coopers
chartered consulting engineers

Our ref: 8562_FCA

Flood Consequences Assessment

for

Land off Stansty Chain Road

Wrexham

For : Castle Green Homes
Unit 20,
St Asaph Business Park
St Asaph
Denbighshire
LL17 0LJ

15th July 2026

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Document Verification

Project Title	Land off Stansty Chain Road, Wrexham
Project Number	8562
Document Title	Flood Consequences Assessment
Document Number	8562_FCA_Issue 1
This document is not to be used for contractual or engineering purposes unless the document verification sheet is signed where indicated by the approver of the document.	

Prepared by

[redacted]

A Jones

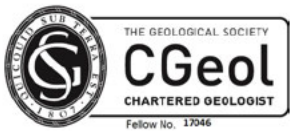
Principal Infrastructure Engineer

Checked and Approved

[redacted]

P R Sykes

BSc (Hons), MSc (Eng), CGeol, FGS



Document Revision

Report Reference	Date	Description	Prepared	Checked and Approved
8562_FCA	15/07/2026	Flood Consequences Assessment	A Jones	P R Sykes

This report has been prepared for and on behalf of our client, in accordance with the terms and conditions of the appointment agreement with Coopers. Other than where specifically allowed for in the said appointment agreement, any other party using this report for any purpose whatsoever does so at their own risk and any duty of care to that party is specifically excluded.

Contents

Section		Page No.
1.0	**Introduction**	3
2.0	**Site Characteristics**	4
3.0	**Sources of Flood Risk Information**	6
4.0	**Sources of Flood Risk**	8
5.0	**Surface Water Drainage**	10
6.0	**Conclusions and Recommendations**	14

Figures

Figure 1	-	Site Location	4
Figure 2	-	Aerial View	5
Figure 3	-	Site Topography	6
Figure 4	-	Natural Resources Wales Flood Map for Planning (Sea and Rivers)	7
Figure 5	-	Natural Resources Wales Surface Water Flooding Map	8

List of Appendices

Appendix 1	-	Reference Drawings
Appendix 2	-	EnviroCheck Flood Screening Report
Appendix 3	-	Infiltration Consideration
Appendix 4	-	Correspondence
Appendix 5	-	Calculations
Appendix 6	-	Drainage Surveys

1.0 Introduction

Coopers (Chester) Ltd, (Coopers) have been appointed by Castle Green Homes Ltd to assess the risk of flooding for two parcels of land off Stansty Chain Road in Wrexham. Castle Green Homes Ltd are proposing a new housing development, comprising of approximately 536 No. dwellings.

Castle Green Homes Ltd are planning the construction of a mixture of semi-detached and detached and terraced residential properties with associated access roads, parking, vehicular access and landscaping subject to conditions. It is understood the site currently benefits from outline planning approval.

This flood consequences assessment (FCA) evaluates the proposals regarding to flood risk, identifying and appraising potential flood risk both to and from the whole site. Coopers have carried out the following:

i. Assessment of the development potential of the site in line with the Welsh Government's Technical Advice Note 15: Development and Flood Risk (TAN15) and;
ii. An assessment of surface water runoff and drainage strategy

Since January 7th, 2019, all new developments will require sustainable drainage for surface water if there are at least 2 No. properties or the construction area is more than 100m^2. The surface water drainage systems must be designed and built to meet Welsh Government standards for sustainable drainage.

These systems must be approved by the local authority (Wrexham County Borough Council) acting in its SuDS Approving Body (SAB) role before construction work begins. The SAB will have a duty to adopt compliant systems.

2.0 Site Characteristics

2.1 Site Location

The site covers 2 agricultural parcels of land on either side of Stansty Chain Road in Wrexham. The site is situated to the northwest of Wrexham town centre and is accessed off Stansty Chain Road The site is located at approximate grid reference SJ324518.



Figure 1 – Site Location

2.2 Site Description

The site covers an overall area of approximately 21.47 Hectares of land. The site is presently pasture ground, with hedgerows, ditches and trees located along the field boundaries. The site is bisected by Stansty Chain Road, with a 5.65Ha parcel to the northeast and 15.82Ha parcel to the southeast.

The site is bounded by a railway along the northeast, A483 highway embankment on the southeast, Mold Road on the west, and agricultural land and farm building located to the north of the site. There are two residential properties located southwest of Stansty Chain Road which are excluded from the proposed development boundary

The southwestern portion of the site has a ditch through the centre flowing west towards the highway embankment. The flows are then culverted under the A483 and continue to flow via a culverted network through the Plas Coch Retail Park.

There is also a highway drainage network along Stansty Chain Road.



Figure 2 – Aerial View

The site is very undulating with slopes in all directions but mainly falling towards the watercourse in the southwestern portion of the site and towards Stansty Chain Road in the centre. There are also general falls towards the site boundaries.

Refer to Appendix 1 for the Topographical Survey.

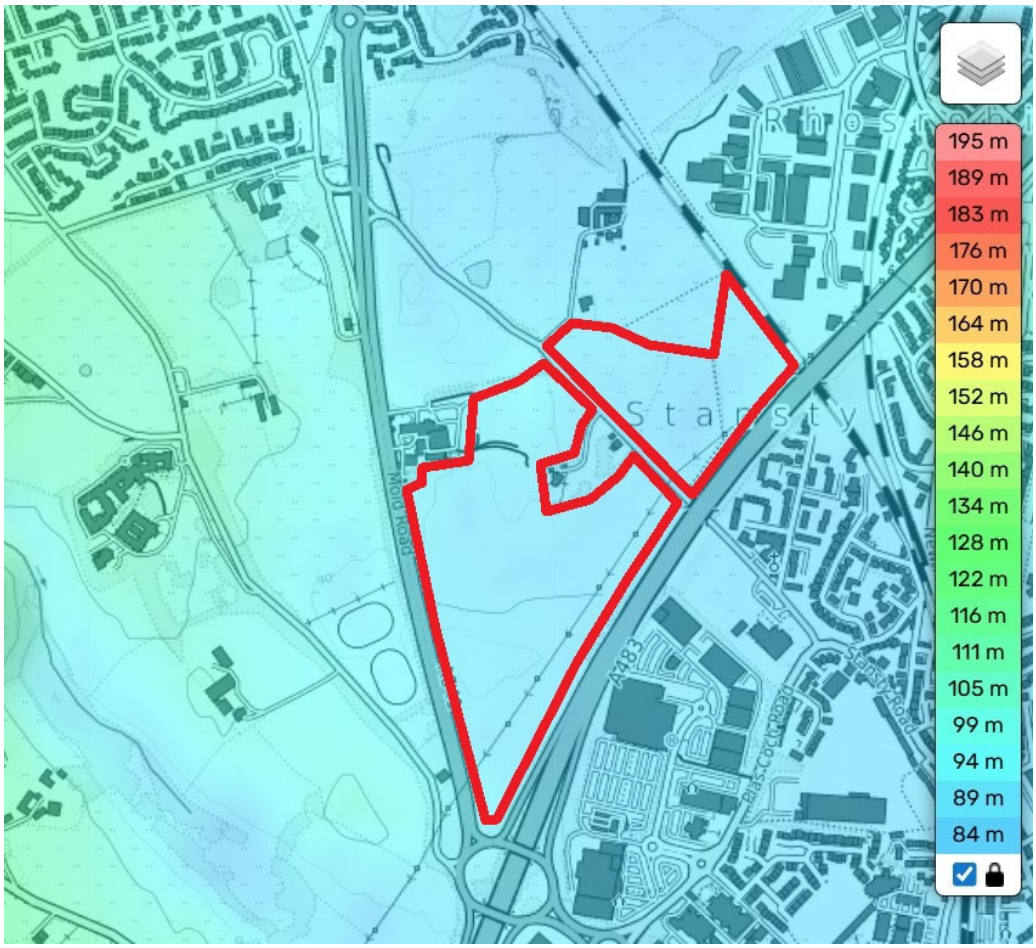


Figure 3 – Site Topography

3.0 Sources of Flood Risk Information

3.1 Natural Resources Wales

The NRW Flood Map shows the site is located within Flood Zone 1 – an area considered to have the lowest probability of fluvial flooding. It is assessed as having a less than 0.1% annual probability of flooding in any given year. Refer to Figure 4.

The proposed residential development is considered to be a 'highly vulnerable' development in accordance with Figure 2 of the Welsh Governments Technical Advice Note 15. Highly vulnerable development is considered to be appropriate within Flood Zone A.

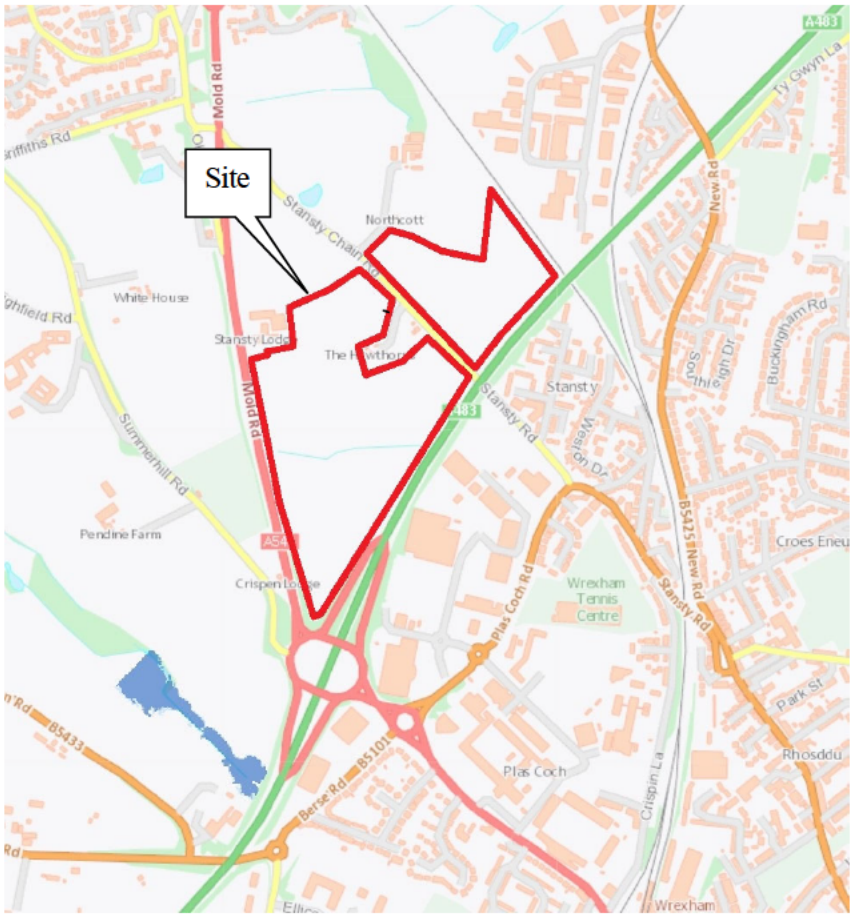


Figure 4 – Natural Resources Wales Flood Map for Planning (Sea and Rivers)

Surface water runoff is defined as water flowing over the ground that has not yet entered a drainage channel or similar. It usually occurs as a result of an intense period of rainfall that exceeds the infiltration capacity of the ground or where the ground is less permeable due to soil type, geology or due to development.

The NRW online Flood Risk from Surface Water Maps (Figure 5) identifies areas that are at risk from surface water flooding. There are three zones of risk for surface water flooding:

- High risk – area that has a chance of flooding of greater than 1 in 30 (3.3%).
- Medium risk – area that has a chance of flooding between 1 in 100 (1%) and 1 in 30 (3.3%).
- Low risk – area that has a chance of flooding between 1 in 1000 (0.1%) and 1 in 100 (1%).

Natural Resources Wales long term flood risk maps indicates that the majority of the site is at a very low risk of flooding from surface water. However, there are a few minor depressions within the topography at low risk. There is also a larger area located north of Stansty Chain Road (southern corner of the northern parcel) which needs to be considered if development covers this area. This is discussed further in section 4.3, but overall, the flood risk from surface water flooding is considered low.

Natural Resources Wales have been contacted for any relevant flood information for the site. Correspondence can be found in Appendix 4.

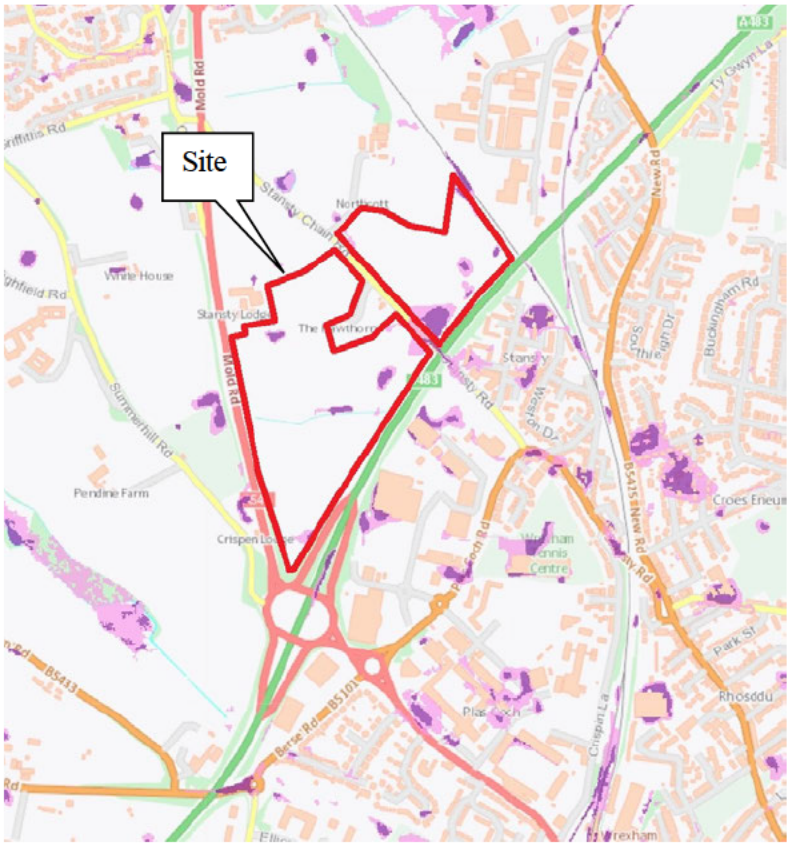


Figure 5 – Natural Resources Wales Surface Water Flooding Map

It should be noted that flooding can occur at any time and in any place from sources such as rising groundwater levels, burst water mains, blocked road drains, run-off from hillsides, sewer overflows, etc.

3.2 Wrexham County Borough Council LLFA

We have contacted Wrexham County Borough Council for confirmation of any known historical flooding within the vicinity of the site.

Refer to Appendix 4 for all correspondence.

4.0 Sources of Flood Risk

4.1 Fluvial

Extreme fluvial flood events have the potential to cause rapid inundation of the site whilst posing a threat to welfare and users. As outlined in Section 3.2; the site is within Flood Zone 1 and is, therefore not at risk from extreme fluvial or tidal flooding. Therefore, the risk from extreme fluvial flooding to

the site is considered to be low.

4.2 Infrastructure Failure (Existing and Proposed)

The failure of infrastructure such as culverts or bridges could increase the risk of flooding at the site. The existing watercourse within the site boundary is at the lowest elevation in the western parcel and is likely to take any residual flows from adjacent land within the site. As riparian owner the client should consider construction of headwalls with safety grilles and ensuring a maintenance plan is in place to reduce the risk of blockages.

An existing 15inch Diameter AC (asbestos cement) water main currently crosses the development site bisecting the southern portion of the western parcel and continuing north adjacent to the A483 highway embankment for the full length of the site. The current layout ensures no development within A 10m easement of this asset.

The risk of flooding is considered as low.

4.3 Overland Flow

Overland flow occurs when the infiltration capacity of the ground is exceeded in a storm event. This can result in water travelling as a sheet flow overland or excess water being conveyed from one location to another via local road networks. The site currently drains naturally via infiltration but some residual flows in storm events or from areas of localised cohesive ground conditions will flow towards minor depressions within the topography or towards the existing watercourse located within the western parcel. Overland flow is not considered a flood risk as flows from the site will be significantly reduced post development with the incorporation of positive drainage and an internal road network reducing any overland flows.

The eastern parcel currently indicates a large area susceptible to surface water which corresponds to a low spot within the topography. Infiltration tests have returned favourable results within this area and there is no record of any flooding. Castle Green Homes Ltd have undertaken drainage investigations in Stansty Chain Road and have determined the highway drainage is in poor condition and currently bad siltation within the manholes and pipes will restrict flow, therefore compromising the surface water drainage in this area. The low spot within Stansty Chain Road is located adjacent to the area of surface water flooding within the development and therefore will be attributed to exceedance of the network.

We also need to consider flows entering the site via overland flow. The land to the north is generally falling south towards the site and whilst most rainfall will drain to ground via infiltration some excess flows may flow into the site. Whilst this is expected to be minimal a land drain along the northern boundary is proposed as mitigation to intercept any flows and direct them to areas exhibiting high infiltration characteristics.

4.4 Sewer Flooding

If the capacity of the sewers is exceeded in an extreme event, or a blockage occurs, surcharging of the network can result in surface flooding. Welsh Water sewer plans which are included in Appendix 1, confirm no public sewer are present with the site boundary.

We are proposing to discharge all foul flows into this 225mm diameter foul sewer in Stansty Chain Road subject to Welsh Water approval. A foul pumping station will be required as site levels do not allow for a gravity connection from the site. A rising main will be required from the foul pumping station to the existing sewer which is located approximately 170m southeast of the Stansty Chain

Road bridge accommodating traffic from the A483.

Welsh Water have responded to a historical flooding enquiry and have confirmed they have no recorded flooding incidents in the area. Refer to Appendix 4 for correspondence.

The overall risk from sewer flooding is considered as low.

4.5 Groundwater Flooding

Groundwater flooding occurs as a result of water rising up from the underlying superficial deposits, bedrock or from springs.

The Envirocheck Flood Report presented in Appendix 2 indicates there is negligible risk of ground water flooding within the site boundary.

Furthermore, groundwater was not encountered during the site investigation soakaway testing other than slight seepage in locations where infiltration rates were not favourable.

The overall risk from groundwater flooding is considered as low.

4.6 Coastal Flooding

The site is not located in proximity of any tidal waterway or within close proximity to the Irish Sea and is therefore not at risk from tidal inundation.

Refer to Figure 4 – NRW Flood Map for Planning (Sea and River).

4.7 Reservoirs

The site is not located in proximity of any reservoirs. Additionally, the NRW maps indicate the site is not at risk of flooding from reservoirs.

4.8 Web Search

A web search for flooding incidents near to the site has not identified any flooding events within the vicinity of the site. The nearest recorded flood event is located approximately 630m southeast of the site on Stansty Road under the railway bridge. This is not considered relevant to this FCA. Furthermore, a search of S19 Flood Reports has not highlighted any historical flood incidents within the vicinity of the site.

5.0 Surface Water Drainage

5.1 General

The design for a surface water drainage system for the proposed development will be guided by the principles set out in the Welsh Government's 'Recommended non-statutory standards for sustainable drainage (SuDS) in Wales – designing, constructing, operating and maintaining surface water drainage systems' (2017)

The SuDS Standards Wales sets out the following hierarchy for surface water runoff destination:

Priority Level 1: Surface water runoff is collected for use;
Priority Level 2: Surface water runoff is infiltrated to ground;
Priority Level 3: Surface water runoff is discharged to a surface water body;
Priority Level 4: Surface water runoff is discharged to a surface water sewer, highway drain, or another drainage system;
Priority Level 5: Surface water runoff is discharged to a combined sewer.

Note that Priority Level 1 is the preferred (highest priority) and that 4 and 5 should only be used in exceptional circumstances.

5.2 Existing Surface Water Drainage

As the site has been proven to be mainly free draining soils, the majority of the site will drain via infiltration into the underlying ground.

The site does not benefit from any positive existing drainage and will rely on infiltration and surface water run-off to dispose of surface water flows. The flows will follow topography and in the western portion of the site some will drain towards the existing ditch / watercourse which then flows towards the culvert passing under the A483. We are not aware of any existing land drainage within the site to assist with drainage, but there may be a land drain at the bottom of the A483 highway embankment which would drain to ground via infiltration. This embankment is also very heavily vegetated which will provide interception to rainfall.

5.3 Existing Site Runoff

The greenfield run-off rates for the site have been calculated using the HR Wallingford Greenfield runoff rate estimation tool. Calculations below are based on a 21.47Ha developable site area and a Soil Type 2 indicating granular free draining materials with potentially good infiltration properties.

1-year	= 39.0 l/s
30-year	= 78.9 l/s
100-year	= 96.7 l/s
QBAR	**= 44.3 l/s**

Refer to Appendix 5 for surface water run-off calculations.

5.4 Proposed Surface Water Drainage and Runoff Rates

Priority Level 1

Whilst rainwater harvesting has been considered for the proposed development it should be noted that any device enabling water re-use cannot be taken into account when sizing attenuation as the storage facility may be full when a storm event occurs. Therefore, an overflow to an infiltration device (where ground conditions allow) or to a watercourse / sewer will be required.

Castle Green Homes Ltd are not proposing to incorporate rainwater harvesting within the development; however, they are proposing to install a water butt to each private dwelling which will allow for water collection for garden re-use.

Priority Level 2

The site investigation report indicates the site is generally underlain with granular sands and gravels with good infiltration properties. This has been confirmed by undertaking BRE365 infiltration tests. However, there are some isolated areas of cohesive clay materials with low infiltration characteristics.

Refer to Appendix 3 for desktop ground condition information.

The entire site shall be drained to ground via a combination of shallow permeable paving, filter drains, plot soakaways and larger communal infiltration basins. Surface water flows in areas of low infiltration characteristics will be redirected to more suitable areas and discharge to larger communal infiltration features. Some areas within the site may need regrading to provide more usable development platforms and to reduce depths within the drainage networks, so final levels will need to be reviewed to determine if the infiltration components are being proposed within the suitable material with confirmed infiltration rates. Otherwise, further infiltration testing will be required.

Priority Level 3

The western portion of the development is bisected by a ditch / watercourse flowing east. This is then culverted under the A483 highway and through the Plas Coch Retail Park. It was previously thought that the watercourse may be a receptor for upstream flows either from Mold Road to the west or possibly land to the west of Mold Road. However, Castle Green Homes Ltd have undertaken drainage surveys, and site investigation works at the head of the watercourse and have found no incoming flows. This corresponds to historical mapping which did not indicate any watercourse prior to the construction of Mold Road.

The watercourse therefore only takes flows from overland flows from within the development itself and post development it will have no function as flows will be collected from roofs, roads and hardstanding's, and drained to ground via various infiltration components.

It should be noted that Wrexham Borough County Council have previously stated that no surface water flows from the development can be discharged to this watercourse as the Plas Coch Retail Park is susceptible to flooding and cannot accommodate additional flows. The proposals to discharge all flows to ground via infiltration and the removal of the watercourse will reduce any flows being passed forward though the culvert under the A483 and reduce any flood risk downstream.

Priority Level 4

A review of the Welsh Water sewer records indicates no surface water sewers within the site.

Priority Level 5

A review of the Welsh Water sewer records indicates no surface water sewers within the site.

5.5 SuDS Approval Bodies

Since January 7th, 2019, all new developments will require sustainable drainage for surface water if there are at least 2 No. properties or the construction area is more than 100m^2. The surface water drainage systems must be designed and built to meet Welsh Government standards for sustainable

drainage.

These systems must be approved by the local authority (Wrexham County Borough Council) acting in its SuDS Approving Body (SAB) role before construction work begins. The SAB will have a duty to adopt compliant systems.

Every SuDS application should go to every attempt to satisfy the Principles and Standards of the legislation. When vetting an application, the SAB officer will look at the clear red line boundary area of the site when considering space for SuDS and water management features and not the space that's left on the proposed site layout.

The principles are as follows:

SuDS schemes should aim to:

1. *manage water on or close to the surface and as close to the source of the runoff as possible;*
2. *treat rainfall as a valuable natural resource;*
3. *ensure pollution is prevented at source, rather than relying on the drainage system to treat or intercept it;*
4. *manage rainfall to help protect people from increased flood risk, and the environment from morphological and associated ecological damage resulting from changes in flow rates, patterns and sediment movement caused by the development;*
5. *take account of likely future pressures on flood risk, the environment and water resources such as climate change and urban creep;*
6. *use the SuDS Management Train, using drainage components in series across a site to achieve a robust surface water management system (rather than using a single "end of pipe" feature, such as a pond, to serve the whole development);*
7. *maximise the delivery of benefits for amenity and biodiversity;*
8. *seek to make the best use of available land through multifunctional usage of public spaces and the public realm;*
9. *perform safely, reliably and effectively over the design life of the development taking into account the need for reasonable levels of maintenance;*
10. *avoid the need for pumping where possible; and*
11. *be affordable, taking into account both construction and long-term maintenance costs and the additional environmental and social benefits afforded by the system.*

Applicants seeking SAB Approval must demonstrate how they have complied with these principles or provide justification for any departure.

An indicative drainage strategy is presented in Appendix 1. We are proposing to drain the entire site to ground via infiltration. This will ensure no surface water flows leave the site. The development will be constructed in phases and the strategy presented in Appendix 1 only covers Phases 1 and 2. Infiltration testing in the area allocated for phase 3 has confirmed this Phase can also be drained via infiltration.

A combination of shallow permeable paving, filter drains, plot soakaways and larger communal infiltration basins are being proposed.

Flows in areas of low infiltration characteristics will be redirected to more suitable areas and discharge to larger communal infiltration features.

In addition, every private dwelling will have a water butt to promote water reuse within the garden.

A land drain along the northern boundary is also being proposed as mitigation to intercept any flows and direct them to areas of high infiltration characteristics. This is discussed further in Section 4.3 and will provide mitigation for any the surface water flood risk within the site.

5.6 Foul Drainage

Welsh Water have confirmed that flows can be accommodated within the public sewerage system. and advise that the flows should be connected to the foul sewer at manhole SJ32517701 located within Stansty Chain Road to the east of the A483.

A foul pumping station will be required due to the site topography. A strategy for foul drainage within Phases 1 and 2 is presented in Appendix 1 sewer depths have been set with consideration of the future phase 3 levels.

6.0 Conclusions and Recommendations

The site is located in Flood Zone 1 and has been shown to be at low risk of flooding from sea, rivers, groundwater, sewers and climate change. Therefore, mitigation measures are not considered necessary for any future development at the site. However, as a precautionary measure the client should consider the construction of a cut off drain to intercept any overland flows from the higher ground to the north of the development with a suitable discharge location where flows can drain to ground.

All potential sources of flooding have been considered as part of this report. There are no known records of historical flooding at the site.

The ground conditions are generally suitable for infiltration techniques for the disposal of surface water. However, some isolated areas did exhibit poor infiltration characteristics in the underlying soils. A combination of infiltration components will be used to drain the entire site and incorporate a network of pipes and manholes to convey flow to areas with high infiltration rates

The possible effects of climate change have been considered by acknowledging the requirements to make allowance for increased rainfall in the calculation of surface water discharge rates over the lifespan of the development in line with current guidance. An allowance for urban creep should also be incorporated in the design with a proportional increase to node catchments.

All properties will benefit from water butts to promote water re-use within gardens. Additional on-site source control components such as permeable paving and bioretention components (tree pits and rain gardens) should be considered further at detailed design stage.

Welsh Water have confirmed that foul flows from the development can be accommodated within the public sewerage system within Stansty Chain Road. A foul pumping station will be required.

All foul sewers should be designed in accordance with Sewers for Adoption 7th Edition / Welsh Ministers Standards and will be subject to S104 Agreement.

A SuDS Maintenance and Management Plan should be produced to outline the activity and frequency of inspections and maintenance works required on any SuDS components subject to SAB Approval / Adoption. All SUDS components will be subject to SAB adoption by Wrexham Borough County Council.

The strategy demonstrates that surface water run-off from the site and flows from land to the north can be managed without increasing the risk elsewhere.

This Flood Consequences Assessment should be submitted to the Wrexham County Borough Council in support of the planning application.

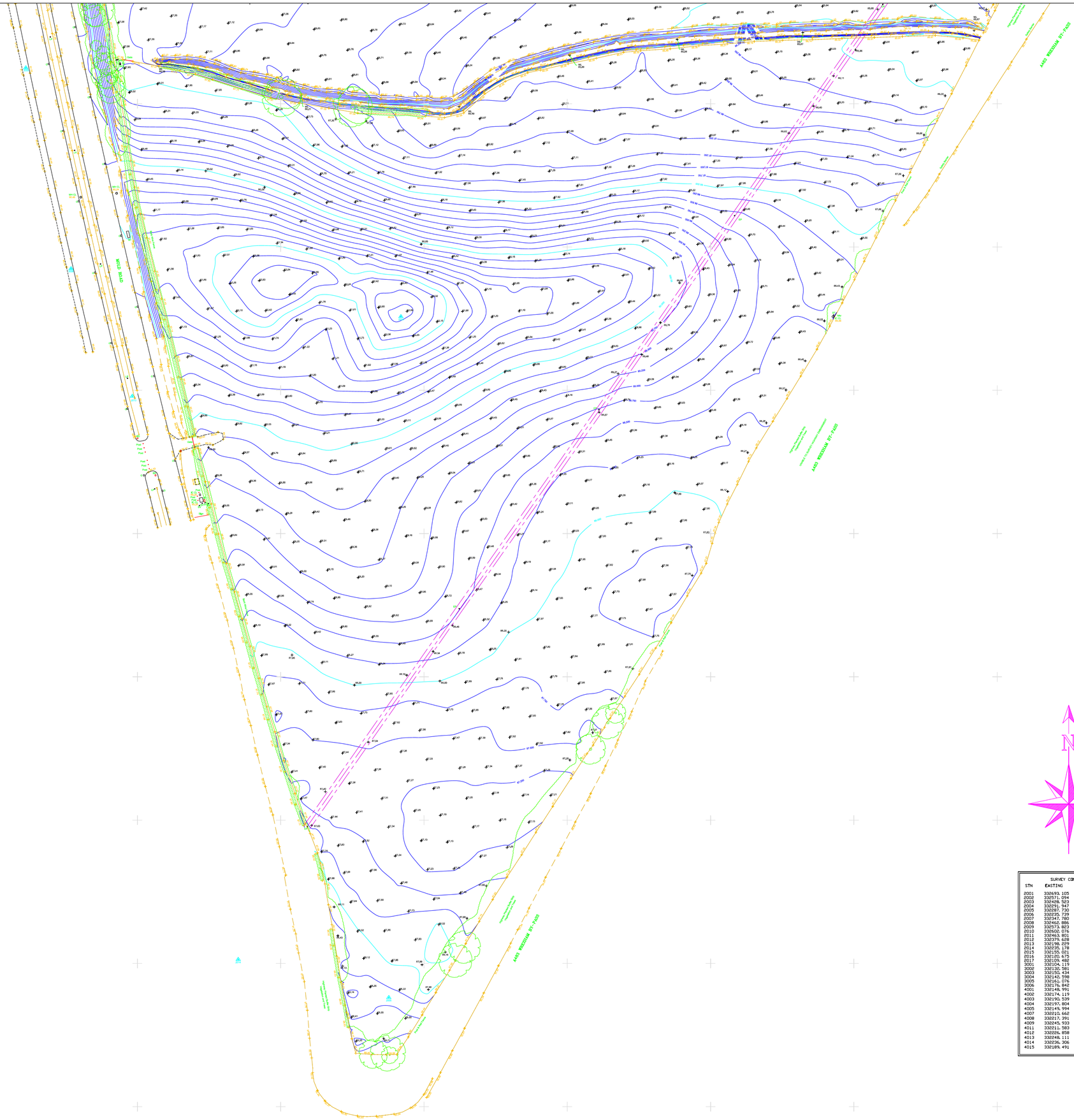
Since January 7th, 2019, all new developments will require sustainable drainage for surface water if there are at least 2 properties or the construction area is more than 100m^2. The surface water drainage systems must be designed and built to meet Welsh Government standards for sustainable drainage.

These systems must be approved by Wrexham Borough County Council acting in its SuDS Approving Body (SAB) role before construction work begins. The SAB will have a duty to adopt compliant systems.

Appendix 1

Reference Drawings

Drawing No.	Revision	Title
01803/Topo-1	*D*	*Topographical Survey (Sheet 1 of 3)*
01803/Topo-2	*D*	*Topographical Survey ((Sheet 2 of 3)*
01803/Topo-3	*D*	*Topographical Survey ((Sheet 3 of 3)*
	-	*Welsh Water Sewer Map*
8562 / SK01-1	*F*	*Drainage Strategy. Sheet 1 of 3*
8562 / SK01-2	*F*	*Drainage Strategy. Sheet 2 of 3*
8562 / SK01-3	*D*	*Drainage Strategy. Sheet 3 of 3*
8562 / SK04	*A*	*SW Catchment Areas*
8562 / SK08	-	*Phase 3 Drainage Proposals*
8562 / SK09	-	*Infiltration Testing*



LEGEND

CONTROL STATIONS
MANHOLE — MH 51.91.20
BUSH
TREE
DROP KERB
TOP BANK
EMBANKMENT
BOTTOM BANK
OVERHEAD ELECTRICITY LINE
OVERHEAD TELEPHONE LINE
FOOTPATH
FENCE
HEDGE
FOLIAGE
DITCH
VERGE
EXISTING BUILDING
MAIN CONTOUR — 50.00
CONTOUR — 49.50
SW SEWER
FW SEWER

AV	Air Valve
BH	Borehole
BD	Bollard
BM	Bench Mark
BS	Bus Stop
BT	BT Inspection Chamber
BL	Bed Level
CATV	Cable TV Cover
CL	Cover Level
C/L	Chain Link Fence
CP	Catch Pit
CPS	Concrete Paving Slab
CTRL	Control Control Box
DW	Building Over Level
EN	Earthing Rod
FB	Flower Bed
FH	Fire Hydrant
FL	Floor Level
GH	Greenhouse
GP	Gate Post
GR	Grate
GV	Gas Valve
G	Gully
IC	Inspection Chamber
IL	Invert Level
KO	Kerb Outlet
JB	Junction Box
LP	Lamp Post
MH	Man Hole
MK	Marker Post
MS	Mile Stone Marker
NP	Street Name Plate
O/H	Overhead
P	Post
PB	Post Box
PI	Pipe
PM	Parking Meter
P/R	Post & Rail Fence
P/W	Post & Wire Fence
P/L	Electricity Pylon
RE	Rodding Eye
RH	Building Ridge Level
RSJ	Reinforced Steel Joist
R/W	Retaining Wall
RWP	Rainwater Pipe
SPS	Stone Paving Slabs
SL	Soffit Level
SP	Sign Post
ST	Stop Tap
SV	Stop Valve
SY	Stay Wire
TC	Tactile Crossing
TOW	Top Of Wall Level
TH	Trial Hole
TL	Traffic Light
TP	Telegraph Pole
UR	Unable to Lift
WM	Water Meter
WL	Water Level
VH	Building Valley Level

Disclaimer

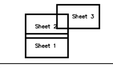
Man Entry to sewers has not been undertaken. Depths, Pipesizes etc are measured from the ground. All sewers and inverts to be checked prior to any works commencing on site. Geomatic Surveys Limited are not responsible for manholes, services, information not surveyed which may have an impact on site development.

Boundaries shown are physical and may not represent legally conveyed ownership

Tree species have only been identified using basic identification techniques. For precise tree species identification, it is recommended that a qualified aboroculturist is used prior to tree removal.

REV	DATE	DESCRIPTION	BY	APP.
D	29.10.19	Proposed Boundary setout on site Areas around the Farm Shop surveyed	SD	
C	01.08.19	Features between boundary wall and footpath surveyed - edge of footpath re-surveyed.	ML	
B	29.07.19	Boundary wall feature surveyed and Mold Road extended as requested,	ML	
A	05.04.17	Top of Embankment and Safety Barrier surveyed to A483 Wrexham By-pass.	MRW	

Sheet Layout



Survey Information

The Survey is related to Ordnance Survey National Grid and Datum, using GPS. A central location for OSNG Grid is Survey Station '2002'. The Scale Factor is 1.0000000.

SURVEY CONTROL STATIONS

STN	EASTING	NORTHING	HEIGHT
2001	332693.105	352134.736	86.453
2002	332571.094	351961.226	84.991
2003	332488.523	351852.457	89.609
2004	332591.947	351675.706	93.027
2005	332287.730	351438.109	88.453
2006	332235.739	351864.396	88.761
2007	332347.780	352061.837	93.682
2008	332462.886	352164.935	88.119
2009	332573.823	352111.103	88.826
2010	332620.076	351929.617	84.954
2011	332463.821	352065.365	86.452
2012	332463.821	352065.365	86.452
2013	332196.229	351647.948	89.782
2014	332235.178	351451.400	91.064
2015	332155.021	351789.940	91.479
2016	332120.675	351982.277	93.649
2017	332109.482	352055.481	94.452
3001	332104.119	352094.593	94.879
3002	332132.581	351984.333	93.429
3003	332150.434	351931.413	92.619
3004	332145.598	351854.018	90.198
3005	332161.076	351762.520	91.173
3006	332176.842	351690.431	90.398
4001	332148.991	352064.704	93.402
4002	332174.119	352072.321	93.067
4003	332190.539	352074.846	92.907
4004	332197.804	352073.015	92.761
4005	332149.994	352046.778	93.072
4007	332210.662	352083.997	92.843
4008	332217.991	352086.674	92.715
4009	332245.933	352090.476	92.042
4011	332211.583	352051.667	92.718
4012	332226.858	352076.837	92.533
4013	332249.111	352069.469	92.453
4014	332236.306	352066.994	92.914
4015	332189.491	351950.217	91.502

Geomatic Surveys Ltd
LAND SURVEYORS AND CONSULTING ENGINEERS
Bank House, The Paddock
Wilmslow Road
Handforth
Cheshire
SK9 3HQ
Tel/Fax:- 01625 521405
Email: info@geomaticsurveys.co.uk
Web: www.geomaticsurveys.co.uk

Client

RUSSELL HOMES LTD

Project Title

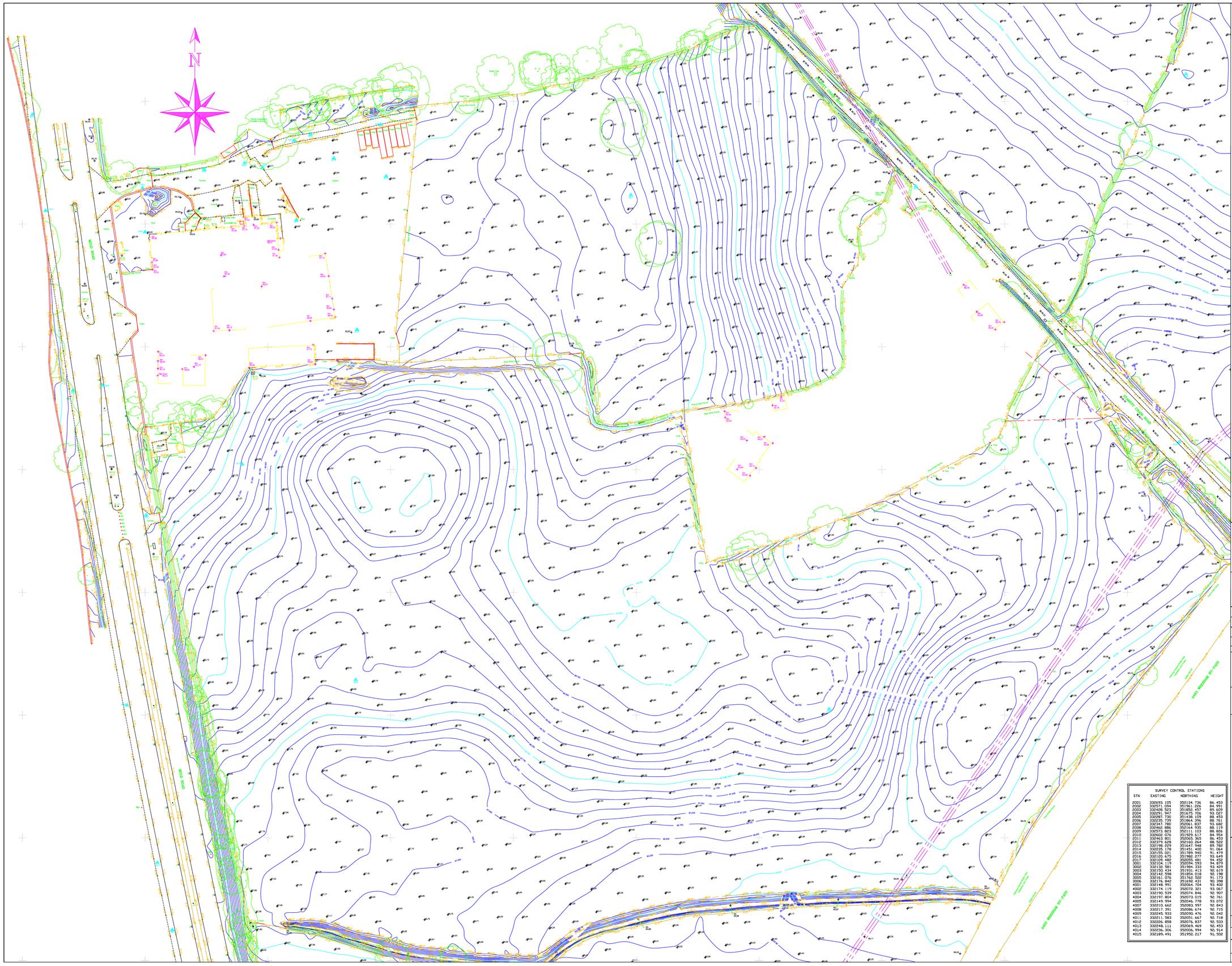
LAND OFF
STANSTY CHAIN ROAD
WREXHAM

Drawing Title

TOPOGRAPHICAL SURVEY

Drawn	Checked	Surveyed Date
MRW	IRH	24/03/2017
Date: 30/03/2017	Scale: 1:500 @ A0	Sheet No.: SHEET 1 OF 3
Drg. No.: 01803/Topo		Rev: D

Copyright©Geomatic Surveys Limited 2019



LEGEND

CONTROL STATIONS
MANHOLE MH 31.20
BUSH
TREE
DROP KERB
TOP BANK
EMBANKMENT
BOTTOM BANK
OVERHEAD ELECTRICITY LINE
OVERHEAD TELEPHONE LINE
FOOTPATH
FENCE
HEDGE
FOLIAGE
DITCH
VERGE
EXISTING BUILDING
MAIN CONTOUR 50.00
CONTOUR 49.50
SW SEWER
FW SEWER

AV	Air Valve
BH	Borehole
BD	Bollard
BM	Bench Mark
BS	Bus Stop
BT	BT Inspection Chamber
BL	Bed Level
CATV	Cable TV Cover
CL	Cover Level
C/L	Chain Link Fence
CP	Catch Pit
CPS	Concrete Paving Slab
ECB	Electricity Control Box
EN	Building Eaves Level
ER	Earthing Rod
FB	Flower Bed
FH	Fire Hydrant
FL	Floor Level
GH	Grove House
GP	Gate Post
GR	Grate
GV	Gas Valve
G	Gully
IC	Inspection Chamber
IL	Invert Level
KO	Kerb Outlet
JB	Junction Box
LP	Lamp Post
MH	Man Hole
MK	Marker Post
MS	Mile Stone Marker
NP	Street Name Plate
O/H	Overhead
P	Post
PB	Post Box
PI	Pipe
PM	Parking Meter
P/R	Post & Rail Fence
P/W	Post & Wire Fence
PYL	Electricity Pylon
RE	Rodding Eye
RH	Building Ridge Level
RSJ	Reinforced Steel Joist
R/W	Retaining Wall
RWP	Rainwater Pipe
SPS	Stone Paving Slabs
SL	Soffit Level
SP	Sign Post
ST	Stop Tap
SV	Stop Valve
SY	Stay Wire
TC	Tactile Crossing
TOW	Top Of Wall Level
TH	Trial Hole
TL	Traffic Light
TP	Telephone Pole
UTL	Unable To Lift
WM	Water Meter
WL	Water Level
VH	Building Valley Level

Disclaimer

Man Entry to sewers has not been undertaken. Depths, Pipesizes etc are measured from the ground. All sewers and inverts to be checked prior to any works commencing on site. Geomatic Surveys Limited are not responsible for manholes, services, information not surveyed which may have an impact on site development.
Boundaries shown are physical and may not represent legally conveyed ownership
Tree species have only been identified using basic identification techniques. For precise tree species identification, it is recommended that a qualified aboroculturist is used prior to tree removal.

REV.	DATE	DESCRIPTION	BY	APP.
D	29.10.19	Proposed Boundary setout on site Areas around the Farm Shop surveyed	SD	
C	01.08.19	Features between boundary wall and footpath surveyed - edge of footpath re-surveyed.	ML	
B	29.07.19	Boundary wall feature surveyed and Mold Road extended as requested.	ML	
A	05.04.17	Top of Embankment and Safety Barrier surveyed to A483 Wrexham Bypass.	MRW	

Sheet Layout

Sheet 1 | Sheet 2 | Sheet 3

Survey Information

The Survey is related to Ordnance Survey National Grid and Datum, using GPS. A central location for OSNG Grid is Survey Station "2002". The Scale Factor is 1.0000000.

SURVEY CONTROL STATIONS

STN	EASTING	NORTHING	HEIGHT
2001	332693.105	352134.736	86.453
2002	332571.094	351961.026	84.991
2003	332428.523	351850.457	89.609
2004	332291.742	351675.109	93.082
2005	332237.797	351567.705	94.053
2006	332225.729	351864.396	86.761
2007	332347.780	352061.837	93.682
2008	332462.886	352164.935	88.119
2009	332573.823	352111.103	88.826
2010	332600.076	351929.617	84.954
2011	332463.801	352065.365	86.453
2012	332379.628	352160.264	88.522
2013	332198.229	351647.948	89.782
2014	332135.171	351591.400	91.474
2015	332120.673	351789.317	91.649
2017	332109.480	352055.481	94.452
3001	332104.119	352094.593	94.879
3002	332132.581	351984.333	93.429
3003	332150.434	351931.413	92.619
3004	332142.598	351854.018	92.198
3005	332161.076	351762.522	91.173
3006	332176.842	351692.431	90.398
4001	332148.991	352064.704	93.402
4002	332174.119	352072.321	93.067
4003	332190.539	352074.846	92.907
4004	332197.804	352073.015	92.761
4005	332149.994	352046.778	93.032
4007	332010.662	352083.997	92.843
4008	332217.391	352086.674	92.715
4009	332245.933	352090.476	92.042
4011	332211.583	352051.667	92.718
4012	332226.959	352076.837	92.533
4013	332248.111	352069.469	92.453
4014	332236.306	352006.994	92.914
4015	332189.491	351952.217	91.502

Geomatic Surveys Ltd
LAND SURVEYORS AND CONSULTING ENGINEERS
Bank House, The Paddock
Wimslow Road
Handforth
Cheshire
SK9 3HQ
Tel/Fax:– 01625 521405
Email: info@geomaticsurveys.co.uk
Web: www.geomaticsurveys.co.uk

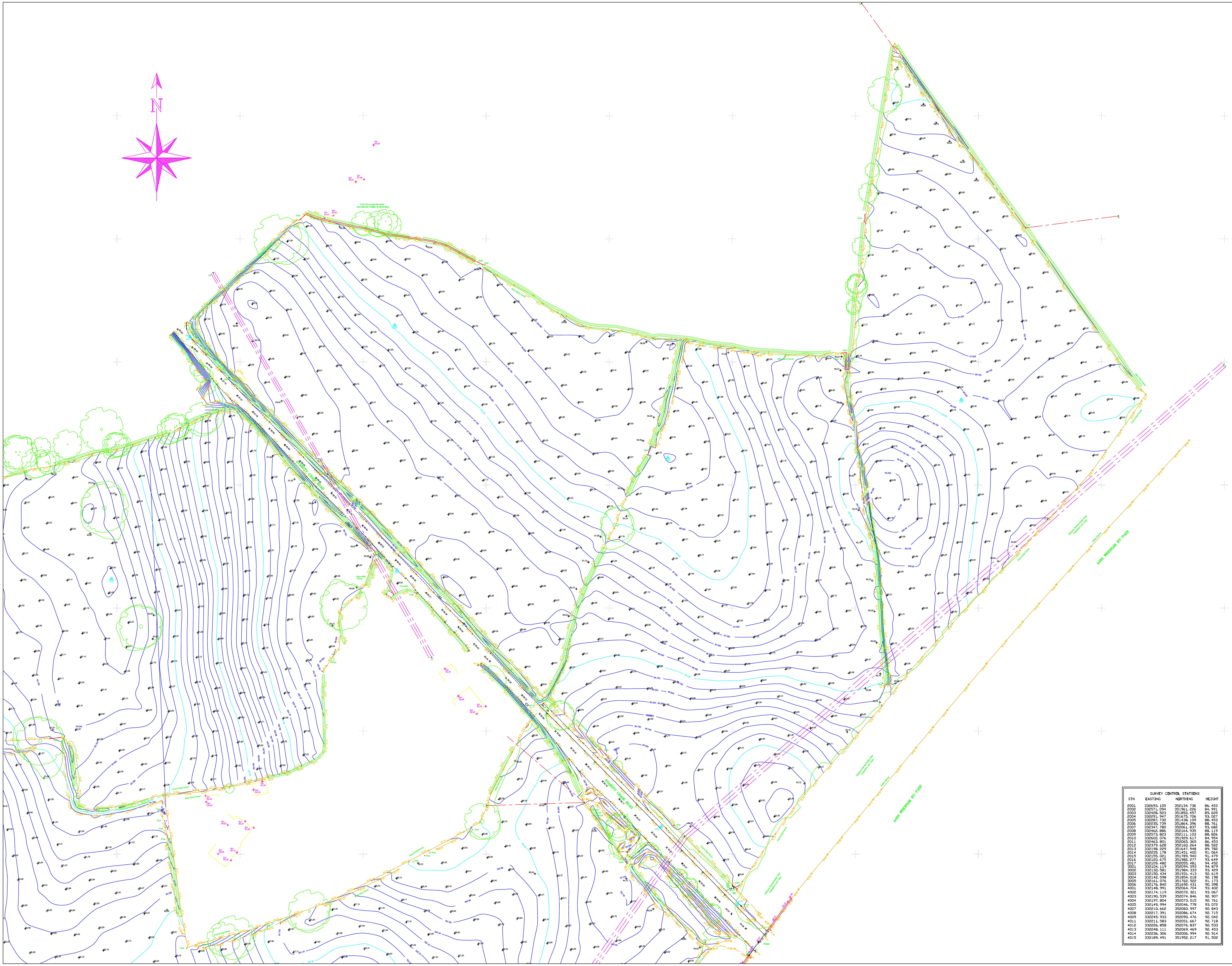
Client
RUSSELL HOMES LTD

Project Title
LAND OFF
STANSTY CHAIN ROAD
WREXHAM

Drawing Title
TOPOGRAPHICAL SURVEY

Drawn	Checked	Surveyed date
MRW	IRH	24/03/2017
Date	Scale	Sheet No.
30/03/2017	1:500 @ A0	SHEET 2 OF 3
Drg. No.		Rev
01803/Topo		D

Copyright©Geomatic Surveys Limited 2019



LEGEND

- CONTROL STATIONS
- MANHOLE (MH, CL 31.20)
- BUSH
- TREE
- DROP KERB
- EMBANKMENT (TOP BANK, BOTTOM BANK)
- OVERHEAD ELECTRICITY LINE
- OVERHEAD TELEPHONE LINE
- FOOTPATH
- FENCE
- HEDGE
- FOLIAGE
- DITCH
- VERGE
- EXISTING BUILDING
- MAIN CONTOUR (50.00)
- CONTOUR (49.50)
- SW SEWER
- FW SEWER

AV	Air Valve
BH	Borehole
BD	Bollard
BM	Bench Mark
BS	Bus Stop
BT	BT Inspection Chamber
BL	Bed Level
CATV	Cable TV Cover
CL	Cover Level
C/L	Chain Link Fence
CP	Catch Pit
CPS	Concrete Paving Slab
ECB	Electricity Control Box
EH	Building Eaves Level
ER	Earthing Rod
FB	Flower Bed
FH	Fire Hydrant
FL	Floor Level
GH	Greenhouse
GP	Gate Post
GR	Grate
GV	Gas Valve
G	Gully
IC	Inspection Chamber
IL	Invert Level
KO	Kerb Outlet
JB	Junction Box
LP	Lamp Post
MH	Man Hole
MK	Marker Post
MS	Mile Stone Marker
NP	Street Name Plate
O/H	Overhead
P	Post
PB	Post Box
PI	Pipe
PM	Parking Meter
P/R	Post & Rail Fence
P/W	Post & Wire Fence
PYL	Electricity Pylon
RE	Rodding Eye
RH	Building Ridge Level
RSJ	Reinforced Steel Joist
R/W	Retaining Wall
RWP	Rainwater Pipe
SPS	Stone Paving Slabs
SL	Soffit Level
SP	Sign Post
ST	Stop Tap
SV	Stop Valve
SY	Stay Wire
TC	Tactile Crossing
TOW	Top Of Wall Level
TH	Trial Hole
TL	Traffic Light
TP	Telegraph Pole
UTL	Unable To Lift
WM	Water Meter
WL	Water Level
VH	Building Valley Level

Disclaimer

Man Entry to sewers has not been undertaken. Depths, Pipesizes etc are measured from the ground. All sewers and inverts to be checked prior to any works commencing on site. Geomatic Surveys Limited are not resposible for manholes, services, information not surveyed which may have an impact on site development.

Boundaries shown are physical and may not represent legally conveyed ownership

Tree species have only been identified using basic identification techniques. For precise tree species identification, it is recommended that a qualified aboroculturist is used prior to tree removal.

REV	DATE	DESCRIPTION	BY	APP.
D	29.10.19	Proposed Boundary setout on site Areas around the Farm Shop surveyed	SD	
C	01.08.19	Features between boundary wall and footpath surveyed - edge of footpath re-surveyed.	ML	
B	29.07.19	Boundary wall feature surveyed and Mold Road extended as requested.	ML	
A	05.04.17	Top of Embankment and Safety Barrier surveyed to A483 Wrexham By-pass.	MRW	

Sheet Layout

Sheet 1 · Sheet 2 · Sheet 3

Survey Information

The Survey is related to Ordnance Survey National Grid and Datum, using GPS. A central location for OSNG Grid is Survey Station '2002'. The Scale Factor is 1.0000000.

SURVEY CONTROL STATIONS

STN	EASTING	NORTHING	HEIGHT
2001	332693. 105	352134. 736	86. 453
2002	332571. 094	351961. 226	84. 991
2003	332428. 523	351852. 457	89. 609
2004	332291. 947	351675. 706	93. 027
2005	332287. 730	351438. 109	88. 453
2006	332235. 739	351864. 396	88. 761
2007	332347. 780	352061. 837	93. 682
2008	332462. 886	352164. 935	88. 119
2009	332573. 823	352111. 103	88. 826
2010	332602. 076	351929. 617	84. 954
2011	332463. 801	352065. 365	86. 453
2012	332379. 628	352160. 264	88. 522
2013	332198. 229	351647. 948	89. 782
2014	332235. 178	351451. 400	91. 064
2015	332155. 021	351789. 940	91. 479
2016	332120. 675	351982. 277	93. 649
2017	332109. 482	352055. 481	94. 452
3001	332104. 119	352094. 593	94. 879
3002	332132. 581	351984. 333	93. 429
3003	332150. 434	351931. 413	92. 619
3004	332142. 598	351854. 018	92. 198
3005	332161. 076	351762. 522	91. 173
3006	332176. 842	351692. 431	90. 398
4001	332148. 991	352064. 704	93. 402
4002	332174. 119	352072. 321	93. 067
4003	332190. 539	352074. 846	92. 907
4004	332197. 804	352073. 015	92. 761
4005	332149. 994	352046. 778	93. 072
4007	332210. 662	352083. 997	92. 843
4008	332217. 391	352086. 674	92. 715
4009	332245. 933	352090. 476	92. 042
4011	332211. 583	352051. 667	92. 718
4012	332226. 858	352076. 837	92. 533
4013	332248. 111	352069. 469	92. 453
4014	332236. 306	352006. 994	92. 914
4015	332189. 491	351952. 217	91. 502

Geomatic Surveys Ltd

LAND SURVEYORS AND CONSULTING ENGINEERS
Bank House, The Paddock
Wilmslow Road
Handforth
Cheshire
SK9 3HQ
Tel/Fax:- 01625 521405
Email: info@geomaticsurveys.co.uk
Web: www.geomaticsurveys.co.uk

Client

RUSSELL HOMES LTD

Project Title

LAND OFF
STANSTY CHAIN ROAD
WREXHAM

Drawing Title

TOPOGRAPHICAL SURVEY

Drawn	Checked	Surveyed Date
MRW	IRH	24/03/2017
Date	**Scale**	**Sheet No.**
30/03/2017	1:500 @ A0	SHEET 3 OF 3
Drg. No.		**Rev**
01803/Topo		D

Copyright © Geomatic Surveys Limited 2019

Dŵr Cymru
Welsh Water

Stansty Chain Road,Wrexham

N
W E
S

LEGEND(Representative of most common features)

Waste network:

- Foul chamber
- Surface water chamber
- Combined chamber
- Combined sewer overflow
- Special purpose chamber
- Treatment works
- Pumping station
- Outfall
- Lamphole
- Storm Overflow
- Rising main
- Gravity sewer
- Private sewer
- Private sewer subject to Sect. 104 adoption agreement (S 104)
- Private Sewer Transfer
- Lateral Drain
- Inspection Chamber

NB: Sewer symbol colour indicates the type.
RED - Combined
GREEN - Surface Water
BROWN - Foul
Purple - Former S24 sewers (for indicative purposes only)

Notes:

Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases, pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be asbestos cement (AC) or Pitch Fibre (PF) . It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

Dwr Cymru Cyf gives this information as to the position of its underground apparatus by way of general guidance only on the strict understanding that it is based on the best information available.
It is the responsibility of the person carrying out any excavations or other works made in the vicinity of the Company's apparatus and any onus of locating the apparatus before carrying out any excavations rests entirely on you. It must be understood that the furnishing of the information is entirely without prejudice to the provision of the New Roads and Streetworks Act 1991 and of the Company's right to be compensated for any damage to its apparatus.

Service pipes are not generally shown but their presence should be anticipated.

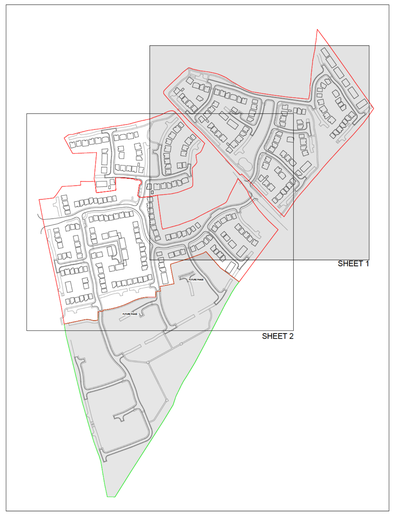
EXACT LOCATIONS OF ALL APPARATUS TO BE DETERMINED ON SITE.

Reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown copyright and database right 2009.
All rights reserved.
Ordnance Survey License number 100019534.

Map Ref:	332374,352166
Map scale:	1:1,250
Printed by:	DT
Printed on:	22/06/2017

DO NOT SCALE

NORTH



KEY PLAN

Northcott

Stansty

Oakhurst

Stansty House

FINNEY CLOSE

STANSTY CHAIN ROAD

Existing PROW

Connection to existing PROW

Soakaway 2
S/A Base Level = 84.65
S/A Size = 10.0m x 7.5m
Infiltration Rate = 2.57x10⁻⁴ m/s
Overall Depth 1.2m

Highway Gullies to discharge into swale, swale to connect into SW network.

INFILTRATION BASIN 4
TOB = 88.500
Base Level = 88.000
Basin Base Area = 68.5m²
1 in 3 Side Slopes
Top Water Levels:
100yr+50%cc = 90.228
100yr = 90.000
30yr = 89.743
Infiltration Rate = 0.3744 m/hr

INFILTRATION BASIN 3
TOB = 85.500
Base Level = 83.500
Basin Base Area = 165m²
1 in 3 Side Slopes
Top Water Levels:
100yr+50%cc = 85.248
100yr = 84.748
30yr = 84.497
Infiltration Rate = 0.3744 m/hr

Nominal 100-200mm locally placed stone protection min. 5m long

Nominal 100-200mm locally placed stone protection min. 5m long

INFILTRATION BASIN 1
TOB = 85.050
Base Level = 83.100
Basin Base Area = 412m²
1 in 3 Side Slopes
Top Water Levels:
100yr+50%cc = 84.718
100yr = 84.241
30yr = 83.998
Infiltration Rate = 0.4032 m/hr

Soakaway 1
S/A Base Level = 83.30
S/A Size = 20m x 4.0m
Infiltration Rate = 4.4x10⁻⁴ m/s
Overall Depth 1.2m

Plot Soakaways
(Plots 284-292, 294-302, 305-308 & 310-313)

INFILTRATION BASIN 2
TOB = 85.500
Base Level = 83.500
Basin Base Area = 478m²
1 in 3 Side Slopes
Top Water Levels:
100yr+50%cc = 85.248
100yr = 84.748
30yr = 84.497
Infiltration Rate = 0.3744 m/hr

Adoptable FW Pumping Station (SfA7)
CL 85.500
Sump Base Level ??.???
(inoming 80.789)

Rising Main to the F96 gravity network to existing FW public sewer.

Emergency storage required.
(160l x 368 = 58.88 cu.m)
Additional upstream storage may be required.

