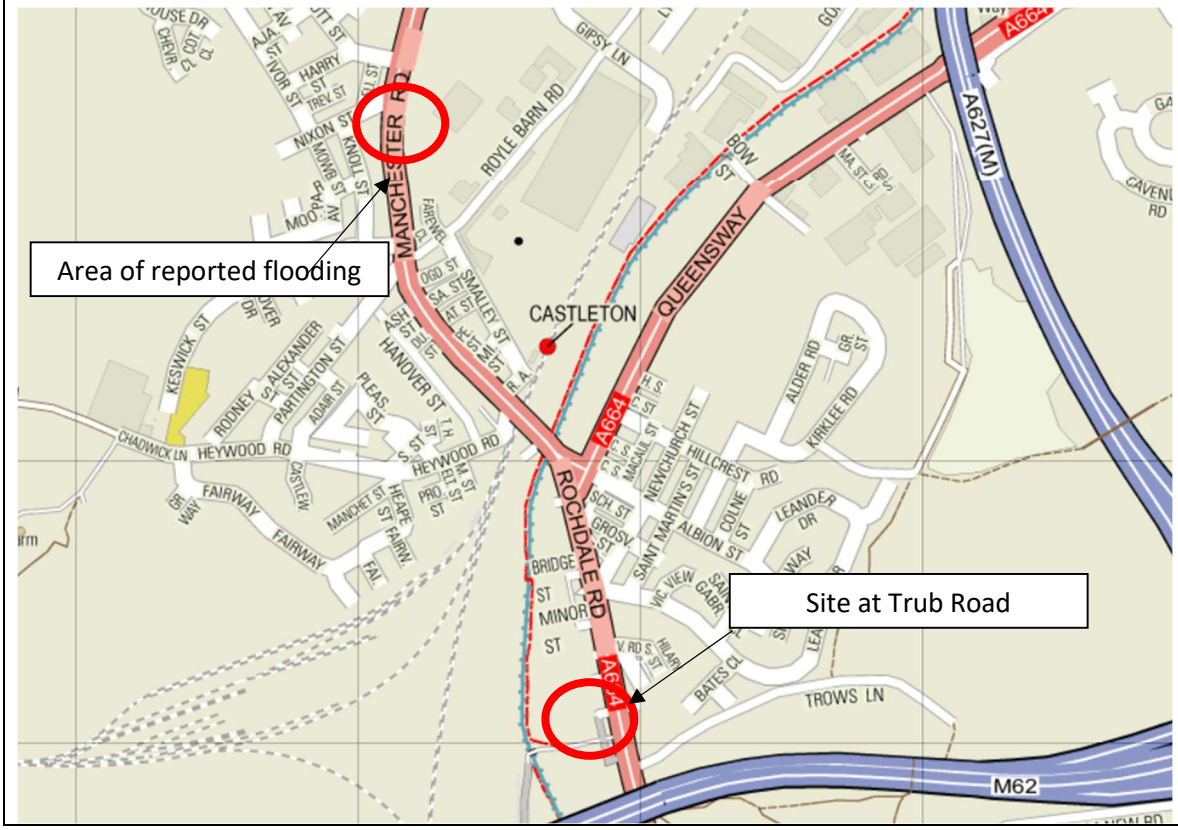
Figure 4.1: Recorded Flood Outlines – Trub Road



4.3 Internet Search

An internet search of flooding in Castleton area has been undertaken and no reports were found in the immediate vicinity. The nearest flooding reported to the site was approximately 1km to the north on Manchester Road next to Nixon Street, (see Figure 4.2). This flooding occurred on the 14th November 2016 and it is understood the cause was blocked drains on the road, mainly from an excess of fallen leaves.

Figure 0.2: Location of nearest flooding relative to Trub Road



5.0 Initial Evaluation of Flood Risk

5.1 The Environment Agency Flood Map

The Environment Agency Flood Map illustrated within Figure 2.1, confirms that proposed development site is located within Flood Zone 1; and overall is considered to have a low risk associated with fluvial flooding.

The definition for each of the flood zones highlighted above is provided for reference within Section 2.2.2 of this report.

5.2 Review of Potential Flood Mechanisms

5.2.1 General Review

Table 3: Possible Flooding Mechanisms

Source/Pathway	Significant?	Comment/Reason
Fluvial	**Yes**	Trub Brook flows from a series of reservoirs located to the east of the site across the south side and into the Rochdale Canal to the west; and the risk of flooding associated with this source should be assessed in further detail.
Tidal/Coastal	No	Application site lies outside the influence of tidal flooding
Canal	**Yes**	Nearest canal to the application site is the Rochdale Canal, which is located 100m west; and the risk of flooding associated with this source should be assessed in further detail.
Artificial Water Sources i.e. canals, lakes and reservoirs	No	Flood Maps[2] indicate the Trub Road development is located outside of the extent where flooding is anticipated to occur in the event of reservoir failure. There are no lakes within close proximity to the development; which are likely to present a flood risk
Groundwater	No	The risk of groundwater flooding is variable across the Rochdale District; however, there is no indication to suggest that the area comprising Trub Road suffers as a result of this flood source.
Pluvial – Surface Water Flood Routes & Ponding	**Yes**	The Long-Term Flood Maps indicate that there is a risk of flooding from this source within the larger extent associated Trub Road; and therefore, further assessment will be required.
Pluvial – Surface Water Runoff	**Yes**	Given the scale of development, and current planning policy, an evaluation of surface water management in accordance with Rochdale Borough Council Development Control Standard will need to be undertaken.

[2] https://flood-warning-information.service.gov.uk/long-term-flood-risk/

Table 3: Possible Flooding Mechanisms

Source/Pathway	Significant?	Comment/Reason
Blockage	**Yes**	Watercourse
Infrastructure failure	No	No pumping; sewage treatment, sluice gates or other such assets noted at the application site, which may fail causing an increase in flood risk.

From the initial assessment it has determined that the flood mechanisms which require further review are:

- Fluvial –watercourse (Trub Brook) & impact of blockage
- Canal – Rochdale Canal
- Pluvial – surface water flooding
- Pluvial – surface water runoff management

6.0 Quantitative Flood Risk Assessment

6.1 National Planning Policy Framework

The flood risk assessment must be undertaken in accordance with the checklist provided within the latest version of the NPPF Planning Practice Guidance.

6.2 Fluvial (Trub Brook) & Pluvial (Surface Water Flooding)

6.2.1 General

Trub Brook is shown to start at a series of reservoirs located to the rear of Trows Lane and flows in a westerly direction to the Rochdale Canal. As the brook flows under Manchester Road it appears to be culverted.

The watercourse is classified as Ordinary Watercourse; and flood risk management associated with Trub Brook lies with the Lead Local Flood Authority i.e. Rochdale Borough Council.

Mapping available from the FEH Web Service indicates that the culvert extends along Trows Lane; under Manchester Road, Rochdale Canal and the M62 before emerging at the north-west of Manchester Golf Course.

The flood risk at the application site therefore is considered to arise as a result from the following mechanisms:

- capacity exceedance associated within the culverted section of watercourse
- operational issues reducing capacity within the culverted watercourse i.e. structural collapse or blockage