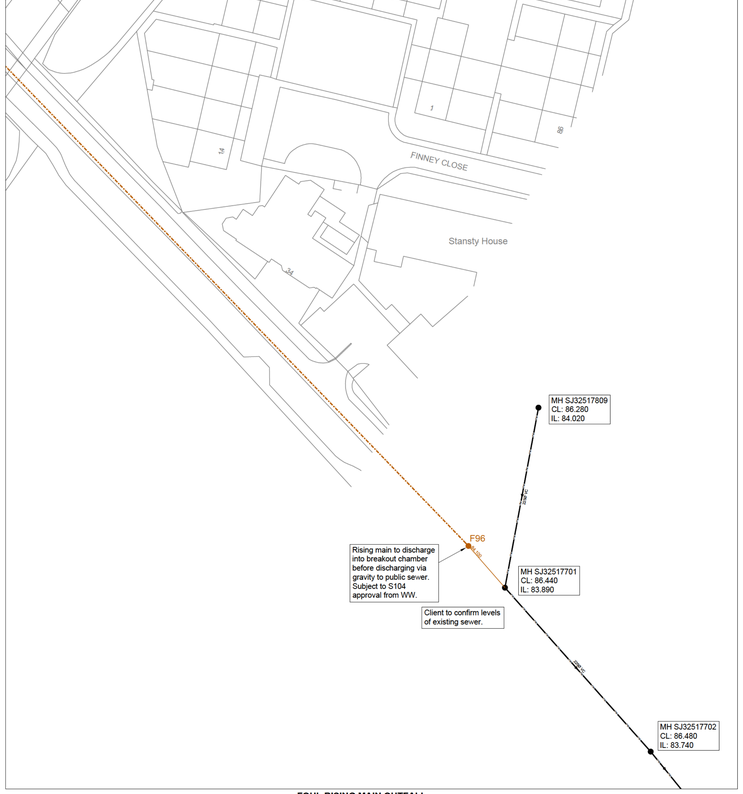
Wet well base level to be supplied by pump supplier.

For further pump station details refer to pump supplier drawings.

Rising main 220m long

SEE INSERT ON SHEET 1 FOR RISING MAIN OUTFALL

A483



FOUL RISING MAIN OUTFALL

© Copyright The original of this drawing contained coloured symbols and/or features. Any black and white reproduction should not be relied upon.

Notes

1. Setting out shall be undertaken using only the information given. Distances should not be scaled from this drawing.
2. All adoptable drainage shall be constructed in accordance with 'Sewers for Adoption' 7th Edition, Welsh Ministers Standards and Welsh Water Details and Guidelines.
3. The minimum gravity pipe diameter under adoptable highways shall be 150mm
4. It is the responsibility of the Contractor to verify all information given with regards to existing services and drainage connections etc. prior to commencing the works. The rates shall include for hand dig around services where necessary. The Contractor shall adhere to the CDM Regulations at all times
8. All materials to bear the relevant B.S. Kitemark and comply fully with the specifications. All concrete & concrete products must use Sulphate resistant cement to withstand Class 3 condition (unless the site investigation report proves that sulphate attack from soils and ground-water will not occur).
9. All opening notices etc. as required under Highways Acts etc. are to be obtained prior to commencement of works. All works are to be inspected by L.A., NHBC or the Network Operator as applicable.
10. Where structured wall UPVC pipes (or similar approved) are used in adoptable drainage they shall be handled and laid in accordance with the manufacturers instructions and will be subject to post installation deformation testing prior to adoption.
    A Class S Bed and Surround must be used for structured wall pipes
10. Trench backfill in highways to within 1m of highway shall, as directed by the Highway Authority be a suitable granular material all in accordance with Sewers for Adoption.
12. Slab levels shall not be varied without reference to the Engineer for guidance.
13. Pipes have not been designed to accommodate construction traffic loading. The contractor is responsible for providing adequate protection to the pipes during construction.
14. All manhole covers and frames shall comply with BS EN124. All adoptable manholes and chambers shall comply with Sewers for Adoption 7th Edition. Covers in roads to be grade D400 and be 150mm deep. Manhole covers in car parking areas and drives to be grade B125 and covers in landscaping areas to be grade A15. All to be sized in accordance with Building Regulations Part H, Tables 11 & 12. "In-fill" type covers should not be used. Where a cover is located in an area of block paving, the bottom of the frame should be 150mm deep.

Legend

- Site Boundary (Phase 1 & 2)
- Applicant Site Boundary
- 900 W — Retaining Wall (GeoWall)
- 1200 W — Retaining Wall (Brick)
- 450 FOE — Flag Retaining Wall
- 300 GB — Gravel Board
- 150 UB — Underbuild
- 300 STEP — Step In Slab
- FFL 18.65 — Plot Slab Level
- S01 — Adoptable Surface Water Sewer
- F01 — Adoptable Foul Sewer
- FC — Flow Control Manhole
- Sewer Easement
- +0.95 -0.95 — Depth of fill (Existing levels to proposed)
- Cellular Soakaways
- Infiltration Basin
- Swale
- Filter Drain
- Permeable Paving

STRATEGY

Rev.	Date	Revision	By	Appd.
F	19.06.26	Foul Water Drainage revised	PW	AJ
E	03.06.26	Updated to suit revised layout	PW	AJ
D	23.04.26	Foul drainage added	PW	AJ
C	21.04.26	Updated to suit revised layout	PW	AJ
B	24.07.25	Phase 1 and Phase 2 boundaries added	PW	AJ
A	24.07.25	Revised Infiltration Basin 2 location	PW	AJ

coopers
chartered consulting engineers
Park House
Sandpiper Court
Chester Business Park
Chester
CH4 9QU
Tel: 01244 684910
Email: admin@coopers.co.uk
Web: http://coopers.co.uk

Client: Castle Green

Project: STANSTY ROAD, WREXHAM

Title: Drainage Strategy Sheet 1 of 3

DRAWING NUMBER	SCALE at A0	1:500	
8562 / SK02-1	DATE	21.07.25	REVISION
	DRAWN	PW	F
	CHECKED	AJ	

DO NOT SCALE

NORTH

KEY PLAN

SHEET 1

SHEET 2

STANSTY LODGE LANE

Nominal 100-200mm locally placed stone protection min. 5m long

Soakaway 2
S/A Base Level = 84.65
S/A Size = 10.0m x 7.5m
Infiltration Rate = 2.57x10⁻⁴ m/s
Overall Depth 1.2m

Plot Soakaways (Plots 230-238)

INFILTRATION BASIN 4
TOB = 90.500
Base Level = 88.500
Basin Base Area = 68.5m²
1 in 3 Side Slopes
Top Water Levels:
100yr+50%cc = 90.228
100yr = 89.816
30yr = 89.575
Infiltration Rate = 0.3744 m/hr

INFILTRATION BASIN 3
TOB = 85.500
Base Level = 83.500
Basin Base Area = 165m²
1 in 3 Side Slopes
Top Water Levels:
100yr+50%cc = 85.248
100yr = 84.748
30yr = 84.497
Infiltration Rate = 0.3744 m/hr

Nominal 100-200mm locally placed stone protection min. 5m long

INFILTRATION BASIN 2
TOB = 85.500
Base Level = 83.500
Basin Base Area = 478m²
1 in 3 Side Slopes
Top Water Levels:
100yr+50%cc = 85.248
100yr = 84.748
30yr = 84.497
Infiltration Rate = 0.3744 m/hr

Highway Gullies to discharge into swale, swale to connect into SW network.

Hatched area indicates an area within the application boundary where no works are proposed as part of this application.

Oakhurst

The Hawthorns

Stansty Lodge

Line of Posts

MOLD ROAD

Drainage Basin

Sinks

Existing Culvert

SEE INSERT ON SHEET 1 FOR RISING MAIN OUTFALL

SCALEBAR (m)
0 5 10 15 20 25 30 35 40 45 50

© Copyright The original of this drawing contained coloured symbols and/or features. Any black and white reproduction should not be relied upon.

Notes

1. Setting out shall be undertaken using only the information given. Distances should not be scaled from this drawing.
2. All adoptable drainage shall be constructed in accordance with 'Sewers for Adoption' 7th Edition, Welsh Ministers Standards and Welsh Water Details and Guidelines.
3. The minimum gravity pipe diameter under adoptable highways shall be 150mm
4. It is the responsibility of the Contractor to verify all information given with regards to existing services and drainage connections etc. prior to commencing the works. The rates shall include for hand dig around services where necessary. The Contractor shall adhere to the CDM Regulations at all times
8. All materials to bear the relevant B.S. Kitemark and comply fully with the specifications. All concrete & concrete products must use Sulphate resistant cement to withstand Class 3 condition (unless the site investigation report proves that sulphate attack from soils and ground-water will not occur).
9. All opening notices etc. as required under Highways Acts etc. are to be obtained prior to commencement of works. All works are to be inspected by L.A., NHBC or the Network Operator as applicable.
10. Where structured wall UPVC pipes (or similar approved) are used in adoptable drainage they shall be handled and laid in accordance with the manufacturers instructions and will be subject to post installation deformation testing prior to adoption.
A Class S Bed and Surround must be used for structured wall pipes
10. Trench backfill in highways to within 1m of highway shall, as directed by the Highway Authority be a suitable granular material all in accordance with Sewers for Adoption.
12. Slab levels shall not be varied without reference to the Engineer for guidance.
13. Pipes have not been designed to accommodate construction traffic loading. The contractor is responsible for providing adequate protection to the pipes during construction.
14. All manhole covers and frames shall comply with BS EN124. All adoptable manholes and chambers shall comply with Sewers for Adoption 7th Edition. Covers in roads to be grade D400 and be 150mm deep. Manhole covers in car parking areas and drives to be grade B125 and covers in landscaping areas to be grade A15. All to be sized in accordance with Building Regulations Part H, Tables 11 & 12. "In-fill" type covers should not be used. Where a cover is located in an area of block paving, the bottom of the frame should be 150mm deep.

Legend

- Site Boundary (Phase 1 & 2)
- Applicant Site Boundary
- 900 W — Retaining Wall (GeoWall)
- 1200 W — Retaining Wall (Brick)
- 450 FOE — Flag Retaining Wall
- 300 GB — Gravel Board
- 150 UB — Underbuild
- 300 STEP — Step In Slab
- FFL 18.65 — Plot Slab Level
- S01 — Adoptable Surface Water Sewer
- F01 — Adoptable Foul Sewer
- FC — Flow Control Manhole
- Sewer Easement
- +0.95 -0.95 — Depth of fill (Existing levels to proposed)
- Cellular Soakaways
- Infiltration Basin
- Swale
- Filter Drain
- Permeable Paving

STRATEGY

Rev.	Date	Revision	By	Appd.
F	19.06.26	Foul Water Drainage revised	PW	AJ
E	03.06.26	Updated to suit revised layout	PW	AJ
D	23.04.26	Foul drainage added	PW	AJ
C	21.04.26	Updated to suit revised layout	PW	AJ
B	24.07.25	Phase 1 and Phase 2 boundaries added	PW	AJ
A	24.07.25	Revised Infiltration Basin 2 location	PW	AJ

coopers
chartered consulting engineers
Park House
Sandpiper Court
Chester Business Park
Chester
CH4 9QU
Tel: 01244 684910
Email: admin@coopers.co.uk
Web: http://coopers.co.uk

Client: Castle Green

Project: STANSTY ROAD, WREXHAM

Title: Drainage Strategy Sheet 2 of 3

DRAWING NUMBER	SCALE at A0	1:500	
8562 / SK02-2	DATE	21.07.25	REVISION
	DRAWN	PW	F
	CHECKED	AJ	

DO NOT SCALE

STORM Network 1

Pipe Code	Diameter (mm)	Gradient (1:)	Pipe Type	Pipe Length	Upstream Manhole Number	Upstream Manhole Invert	Upstream Manhole Cover	Downstream Manhole Number	Downstream Manhole Invert	Downstream Manhole Cover
1.000	450	400	Circular	35.996	S101	84.39	86.67	S102	84.30	87.46
1.001	450	400	Circular	16.099	S102	84.30	87.46	S103	84.26	88.08
1.002	450	400	Circular	28.027	S103	84.26	88.08	S104	84.19	88.90
1.003	450	400	Circular	28.989	S104	84.19	88.90	S105	84.12	89.26
1.004	450	400	Circular	29.862	S105	84.12	89.26	S106	84.04	89.44
1.005	450	400	Circular	35.285	S106	84.04	89.44	S110	83.95	89.01
1.006	450	400	Circular	25.655	S110	83.95	89.01	S114	83.89	88.09
1.007	450	400	Circular	25.141	S114	83.89	88.09	S115	83.83	88.61
1.008	450	400	Circular	27.758	S115	83.83	88.61	S116	83.76	88.92
1.009	450	400	Circular	20.623	S116	83.76	88.92	S117	83.71	88.28
1.010	450	400	Circular	11.493	S117	83.71	88.28	S118	83.68	87.74
1.011	450	400	Circular	14.329	S118	83.68	87.74	S119	83.64	87.03
1.012	450	400	Circular	18.688	S119	83.64	87.03	S120	83.59	86.10
1.013	525	400	Circular	29.124	S120	83.52	86.10	S121	83.45	85.05
1.014	525	400	Circular	18.239	S121	83.45	85.05	S129	83.40	85.05
1.015	150	399	Circular	7.572	S129	84.85	85.05	S130	84.83	85.05
2.000	225	52	Circular	43.533	S107	86.48	88.43	S108	85.65	88.57
2.001	300	240	Circular	25.553	S108	85.57	88.57	S109	85.47	89.03
2.002	300	80	Circular	37.099	S109	85.47	89.03	S110	85.00	89.01
3.000	225	170	Circular	20.953	S111	84.62	87.21	S112	84.50	86.53
3.001	300	170	Circular	29.510	S112	84.42	86.53	S113	84.25	86.79
3.002	375	170	Circular	35.297	S113	84.17	86.79	S114	83.97	88.09
4.000	225	170	Circular	24.050	S122	85.76	87.19	S123	85.62	87.45
4.001	300	170	Circular	29.682	S123	85.55	87.45	S124	85.37	87.17
4.002	300	219	Circular	24.485	S124	85.37	87.17	S125	85.26	86.76
4.003	300	74	Circular	31.185	S125	85.26	86.76	S126	84.84	86.34
4.004	300	240	Circular	56.256	S126	84.84	86.34	S127	84.60	86.42
4.005	300	21	Circular	20.029	S127	84.60	86.42	S128	83.66	85.05
4.006	300	300	Circular	9.780	S128	83.66	85.05	S129	83.62	85.05

STORM Network 2

Pipe Code	Diameter (mm)	Gradient (1:)	Pipe Type	Pipe Length	Upstream Manhole Number	Upstream Manhole Invert	Upstream Manhole Cover	Downstream Manhole Number	Downstream Manhole Invert	Downstream Manhole Cover
1.000	225	170	Circular	34.125	S201	83.86	85.29	S202	83.66	86.78
1.001	225	170	Circular	20.677	S202	83.66	86.78	S204	83.54	87.52
1.002	300	240	Circular	24.376	S204	83.47	87.52	S205	83.36	87.18
1.003	300	240	Circular	20.370	S205	83.36	87.18	S206	83.28	86.93
1.004	300	240	Circular	52.112	S206	83.28	86.93	S207	83.06	84.98
1.005	300	240	Circular	14.981	S207	83.06	84.98	S208	83.00	85.76
1.006	300	242	Circular	8.954	S208	84.50	85.76	S209	84.46	86.05
2.000	225	15	Circular	23.030	S203	86.56	88.29	S204	85.04	87.52

STORM Network 3

Pipe Code	Diameter (mm)	Gradient (1:)	Pipe Type	Pipe Length	Upstream Manhole Number	Upstream Manhole Invert	Upstream Manhole Cover	Downstream Manhole Number	Downstream Manhole Invert	Downstream Manhole Cover
1.000	225	25	Circular	31.486	S301	89.90	91.33	S302	88.66	90.08
1.001	300	35	Circular	40.417	S302	88.58	90.08	S303	87.44	88.94
1.002	375	300	Circular	36.901	S303	87.37	88.94	S304	87.24	89.77
1.003	375	300	Circular	37.364	S304	87.24	89.77	S305	87.12	91.20
1.004	450	400	Circular	14.596	S305	87.04	91.20	S306	87.01	91.09
1.005	450	400	Circular	9.852	S306	87.01	91.09	S307	86.98	90.96
1.006	450	400	Circular	11.042	S307	86.98	90.96	S308	86.95	90.82
1.007	450	400	Circular	19.592	S308	86.95	90.82	S309	86.90	90.57
1.008	450	400	Circular	16.543	S309	86.90	90.57	S310	86.86	90.37
1.009	450	27	Circular	17.800	S310	86.86	90.37	S328	86.21	90.15
1.010	750	400	Circular	13.542	S328	84.41	90.15	S329	84.38	89.99
1.011	750	400	Circular	16.815	S329	84.38	89.99	S330	84.34	89.78
1.012	750	400	Circular	29.850	S330	84.34	89.78	S332	84.26	89.41
1.013	750	402	Circular	16.473	S332	84.26	89.41	S333	84.22	89.05
1.014	750	396	Circular	14.267	S333	84.22	89.05	S334	84.19	88.48
1.015	750	396	Circular	11.894	S334	84.19	88.48	S338	84.16	87.90
1.016	750	396	Circular	16.646	S338	84.16	87.90	S339	84.11	87.05
1.017	750	400	Circular	15.185	S339	84.11	87.05	S340	84.08	86.29
1.018	750	398	Circular	19.907	S340	84.08	86.29	S341	84.03	86.04
1.019	750	118	Circular	37.729	S341	84.03	86.04	S343	83.71	85.66
1.020	750	398	Circular	13.527	S343	83.71	85.66	S344	83.67	85.75
1.021	150	405	Circular	10.122	S344	85.50	85.75	S345	85.47	85.75
2.000	225	170	Circular	28.526	S311	87.66	89.09	S312	87.49	89.36
2.001	375	181	Circular	55.137	S312	87.34	89.36	S314	87.04	88.61
2.002	375	63	Circular	23.547	S314	87.04	88.61	S317	86.67	88.32
2.003	450	101	Circular	28.628	S317	86.59	88.32	S318	86.31	87.96
2.004	450	80	Circular	24.286	S318	86.31	87.96	S319	86.01	87.66
2.005	450	55	Circular	19.389	S319	86.01	87.66	S321	85.65	87.41
2.006	600	54	Circular	28.544	S321	85.48	87.41	S322	84.96	86.95
2.007	750	400	Circular	64.880	S322	84.81	86.95	S323	84.64	86.89
2.008	750	400	Circular	17.787	S323	84.64	86.89	S324	84.60	87.69
2.009	750	400	Circular	31.149	S324	84.60	87.69	S325	84.52	89.24
2.010	750	400	Circular	16.620	S325	84.52	89.24	S326	84.48	89.75
2.011	750	400	Circular	16.490	S326	84.48	89.75	S327	84.44	89.97
2.012	750	400	Circular	10.472	S327	84.44	89.97	S328	84.41	90.15
3.000	225	91	Circular	26.846	S313	87.49	88.91	S314	87.19	88.61
4.000	225	82	Circular	25.505	S315	87.51	88.94	S316	87.20	88.63
4.001	300	85	Circular	32.573	S316	87.13	88.63	S317	86.74	88.32
5.000	450	400	Circular	8.881	S320	85.65	87.30	S321	85.63	87.41
6.000	225	11	Circular	21.053	S331	88.36	89.79	S332	86.52	89.41
7.000	450	400	Circular	33.617	S335	84.69	86.42	S336	84.61	87.07
7.001	450	400	Circular	39.162	S336	84.61	87.07	S337	84.51	87.57
7.002	450	400	Circular	21.419	S337	84.51	87.57	S338	84.46	87.90
8.000	750	400	Circular	13.983	S342	83.75	85.80	S343	83.71	85.66

STORM Network 4

Pipe Code	Diameter (mm)	Gradient (1:)	Pipe Type	Pipe Length	Upstream Manhole Number	Upstream Manhole Invert	Upstream Manhole Cover	Downstream Manhole Number	Downstream Manhole Invert	Downstream Manhole Cover
1.000	375	300	Circular	40.661	S401	90.57	92.14	S402	90.43	92.92
1.001	375	300	Circular	19.602	S402	90.43	92.92	S403	90.37	92.78
1.002	375	300	Circular	24.498	S403	90.37	92.78	S404	90.28	92.59
1.003	375	300	Circular	15.357	S404	90.28	92.59	S405	90.23	92.85
1.004	375	300	Circular	18.974	S405	90.23	92.85	S406	90.17	93.17
1.005	375	125	Circular	40.147	S406	90.17	93.17	S407	89.85	91.76
1.006	375	22	Circular	16.805	S407	89.85	91.76	S408	89.08	90.65
1.007	450	400	Circular	40.694	S408	89.00	90.65	S409	88.90	92.08
1.008	450	400	Circular	38.179	S409	88.90	92.08	S410	88.80	91.26
1.009	150	398	Circular	10.357	S410	90.80	91.26	S411	90.77	91.02

STORM Network 5

Pipe Code	Diameter (mm)	Gradient (1:)	Pipe Type	Pipe Length	Upstream Manhole Number	Upstream Manhole Invert	Upstream Manhole Cover	Downstream Manhole Number	Downstream Manhole Invert	Downstream Manhole Cover
1.000	225	16	Circular	31.258	S501	87.80	89.23	S502	85.88	87.30
1.001	225	50	Circular	34.043	S502	85.88	87.30	S503	85.20	86.62
1.002	225	170	Circular	12.406	S503	85.20	86.62	S504	85.12	86.61
1.003	225	21	Circular	9.832	S504	85.12	86.61	S505	84.65	86.75
1.004	225	170	Circular	6.624	S505	85.90	86.75	S506	85.86	86.75

FOUL Network 6

Pipe Code	Diameter (mm)	Gradient (1:)	Pipe Type	Pipe Length	Upstream Manhole Number	Upstream Manhole Invert	Upstream Manhole Cover	Downstream Manhole Number	Downstream Manhole Invert	Downstream Manhole Cover
1.000	100	80	Circular	23.289	F1	92.35	93.35	F2	92.06	93.10
1.001	100	29	Circular	16.218	F2	92.06	93.10	F3	91.50	92.80
1.002	150	20	Circular	11.437	F3	91.45	92.80	F6	90.87	92.65
1.003	150	150	Circular	39.641	F6	90.87	92.65	F7	90.61	93.00
1.004	150	7	Circular	4.366	F7	90.61	93.00	F10	90.00	92.87
1.005	150	150	Circular	28.891	F10	90.00	92.87	F13	89.81	92.23
1.006	150	150	Circular	44.717	F13	89.81	92.23	F14	89.51	93.35
1.007	150	150	Circular	41.961	F14	89.51	93.35	F15	89.23	91.75
1.008	150	65	Circular	18.023	F15	89.23	91.75	F16	88.95	90.00
1.009	150	21	Circular	20.590	F16	88.95	90.00	F19	87.95	89.00
1.010	150	13	Circular	19.285	F19	87.95	89.00	F20	86.45	87.80
1.011	150	48	Circular	50.334	F20	86.45	87.80	F33	85.40	86.75
1.012	150	16	Circular	23.338	F33	85.11	86.75	F45	83.69	87.00
1.013	150	150	Circular	36.457	F45	83.69	87.00	F46	83.45	86.70
1.014	150	150	Circular	3.601	F46	83.45	86.70	F47	83.42	86.65
1.015	150	150	Circular	24.875	F47	83.42	86.65	F60	83.26	86.75
1.016	150	150	Circular	51.897	F60	83.26	86.75	F61	82.91	85.40
1.017	150	150	Circular	14.736	F61	82.91	85.40	F71	82.81	85.45
1.018	150	150	Circular	19.424	F71	82.81	85.45	F72	82.68	85.00
1.019	150	10	Circular	7.800	F72	82.68	85.00	F110	81.88	84.50
1.020	150	150	Circular	32.101	F110	81.88	84.50	F111	81.66	85.48
1.021	150	150	Circular	22.556	F111	81.66	85.48	F134	81.51	86.03
1.022	150	150	Circular	17.873	F134	81.51	86.03	F135	81.39	86.20
1.023	150	150	Circular	16.979	F135	81.39	86.20	F136	81.28	86.00
1.024	150	150	Circular	45.178	F136	81.28	86.00	F204	80.98	85.67
1.025	225	150	Circular	17.581	F204	80.91	85.67	F205	80.79	85.50
2.000	100	80	Circular	20.041	F4	91.25	92.25	F5	91.00	92.60
2.001	150	150	Circular	11.268	F5	90.95	92.60	F6	90.87	92.65
3.000	100	40	Circular	11.374	F8	91.80	93.10	F9	91.52	93.05
3.001	100	37	Circular	6.109	F9	91.52	93.05	F10	91.35	92.87
4.000	100	80	Circular	64.676	F11	91.30	92.60	F12	90.49	92.25
4.001	150	7	Circular	4.228	F12	90.44	92.25	F13	89.81	92.23
5.000	100	14	Circular	16.402	F17	90.70	92.00	F18	89.50	90.80
5.001	100	17	Circular	25.757	F18	89.50	90.80	F19	88.00	89.00
6.000	100	80	Circular	27.343	F21	92.30	93.30	F22	91.96	93.30
6.001	100	80	Circular	23.045	F22	91.96	93.30	F23	91.67	93.00
6.002	150	20	Circular	5.351	F23	91.62	93.00	F24	91.35	92.70
6.003	150	15	Circular	17.206	F24	91.35	92.70	F25	90.20	91.58
6.004	150	20	Circular	16.843	F25	89.30	91.58	F28	88.47	90.45
6.005	150	14	Circular	13.852	F28	88.47	90.45	F29	87.50	89.53
6.006	150	17	Circular	33.968	F29	87.50	89.53	F30	85.52	87.36
6.007	150	150	Circular	34.197	F30	85.52	87.36	F31	85.29	87.00
6.008	150	150	Circular	13.397	F31	85.29	87.00	F32	85.20	86.85
6.009	150	150	Circular	14.599	F32	85.20	86.85	F33	85.11	86.75
7.000	100	24	Circular	28.373	F26	90.80	92.10	F27	89.60	90.90
7.001	150	6	Circular	6.670	F27	89.55	90.90	F28	88.47	90.45
8.000	100	80	Circular	18.863	F34	88.60	89.60	F35	88.36	89.55
8.001	100	57	Circular	32.349	F35	88.36	89.55	F36	87.80	89.10
8.002	150	63	Circular	8.600	F36	87.75	89.10	F39	87.61	88.73
8.003	150	150	Circular	24.991	F39	86.26	88.73	F40	86.10	87.92
8.004	150	150	Circular	8.866	F40	86.10	87.92	F41	86.04	87.54
8.005	150	16	Circular	33.541	F41	86.04	87.54	F44	83.94	86.73
8.006	150	150	Circular	37.430	F44	83.94	86.73	F45	83.69	87.00
9.000	100	80	Circular	27.605	F37	86.75	87.75	F38	86.41	88.85
9.001	150	150	Circular	13.588	F38	86.35	88.85	F39	86.26	88.73
10.000	100	80	Circular	44.786	F42	85.40	86.40	F43	84.84	86.75
10.001	150	150	Circular	5.687	F43	84.79	86.75	F44	84.75	86.73
11.000	100	27	Circular	7.929	F48	87.55	88.55	F50	87.26	88.40
11.001	100	40	Circular	9.425	F50	87.26	88.40	F51	87.02	88.45
11.002	100	80	Circular	19.230	F51	87.02	88.45	F52	86.78	88.70
11.003	150	150	Circular	7.542	F52	86.73	88.70	F53	86.68	88.70
11.004	150	150	Circular	19.451	F53	86.68	88.70	F57	86.55	88.66
11.005	150	150	Circular	7.206	F57	86.55	88.66	F58	86.51	88.50
11.006	150	59	Circular	32.588	F58	86.51	88.50	F59	85.95	87.30
11.007	150	21	Circular	28.469	F59	85.95	87.30	F60	84.61	86.75
12.000	100	80	Circular	3.194	F49	87.30	88.30	F50	87.26	88.40
13.000	100	80	Circular	18.343	F54	88.20	89.20	F55	87.97	89.20
13.001	100	80	Circular	19.949	F55	87.97	89.20	F56	87.72	88.95
13.002	150	78	Circular	5.307	F56	87.67	88.95	F57	87.60	88.66
14.000	100	80	Circular	8.177	F62	87.70	88.70	F63	87.60	88.85
14.001	100	80	Circular	18.134	F63	87.60	88.85	F64	87.37	88.85
14.002	150	150	Circular	12.840	F64	87.32	88.85	F65	87.23	88.85
14.003	150	150	Circular	16.833	F65	87.23	88.85	F66	87.12	88.50
14.004	150	33	Circular	17.278	F66	87.12	88.50	F67	86.60	87.95
14.005	150	30	Circular	15.111	F67	86.60	87.95	F68	86.10	87.45
14.006	150	35	Circular	17.345	F68	86.10	87.45	F69	85.60	86.65
14.007	150	20	Circular	15.862	F69	85.60	86.65	F70	84.80	85.85
14.008	150	9	Circular	17.166	F70	84.80	85.85	F71	82.81	85.45
15.000	100	80	Circular	8.597	F73	85.60	86.60	F74	85.49	86.75
15.001	150	150	Circular	43.573	F74	85.44	86.75	F75	85.15	87.60
15.002	150	150	Circular	11.486	F75	85.15	87.60	F76	85.08	87.55
15.003	150	150	Circular	21.505	F76	85.08	87.55	F77	84.93	87.20
15.004	150	60	Circular	19.832	F77	84.93	87.20	F80	84.60	86.85
15.005	150	150	Circular	22.370	F80	84.60	86.85	F82	84.45	86.45
15.006	150	150	Circular	12.472	F82	84.45	86.45	F83	84.37	86.50
15.007	150	150	Circular	57.781	F83	84.37	86.50	F84	83.98	86.00
15.008	150	60	Circular	32.046	F84	83.98	86.00	F91	83.45	84.80
15.009	150	150	Circular	26.095	F91	83.45	84.80	F97	83.28	85.95
15.010	150	150	Circular	16.866	F97	83.28	85.95	F98	83.16	86.00
15.011	150	150	Circular	29.740	F98	83.16	86.00	F99	82.97	86.50
15.012	150	150	Circular	19.545	F99	82.97	86.50	F100	82.84	86.50
15.013	150	150	Circular	31.972	F100	82.84	86.50	F101	82.62	85.55
15.014	150	150	Circular	9.115	F101	82.62	85.55	F107	82.56	85.13
15.015	150	150	Circular	8.475	F107	82.56	85.13	F108	82.50	84.70
15.016	150	150	Circular	55.417	F108	82.50	84.70	F109	82.14	84.80
15.017	150	150	Circular	38.765	F109	82.14	84.80	F110	81.88	84.50
16.000	100	23	Circular	31.813	F78	86.30	87.30	F79	84.92	86.85
16.001	150	37	Circular	9.640	F79	84.86	86.85	F80	84.60	86.85
17.000	100	33	Circular	18.139	F81	85.05	86.35	F82	84.50	86.45
18.000	100	80	Circular	22.031	F85	86.45	87.45	F86	86.17	87.55
18.001	100	80	Circular	18.152	F86	86.17	87.55	F87	85.95	87.05
18.002	100	30	Circular	13.430	F87	85.95	87.05	F88	85.50	86.50
18.003	100	32	Circular	25.317	F88	85.50	86.50	F89	84.70	85.70
18.004	100	50	Circular	15.113	F89	84.70	85.70	F90	84.40	85.40
18.005	100	15	Circular	13.324	F90	84.40	85.40	F91	83.50	84.80
19.000	100	79	Circular	19.681	F92	85.90	86.90	F93	85.65	86.65
19.001	100	38	Circular	30.595	F93	85.65	86.65	F94	84.85	85.85
19.002	100	80	Circular	7.462	F94	84.85	85.85	F95	84.76	86.15
19.003	150	95	Circular	7.663	F95	84.71	86.15	F97	84.63	85.95
20.000	100	20	Circular	23.774	F96	85.84	87.14	F97	84.63	85.95
21.000	100	28	Circular	25.317	F102	86.20	87.20	F103	85.30	86.60
21.001	150	19	Circular	6.374	F103	85.25	86.60	F106	84.92	86.26
21.002	150	23	Circular	23.347	F106	84.92	86.26	F107	83.91	85.13
22.000	150	33	Circular	13.154	F104	85.55	86.90	F105	85.15	86.50
22.001	150	22	Circular	5.125	F105	85.15	86.50	F106	84.92	86.26
23.000	100	60	Circular	56.555	F112	90.60	91.60	F113	89.65	90.65
23.001	100	30	Circular	16.545	F113	89.65	90.65	F114	89.10	90.40
23.002	150	29	Circular	4.523	F114	89.05	90.40	F119	88.89	90.24
23.003	150	79	Circular	9.889	F119	88.89	90.24	F120	88.77	90.12
23.004	150	150	Circular	12.973	F120	88.77	90.12	F121	88.68	90.10
23.005	150	74	Circular	30.844	F121	88.68	90.10	F124	88.27	89.70
23.006	150	91	Circular	15.013	F124	88.27	89.70	F125	88.10	89.45

FOUL Network 6

Pipe Code	Diameter (mm)	Gradient (1:)	Pipe Type	Pipe Length	Upstream Manhole Number	Upstream Manhole Invert	Upstream Manhole Cover	Downstream Manhole Number	Downstream Manhole Invert	Downstream Manhole Cover
23.007	150	133	Circular	13.273	F125	88.10	89.45	F126	88.00	89.05
23.008	150	15	Circular	16.725	F126	88.00	89.05	F127	86.85	88.20
23.009	150	30	Circular	4.244	F127	86.85	88.20	F131	86.71	88.06
23.010	150	20	Circular	23.867	F131	86.71	88.06	F132	85.52	86.87
23.011	150	30	Circular	27.128	F132	85.52	86.87	F133	84.61	85.96
23.012	150	16	Circular	28.056	F133	84.61	85.96	F134	82.86	86.03
24.000	100	80	Circular	23.300	F115	89.90	90.90	F116	89.61	90.65
24.001	100	31	Circular	15.841	F116	89.61	90.65	F118	89.11	90.45
24.002	150	64	Circular	10.438	F118	89.06	90.45	F119	88.89	90.24
25.000	100	80	Circular	7.555	F117	89.20	90.20	F118	89.11	90.45
26.000	100	42	Circular	22.911	F122	88.95	89.95	F123	88.40	89.70
26.001	150	150	Circular	12.751	F123	88.35	89.70	F124	88.27	89.70
27.000	100	67	Circular	20.205	F128	88.10	89.40	F129	87.80	88.80
27.001	100	18	Circular	9.125	F129	87.80	88.80	F130	87.30	88.60
27.002	150	16	Circular	8.791	F130	87.25	88.60	F131	86.71	88.06
28.000	100	20	Circular	19.947	F137	89.40	90.40	F138	88.40	89.40
28.001	100	80	Circular	25.049	F138	88.40	89.40	F139	88.09	89.10
28.002	100	80	Circular	10.921	F139	88.09	89.10	F140	87.95	89.25
28.003	100	80	Circular	11.888	F140	87.95	89.25	F141	87.80	89.45
28.004	150	150	Circular	18.032	F141	87.75	89.45	F149	87.63	89.17
28.005	150	40	Circular	23.704	F149	87.63	89.17	F150	87.04	88.93
28.006	150	66	Circular	30.852	F150	87.04	88.93	F158	86.56	88.59
28.007	150	59	Circular	18.803	F158	86.56	88.59	F164	86.25	88.35
28.008	150	76	Circular	25.653	F164	86.25	88.35	F165	85.91	88.03
28.009	150	150	Circular	8.616	F165	85.91	88.03	F166	85.85	88.15
28.010	150	91	Circular	23.189	F166	85.85	88.15	F169	85.60	87.85
28.011	150	45	Circular	18.590	F169	85.60	87.85	F176	85.19	87.60
28.012	150	150	Circular	25.786	F176	85.19	87.60	F177	85.02	87.00
28.013	150	86	Circular	64.011	F177	85.02	87.00	F178	84.27	87.75
28.014	150	150	Circular	18.190	F178	84.27	87.75	F185	84.15	87.78
28.015	150	150	Circular	13.723	F185	84.15	87.78	F186	84.06	87.10
28.016	150	150	Circular	19.517	F186	84.06	87.10	F187	83.93	86.50
28.017	150	150	Circular	17.928	F187	83.93	86.50	F188	83.81	86.71
28.018	150	150	Circular	17.752	F188	83.81	86.71	F189	83.69	87.15
28.019	150	150	Circular	20.422	F189	83.69	87.15	F190	83.56	87.65
28.020	150	150	Circular	62.933	F190	83.56	87.65	F191	83.14	86.11
28.021	150	150	Circular	29.006	F191	83.14	86.11	F192	82.94	86.10
28.022	150	150	Circular	17.702	F192	82.94	86.10	F193	82.82	86.25
28.023	150	150	Circular	19.081	F193	82.82	86.25	F194	82.70	86.45
28.024	150	150	Circular	41.229	F194	82.70	86.45	F195	82.42	86.45
28.025	150	150	Circular	13.400	F195	82.42	86.45	F202	82.33	86.45
28.026	150	150	Circular	27.758	F202	82.33	86.45	F203	82.15	86.27
28.027	150	27	Circular	31.548	F203	82.15	86.27	F204	80.98	85.67
29.000	100	13	Circular	28.541	F142	90.85	91.85	F143	88.60	90.60
29.001	150	150	Circular	15.522	F143	88.55	90.60	F144	88.45	90.40
29.002	150	39	Circular	15.379	F144	88.45	90.40	F145	88.05	89.40
29.003	150	18	Circular	7.454	F145	88.05	89.40	F149	87.63	89.17
30.000	100	26	Circular	20.599	F146	90.35	91.35	F147	89.55	90.55
30.001	100	37	Circular	56.931	F147	89.55	90.55	F148	88.00	89.30
30.002	150	48	Circular	15.363	F148	87.95	89.30	F149	87.63	89.17
31.000	100	80	Circular	13.148	F151	87.80	88.80	F152	87.64	88.80
31.001	100	80	Circular	5.922	F152	87.64	88.80	F153	87.56	89.05
31.002	150	24	Circular	11.229	F153	87.51	89.05	F154	87.04	89.15
31.003	150	150	Circular	14.484	F154	87.04	89.15	F155	86.94	89.45
31.004	150	150	Circular	5.828	F155	86.94	89.45	F156	86.90	89.40
31.005	150	150	Circular	17.711	F156	86.90	89.40	F157	86.79	89.26
31.006	150	150	Circular	33.141	F157	86.79	89.26	F158	86.57	88.59
32.000	100	34	Circular	30.756	F159	89.90	90.90	F160	89.00	90.00
32.001	100	23	Circular	18.248	F160	89.00	90.00	F161	88.20	89.50
32.002	150	13	Circular	13.282	F161	88.15	89.50	F162	87.09	89.03
32.003	150	80	Circular	25.226	F162	87.09	89.03	F163	86.78	88.72
32.004	150	63	Circular	33.299	F163	86.78	88.72	F164	86.25	88.35
33.000	100	44	Circular	11.611	F167	86.70	88.00	F168	86.44	87.85
33.001	150	150	Circular	13.375	F168	85.69	87.85	F169	85.60	87.85
34.000	100	76	Circular	18.932	F170	86.85	87.85	F171	86.60	87.60
34.001	100	55	Circular	21.930	F171	86.60	87.60	F172	86.20	87.20
34.002	100	80	Circular	52.577	F172	86.20	87.20	F173	85.54	87.50
34.003	150	150	Circular	5.166	F173	85.49	87.50	F174	85.46	87.38
34.004	150	27	Circular	5.685	F174	85.46	87.38	F175	85.25	87.46
34.005	150	150	Circular	8.821	F175	85.25	87.46	F176	85.19	87.60
35.000	100	62	Circular	6.207	F179	88.90	89.90	F180	88.80	89.80
35.001	100	15	Circular	10.821	F180	88.80	89.80	F183	88.10	89.40
35.002	150	17	Circular	29.841	F183	88.05	89.40	F184	86.25	87.90
35.003	150	6	Circular	4.217	F184	86.25	87.90	F185	85.50	87.78
36.000	100	50	Circular	22.310	F181	88.65	89.95	F182	88.20	89.50
36.001	150	116	Circular	11.617	F182	88.15	89.50	F183	88.05	89.40
37.000	100	79	Circular	15.823	F196	86.60	87.60	F197	86.40	87.40
37.001	100	31	Circular	18.894	F197	86.40	87.40	F198	85.80	87.10
37.002	150	26	Circular	6.008	F198	85.75	87.10	F201	85.52	86.87
37.003	150	13	Circular	24.492	F201	85.52	86.87	F202	83.68	86.45
38.000	100	67	Circular	26.904	F199	86.20	87.50	F200	85.80	87.10
38.001	150	37	Circular	8.633	F200	85.75	87.10	F201	85.52	86.87

Notes

1. Setting out shall be undertaken using only the information given. Distances should not be scaled from this drawing.

2. All adoptable drainage shall be constructed in accordance with 'Sewers for Adoption' 7th Edition, Welsh Ministers Standards and Welsh Water Details and Guidelines.

3. The minimum gravity pipe diameter under adoptable highways shall be 150mm

4. It is the responsibility of the Contractor to verify all information given with regards to existing services and drainage connections etc. prior to commencing the works. The rates shall include for hand dig around services where necessary. The Contractor shall adhere to the CDM Regulations at all times

8. All materials to bear the relevant B.S. Kitemark and comply fully with the specifications. All concrete & concrete products must use Sulphate resistant cement to withstand Class 3 condition (unless the site investigation report proves that sulphate attack from soils and groundwater will not occur).

9. All opening notices etc. as required under Highways Acts etc. are to be obtained prior to commencement of works. All works are to be inspected by L.A., NHBC or the Network Operator as applicable.

10. Where structured wall UPVC pipes (or similar approved) are used in adoptable drainage they shall be handled and laid in accordance with the manufacturers instructions and will be subject to post installation deformation testing prior to adoption.
A Class S Bed and Surround must be used for structured wall pipes

10. Trench backfill in highways to within 1m of highway shall, as directed by the Highway Authority be a suitable granular material all in accordance with Sewers for Adoption.

12. Slab levels shall not be varied without reference to the Engineer for guidance.

13. Pipes have not been designed to accommodate construction traffic loading. The contractor is responsible for providing adequate protection to the pipes during construction.

14. All manhole covers and frames shall comply with BS EN124. All adoptable manholes and chambers shall comply with Sewers for Adoption 7th Edition. Covers in roads to be grade D400 and be 150mm deep. Manhole covers in car parking areas and drives to be grade B125 and covers in landscaping areas to be grade A15. All to be sized in accordance with Building Regulations Part H, Tables 11 & 12. "In-fill" type covers should not be used. Where a cover is located in an area of block paving, the bottom of the frame should be 150mm deep.

STRATEGY

Rev.	Date	Revision	By	Appd.
D	19.06.26	Foul Water Drainage revised	PW	AJ
C	03.06.26	Updated to suit revised layout	PW	AJ
B	23.04.26	Foul drainage added	PW	AJ
A	21.04.26	Updated to suit revised layout	PW	AJ

coopers
chartered consulting engineers
Park House
Sandpiper Court
Chester Business Park
Chester
CH4 9QU
Tel: 01244 684910
Email: admin@coopers.co.uk
Web: http://coopers.co.uk

Client
Castle Green

Project
STANSTY ROAD, WREXHAM

Title
Drainage Strategy
Sheet 3 of 3

DRAWING NUMBER	SCALE at A1	1:500	
8562 / SK02-3	DATE	21.07.25	REVISION
	DRAWN	PW	D
	CHECKED	AJ	

© Copyright The original of this drawing contained coloured symbols and/or features. Any black and white reproduction should not be relied upon.

DO NOT SCALE

NORTH

Network 1

PIPE REF:	U/S MH REF:	IMPERMEABLE AREA	IMPERMEABLE AREA (+10%)
0.000	S101	1310	1440
0.000	S102	550	610
0.000	S103	430	470
0.000	S104	1000	1100
0.000	S105	570	630
0.000	S106	640	700
0.000	S107	1150	1260
0.000	S108	1980	2180
0.000	S109	750	830
0.000	S110	160	180
0.000	S111	380	420
0.000	S112	540	590
0.000	S113	520	570
0.000	S114	230	250
0.000	S115	550	610
0.000	S116	160	180
0.000	S117	310	340
0.000	S118	100	110
0.000	S119	280	310
0.000	S120	420	460
0.000	S121	1300	1430
0.000	S122	1110	1220
0.000	S123	410	450
0.000	S124	730	800
0.000	S125	1000	1100
0.000	S126	550	610
0.000	S127	940	1030
0.000	S128	-	-
0.000	S129	-	-
TOTAL		18,070	19,880

Network 2

PIPE REF:	U/S MH REF:	IMPERMEABLE AREA	IMPERMEABLE AREA (+10%)
0.000	S201	520	570
0.000	S202	230	250
0.000	S203	480	530
0.000	S204	160	180
0.000	S205	140	160
0.000	S206	370	410
0.000	S207	620	680
0.000	S208	220	240
0.000	S209		
TOTAL		2,740	3,020

Network 3

PIPE REF:	U/S MH REF:	IMPERMEABLE AREA	IMPERMEABLE AREA (+10%)
0.000	S301	1620	1780
0.000	S302	730	800
0.000	S303	840	920
0.000	S304	1360	1500
0.000	S305	740	810
0.000	S306	290	320
0.000	S307	500	550
0.000	S308	450	500
0.000	S309	500	550
0.000	S310	430	470
0.000	S311	1350	1490
0.000	S312	1480	1630
0.000	S313	790	870
0.000	S314	940	1030
0.000	S315	1090	1200
0.000	S316	850	940
0.000	S317	710	780
0.000	S318	850	940
0.000	S319	750	820
0.000	S320	340	370
0.000	S321	1420	1560
0.000	S322	-	-
0.000	S323	1490	1640
0.000	S324	840	920
0.000	S325	160	180
0.000	S326	410	500
0.000	S327	410	450
0.000	S328	680	750
0.000	S329	170	190
0.000	S330	300	330
0.000	S331	250	280
0.000	S332	1050	1160
0.000	S333	150	170
0.000	S334	670	740
0.000	S335	1190	1310
0.000	S336	1130	1240
0.000	S337	160	180
0.000	S338	450	500
0.000	S339	410	450
0.000	S340	380	420
0.000	S341	700	770
0.000	S342	-	-
0.000	S343	170	190
0.000	S344	900	990
TOTAL		30,140	33,190

Network 4

PIPE REF:	U/S MH REF:	IMPERMEABLE AREA	IMPERMEABLE AREA (+10%)
0.000	S401	2380	2620
0.000	S402	430	470
0.000	S403	610	670
0.000	S404	850	940
0.000	S405	350	390
0.000	S406	540	590
0.000	S407	520	570
0.000	S408	730	800
0.000	S409	250	270
0.000	S410	1030	1130
TOTAL		7,690	8,450

Network 5

PIPE REF:	U/S MH REF:	IMPERMEABLE AREA	IMPERMEABLE AREA (+10%)
0.000	S501	580	640
0.000	S502	430	470
0.000	S503	430	470
0.000	S504	530	580
0.000	S505	-	-
TOTAL		1,970	2,160

Stansty

Northcott

STANSTY LODGE LANE

Abattoir

Cattle Grid

Oakhurst

The Hawthorns

Parkland

A483

FUTURE PHASE 3

FUTURE PHASE 3

MOLD ROAD

Line of Poles

Stansty Lodge

Indicative zone extension to area within the application boundary where no access is available at point of this application

Drainage Basin

Drainage basin

Overhead Power Line

Underground Gas Main

Underground Water Main

P-01

P-02

P-03

© Copyright

The original of this drawing contained coloured symbols and/or features. Any black and white reproduction should not be relied upon.

STRATEGY

Rev.	Date	Revision	By	Appd.
A	15.07.26	Updated to suit revised layout	PW	AJ

coopers
chartered consulting engineers
Park House
Sandpiper Court
Chester Business Park
Chester
CH4 9QU
Tel: 01244 684910
Email: admin@coopers.co.uk
Web: http://coopers.co.uk

Client

Castle Green

Project

STANSTY ROAD, WREXHAM

Title

SW Catchment Areas

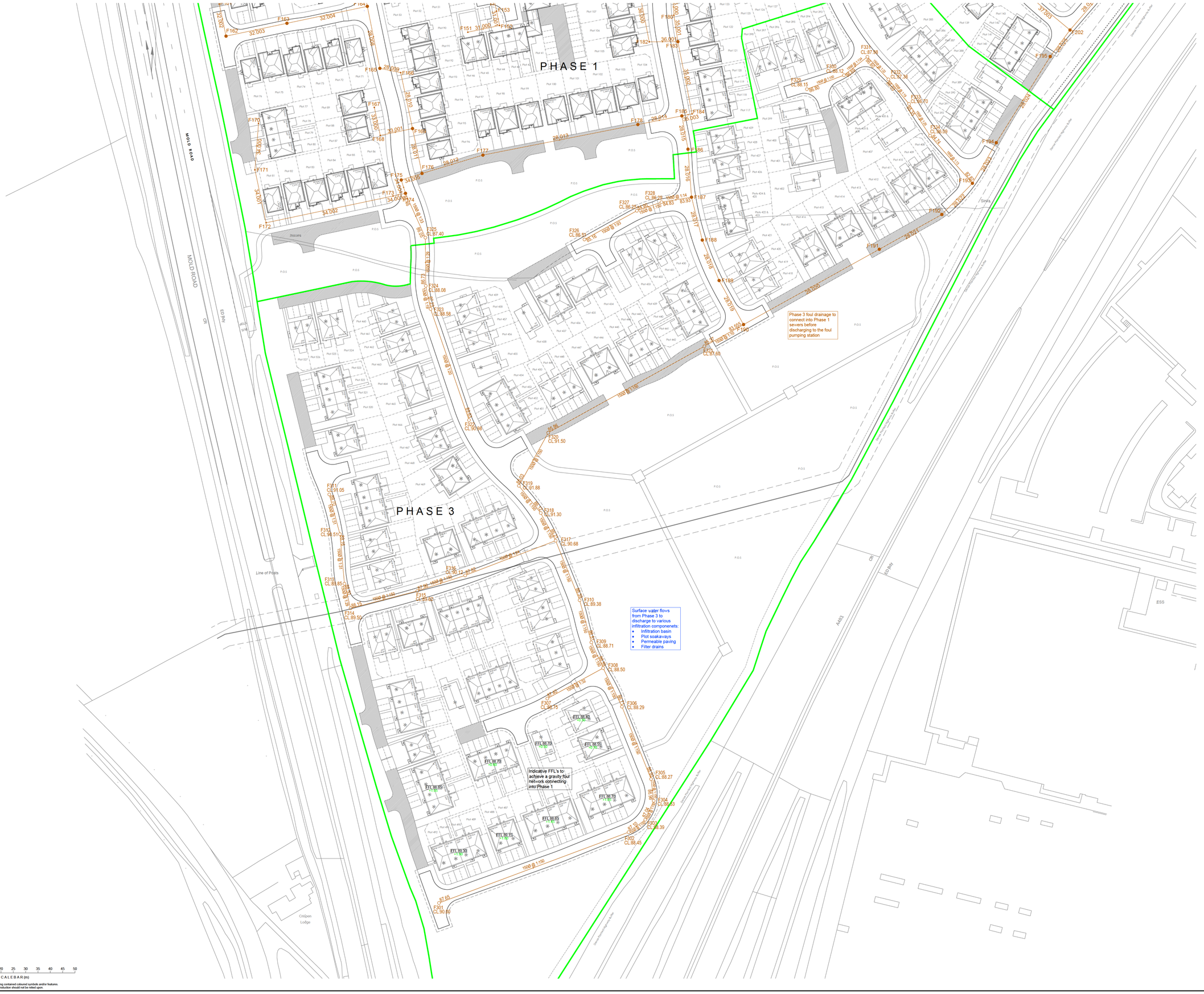
DRAWING NUMBER

8562 / SK04

SCALE at A0	NTS	
DATE	21.07.25	REVISION
DRAWN	PW	A
CHECKED	AJ	

DO NOT SCALE

NORTH



0 5 10 15 20 25 30 35 40 45 50

SCALEBAR (m)

© Copyright The original of this drawing contained coloured symbols and/or features. Any black and white reproduction should not be relied upon.

STRATEGY

coopers
chartered consulting engineers
Park House
Sandpiper Court
Chester Business Park
Chester
CH4 9QU
Tel: 01244 684910
Email: admin@coopers.co.uk
Web: http://coopers.co.uk

Client

Castle Green

Project

STANSTY ROAD,
WREXHAM

Title

Phase 3 Drainage Proposal

DRAWING NUMBER	SCALE at A0	1:500	
8562 / SK08	DATE	19.06.26	REVISION
	DRAWN	PW	-
	CHECKED	AJ	

DO NOT SCALE



© Copyright The original of this drawing contained coloured symbols and/or features. Any black and white reproduction should not be relied upon.

Coopers Soakaway Test Results (2025)

Soakaway Test	Test Results	PASS / FAIL	TEST DEPTH
ITP 01	5.01×10^{-5} 6.05×10^{-5} 4.98×10^{-5}	PASS	1.80m
ITP 02	9.11×10^{-6} 7.16×10^{-6} 6.93×10^{-6}	FAIL	2.20m
ITP 04	3.04×10^{-4} 7.77×10^{-4} 1.93×10^{-4}	PASS	2.16m
ITP 05	1.56×10^{-5} 8.19×10^{-6} 8.19×10^{-6}	FAIL	2.10m
ITP 06	1.13×10^{-4} 1.16×10^{-4} 1.04×10^{-4}	PASS	2.45m
ITP 07	2.99×10^{-5} 9.29×10^{-6} 7.23×10^{-6}	FAIL	2.36m
ITP 08	N/A N/A N/A	FAIL	1.95m
ITP 09	N/A N/A N/A	FAIL	2.00m
ITP 10	1.10×10^{-4} 6.90×10^{-5} 6.75×10^{-5}	PASS	2.10m
ITP 11	4.97×10^{-4} 2.76×10^{-4} 2.47×10^{-4}	PASS	2.10m
ITP 12	5.08×10^{-6} N/A N/A	FAIL	2.60m
ITP 14	3.72×10^{-4} 3.16×10^{-4} 2.57×10^{-4}	PASS	2.30m
ITP 15	1.37×10^{-3} 9.47×10^{-4} 7.95×10^{-4}	PASS	2.60m
ITP 16	5.36×10^{-4} 4.40×10^{-4} 4.55×10^{-4}	PASS	2.30m
ITP 17	1.25×10^{-4} 1.12×10^{-4} 1.13×10^{-4}	PASS	2.24m
ITP 18	N/A N/A N/A	FAIL	2.40m

Coopers Soakaway Test Results (2026)

Soakaway Test	Test Results	PASS / FAIL	TEST DEPTH
ITP 101	1.93×10^{-4} 9.18×10^{-5} 9.09×10^{-5}	PASS	1.00m
ITP 102	1.06×10^{-5} 7.37×10^{-6} 4.92×10^{-6}	FAIL	1.00m
ITP 103	5.83×10^{-4} 3.09×10^{-4} 2.92×10^{-4}	PASS	2.00m
ITP 104	1.92×10^{-4} 2.56×10^{-4} 1.85×10^{-4}	PASS	2.00m
ITP 105	7.99×10^{-5} 3.84×10^{-5} 2.77×10^{-5}	PASS	2.00m
ITP 106	4.79×10^{-4} 2.41×10^{-4} 2.04×10^{-4}	PASS	2.00m
ITP 107	Drained down 160mm in 200 min's	FAIL	1.48m
ITP 108	1.54×10^{-4} 1.38×10^{-4} 1.42×10^{-4}	PASS	2.99m
ITP 109	2.00×10^{-4} 2.39×10^{-4} 1.76×10^{-4}	PASS	2.60m

INFORMATION

coopers
chartered consulting engineers
Park House
Sandpiper Court
Chester Business Park
Chester
CH4 9QU
Tel: 01244 684910
Email: admin@coopers.co.uk
Web: http://coopers.co.uk

Client

Castle Green

Project

STANSTY ROAD,
WREXHAM.