6.2.2 Modelled Data

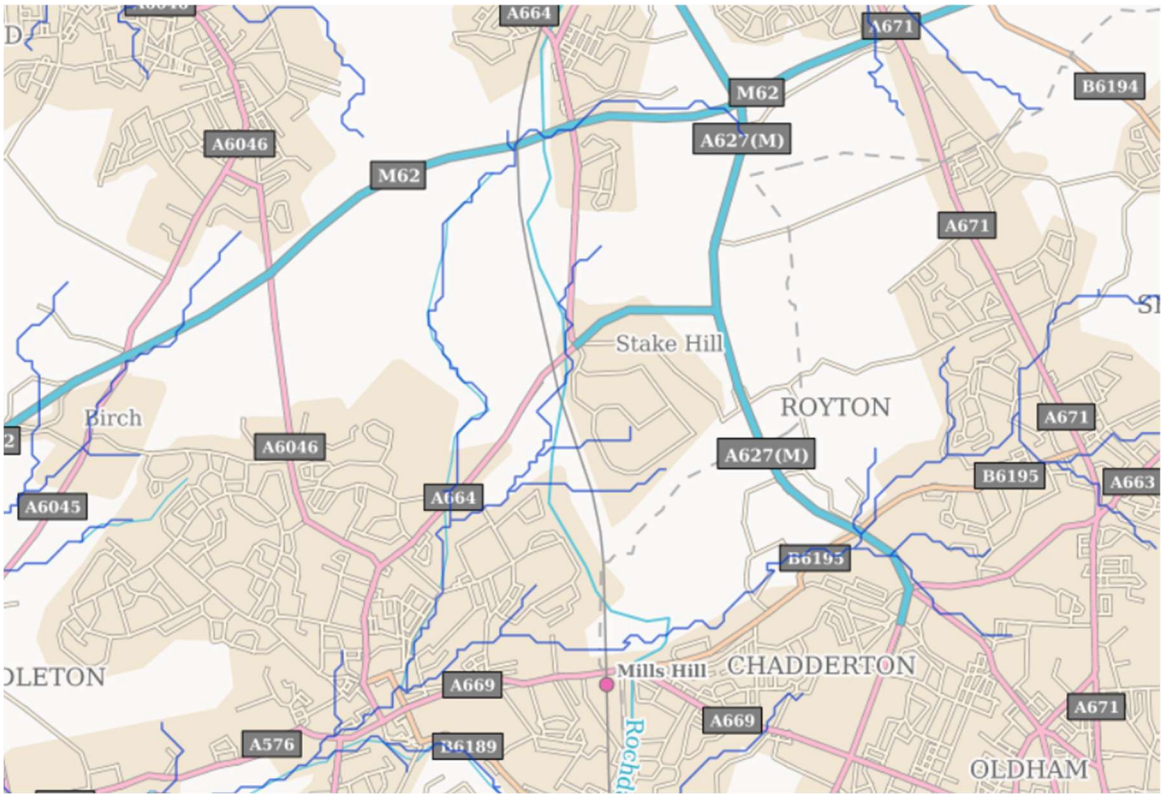
There is no modelled data available for Trub Brook.

It is noted that the Long-Term Flood Maps combine an element associated with the risk of flooding for small Ordinary Watercourses, which are not necessarily incorporated within the Flood Map for Planning or Fluvial Flood Maps, with surface water flood risk.

As such in order to investigate the impact of flood risk associated with Trub Brook, detailed surface water flood mapping has been reviewed within Section 6.3 overleaf.

A map has been extracted from the FEH (Flood Estimation Handbook) Web Service, which illustrates the route of Trub Brook as it flows through Castleton, and southwards, where it becomes Whit Brook to the south side of Stanycliffe Bridge. The watercourse continues generally southwards through Middleton, where it connects with the River Irk at Spring Vale.

Figure 6.1: FEH Web Service Map of Trub Brook Drainage Route



6.3 Pluvial: Surface Water Flooding

6.3.1 General

The surface water flood map indicates that flooding typically follows the route of Trub Brook, along the open channel section upstream, through the culverted section to the south of Trub Road; and again, within the open channel section downstream of the application site.

Within proximity to the application site, flooding is shown to occur during the high, medium and low risk flood events; and appears to be concentrated along the book itself.

A map indicating the flood risk associated with surface water flooding is provided for reference overleaf.

6.3.2 High Risk Surface Water Flooding

Definition: means that each year this area has a chance of flooding of greater than 3.3% i.e. 1in 30-year return period.

Flooding is shown to occur along the brook, and within Montrose Street top the south of the proposed site, but does not encroach into the site itself.

The area of flooding appears to be situated at a location where a weir is present before the brook is culverted under Rochdale Canal. This suggests the possibility of flooding caused by backflow, resulting from restrictions downstream for the culvert under Manchester Road.

A copy of the detailed map is provided within Figure 6.3 for reference.

Figure 6.2: Surface Water Flood Map



Figure 6.3: High Risk Surface Water Flood Map



6.3.3 Medium Risk Surface Water Flooding

Definition: means that each year this area has a chance of flooding of between 1% and 3.3% i.e. between the 1 in 30-year, and 1 in 100-year return periods.

Flooding is shown to extend along the route of the watercourse, and at the west end of Trub Lane; however, no flooding is indicated within the red-line development boundary of the application site.

A copy of the detailed map is provided below for reference.

Figure 6.4: Medium Risk Surface Water Flood Map



6.3.4 Low Risk Surface Water Flooding

Definition: means that each year this area has a chance of flooding of between 0.1% and 1% i.e. between the 1 in 100-year, and 1 in 1000-year return periods.

During the extreme surface water flood event, the flooding around the site is again extended in comparison to the 1 in 100-year event; with areas of flooding linking together though low areas of local topography to create a flow along Trows Lane, exiting the industrial unit to the west of the site.

Again, capacity issues within the receiving culverted watercourse to accept significant flows generated by the extreme surface water flood event are considered to cause the risk of flooding from this source. Flooding is not shown to encroach into the application site.

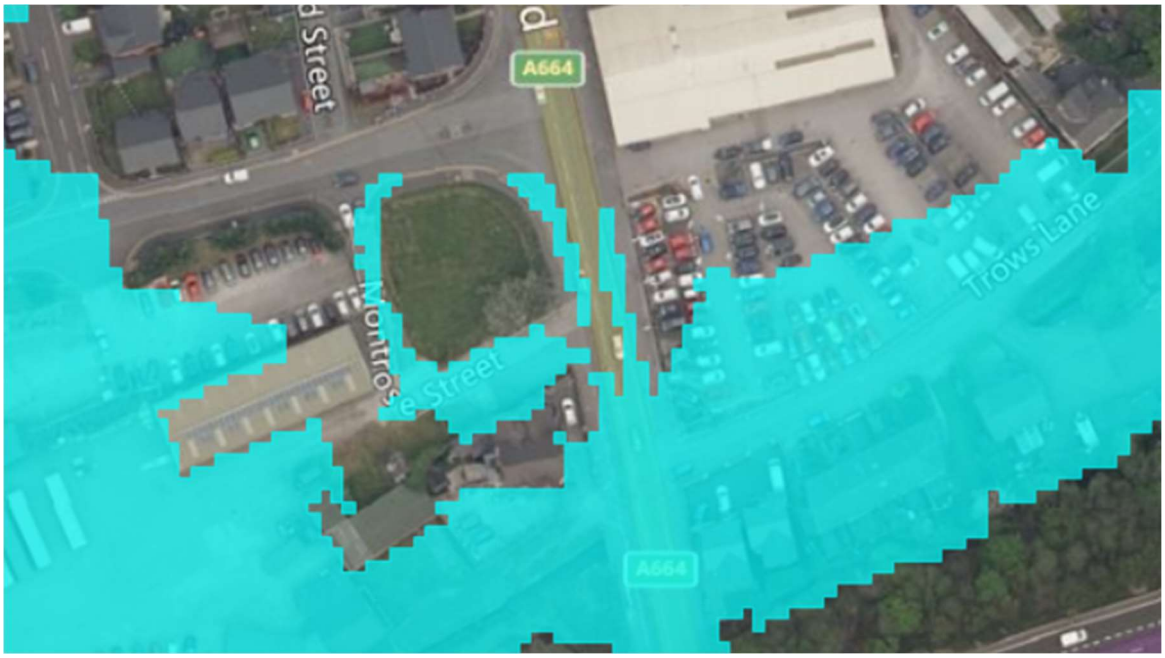
A copy of the detailed map is provided overleaf for reference.

6.3.5 Conclusion

There is a very low risk from surface water flooding within the application site; however, the risk is increased within Montrose Street, along the south boundary of the site for the medium and high-risk events; with surface water flooding anticipated to increase around the perimeter of the site for the low risk event.

Any emergency routing from the site, in the event of extreme surface water flooding, should take this into consideration.

Figure 6.5: Low Risk Surface Water Flood Map



6.4 Surface Water Runoff Management:

6.4.1 Introduction

Surface water management for proposed development should follow the requirements of the NPPF and Lead Local Flood Authority.

Rochdale Borough's Strategy for Flood Risk Management was updated in 2014; and has been utilised to inform this assessment.

6.4.2 Existing Drainage Provision

United Utilities Public Sewer Network:

Sewer records for the area surrounding the Trub Road site indicate that there is a 300mm diameter combined sewer serving Manchester Road, which flows in a south direction adjacent to the east boundary of the site, and then turns west along Montrose Street. Here the sewer connects with a 450mm diameter combined sewer flowing in a southerly direction to the west of the site. The continuation combined sewer then becomes 525mm diameter and flows in a westerly direction.