Title

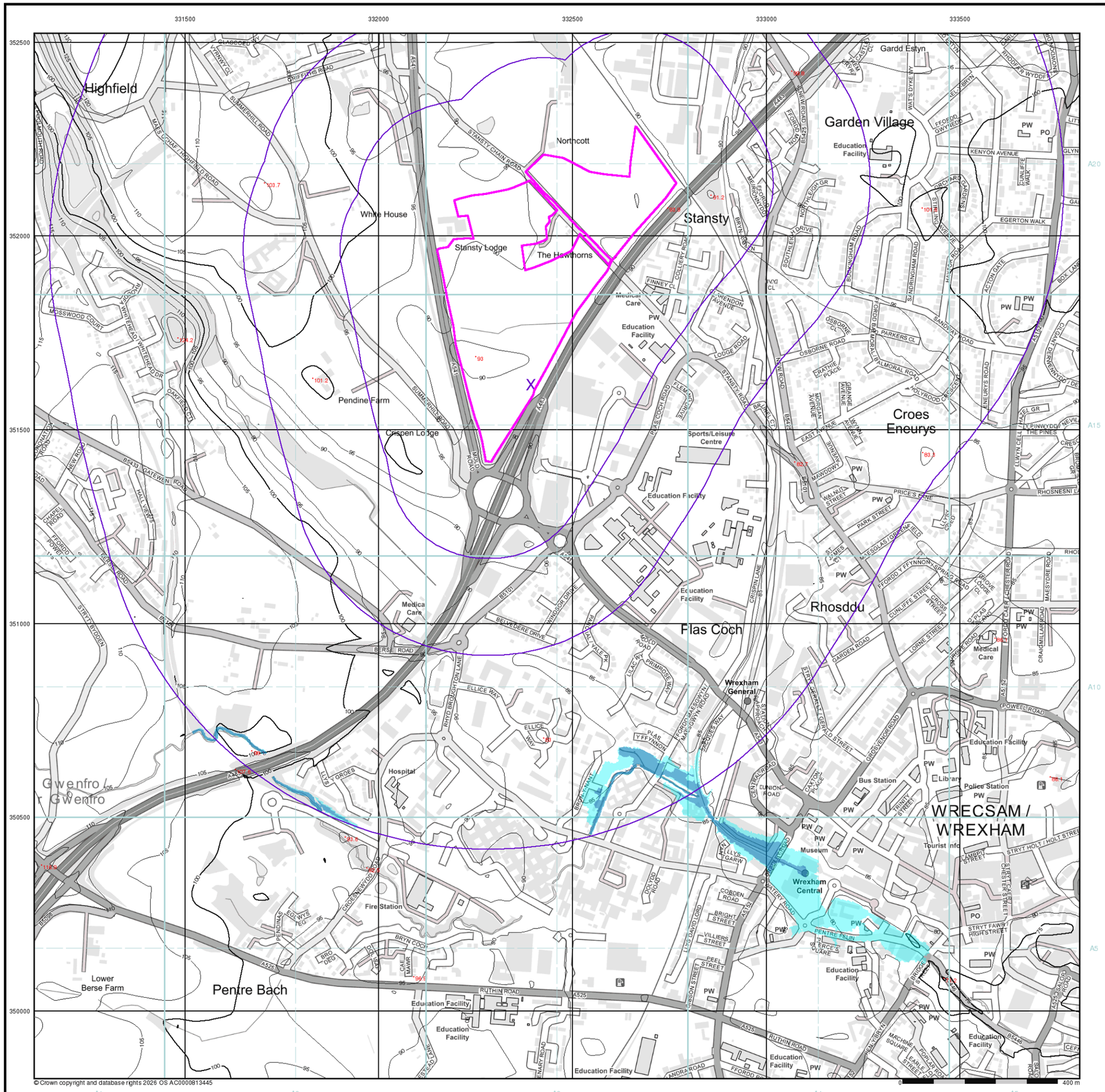
Infiltration Tests

DRAWING NUMBER	SCALE at A0	1:250	
8562 / SK09	DATE	14.07.2026	REVISION
	DRAWN	AJ	
	CHECKED	AJ	

Appendix 2

Envirocheck Flood Screening Report

Order Number: 403509245_1_1



Envirocheck®

LANDMARK INFORMATION GROUP®

EA/NRW Flood Data Map (1:10,000)

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

Flood Data

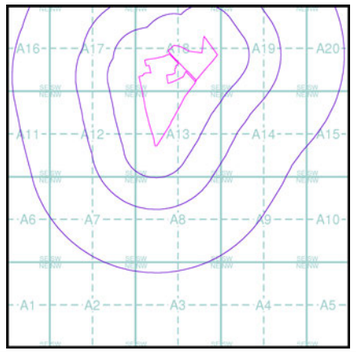
- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Contours (height in metres)

Standard Contour 105
Master Contour 100 95
Spot Height 167.8

MLW Mean Low Water
MHW Mean High Water

EA/NRW Flood Data Map - Slice A



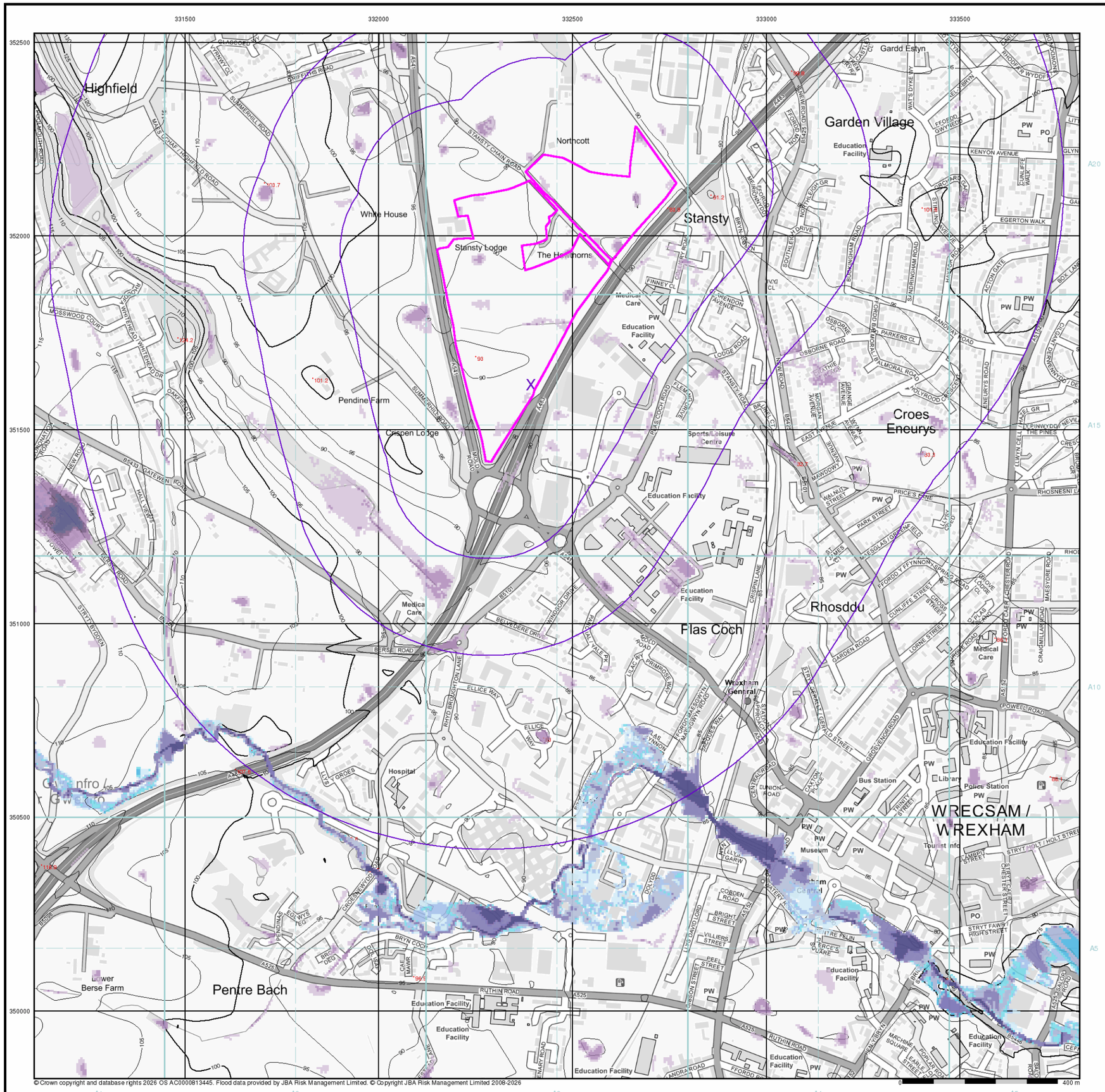
Order Details

Order Number:	403509245_1_1
Customer Ref:	8562
National Grid Reference:	332390, 351620
Slice:	A
Site Area (Ha):	21.87
Search Buffer (m):	1000

Site Details

Land Either Side of Stansty Chain Road, Wrexham, LL11 4YF

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Envirocheck®

LANDMARK INFORMATION GROUP®

JBA 75 Year Return Flood Map (Undefended) (1:10,000)

General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

Modelled Flood Depth

Pluvial Depth	Fluvial Depth	Coastal Depth
0.1m	0.01m - 0.05m	0.01m - 0.05m
0.1m - 0.3m	0.05m - 0.1m	0.05m - 0.1m
0.3m - 1m	0.1m - 0.3m	0.1m - 0.3m
>1m	0.3m - 1m	0.3m - 1m
	>1m	>1m

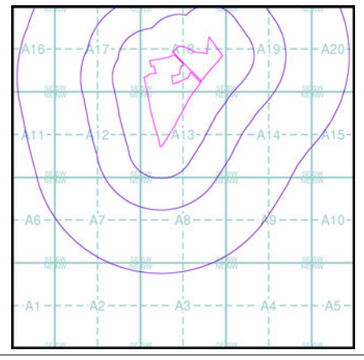
Contours (height in metres)

Standard Contour 105 100 95 — MLW Mean Low Water

Master Contour — MHW Mean High Water

Spot Height 157.8

JBA 75 Year Return Flood Map (Undefended) - Slice A



Order Details

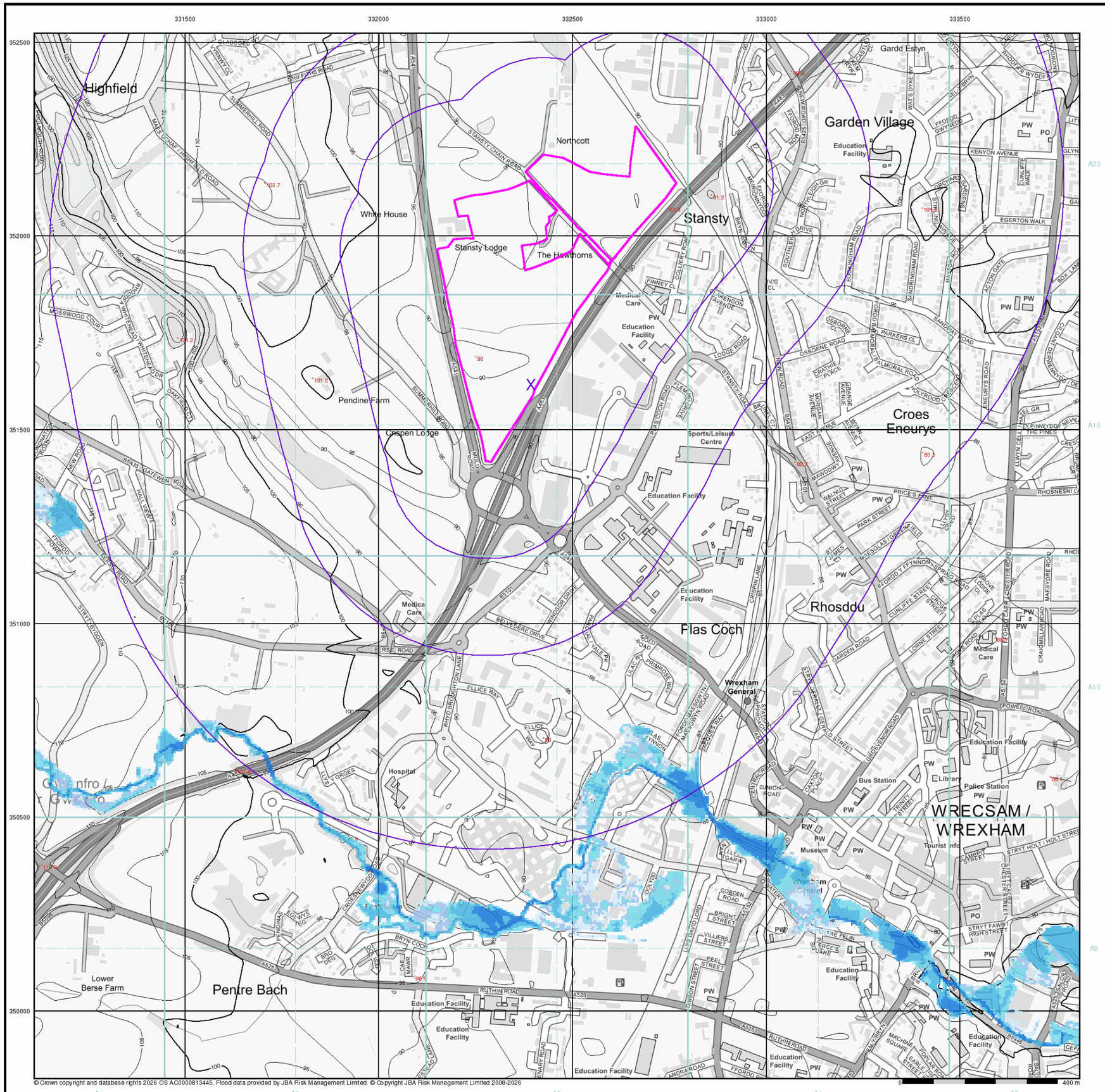
Order Number:	403509245_1_1
Customer Ref:	8562
National Grid Reference:	332390, 351620
Slice:	A
Site Area (Ha):	21.87
Search Buffer (m):	1000

Site Details

Land Either Side of Stansty Chain Road, Wrexham, LL11 4YF

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Envirocheck®

LANDMARK INFORMATION GROUP®

JBA 100 Year Return Flood Map (Undefended) (1:10,000)

General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

Modelled Flood Depth

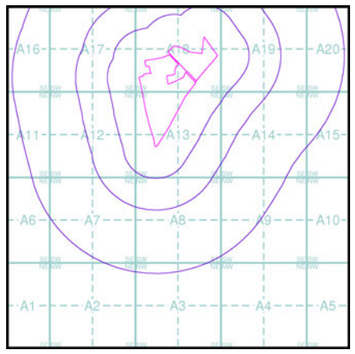
Fluvial Depth	Coastal Depth
0.01m - 0.05m	0.01m - 0.05m
0.05m - 0.1m	0.05m - 0.1m
0.1m - 0.3m	0.1m - 0.3m
0.3m - 1m	0.3m - 1m
>1m	>1m

Contours (height in metres)

Standard Contour 105
Master Contour 100 95
Spot Height 167.8

MLW Mean Low Water
MHW Mean High Water

JBA 100 Year Return Flood Map (Undefended) - Slice A



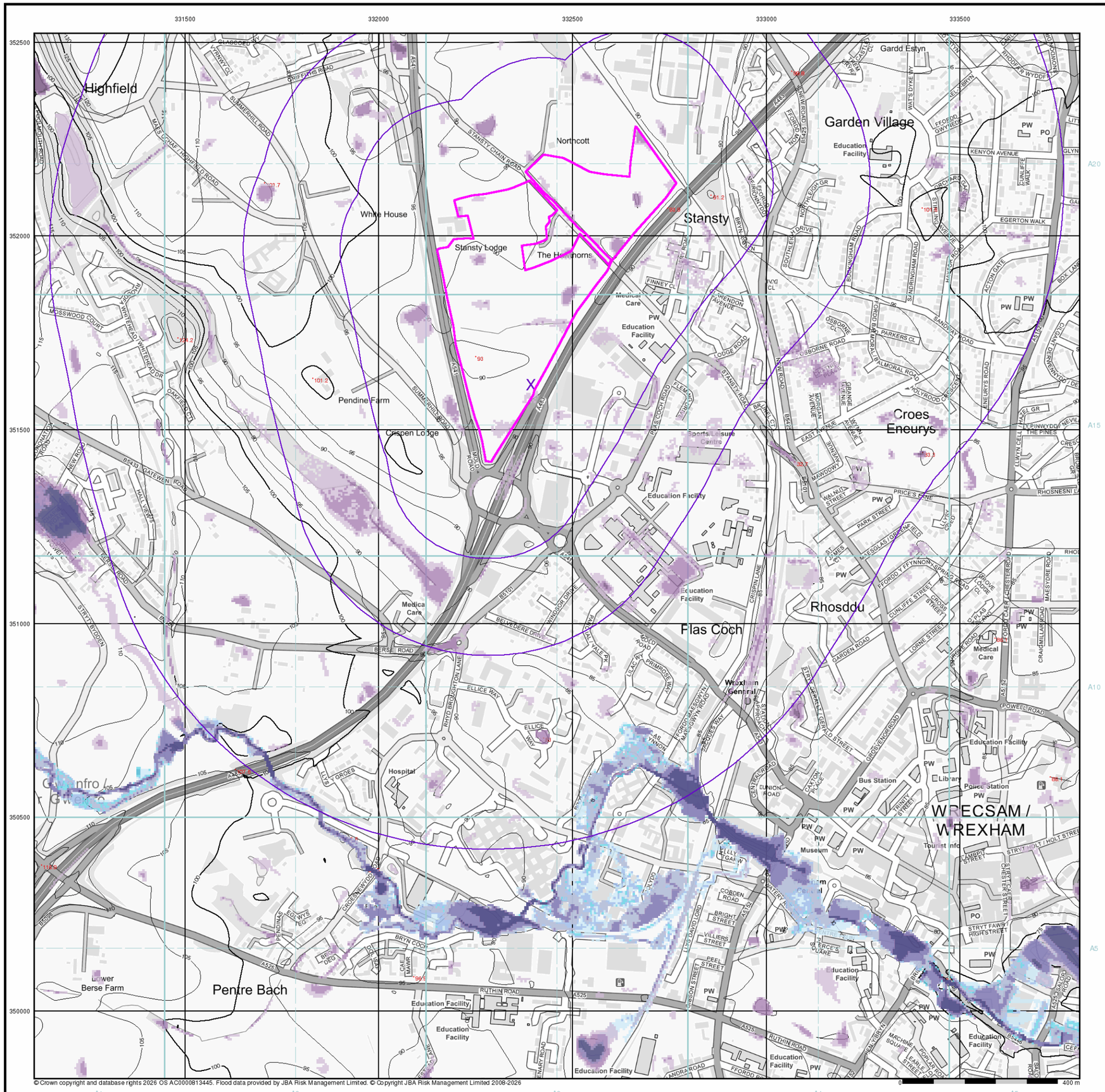
Order Details

Order Number:	403509245_1_1
Customer Ref:	8562
National Grid Reference:	332390, 351620
Slice:	A
Site Area (Ha):	21.87
Search Buffer (m):	1000

Site Details

Land Either Side of Stansty Chain Road, Wrexham, LL11 4YF

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Envirocheck®

LANDMARK INFORMATION GROUP®

JBA 200 Year Return Flood Map (Undefended) (1:10,000)

General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

Modelled Flood Depth

Pluvial Depth	Fluvial Depth	Coastal Depth
0.1m	0.01m - 0.05m	0.01m - 0.05m
0.1m - 0.3m	0.05m - 0.1m	0.05m - 0.1m
0.3m - 1m	0.1m - 0.3m	0.1m - 0.3m
>1m	0.3m - 1m	0.3m - 1m
	>1m	>1m

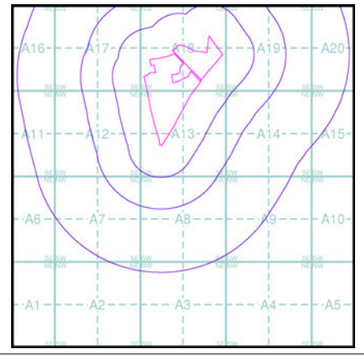
Contours (height in metres)

Standard Contour 105 100 95 — MLW Mean Low Water

Master Contour — MHW Mean High Water

Spot Height *157.8

JBA 200 Year Return Flood Map (Undefended) - Slice A



Order Details

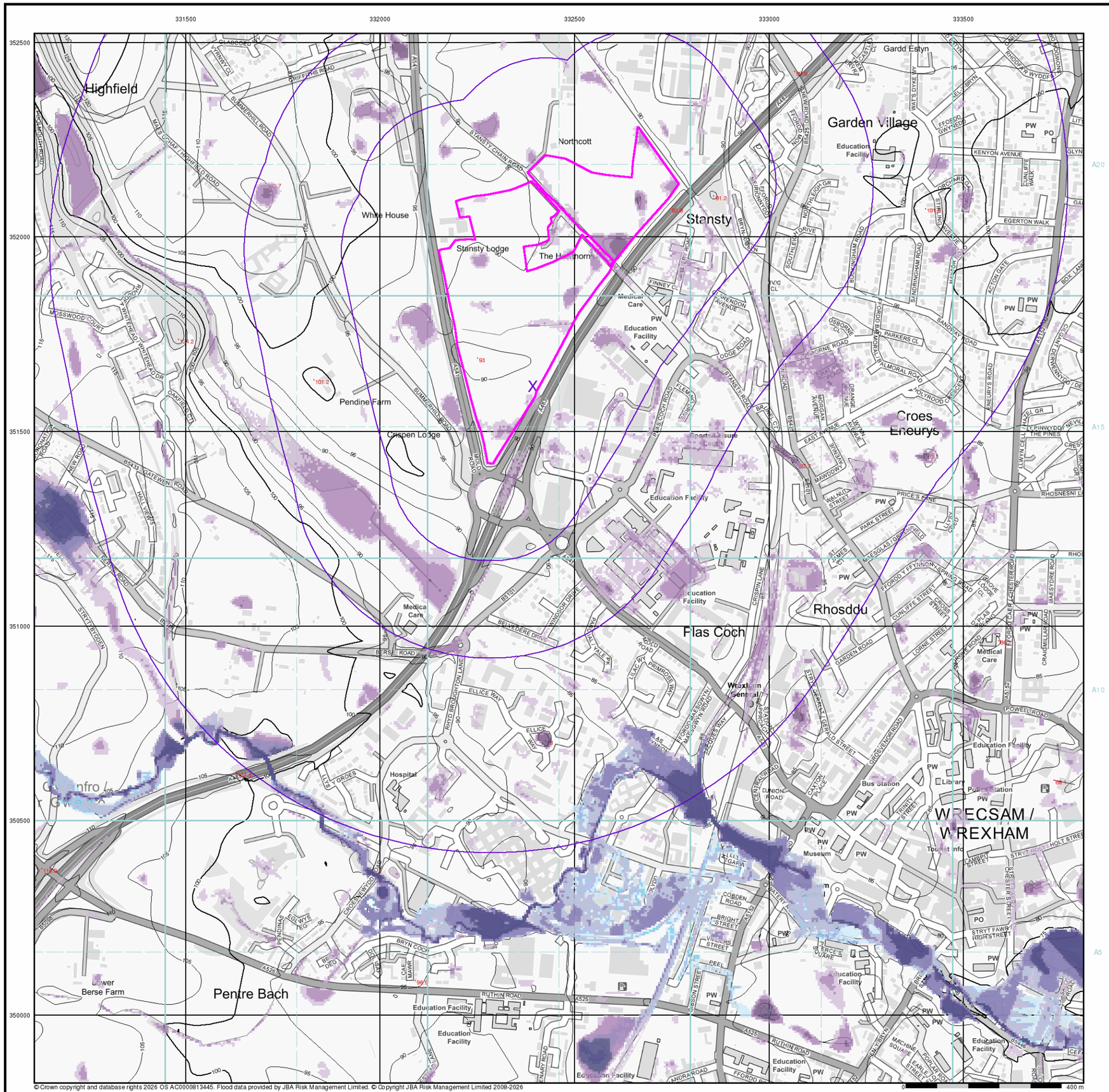
Order Number:	403509245_1_1
Customer Ref:	8562
National Grid Reference:	332390, 351620
Slice:	A
Site Area (Ha):	21.87
Search Buffer (m):	1000

Site Details

Land Either Side of Stansty Chain Road, Wrexham, LL11 4YF

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Envirocheck®

LANDMARK INFORMATION GROUP®

JBA 1000 Year Return Flood Map (Undefended) (1:10,000)

General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

Modelled Flood Depth

Pluvial Depth	Fluvial Depth	Coastal Depth
0.1m	0.01m - 0.05m	0.01m - 0.05m
0.1m - 0.3m	0.05m - 0.1m	0.05m - 0.1m
0.3m - 1m	0.1m - 0.3m	0.1m - 0.3m
>1m	0.3m - 1m	0.3m - 1m
	>1m	>1m

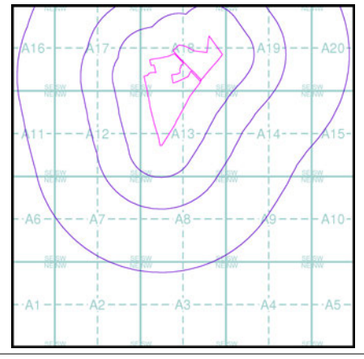
Contours (height in metres)

Standard Contour 105 100 95 — MLW Mean Low Water

Master Contour — MHW Mean High Water

Spot Height 157.8

JBA 1000 Year Return Flood Map (Undefended) - Slice A



Order Details

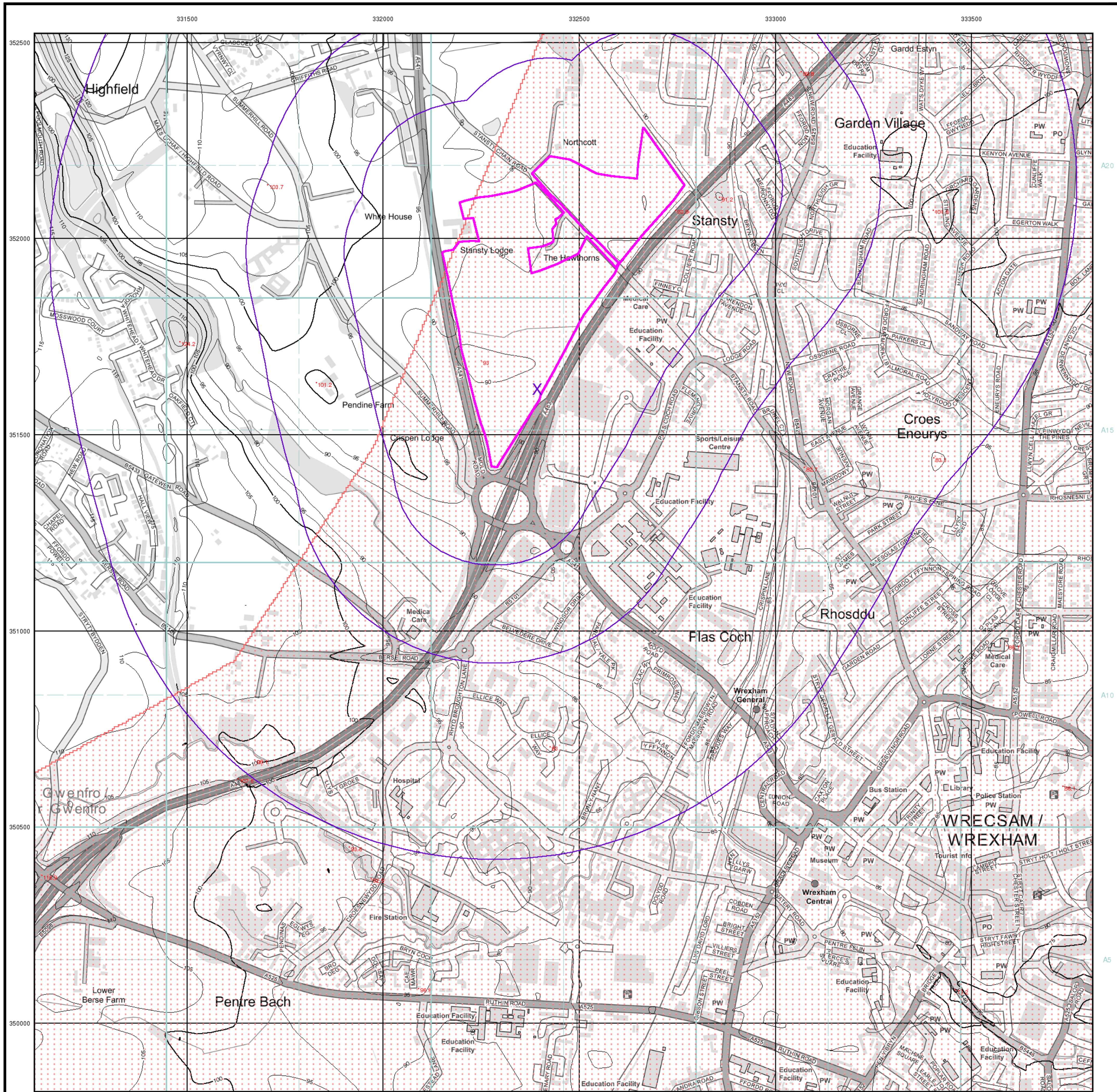
Order Number:	403509245_1_1
Customer Ref:	8562
National Grid Reference:	332390, 351620
Slice:	A
Site Area (Ha):	21.87
Search Buffer (m):	1000

Site Details

Land Either Side of Stansty Chain Road, Wrexham, LL11 4YF

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



© Crown copyright and database rights 2026 OS AC0000813445. Flood data provided by JBA Risk Management Limited. © Copyright JBA Risk Management Limited 2008-2026

A1 A2 A3 A4 A5

Envirocheck®

LANDMARK INFORMATION GROUP®

JBA Canal Failure Map (1:10,000)

General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

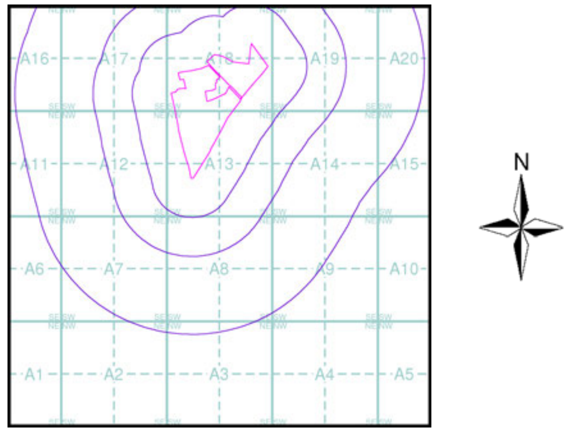
Flood Data

- Canal Failure
- Coverage

Contours (height in metres)

- Standard Contour
- Master Contour
- Spot Height (167.8)
- MLW Mean Low Water
- MHW Mean High Water

JBA Canal Failure Flood Map - Slice A



Order Details

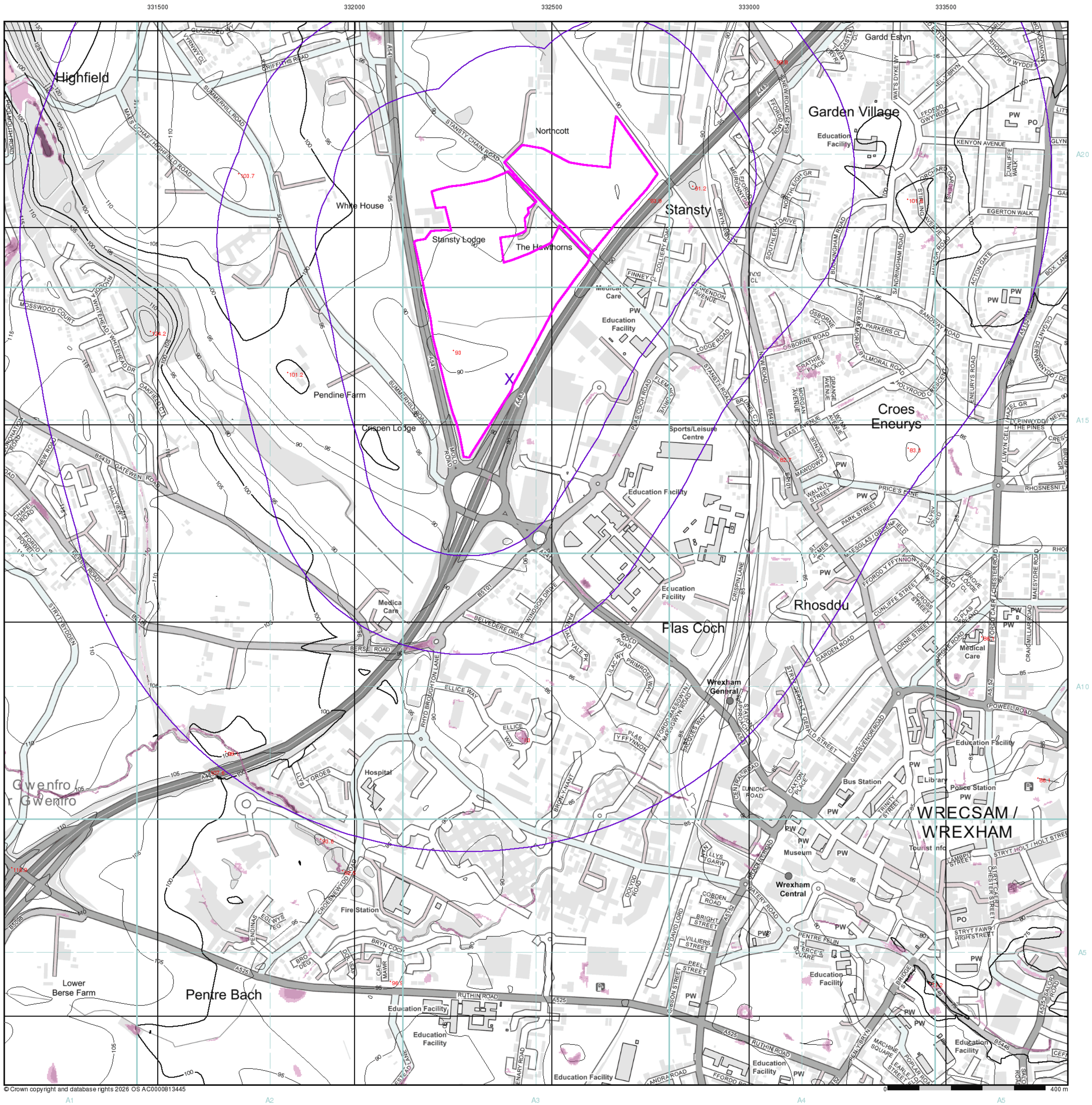
Order Number: 403509245_1_1
Customer Ref: 8562
National Grid Reference: 332390, 351620
Slice: A
Site Area (Ha): 21.87
Search Buffer (m): 1000

Site Details

Land Either Side of Stansty Chain Road, Wrexham, LL11 4YF

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



© Crown copyright and database rights 2026 OS AC0000813445

Envirocheck®

LANDMARK INFORMATION GROUP®

EA/NRW Surface Water 30 Year Return Depth Map (1:10,000)

General

Specified Site
Specified Buffer(s)
X Bearing Reference Point

Surface Water Depth

- 0 - 0.15m
- 0.15 - 0.30m
- 0.30 - 0.60m
- 0.60 - 0.90m
- 0.90 - 1.20m
- > 1.20m

Contours (height in metres)

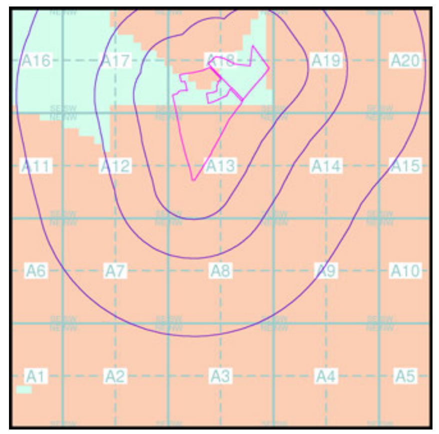
Standard Contour
Master Contour
Spot Height 167.8
MLW Mean Low Water
MHW Mean High Water

Suitability

See the suitability map below

- National to county
- County to town
- Town to street
- Street to parcels of land
- Property

EA/NRW Suitability Map - Slice A



Order Details

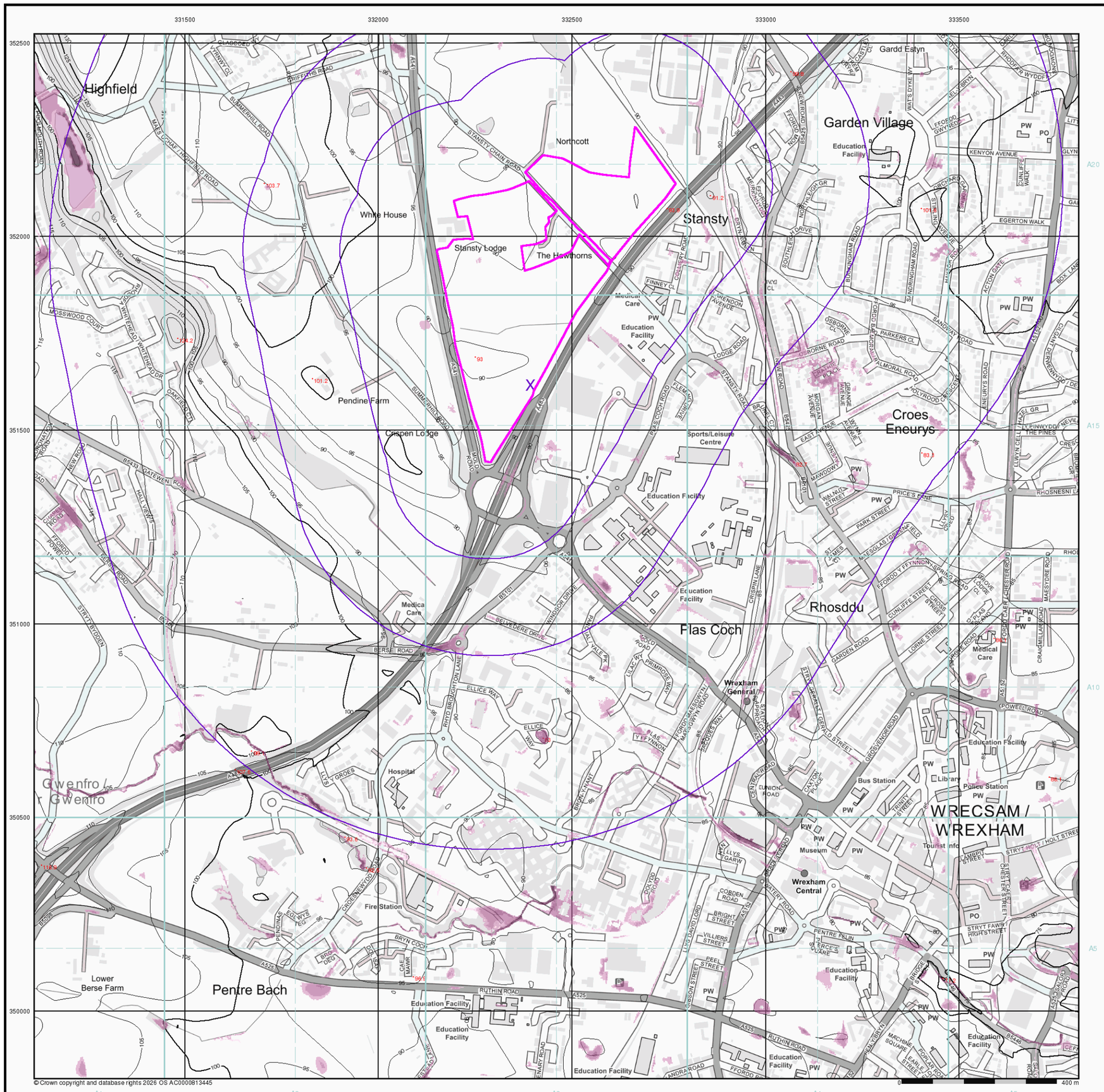
Order Number: 403509245_1_1
Customer Ref: 8562
National Grid Reference: 332390, 351620
Slice: A
Site Area (Ha): 21.87
Search Buffer (m): 1000

Site Details

Land Either Side of Stansty Chain Road, Wrexham, LL11 4YF

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



© Crown copyright and database rights 2026 OS AC0000813445

Envirocheck®

LANDMARK INFORMATION GROUP®

EA/NRW Surface Water 100 Year Return Depth Map

General

Specified Site | Specified Buffer(s) | X Bearing Reference Point

Surface Water Depth

- 0 - 0.15m
- 0.15 - 0.30m
- 0.30 - 0.60m
- 0.60 - 0.90m
- 0.90 - 1.20m
- > 1.20m

Contours (height in metres)

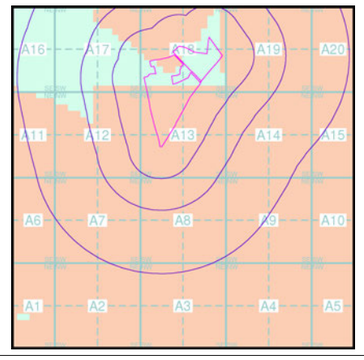
Standard Contour | Master Contour | Spot Height *167.8 | MLW Mean Low Water | MHW Mean High Water

Suitability

See the suitability map below

- National to county
- County to town
- Town to street
- Street to parcels of land
- Property

EA/NRW Suitability Map - Slice A



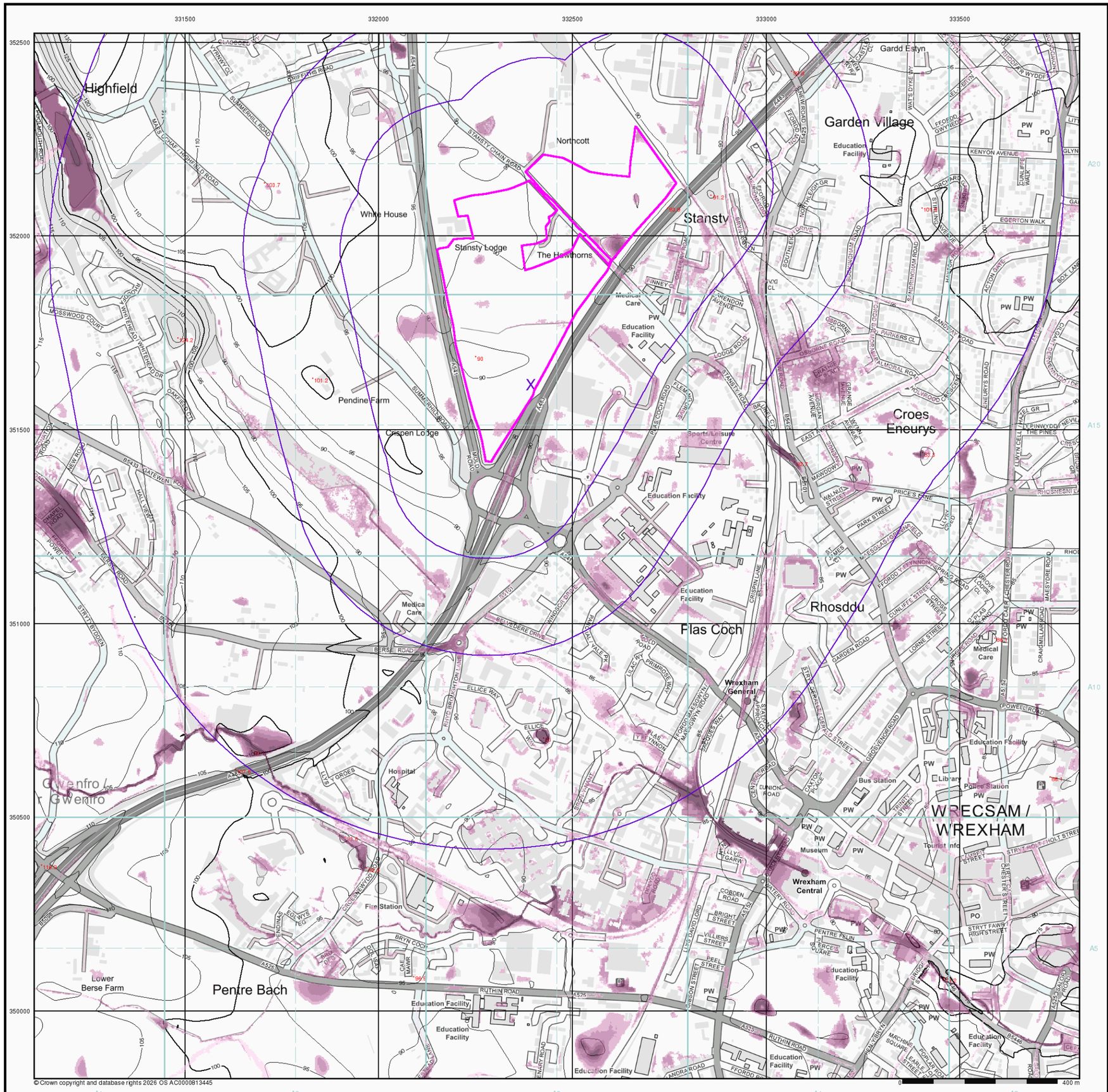
Order Details

Order Number:	403509245_1_1
Customer Ref:	8562
National Grid Reference:	332390, 351620
Slice:	A
Site Area (Ha):	21.87
Search Buffer (m):	1000

Site Details

Land Either Side of Stansty Chain Road, Wrexham, LL11 4YF

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



© Crown copyright and database rights 2026 OS AC0000813445

Envirocheck®

LANDMARK INFORMATION GROUP®

EA/NRW Surface Water 1000 Year Return Depth Map (1:10,000)

General

Specified Site | Specified Buffer(s) | X Bearing Reference Point

Surface Water Depth

- 0 - 0.15m
- 0.15 - 0.30m
- 0.30 - 0.60m
- 0.60 - 0.90m
- 0.90 - 1.20m
- > 1.20m

Contours (height in metres)

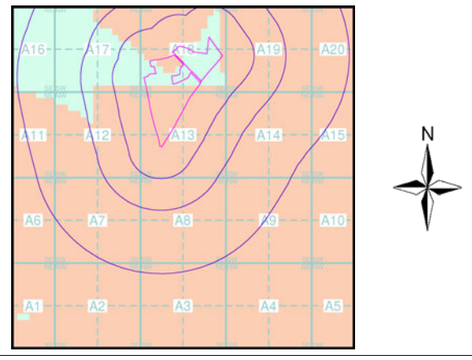
Standard Contour | Master Contour | Spot Height (*167.8) | MLW Mean Low Water | MHW Mean High Water

Suitability

See the suitability map below

- National to county
- County to town
- Town to street
- Street to parcels of land
- Property

EA/NRW Suitability Map - Slice A



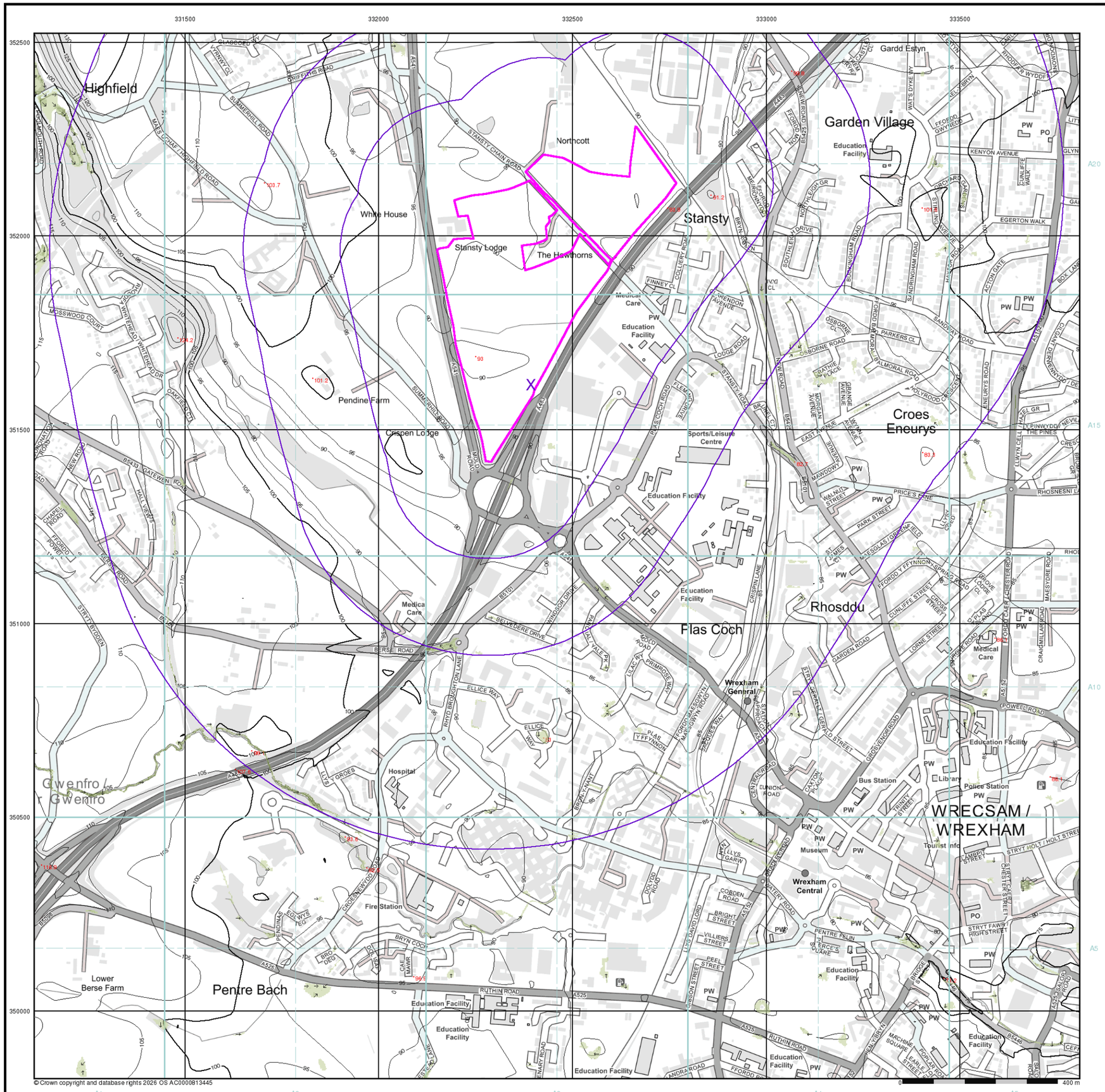
Order Details

Order Number:	403509245_1_1
Customer Ref:	8562
National Grid Reference:	332390, 351620
Slice:	A
Site Area (Ha):	21.87
Search Buffer (m):	1000

Site Details

Land Either Side of Stansty Chain Road, Wrexham, LL11 4YF

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Envirocheck®

LANDMARK INFORMATION GROUP®

EA/NRW Surface Water 30 Year Return Velocity and Flow Direction Map (1:10,000)

General

Specified Site | Specified Buffer(s) | X Bearing Reference Point

Surface Water Velocity and Direction

- 0.00 - 0.25m/s
- 0.25 - 0.50m/s
- 0.50 - 1.00m/s
- 1.00 - 2.00m/s
- > 2.00m/s

Flow Direction at maximum velocity

Contours (height in metres)

Standard Contour 105 | Master Contour 100 | Spot Height *167.8

MLW Mean Low Water

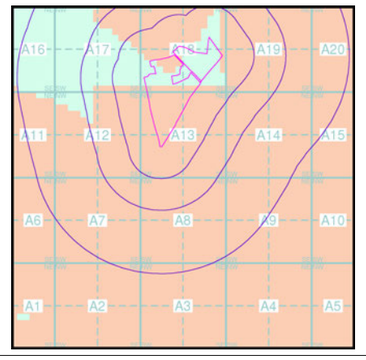
MHW Mean High Water

Suitability

See the suitability map below

- National to county
- County to town
- Town to street
- Street to parcels of land
- Property

EA/NRW Suitability Map - Slice A



Order Details

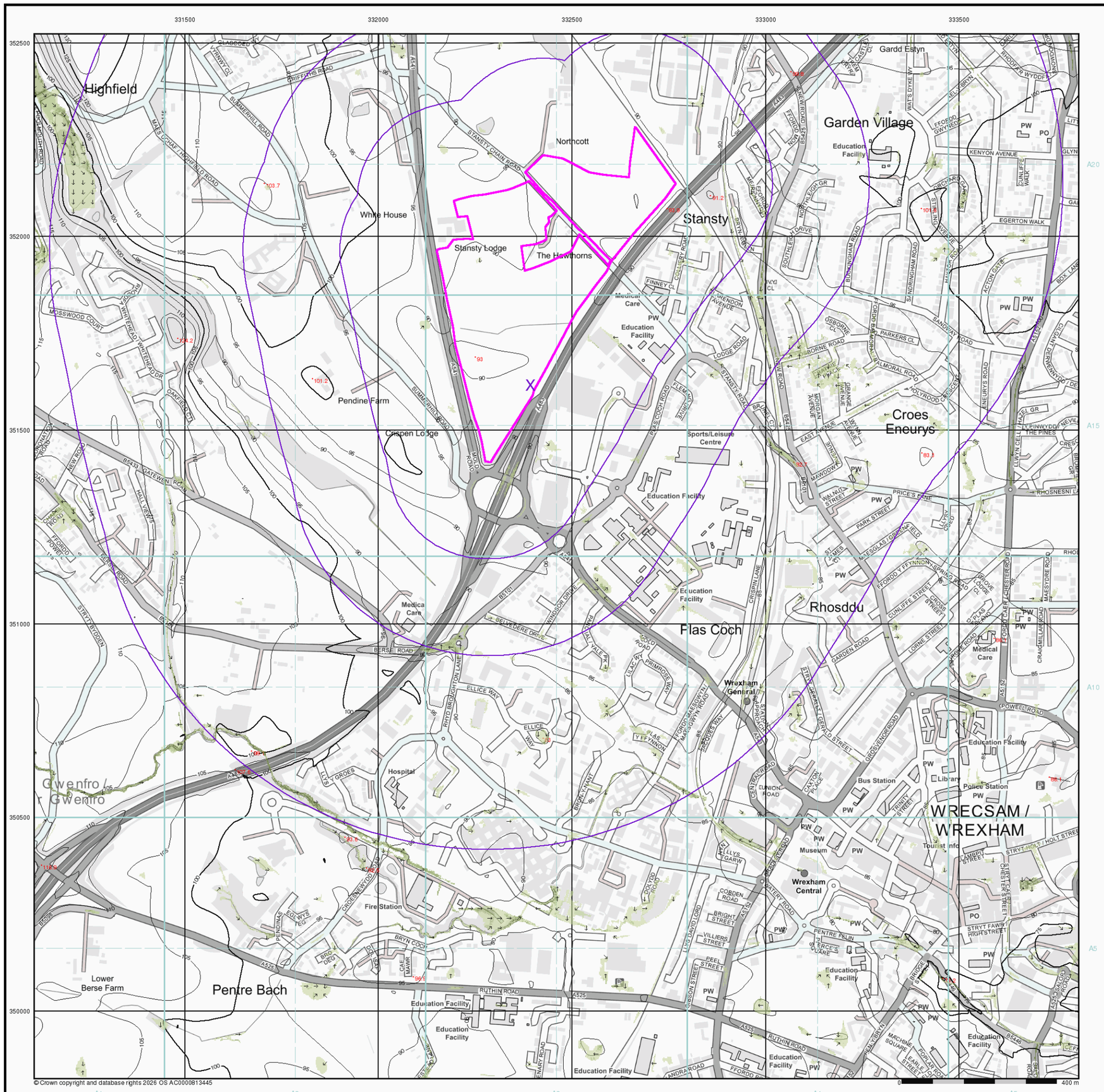
Order Number:	403509245_1_1
Customer Ref:	8562
National Grid Reference:	332390, 351620
Slice:	A
Site Area (Ha):	21.87
Search Buffer (m):	1000

Site Details

Land Either Side of Stansty Chain Road, Wrexham, LL11 4YF

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



© Crown copyright and database rights 2026 OS AC0000813445

Envirocheck®

LANDMARK INFORMATION GROUP®

EA/NRW Surface Water 100 Year Return Velocity and Flow Direction Map (1:10,000)

General

Specified Site | Specified Buffer(s) | X Bearing Reference Point

Surface Water Velocity and Direction

- 0.00 - 0.25m/s
- 0.25 - 0.50m/s
- 0.50 - 1.00m/s
- 1.00 - 2.00m/s
- > 2.00m/s

Flow Direction at maximum velocity

Contours (height in metres)

Standard Contour 105 | Master Contour 100 95 | Spot Height *167.8

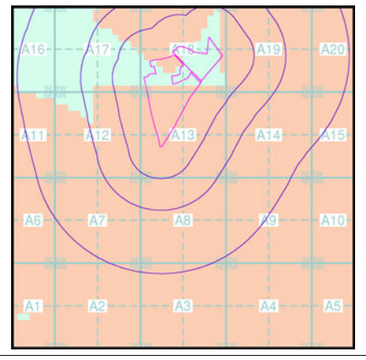
MLW Mean Low Water | MHW Mean High Water

Suitability

See the suitability map below

- National to county
- County to town
- Town to street
- Street to parcels of land
- Property

EA/NRW Suitability Map - Slice A



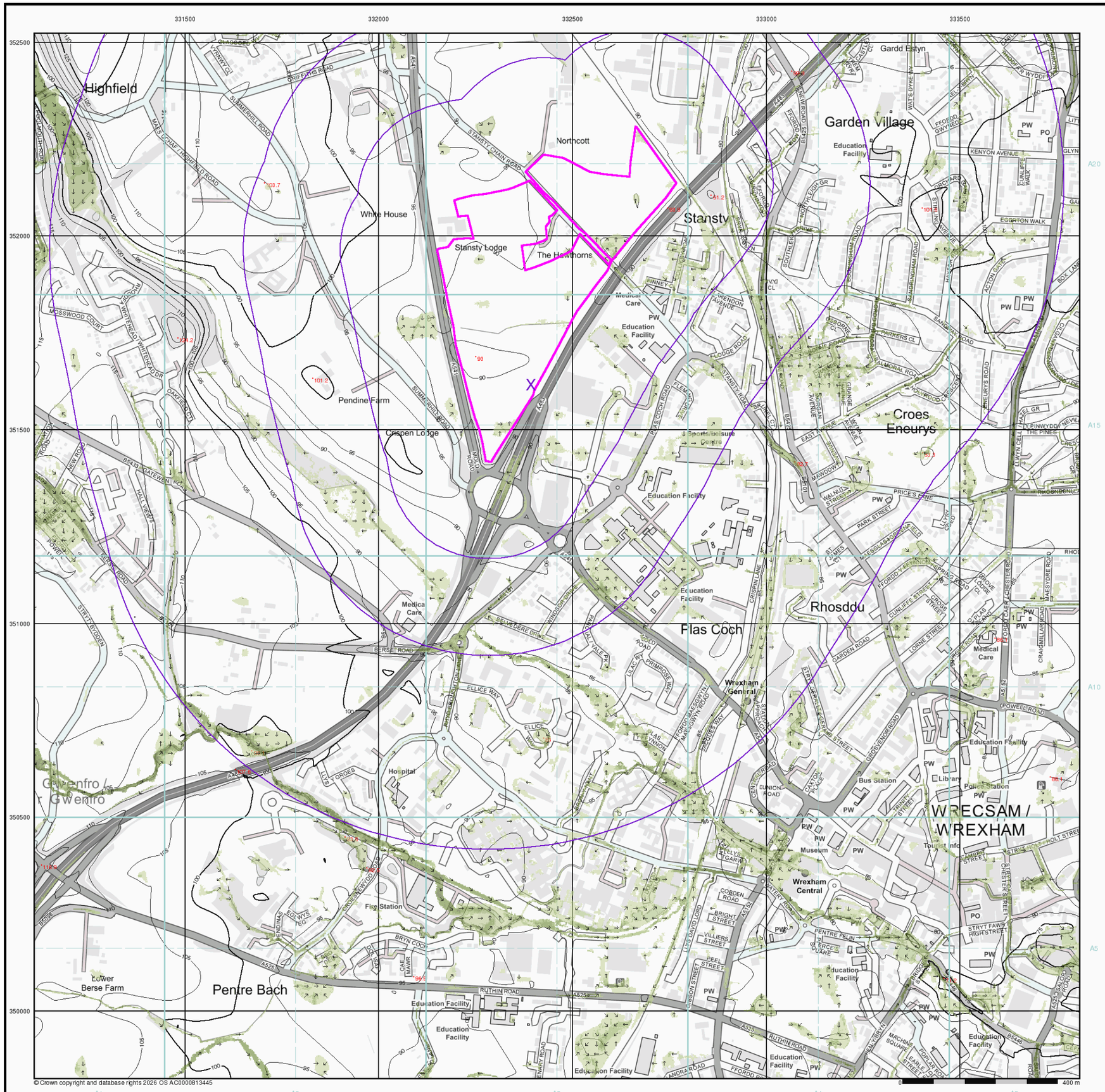
Order Details

Order Number:	403509245_1_1
Customer Ref:	8562
National Grid Reference:	332390, 351620
Slice:	A
Site Area (Ha):	21.87
Search Buffer (m):	1000

Site Details

Land Either Side of Stansty Chain Road, Wrexham, LL11 4YF

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Envirocheck®

LANDMARK INFORMATION GROUP®

EA/NRW Surface Water 1000 Year Return Velocity and Flow Direction Map (1:10,000)

General

Specified Site | Specified Buffer(s) | X Bearing Reference Point

Surface Water Velocity and Direction

- 0.00 - 0.25m/s
- 0.25 - 0.50m/s
- 0.50 - 1.00m/s
- 1.00 - 2.00m/s
- > 2.00m/s

Flow Direction at maximum velocity

Contours (height in metres)

Standard Contour 105 | Master Contour 100 | Spot Height *167.8

MLW Mean Low Water

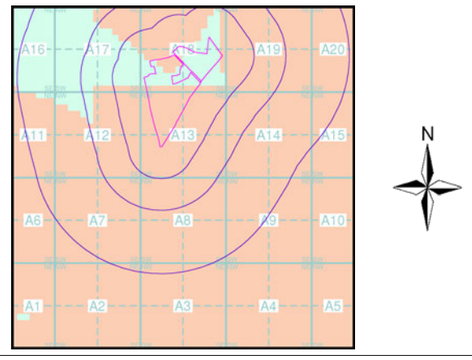
MHW Mean High Water

Suitability

See the suitability map below

- National to county
- County to town
- Town to street
- Street to parcels of land
- Property

EA/NRW Suitability Map - Slice A



Order Details

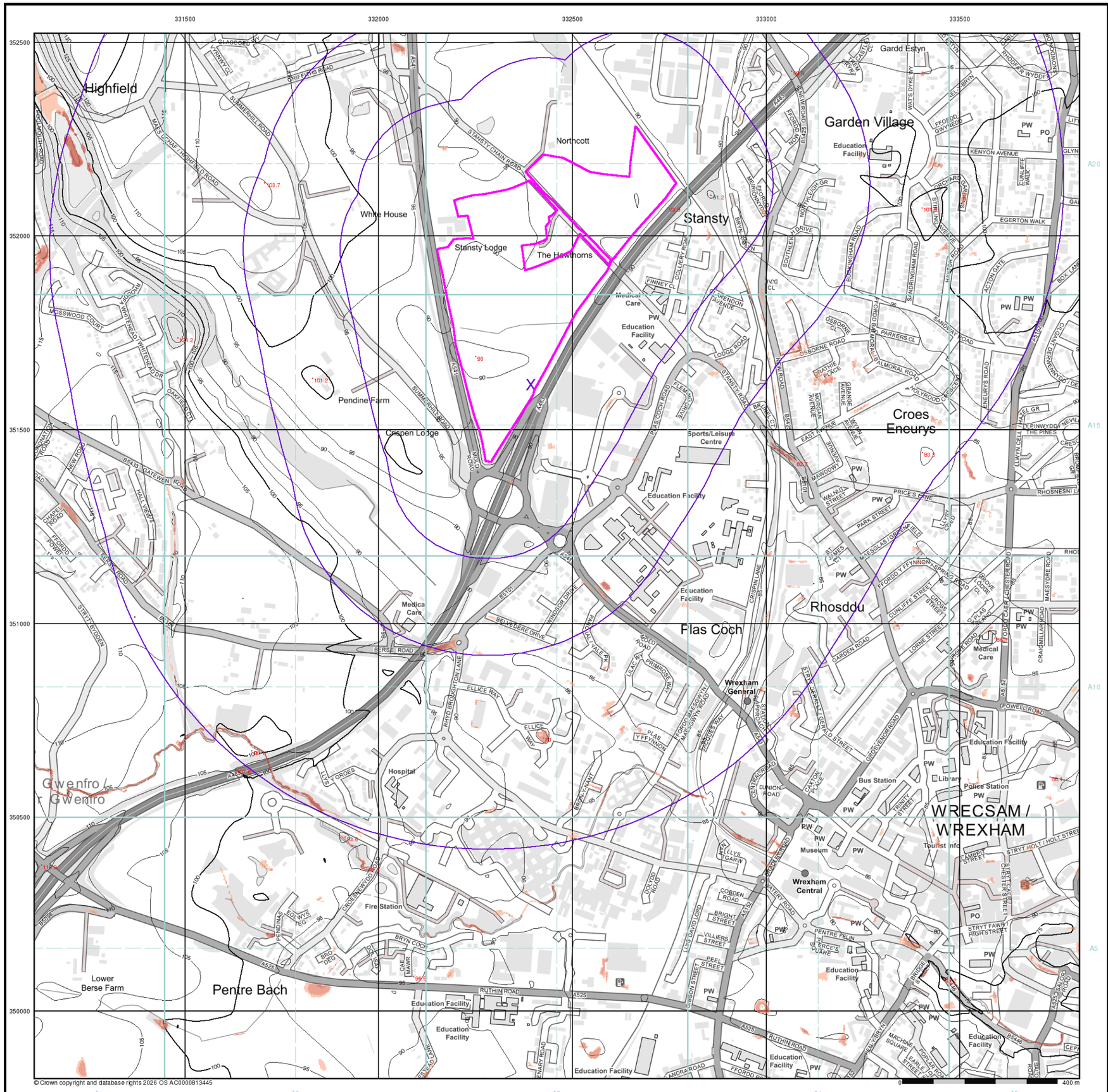
Order Number:	403509245_1_1
Customer Ref:	8562
National Grid Reference:	332390, 351620
Slice:	A
Site Area (Ha):	21.87
Search Buffer (m):	1000

Site Details

Land Either Side of Stansty Chain Road, Wrexham, LL11 4YF

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Envirocheck®

LANDMARK INFORMATION GROUP®

EA/NRW Surface Water 30 Year Return Hazard Rating Map (1:10,000)

General

Specified Site | Specified Buffer(s) | X Bearing Reference Point

Surface Water Hazard Rating

- Low (0.5 – 0.75)
- Moderate (0.75 – 1.25)
- Significant (1.25 – 2.0)
- Extreme (>2.0)

Contours (height in metres)

Standard Contour 105 | Master Contour 100 | Spot Height *167.8

MLW Mean Low Water

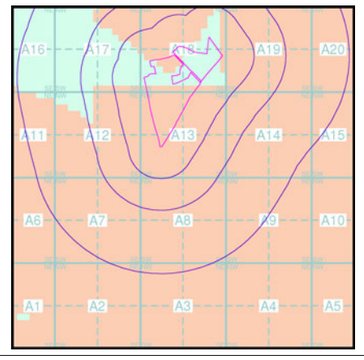
MHW Mean High Water

Suitability

See the suitability map below

- National to county
- County to town
- Town to street
- Street to parcels of land
- Property