Existing On-Site Drainage Regime:

As the current site is undeveloped, there is no drainage within the boundary. However, looking at the UU records, there appears to be a connection ready for the site at manhole 4902 to the south. It is understood that this connection serviced a previous development located at the site, which appears to have been demolished more than five years ago.

6.4.3 Management Hierarchy

The NPPF and Building Regulations Approved Document H requires that the following hierarchy is applied to surface water runoff from new development:

- Infiltration – discharge to ground e.g. soakaways
- Watercourse
- Sewer
    - Surface water
    - Combined

Infiltration:

A site investigation report is not currently available; and therefore, in order to assess the suitability for infiltration a simple desk-top assessment has been undertaken.

British Geological Society Mapping indicates superficial deposits of sand and gravel; overlying a bedrock of mudstone, siltstone and sandstone.

Reviewing historic borehole logs in proximity to the development the closest is located in the grounds of the transport services to the west of Trub Lane; and provides the following information:

- SD80NE102 – Castleton Sewer A8
- Easting: 388410; Northing: 409980
- Norwest Holst Soil Engineering Ltd, 13/09/1982
- Depth = 6m
- Made Ground – Loose ash 0.0-0.7m
- Loose brown fine to medium sand 0.7-1.3m
- Medium dense brown sandy, medium to coarse gravel 1.3-2.7m
- Very loose orange-brown fine to medium sand 2.7-6.0m
- Dry Borehole

Soilscape maps produced by the Cranfield Soil and Agrifood Institute at Cranfield University indicate that the site at Trub Road is underlain by Soil Type 10, which is described as freely draining slightly acid sandy soils.

Overall is considered that soakaways or other infiltration methods may be suitable to offset any increase in surface water runoff attributable to the site, as a result of climate change over the design life of the project; or by proper management of surface water runoff from roof areas.

Recommendation: Soakway testing to BRE Digest 365 is recommended prior to the detailed design stage of the project, to determine the feasibility for infiltration methods, and establish design infiltration rates at the development site.

Watercourse:

In the event that infiltration of ground within the development is insufficient to dissipate surface water runoff to ground, then in accordance with the management hierarchy, surface water should be directed to discharge to watercourse i.e. Trub Brook.

It is highlighted that although the watercourse lies only a short distance from the applications site; the route to the watercourse, would require a dedicated surface water sewer routed through an existing industrial site i.e. Lomax Transport Services; or along the A665 Manchester Road. Both routes are considered to present significant challenges with regard to traffic management, business disruption and cost. Consequently, it is considered that discharge to

watercourse is not feasible for this development and therefore it is recommended that surface water runoff is directed to the public sewer; subject to approval from United Utilities.

Sewer:

There is no separate surface water sewer within the area of Trub Lane.

Surface water runoff will be directed to an existing combined sewer connection, located along the south boundary of the site.

6.4.4 Conclusion

All surface water runoff from the application site should be managed using infiltration methods, or if this is not feasible, directed to the surface water sewer traversing the site to discharge to watercourse.

6.4.5 Existing Discharge/Runoff Rates

Greenfield runoff rates have been calculated using the ICP SUDS Method within MicroDrainage Source Control.

- QBAR = 0.7 l/s
- 1 in 1-year = 0.6 l/s
- 1 in 30-year = 1.2 l/s
- 1 in 100-year = 1.4 l/s

In the event that infiltration is not feasible, existing greenfield runoff rates must not be exceeded, any flows in excess of this must be attenuated on site.

6.4.6 Proposed Drained Areas

The development plan indicates that 1 No. 3 story building will be constructed to provide 17No. residential dwellings; with car parking area.

As there is currently no drained are within the site all flows will need to be attenuated on-site.

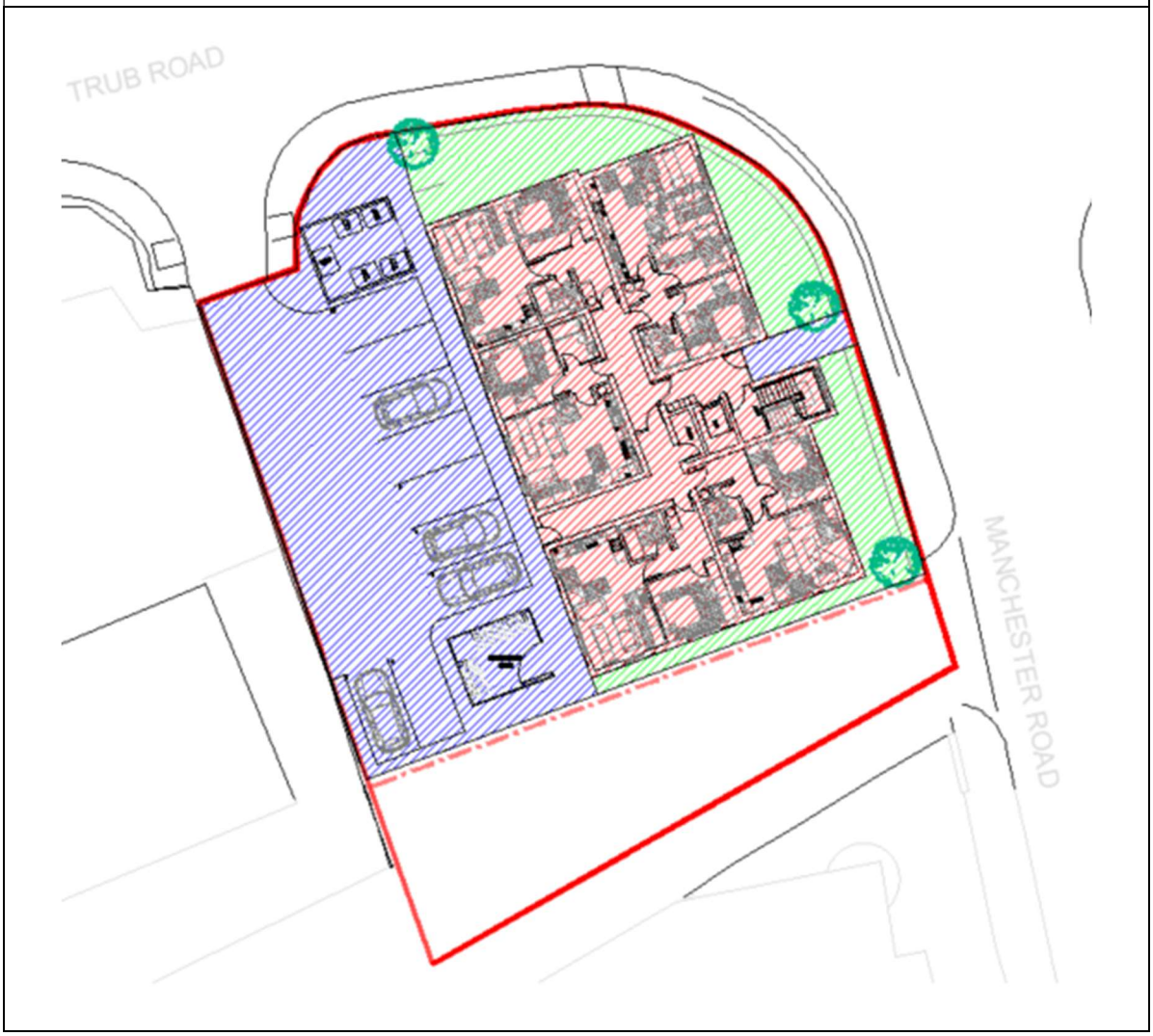
Figure 6.6 overleaf, illustrates a preliminary assessment of drainage areas for the proposed scenario.

Drained Area:

- Total Area (Red-line Boundary) = 0.1077Ha
- Grass/landscaping (green hatch) = 0.0166Ha
- Roof (drained red hatch) = 0.0443Ha
- Paving (concrete/tarmac 100% impermeable blue hatch) = 0.0467Ha
- Drained area = 0.0910Ha

Recommendation: It is recommended that areas of hardstanding, such as the car park and pavement areas within the site are surfaced using permeable materials, wherever practicable.

Figure 6.6: Drained Areas – Proposed Site



6.4.7 Climate Change

A climate change allowance of 40% must be applied to rainfall values for residential development.