EA/NRW Suitability Map - Slice A



Order Details

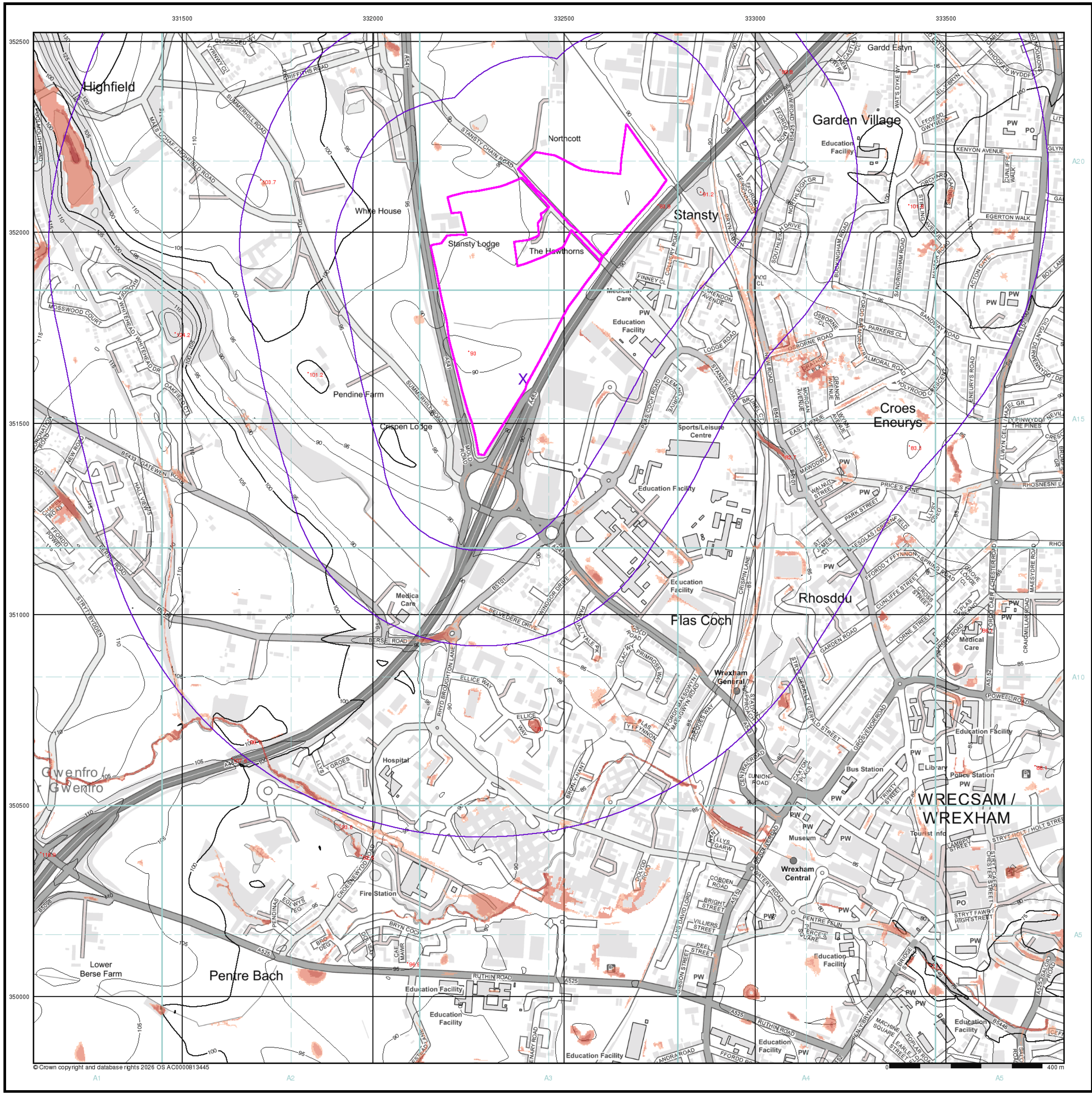
Order Number:	403509245_1_1
Customer Ref:	8562
National Grid Reference:	332390, 351620
Slice:	A
Site Area (Ha):	21.87
Search Buffer (m):	1000

Site Details

Land Either Side of Stansty Chain Road, Wrexham, LL11 4YF

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Envirocheck®

LANDMARK INFORMATION GROUP®

EA/NRW Surface Water 100 Year Return Hazard Rating Map (1:10,000)

General

Specified Site | Specified Buffer(s) | X Bearing Reference Point

Surface Water Hazard Rating

- Low (0.5 – 0.75)
- Moderate (0.75 – 1.25)
- Significant (1.25 – 2.0)
- Extreme (>2.0)

Contours (height in metres)

Standard Contour — Mean Low Water (MLW)

Master Contour — Mean High Water (MHW)

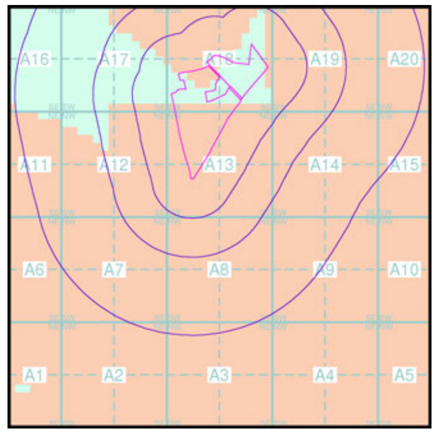
Spot Height 167.8

Suitability

See the suitability map below

- National to county
- Street to parcels of land
- County to town
- Property
- Town to street

EA/NRW Suitability Map - Slice A



Order Details

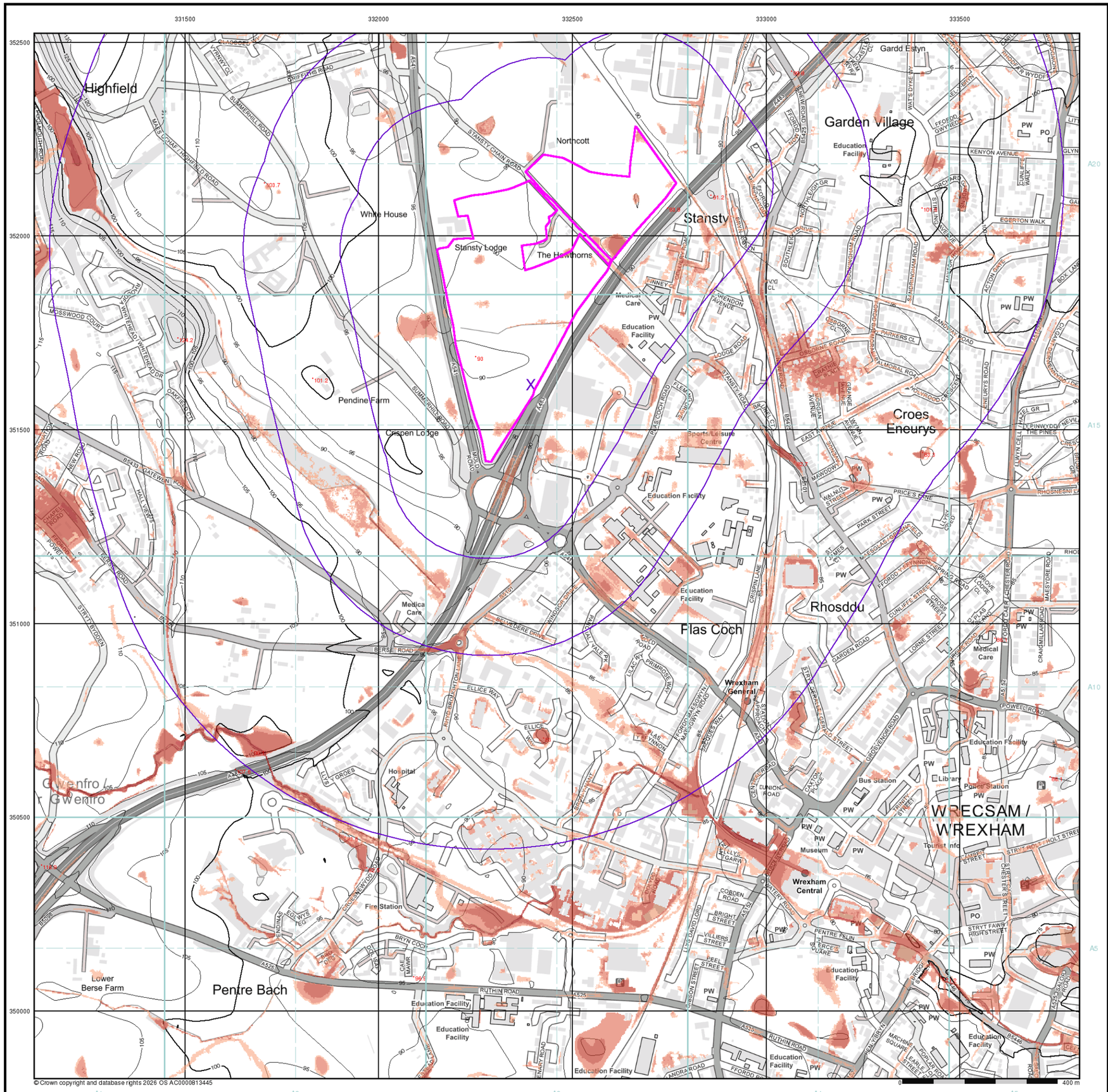
Order Number: 403509245_1_1
Customer Ref: 8562
National Grid Reference: 332390, 351620
Slice: A
Site Area (Ha): 21.87
Search Buffer (m): 1000

Site Details

Land Either Side of Stansty Chain Road, Wrexham, LL11 4YF

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Envirocheck®

LANDMARK INFORMATION GROUP®

EA/NRW Surface Water 1000 Year Return Hazard Rating Map (1:10,000)

General

Specified Site | Specified Buffer(s) | X Bearing Reference Point

Surface Water Hazard Rating

- Low (0.5 – 0.75)
- Moderate (0.75 – 1.25)
- Significant (1.25 – 2.0)
- Extreme (>2.0)

Contours (height in metres)

Standard Contour | Master Contour | Spot Height *167.8

MLW Mean Low Water

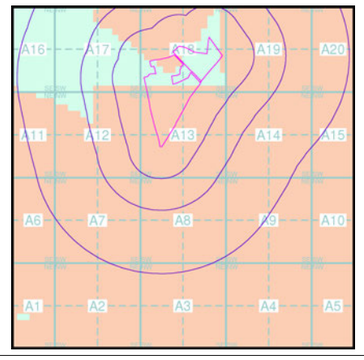
MHW Mean High Water

Suitability

See the suitability map below

- National to county
- County to town
- Town to street
- Street to parcels of land
- Property

EA/NRW Suitability Map - Slice A



Order Details

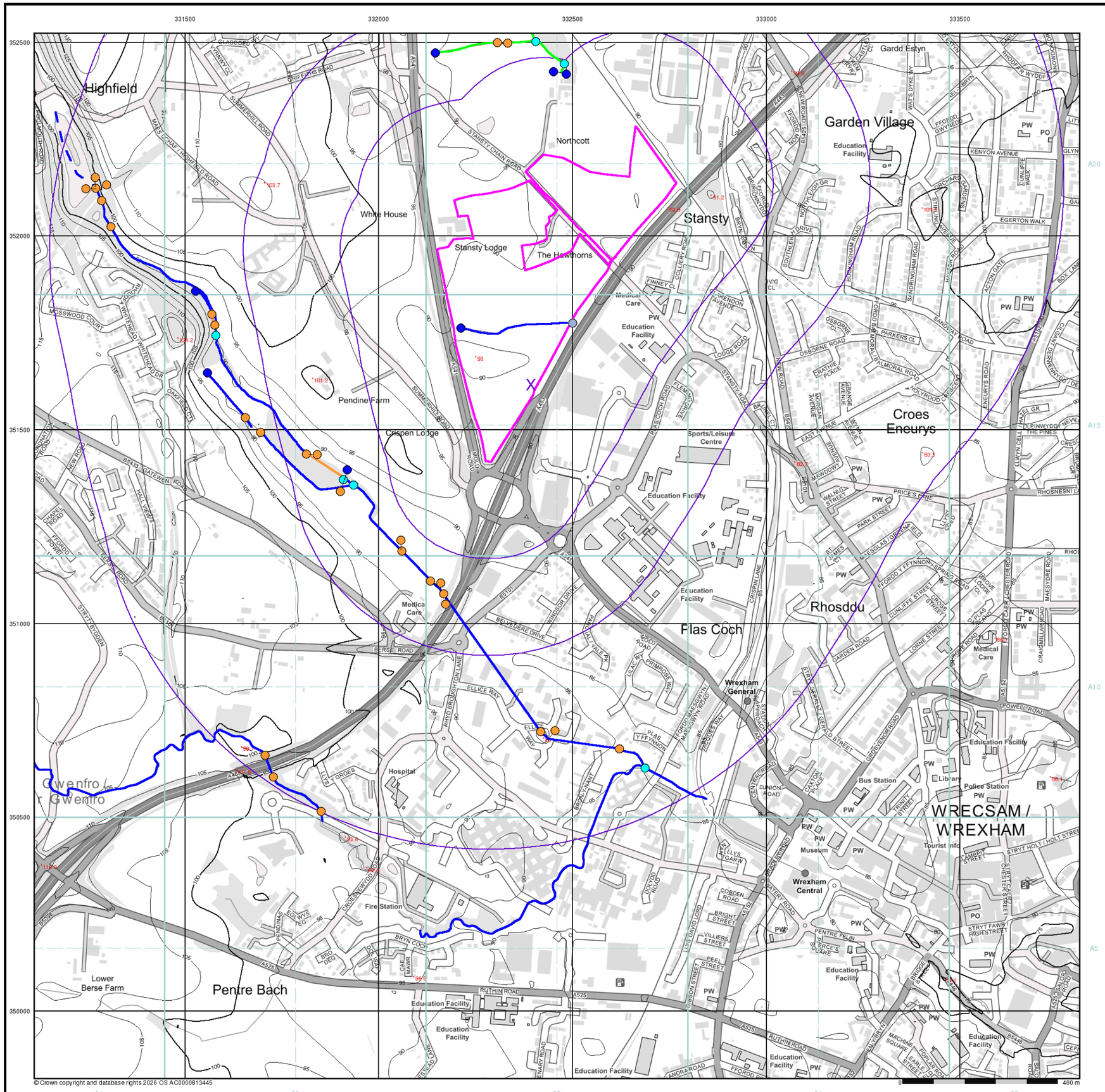
Order Number:	403509245_1_1
Customer Ref:	8562
National Grid Reference:	332390, 351620
Slice:	A
Site Area (Ha):	21.87
Search Buffer (m):	1000

Site Details

Land Either Side of Stansty Chain Road, Wrexham, LL11 4YF

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



© Crown copyright and database rights 2026 OS AC0000813445

Envirocheck®

LANDMARK INFORMATION GROUP®

OS NGD Water Network Map (1:10,000)

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

OS NGD Water Network Data

- Canal
- Canal Feeder
- Reservoir
- Foreshore
- Marsh
- Watercourse
- Overflow
- Drain
- Other
- Still Water
- Leat
- Lock
- Sea
- Junction
- Outlet
- Pseudo
- Tidal Outlet
- Source
- Unknown
- Other

Contours (height in metres)

Standard Contour 105 100 95

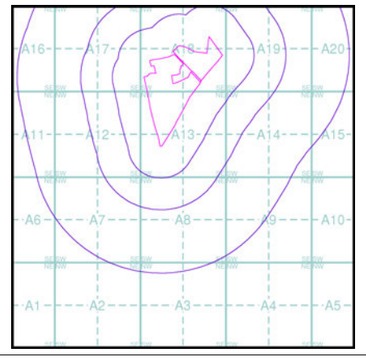
Master Contour

Spot Height 167.3

MLW Mean Low Water

MHW Mean High Water

OS NGD Water Network Map - Slice A



Order Details

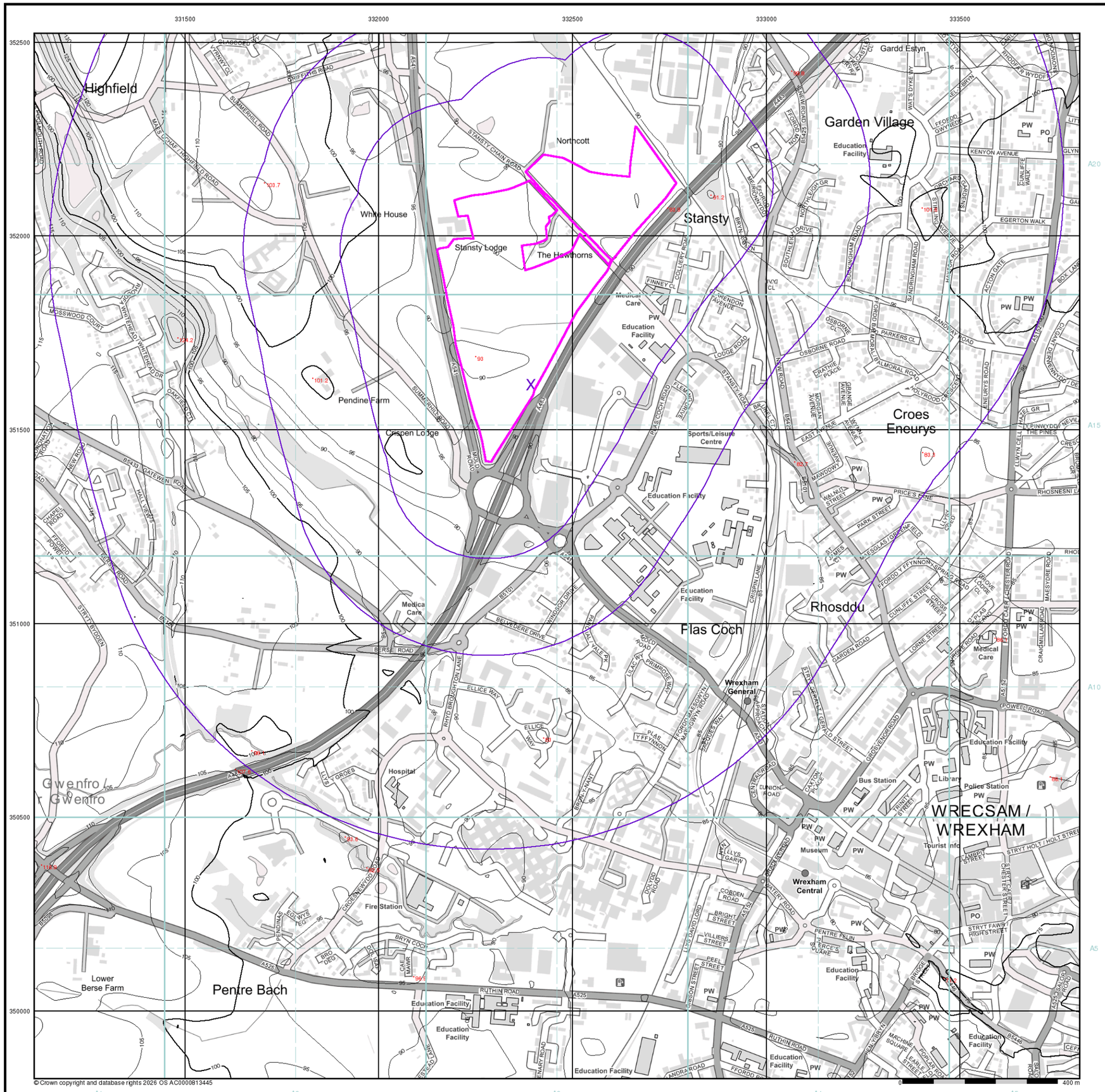
Order Number:	403509245_1_1
Customer Ref:	8562
National Grid Reference:	332390, 351620
Slice:	A
Site Area (Ha):	21.87
Search Buffer (m):	1000

Site Details

Land Either Side of Stansty Chain Road, Wrexham, LL11 4YF

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Envirocheck®

LANDMARK INFORMATION GROUP®

EA/NRW Historic Flood Map (1:10,000)

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID

Historic Flood Events Data

- Channel Capacity Exceeded (no raised defences)
- Channel Capacity Exceeded /Surface Water
- Groundwater/High Water Table
- Local Drainage/Surface Water
- Mechanical Failure
- Obstruction/Blockage - Bridge
- Obstruction/Blockage - Channel
- Historical Flood Liabilities
- Obstruction/Blockage - Culvert
- Obstruction/Blockage - Debris Screen
- Operational Failure/ Breach of Defence
- Other
- Overtopping of Defences
- Surface Water
- Unknown

Contours (height in metres)

Standard Contour 105

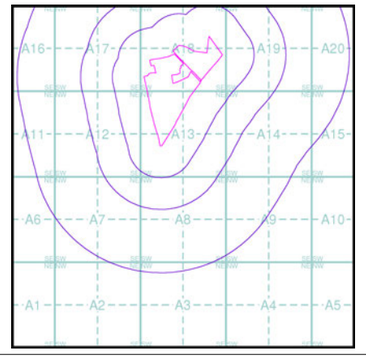
Master Contour 100 95

Spot Height *167.8

MLW Mean Low Water

MHW Mean High Water

EA/NRW Historic Flood Map - Slice A



Order Details

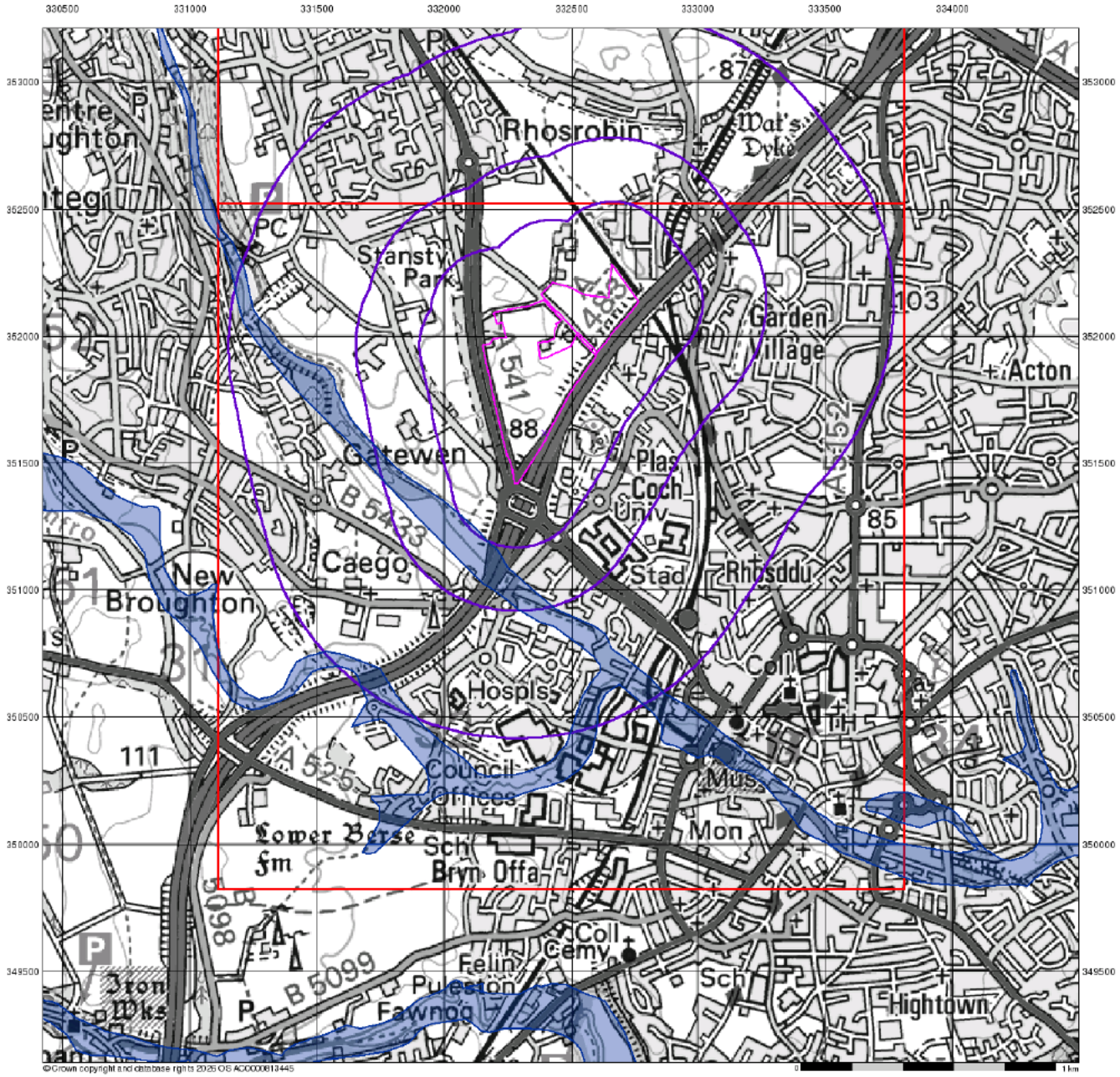
Order Number:	403509245_1_1
Customer Ref:	8562
National Grid Reference:	332390, 351620
Slice:	A
Site Area (Ha):	21.87
Search Buffer (m):	1000

Site Details

Land Either Side of Stansty Chain Road, Wrexham, LL11 4YF

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



©Crown copyright and database rights 2026 OS AC0000813445

Envirocheck

LANDMARK INFORMATION GROUP

BGS Flood Data (1:50,000)

General

Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

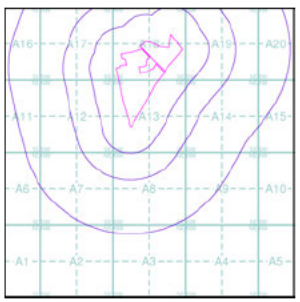
BGS Geological Indicators of Flooding

Coastal

Inland

Bodies of Water

BGS Flood Data Map - Slice A



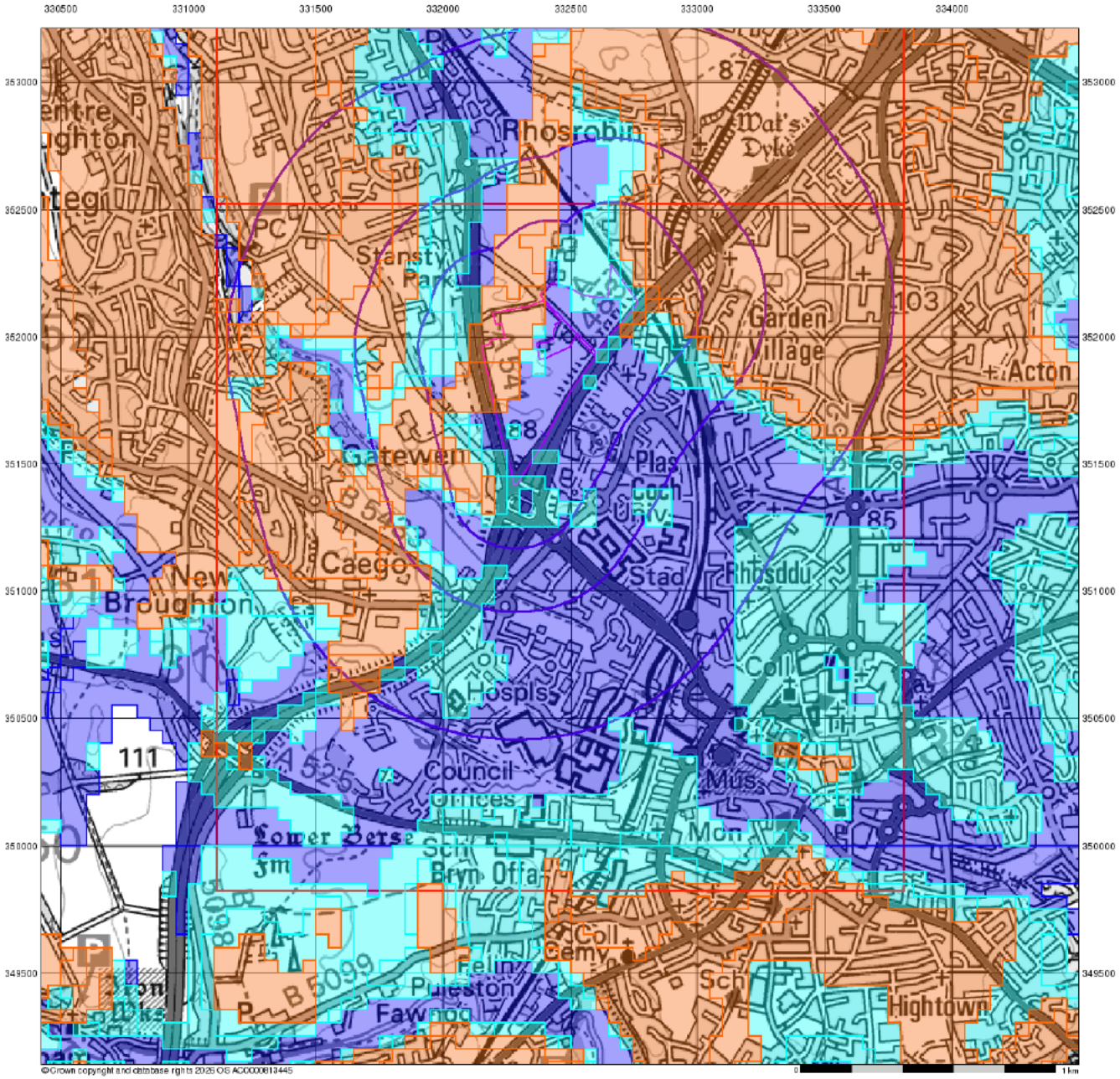
Order Details

Order Number:	403509245_1_1
Customer Ref:	8562
National Grid Reference:	332390, 351620
Slice:	A
Site Area (Ha):	21.87
Search Buffer (m):	1000

Site Details

Land Either Side of Stansty Chain Road, Wrexham, LL11 4YF

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



©Crown copyright and database rights 2026 OS AC0000813445

0 1km

Envirocheck®

LANDMARK INFORMATION GROUP®

BGS Flood Data (1:50,000)

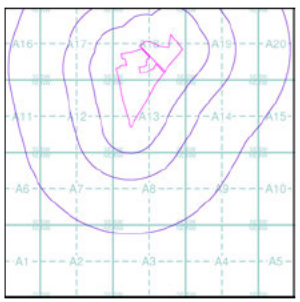
General

Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

BGS Groundwater Flooding Susceptibility

- Potential for Groundwater Flooding to Occur at Surface
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Limited Potential for Groundwater Flooding to Occur

BGS Flood Data Map - Slice A





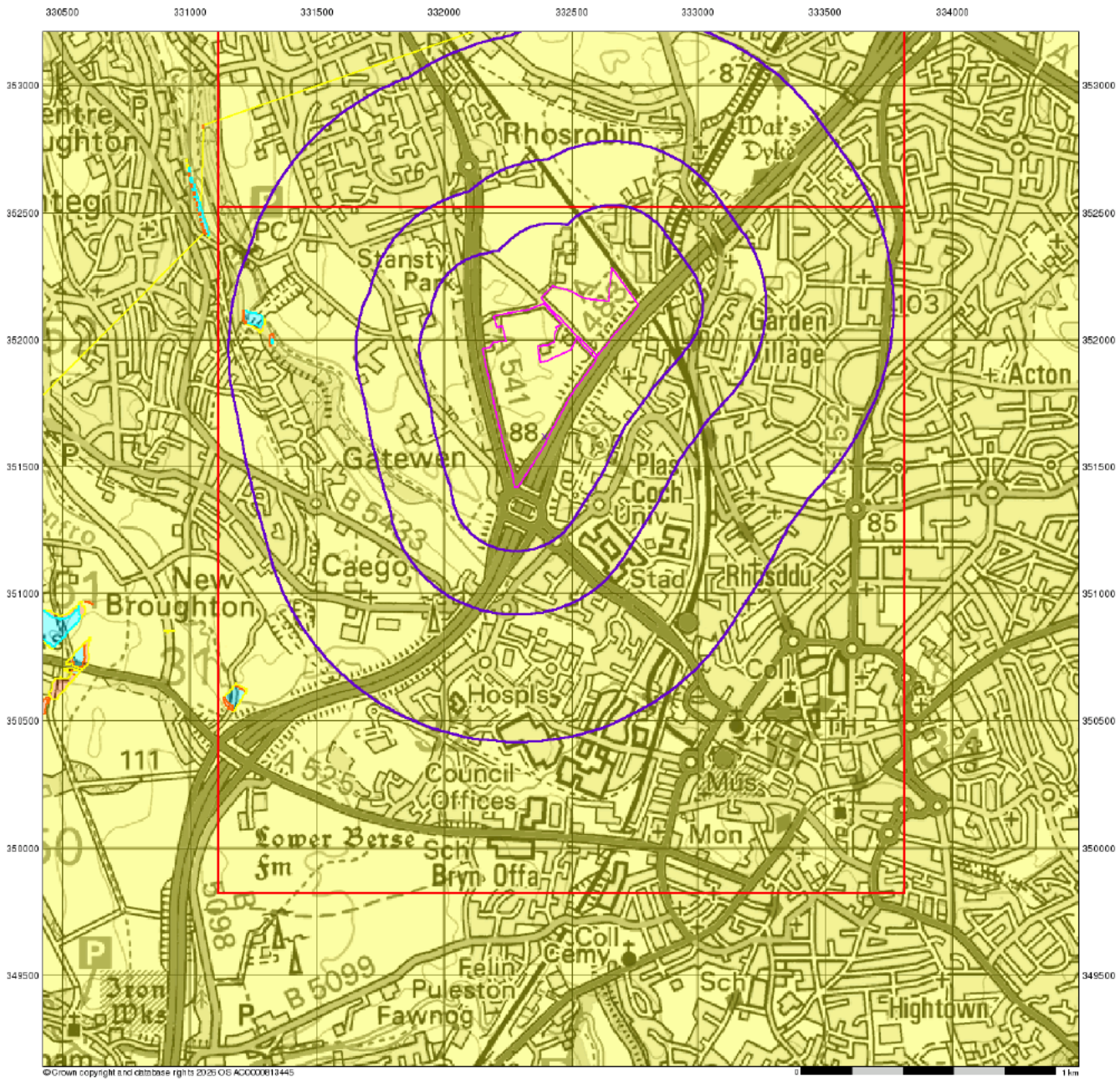
Order Details

Order Number:	403509245_1_1
Customer Ref:	8562
National Grid Reference:	332390, 351620
Slice:	A
Site Area (Ha):	21.87
Search Buffer (m):	1000

Site Details

Land Either Side of Stansty Chain Road, Wrexham, LL11 4YF

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Envirocheck®

LANDMARK INFORMATION GROUP®

GeoSmart Information Groundwater Flood Map (1:50,000)

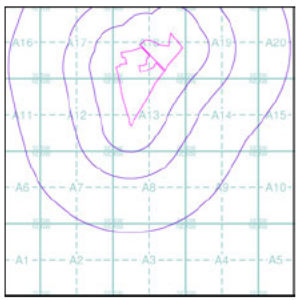
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice

GeoSmart Information Groundwater Flooding Risk

- High Risk
- Moderate Risk
- Low Risk
- Negligible Risk

GeoSmart Information Groundwater Flood Map - Slice A



Order Details

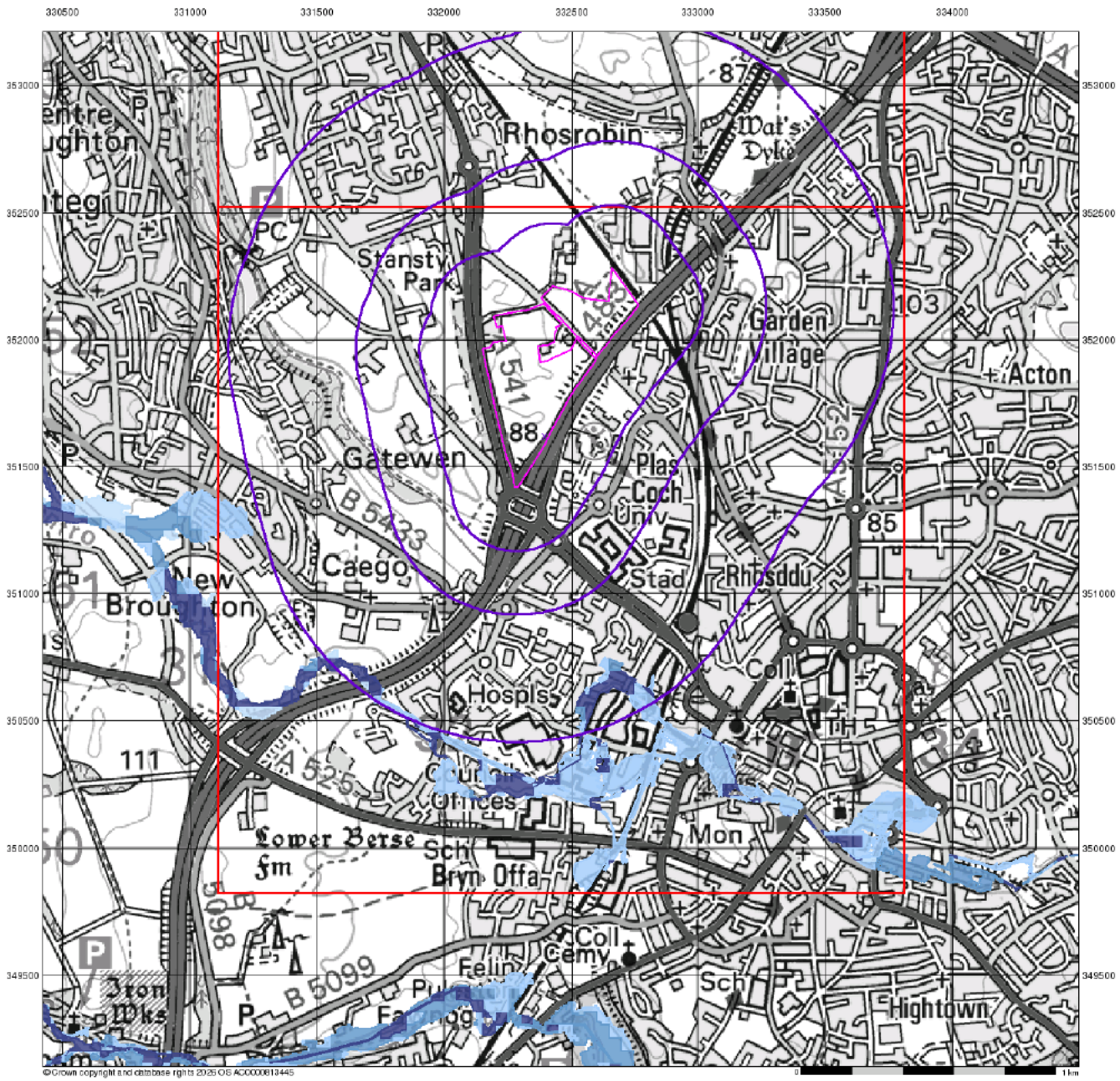
Order Number:	403509245_1_1
Customer Ref:	8562
National Grid Reference:	332390, 351620
Slice:	A
Site Area (Ha):	21.87
Search Buffer (m):	1000

Site Details

Land Either Side of Stansty Chain Road, Wrexham, LL11 4YF

Landmark® INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Envirocheck

LANDMARK INFORMATION GROUP

EA/NRW RoFRS Data (1:50,000)

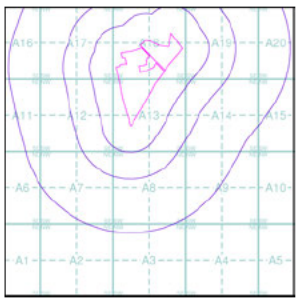
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Risk of Flooding from Rivers and Sea (RoFRS)

- High Risk
- Medium Risk
- Low Risk
- Very Low Risk

EA/NRW RoFRS Data Map - Slice A



Order Details

Order Number:	403509245_1_1
Customer Ref:	8562
National Grid Reference:	332390, 351620
Slice:	A
Site Area (Ha):	21.87
Search Buffer (m):	1000

Site Details

Land Either Side of Stansty Chain Road, Wrexham, LL11 4YF

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

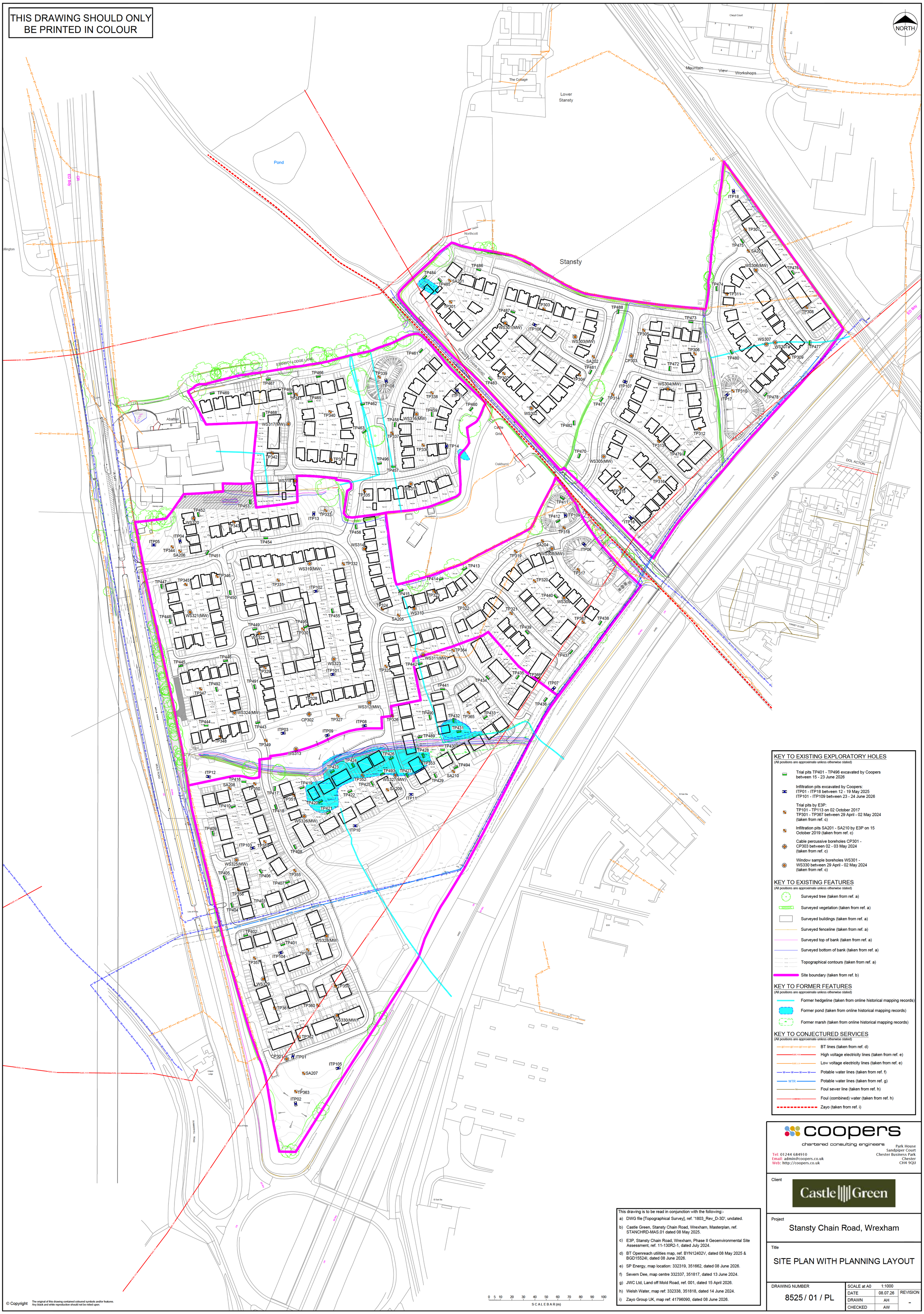
Appendix 3

Infiltration Consideration

Infiltration Testing

THIS DRAWING SHOULD ONLY BE PRINTED IN COLOUR

NORTH



KEY TO EXISTING EXPLORATORY HOLES

(All positions are approximate unless otherwise stated)

- Trial pits TP401 - TP496 excavated by Coopers between 15 - 23 June 2026
- Infiltration pits excavated by Coopers: ITP01 - ITP18 between 12 - 19 May 2025 ITP101 - ITP109 between 23 - 24 June 2026
- Trial pits by E3P: TP101 - TP113 on 02 October 2017 TP301 - TP367 between 29 April - 02 May 2024 (taken from ref. c)
- Infiltration pits SA201 - SA210 by E3P on 15 October 2019 (taken from ref. c)
- Cable percussive boreholes CP301 - CP303 between 02 - 03 May 2024 (taken from ref. c)
- Window sample boreholes WS301 - WS330 between 29 April - 02 May 2024 (taken from ref. c)

KEY TO EXISTING FEATURES

(All positions are approximate unless otherwise stated)

- Surveyed tree (taken from ref. a)
- Surveyed vegetation (taken from ref. a)
- Surveyed buildings (taken from ref. a)
- Surveyed fenceline (taken from ref. a)
- Surveyed top of bank (taken from ref. a)
- Surveyed bottom of bank (taken from ref. a)
- Topographical contours (taken from ref. a)
- Site boundary (taken from ref. b)

KEY TO FORMER FEATURES

(All positions are approximate unless otherwise stated)

- Former hedgeline (taken from online historical mapping records)
- Former pond (taken from online historical mapping records)
- Former marsh (taken from online historical mapping records)

KEY TO CONJECTURED SERVICES

(All positions are approximate unless otherwise stated)

- BT lines (taken from ref. d)
- High voltage electricity lines (taken from ref. e)
- Low voltage electricity lines (taken from ref. e)
- Potable water lines (taken from ref. f)
- Potable water lines (taken from ref. g)
- Foul sewer line (taken from ref. h)
- Foul (combined) water (taken from ref. h)
- Zayo (taken from ref. i)

0 5 10 20 30 40 50 60 70 80 90 100
SCALEBAR (m)

This drawing is to be read in conjunction with the following:-

a) DWG file [Topographical Survey], ref. '1803_Rev_D-3D', undated.
b) Castle Green, Stansty Chain Road, Wrexham, Masterplan, ref. STANCHRD-MAS.01 dated 08 May 2025.
c) E3P, Stansty Chain Road, Wrexham, Phase II Geoenvironmental Site Assessment, ref. 11-130R2-1, dated July 2024.
d) BT Openreach utilities map, ref. BYN12402V, dated 08 May 2025 & BGD15524I, dated 08 June 2026.
e) SP Energy, map location: 332319, 351662, dated 08 June 2026.
f) Severn Dee, map centre 332337, 351817, dated 13 June 2024.
g) JWC Ltd, Land off Mold Road, ref. 001, dated 15 April 2026.
h) Welsh Water, map ref: 332338, 351818, dated 14 June 2024.
i) Zayo Group UK, map ref: 41796090, dated 08 June 2026.

© Copyright
The original of this drawing contained coloured symbols and/or features. Any black and white reproduction should not be relied upon.

coopers
chartered consulting engineers
Park House
Sandpiper Court
Chester Business Park
Chester
CH4 9QU
Tel: 01244 684910
Email: admin@coopers.co.uk
Web: http://coopers.co.uk

Client: Castle Green

Project: Stansty Chain Road, Wrexham

Title: SITE PLAN WITH PLANNING LAYOUT

DRAWING NUMBER	SCALE at A0	1:1000	
8525 / 01 / PL	DATE	08.07.26	REVISION
	DRAWN	AH	-
	CHECKED	AW	

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP01

Machine : JCB 3CX
Method : Mechanical Excavation

Dimensions
2.10 x 0.65 x 1.80m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
12/05/2025

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	B				(0.30)	TOPSOIL. Grass over dark brown, slightly gravelly, silty, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to medium of various lithologies. Contains rootlets throughout.		
					0.30			
0.40	B					Light brown, slightly silty, gravelly, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. *Assumed as loose to medium dense.		
					(1.00)			
					1.30			
1.40	B					Brown, slightly clayey, slightly sandy, sub-angular to sub-rounded, fine to coarse (predominantly fine to medium) GRAVEL of various lithologies. Sand is fine to coarse. *Assumed as loose to medium dense.		
					(0.50)			
					1.80			
						Complete at 1.80m		



Remarks

Location CAT scanned prior to excavation.
Sides stable from 0.00m - 0.80m. Spalling below 0.80m.
No groundwater encountered during excavation.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy.
Trial pit excavated for infiltration test and backfilled with single size stone and slotted pipe. Reinstated at surface with topsoil.

Scale (approx)	Logged By	Checked By
1:25	ST	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP02

Machine : JCB 3CX
Method : Mechanical Excavation

Dimensions
2.50 x 0.45 x 2.10m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
12/05/2025

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	B				(0.40)	TOPSOIL. Grass over dark brown, slightly gravelly, silty, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Contains rootlets throughout.		
					0.40			
0.60	B				(0.60)	Brown, slightly clayey, very sandy, sub-angular to sub-rounded, fine to coarse GRAVEL. Sand is fine to coarse. *Assumed as loose to medium dense.		
					1.00			
1.20	B				(1.10)	Brown, slightly sandy, slightly clayey, sub-angular to sub-rounded, fine to coarse GRAVEL of various lithologies. Low cobble content. Sand is fine to coarse (predominantly fine to medium). *Assumed as loose to medium dense. Below 1.80m: Lenses of firm clay		
					2.10	Complete at 2.10m		



Remarks

Location CAT scanned prior to excavation.
Sides stable from 0.00m - 1.50m. Spalling below 1.50m.
No groundwater encountered during excavation.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy.
Trial pit excavated for infiltration test and backfilled with single size stone and slotted pipe. Reinstated at surface with topsoil.

Scale (approx)	Logged By	Checked By
1:25	ST	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP03

Machine : JCB 3CX

Method : Mechanical Excavation

Dimensions
2.50 x 0.45 x 2.20m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
12/05/2025

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	B		Moderate groundwater inflow(1) at 0.90m.		(0.30)	TOPSOIL. Grass over dark brown, slightly gravelly, silty, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Contains rootlets throughout.		
0.40	B				0.30			
					(0.30)	Firm, brown, slightly gravelly, very sandy CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.70	B				0.60			
					(1.60)	Light reddish brown, slightly gravelly, clayey, fine to coarse SAND with a low cobble content. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. *Assumed as loose due to water ingress.		▽1
					2.20	At 2.20m: Pocket of firm, reddish brown clay		
						Complete at 2.20m		



Remarks

Location CAT scanned prior to excavation.
No infiltration test pit installed.
Sides stable from 0.00m - 0.60m. Spalling below 0.60m.
Moderate inflow of groundwater at 0.90m during excavation. Depth at 2.20m at time of backfill.
Unable to take shear vanes from 0.30m - 0.60m, clay fractured on attempt.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy.
Trial pit backfilled with arisings upon completion.

Scale (approx)	Logged By	Checked By
1:25	ST	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site STANSTY CHAIN ROAD, WREXHAM			**Trial Pit Number** ITP03A
Machine : JCB 3CX **Method :** Mechanical Excavation	**Dimensions** 2.50 x 0.45 x 2.30m	**Ground Level (mOD)**	**Client** Castle Green Homes Ltd	**Job Number** 8525
	Location (Observed measurements)	**Dates** 12/05/2025	**Engineer** Coopers (Chester) Ltd	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
			Moderate groundwater inflow(1) at 0.90m.		(0.30)	TOPSOIL. Grass over dark brown, slightly gravelly, silty, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Contains rootlets throughout.		
					0.30			
					(0.60)	Brown, slightly clayey, sandy, sub-angular to sub-rounded, fine to coarse GRAVEL of various lithologies. Sand is fine to coarse. *Assumed as loose to medium dense.		
					0.90			▽1
					(1.40)	Light reddish brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. *Assumed as loose due to water ingress.		
					2.30	Complete at 2.30m		



Remarks

Location CAT scanned prior to excavation.
Sides stable from 0.00m - 0.90m. Collapsing from 0.90m - 2.30m.
Moderate inflow of groundwater at 0.90m during excavation. Depth at 2.30m at time of backfill.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy.
No infiltration test pit installed.
Trial pit backfilled with arisings upon completion.

Scale (approx)	Logged By	Checked By
1:25	ST	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP04

Machine : JCB 3CX

Method : Mechanical Excavation

Dimensions
2.50 x 0.55 x 2.30m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
12/05/2025

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	B				(0.30)	TOPSOIL. Grass over dark brown, slightly gravelly, silty, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Contains rootlets throughout.		
					0.30			
0.50	B					Brown, slightly gravelly, silty, fine to coarse (predominantly fine to medium) SAND with a low cobble and boulder content. *Assumed as loose to medium dense.		
					(2.00)	Below 1.80m: Contains pockets of coal		
					2.30			
2.30	B					Complete at 2.30m		



Remarks

Location CAT scanned prior to excavation.
Sides stable from 0.00m - 1.50m. Spalling from 1.50m - 2.30m.
No groundwater encountered during excavation.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy.
Trial pit excavated for infiltration test and backfilled with single size stone and slotted pipe. Reinstated at surface with topsoil.

Scale (approx)	Logged By	Checked By
1:25	ST	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP05

Machine : JCB 3CX

Method : Mechanical Excavation

Dimensions
2.50 x 0.45 x 2.10m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
12/05/2025

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	B				(0.40) 0.40	TOPSOIL. Grass over dark brown, slightly clayey, slightly gravelly, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Contains rootlets throughout.		
1.10	B				(1.70) 2.10	Light brown, slightly silty, slightly gravelly, fine to coarse (predominantly fine to medium) SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. *Assumed as loose to medium dense.		
						Complete at 2.10m		



Remarks

Location CAT scanned prior to excavation.
Sides stable during excavation.
No groundwater encountered during excavation.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy.
Trial pit excavated for infiltration test and backfilled with single size stone and slotted pipe. Reinstated at surface with topsoil.

Scale (approx)	Logged By	Checked By
1:25	ST	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP06

Machine : JCB 3CX
Method : Mechanical Excavation

Dimensions
2.10 x 0.45 x 2.50m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
14/05/2025

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	B				(0.30)	TOPSOIL. Grass over dark brown, slightly clayey, slightly gravelly, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
					0.30	Firm, reddish brown, slightly gravelly, very sandy CLAY. Sand is fine to medium. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.80 0.90	B SV 88kPa		Medium vane		(1.20)	From 0.90m: Firm to stiff, high strength		
					1.50			
1.60	B				(0.50)	Reddish brown, slightly clayey, sandy, sub-angular to sub-rounded, fine to coarse GRAVEL of various lithologies including coal, mudstone and sandstone. *Assumed as loose to medium dense.		
					2.00			
					(0.50)	Stiff, brown, slightly sandy, very gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies including mudstone and sandstone.		
					2.50	Complete at 2.50m		



Remarks

Location CAT scanned prior to excavation.
Sides stable from 0.00m - 0.30m. Spalling from 0.30m - 2.50m.
No groundwater encountered during excavation.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy.
Shear vane SV009 used.
Trial pit excavated for infiltration test and backfilled with single size stone and slotted pipe. Reinstated at surface with topsoil.

Scale (approx)	Logged By	Checked By
1:25	ST	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP07

Machine : JCB 3CX
Method : Mechanical Excavation

Dimensions
2.60 x 0.45 x 2.40m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
14/05/2025

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	B				(0.30)	MADEGROUND (similar to topsoil). Grass over dark brown, slightly gravelly, silty, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Contains rootlets throughout.		
					0.30			
					(0.30)	MADEGROUND. Firm, reddish brown, slightly sandy, slightly gravelly, silty CLAY. Sand is fine to medium. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Contains pockets of brown, fine to coarse sand throughout.		
0.50	B				0.60			
0.70	SV 78kPa		Medium vane			MADEGROUND (relic topsoil). Firm, dark greyish brown, slightly gravelly, sandy, clayey SILT. Sand is fine to coarse. Gravel is sub-angular to sub-rounded, fine to medium of various lithologies. Contains rare rootlets. From 0.70m: Firm to stiff, high strength		
0.90	B				(0.70)			
					1.30			
1.40	B					Brown, slightly gravelly, silty, fine to coarse (predominantly fine to medium) SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies including mudstone and sandstone. *Assumed as loose to medium dense.		
					(0.80)			
					2.10			
2.20	B				(0.30)	Light brown, slightly silty, gravelly, fine to coarse SAND with a low cobble content. Gravel is angular to sub-rounded, fine to coarse of various lithologies including coal, mudstone, sandstone and quartz. *Assumed as loose to medium dense.		
					2.40	Complete at 2.40m		



Remarks

Location CAT scanned prior to excavation.
Sides stable during excavation.
No groundwater encountered during excavation.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy.
Shear vane SV09 used.
Trial pit excavated for infiltration test and backfilled with single size stone and slotted pipe. Reinstated at surface with topsoil.

Scale (approx)	Logged By	Checked By
1:25	ST	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP08

Machine : JCB 3CX
Method : Mechanical Excavation

Dimensions
2.80 x 0.45 x 2.00m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
14/05/2025

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	B				(0.30)	TOPSOIL. Grass over dark brown, slightly gravelly, silty, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Contains rootlets throughout.		
					0.30	Firm, reddish brown, slightly gravelly, silty, sandy CLAY. Sand is fine to medium. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.60	SV 80kPa		Medium vane			From 0.60m: Firm to stiff, high strength		
0.80	B				(1.70)			
1.60	SV 90kPa		Medium vane					
1.80	SV 74kPa		Medium vane			From 1.80m: Firm, medium strength From 1.90m - 1.95m: Running sand pocket		
					2.00	Complete at 2.00m		



Remarks

Location CAT scanned prior to excavation.
Sides stable during excavation.
No groundwater encountered during excavation.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy.
Shear vane SV09 used.
Trial pit excavated for infiltration test and backfilled with single size stone and slotted pipe. Reinstated at surface with topsoil.

Scale (approx)	Logged By	Checked By
1:25	ST	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP09

Machine : JCB 3CX
Method : Mechanical Excavation

Dimensions
2.80 x 0.45 x 1.80m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
14/05/2025

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	B				(0.30)	TOPSOIL. Grass over dark brown, slightly gravelly, silty, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Contains rootlets throughout.		
					0.30			
0.40	B					Firm, reddish brown, slightly gravelly, sandy CLAY. Sand is fine to medium. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.60	SV 78kPa		Medium vane		(0.60)	From 0.60m: Firm to stiff, high strength		
			Moderate inflow(1) at 0.90m.		0.90	Light reddish brown, clayey, gravelly, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. *Assumed as loose due to water ingress.		▽1
1.10	B				(0.90)			
					1.80	Complete at 1.80m		



Remarks

Location CAT scanned prior to excavation.
No infiltration test pit constructed.
Sides stable from 0.00m - 0.90m. Collapsing/spalling from 0.90m - 1.80m.
Moderate inflow of groundwater at 0.90m during excavation. Depth at 1.80m at time of backfill.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy.
Shear vane SV09 used.
Trial pit backfilled with arisings upon completion.

Scale (approx)	Logged By	Checked By
1:25	ST	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP10

Machine : JCB 3CX
Method : Mechanical Excavation

Dimensions
2.20 x 0.45 x 2.10m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
14/05/2025

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	B				(0.30)	TOPSOIL. Grass over dark brown, slightly gravelly, silty, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Contains rootlets throughout.		
					0.30			
0.50	B				(1.00)	Light brown, slightly gravelly, clayey, fine to medium SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Low cobble content. Contains occasional lenses of firm, reddish brown clay. *Assumed as loose to medium dense.		
					1.30			
1.40	B				(0.50)	Firm, reddish brown, slightly sandy, slightly gravelly, silty CLAY. Sand is fine to medium. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
1.60	SV 88kPa		Medium vane			From 1.60m: Firm to stiff, high strength		
					1.80			
1.90	b				(0.30)	Light reddish brown, slightly clayey, very gravelly, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Low cobble content. *Assumed as loose to medium dense.		
					2.10	Complete at 2.10m		



Remarks

Location CAT scanned prior to excavation.
Sides stable during excavation.
No groundwater encountered during excavation.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy.
Shear vane SV09 used.
Trial pit excavated for infiltration test and backfilled with single size stone and slotted pipe. Reinstated at surface with topsoil.

Scale (approx)	Logged By	Checked By
1:25	ST	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP11

Machine : JCB 3CX
Method : Mechanical Excavation

Dimensions
2.40 x 0.55 x 2.10m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
14/05/2025

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	B				(0.30)	TOPSOIL. Grass over dark brown, slightly gravelly, silty, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Contains rootlets throughout.		
					0.30			
0.50	B				(0.40)	Brown, slightly gravelly, clayey, fine to medium SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. *Assumed as loose to medium dense.		
					0.70			
0.80	B					Firm, light brown, slightly gravelly, silty, very sandy CLAY. Sand is fine to medium. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.90	SV 64kPa		Medium vane		(0.50)	From 0.90m: Medium strength		
					1.20			
1.40	B					Light brown, slightly clayey, very sandy, sub-angular to sub-rounded, fine to coarse GRAVEL of various lithologies including coal, sandstone, mudstone and quartz. Sand is fine to coarse. Low cobble content. *Assumed as loose to medium dense.		
					(0.90)			
					2.10	Complete at 2.10m		



Remarks

Location CAT scanned prior to excavation.
Sides stable from 0.00m - 1.20m. Spalling/minor collapse below 1.20m.
No groundwater encountered during excavation.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy.
Shear vane SV09 used.
Trial pit excavated for infiltration test and backfilled with single size stone and slotted pipe. Reinstated at surface with topsoil.

Scale (approx)	Logged By	Checked By
1:25	ST	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP12

Machine : JCB 3CX
Method : Mechanical Excavation

Dimensions
2.40 x 0.45 x 2.60m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
14/05/2025

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	B				(0.30)	TOPSOIL. Grass over dark brown, slightly gravelly, silty, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Contains rootlets throughout.		
0.40	B				0.30 (0.60)	Light brown, slightly clayey, slightly gravelly, fine to medium SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. *Assumed as loose to medium dense.		
1.00	B				0.90 (0.40)	Soft, light brown and orangish brown, slightly gravelly, very sandy CLAY. Sand is fine to medium. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
1.10	SV 38kPa		Medium vane			From 1.10m: Low strength		
1.40	SV 72kPa		Medium vane		1.30	Firm, reddish brown mottled grey, slightly sandy, slightly gravelly, silty CLAY. Sand is fine to medium. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
1.50	B					From 1.40m: Medium strength		
1.90	SV 114kPa		Medium vane		(1.30)	From 1.80m: Stiff, high strength		
2.20	SV 120kPa		Medium vane			From 2.30m - 2.50m: Running sand pocket		
					2.60	Complete at 2.60m		



Remarks

Location CAT scanned prior to excavation.
Sides stable during excavation.
No groundwater encountered during excavation.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy.
Shear vane SV09 used.
Trial pit excavated for infiltration test and backfilled with single size stone and slotted pipe. Reinstated at surface with topsoil.

Scale (approx)	Logged By	Checked By
1:25	ST	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP13

Machine : JCB 3CX
Method : Mechanical Excavation

Dimensions
2.60 x 0.45 x 2.70m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
14/05/2025

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	B				(0.30)	TOPSOIL. Grass over dark brown, slightly gravelly, silty, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Contains rootlets throughout.		
					0.30			
0.50	SV 70kPa		Medium vane			Firm, reddish brown mottled grey, slightly sandy, slightly gravelly, silty CLAY. Sand is fine to medium. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Low cobble content. From 0.50m: Medium strength		
0.60	B							
1.00	SV 75kPa		Medium vane			From 1.00m: Firm to stiff, high strength		
1.50	SV 83kPa		Medium vane		(2.40)			
2.00	B							
2.20	SV 88kPa		Medium vane					
2.70	SV 88kPa		Medium vane		2.70	Complete at 2.70m		



Remarks

Location CAT scanned prior to excavation.
Sides stable during excavation.
No groundwater encountered during excavation.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy.
Shear vane SV09 used.
Trial pit excavated for infiltration test and backfilled with single size stone and slotted pipe. Reinstated at surface with topsoil.

Scale (approx)	Logged By	Checked By
1:25	ST	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP14

Machine : JCB 3CX
Method : Mechanical Excavation

Dimensions
2.70 x 0.45 x 2.40m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
14/05/2025

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	B				(0.30)	TOPSOIL. Grass over dark brown, slightly gravelly, silty, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Contains rootlets throughout.		
					0.30			
0.40	B					Firm, reddish brown mottled grey, slightly gravelly, silty, sandy CLAY. Sand is fine to medium. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Low cobble content.		
0.50	SV 65kPa		Medium vane			From 0.50m: Medium strength		
					(1.40)	From 1.00m: Firm to stiff, high strength		
1.50	SV 80kPa		Medium vane					
					1.70			
1.90	B					Reddish brown, slightly sandy, clayey, sub-angular to sub-rounded, fine to coarse GRAVEL with a high cobble content. Sand is fine to coarse. *Assumed as loose to medium dense.		
					(0.70)			
					2.40	Complete at 2.40m		



Remarks

Location CAT scanned prior to excavation.
Sides stable during excavation.
No groundwater encountered during excavation.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy.
Shear vane SV09 used.
Trial pit excavated for infiltration test and backfilled with single size stone and slotted pipe. Reinstated at surface with topsoil.

Scale (approx)	Logged By	Checked By
1:25	ST	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP15

Machine : JCB 3CX
Method : Mechanical Excavation

Dimensions
2.70 x 0.55 x 2.60m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
14/05/2025

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	B				(0.20) 0.20	TOPSOIL. Grass over dark brown, slightly gravelly, silty, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Contains rootlets throughout.		
0.40	B				(0.30) 0.50	Brown, slightly clayey, slightly gravelly, fine to medium SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. *Assumed as loose to medium dense.		
0.60 0.70	B SV 54kPa		Medium vane		(1.30)	Firm, reddish brown, slightly gravelly, silty, very sandy CLAY. Sand is fine to medium. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
1.60	SV 58kPa		Medium vane		1.80			
1.90	B				(0.80)	Light reddish brown, slightly clayey, very sandy, sub-angular to sub-rounded, fine to coarse GRAVEL of various lithologies. Moderate cobble content. *Assumed as loose to medium dense.		
					2.60	Complete at 2.60m		



Remarks

Location CAT scanned prior to excavation.
Sides stable from 0.00m - 1.80m. Spalling/minor collapse below 1.80m.
No groundwater encountered during excavation.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy.
Shear vane SV09 used.
Trial pit excavated for infiltration test and backfilled with single size stone and slotted pipe. Reinstated at surface with topsoil.

Scale (approx)	Logged By	Checked By
1:25	ST	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP16

Machine : JCB 3CX
Method : Mechanical Excavation

Dimensions
2.50 x 0.60 x 2.30m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
19/05/2025

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	B				(0.35)	TOPSOIL. Grass over dark brown, slightly clayey, slightly gravelly, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
					0.35			
0.70	B				(0.65)	Firm, reddish brown, slightly sandy, silty, gravelly CLAY with a moderate cobble content. Sand is fine to medium. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies including sandstone.		
					1.00			
1.10	B				(1.30)	Reddish brown, slightly clayey, sandy, sub-angular to sub-rounded, fine to coarse GRAVEL of various lithologies including sandstone and mudstone. Moderate cobble content of various lithologies. *Assumed as loose to medium dense.		
					2.30	Complete at 2.30m		



Remarks

Location CAT scanned prior to excavation.
Sides stable from 0.00m - 1.00m. Minor spalling from 1.00m - 2.30m.
No groundwater encountered during excavation.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy.
Trial pit excavated for infiltration test and backfilled with single size stone and slotted pipe. Reinstated at surface with topsoil.

Scale (approx)	Logged By	Checked By
1:25	ST	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP17

Machine : JCB 3CX
Method : Mechanical Excavation

Dimensions
2.70 x 0.60 x 2.30m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
19/05/2025

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	B				(0.40)	TOPSOIL. Grass over dark brown, slightly gravelly, silty, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
					0.40			
0.50	B				(0.20)	Brown, slightly clayey, slightly gravelly, fine to coarse (predominantly fine to medium) SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. *Assumed as loose to medium dense.		
					0.60			
					(1.10)	Light greyish brown, slightly silty, slightly gravelly, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Low cobble content. Contains pockets of firm clay throughout.		
					1.70			
2.10	B				(0.60)	Light brown, slightly clayey, very sandy, sub-angular to sub-rounded, fine to coarse GRAVEL of various lithologies including sandstone and coal. Sand is fine to coarse. Low cobble content. *Assumed as loose to medium dense.		
					2.30	Complete at 2.30m		



Remarks

Location CAT scanned prior to excavation.
Sides stable from 0.00m - 0.40m. Minor spalling from 0.40m - 1.70m.
Spalling from 1.70m - 2.30m.
No groundwater encountered during excavation.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy.
Trial pit excavated for infiltration test and backfilled with single size stone and slotted pipe. Reinstated at surface with topsoil.

Scale (approx)	Logged By	Checked By
1:25	ST	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP18

Machine : JCB 3CX
Method : Mechanical Excavation

Dimensions
2.50 x 0.60 x 2.30m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
19/05/2025

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	B				(0.30)	*TOPSOIL. Grass over dark brown, slightly gravelly, silty, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Contains rootlets throughout.		
					0.30			
0.40	B				(0.30)	*Brown, slightly silty, slightly gravelly, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. **Assumed as loose to medium dense.		
					0.60			
0.70	B				(0.20)	Firm, greyish brown with brown mottling, slightly sandy, slightly gravelly CLAY. Sand is fine to medium. Gravel is sub-angular to sub-rounded, fine to medium of various lithologies. Contains fine to coarse rootlets throughout. ***		
0.75	SV 48kPa		Medium vane		0.80	From 0.75m: Medium strength		
1.00	B				(0.60)	Firm, grey and light brown, slightly sandy, slightly gravelly, silty CLAY. Sand is fine to medium. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
1.20	SV 70kPa		Medium vane			From 1.20m: Medium strength		
					1.40			
					(0.90)	Light reddish brown, slightly clayey, slightly gravelly, fine to coarse (predominantly fine to medium) SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Contains occasional pockets of firm, reddish brown clay throughout. **Assumed as loose to medium dense.		
2.00	B					Below 2.20m: Clay pockets no longer present		
					2.30	Complete at 2.30m		



Remarks

Location CAT scanned prior to excavation.
Sides stable during excavation.
No groundwater encountered during excavation.
**Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy.
Shear vane SV09 used.
*Possible madeground.
***Possible relic topsoil (madeground).
Trial pit excavated for infiltration test and backfilled with single size stone and slotted pipe. Reinstated at surface with topsoil.

Scale (approx)	Logged By	Checked By
1:25	ST	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP101

Machine : JCB 3CX
Method : Mechanical Excavation

Dimensions
2.00 x 0.45 x 1.00m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
23/06/2026

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30) 0.30	TOPSOIL. Grass over dark brown, slightly clayey, slightly gravelly, fine to coarse SAND with occasional rootlets. Gravel is sub-angular to sub-rounded of natural stone. *Assumed as loose to medium dense.		
0.50	B				(0.70) 1.00	Light orangish brown, slightly gravelly, slightly silty, fine to coarse SAND. Gravel is sub-angular to sub-rounded of natural lithologies. Moderate content of sub-angular to sub-rounded cobbles. Low content of sub-angular to sub-rounded boulders. Boulders measuring up to 150mm x 200mm. *Assumed as loose to medium dense.		
						Complete at 1.00m		



Remarks

Location CAT scanned prior to excavation.
Sides stable during excavation.
No groundwater encountered during excavation.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as as hard copy.
Trial pit locations shown on Coopers Drawing No. 8525/01/P1-RevA.
Backfilled with arisings upon completion.

North	Scale (approx)	Logged By	Checked By
←	1:25	LB	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP102

Machine : JCB 3CX
Method : Mechanical Excavation

Dimensions
2.00 x 0.45 x 1.00m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
23/06/2026

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30) 0.30	TOPSOIL. Grass over dark brown, slightly clayey, slightly gravelly, fine to coarse SAND with occasional rootlets. Gravel is sub-angular to sub-rounded of natural stone. *Assumed as loose to medium dense.		
0.60	B				(0.70) 1.00	Dark orangish brown, slightly gravelly, slightly clayey, fine to coarse SAND. Gravel is fine to coarse, sub-angular to sub-rounded of natural lithologies. Low content of sub-angular to sub-rounded cobbles. *Assumed as loose to medium dense.		
						Complete at 1.00m		



Remarks

Location CAT scanned prior to excavation.
Sides stable during excavation.
No groundwater encountered during excavation.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as as hard copy.
Trial pit locations shown on Coopers Drawing No. 8525/01/P1-RevA.
Backfilled with arisings upon completion.

North	Scale (approx)	Logged By	Checked By
←	1:25	LB	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP103

Machine : JCB 3CX
Method : Mechanical Excavation

Dimensions
2.00 x 0.45 x 2.00m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
23/06/2026

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	TOPSOIL. Grass over dark brown, slightly clayey, slightly gravelly, fine to coarse SAND with occasional rootlets. Gravel is sub-angular to sub-rounded of natural lithologies. *Assumed as loose to medium dense.		
					0.30			
0.50	B				(0.50)	Light brown, gravelly, slightly silty, fine to coarse SAND. Gravel is sub-angular to sub-rounded of natural lithologies. Moderate content of sub-angular to sub-rounded cobbles. Low content of sub-angular to sub-rounded boulders. Boulders measuring up to 250mm x 100mm.		
					0.80			
1.00	B				(1.20)	Light greyish brown, sandy, slightly clayey, fine to coarse, sub-angular to sub-rounded GRAVEL of natural lithologies. Sand is fine to coarse. Moderate content of sub-angular to sub-rounded cobbles. Low content of sub-angular to sub-rounded boulders. Boulders measuring up to 200mm x 250mm. *Assumed as loose to medium dense.		
					2.00			
						Complete at 2.00m		



Remarks

Location CAT scanned prior to excavation.
Spalling from 0.80m.
No groundwater encountered during excavation.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as as hard copy.
Trial pit locations shown on Coopers Drawing No. 8525/01/P1-RevA.
Backfilled with arisings upon completion.

North	Scale (approx)	Logged By	Checked By
←	1:25	LB	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP104

Machine : JCB 3CX

Method : Mechanical Excavation

Dimensions
2.00 x 0.45 x 2.00m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
23/06/2026

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30) 0.30	TOPSOIL. Grass over dark brown, slightly clayey, slightly gravelly, fine to coarse SAND with occasional rootlets. Gravel is sub-angular to sub-rounded of natural lithologies. *Assumed as loose to medium dense.		
0.60	B				(1.20) 1.50	Light orangish brown, slightly gravelly, slightly clayey, silty, fine to coarse SAND. Gravel is sub-angular to sub-rounded of various lithologies. *Assumed as loose to medium dense.		
1.60	B				(0.50) 2.00	Light greyish brown, slightly clayey, very sandy, fine to coarse, sub-angular to sub-rounded GRAVEL of various lithologies. Sand is fine to coarse. Moderate content of sub-angular to sub-rounded cobbles. Low content of sub-angular to sub-rounded boulders. Boulders measuring up to 200mm x 210mm. *Assumed as loose to medium dense.		
						Complete at 2.00m		



Remarks

Location CAT scanned prior to excavation.
Sides stable during excavation.
No groundwater encountered during excavation.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as as hard copy.
Trial pit locations shown on Coopers Drawing No. 8525/01/P1-RevA.
Backfilled with arisings upon completion.

North	Scale (approx)	Logged By	Checked By
←	1:25	LB	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP105

Machine : JCB 3CX
Method : Mechanical Excavation

Dimensions
2.00 x 0.45 x 2.00m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
23/06/2026

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.40)	TOPSOIL. Grass over dark brown, slightly clayey, slightly gravelly, fine to coarse SAND with occasional rootlets. Gravel is fine to coarse, sub-angular to sub-rounded of natural lithologies. *Assumed as loose to medium dense.		
					0.40			
0.50	B				(0.30)	Dark orangish brown, slightly gravelly, slightly clayey, fine to coarse SAND. Gravel is fine to coarse, sub-angular to sub-rounded of natural lithologies. *Assumed as loose to medium dense.		
					0.70			
1.20	B				(1.30)	Orangish brown, slightly gravelly, slightly silty, fine to coarse SAND. Gravel is fine to coarse, sub-angular to sub-rounded of natural lithologies. *Assumed as loose to medium dense.		
					2.00	Complete at 2.00m		



Remarks

Location CAT scanned prior to excavation.
Slight spalling from 0.40m during excavation.
No groundwater encountered during excavation.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as as hard copy.
Trial pit locations shown on Coopers Drawing No. 8525/01/P1-RevA.
Backfilled with arisings upon completion.

North	Scale (approx)	Logged By	Checked By
←	1:25	LB	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP106

Machine : JCB 3CX

Method : Mechanical Excavation

Dimensions
1.40 x 0.45 x 2.00m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
23/06/2026

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.40)	TOPSOIL. Grass over dark brown, slightly clayey, slightly gravelly, fine to coarse SAND with occasional rootlets. Gravel is fine to coarse, sub-angular to sub-rounded of natural lithologies. *Assumed as loose to medium dense.		
					0.40			
0.60	B				(0.50)	Orangish brown, slightly gravelly, slightly clayey, fine to coarse SAND. Gravel is fine to coarse, sub-angular to sub-rounded of natural lithologies. *Assumed as loose to medium dense.		
					0.90			
1.50	B				(1.10)	Greyish brown, slightly clayey, very sandy, fine to coarse, sub-angular to sub-rounded GRAVEL of natural lithologies. Moderate content of sub-angular to sub-rounded cobbles. Low content of sub-angular to sub-rounded boulders. Boulders measuring up to 300mm x 170mm.*Assumed as loose to medium dense.		
					2.00			
						Complete at 2.00m		



Remarks

Location CAT scanned prior to excavation.
Sides stable. Slight spalling from 1.20m.
No groundwater encountered during excavation.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as as hard copy.
Trial pit locations shown on Coopers Drawing No. 8525/01/P1-RevA.
Backfilled with arisings upon completion.

North	Scale (approx)	Logged By	Checked By
↓	1:25	LB	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site STANSTY CHAIN ROAD, WREXHAM			**Trial Pit Number** ITP107
Machine : JCB 3CX **Method :** Mechanical Excavation	**Dimensions** 1.60 x 0.45 x 1.50m	**Ground Level (mOD)**	**Client** Castle Green Homes Ltd	**Job Number** 8525
	Location (Observed measurements)	**Dates** 23/06/2026	**Engineer** Coopers (Chester) Ltd	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	TOPSOIL. Grass over dark brown, slightly clayey, slightly gravelly, fine to coarse SAND with occasional rootlets. Gravel is fine to coarse, sub-angular to sub-rounded of natural lithologies. *Assumed as loose to medium dense.		
					0.30			
0.50	B				(0.70)	Orangish brown, slightly gravelly, slightly clayey, fine to coarse SAND. Gravel is fine to coarse, sub-angular to sub-rounded of natural lithologies. *Assumed as loose to medium dense.		
					1.00			
1.10	SV 98**kPa		Small vane		(0.20)	Firm, reddish brown, slightly gravelly, very sandy, silty CLAY. Gravel is fine to coarse, sub-angular to sub-rounded of natural lithologies. Sand is fine to coarse.		
1.10	B				1.20			
1.30	B				(0.30)	Reddish brown, slightly gravelly, clayey, silty, fine to coarse SAND. Gravel is sub-angular to sub-rounded of natural lithologies. *Assumed as loose to medium dense.		
					1.50	Complete at 1.50m		



Remarks

Location CAT scanned prior to excavation.
Sides stable during excavation.
No groundwater encountered during excavation.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as as hard copy.
Trial pit locations shown on Coopers Drawing No. 8525/01/P1-RevA.
Shear vane SV10 used. **Spurious shear vane result, sample breaking apart.
Backfilled with arisings upon completion.

North	Scale (approx)	Logged By	Checked By
↓	1:25	LB	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP108

Machine : JCB 3CX

Method : Mechanical Excavation

Dimensions
1.60 x 0.45 x 3.00m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
23/06/2026

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	TOPSOIL. Grass over dark brown, slightly gravelly, slightly clayey, fine to coarse SAND with occasional rootlets. Gravel is fine to coarse, sub-angular to sub-rounded of natural lithologies. *Assumed as loose to medium dense.		
					0.30			
0.40	B				(0.30)	Orangish brown, slightly gravelly, slightly clayey, fine to coarse SAND. Gravel is fine to coarse, sub-angular to sub-rounded of natural lithologies. *Assumed as loose to medium dense.		
					0.60			
0.80	SV 36**kPa		Medium vane			Soft to firm, low to medium strength, orangish brown, slightly gravelly, very sandy, silty CLAY. Gravel is fine to coarse, sub-angular to sub-rounded of various natural lithologies. Sand is fine to coarse.		
0.80	B							
1.20	SV 56**kPa		Medium vane					
1.50	SV 46**kPa		Medium vane		(1.85)			
2.00	SV 56**kPa		Medium vane					
					2.45			
					(0.55)	Light greyish brown, slightly clayey, very sandy, fine to coarse, sub-angular to sub-rounded GRAVEL of natural lithologies. Moderate content of sub-angular to sub-rounded cobbles. Low content of sub-angular to sub-rounded boulders. Boulders measuring up to 250mm x 100mm.		
					3.00			
						Complete at 3.00m		



Remarks

Location CAT scanned prior to excavation.
Sides stable. Slight spalling from 2.45m.
No groundwater encountered during excavation.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as as hard copy.
Trial pit locations shown on Coopers Drawing No. 8525/01/P1-RevA.
Shear vane SV10 used. **Spurious shear vane result, sample breaking apart.
Backfilled with arisings upon completion.

North	Scale (approx)	Logged By	Checked By
←	1:25	LB	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers
chartered consulting engineers

Coopers (Chester) Ltd
tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Site
STANSTY CHAIN ROAD, WREXHAM

Trial Pit Number
ITP109

Machine : JCB 3CX
Method : Mechanical Excavation

Dimensions
2.00 x 0.60 x 2.60m

Ground Level (mOD)

Client
Castle Green Homes Ltd

Job Number
8525

Location (Observed measurements)

Dates
24/06/2026

Engineer
Coopers (Chester) Ltd

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	B				(0.40)	TOPSOIL. Grass over dark brown, slightly gravelly, silty, fine to coarse SAND. Gravel is fine to coarse, angular to sub-angular of natural stone. Frequent rootlets present.		
0.60	B				0.40 (1.00)	Orangish brown, slightly clayey, gravelly, silty, fine to coarse SAND. Gravel is fine to coarse, sub-angular to sub-rounded of natural stone. *Assumed as loose to medium dense.		
1.60	B				1.40 (1.20)	Brown, gravelly, silty, fine to coarse SAND. Gravel is fine to coarse, sub-angular to sub-rounded of natural stone including sandstone. Frequent sub-angular to sub-rounded cobbles of natural stone present. *Assumed as loose to medium dense.		
					2.60	Complete at 2.60m		



Remarks

Location CAT scanned prior to excavation.
Spalling from 1.40m.
No groundwater encountered during excavation.
*Based upon trenchside stability characteristics.
Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as as hard copy.
Trial pit locations shown on Coopers Drawing No. 8525_01.
Trial pit excavated for infiltration test and backfilled with single size stone and slotted pipe.

Scale (approx)	Logged By	Checked By
1:25	LB	PRS

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

coopers

chartered consulting engineers

Date of Test: 13 May 2025

Produced by: S Thomas

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 1 (Test 1)

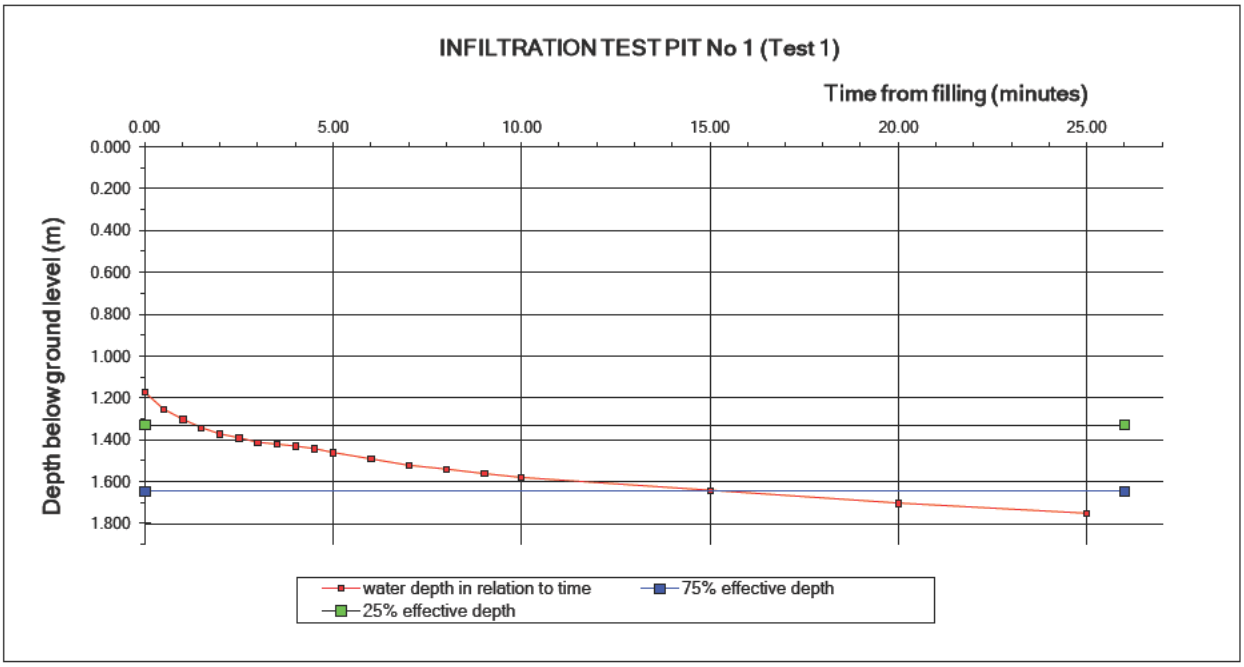
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	1.170
0	00	30	0.50	1.250
0	01	00	1.00	1.300
0	01	30	1.50	1.340
0	02	00	2.00	1.370
0	02	30	2.50	1.390
0	03	00	3.00	1.410
0	03	30	3.50	1.420
0	04	00	4.00	1.430
0	04	30	4.50	1.440
0	05	00	5.00	1.460
0	06	00	6.00	1.490
0	07	00	7.00	1.520
0	08	00	8.00	1.540
0	09	00	9.00	1.560
0	10	00	10.00	1.580
0	15	00	15.00	1.640
0	20	00	20.00	1.700
0	25	00	25.00	1.750

Test Pit Dimensions

Test Pit Length	2.10 m
Test Pit Width	0.65 m
Test Pit Depth	1.80 m
Standing Water Level	m

Infiltration Parameters

Total Depth	0.630 m
Total Effective Depth	0.630 m
25% Depth	1.328 m
75% Depth	1.643 m
25% Time	1.34 min
75% Time	15.21 min
Free Volume	0.128993 cu.m
Surface Area	3.0975 sq.m
Time of Outflow	13.86 min



Soil infiltration Rate	**1.80E-01**	**m/hr**
	5.01E-05	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 13 May 2025

Produced by: S Thomas

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 1 (Test 2)

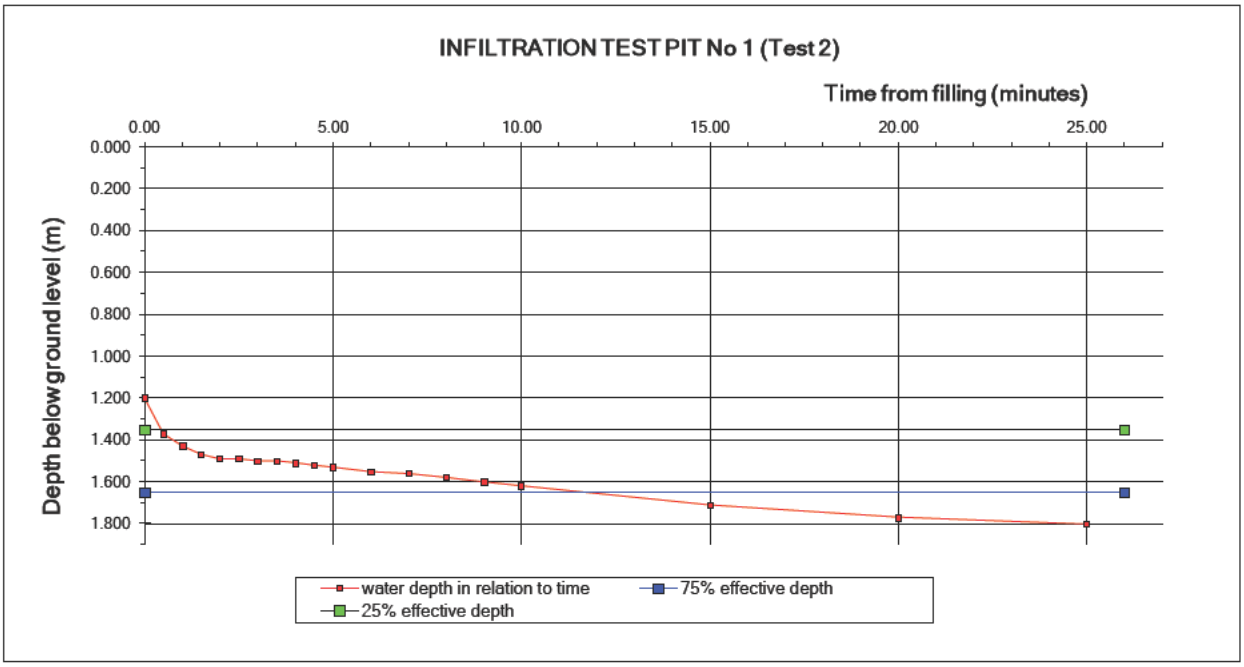
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	1.200
0	00	30	0.50	1.370
0	01	00	1.00	1.430
0	01	30	1.50	1.470
0	02	00	2.00	1.490
0	02	30	2.50	1.490
0	03	00	3.00	1.500
0	03	30	3.50	1.500
0	04	00	4.00	1.510
0	04	30	4.50	1.520
0	05	00	5.00	1.530
0	06	00	6.00	1.550
0	07	00	7.00	1.560
0	08	00	8.00	1.580
0	09	00	9.00	1.600
0	10	00	10.00	1.620
0	15	00	15.00	1.710
0	20	00	20.00	1.770
0	25	00	25.00	1.800

Test Pit Dimensions

Test Pit Length	2.10 m
Test Pit Width	0.65 m
Test Pit Depth	1.80 m
Standing Water Level	m

Infiltration Parameters

Total Depth	0.600 m
Total Effective Depth	0.600 m
25% Depth	1.350 m
75% Depth	1.650 m
25% Time	0.44 min
75% Time	11.67 min
Free Volume	0.12285 cu.m
Surface Area	3.015 sq.m
Time of Outflow	11.23 min



Soil infiltration Rate	**2.18E-01**	**m/hr**
	6.05E-05	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 13 May 2025

Produced by: S Thomas

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 1 (Test 3)

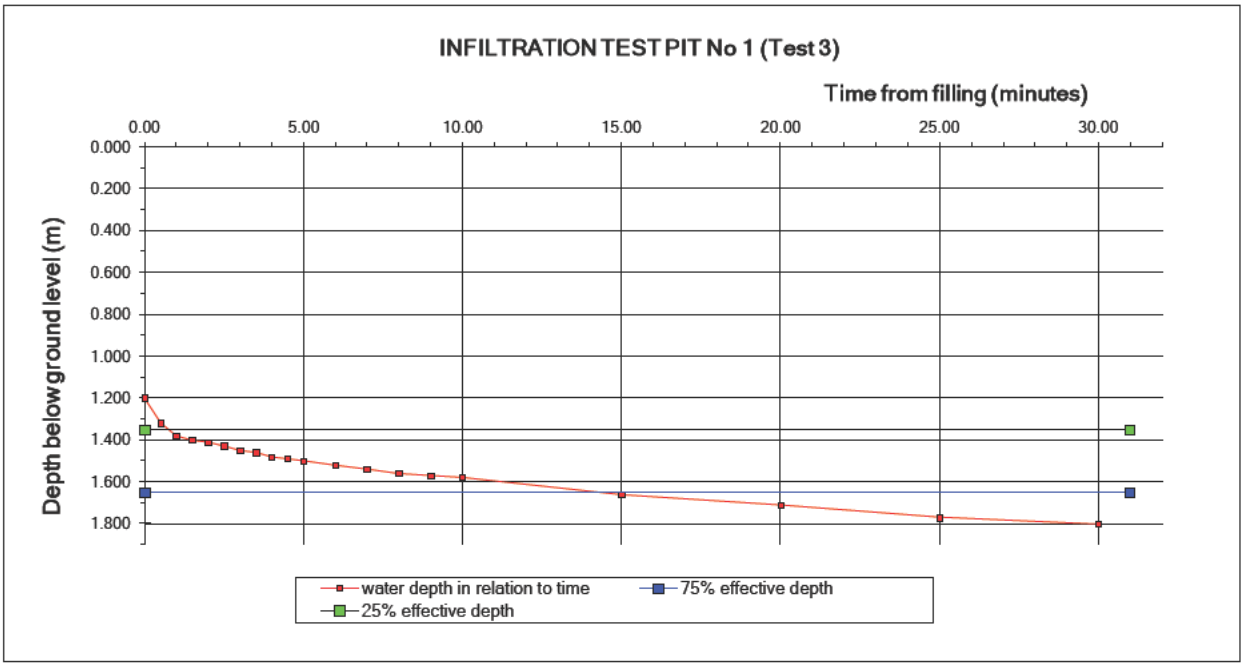
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	1.200
0	00	30	0.50	1.320
0	01	00	1.00	1.380
0	01	30	1.50	1.400
0	02	00	2.00	1.410
0	02	30	2.50	1.430
0	03	00	3.00	1.450
0	03	30	3.50	1.460
0	04	00	4.00	1.480
0	04	30	4.50	1.490
0	05	00	5.00	1.500
0	06	00	6.00	1.520
0	07	00	7.00	1.540
0	08	00	8.00	1.560
0	09	00	9.00	1.570
0	10	00	10.00	1.580
0	15	00	15.00	1.660
0	20	00	20.00	1.710
0	25	00	25.00	1.770
0	30	00	30.00	1.800

Test Pit Dimensions

Test Pit Length	2.10 m
Test Pit Width	0.65 m
Test Pit Depth	1.80 m
Standing Water Level	m

Infiltration Parameters

Total Depth	0.600 m
Total Effective Depth	0.600 m
25% Depth	1.350 m
75% Depth	1.650 m
25% Time	0.75 min
75% Time	14.38 min
Free Volume	0.12285 cu.m
Surface Area	3.015 sq.m
Time of Outflow	13.63 min



Soil infiltration Rate	**1.79E-01**	**m/hr**
	4.98E-05	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 13 May 2025

Produced by: S Thomas

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 2 (Test 1)

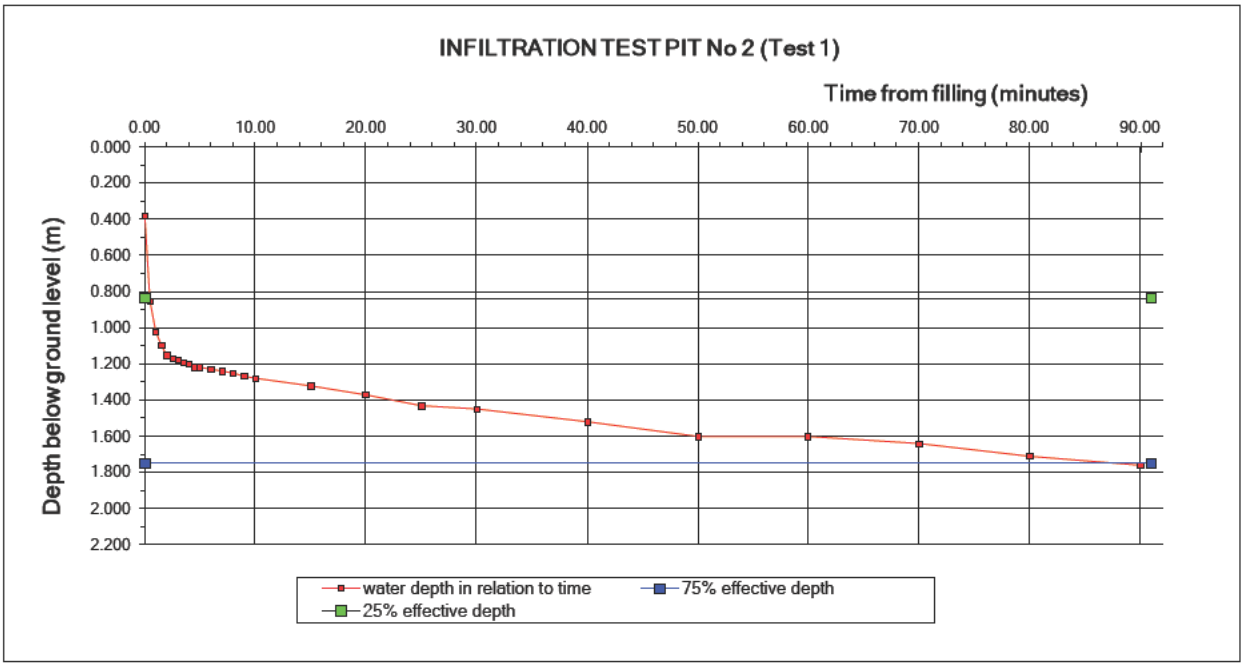
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.380
0	00	30	0.50	0.850
0	01	00	1.00	1.020
0	01	30	1.50	1.100
0	02	00	2.00	1.150
0	02	30	2.50	1.170
0	03	00	3.00	1.180
0	03	30	3.50	1.190
0	04	00	4.00	1.200
0	04	30	4.50	1.220
0	05	00	5.00	1.220
0	06	00	6.00	1.230
0	07	00	7.00	1.240
0	08	00	8.00	1.250
0	09	00	9.00	1.270
0	10	00	10.00	1.280
0	15	00	15.00	1.320
0	20	00	20.00	1.370
0	25	00	25.00	1.430
0	30	00	30.00	1.450
0	40	00	40.00	1.520
0	50	00	50.00	1.600
1	00	00	60.00	1.600
1	10	00	70.00	1.640
1	20	00	80.00	1.710
1	30	00	90.00	1.760

Test Pit Dimensions

Test Pit Length	2.50 m
Test Pit Width	0.45 m
Test Pit Depth	2.20 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.820 m
Total Effective Depth	1.820 m
25% Depth	0.835 m
75% Depth	1.745 m
25% Time	0.48 min
75% Time	87.00 min
Free Volume	0.307125 cu.m
Surface Area	6.494 sq.m
Time of Outflow	86.52 min



Soil infiltration Rate	**3.28E-02**	**m/hr**
	9.11E-06	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 13 May 2025

Produced by: S Thomas

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 2 (Test 2)

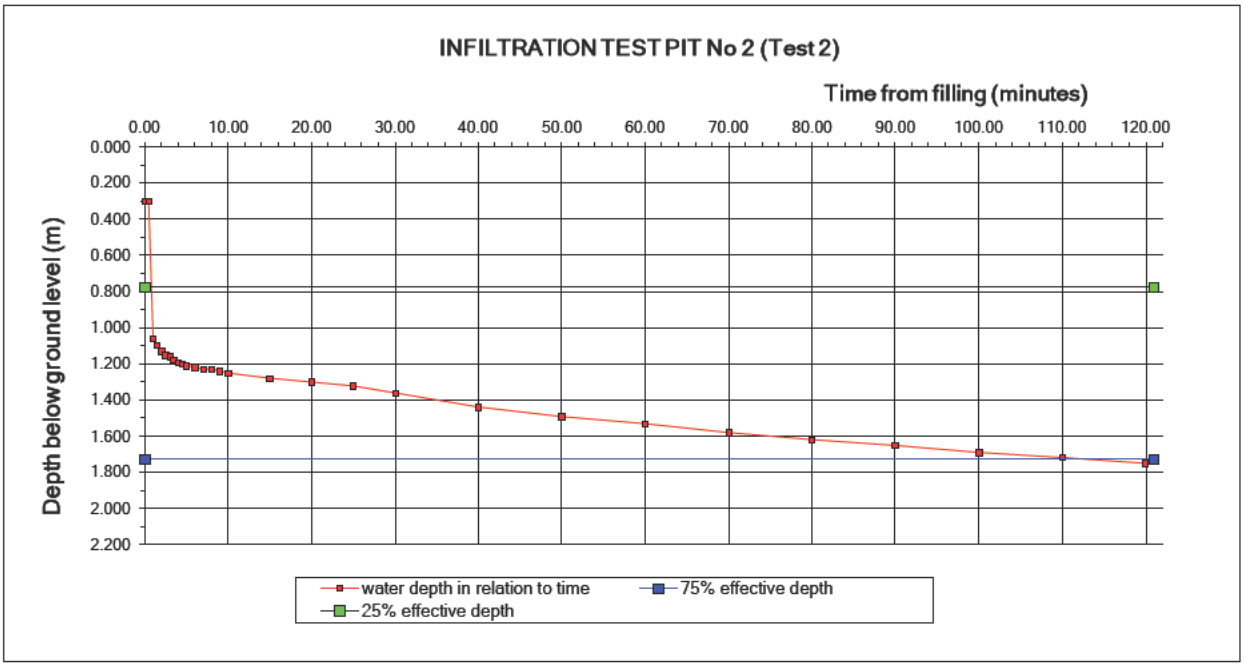
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.300
0	00	30	0.50	0.300
0	01	00	1.00	1.060
0	01	30	1.50	1.100
0	02	00	2.00	1.130
0	02	30	2.50	1.150
0	03	00	3.00	1.160
0	03	30	3.50	1.180
0	04	00	4.00	1.190
0	04	30	4.50	1.200
0	05	00	5.00	1.210
0	06	00	6.00	1.220
0	07	00	7.00	1.230
0	08	00	8.00	1.230
0	09	00	9.00	1.240
0	10	00	10.00	1.250
0	15	00	15.00	1.280
0	20	00	20.00	1.300
0	25	00	25.00	1.320
0	30	00	30.00	1.360
0	40	00	40.00	1.440
0	50	00	50.00	1.490
1	00	00	60.00	1.530
1	10	00	70.00	1.580
1	20	00	80.00	1.620
1	30	00	90.00	1.650
1	40	00	100.00	1.690
1	50	00	110.00	1.720
2	00	00	120.00	1.750

Test Pit Dimensions

Test Pit Length	2.50 m
Test Pit Width	0.45 m
Test Pit Depth	2.20 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.900 m
Total Effective Depth	1.900 m
25% Depth	0.775 m
75% Depth	1.725 m
25% Time	0.81 min
75% Time	111.67 min
Free Volume	0.320625 cu.m
Surface Area	6.73 sq.m
Time of Outflow	110.85 min



Soil infiltration Rate	**2.58E-02**	**m/hr**
	7.16E-06	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 13 May 2025

Produced by: S Thomas

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 2 (Test 3)

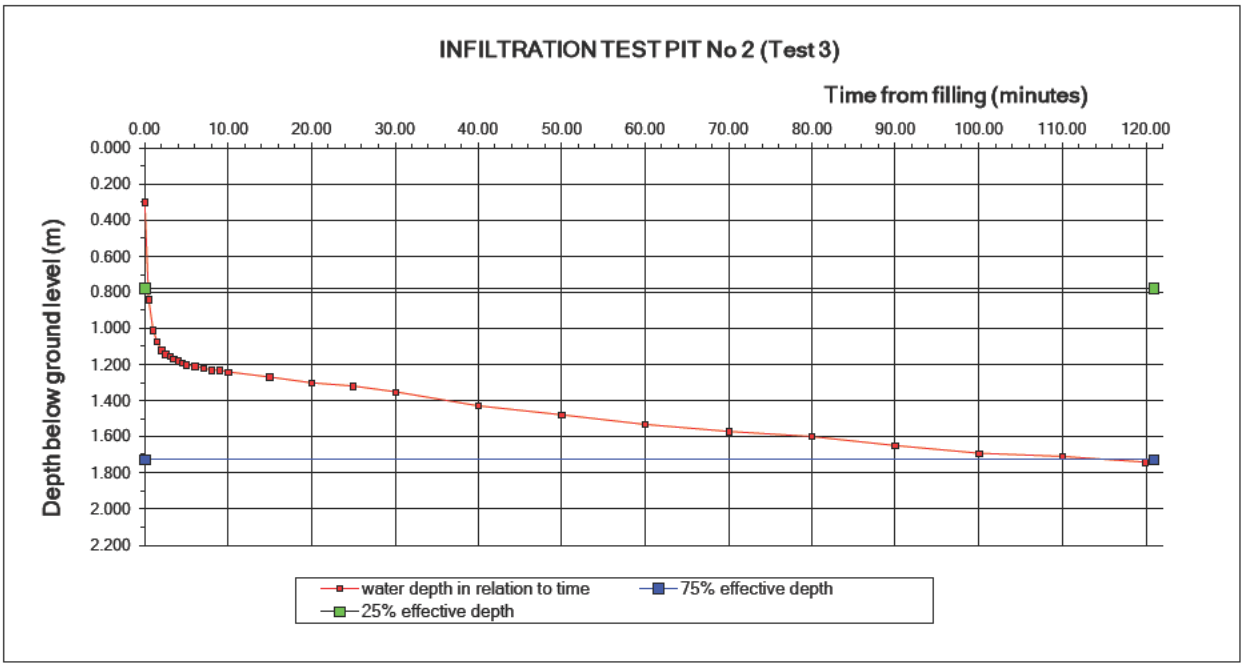
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.300
0	00	30	0.50	0.840
0	01	00	1.00	1.010
0	01	30	1.50	1.070
0	02	00	2.00	1.120
0	02	30	2.50	1.140
0	03	00	3.00	1.150
0	03	30	3.50	1.170
0	04	00	4.00	1.180
0	04	30	4.50	1.190
0	05	00	5.00	1.200
0	06	00	6.00	1.210
0	07	00	7.00	1.220
0	08	00	8.00	1.230
0	09	00	9.00	1.230
0	10	00	10.00	1.240
0	15	00	15.00	1.270
0	20	00	20.00	1.300
0	25	00	25.00	1.320
0	30	00	30.00	1.350
0	40	00	40.00	1.430
0	50	00	50.00	1.480
1	00	00	60.00	1.530
1	10	00	70.00	1.570
1	20	00	80.00	1.600
1	30	00	90.00	1.650
1	40	00	100.00	1.690
1	50	00	110.00	1.710
2	00	00	120.00	1.740

Test Pit Dimensions

Test Pit Length	2.50 m
Test Pit Width	0.45 m
Test Pit Depth	2.20 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.900 m
Total Effective Depth	1.900 m
25% Depth	0.775 m
75% Depth	1.725 m
25% Time	0.44 min
75% Time	115.00 min
Free Volume	0.320625 cu.m
Surface Area	6.73 sq.m
Time of Outflow	114.56 min



Soil infiltration Rate	**2.50E-02**	**m/hr**
	6.93E-06	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 13 May 2025

Produced by: S Thomas

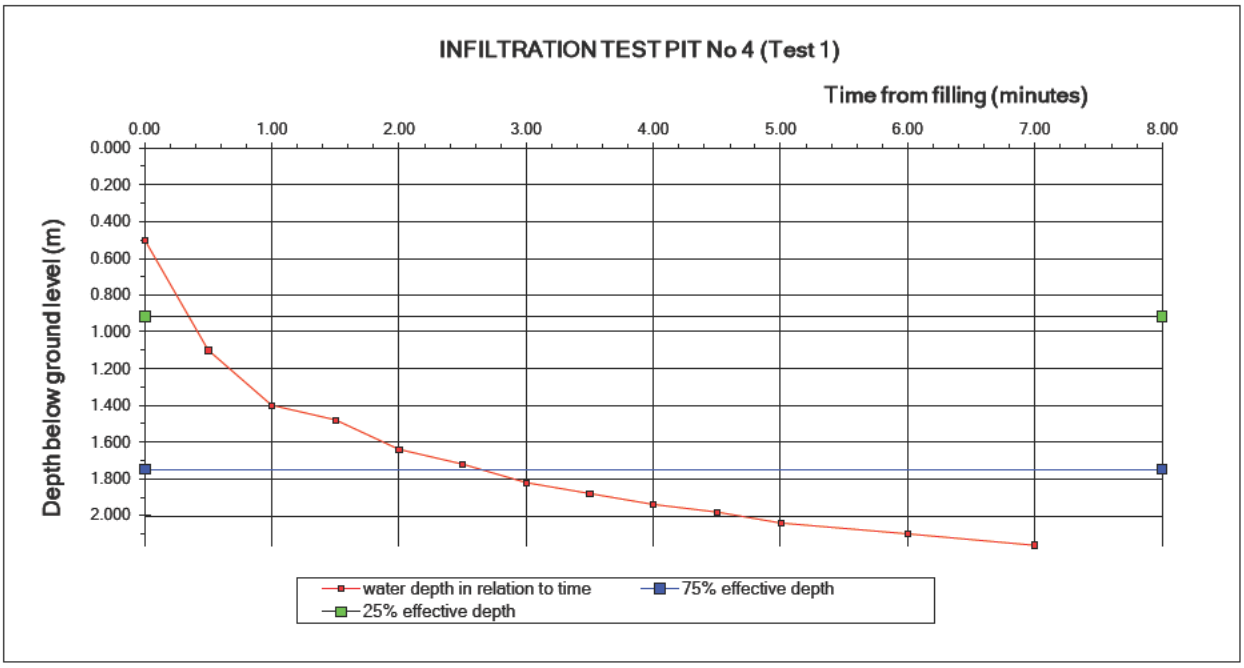
Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 4 (Test 1)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.500
0	00	30	0.50	1.100
0	01	00	1.00	1.400
0	01	30	1.50	1.480
0	02	00	2.00	1.640
0	02	30	2.50	1.720
0	03	00	3.00	1.820
0	03	30	3.50	1.880
0	04	00	4.00	1.940
0	04	30	4.50	1.980
0	05	00	5.00	2.040
0	06	00	6.00	2.100
0	07	00	7.00	2.160

Test Pit Dimensions	
Test Pit Length	2.50 m
Test Pit Width	0.45 m
Test Pit Depth	2.16 m
Standing Water Level	m

Infiltration Parameters	
Total Depth	1.660 m
Total Effective Depth	1.660 m
25% Depth	0.915 m
75% Depth	1.745 m
25% Time	0.35 min
75% Time	2.63 min
Free Volume	0.280125 cu.m
Surface Area	6.022 sq.m
Time of Outflow	2.28 min



Soil infiltration Rate	**1.22E+00**	**m/hr**
	3.40E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 13 May 2025

Produced by: S Thomas

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 4 (Test 2)

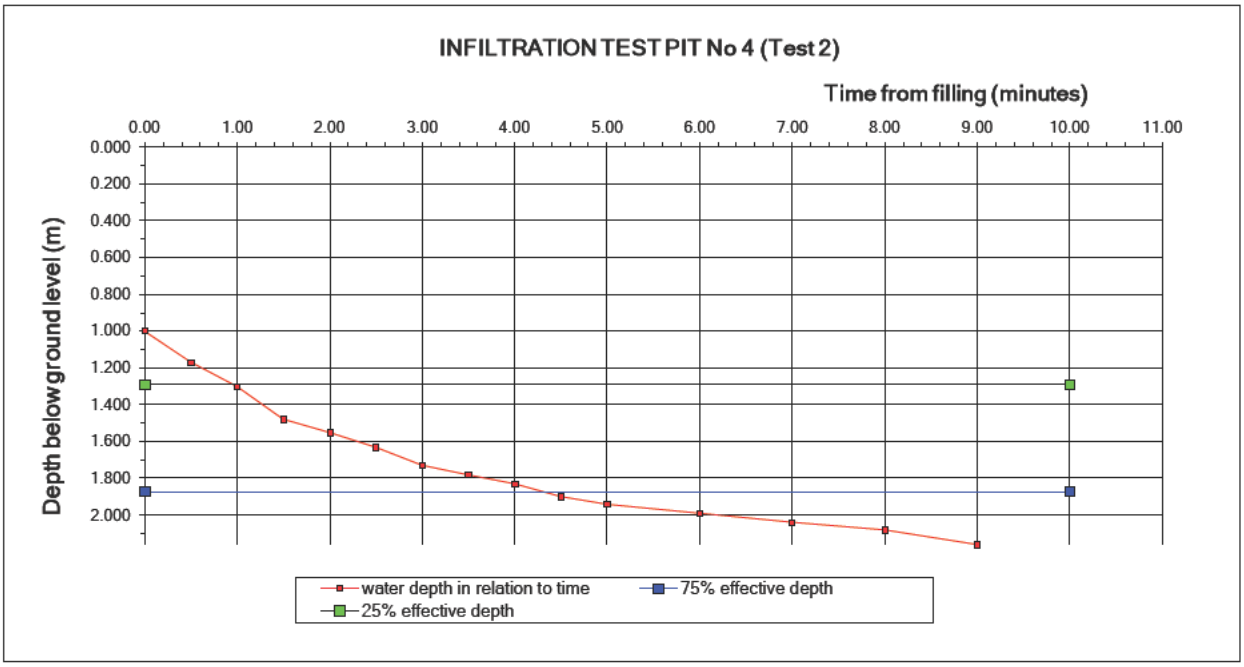
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	1.000
0	00	30	0.50	1.170
0	01	00	1.00	1.300
0	01	30	1.50	1.480
0	02	00	2.00	1.550
0	02	30	2.50	1.630
0	03	00	3.00	1.730
0	03	30	3.50	1.780
0	04	00	4.00	1.830
0	04	30	4.50	1.900
0	05	00	5.00	1.940
0	06	00	6.00	1.990
0	07	00	7.00	2.040
0	08	00	8.00	2.080
0	09	00	9.00	2.160

Test Pit Dimensions

Test Pit Length	2.50 m
Test Pit Width	0.45 m
Test Pit Depth	2.16 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.160 m
Total Effective Depth	1.160 m
25% Depth	1.290 m
75% Depth	1.870 m
25% Time	0.96 min
75% Time	4.29 min
Free Volume	0.19575 cu.m
Surface Area	4.547 sq.m
Time of Outflow	3.32 min



Soil infiltration Rate	**7.77E-01**	**m/hr**
	2.16E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 13 May 2025

Produced by: S Thomas

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 4 (Test 3)

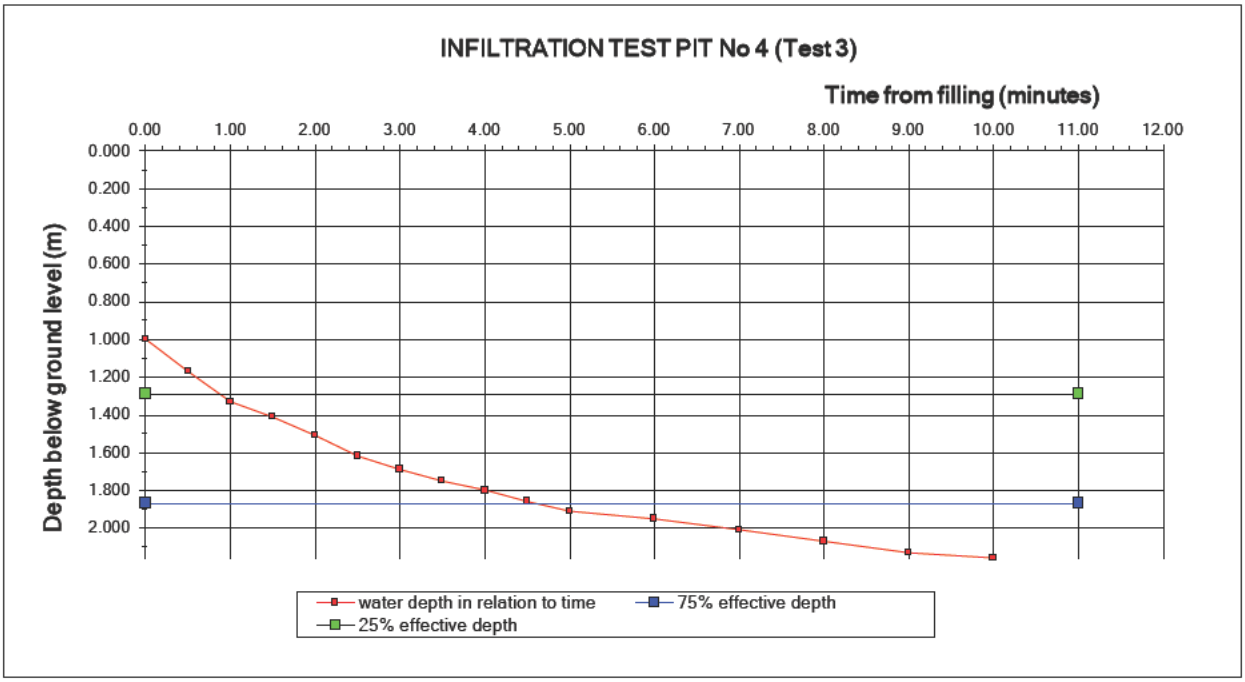
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	1.000
0	00	30	0.50	1.170
0	01	00	1.00	1.330
0	01	30	1.50	1.410
0	02	00	2.00	1.510
0	02	30	2.50	1.620
0	03	00	3.00	1.690
0	03	30	3.50	1.750
0	04	00	4.00	1.800
0	04	30	4.50	1.860
0	05	00	5.00	1.910
0	06	00	6.00	1.950
0	07	00	7.00	2.010
0	08	00	8.00	2.070
0	09	00	9.00	2.130
0	10	00	10.00	2.160

Test Pit Dimensions

Test Pit Length	2.50 m
Test Pit Width	0.45 m
Test Pit Depth	2.16 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.160 m
Total Effective Depth	1.160 m
25% Depth	1.290 m
75% Depth	1.870 m
25% Time	0.88 min
75% Time	4.60 min
Free Volume	0.19575 cu.m
Surface Area	4.547 sq.m
Time of Outflow	3.73 min



Soil infiltration Rate	**6.93E-01**	**m/hr**
	1.93E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 14 May 2025

Produced by: L Buxton

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 5 (Test 1)

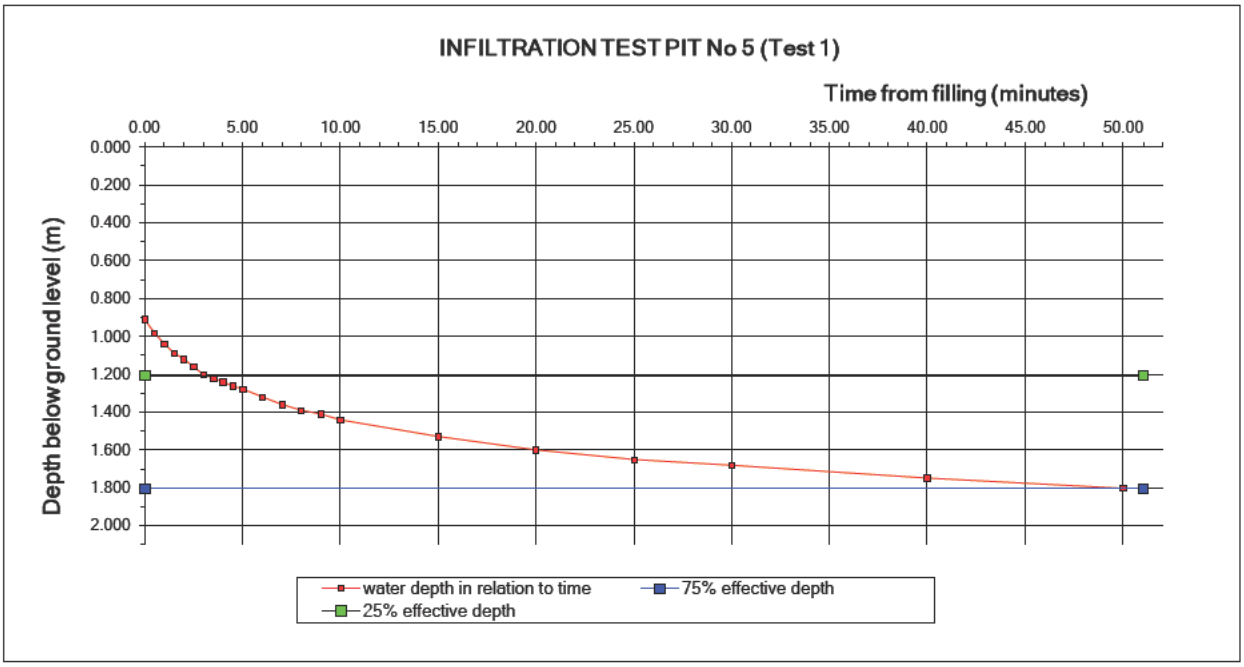
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.910
0	00	30	0.50	0.980
0	01	00	1.00	1.040
0	01	30	1.50	1.090
0	02	00	2.00	1.120
0	02	30	2.50	1.160
0	03	00	3.00	1.200
0	03	30	3.50	1.220
0	04	00	4.00	1.240
0	04	30	4.50	1.260
0	05	00	5.00	1.280
0	06	00	6.00	1.320
0	07	00	7.00	1.360
0	08	00	8.00	1.390
0	09	00	9.00	1.410
0	10	00	10.00	1.440
0	15	00	15.00	1.530
0	20	00	20.00	1.600
0	25	00	25.00	1.650
0	30	00	30.00	1.680
0	40	00	40.00	1.750
0	50	00	50.00	1.800

Test Pit Dimensions

Test Pit Length	2.50 m
Test Pit Width	0.45 m
Test Pit Depth	2.10 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.190 m
Total Effective Depth	1.190 m
25% Depth	1.208 m
75% Depth	1.803 m
25% Time	3.19 min
75% Time*	49.47 min
Free Volume	0.200813 cu.m
Surface Area	4.6355 sq.m
Time of Outflow*	46.28 min



*Soil infiltration Rate	5.62E-02	m/hr
	1.56E-05	m/sec

Infiltration rate projected based on gradient of curve

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 14 May 2025

Produced by: L Buxton

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 5 (Test 2)