6.4.8 Attenuation Requirements

As a soakaway is being proposed, attenuation is not required.

6.4.9 Evaluation of SUDS

The surface water drainage system serving any new development should be designed in accordance with CIRIA C753 The SUDS Manual; Building Regulations Approved Document H; the Interim Code of Practice for SUDS, and the latest guidance for the adoption of sewers by the Sewerage Authority:

- No surcharging of the drainage system in the 1 in 1 or 2-year storm
- Surcharge but no surface flooding in the 1 in 30-year storm

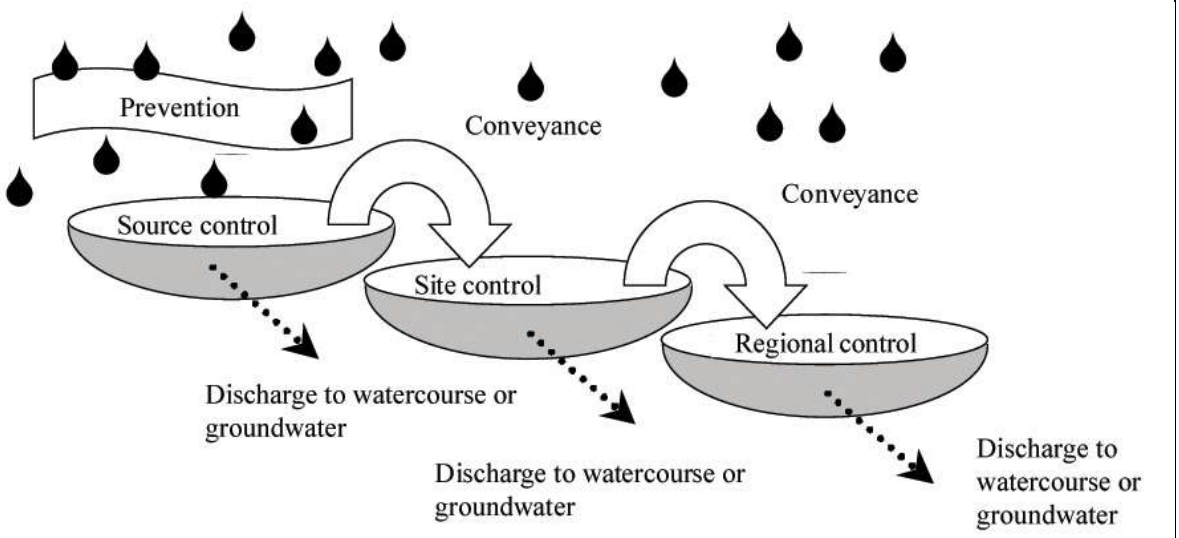
- No internal flooding of properties in the 1 in 100-year + 20% & 40% climate change storm events

Table 4: SUDS Appraisal

SUDS Group	Type	Comment
Retention	Pond	The proposed plan indicates that there is not enough space available on-site to attenuate surface water runoff using a retention basin, however sub-surface storage could be a possibility prior to discharge to the culverted watercourse.
	Sub-surface Storage	
Wetland	Shallow Wetland	Borehole logs suggest that groundwater levels are fairly deep in the Trub area and therefore wetland are not considered to be suitable at the location of the application site.
	Extended Detention Wetland	
	Pond	
	Pocket Wetland	
	Submerged Gravel	
	Wetland Channel	
Infiltration	Infiltration Trench	Infiltration of additional surface water runoff generated as a result of climate change and the requirement to provide a betterment on the existing situation is the preferred option; however, is subject to soakway testing in accordance with BRE Digest 365. Dissipation of runoff the ground should be the first option for any detailed drainage design works to service the proposed development.
	Infiltration Basin	
	Soakaway	
Filtration	Surface Sand Filter	Limited space availability for surface and sub-surface sand filter systems, which are typically utilised for commercial and industrial development to provide an element of pollution control.
	Sub-surface sand filter	
	Bioretention	
	Filter strips and trenches	
Detention	Detention Basin	The proposed plan indicates that there not sufficient space available for placement of a detention basin on-site.
Swales	Conveyance Swale	Limited space availability within the areas of redevelopment within the site
	Enhanced Dry Swale	
	Enhanced Wet Swale	
Source Control	Green Roof	Provides interception storage for first flush of rainfall; and can act to offset any increase in surface water runoff volume generated as a result of the development in accordance with the Interim Code of Practice for SUDS and the NPPF. Such systems should be considered to application at the
	Rainwater Harvesting	

		proposed residential development, in order to provide additional benefit in the reduction of surface water runoff permitted to leave the site.
	Permeable Pavements	It is highly recommended that permeable surfacing is utilised throughout the site in order to minimise any increase in surface water runoff volume permitted to leave the development; and reduce the on-site attenuation requirement.

Figure 6.7: Typical SUDS Train



Drainage Features – Site Placement:

Large diameter pipes, box culvert or surface water attenuation arrangements, should be sited within access roads, or public open space, again to maintain access for inspection and/or maintenance.

Tank systems for attenuation purposes should be sited within public open space or under car park and driveway areas.

Bioretention areas, basin, and pond areas are ideally placed within proposed landscaped areas throughout the development e.g. areas which have been set aside for public open space.

Source control measures i.e. permeable paving; green roof or rainwater harvesting, should be considered as a practical solution for reducing surface water runoff rates and volumes from the development.

6.4.10 Drainage Strategy – Surface Water

Roof area and the permeably paved area will be directed to a new surface water drainage system. The proposed system involves all run off from these areas being directed to a 50m² geocellular soakaway located under the car park.

6.4.11 Drainage Strategy - Foul

UU records show an existing 300mm diameter combined sewer in Montrose Street with a connection from manhole 4902, which is presumed to be an existing connection for the previous building which was situated on this site.

Looking at the site on google street view, this manhole is not visible, meaning It is possible this manhole is currently buried and is potentially under the footprint of the current proposed design.

The existing combined sewer in Montrose Street will typically have a 3m easement applied, meaning if the building is to be placed over an existing manhole/sewer or within this easement area, a S185 diversion or a building over agreement will need to be obtained.

6.4.12 Management & Maintenance

It is envisaged that the on-site drainage system will be retained under private ownership; with responsibility for management and maintenance lying with:

- Management company to be created in order to facilitate management and maintenance of drainage assets located within the communal areas within the site.

6.4.13 Statutory Easements

The culverted sections of Trub Brook, which is classed as ordinary watercourse, has a statutory easement of 6m either side of the culvert structure.

United Utilities will require a Statutory easement of 3m either side of a foul, combined or surface water public sewer.

6.4.14 New Drainage Connections

New connections to the culverted watercourse or within the easement will require Land Drainage Consent from the LLFA i.e. Rochdale Borough Council.

New drainage connections to the public sewer will require a Section 106 Agreement with United Utilities.

7.0 Mitigation Measures

7.1 Finished Floor/Ground Levels

7.1.1 Development Plots:

The existing buildings are located outside of the area impacted by surface water flood risk; and therefore, the Finished Floor Level for new residential development should be set a minimum of 150mm above external finished ground levels.

7.2 Access and Egress

Due to the potential surface water flood risk within proximity to the site; in the event that flooding of Trub Brook occurs and Local Authority or emergency services ask residents to evacuate from the site, people should be advised to relocated to the north, where the risk from surface water flooding is shown to be lower within the current flood maps.

8.0 Conclusions & Recommendations

Proposals include the construction of 1no three story building to provide a total of 17no new residential dwellings.

The red-line development boundary covers an area of 0.107 Hectares.

The primary source of flood risk to the development is identified to be from:

- Fluvial – culverted watercourse (Trub Brook) & impact of blockage
- Pluvial – surface water flooding
- Pluvial – surface water runoff management

Flood Map:

- Fluvial Flood Zone 1 (low risk)
- Pluvial – surface water flooding
    - Low risk within the proposed development area

Fluvial: Trub Brook flows in culvert to the south west of the proposed site. There are no modelled flood levels for the watercourse. Long-term flood maps provide an indication of flooding from pluvial (surface water) sources. Further assessment was undertaken with reference to mapping provided for pluvial or surface water flooding.

Pluvial: Surface water flooding. Mapping indicates that during the high, medium and low-risk events, surface water flooding is likely to occur at a location beyond the south and west boundaries associated with the proposed development area.

In conclusion, it is considered that the risk of fluvial and pluvial flooding at the application site is low.

Pluvial: Increase in surface water runoff. Additional surface water runoff from the development should be managed sustainably, utilising the hierarchy set out within current design guidance and the NPPF.

Management Hierarchy:

Infiltration: A desk-top assessment concluded that dissipation to ground using infiltration methods may be suitable; and therefore, it is highly recommended that percolation testing in accordance with BRE Digest 365 is undertaken at the site.

Watercourse: In the event that infiltration is not found to provide a feasible management solution, surface water runoff should be directed to watercourse i.e. Trub Brook.

Sewer: No surface water sewers are located in the vicinity of the proposed development.

Climate Change: The required allowance for climate change is 40%.

Preliminary Surface Water Drainage Strategy:

- Rainwater pipes directed to gravity drainage system comprising inspection chambers/manholes, catchpit and pipes.
- Areas of hardstanding to be permeably paved where practical
- Soakaway to be installed under carpark to deal with all surface water flows (subject to percolation testing)

- Preliminary designs show the building to have a flat roof, and therefore a green roof should be considered. This would aid the provision of SUDs at the site and reduce the amount of storage required for the soakaway.

Foul Flows: Foul drainage from the development will be conveyed to the existing 300mm diameter public foul sewer located in proximity to the site access.

Easements:

- 6m either side of the culverted watercourse
- 3m either side of the public sewer

Connections:

- New connections or works within the statutory easement for the culverted watercourse will require Land Drainage Consent from the LLFA i.e. Rochdale Borough Council.
- Any new connections to the public foul or surface water sewer are subject to a section 106 agreement with United Utilities in accordance with the Water industry Act 1991.

Management & Maintenance: the management and maintenance responsibilities will be retained under private ownership.

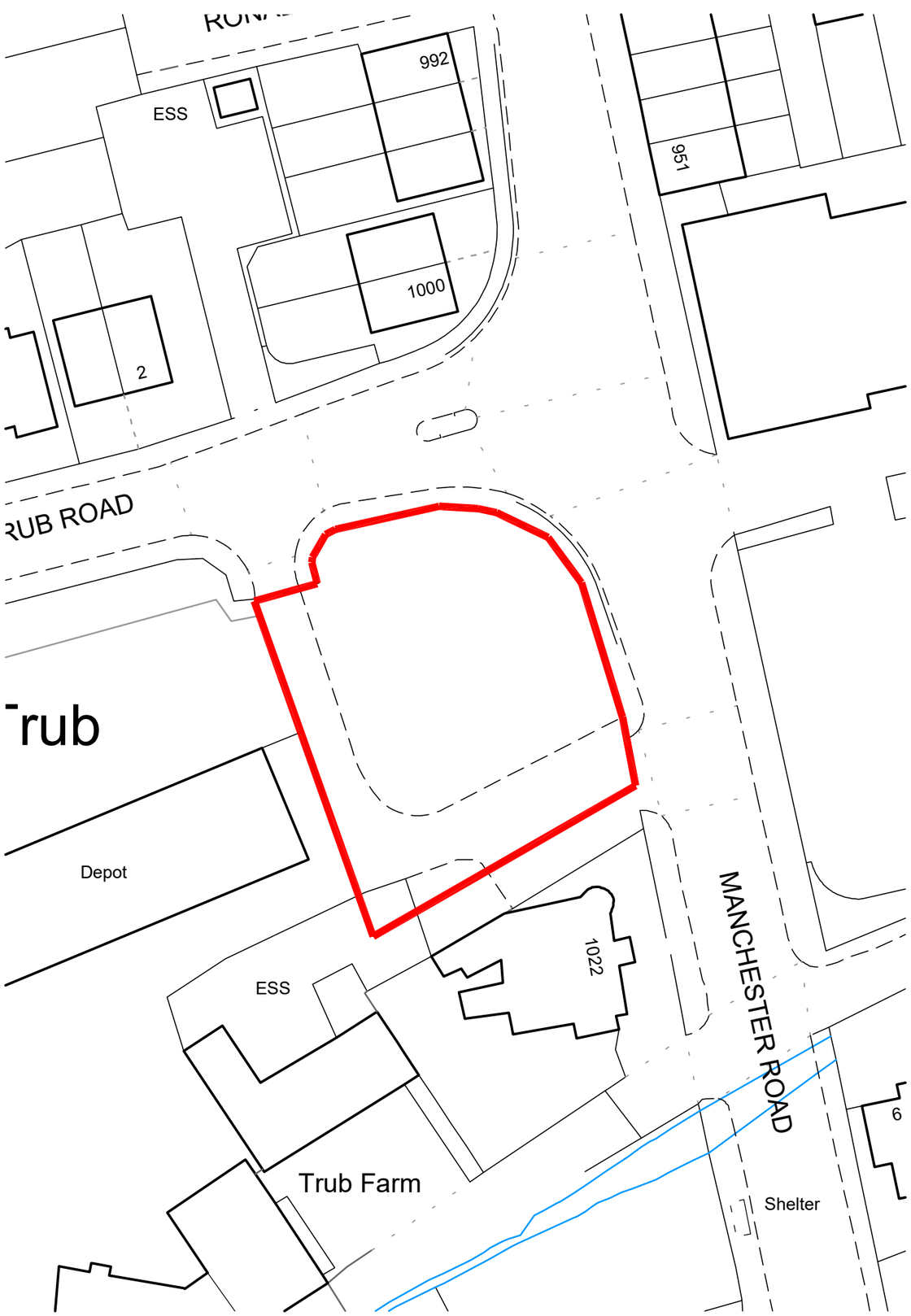
Mitigation Measures:

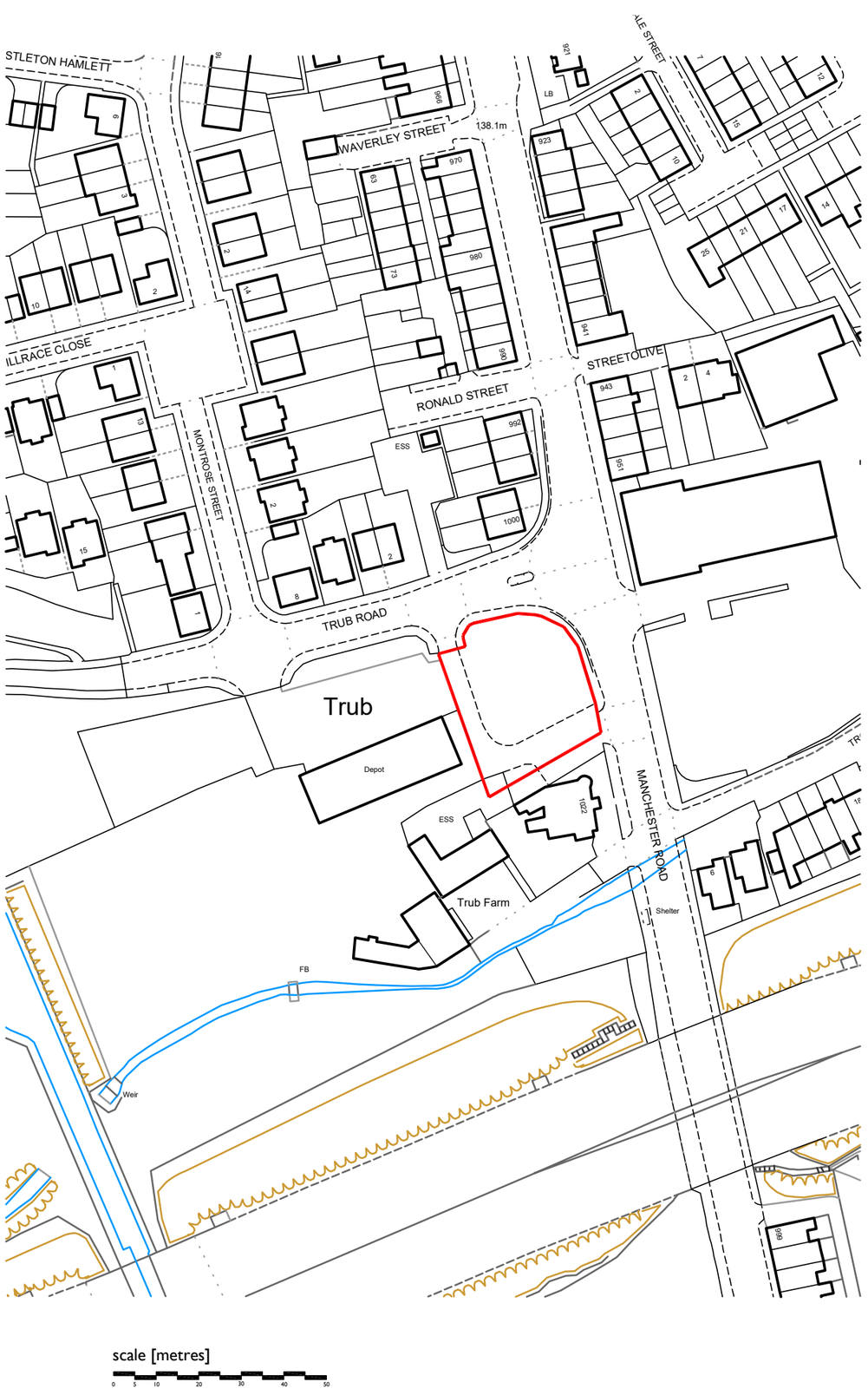
- FFL's to be set a minimum of 0.15m above external ground levels