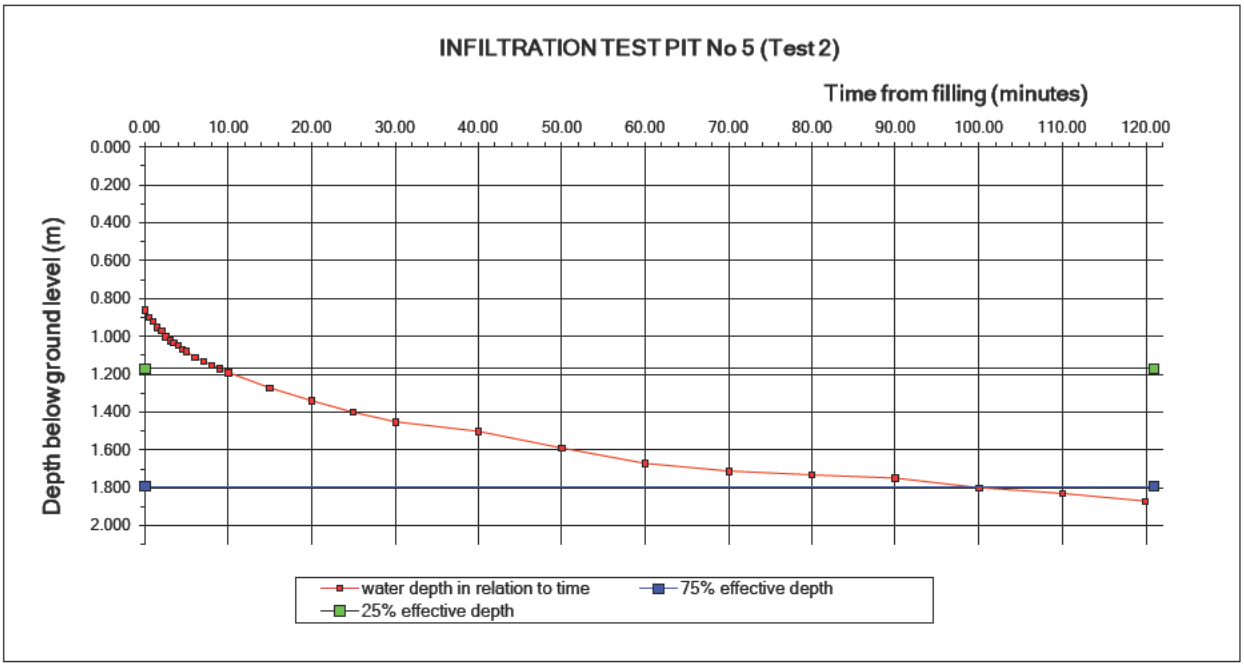
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.860
0	00	30	0.50	0.900
0	01	00	1.00	0.920
0	01	30	1.50	0.950
0	02	00	2.00	0.970
0	02	30	2.50	1.000
0	03	00	3.00	1.020
0	03	30	3.50	1.030
0	04	00	4.00	1.050
0	04	30	4.50	1.070
0	05	00	5.00	1.080
0	06	00	6.00	1.110
0	07	00	7.00	1.130
0	08	00	8.00	1.150
0	09	00	9.00	1.170
0	10	00	10.00	1.190
0	15	00	15.00	1.270
0	20	00	20.00	1.340
0	25	00	25.00	1.400
0	30	00	30.00	1.450
0	40	00	40.00	1.500
0	50	00	50.00	1.590
0	60	00	60.00	1.670
1	10	00	70.00	1.710
1	20	00	80.00	1.730
1	30	00	90.00	1.750
1	40	00	100.00	1.800
1	50	00	110.00	1.830
1	60	00	120.00	1.870

Test Pit Dimensions

Test Pit Length	2.50 m
Test Pit Width	0.45 m
Test Pit Depth	2.10 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.240 m
Total Effective Depth	1.240 m
25% Depth	1.170 m
75% Depth	1.790 m
25% Time	9.00 min
75% Time	98.00 min
Free Volume	0.20925 cu.m
Surface Area	4.783 sq.m
Time of Outflow	89.00 min



Soil infiltration Rate	**2.95E-02**	**m/hr**
	8.19E-06	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 14 May 2025

Produced by: L Buxton

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 5 (Test 3)

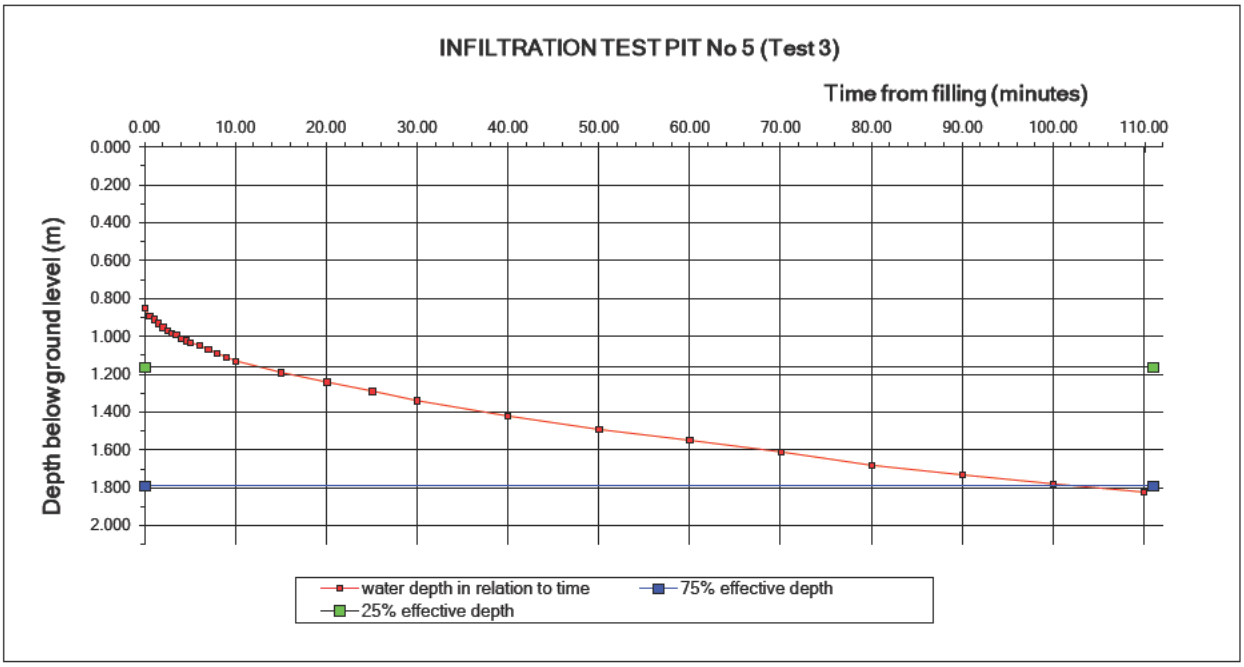
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.850
0	00	30	0.50	0.890
0	01	00	1.00	0.910
0	01	30	1.50	0.930
0	02	00	2.00	0.950
0	02	30	2.50	0.970
0	03	00	3.00	0.980
0	03	30	3.50	0.990
0	04	00	4.00	1.010
0	04	30	4.50	1.020
0	05	00	5.00	1.030
0	06	00	6.00	1.050
0	07	00	7.00	1.070
0	08	00	8.00	1.090
0	09	00	9.00	1.110
0	10	00	10.00	1.130
0	15	00	15.00	1.190
0	20	00	20.00	1.240
0	25	00	25.00	1.290
0	30	00	30.00	1.340
0	40	00	40.00	1.420
0	50	00	50.00	1.490
0	60	00	60.00	1.550
1	10	00	70.00	1.610
1	20	00	80.00	1.680
1	30	00	90.00	1.730
1	40	00	100.00	1.780
1	50	00	110.00	1.820

Test Pit Dimensions

Test Pit Length	2.50 m
Test Pit Width	0.45 m
Test Pit Depth	2.10 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.250 m
Total Effective Depth	1.250 m
25% Depth	1.163 m
75% Depth	1.788 m
25% Time	12.71 min
75% Time	101.88 min
Free Volume	0.210938 cu.m
Surface Area	4.8125 sq.m
Time of Outflow	89.17 min



Soil infiltration Rate	**2.95E-02**	**m/hr**
	8.19E-06	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 14 May 2025

Produced by: L Buxton

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 6 (Test 1)

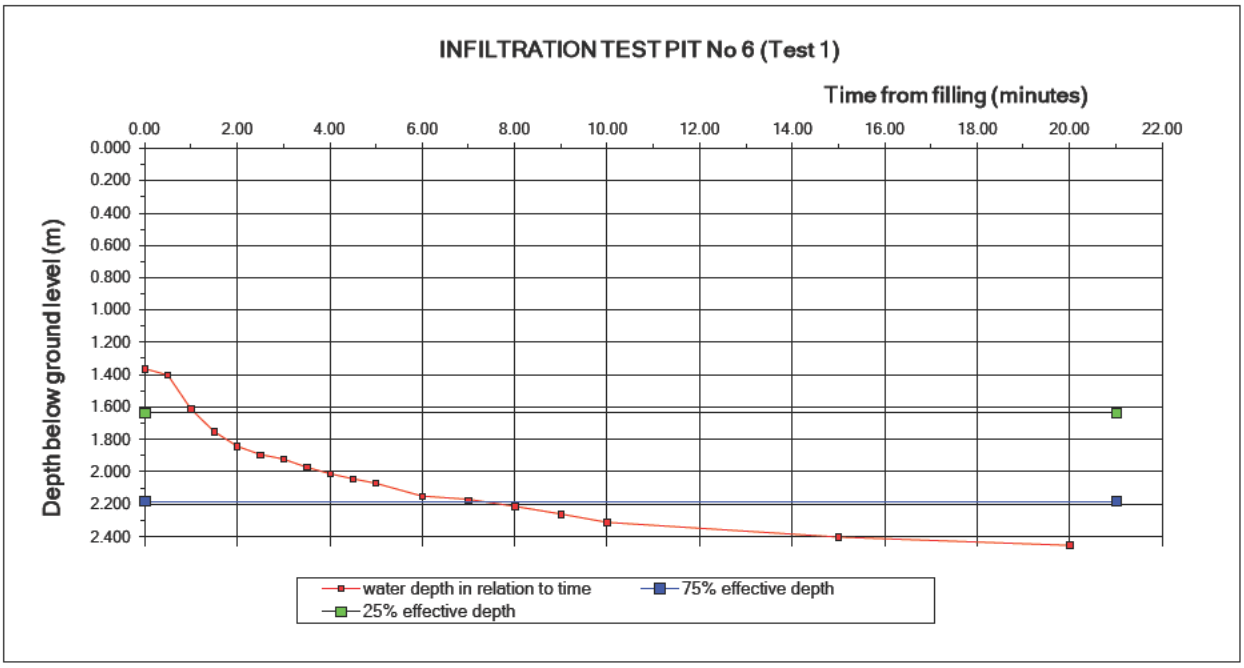
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	1.360
0	00	30	0.50	1.400
0	01	00	1.00	1.610
0	01	30	1.50	1.750
0	02	00	2.00	1.840
0	02	30	2.50	1.890
0	03	00	3.00	1.920
0	03	30	3.50	1.970
0	04	00	4.00	2.010
0	04	30	4.50	2.040
0	05	00	5.00	2.070
0	06	00	6.00	2.150
0	07	00	7.00	2.170
0	08	00	8.00	2.210
0	09	00	9.00	2.260
0	10	00	10.00	2.310
0	15	00	15.00	2.400
0	20	00	20.00	2.450

Test Pit Dimensions

Test Pit Length	2.10 m
Test Pit Width	0.45 m
Test Pit Depth	2.45 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.090 m
Total Effective Depth	1.090 m
25% Depth	1.633 m
75% Depth	2.178 m
25% Time	1.08 min
75% Time	7.19 min
Free Volume	0.154508 cu.m
Surface Area	3.7245 sq.m
Time of Outflow	6.11 min



Soil infiltration Rate	**4.08E-01**	**m/hr**
	1.13E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 14 May 2025

Produced by: L Buxton

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 6 (Test 2)

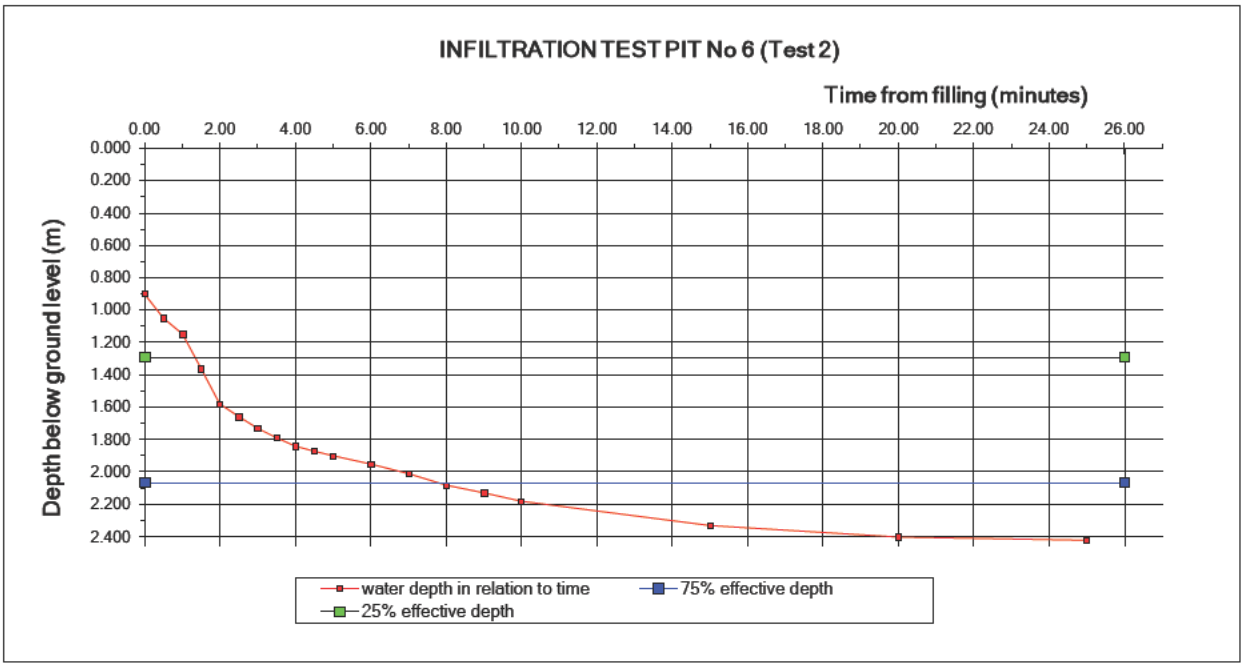
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.900
0	00	30	0.50	1.050
0	01	00	1.00	1.150
0	01	30	1.50	1.360
0	02	00	2.00	1.580
0	02	30	2.50	1.660
0	03	00	3.00	1.730
0	03	30	3.50	1.790
0	04	00	4.00	1.840
0	04	30	4.50	1.870
0	05	00	5.00	1.900
0	06	00	6.00	1.950
0	07	00	7.00	2.010
0	08	00	8.00	2.080
0	09	00	9.00	2.130
0	10	00	10.00	2.180
0	15	00	15.00	2.330
0	20	00	20.00	2.400
0	25	00	25.00	2.420

Test Pit Dimensions

Test Pit Length	2.10 m
Test Pit Width	0.45 m
Test Pit Depth	2.45 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.550 m
Total Effective Depth	1.550 m
25% Depth	1.288 m
75% Depth	2.063 m
25% Time	1.33 min
75% Time	7.75 min
Free Volume	0.219713 cu.m
Surface Area	4.8975 sq.m
Time of Outflow	6.42 min



Soil infiltration Rate	**4.19E-01**	**m/hr**
	1.16E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 14 May 2025

Produced by: L Buxton

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 6 (Test 3)

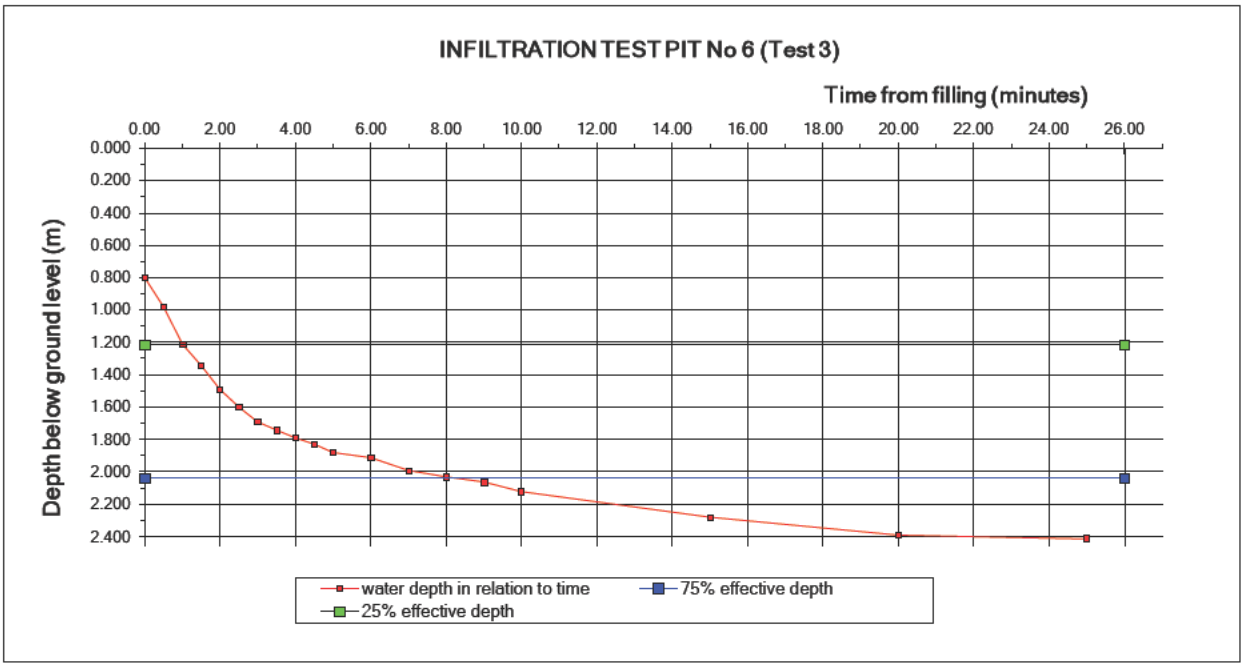
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.800
0	00	30	0.50	0.980
0	01	00	1.00	1.210
0	01	30	1.50	1.340
0	02	00	2.00	1.490
0	02	30	2.50	1.600
0	03	00	3.00	1.690
0	03	30	3.50	1.740
0	04	00	4.00	1.790
0	04	30	4.50	1.830
0	05	00	5.00	1.880
0	06	00	6.00	1.910
0	07	00	7.00	1.990
0	08	00	8.00	2.030
0	09	00	9.00	2.060
0	10	00	10.00	2.120
0	15	00	15.00	2.280
0	20	00	20.00	2.390
0	25	00	25.00	2.410

Test Pit Dimensions

Test Pit Length	2.10 m
Test Pit Width	0.45 m
Test Pit Depth	2.45 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.650 m
Total Effective Depth	1.650 m
25% Depth	1.213 m
75% Depth	2.038 m
25% Time	1.01 min
75% Time	8.25 min
Free Volume	0.233888 cu.m
Surface Area	5.1525 sq.m
Time of Outflow	7.24 min



Soil infiltration Rate	**3.76E-01**	**m/hr**
	1.04E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 14 May 2025

Produced by: S Thomas, L Buxton, M Knowles

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 7 (Test 1)

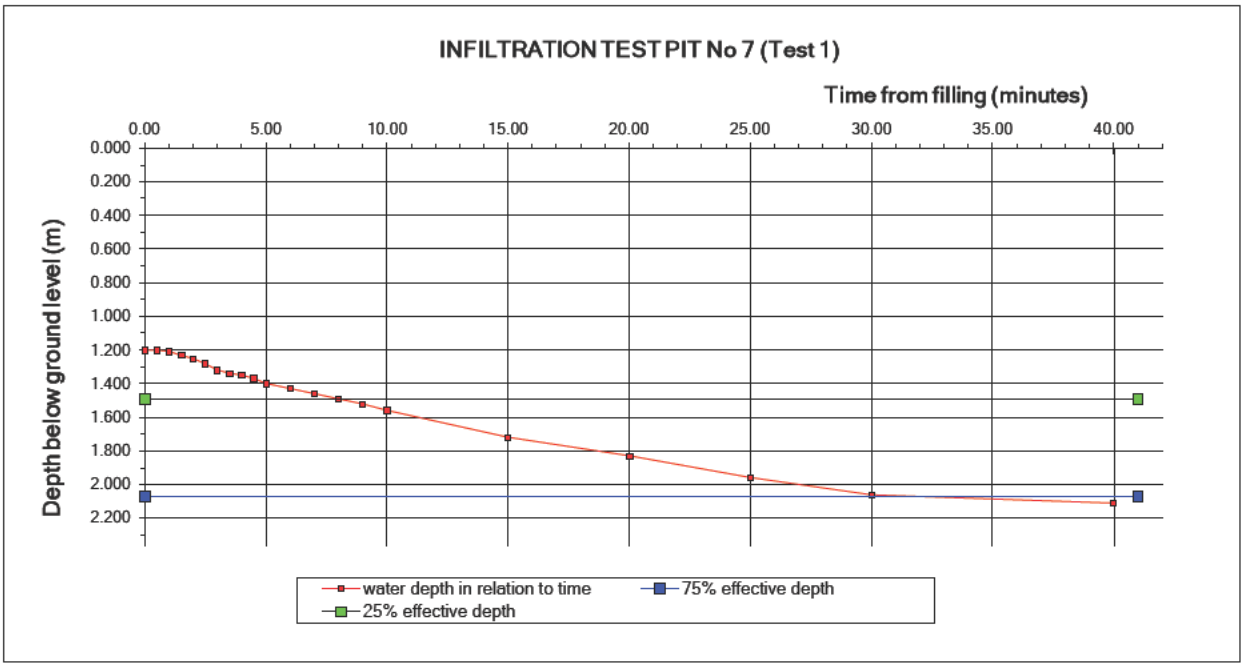
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	1.200
0	00	30	0.50	1.200
0	01	00	1.00	1.210
0	01	30	1.50	1.230
0	02	00	2.00	1.250
0	02	30	2.50	1.280
0	03	00	3.00	1.320
0	03	30	3.50	1.340
0	04	00	4.00	1.350
0	04	30	4.50	1.370
0	05	00	5.00	1.400
0	06	00	6.00	1.430
0	07	00	7.00	1.460
0	08	00	8.00	1.490
0	09	00	9.00	1.520
0	10	00	10.00	1.560
0	15	00	15.00	1.720
0	20	00	20.00	1.830
0	25	00	25.00	1.960
0	30	00	30.00	2.060
0	40	00	40.00	2.110

Test Pit Dimensions

Test Pit Length	2.50 m
Test Pit Width	0.45 m
Test Pit Depth	2.36 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.160 m
Total Effective Depth	1.160 m
25% Depth	1.490 m
75% Depth	2.070 m
25% Time	8.00 min
75% Time	32.00 min
Free Volume	0.19575 cu.m
Surface Area	4.547 sq.m
Time of Outflow	24.00 min



Soil infiltration Rate	**1.08E-01**	**m/hr**
	2.99E-05	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 14 May 2025

Produced by: S Thomas, M Knowles, L Buxton

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 7 (Test 2)

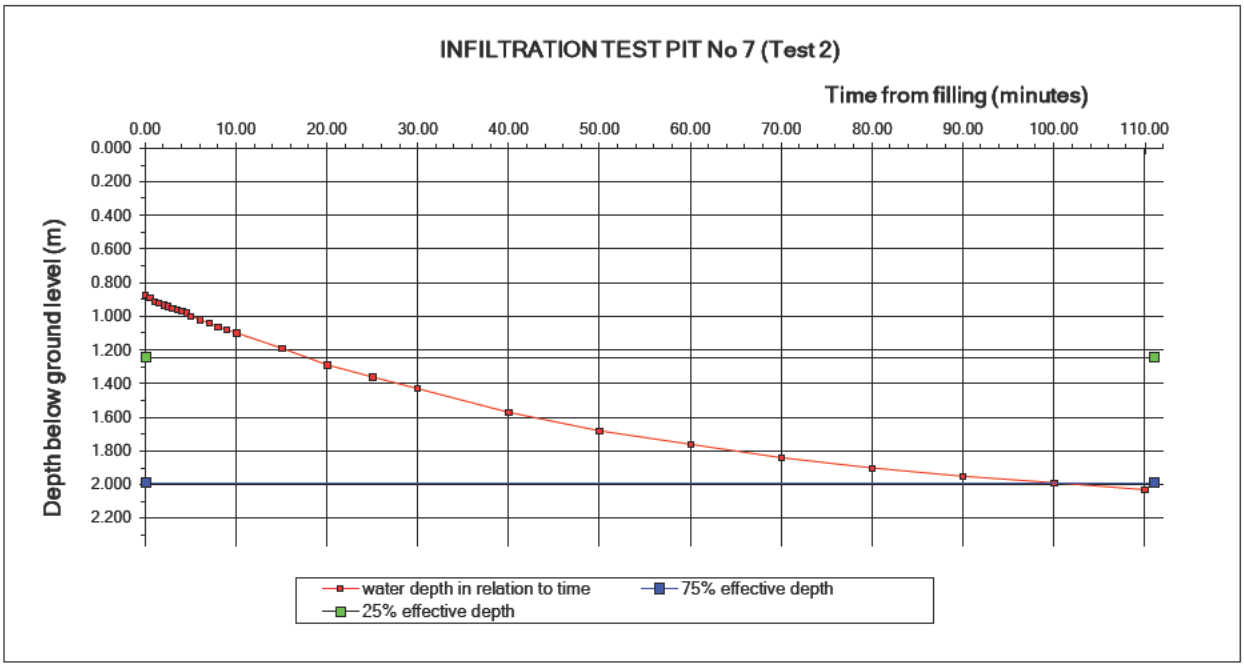
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.870
0	00	30	0.50	0.890
0	01	00	1.00	0.910
0	01	30	1.50	0.920
0	02	00	2.00	0.930
0	02	30	2.50	0.940
0	03	00	3.00	0.950
0	03	30	3.50	0.960
0	04	00	4.00	0.970
0	04	30	4.50	0.980
0	05	00	5.00	1.000
0	06	00	6.00	1.020
0	07	00	7.00	1.040
0	08	00	8.00	1.060
0	09	00	9.00	1.080
0	10	00	10.00	1.100
0	15	00	15.00	1.190
0	20	00	20.00	1.290
0	25	00	25.00	1.360
0	30	00	30.00	1.430
0	40	00	40.00	1.570
0	50	00	50.00	1.680
1	00	00	60.00	1.760
1	10	00	70.00	1.840
1	20	00	80.00	1.900
1	30	00	90.00	1.950
1	40	00	100.00	1.990
1	50	00	110.00	2.030

Test Pit Dimensions

Test Pit Length	2.50 m
Test Pit Width	0.45 m
Test Pit Depth	2.36 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.490 m
Total Effective Depth	1.490 m
25% Depth	1.243 m
75% Depth	1.988 m
25% Time	17.63 min
75% Time	99.38 min
Free Volume	0.251438 cu.m
Surface Area	5.5205 sq.m
Time of Outflow	81.75 min



Soil infiltration Rate	**3.34E-02**	**m/hr**
	9.29E-06	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 14 May 2025

Produced by: S Thomas, M Knowles, L Buxton

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 7 (Test 3)

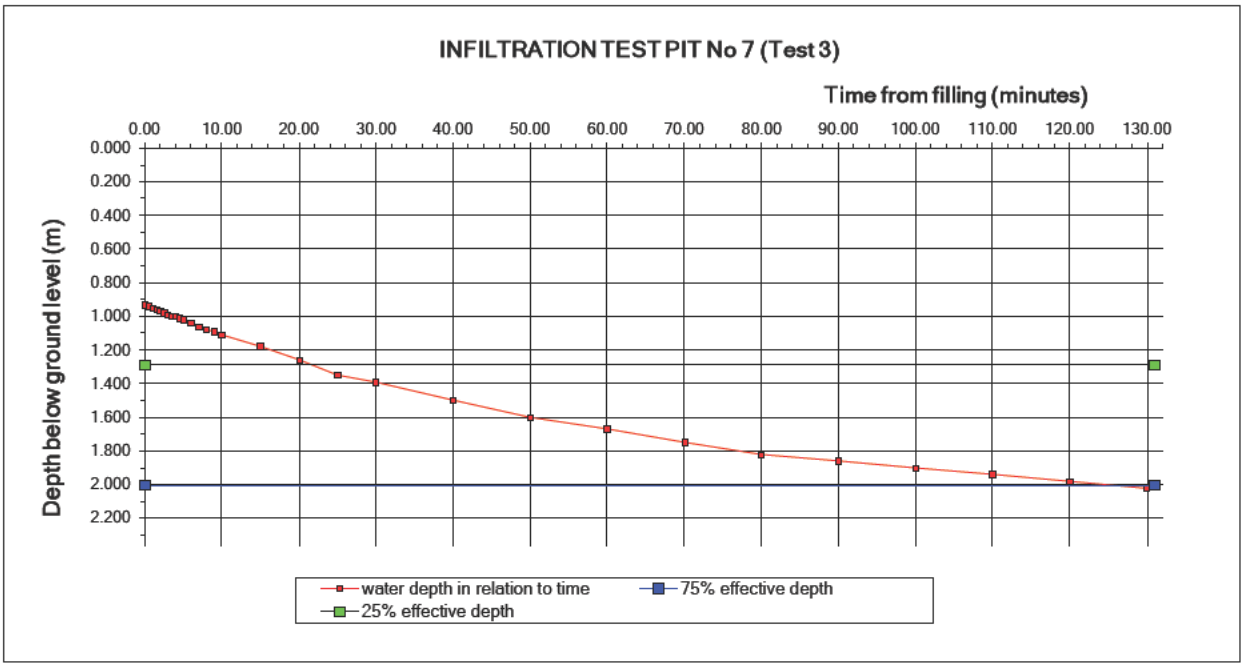
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.930
0	00	30	0.50	0.940
0	01	00	1.00	0.950
0	01	30	1.50	0.960
0	02	00	2.00	0.970
0	02	30	2.50	0.980
0	03	00	3.00	0.990
0	03	30	3.50	1.000
0	04	00	4.00	1.000
0	04	30	4.50	1.010
0	05	00	5.00	1.020
0	06	00	6.00	1.040
0	07	00	7.00	1.060
0	08	00	8.00	1.080
0	09	00	9.00	1.090
0	10	00	10.00	1.110
0	15	00	15.00	1.180
0	20	00	20.00	1.260
0	25	00	25.00	1.350
0	30	00	30.00	1.390
0	40	00	40.00	1.500
0	50	00	50.00	1.600
1	00	00	60.00	1.670
1	10	00	70.00	1.750
1	20	00	80.00	1.820
1	30	00	90.00	1.860
1	40	00	100.00	1.900
1	50	00	110.00	1.940
2	00	00	120.00	1.980
2	10	00	130.00	2.020

Test Pit Dimensions

Test Pit Length	2.50 m
Test Pit Width	0.45 m
Test Pit Depth	2.36 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.430 m
Total Effective Depth	1.430 m
25% Depth	1.288 m
75% Depth	2.003 m
25% Time	21.53 min
75% Time	125.63 min
Free Volume	0.241313 cu.m
Surface Area	5.3435 sq.m
Time of Outflow	104.10 min



Soil infiltration Rate	**2.60E-02**	**m/hr**
	7.23E-06	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 14 May 2025

Produced by: L Buxton

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 8 (Test 1)

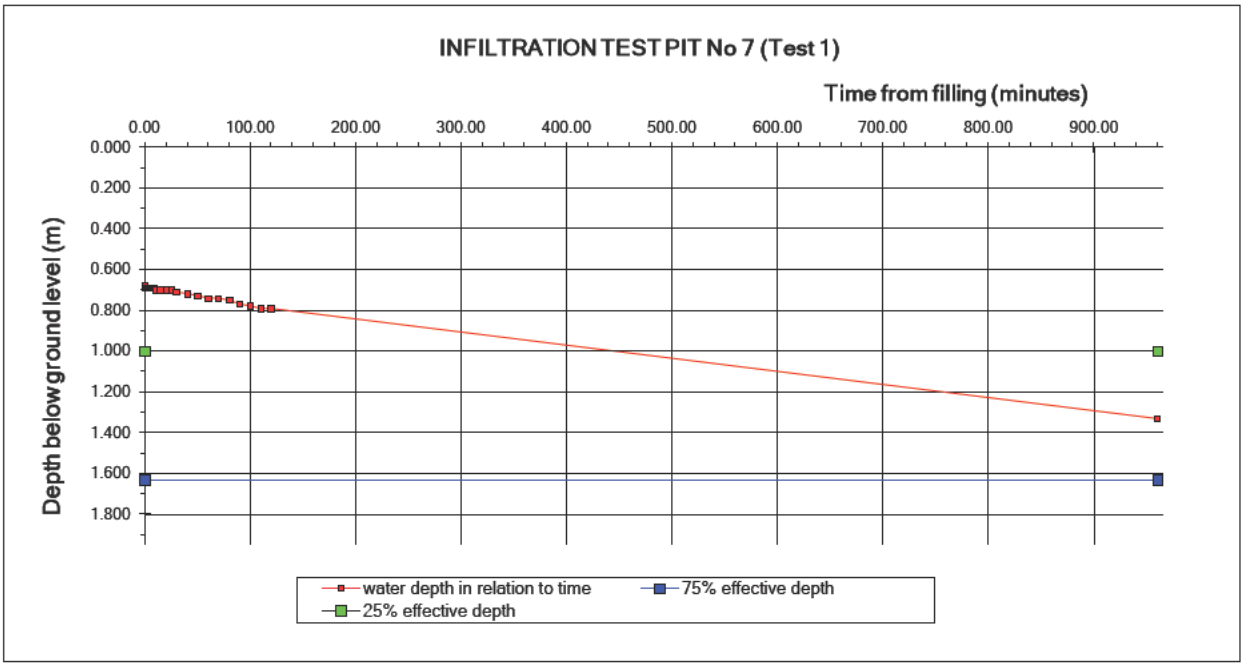
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.680
0	00	30	0.50	0.690
0	01	00	1.00	0.690
0	01	30	1.50	0.690
0	02	00	2.00	0.690
0	02	30	2.50	0.690
0	03	00	3.00	0.690
0	03	30	3.50	0.690
0	04	00	4.00	0.690
0	04	30	4.50	0.690
0	05	00	5.00	0.690
0	06	00	6.00	0.690
0	07	00	7.00	0.690
0	08	00	8.00	0.690
0	09	00	9.00	0.690
0	10	00	10.00	0.700
0	15	00	15.00	0.700
0	20	00	20.00	0.700
0	25	00	25.00	0.700
0	30	00	30.00	0.710
0	40	00	40.00	0.720
0	50	00	50.00	0.730
1	00	00	60.00	0.740
1	10	00	70.00	0.740
1	20	00	80.00	0.750
1	30	00	90.00	0.770
1	40	00	100.00	0.780
1	50	00	110.00	0.790
2	00	00	120.00	0.790
16	00	00	960.00	1.330

Test Pit Dimensions

Test Pit Length	2.10 m
Test Pit Width	0.45 m
Test Pit Depth	1.95 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.270 m
Total Effective Depth	1.270 m
25% Depth	0.998 m
75% Depth	1.633 m
25% Time	FAIL min
75% Time	FAIL min
Free Volume	FAIL cu.m
Surface Area	FAIL sq.m
Time of Outflow	FAIL min



Soil infiltration Rate	**N/A**	**m/hr**
	N/A	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 15 May 2025

Produced by: S Thomas

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 10 (Test 1)

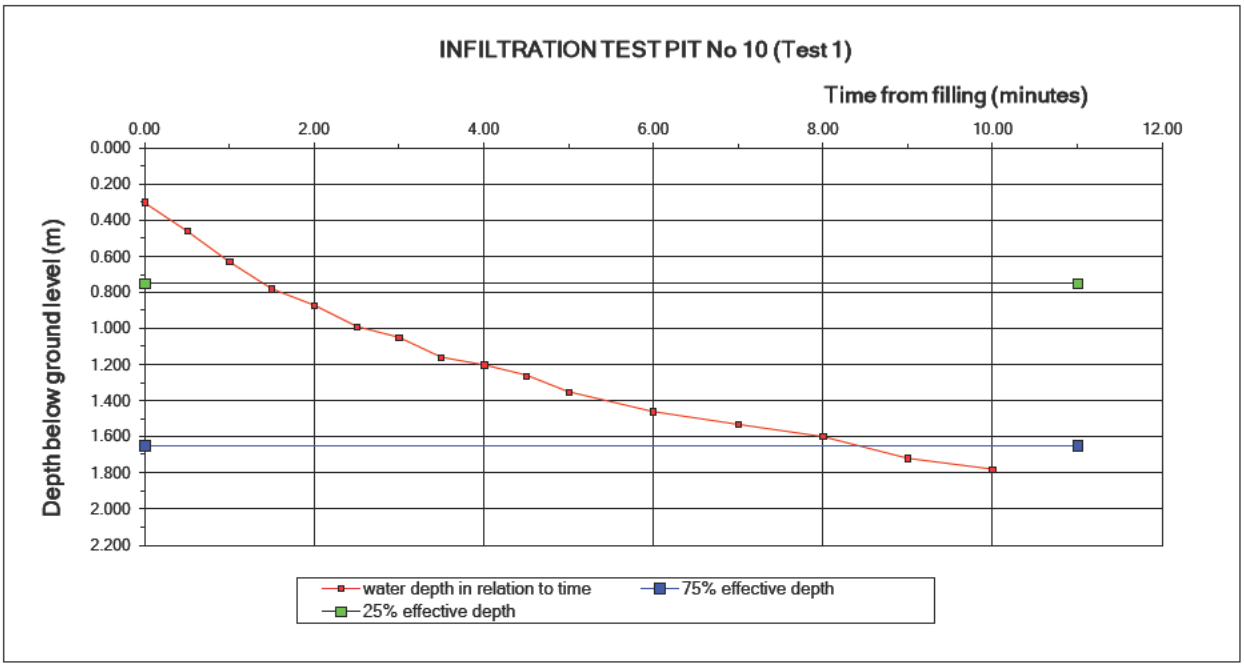
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.300
0	00	30	0.50	0.460
0	01	00	1.00	0.630
0	01	30	1.50	0.780
0	02	00	2.00	0.870
0	02	30	2.50	0.990
0	03	00	3.00	1.050
0	03	30	3.50	1.160
0	04	00	4.00	1.200
0	04	30	4.50	1.260
0	05	00	5.00	1.350
0	06	00	6.00	1.460
0	07	00	7.00	1.530
0	08	00	8.00	1.600
0	09	00	9.00	1.720
0	10	00	10.00	1.780

Test Pit Dimensions

Test Pit Length	2.20 m
Test Pit Width	0.45 m
Test Pit Depth	2.10 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.800 m
Total Effective Depth	1.800 m
25% Depth	0.750 m
75% Depth	1.650 m
25% Time	1.40 min
75% Time	8.42 min
Free Volume	0.2673 cu.m
Surface Area	5.76 sq.m
Time of Outflow	7.02 min



Soil infiltration Rate	**3.97E-01**	**m/hr**
	1.10E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 15 May 2025

Produced by: S Thomas

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 10 (Test 2)

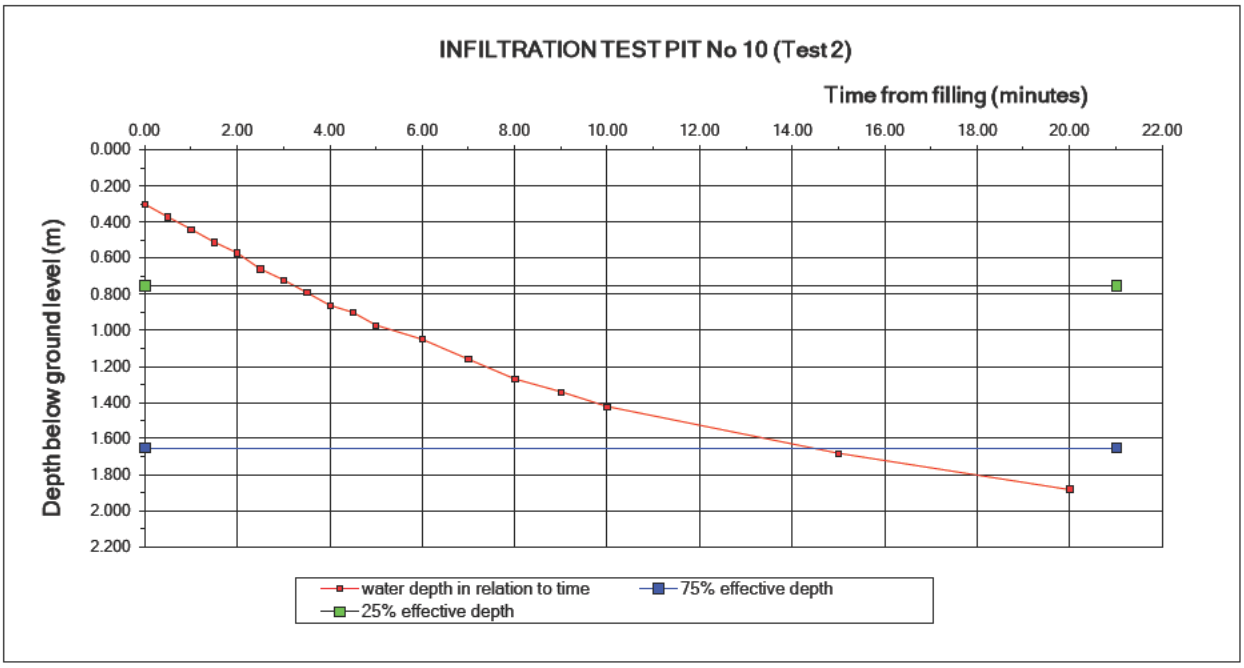
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.300
0	00	30	0.50	0.370
0	01	00	1.00	0.440
0	01	30	1.50	0.510
0	02	00	2.00	0.570
0	02	30	2.50	0.660
0	03	00	3.00	0.720
0	03	30	3.50	0.790
0	04	00	4.00	0.860
0	04	30	4.50	0.900
0	05	00	5.00	0.970
0	06	00	6.00	1.050
0	07	00	7.00	1.160
0	08	00	8.00	1.270
0	09	00	9.00	1.340
0	10	00	10.00	1.420
0	15	00	15.00	1.680
0	20	00	20.00	1.880

Test Pit Dimensions

Test Pit Length	2.20 m
Test Pit Width	0.45 m
Test Pit Depth	2.10 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.800 m
Total Effective Depth	1.800 m
25% Depth	0.750 m
75% Depth	1.650 m
25% Time	3.21 min
75% Time	14.42 min
Free Volume	0.2673 cu.m
Surface Area	5.76 sq.m
Time of Outflow	11.21 min



Soil infiltration Rate	**2.48E-01**	**m/hr**
	6.90E-05	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 15 May 2025

Produced by: S Thomas

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 10 (Test 3)

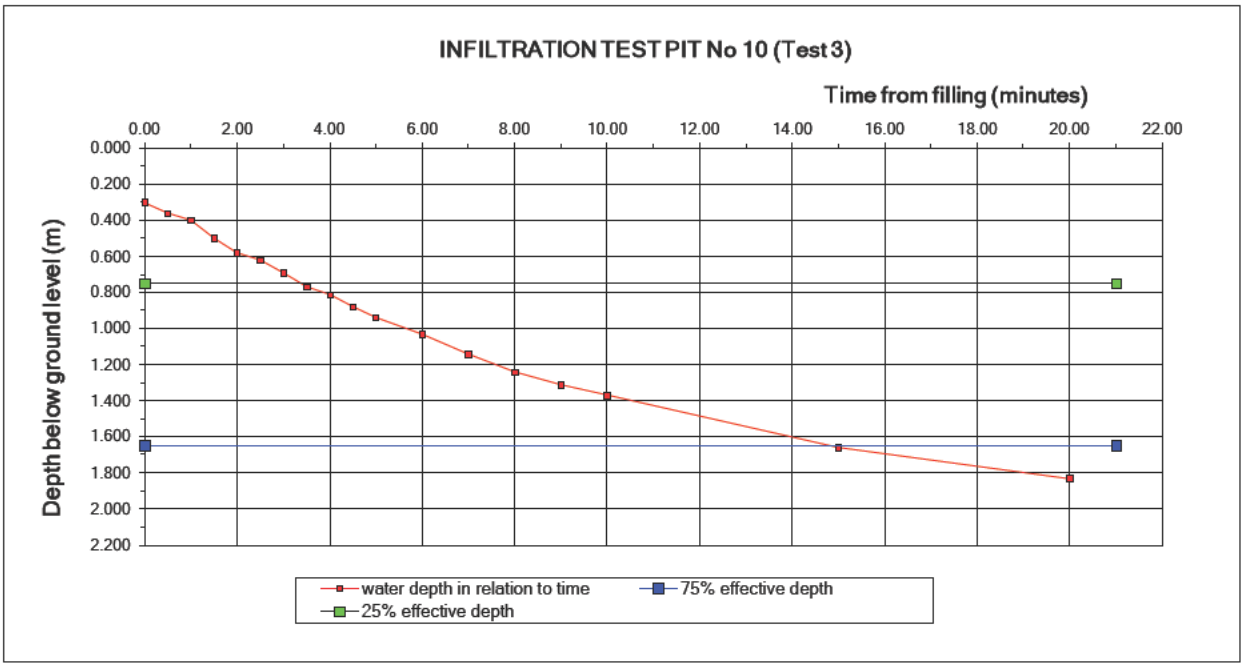
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.300
0	00	30	0.50	0.360
0	01	00	1.00	0.400
0	01	30	1.50	0.500
0	02	00	2.00	0.580
0	02	30	2.50	0.620
0	03	00	3.00	0.690
0	03	30	3.50	0.770
0	04	00	4.00	0.810
0	04	30	4.50	0.880
0	05	00	5.00	0.940
0	06	00	6.00	1.030
0	07	00	7.00	1.140
0	08	00	8.00	1.240
0	09	00	9.00	1.310
0	10	00	10.00	1.370
0	15	00	15.00	1.660
0	20	00	20.00	1.830

Test Pit Dimensions

Test Pit Length	2.20 m
Test Pit Width	0.45 m
Test Pit Depth	2.10 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.800 m
Total Effective Depth	1.800 m
25% Depth	0.750 m
75% Depth	1.650
25% Time	3.38 min
75% Time	14.83 min
Free Volume	0.2673 cu.m
Surface Area	5.76 sq.m
Time of Outflow	11.45 min



Soil infiltration Rate	**2.43E-01**	**m/hr**
	6.75E-05	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 15 May 2025

Produced by: S Thomas

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 11 (Test 1)

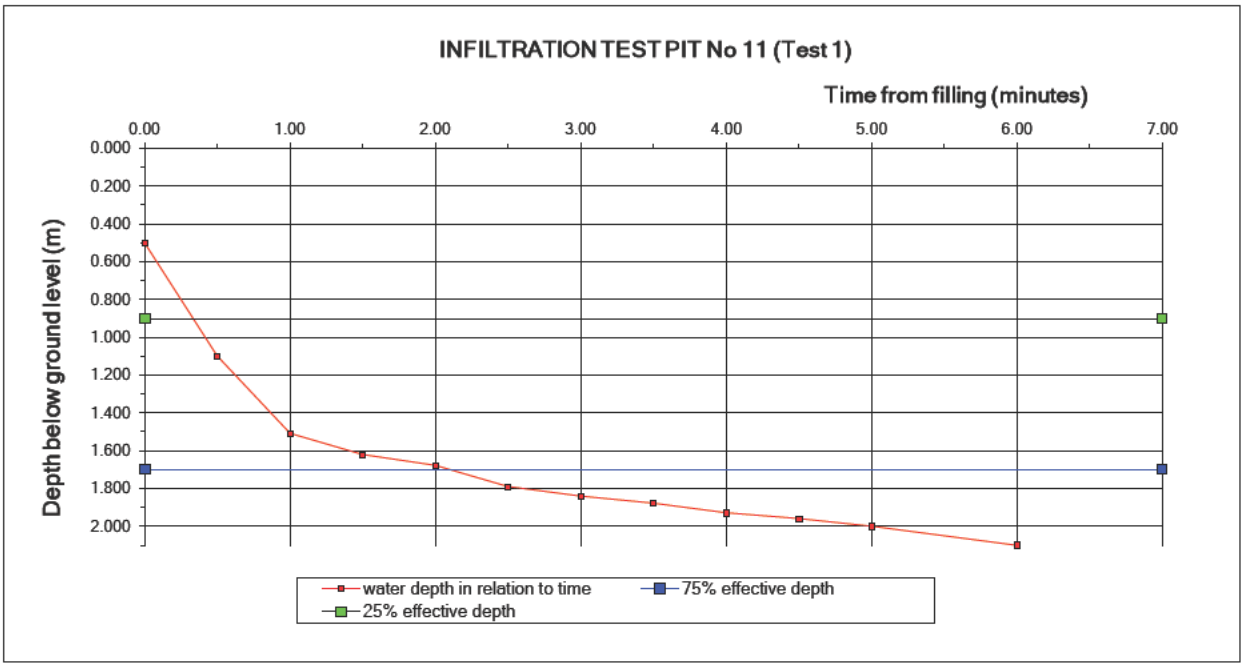
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.500
0	00	30	0.50	1.100
0	01	00	1.00	1.510
0	01	30	1.50	1.620
0	02	00	2.00	1.680
0	02	30	2.50	1.790
0	03	00	3.00	1.840
0	03	30	3.50	1.880
0	04	00	4.00	1.930
0	04	30	4.50	1.960
0	05	00	5.00	2.000
0	06	00	6.00	2.100

Test Pit Dimensions

Test Pit Length	2.40 m
Test Pit Width	0.55 m
Test Pit Depth	2.10 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.600 m
Total Effective Depth	1.600 m
25% Depth	0.900 m
75% Depth	1.700 m
25% Time	0.33 min
75% Time	2.09 min
Free Volume	0.3168 cu.m
Surface Area	6.04 sq.m
Time of Outflow	1.76 min



Soil infiltration Rate	**1.79E+00**	**m/hr**
	4.97E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 15 May 2025

Produced by: S Thomas

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 11 (Test 2)

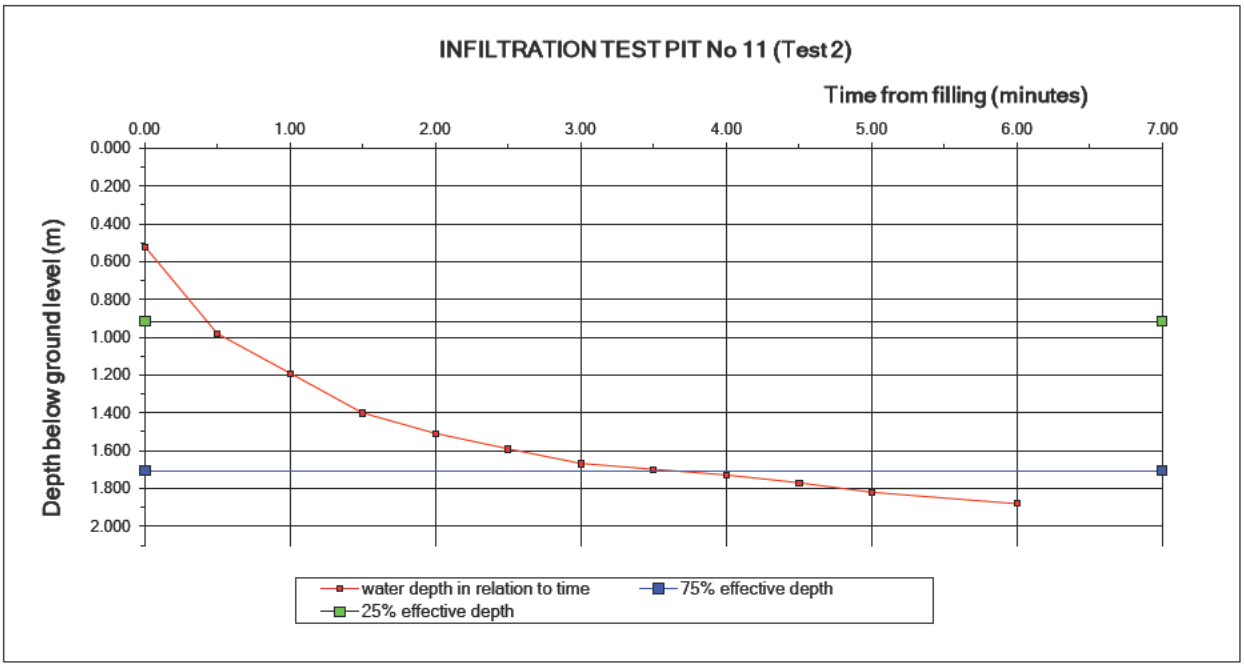
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.520
0	00	30	0.50	0.980
0	01	00	1.00	1.190
0	01	30	1.50	1.400
0	02	00	2.00	1.510
0	02	30	2.50	1.590
0	03	00	3.00	1.670
0	03	30	3.50	1.700
0	04	00	4.00	1.730
0	04	30	4.50	1.770
0	05	00	5.00	1.820
0	06	00	6.00	1.880

Test Pit Dimensions

Test Pit Length	2.40 m
Test Pit Width	0.55 m
Test Pit Depth	2.10 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.580 m
Total Effective Depth	1.580 m
25% Depth	0.915 m
75% Depth	1.705 m
25% Time	0.43 min
75% Time	3.58 min
Free Volume	0.31284 cu.m
Surface Area	5.981 sq.m
Time of Outflow	3.15 min



Soil infiltration Rate	**9.95E-01**	**m/hr**
	2.76E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 15 May 2025

Produced by: S Thomas

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 11 (Test 3)

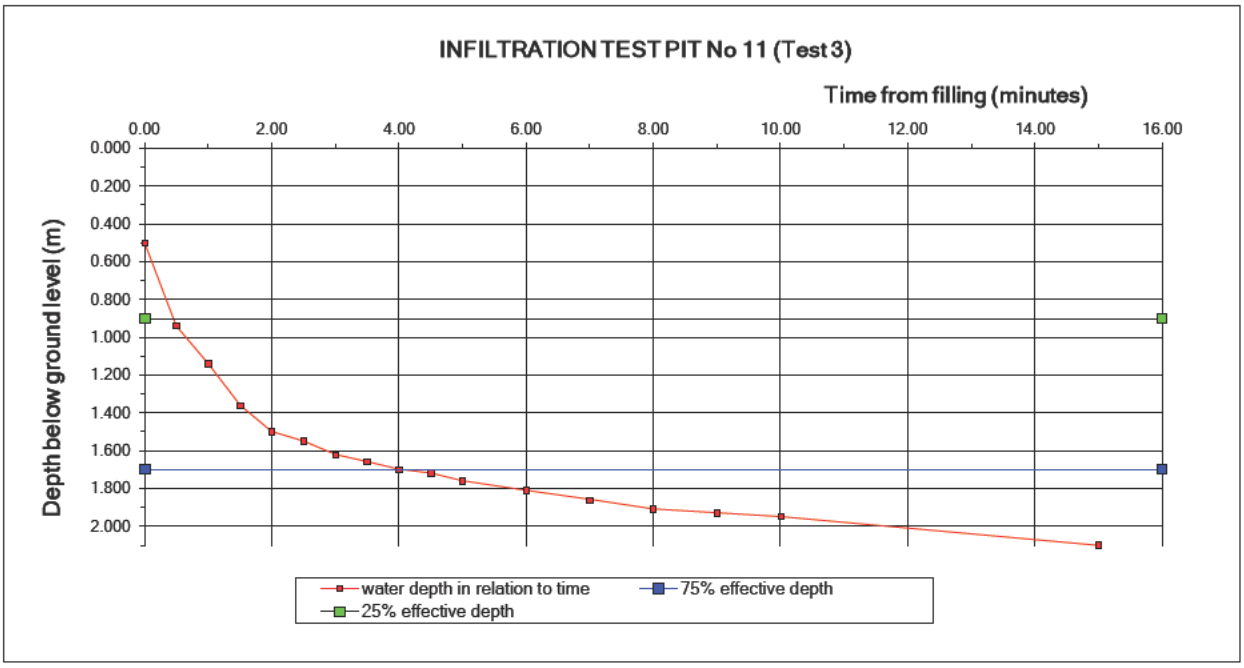
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.500
0	00	30	0.50	0.940
0	01	00	1.00	1.140
0	01	30	1.50	1.360
0	02	00	2.00	1.500
0	02	30	2.50	1.550
0	03	00	3.00	1.620
0	03	30	3.50	1.660
0	04	00	4.00	1.700
0	04	30	4.50	1.720
0	05	00	5.00	1.760
0	06	00	6.00	1.810
0	07	00	7.00	1.860
0	08	00	8.00	1.910
0	09	00	9.00	1.930
0	10	00	10.00	1.950
0	15	00	15.00	2.100

Test Pit Dimensions

Test Pit Length	2.40 m
Test Pit Width	0.55 m
Test Pit Depth	2.10 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.600 m
Total Effective Depth	1.600 m
25% Depth	0.900 m
75% Depth	1.700 m
25% Time	0.45 min
75% Time	4.00 min
Free Volume	0.3168 cu.m
Surface Area	6.04 sq.m
Time of Outflow	3.55 min



Soil infiltration Rate	**8.88E-01**	**m/hr**
	2.47E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 15 May 2025

Produced by: L Buxton

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 12 (Test 1)

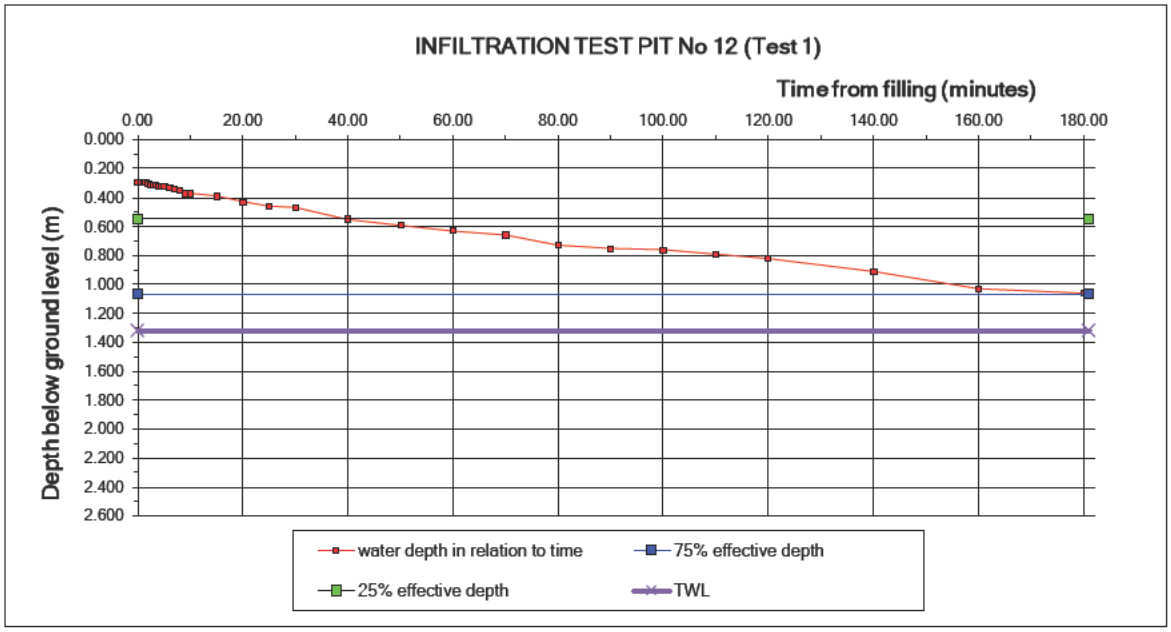
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.290
0	00	30	0.50	0.290
0	01	00	1.00	0.290
0	01	30	1.50	0.290
0	02	00	2.00	0.300
0	02	30	2.50	0.310
0	03	00	3.00	0.310
0	03	30	3.50	0.310
0	04	00	4.00	0.320
0	04	30	4.50	0.320
0	05	00	5.00	0.320
0	06	00	6.00	0.330
0	07	00	7.00	0.340
0	08	00	8.00	0.350
0	09	00	9.00	0.370
0	10	00	10.00	0.370
0	15	00	15.00	0.390
0	20	00	20.00	0.430
0	25	00	25.00	0.460
0	30	00	30.00	0.470
0	40	00	40.00	0.550
0	50	00	50.00	0.590
1	00	00	60.00	0.630
1	10	00	70.00	0.660
1	20	00	80.00	0.730
1	30	00	90.00	0.750
1	40	00	100.00	0.760
1	50	00	110.00	0.790
2	00	00	120.00	0.820
2	20	00	140.00	0.910
2	40	00	160.00	1.030
3	00	00	180.00	1.060

Test Pit Dimensions

Test Pit Length	2.40 m
Test Pit Width	0.45 m
Test Pit Depth	2.60 m
Standing Water Level	1.32 m

Infiltration Parameters

Total Depth	2.310 m
Total Effective Depth	1.030 m
25% Depth	0.548 m
75% Depth	1.063 m
25% Time	39.69 min
75% Time*	175.92 min
Free Volume	0.16686 cu.m
Surface Area	4.0155 sq.m
Time of Outflow*	136.23 min



*Soil infiltration Rate	1.83E-02	m/hr
	5.08E-06	m/sec

Infiltration rate projected based on gradient of curve

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 15 May 2025

Produced by: L Buxton

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 13 (Test 1)