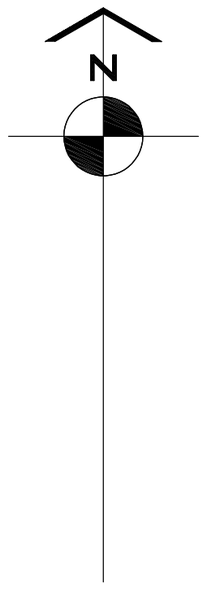
Recommendations:

- Percolation testing in accordance with BRE Digest 365 is undertaken

Appendix A: - Existing & Proposed Development Plans







scale [metres]

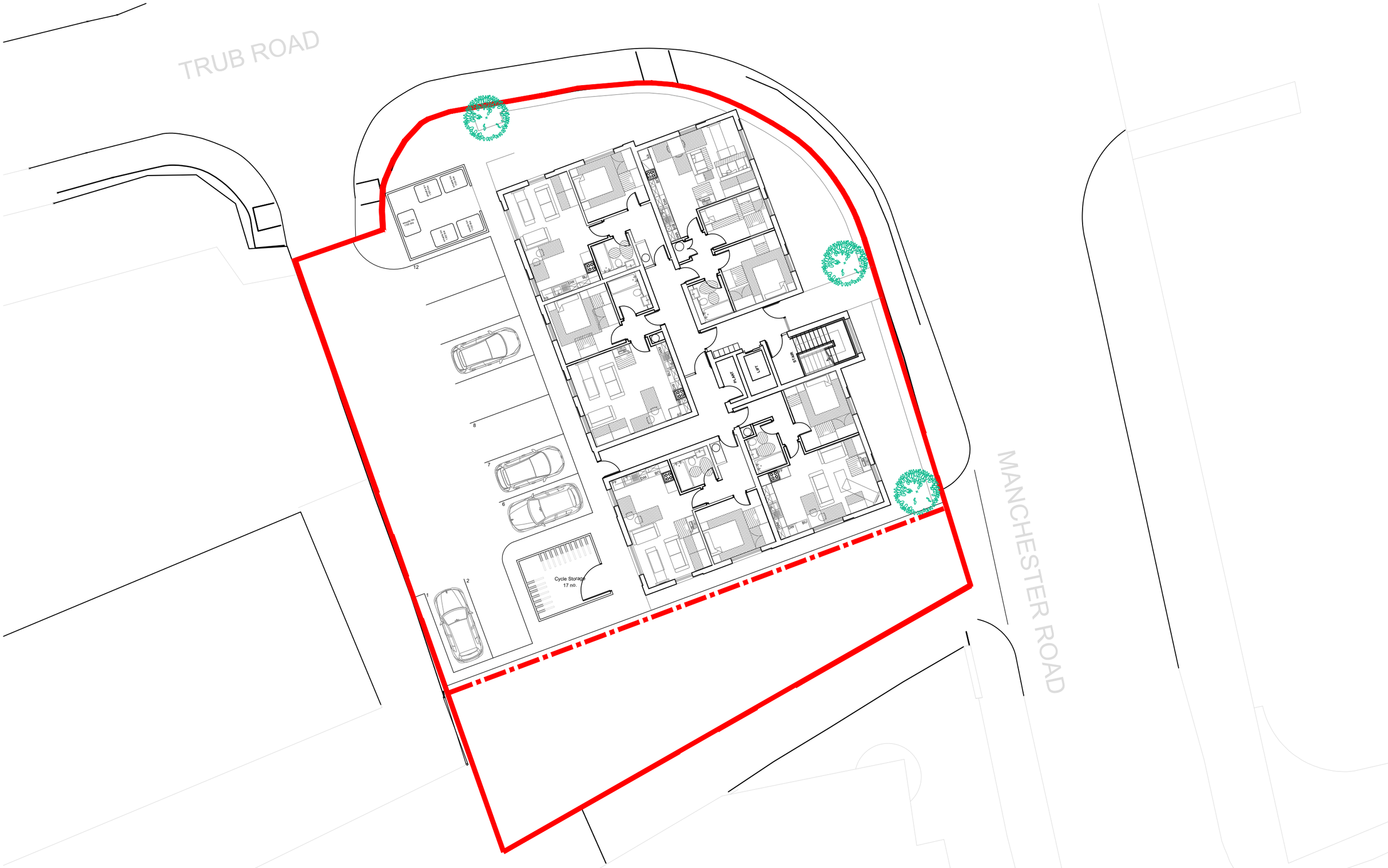
0 5 10 20 30 40 50

Scale 1:1250 @ A3

NORTH WEST HA PROJECTS Ltd

Trub Road, Castleton

HATTRELL DS One Architects LLP
MANCHESTER COVENTRY
Suite D, Kings Court, Railway Street ALTRINCHAM CHESHIRE WA14 2RD
TELEPHONE 0161 236 3521
e-mail: design@hattrellarchitects.com / www.hattrellarchitects.com



REVISION	AMENDMENTS	DATE	CHKD
A	Site boundary amended and building footprint reduced	Nov 20	IS

scale [metres]

0 2 4 6 8 10

Scale 1:200 @ A3

2472.2.001 Rev A - Proposed Site Plan

NORTH WEST HA PROJECTS Ltd

Trub Road, Castleton

HATTRELL DS One Architects LLP

MANCHESTER COVENTRY
Suite E, Kings Court, Railway Street, ALTRINCHAM CHESHIRE WA14 2RD
TELEPHONE 0161 820 4207
e-mail: design@hattrellarchitects.com / www.hattrellarchitects.com

Appendix B: - United Utilities Sewer Records

United Utilities
Water for the North West

How to contact us:

United Utilities Water Limited
Property Searches
Haweswater House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP

Telephone: 0370 7510101

E-mail: propertysearches@uuplc.co.uk

Flood Risk Consultancy Ltd

c54 Northbridge House
c54 Northbridge House, Elm Street
Burnley, Lancashire
BB10 1PD

FAO:

Your Ref: Trub01
Our Ref: UUPS-ORD-206200
Date: 19/10/2020

Dear Sirs

Location: Land at Trub Road

I acknowledge with thanks your request dated 12/10/2020 for information on the location of our services.

Please find enclosed plans showing the approximate position of United Utilities' apparatus known to be in the vicinity of this site.

The enclosed plans are being provided to you subject to the United Utilities terms and conditions for both the wastewater and water distribution plans which are shown attached.

If you are planning works anywhere in the North West, please read United Utilities' access statement before you start work to check how it will affect our network. http://www.unitedutilities.com/work-near-asset.aspx .

I trust the above meets with your requirements and look forward to hearing from you should you need anything further.

If you have any queries regarding this matter please contact us .

Yours Faithfully,

Karen McCormack
Property Searches Manager

United Utilities Water Limited
Registered In England & Wales No. 2366678
Registered Office Haweswater House, Lingley Mere Business Park,
Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP

Water for the North West

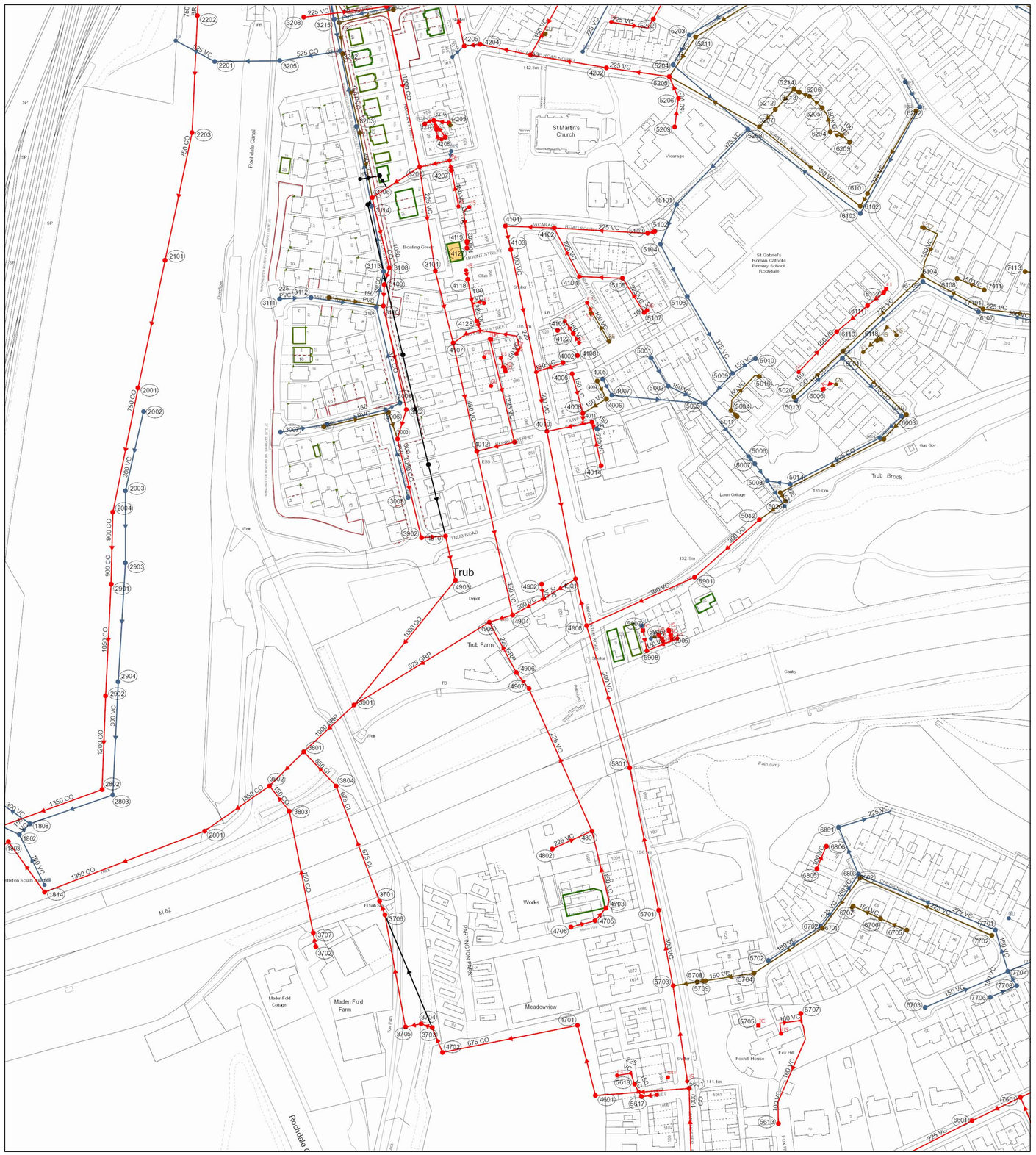
TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self construction of water mains) (UUWL apparatus) of United Utilities Water Limited "(UUWL)".

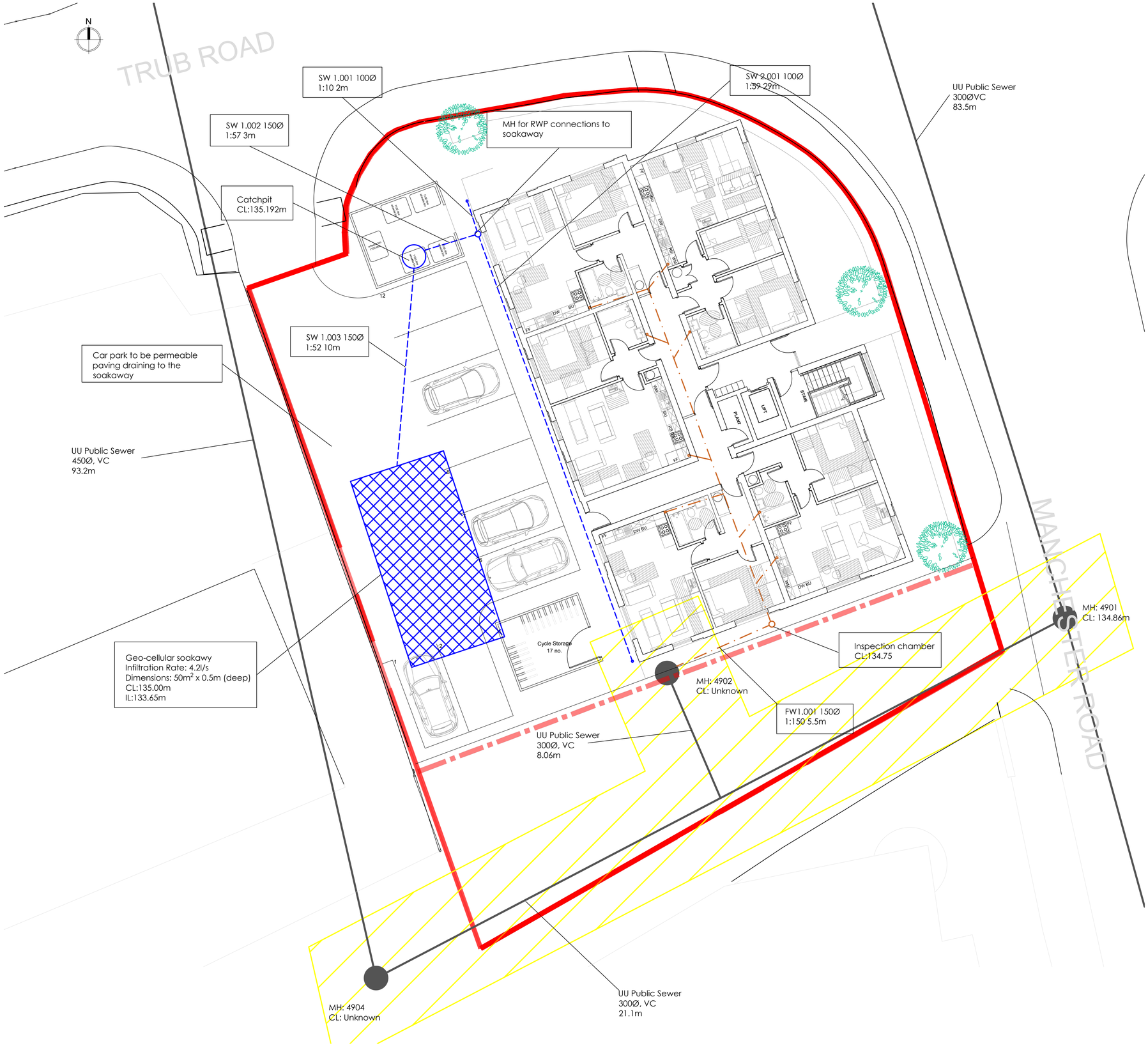
TERMS AND CONDITIONS:

- This Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
- This Map and any information supplied with it is provided for general guidance only and no representation, undertaking or warranty as to its accuracy, completeness or being up to date is given or implied.
- In particular, the position and depth of any UUWL apparatus shown on the Map are approximate only. UUWL strongly recommends that a comprehensive survey is undertaken in addition to reviewing this Map to determine and ensure the precise location of any UUWL apparatus. The exact location, positions and depths should be obtained by excavation trial holes.
- The location and position of private drains, private sewers and service pipes to properties are not normally shown on this Map but their presence must be anticipated and accounted for and you are strongly advised to carry out your own further enquiries and investigations in order to locate the same.
- The position and depth of UUWL apparatus is subject to change and therefore this Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the Map have been made subsequent to issue and prior to any works being carried out.
- This Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) in the vicinity of UUWL apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUWL apparatus by reason of the actual position and/or depths of UUWL apparatus being different from those shown on the Map and any information supplied with it.
- If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
- This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent UUWL from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.