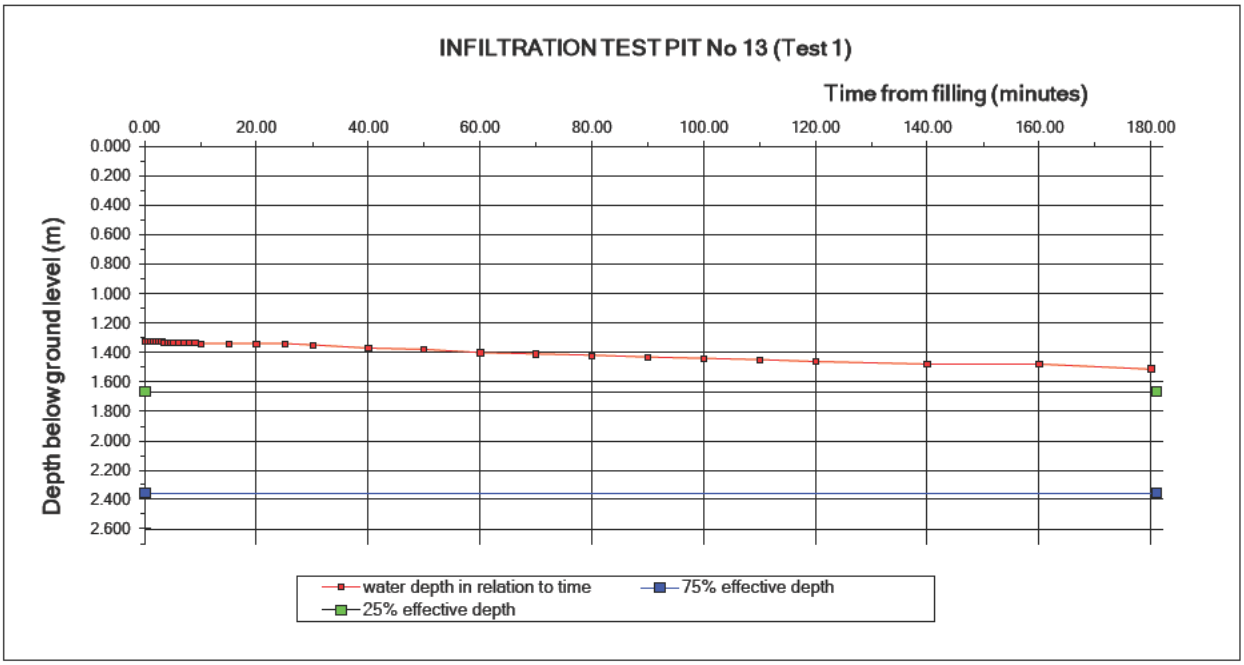
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	1.320
0	00	30	0.50	1.320
0	01	00	1.00	1.320
0	01	30	1.50	1.320
0	02	00	2.00	1.320
0	02	30	2.50	1.320
0	03	00	3.00	1.320
0	03	30	3.50	1.330
0	04	00	4.00	1.330
0	04	30	4.50	1.330
0	05	00	5.00	1.330
0	06	00	6.00	1.330
0	07	00	7.00	1.330
0	08	00	8.00	1.330
0	09	00	9.00	1.330
0	10	00	10.00	1.340
0	15	00	15.00	1.340
0	20	00	20.00	1.340
0	25	00	25.00	1.340
0	30	00	30.00	1.350
0	40	00	40.00	1.370
0	50	00	50.00	1.380
1	00	00	60.00	1.400
1	10	00	70.00	1.410
1	20	00	80.00	1.420
1	30	00	90.00	1.430
1	40	00	100.00	1.440
1	50	00	110.00	1.450
2	00	00	120.00	1.460
2	20	00	140.00	1.480
2	40	00	160.00	1.480
3	00	00	180.00	1.510

Test Pit Dimensions

Test Pit Length	2.60 m
Test Pit Width	0.45 m
Test Pit Depth	2.70 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.380 m
Total Effective Depth	1.380 m
25% Depth	1.665 m
75% Depth	2.355 m
25% Time	FAIL min
75% Time	FAIL min
Free Volume	FAIL cu.m
Surface Area	FAIL sq.m
Time of Outflow	FAIL min



Soil infiltration Rate	**N/A**	**m/hr**
	N/A	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 16 May 2025

Produced by: L Buxton

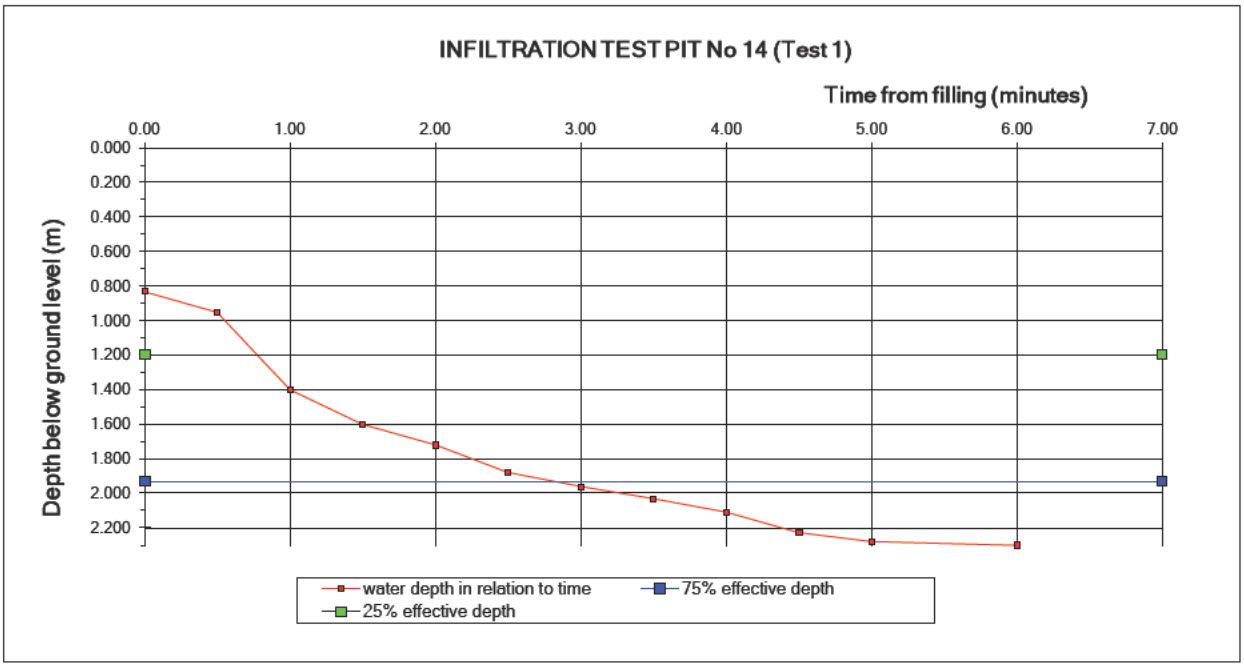
Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 14 (Test 1)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.830
0	00	30	0.50	0.950
0	01	00	1.00	1.400
0	01	30	1.50	1.600
0	02	00	2.00	1.720
0	02	30	2.50	1.880
0	03	00	3.00	1.960
0	03	30	3.50	2.030
0	04	00	4.00	2.110
0	04	30	4.50	2.230
0	05	00	5.00	2.280
0	06	00	6.00	2.300

Test Pit Dimensions	
Test Pit Length	2.70 m
Test Pit Width	0.45 m
Test Pit Depth	2.30 m
Standing Water Level	m

Infiltration Parameters	
Total Depth	1.470 m
Total Effective Depth	1.470 m
25% Depth	1.198 m
75% Depth	1.933 m
25% Time	0.78 min
75% Time	2.83 min
Free Volume	0.267908 cu.m
Surface Area	5.8455 sq.m
Time of Outflow	2.05 min



Soil infiltration Rate	**1.34E+00**	**m/hr**
	3.72E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 16 May 2025

Produced by: L Buxton

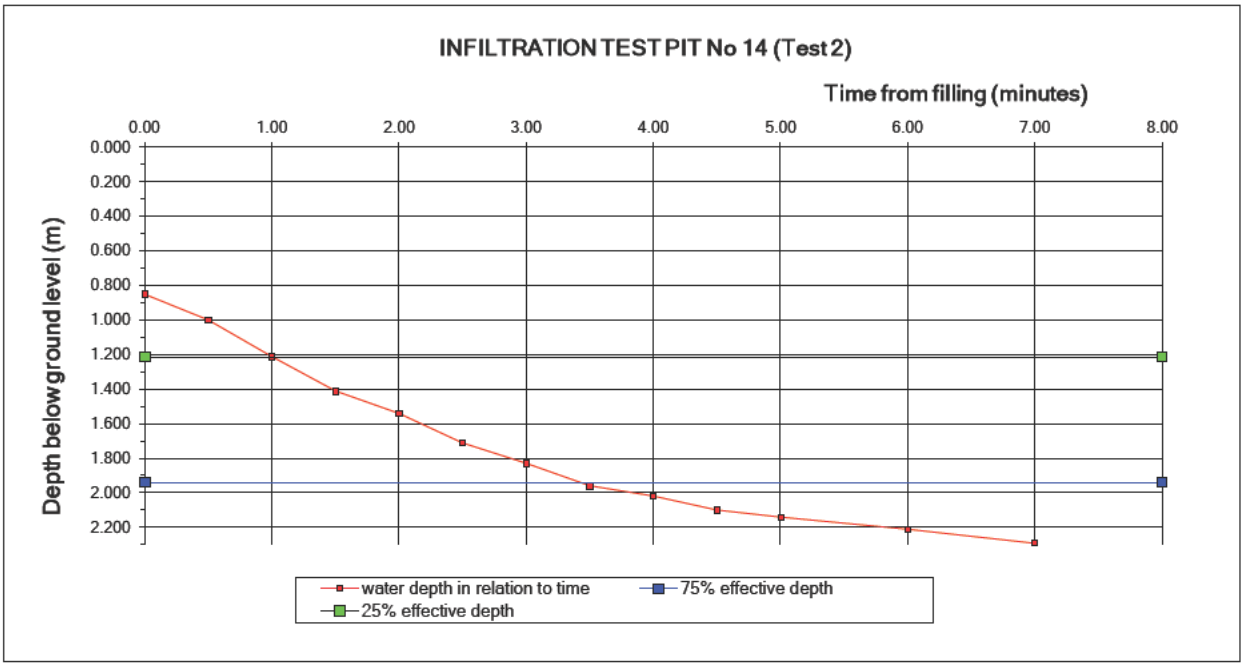
Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 14 (Test 2)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.850
0	00	30	0.50	1.000
0	01	00	1.00	1.210
0	01	30	1.50	1.410
0	02	00	2.00	1.540
0	02	30	2.50	1.710
0	03	00	3.00	1.830
0	03	30	3.50	1.960
0	04	00	4.00	2.020
0	04	30	4.50	2.100
0	05	00	5.00	2.140
0	06	00	6.00	2.210
0	07	00	7.00	2.290

Test Pit Dimensions	
Test Pit Length	2.70 m
Test Pit Width	0.45 m
Test Pit Depth	2.30 m
Standing Water Level	m

Infiltration Parameters	
Total Depth	1.450 m
Total Effective Depth	1.450 m
25% Depth	1.213 m
75% Depth	1.938 m
25% Time	1.01 min
75% Time	3.41 min
Free Volume	0.264263 cu.m
Surface Area	5.7825 sq.m
Time of Outflow	2.41 min



Soil infiltration Rate	**1.14E+00**	**m/hr**
	3.16E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 16 May 2025

Produced by: L Buxton

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 14 (Test 3)

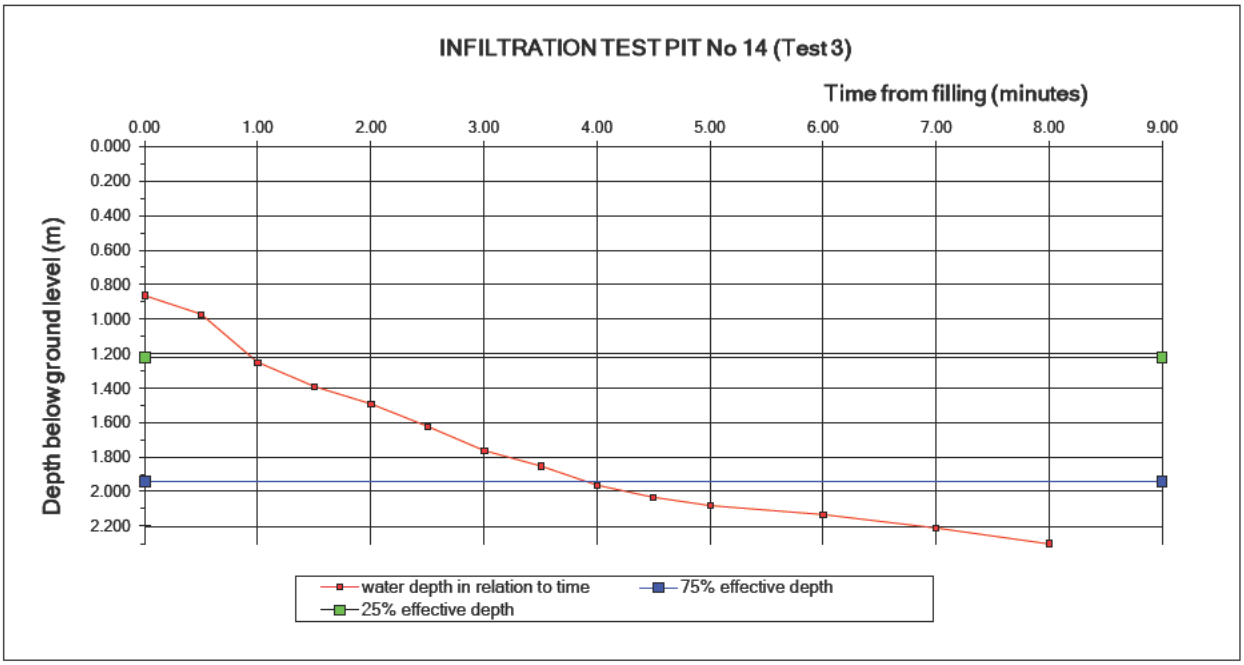
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.860
0	00	30	0.50	0.970
0	01	00	1.00	1.250
0	01	30	1.50	1.390
0	02	00	2.00	1.490
0	02	30	2.50	1.620
0	03	00	3.00	1.760
0	03	30	3.50	1.850
0	04	00	4.00	1.960
0	04	30	4.50	2.030
0	05	00	5.00	2.080
0	06	00	6.00	2.130
0	07	00	7.00	2.210
0	08	00	8.00	2.300

Test Pit Dimensions

Test Pit Length	2.70 m
Test Pit Width	0.45 m
Test Pit Depth	2.30 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.440 m
Total Effective Depth	1.440 m
25% Depth	1.220 m
75% Depth	1.940 m
25% Time	0.95 min
75% Time	3.91 min
Free Volume	0.26244 cu.m
Surface Area	5.751 sq.m
Time of Outflow	2.96 min



Soil infiltration Rate	**9.24E-01**	**m/hr**
	2.57E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 16 May 2025

Produced by: S Thomas

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 15 (Test 1)

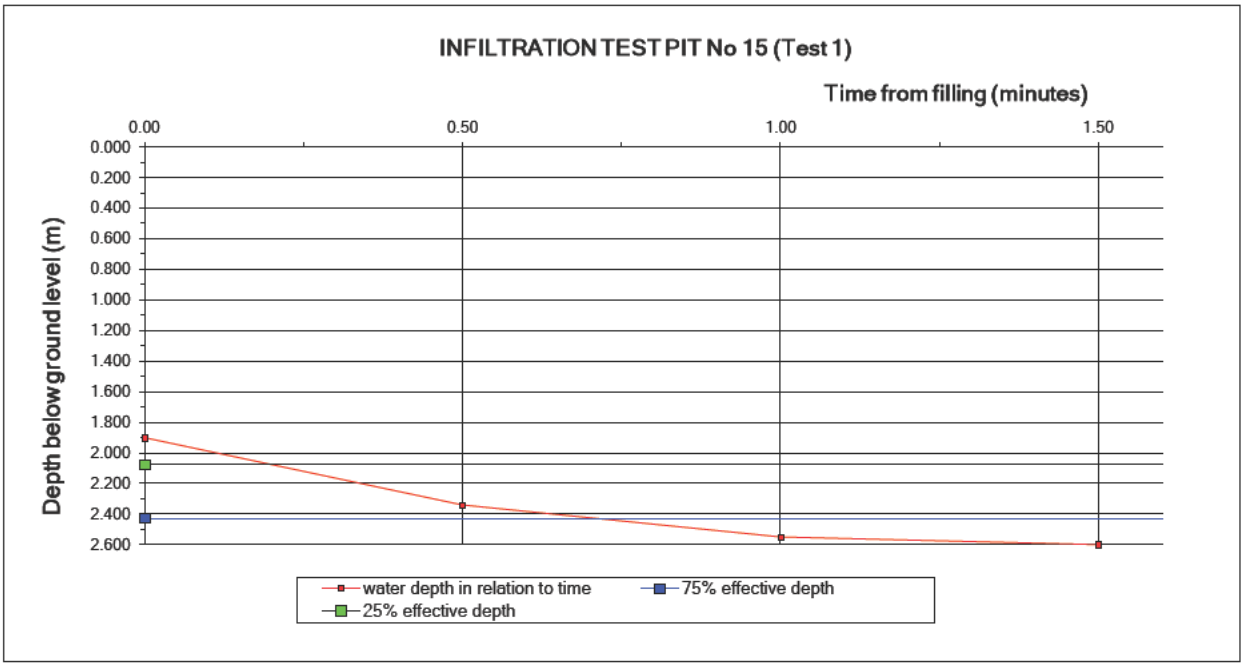
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	1.900
0	00	30	0.50	2.340
0	01	00	1.00	2.550
0	01	30	1.50	2.600

Test Pit Dimensions

Test Pit Length	2.70 m
Test Pit Width	0.55 m
Test Pit Depth	2.60 m
Standing Water Level	m

Infiltration Parameters

Total Depth	0.700 m
Total Effective Depth	0.700 m
25% Depth	2.075 m
75% Depth	2.425 m
25% Time	0.20 min
75% Time	0.70 min
Free Volume	0.155925 cu.m
Surface Area	3.76 sq.m
Time of Outflow	0.50 min



Soil infiltration Rate	**4.94E+00**	**m/hr**
	1.37E-03	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 16 May 2025

Produced by: S Thomas

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 15 (Test 2)

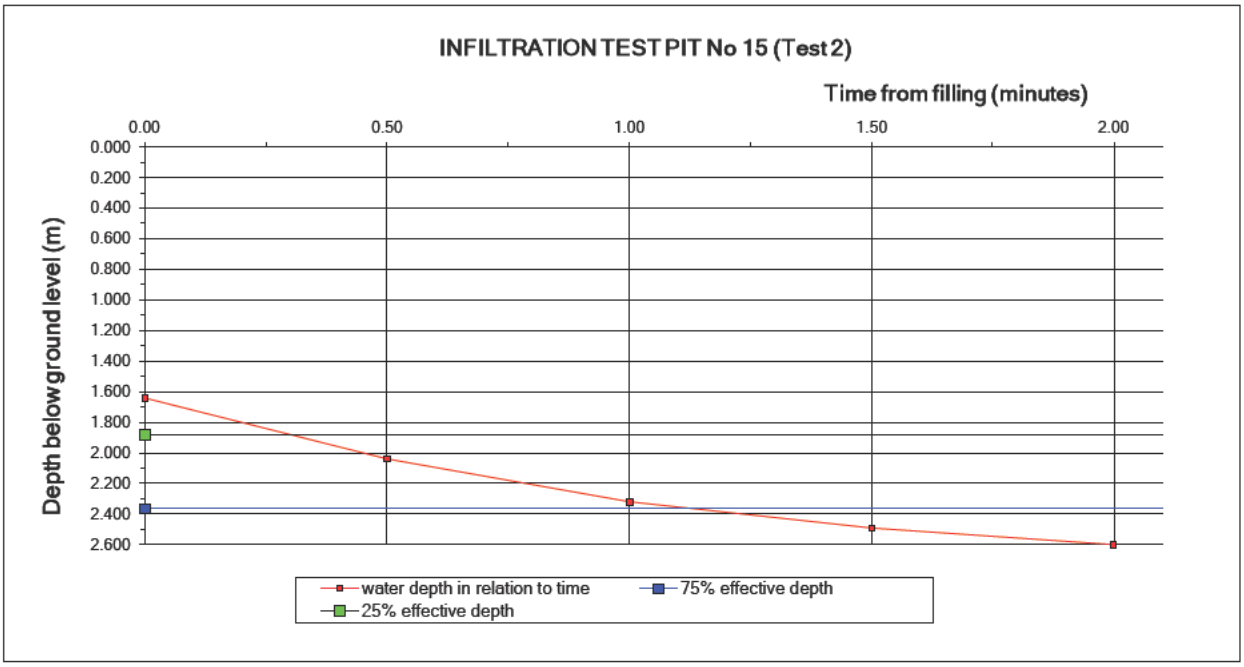
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	1.640
0	00	30	0.50	2.040
0	01	00	1.00	2.320
0	01	30	1.50	2.490
0	02	00	2.00	2.600

Test Pit Dimensions

Test Pit Length	2.70 m
Test Pit Width	0.55 m
Test Pit Depth	2.60 m
Standing Water Level	m

Infiltration Parameters

Total Depth	0.960 m
Total Effective Depth	0.960 m
25% Depth	1.880 m
75% Depth	2.360 m
25% Time	0.30 min
75% Time	1.12 min
Free Volume	0.21384 cu.m
Surface Area	4.605 sq.m
Time of Outflow	0.82 min



Soil infiltration Rate	**3.41E+00**	**m/hr**
	9.47E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 16 May 2025

Produced by: S Thomas

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 15 (Test 3)

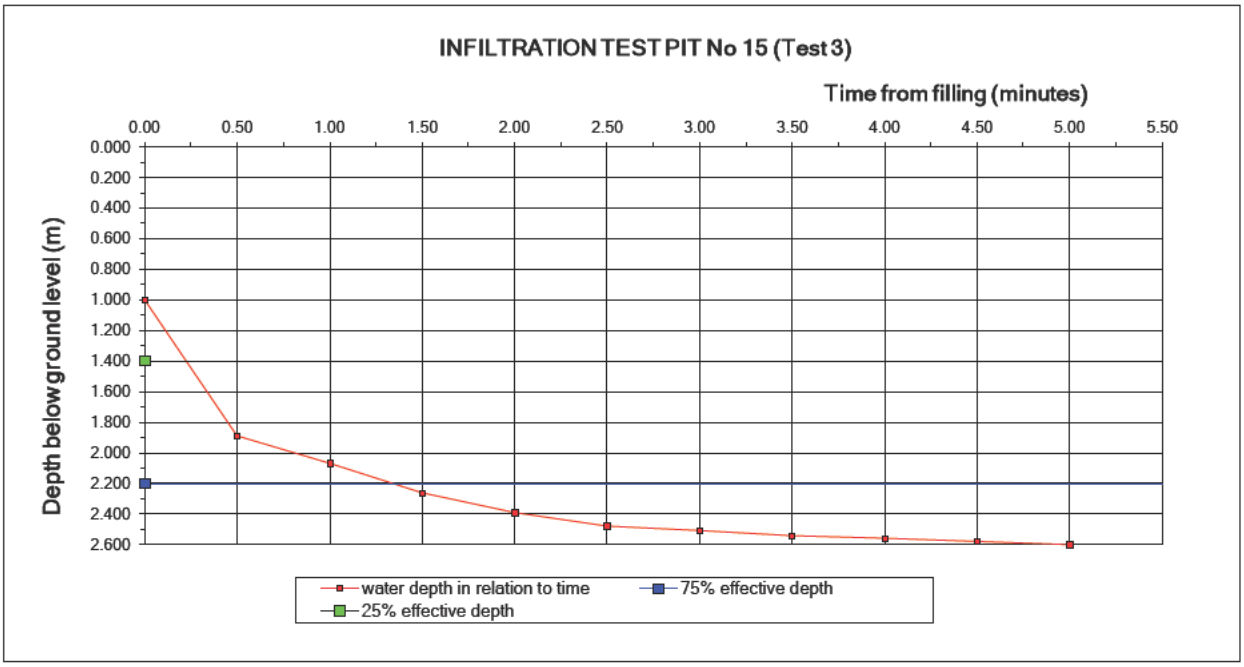
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	1.000
0	00	30	0.50	1.890
0	01	00	1.00	2.070
0	01	30	1.50	2.260
0	02	00	2.00	2.390
0	02	30	2.50	2.480
0	03	00	3.00	2.510
0	03	30	3.50	2.540
0	04	00	4.00	2.560
0	04	30	4.50	2.580
0	05	00	5.00	2.600

Test Pit Dimensions

Test Pit Length	2.70 m
Test Pit Width	0.55 m
Test Pit Depth	2.60 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.600 m
Total Effective Depth	1.600 m
25% Depth	1.400 m
75% Depth	2.200 m
25% Time	0.22 min
75% Time	1.34 min
Free Volume	0.3564 cu.m
Surface Area	6.685 sq.m
Time of Outflow	1.12 min



Soil infiltration Rate	**2.86E+00**	**m/hr**
	7.95E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 19 May 2025

Produced by: L Buxton

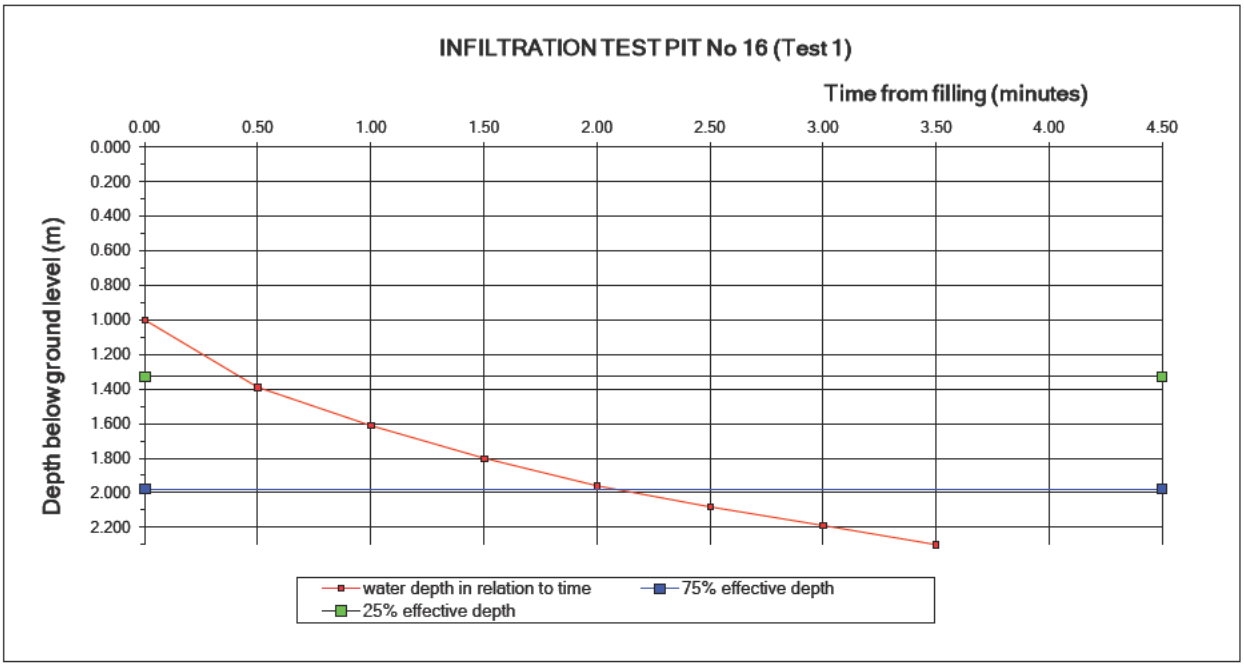
Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 16 (Test 1)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	1.000
0	00	30	0.50	1.390
0	01	00	1.00	1.610
0	01	30	1.50	1.800
0	02	00	2.00	1.960
0	02	30	2.50	2.080
0	03	00	3.00	2.190
0	03	30	3.50	2.300

Test Pit Dimensions	
Test Pit Length	2.50 m
Test Pit Width	0.60 m
Test Pit Depth	2.30 m
Standing Water Level	m

Infiltration Parameters	
Total Depth	1.300 m
Total Effective Depth	1.300 m
25% Depth	1.325 m
75% Depth	1.975 m
25% Time	0.42 min
75% Time	2.06 min
Free Volume	0.2925 cu.m
Surface Area	5.53 sq.m
Time of Outflow	1.65 min



Soil infiltration Rate	**1.93E+00**	**m/hr**
	5.36E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 19 May 2025

Produced by: L Buxton

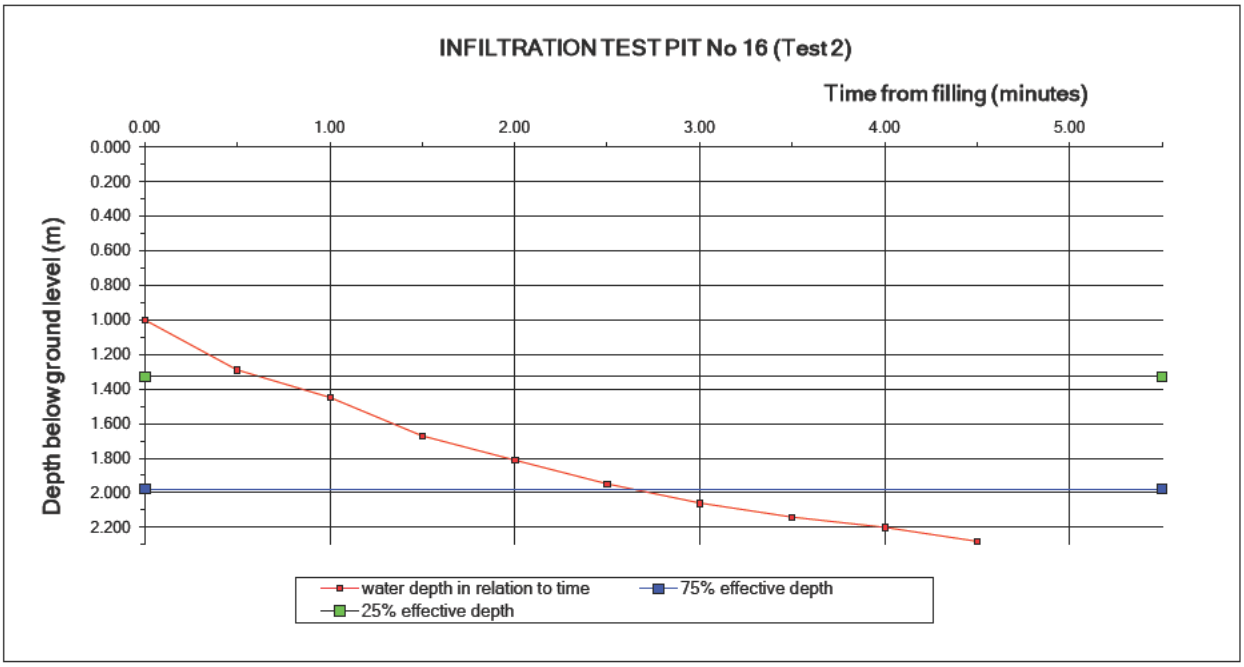
Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 16 (Test 2)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	1.000
0	00	30	0.50	1.290
0	01	00	1.00	1.450
0	01	30	1.50	1.670
0	02	00	2.00	1.810
0	02	30	2.50	1.950
0	03	00	3.00	2.060
0	03	30	3.50	2.140
0	04	00	4.00	2.200
0	04	30	4.50	2.280

Test Pit Dimensions	
Test Pit Length	2.50 m
Test Pit Width	0.60 m
Test Pit Depth	2.30 m
Standing Water Level	m

Infiltration Parameters	
Total Depth	1.300 m
Total Effective Depth	1.300 m
25% Depth	1.325 m
75% Depth	1.975 m
25% Time	0.61 min
75% Time	2.61 min
Free Volume	0.2925 cu.m
Surface Area	5.53 sq.m
Time of Outflow	2.00 min



Soil infiltration Rate	**1.58E+00**	**m/hr**
	4.40E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 19 May 2025

Produced by: L Buxton

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 16 (Test 3)

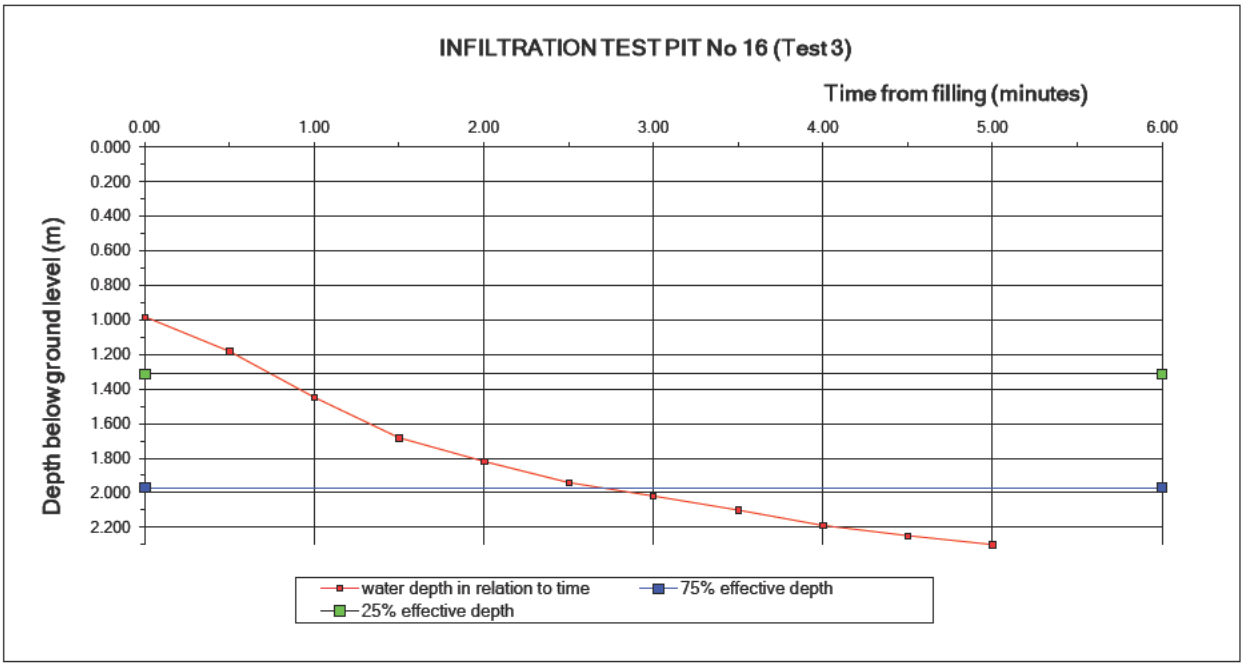
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.980
0	00	30	0.50	1.180
0	01	00	1.00	1.450
0	01	30	1.50	1.680
0	02	00	2.00	1.820
0	02	30	2.50	1.940
0	03	00	3.00	2.020
0	03	30	3.50	2.100
0	04	00	4.00	2.190
0	04	30	4.50	2.250
0	05	00	5.00	2.300

Test Pit Dimensions

Test Pit Length	2.50 m
Test Pit Width	0.60 m
Test Pit Depth	2.30 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.320 m
Total Effective Depth	1.320 m
25% Depth	1.310 m
75% Depth	1.970 m
25% Time	0.74 min
75% Time	2.69 min
Free Volume	0.297 cu.m
Surface Area	5.592 sq.m
Time of Outflow	1.95 min



Soil infiltration Rate	**1.64E+00**	**m/hr**
	4.55E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 19 May 2025

Produced by: S Thomas, M Knowles

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 17 (Test 1)

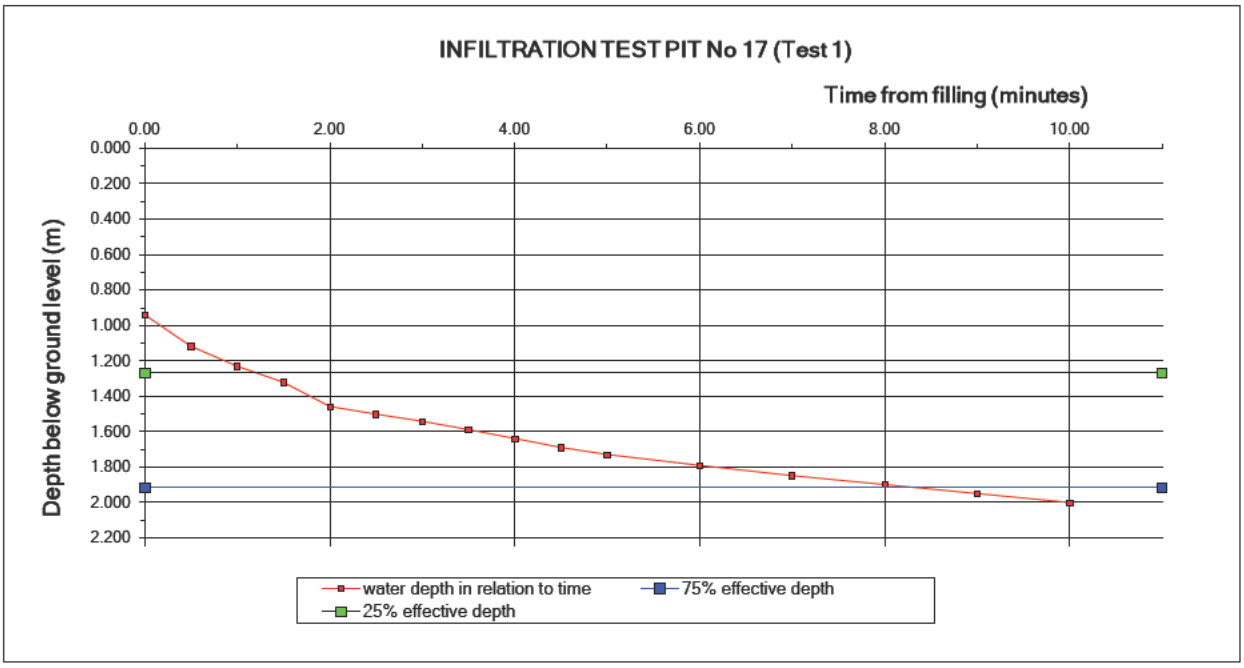
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.940
0	00	30	0.50	1.120
0	01	00	1.00	1.230
0	01	30	1.50	1.320
0	02	00	2.00	1.460
0	02	30	2.50	1.500
0	03	00	3.00	1.540
0	03	30	3.50	1.590
0	04	00	4.00	1.640
0	04	30	4.50	1.690
0	05	00	5.00	1.730
0	06	00	6.00	1.790
0	07	00	7.00	1.850
0	08	00	8.00	1.900
0	09	00	9.00	1.950
0	10	00	10.00	2.000

Test Pit Dimensions

Test Pit Length	2.70 m
Test Pit Width	0.60 m
Test Pit Depth	2.24 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.300 m
Total Effective Depth	1.300 m
25% Depth	1.265 m
75% Depth	1.915 m
25% Time	1.19 min
75% Time	8.30 min
Free Volume	0.3159 cu.m
Surface Area	5.91 sq.m
Time of Outflow	7.11 min



Soil infiltration Rate	**4.51E-01**	**m/hr**
	1.25E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 19 May 2025

Produced by: S Thomas, M Knowles

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 17 (Test 2)

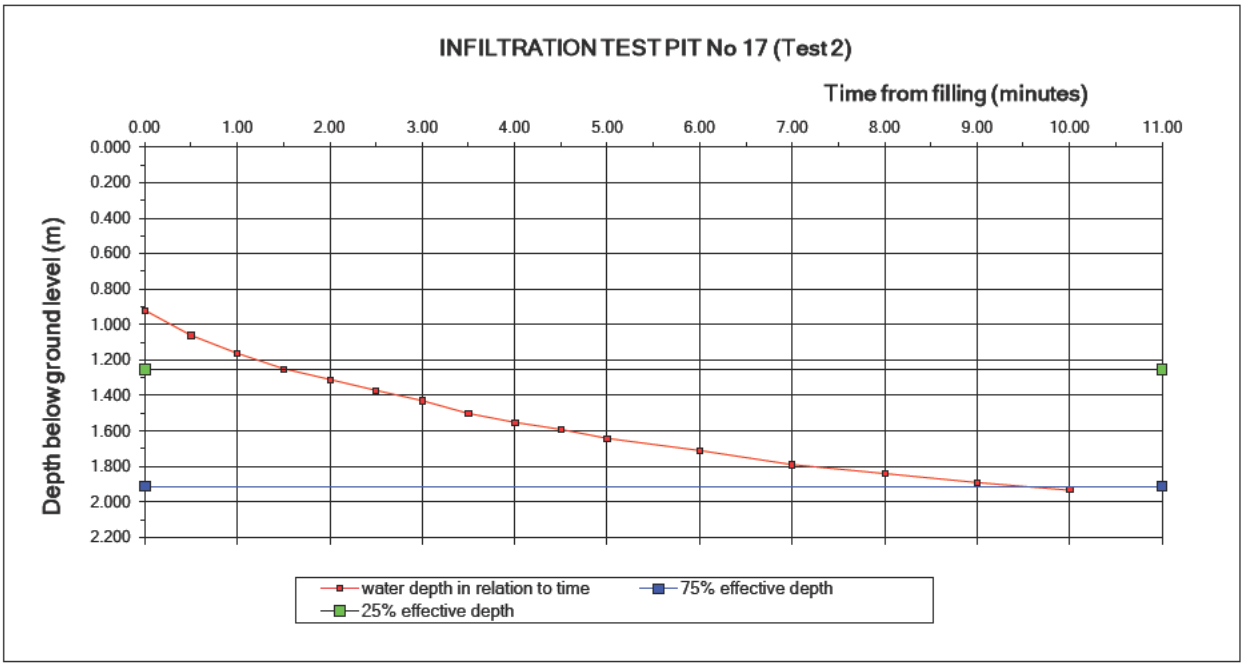
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.920
0	00	30	0.50	1.060
0	01	00	1.00	1.160
0	01	30	1.50	1.250
0	02	00	2.00	1.310
0	02	30	2.50	1.370
0	03	00	3.00	1.430
0	03	30	3.50	1.500
0	04	00	4.00	1.550
0	04	30	4.50	1.590
0	05	00	5.00	1.640
0	06	00	6.00	1.710
0	07	00	7.00	1.790
0	08	00	8.00	1.840
0	09	00	9.00	1.890
0	10	00	10.00	1.930

Test Pit Dimensions

Test Pit Length	2.70 m
Test Pit Width	0.60 m
Test Pit Depth	2.24 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.320 m
Total Effective Depth	1.320 m
25% Depth	1.250 m
75% Depth	1.910 m
25% Time	1.50 min
75% Time	9.50 min
Free Volume	0.32076 cu.m
Surface Area	5.976 sq.m
Time of Outflow	8.00 min



Soil infiltration Rate	**4.03E-01**	**m/hr**
	1.12E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 19 May 2025

Produced by: S Thomas, M Knowles

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 17 (Test 3)

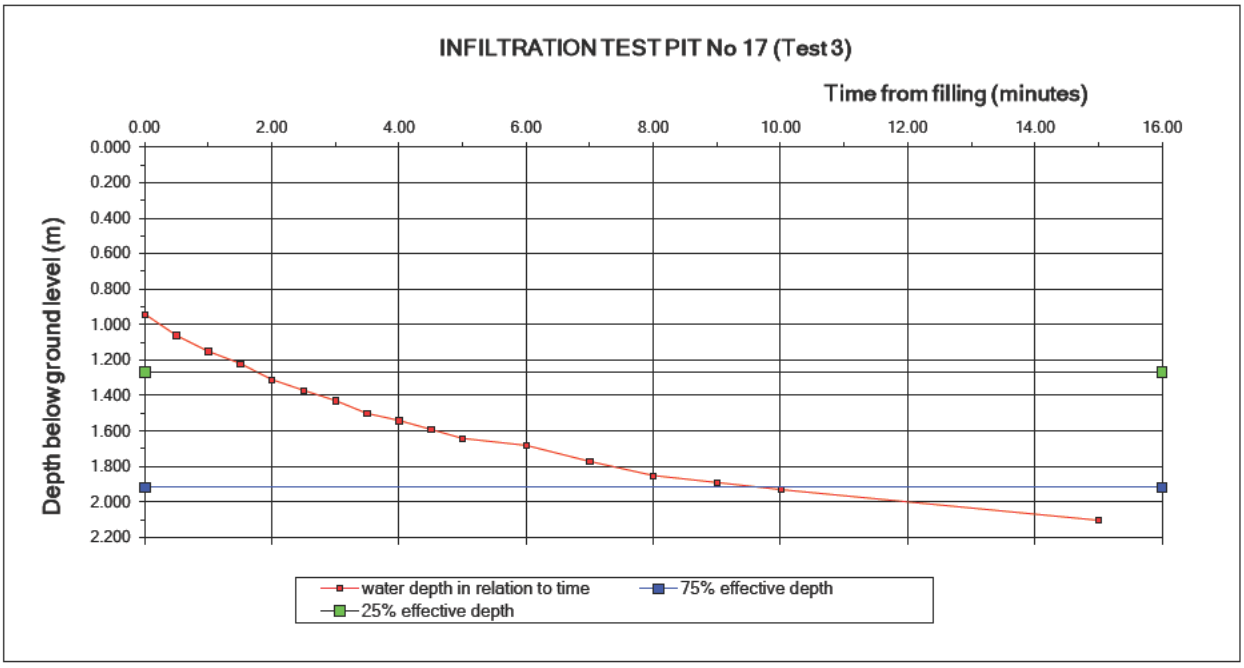
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.940
0	00	30	0.50	1.060
0	01	00	1.00	1.150
0	01	30	1.50	1.220
0	02	00	2.00	1.310
0	02	30	2.50	1.370
0	03	00	3.00	1.430
0	03	30	3.50	1.500
0	04	00	4.00	1.540
0	04	30	4.50	1.590
0	05	00	5.00	1.640
0	06	00	6.00	1.680
0	07	00	7.00	1.770
0	08	00	8.00	1.850
0	09	00	9.00	1.890
0	10	00	10.00	1.930
0	15	00	15.00	2.100

Test Pit Dimensions

Test Pit Length	2.70 m
Test Pit Width	0.60 m
Test Pit Depth	2.24 m
Standing Water Level	m

Infiltration Parameters

Total Depth	1.300 m
Total Effective Depth	1.300 m
25% Depth	1.265 m
75% Depth	1.915 m
25% Time	1.75 min
75% Time	9.63 min
Free Volume	0.3159 cu.m
Surface Area	5.91 sq.m
Time of Outflow	7.88 min



Soil infiltration Rate	**4.07E-01**	**m/hr**
	1.13E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 19 May 2025

Produced by: N Rothwell

Coopers
Consulting Engineers

STANSTY CHAIN ROAD, WREXHAM
INFILTRATION TEST PIT No 18 (Test 1)

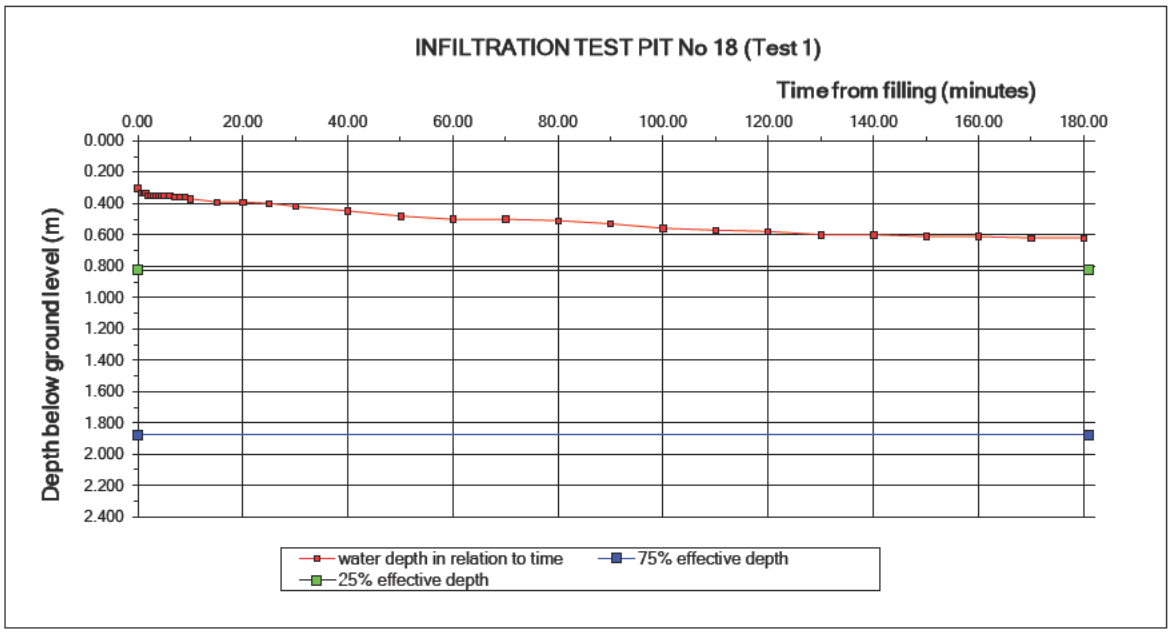
Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.300
0	00	30	0.50	0.330
0	01	00	1.00	0.330
0	01	30	1.50	0.330
0	02	00	2.00	0.350
0	02	30	2.50	0.350
0	03	00	3.00	0.350
0	03	30	3.50	0.350
0	04	00	4.00	0.350
0	04	30	4.50	0.350
0	05	00	5.00	0.350
0	06	00	6.00	0.350
0	07	00	7.00	0.360
0	08	00	8.00	0.360
0	09	00	9.00	0.360
0	10	00	10.00	0.370
0	15	00	15.00	0.390
0	20	00	20.00	0.390
0	25	00	25.00	0.400
0	30	00	30.00	0.420
0	40	00	40.00	0.450
0	50	00	50.00	0.480
1	00	00	60.00	0.500
1	10	00	70.00	0.500
1	20	00	80.00	0.510
1	30	00	90.00	0.530
1	40	00	100.00	0.560
1	50	00	110.00	0.570
2	00	00	120.00	0.580
2	10	00	130.00	0.600
2	20	00	140.00	0.600
2	30	00	150.00	0.610
2	40	00	160.00	0.610
2	50	00	170.00	0.620
3	00	00	180.00	0.620

Test Pit Dimensions

Test Pit Length	2.50 m
Test Pit Width	0.60 m
Test Pit Depth	2.40 m
Standing Water Level	m

Infiltration Parameters

Total Depth	2.100 m
Total Effective Depth	2.100 m
25% Depth	0.825 m
75% Depth	1.875 m
25% Time	FAIL min
75% Time	FAIL min
Free Volume	FAIL cu.m
Surface Area	FAIL sq.m
Time of Outflow	FAIL min



Soil infiltration Rate	**N/A**	**m/hr**
	N/A	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 24 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 101 (Test 1)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.510
0	00	30	0.50	0.560
0	01	00	1.00	0.620
0	01	30	1.50	0.660
0	02	00	2.00	0.700
0	02	30	2.50	0.770
0	03	00	3.00	0.800
0	03	30	3.50	0.840
0	04	00	4.00	0.900
0	04	30	4.50	0.980

Test Pit Dimensions

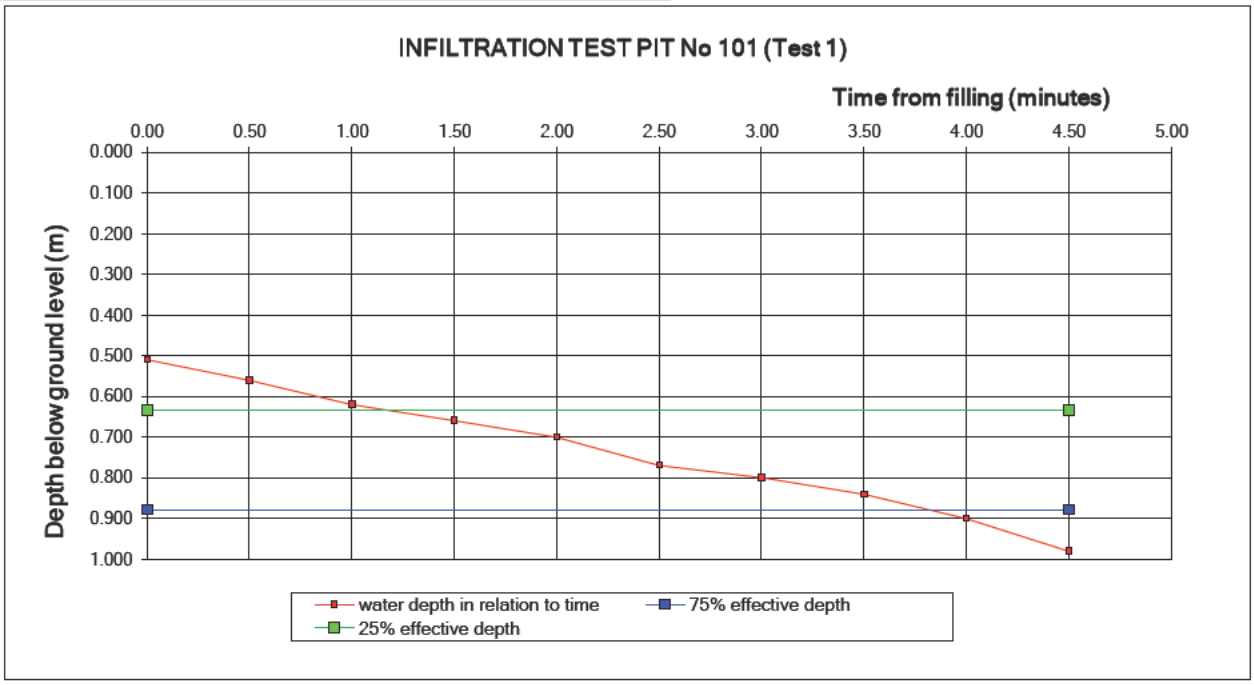
Test Pit Length	1.60	m
Test Pit Width	0.45	m
Test Pit Depth	1.00	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	0.490	m
Total Effective Depth	0.490	m
25% Depth	0.633	m
75% Depth	0.878	m
25% Time	1.16	min
75% Time	3.81	min
Free Volume	0.053	m^3
Surface Area	1.7245	m^2
Time of Outflow	2.66	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**6.93E-01**	**m/hr**
	1.93E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 24 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 101 (Test 2)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.450
0	00	30	0.50	0.470
0	01	00	1.00	0.500
0	01	30	1.50	0.540
0	02	00	2.00	0.590
0	02	30	2.50	0.630
0	03	00	3.00	0.640
0	03	30	3.50	0.670
0	04	00	4.00	0.700
0	04	30	4.50	0.720
0	05	00	5.00	0.750
0	06	00	6.00	0.800
0	07	00	7.00	0.830
0	08	00	8.00	0.870

Test Pit Dimensions

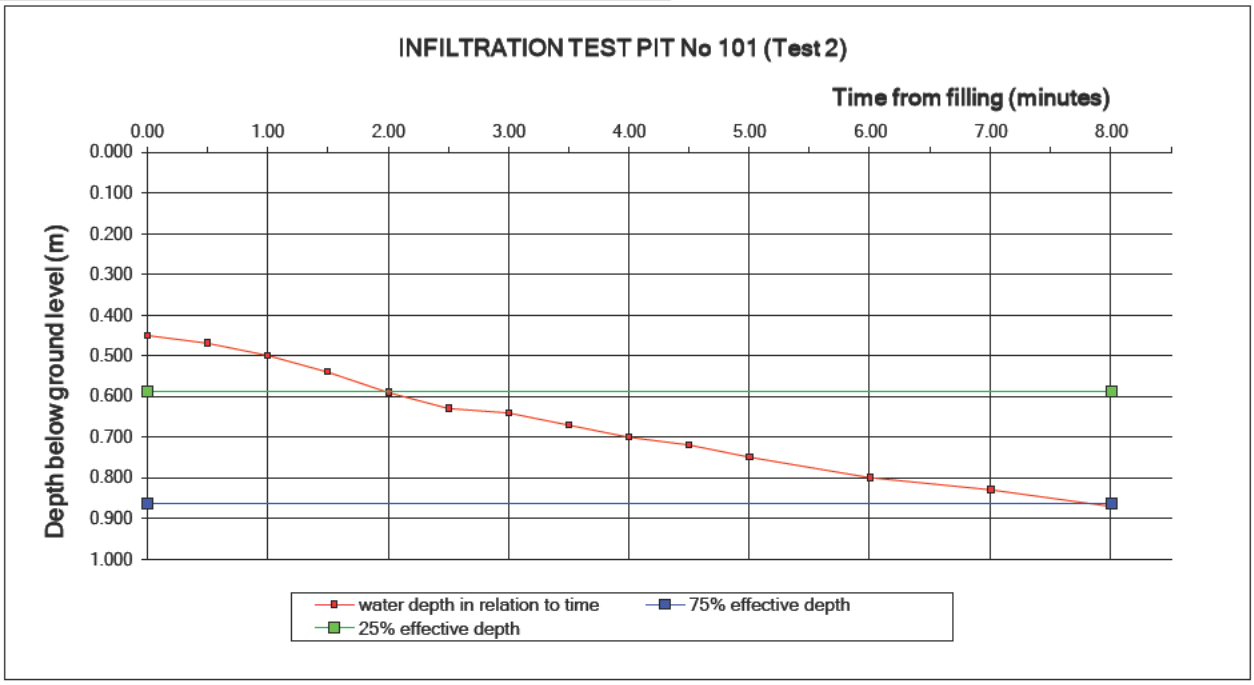
Test Pit Length	1.60	m
Test Pit Width	0.45	m
Test Pit Depth	1.00	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	0.550	m
Total Effective Depth	0.550	m
25% Depth	0.588	m
75% Depth	0.863	m
25% Time	1.98	min
75% Time	7.81	min
Free Volume	0.059	m^3
Surface Area	1.8475	m^2
Time of Outflow	5.84	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**3.30E-01**	**m/hr**
	9.18E-05	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 24 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 101 (Test 3)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.430
0	00	30	0.50	0.450
0	01	00	1.00	0.470
0	01	30	1.50	0.510
0	02	00	2.00	0.560
0	02	30	2.50	0.590
0	03	00	3.00	0.620
0	03	30	3.50	0.650
0	04	00	4.00	0.690
0	04	30	4.50	0.710
0	05	00	5.00	0.740
0	06	00	6.00	0.780
0	07	00	7.00	0.810
0	08	00	8.00	0.850
0	09	00	9.00	0.890

Test Pit Dimensions

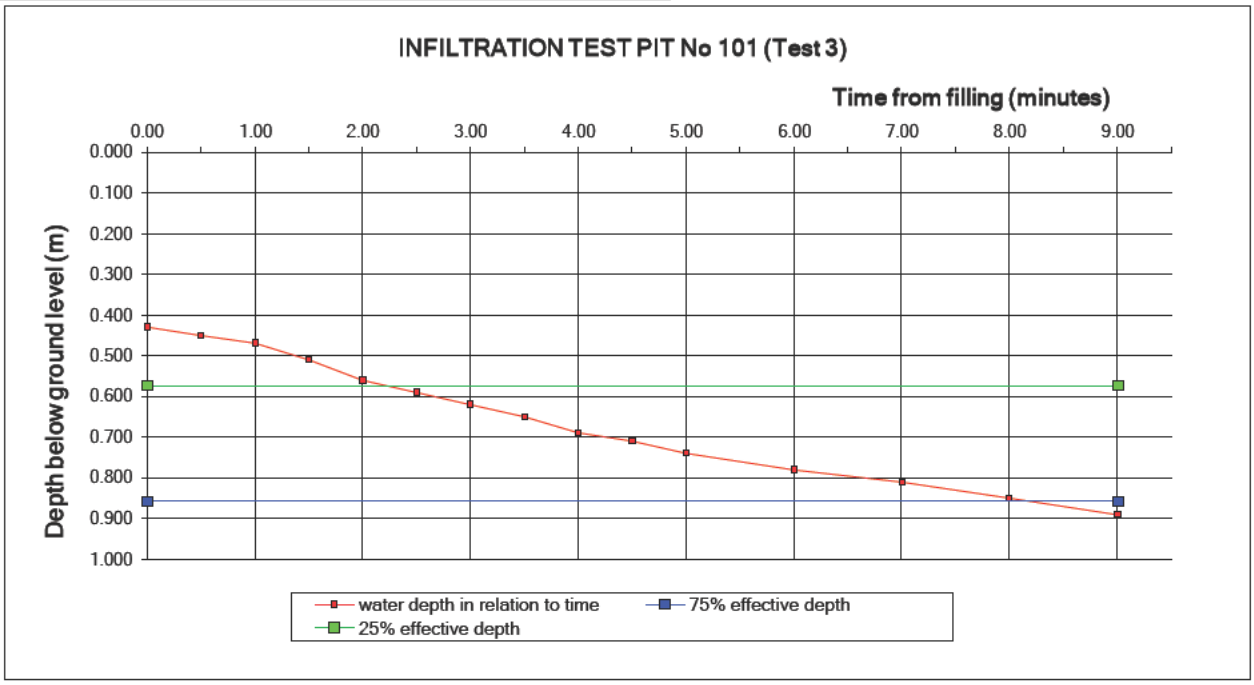
Test Pit Length	1.60	m
Test Pit Width	0.45	m
Test Pit Depth	1.00	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	0.570	m
Total Effective Depth	0.570	m
25% Depth	0.573	m
75% Depth	0.858	m
25% Time	2.21	min
75% Time	8.19	min
Free Volume	0.062	m^3
Surface Area	1.8885	m^2
Time of Outflow	5.98	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**3.27E-01**	**m/hr**
	9.09E-05	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 24 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 102 (Test 1)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.380
0	00	30	0.50	0.420
0	01	00	1.00	0.440
0	01	30	1.50	0.460
0	02	00	2.00	0.470
0	02	30	2.50	0.490
0	03	00	3.00	0.500
0	03	30	3.50	0.510
0	04	00	4.00	0.510
0	04	30	4.50	0.520
0	05	00	5.00	0.530
0	06	00	6.00	0.550
0	07	00	7.00	0.560
0	08	00	8.00	0.580
0	09	00	9.00	0.590
0	10	00	10.00	0.610
0	15	00	15.00	0.650
0	20	00	20.00	0.700
0	25	00	25.00	0.730
0	30	00	30.00	0.740
0	40	00	40.00	0.760
0	50	00	50.00	0.820
1	00	00	60.00	0.850