United Utilities Water Limited
Registered In England & Wales No. 2366678
Registered Office Haweswater House, Lingley Mere Business Park,
Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP


Trub
St Martin's Church
Vicarage
St Gabriel's Roman Catholic Primary School, Rochdale
Trub Brook
Trub Farm
Depot
Works
Meadowview
Maden Fold Farm
Maden Fold Cottage
Lawn Cottage
Foshill House
Fox Hill
Gantry
Sluice
Weir
Footbridge
Path (um)
Rochdale Canal
Bridleway
Trub Road
Broadfield
Mount Street
Rossini Street
Vicarage Road
Factinda Park
Hamer Lane
Hollin Hey Road
Rochdale Canal Towpath
Rochdale Canal Towpath Cycle Route
Manchester to Rochdale Canal Towpath Cycle Route
M 62
Littleton South Works
El Sub Sta
Gas Gov
Bowling Green
Club
Chapel
Ch
Overflow
Culvert
Trub Brook
Trub Road
Rochdale Canal
Rochdale Canal Towpath
Rochdale Canal Towpath Cycle Route
Manchester to Rochdale Canal Towpath Cycle Route
Vicarage Road
Mount Street
Rossini Street
Factinda Park
Hamer Lane
Hollin Hey Road
Trub Road
Broadfield
Bowling Green
Trub Brook
Trub Farm
Depot
Works
Meadowview
Maden Fold Farm
Maden Fold Cottage
Lawn Cottage
Foshill House
Fox Hill
Gantry
Sluice
Weir
Footbridge
Path (um)

Appendix C: - Preliminary Drainage Strategy Plan



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6. COMBINED SEWER DIVERSION IS SUBJECT TO S185AGREEMENT WITH UNITED UTILITIES

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARDS, RISKS NORMALLY ASSOCIATED WITH THE TYPE OF CONSTRUCTION WORK OR RELATED STRUCTURAL WORK DETAILED ON THIS DRAWING, THE FOLLOWING SIGNIFICANT RISKS AND INFORMATION HAVE BEEN NOTED.

RISKS LISTED HERE ARE SIGNIFICANT, AND ASSOCIATED WITH THE CONSTRUCTION WORK OR RELATED STRUCTURAL WORK.

HAZARDOUS SUBSTANCE - SKIN CONTACT WITH HOT BITUMEN AND CEMENTITIOUS MATERIAL.

DUST - AIRBORNE DUST PARTICLES FROM GRANULAR SUB BASE AND CUTTING OF CONCRETE.

PUBLIC - STRUCK BY MOVING PLANT.

FOR INFORMATION RELATING TO END USE, MAINTENANCE, AND DEMOLITION WORKS, REFER TO THE CDM HEALTH AND SAFETY FILE.

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

THE TABLE BELOW IDENTIFIES IN MORE DETAIL THE POTENTIAL RISKS ASSOCIATED WITH DIFFERENT TASKS.

	RECOMMENDATION
1. EXCAVATION ADJACENT TO BOUNDARIES	CARE TO BE TAKEN WITH DEEP EXCAVATIONS IN ORDER TO PREVENT SIDEWALL COLLAPSE / SLIPPAGE. CONTRACTOR TO PROVIDE METHOD STATEMENTS WHERE NECESSARY. EXCAVATIONS TO BE SAFELY CORDONED OFF AND ENSURE SAFE PEDESTRIAN AND VEHICLE ACCESS IS MAINTAINED TO ADJACENT BUILDINGS. ENSURE EXCAVATIONS/PLANT AND MACHINERY ARE MADE SECURE OUTSIDE WORKING HOURS TO PREVENT INJURY TO THE PUBLIC.
2. CONSTRUCTING NEW M.H'S AND ALTERATIONS TO EXISTING MANHOLES	CONTRACTOR TO PROVIDE METHOD STATEMENT FOR SAFE CONSTRUCTION WHEN WORKING IN CONFINED SPACES. ALL PERSONNEL AFFECTED TO BE TRAINED AND BRIEFED ON THE RELEVANT METHOD STATEMENT.
3. PLACING AND HANDLING CUT AND BENT REINFORCEMENT	CONTRACTOR TO ENSURE WEIGHTS OF MATERIALS ARE INLINE WITH CURRENT REGULATIONS. NO PROJECTING BARS DETAILED. LENGTH OF BARS LIMITED TO MANAGEABLE SECTIONS.
4. EXCAVATION NEAR TO EXISTING SERVICES.	NEW CAVITY WALL LEAVES TO BE CONSTRUCTED SIMULTANEOUSLY THROUGHOUT CONSTRUCTION TO REDUCE RISK OF COLLAPSE AND PREVENTS EXPOSURE OF PROTRUDING WALL TIES. WALLS TO BE CONSTRUCTED IN SUITABLE LIFTS TO MAINTAIN FRESH MORTAR STABILITY. ISSUE AVAILABLE SERVICE RECORDS TO THE CONTRACTOR.
5. WORKING NEAR TO LIVE TRAFFIC.	CONTRACTOR TO PROVIDE METHOD STATEMENT FOR TRAFFIC MANAGEMENT/TEMPORARY WORKS. CONTRACTOR TO PROVIDE APPROPRIATE PROTECTION BARRIERS IF REQUIRED. WORKERS TO WEAR HIGH VISIBILITY CLOTHING TO AVOID BEING STRUCK BY PASSING VEHICLES OR PLANT.
6. GENERAL PUBLIC; EXISTING RESIDENTS; OR CHILDREN ON SITE.	ENSURE THAT THE SITE IS PROPERLY SECURE TO PREVENT INJURY FROM SLIPS, TRIPS, FALLS, FALLING FROM HEIGHT, UNCOVERED MANHOLES/TRENCHES. PROVIDE ADVANCE WARNING TO RESIDENTS REGARDING THE START OF CONSTRUCTION. IDENTIFY DIVERSIONS TO PUBLIC RIGHTS OF WAY, ESTABLISHED AND CLEARLY SIGNED IF REQUIRED.
7. NOISE, DUST AND VIBRATION RESULTING FROM CONSTRUCTION WORKS	METHOD STATEMENT TO BE PROVIDED. SITE STAFF TO BE PROVIDED WITH APPROPRIATE PPE. WORK MAY HAVE TO BE UNDERTAKEN AT SPECIFIC TIMES IN SENSETIVE AREAS TO MINIMISE DISRUPTION TO ADJACENT PROPERTIES.
8.0 WORKING NEAR WATER	CONTRACTOR TO PROVIDE DETAILED METHOD STATEMENT IN ACCORDANCE WITH THE APPROVED LAND DRAINAGE CONSENT, TO ENSURE SAFE WORKING ARRANGEMENTS AROUND AREAS OF OPEN OR FLOWING WATER; AND TO ENSURE THAT SUITABLE SITE OPERATION PROCEDURES ARE IN PLACE TO ELIMINATE THE RISK OF POLLUTION TRANSFER TO THE WATER ENVIRONMENT FROM PLANT & SITE MATERIALS.

EASEMENT APPLICABLE

EXISTING COMBINED MANHOLE

EXISTING COMBINED SEWER

PROPOSED SITE BOUNDARY

NEW SURFACE WATER SEWER

NEW SURFACE WATER MANHOLE/CATCHPIT

RWP

NEW FOUL SEWER

SVP

PROPOSED SOAKAWAY - TO BE DESIGNED IN ACCORDANCE WITH CIRIA C753 THE SUDS MANUAL; AND HAVE A HALF DRAIN DOWN TIME OF LESS THAN 24 HOURS.

DRAWING: STATUS **FOR APPROVAL**

REVISION	COMMENT	DATE	BY
A	Update to Footprint of Building	01/12/20	LA
/	First Issue	28/10/20	LA

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CLIENT:	North West HA Projects Ltd
PROJECT:	Trub Road, Manchester Road, Castleton
DRAWING TITLE:	Preliminary Drainage Strategy Plan
DRAWING REFERENCE:	20054-01
DATE:	01/12/2020
DRAWN BY:	LA
SCALE:	1:100
SIZE:	A1
REVISION:	A