Test Pit Dimensions

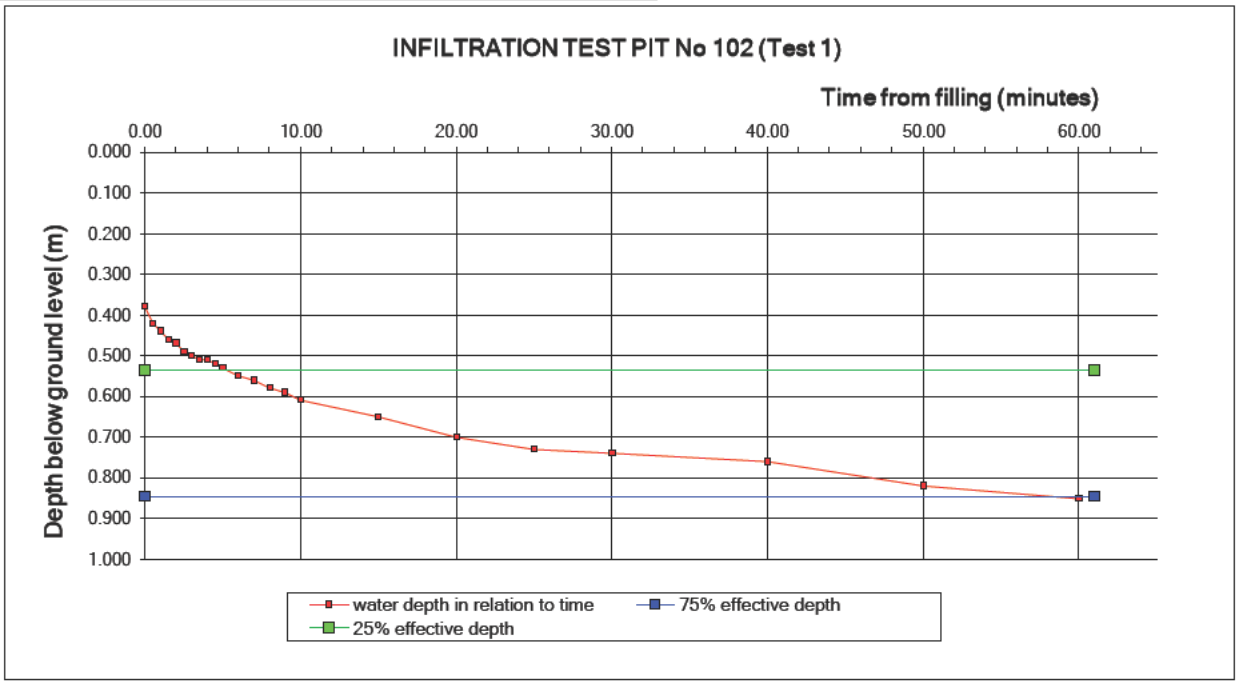
Test Pit Length	1.60	m
Test Pit Width	0.45	m
Test Pit Depth	1.00	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	0.620	m
Total Effective Depth	0.620	m
25% Depth	0.535	m
75% Depth	0.845	m
25% Time	5.25	min
75% Time	58.33	min
Free Volume	0.067	m^3
Surface Area	1.991	m^2
Time of Outflow	53.08	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**3.80E-02**	**m/hr**
	1.06E-05	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 24 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 102 (Test 2)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.300
0	00	30	0.50	0.310
0	01	00	1.00	0.320
0	01	30	1.50	0.320
0	02	00	2.00	0.320
0	02	30	2.50	0.320
0	03	00	3.00	0.330
0	03	30	3.50	0.350
0	04	00	4.00	0.340
0	04	30	4.50	0.350
0	05	00	5.00	0.350
0	06	00	6.00	0.360
0	07	00	7.00	0.370
0	08	00	8.00	0.390
0	09	00	9.00	0.400
0	10	00	10.00	0.410
0	15	00	15.00	0.470
0	20	00	20.00	0.510
0	25	00	25.00	0.520
0	30	00	30.00	0.540
0	40	00	40.00	0.590
0	50	00	50.00	0.620
1	00	00	60.00	0.690
1	10	00	70.00	0.710
1	20	00	80.00	0.760
1	30	00	90.00	0.820
1	40	00	100.00	0.830
1	50	00	110.00	0.850

Test Pit Dimensions

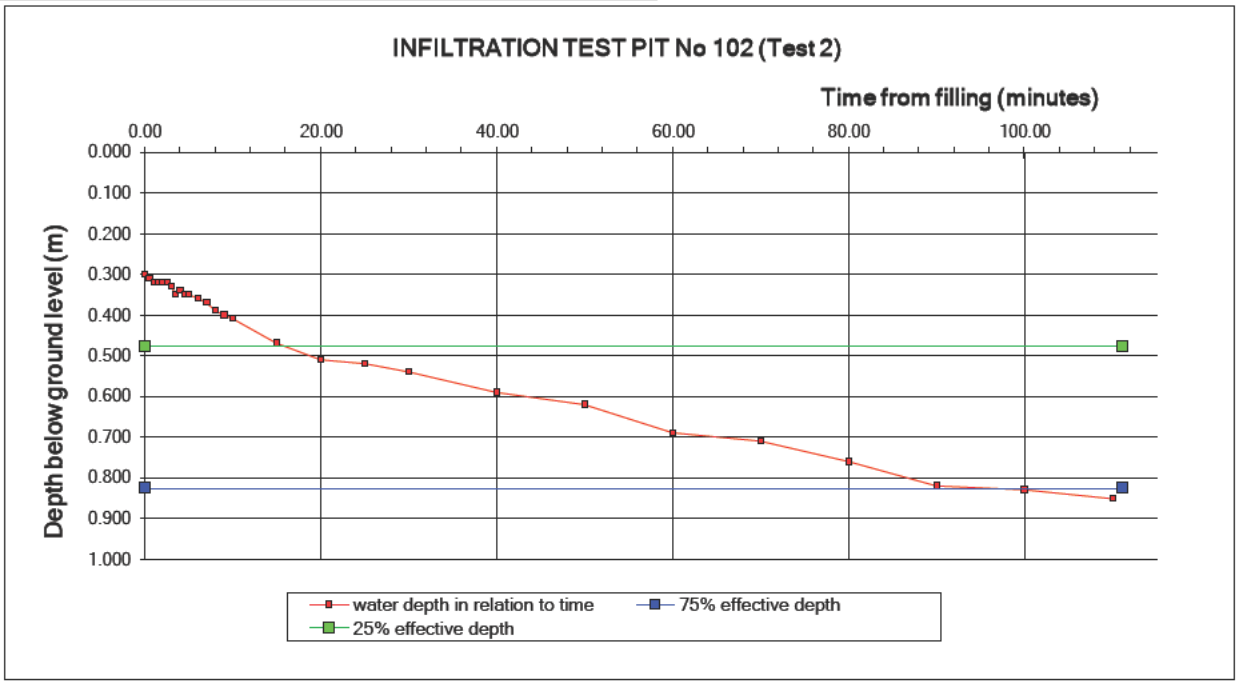
Test Pit Length	1.60	m
Test Pit Width	0.45	m
Test Pit Depth	1.00	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	0.700	m
Total Effective Depth	0.700	m
25% Depth	0.475	m
75% Depth	0.825	m
25% Time	15.63	min
75% Time	95.00	min
Free Volume	0.076	m^3
Surface Area	2.155	m^2
Time of Outflow	79.38	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**2.65E-02**	**m/hr**
	7.37E-06	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 24 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 102 (Test 3)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.250
0	00	30	0.50	0.250
0	01	00	1.00	0.250
0	01	30	1.50	0.260
0	02	00	2.00	0.260
0	02	30	2.50	0.260
0	03	00	3.00	0.260
0	03	30	3.50	0.260
0	04	00	4.00	0.260
0	04	30	4.50	0.260
0	05	00	5.00	0.260
0	06	00	6.00	0.270
0	07	00	7.00	0.270
0	08	00	8.00	0.300
0	09	00	9.00	0.310
0	10	00	10.00	0.310
0	15	00	15.00	0.370
0	20	00	20.00	0.390
0	25	00	25.00	0.430
0	30	00	30.00	0.450
0	40	00	40.00	0.500
0	50	00	50.00	0.550
1	00	00	60.00	0.600
1	10	00	70.00	0.620
1	20	00	80.00	0.650
1	30	00	90.00	0.670
1	50	00	110.00	0.740
2	00	00	120.00	0.770
2	20	00	140.00	0.800
2	40	00	160.00	0.830

Test Pit Dimensions

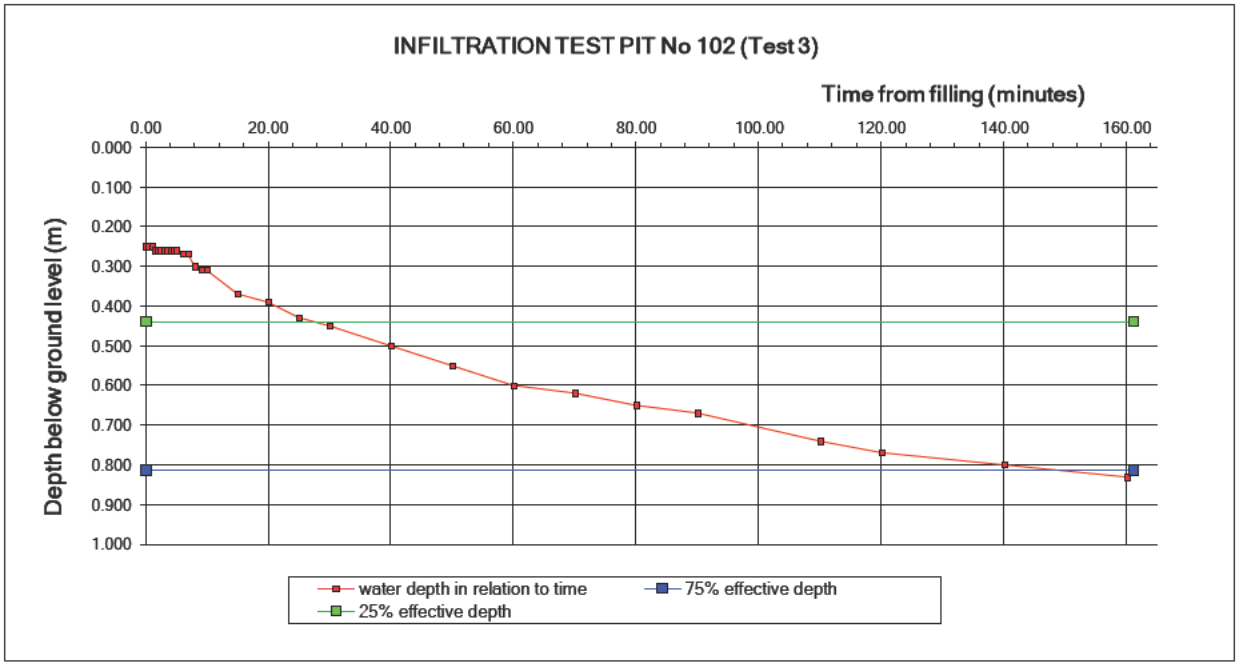
Test Pit Length	1.60	m
Test Pit Width	0.45	m
Test Pit Depth	1.00	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	0.750	m
Total Effective Depth	0.750	m
25% Depth	0.438	m
75% Depth	0.813	m
25% Time	26.88	min
75% Time	148.33	min
Free Volume	0.081	m^3
Surface Area	2.2575	m^2
Time of Outflow	121.46	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**1.77E-02**	**m/hr**
	4.92E-06	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 24 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 108 (Test 1)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.880
0	00	30	0.50	1.310
0	01	00	1.00	1.610
0	01	30	1.50	1.700
0	02	00	2.00	1.830
0	02	30	2.50	1.920
0	03	00	3.00	2.020
0	03	30	3.50	2.110
0	04	00	4.00	2.190
0	04	30	4.50	2.250
0	05	00	5.00	2.310
0	06	00	6.00	2.520
0	07	00	7.00	2.670
0	08	00	8.00	2.720
0	09	00	9.00	2.830
0	10	00	10.00	2.850
0	15	00	15.00	2.880

Test Pit Dimensions

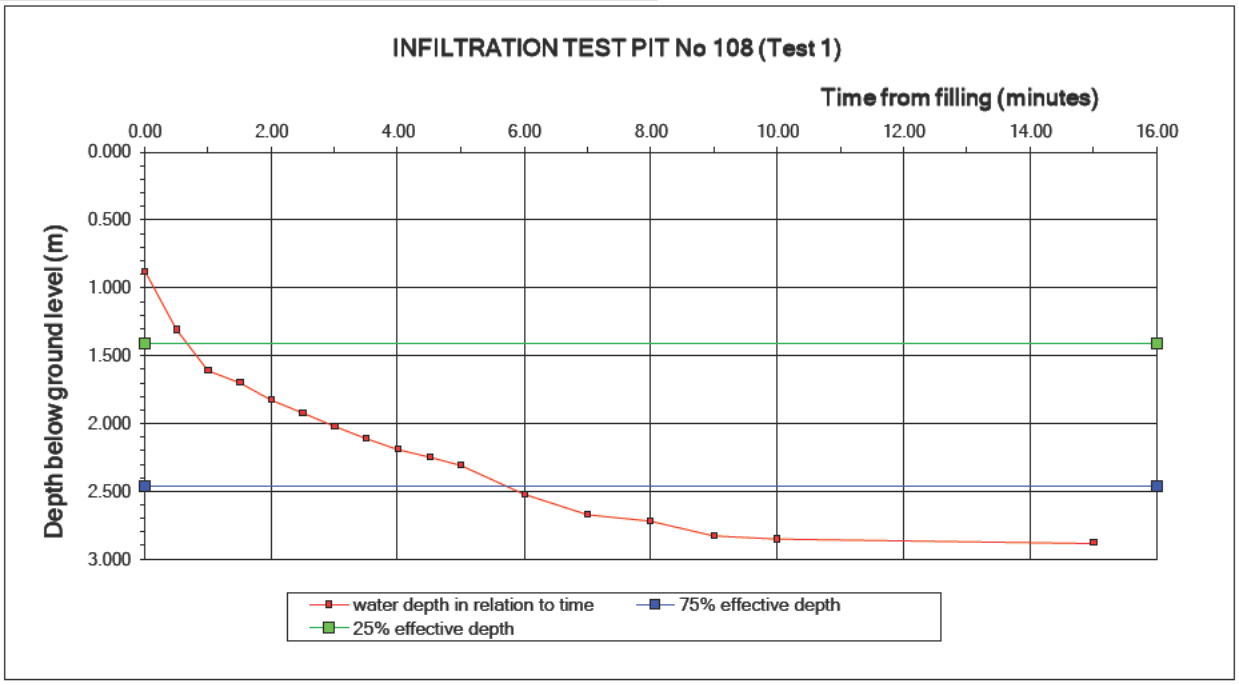
Test Pit Length	2.00	m
Test Pit Width	0.45	m
Test Pit Depth	2.99	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	2.110	m
Total Effective Depth	2.110	m
25% Depth	1.408	m
75% Depth	2.463	m
25% Time	0.66	min
75% Time	5.73	min
Free Volume	0.285	m^3
Surface Area	6.0695	m^2
Time of Outflow	5.06	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**5.56E-01**	**m/hr**
	1.54E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 24 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 108 (Test 2)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.950
0	00	30	0.50	1.100
0	01	00	1.00	1.360
0	01	30	1.50	1.540
0	02	00	2.00	1.740
0	02	30	2.50	1.820
0	03	00	3.00	1.880
0	03	30	3.50	1.990
0	04	00	4.00	2.080
0	04	30	4.50	2.170
0	05	00	5.00	2.260
0	06	00	6.00	2.380
0	07	00	7.00	2.490
0	08	00	8.00	2.540
0	09	00	9.00	2.560

Test Pit Dimensions

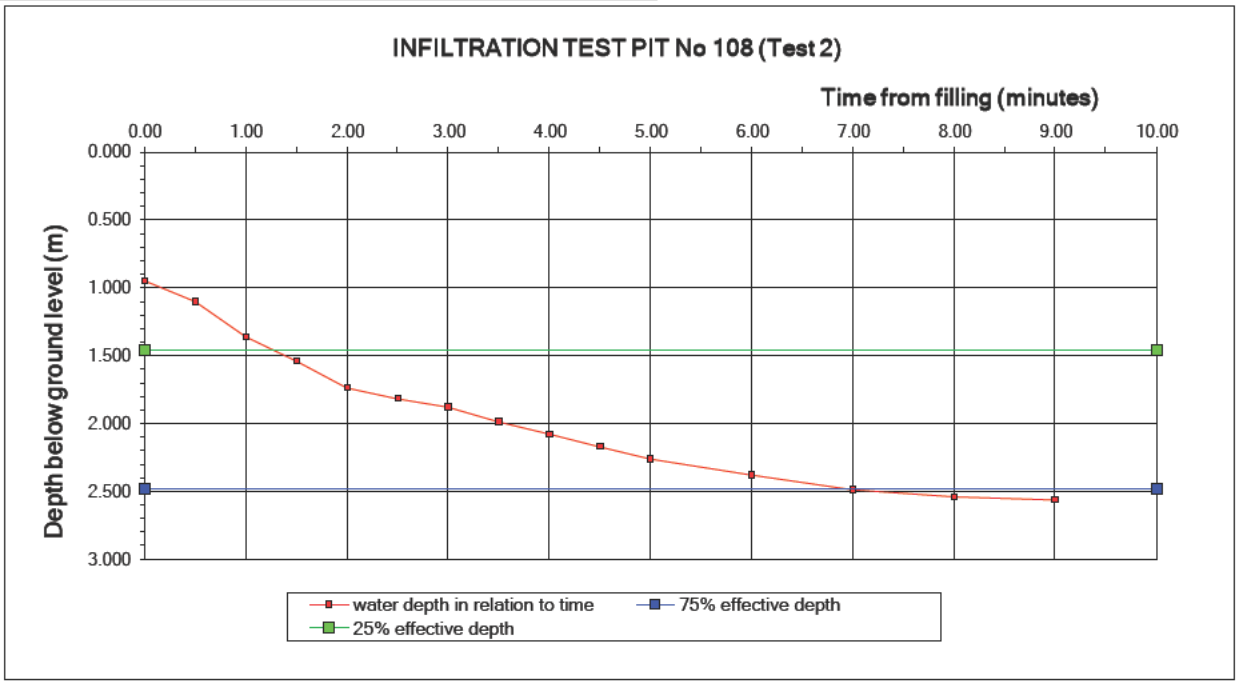
Test Pit Length	2.00	m
Test Pit Width	0.45	m
Test Pit Depth	2.99	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	2.040	m
Total Effective Depth	2.040	m
25% Depth	1.460	m
75% Depth	2.480	m
25% Time	1.28	min
75% Time	6.91	min
Free Volume	0.275	m^3
Surface Area	5.898	m^2
Time of Outflow	5.63	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**4.98E-01**	**m/hr**
	1.38E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 24 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 108 (Test 3)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.920
0	00	30	0.50	1.100
0	01	00	1.00	1.400
0	01	30	1.50	1.520
0	02	00	2.00	1.630
0	02	30	2.50	1.820
0	03	00	3.00	1.930
0	03	30	3.50	2.020
0	04	00	4.00	2.120
0	04	30	4.50	2.170
0	05	00	5.00	2.230
0	06	00	6.00	2.400
0	07	00	7.00	2.510
0	08	00	8.00	2.550

Test Pit Dimensions

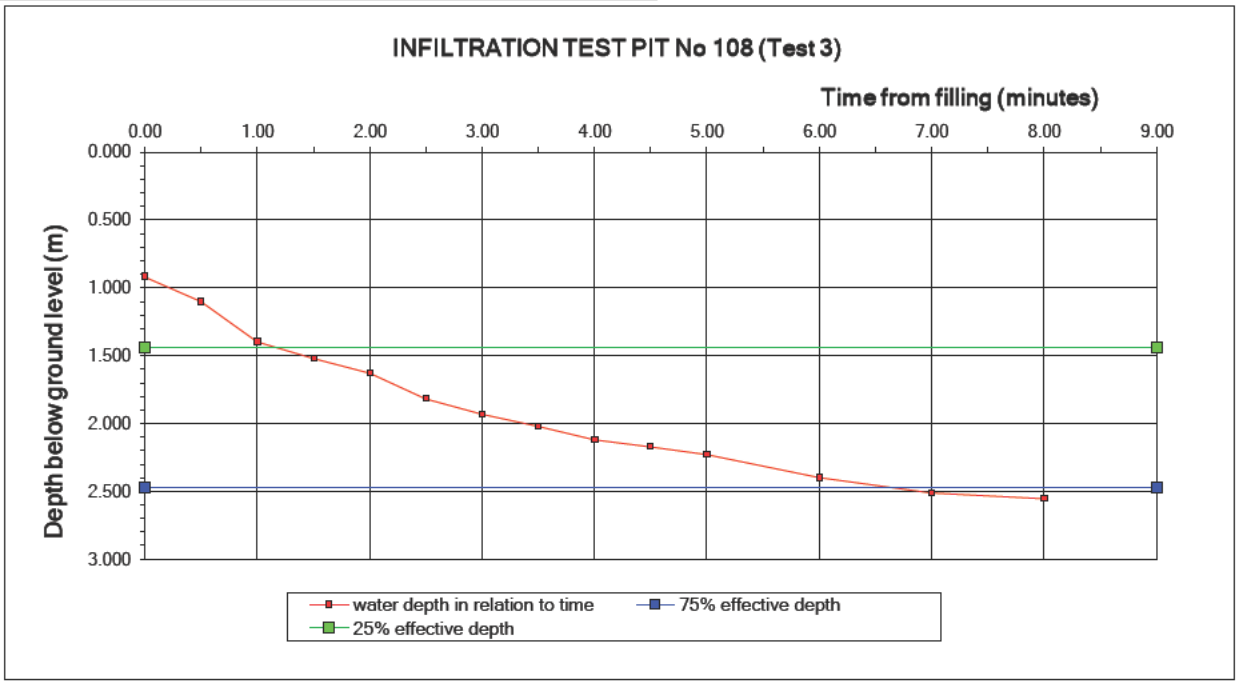
Test Pit Length	2.00	m
Test Pit Width	0.45	m
Test Pit Depth	2.99	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	2.070	m
Total Effective Depth	2.070	m
25% Depth	1.438	m
75% Depth	2.473	m
25% Time	1.16	min
75% Time	6.66	min
Free Volume	0.279	m^3
Surface Area	5.9715	m^2
Time of Outflow	5.50	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**5.10E-01**	**m/hr**
	1.42E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 24 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 109 (Test 1)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	1.020
0	00	30	0.50	1.160
0	01	00	1.00	1.550
0	01	30	1.50	1.700
0	02	00	2.00	1.810
0	02	30	2.50	1.870
0	03	00	3.00	1.980
0	03	30	3.50	2.030
0	04	00	4.00	2.100
0	04	30	4.50	2.210
0	05	00	5.00	2.360
0	06	00	6.00	2.410
0	07	00	7.00	2.450
0	08	00	8.00	2.560

Test Pit Dimensions

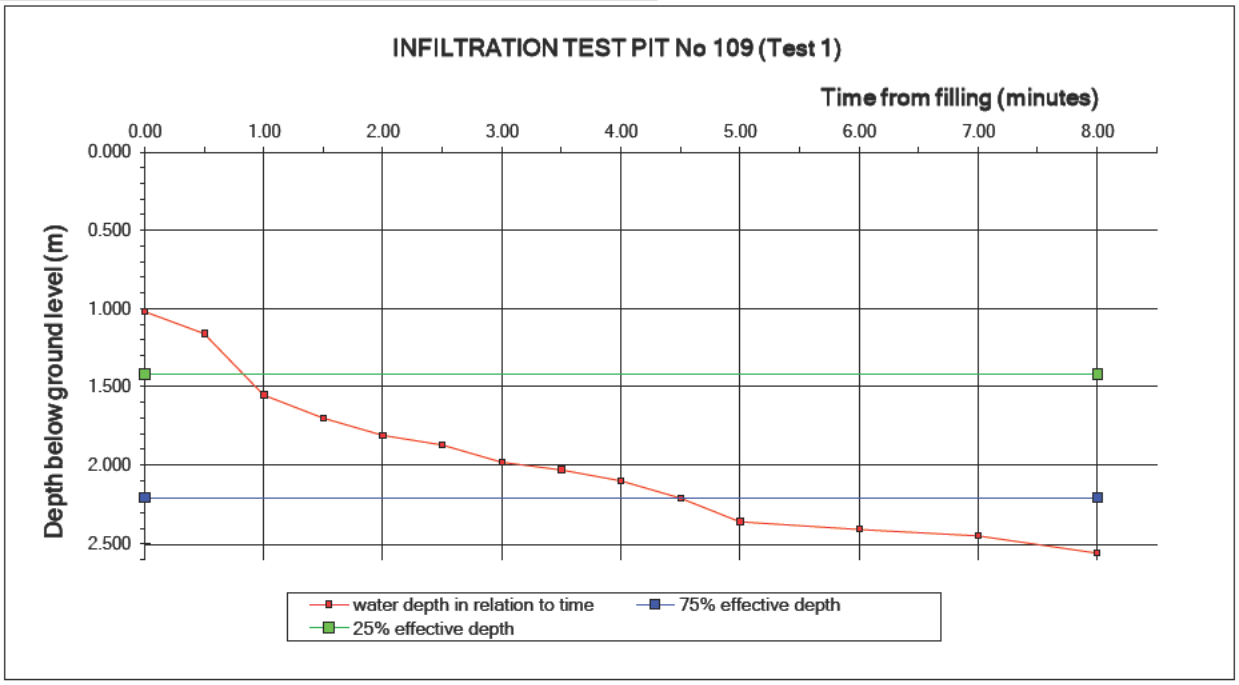
Test Pit Length	2.00	m
Test Pit Width	0.45	m
Test Pit Depth	2.60	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	1.580	m
Total Effective Depth	1.580	m
25% Depth	1.415	m
75% Depth	2.205	m
25% Time	0.83	min
75% Time	4.48	min
Free Volume	0.213	m^3
Surface Area	4.771	m^2
Time of Outflow	3.65	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**7.35E-01**	**m/hr**
	2.04E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 24 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 109 (Test 2)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.750
0	00	30	0.50	0.820
0	01	00	1.00	0.950
0	01	30	1.50	1.050
0	02	00	2.00	1.630
0	02	30	2.50	1.750
0	03	00	3.00	1.850
0	03	30	3.50	1.940
0	04	00	4.00	2.030
0	04	30	4.50	2.060
0	05	00	5.00	2.170
0	06	00	6.00	2.250
0	07	00	7.00	2.280
0	08	00	8.00	2.340
0	09	00	9.00	2.460

Test Pit Dimensions

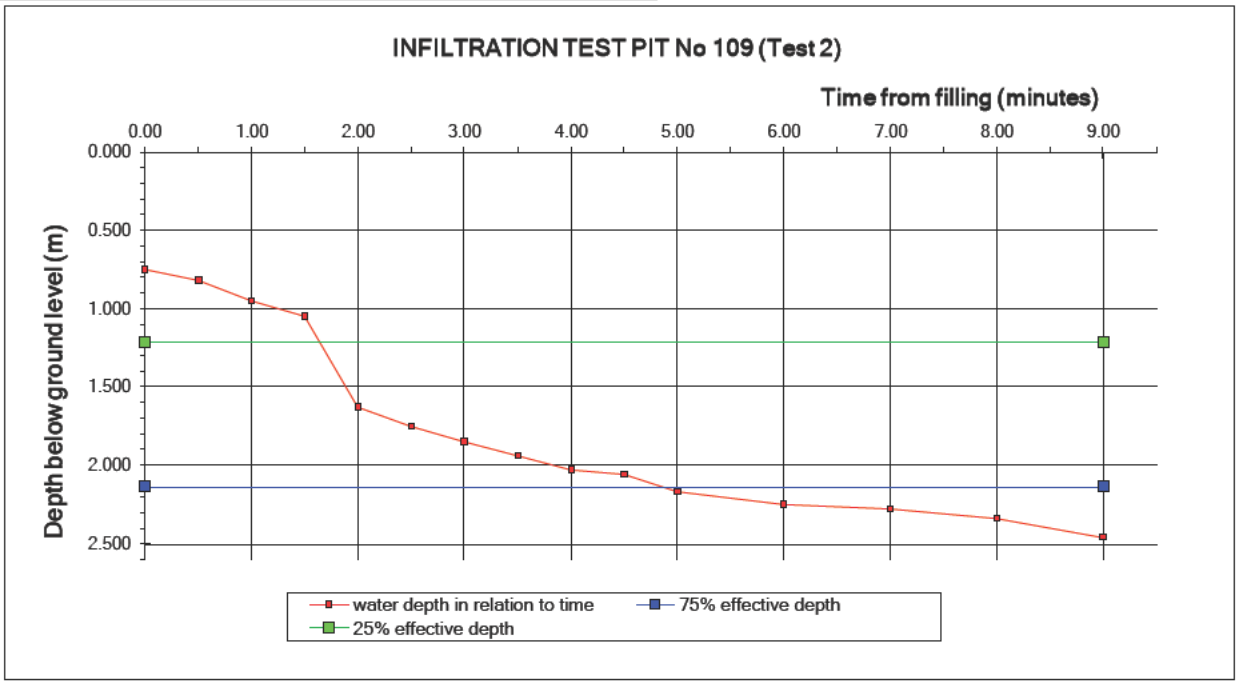
Test Pit Length	2.00	m
Test Pit Width	0.45	m
Test Pit Depth	2.60	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	1.850	m
Total Effective Depth	1.850	m
25% Depth	1.213	m
75% Depth	2.138	m
25% Time	1.64	min
75% Time	4.85	min
Free Volume	0.250	m^3
Surface Area	5.4325	m^2
Time of Outflow	3.21	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**8.59E-01**	**m/hr**
	2.39E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 24 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 109 (Test 3)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.760
0	00	30	0.50	0.870
0	01	00	1.00	0.940
0	01	30	1.50	1.190
0	02	00	2.00	1.550
0	02	30	2.50	1.710
0	03	00	3.00	1.850
0	03	30	3.50	1.910
0	04	00	4.00	1.950
0	04	30	4.50	2.020
0	05	00	5.00	2.060
0	06	00	6.00	2.150
0	07	00	7.00	2.210
0	08	00	8.00	2.290
0	09	00	9.00	2.420

Test Pit Dimensions

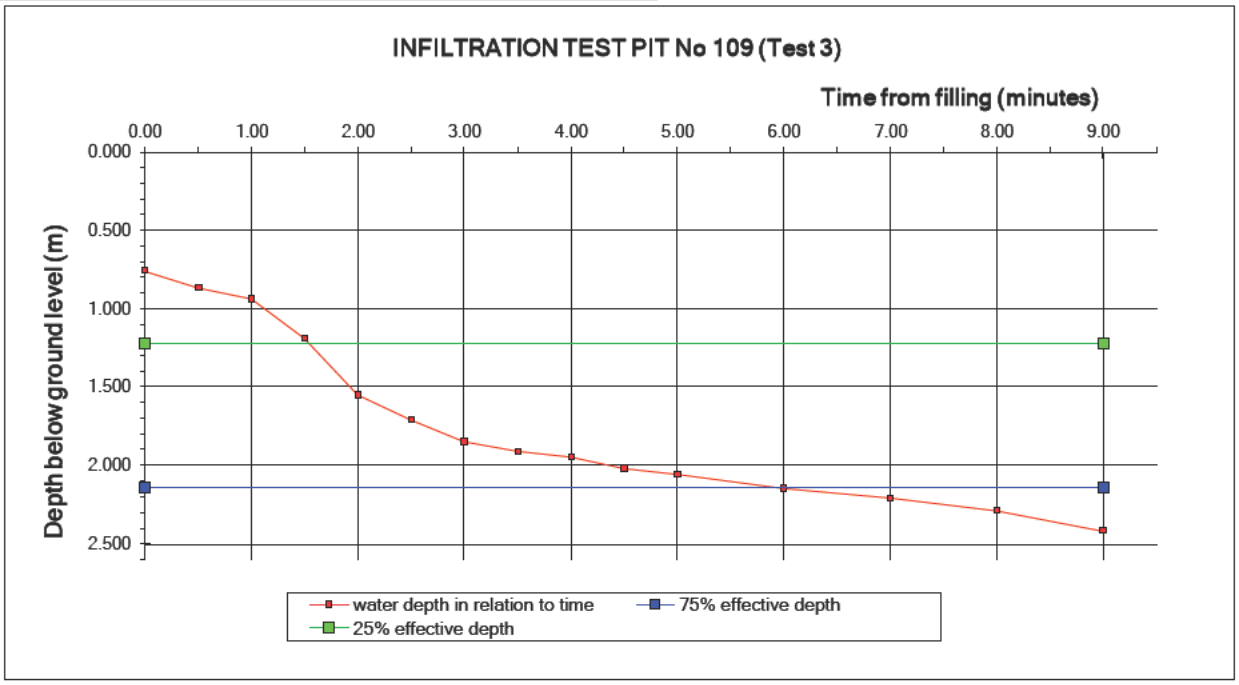
Test Pit Length	2.00	m
Test Pit Width	0.45	m
Test Pit Depth	2.60	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	1.840	m
Total Effective Depth	1.840	m
25% Depth	1.220	m
75% Depth	2.140	m
25% Time	1.54	min
75% Time	5.89	min
Free Volume	0.248	m^3
Surface Area	5.408	m^2
Time of Outflow	4.35	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**6.34E-01**	**m/hr**
	1.76E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 26 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 103 (Test 1)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.970
0	00	30	0.50	1.160
0	01	00	1.00	1.490
0	01	30	1.50	1.690
0	02	00	2.00	1.790
0	02	30	2.50	1.920

Test Pit Dimensions

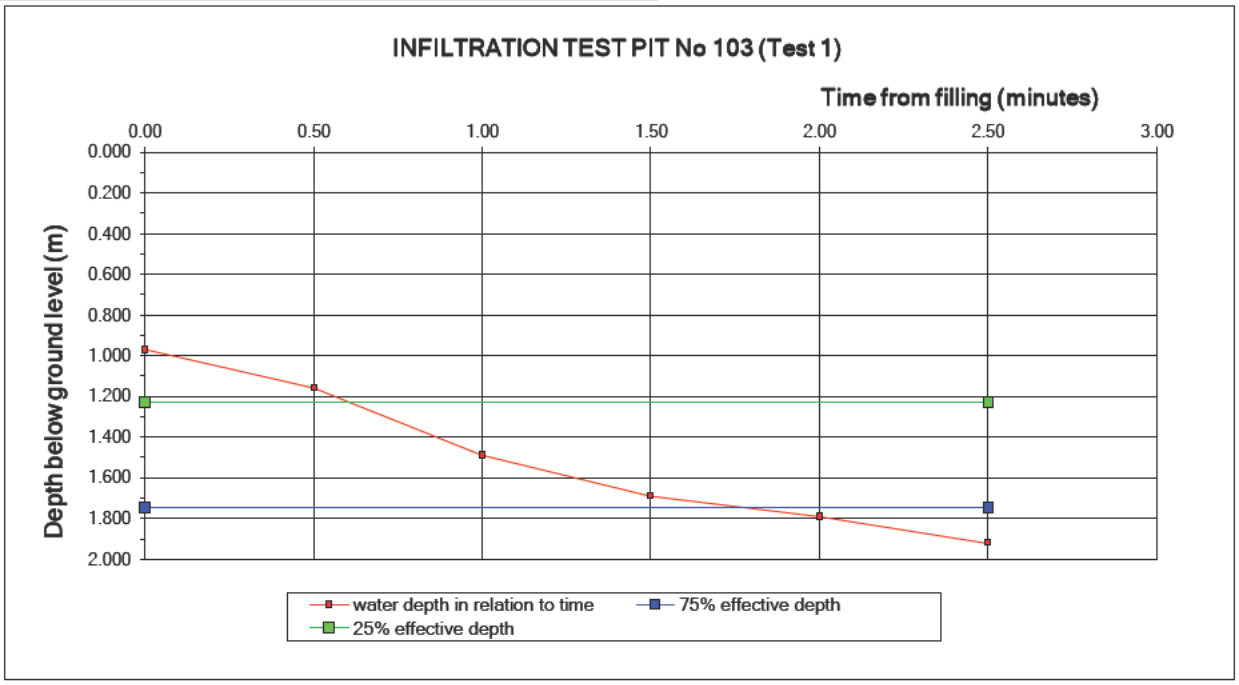
Test Pit Length	2.00	m
Test Pit Width	0.45	m
Test Pit Depth	2.00	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	1.030	m
Total Effective Depth	1.030	m
25% Depth	1.228	m
75% Depth	1.743	m
25% Time	0.60	min
75% Time	1.76	min
Free Volume	0.139	m^3
Surface Area	3.4235	m^2
Time of Outflow	1.16	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**2.10E+00**	**m/hr**
	5.83E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 26 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 103 (Test 2)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.980
0	00	30	0.50	1.080
0	01	00	1.00	1.280
0	01	30	1.50	1.390
0	02	00	2.00	1.460
0	02	30	2.50	1.600
0	03	00	3.00	1.720
0	03	30	3.50	1.900
0	04	00	4.00	2.000

Test Pit Dimensions

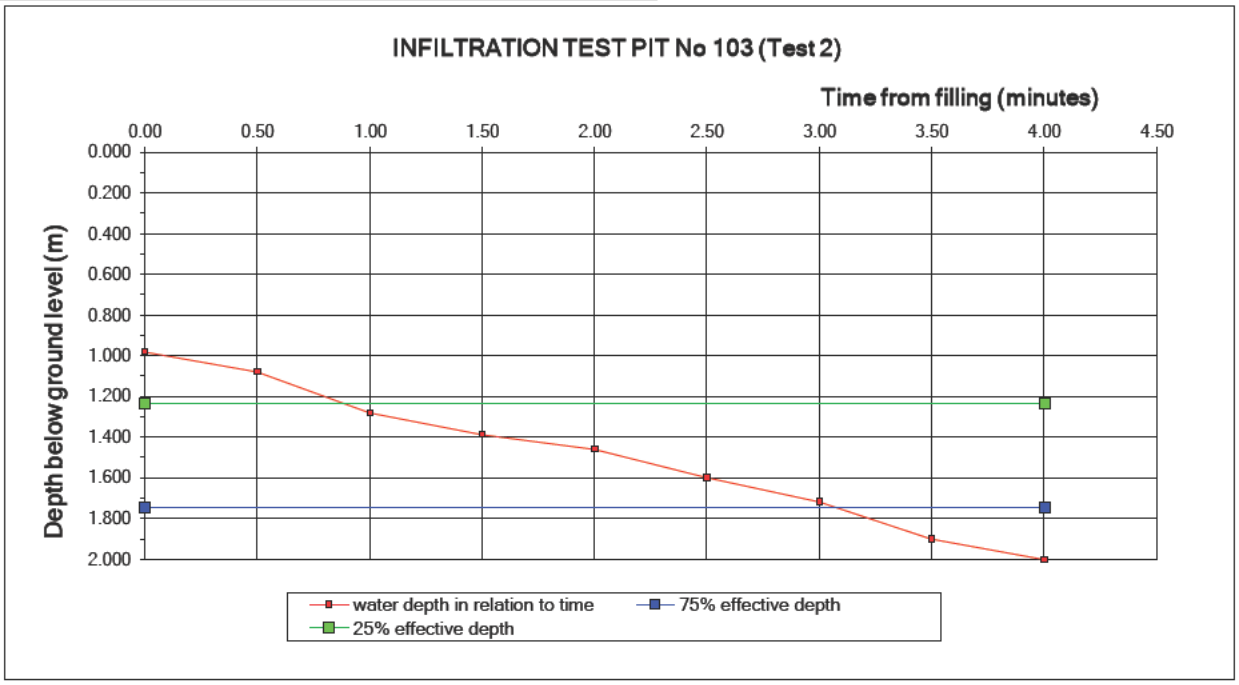
Test Pit Length	2.00	m
Test Pit Width	0.45	m
Test Pit Depth	2.00	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	1.020	m
Total Effective Depth	1.020	m
25% Depth	1.235	m
75% Depth	1.745	m
25% Time	0.89	min
75% Time	3.07	min
Free Volume	0.138	m^3
Surface Area	3.399	m^2
Time of Outflow	2.18	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**1.11E+00**	**m/hr**
	3.09E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 26 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 103 (Test 3)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.970
0	00	30	0.50	1.020
0	01	00	1.00	1.310
0	01	30	1.50	1.430
0	02	00	2.00	1.520
0	02	30	2.50	1.630
0	03	00	3.00	1.700
0	03	30	3.50	1.820
0	04	00	4.00	1.980

Test Pit Dimensions

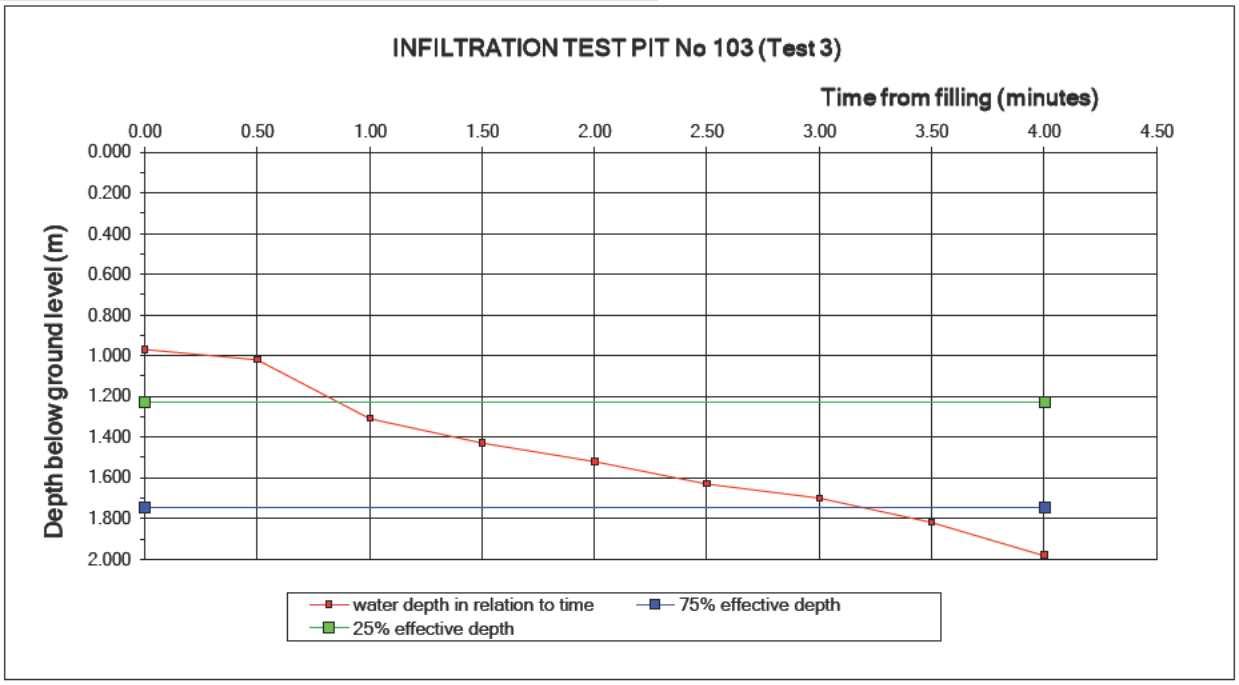
Test Pit Length	2.00	m
Test Pit Width	0.45	m
Test Pit Depth	2.00	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	1.030	m
Total Effective Depth	1.030	m
25% Depth	1.228	m
75% Depth	1.743	m
25% Time	0.86	min
75% Time	3.18	min
Free Volume	0.139	m^3
Surface Area	3.4235	m^2
Time of Outflow	2.32	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**1.05E+00**	**m/hr**
	2.92E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 26 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 106 (Test 1)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.640
0	00	30	0.50	0.820
0	01	00	1.00	1.250
0	01	30	1.50	1.500
0	02	00	2.00	1.640
0	02	30	2.50	1.710
0	03	00	3.00	1.810
0	03	30	3.50	1.830
0	04	00	4.00	1.860
0	04	30	4.50	1.890
0	05	00	5.00	1.920
0	06	00	6.00	1.960

Test Pit Dimensions

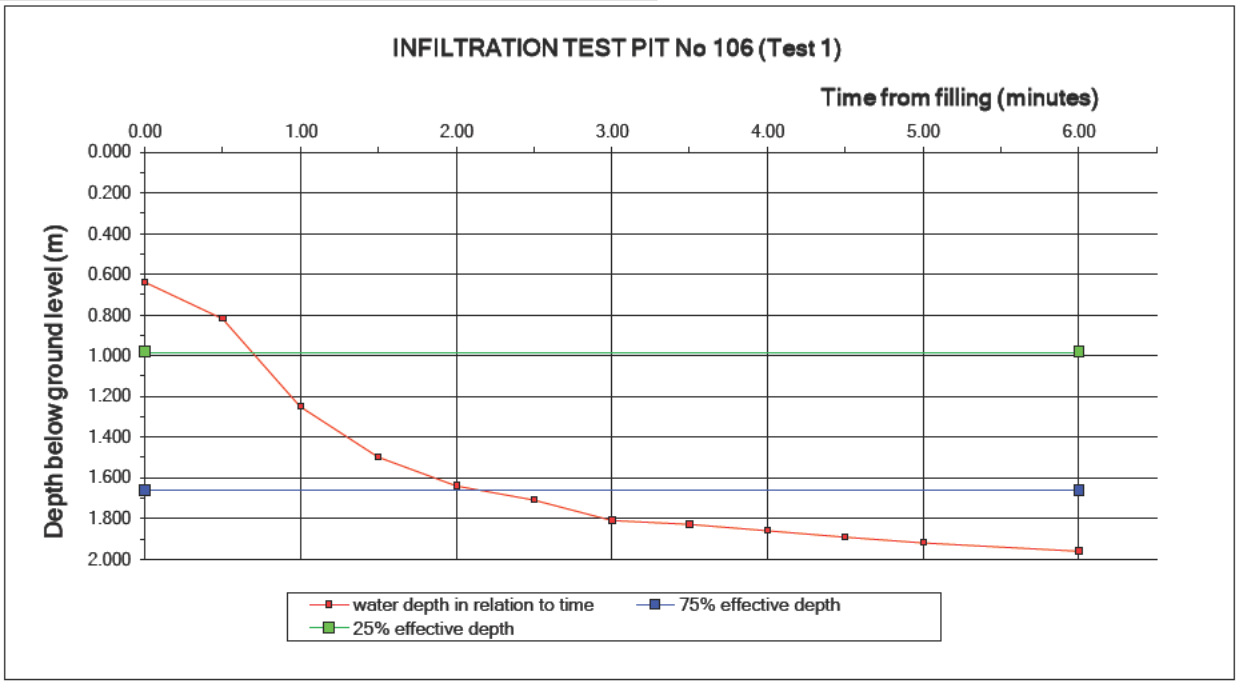
Test Pit Length	1.60	m
Test Pit Width	0.45	m
Test Pit Depth	2.00	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	1.360	m
Total Effective Depth	1.360	m
25% Depth	0.980	m
75% Depth	1.660	m
25% Time	0.69	min
75% Time	2.14	min
Free Volume	0.147	m^3
Surface Area	3.508	m^2
Time of Outflow	1.46	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**1.72E+00**	**m/hr**
	4.79E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 26 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 106 (Test 2)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.600
0	00	30	0.50	0.850
0	01	00	1.00	1.140
0	01	30	1.50	1.310
0	02	00	2.00	1.420
0	02	30	2.50	1.520
0	03	00	3.00	1.580
0	03	30	3.50	1.640
0	04	00	4.00	1.700
0	04	30	4.50	1.750
0	05	00	5.00	1.770
0	06	00	6.00	1.820

Test Pit Dimensions

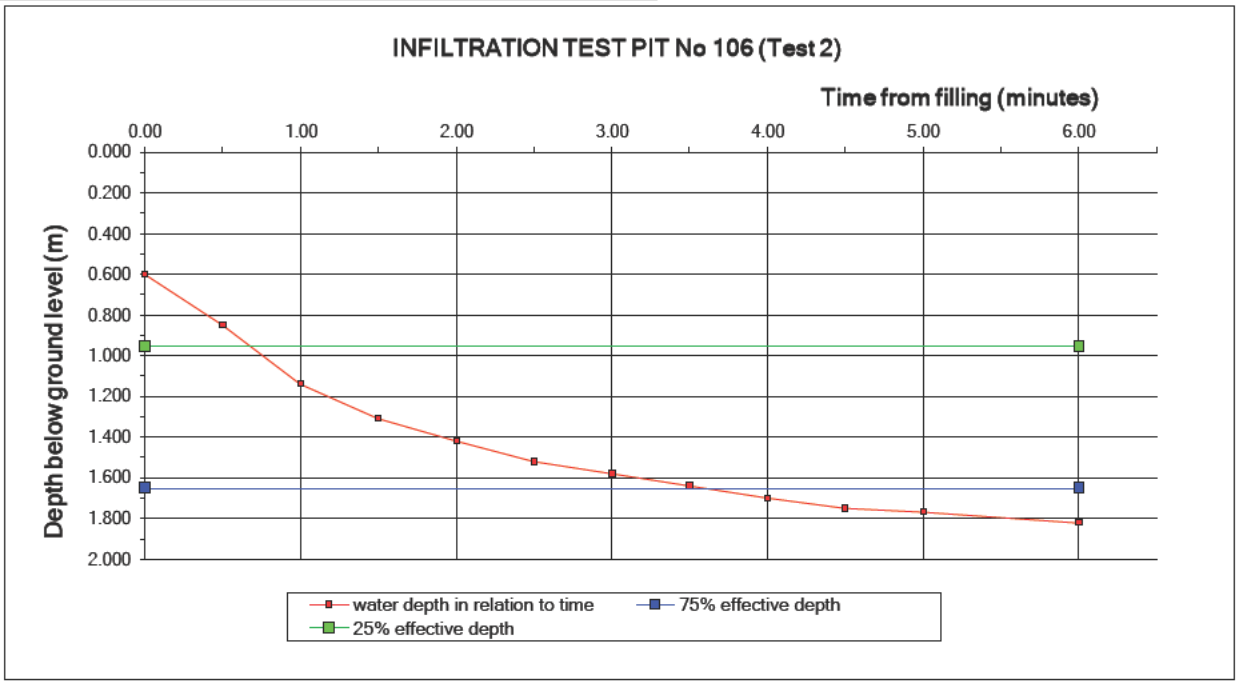
Test Pit Length	1.60	m
Test Pit Width	0.45	m
Test Pit Depth	2.00	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	1.400	m
Total Effective Depth	1.400	m
25% Depth	0.950	m
75% Depth	1.650	m
25% Time	0.67	min
75% Time	3.58	min
Free Volume	0.151	m^3
Surface Area	3.59	m^2
Time of Outflow	2.91	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**8.68E-01**	**m/hr**
	2.41E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 26 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 106 (Test 3)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.500
0	00	30	0.50	0.830
0	01	00	1.00	1.030
0	01	30	1.50	1.220
0	02	00	2.00	1.340
0	02	30	2.50	1.450
0	03	00	3.00	1.510
0	03	30	3.50	1.570
0	04	00	4.00	1.610
0	04	30	4.50	1.680
0	05	00	5.00	1.710
0	06	00	6.00	1.770
0	07	00	7.00	1.810

Test Pit Dimensions

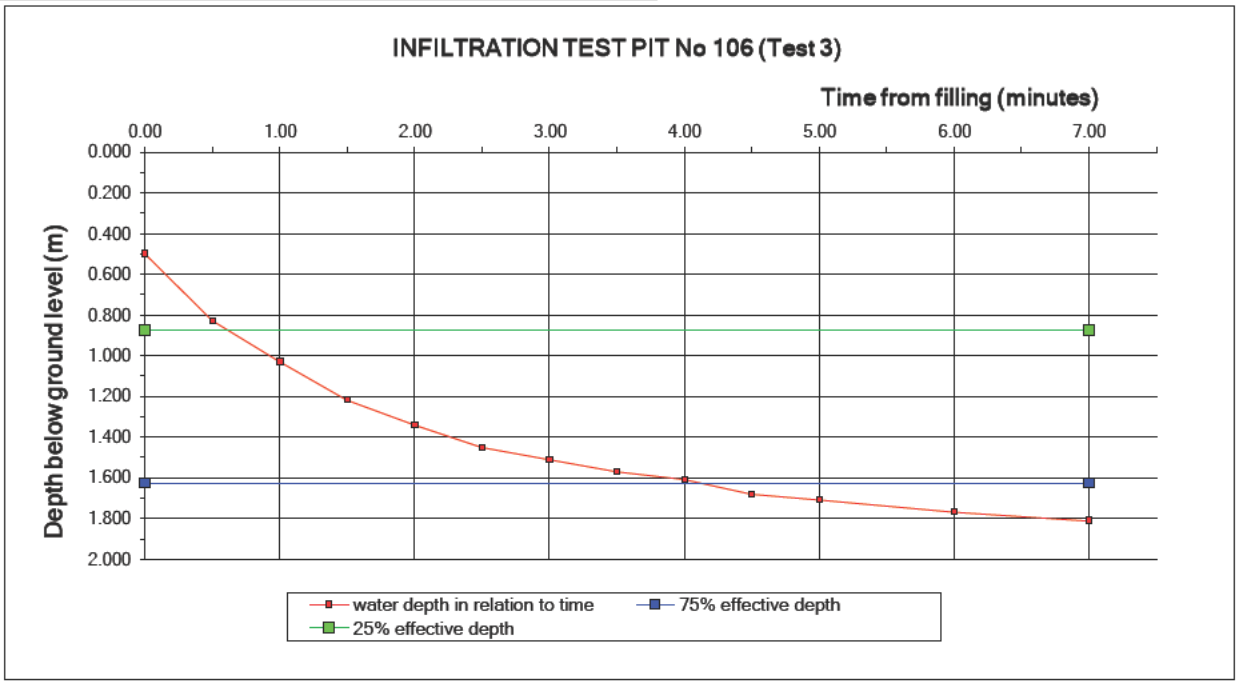
Test Pit Length	1.60	m
Test Pit Width	0.45	m
Test Pit Depth	2.00	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	1.500	m
Total Effective Depth	1.500	m
25% Depth	0.875	m
75% Depth	1.625	m
25% Time	0.61	min
75% Time	4.11	min
Free Volume	0.162	m^3
Surface Area	3.795	m^2
Time of Outflow	3.49	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**7.33E-01**	**m/hr**
	2.04E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 26 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 107 (Test 1)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.450
0	00	30	0.50	0.480
0	01	00	1.00	0.500
0	01	30	1.50	0.500
0	02	00	2.00	0.500
0	02	30	2.50	0.500
0	03	00	3.00	0.500
0	03	30	3.50	0.500
0	04	00	4.00	0.500
0	04	30	4.50	0.500
0	05	00	5.00	0.500
0	06	00	6.00	0.500
0	07	00	7.00	0.510
0	08	00	8.00	0.510
0	09	00	9.00	0.520
0	10	00	10.00	0.520
0	15	00	15.00	0.530
0	20	00	20.00	0.540
0	25	00	25.00	0.540
0	30	00	30.00	0.550
0	42	00	42.00	0.550
0	50	00	50.00	0.550
1	00	00	60.00	0.550
1	10	00	70.00	0.560
1	20	00	80.00	0.570
1	30	00	90.00	0.570
1	40	00	100.00	0.580
2	00	00	120.00	0.590
2	20	00	140.00	0.600
2	40	00	160.00	0.600
3	00	00	180.00	0.610
3	20	00	200.00	0.610
74	30	00	4470.00	0.980

Test Pit Dimensions

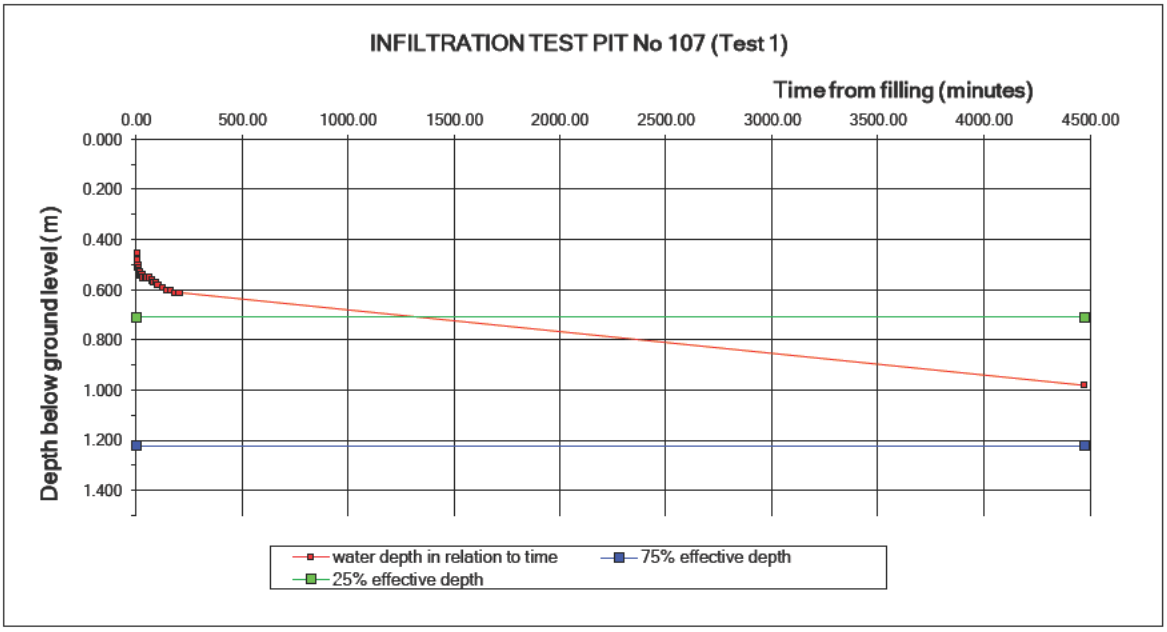
Test Pit Length	1.60	m
Test Pit Width	0.45	m
Test Pit Depth	1.48	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	1.030	m
Total Effective Depth	1.030	m
25% Depth	0.708	m
75% Depth	1.223	m
25% Time	1325.20	min
75% Time	FAIL	min
Free Volume	FAIL	m^3
Surface Area	FAIL	m^2
Time of Outflow	FAIL	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**N/A**	**m/hr**
	N/A	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 29 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 104 (Test 1)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.650
0	00	30	0.50	0.810
0	01	00	1.00	0.920
0	01	30	1.50	1.160
0	02	00	2.00	1.270
0	02	30	2.50	1.320
0	03	00	3.00	1.390
0	03	30	3.50	1.450
0	04	00	4.00	1.510
0	04	30	4.50	1.630
0	05	00	5.00	1.690
0	06	00	6.00	1.860

Test Pit Dimensions

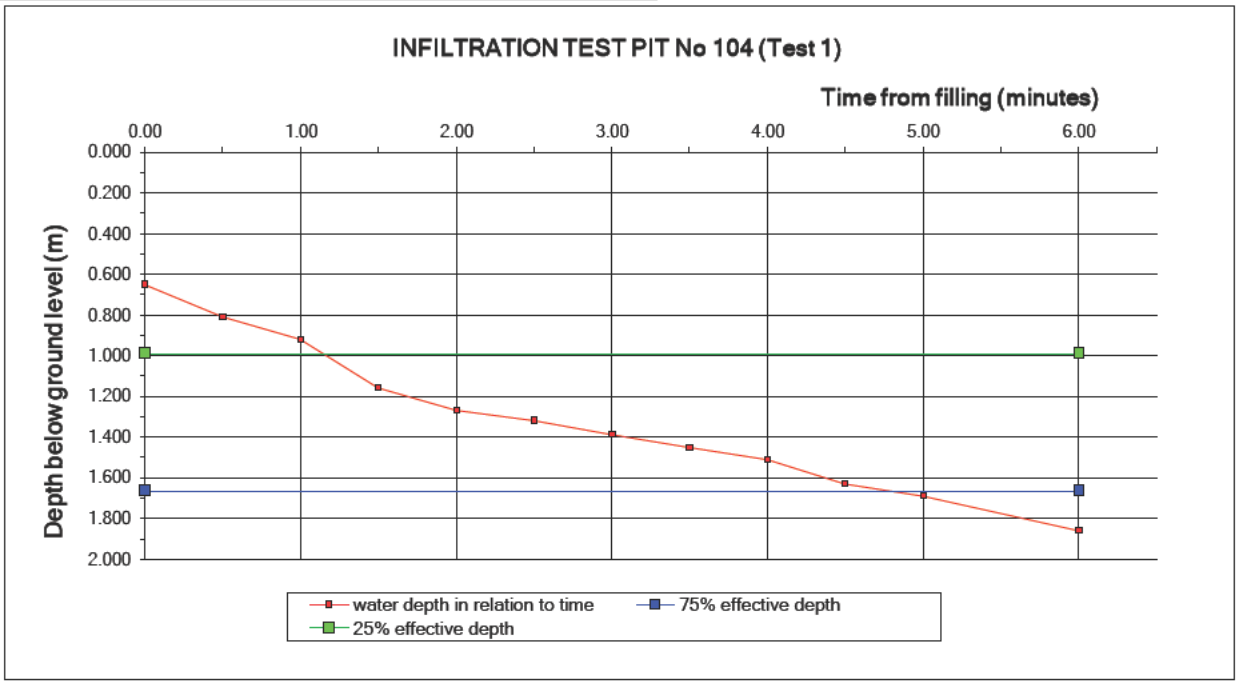
Test Pit Length	1.60	m
Test Pit Width	0.45	m
Test Pit Depth	2.00	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	1.350	m
Total Effective Depth	1.350	m
25% Depth	0.988	m
75% Depth	1.663	m
25% Time	1.14	min
75% Time	4.77	min
Free Volume	0.146	m^3
Surface Area	3.4875	m^2
Time of Outflow	3.63	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**6.91E-01**	**m/hr**
	1.92E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 29 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 104 (Test 2)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.780
0	00	30	0.50	0.860
0	01	00	1.00	1.060
0	01	30	1.50	1.210
0	02	00	2.00	1.320
0	02	30	2.50	1.460
0	03	00	3.00	1.580
0	03	30	3.50	1.640
0	04	00	4.00	1.750
0	04	30	4.50	1.790

Test Pit Dimensions

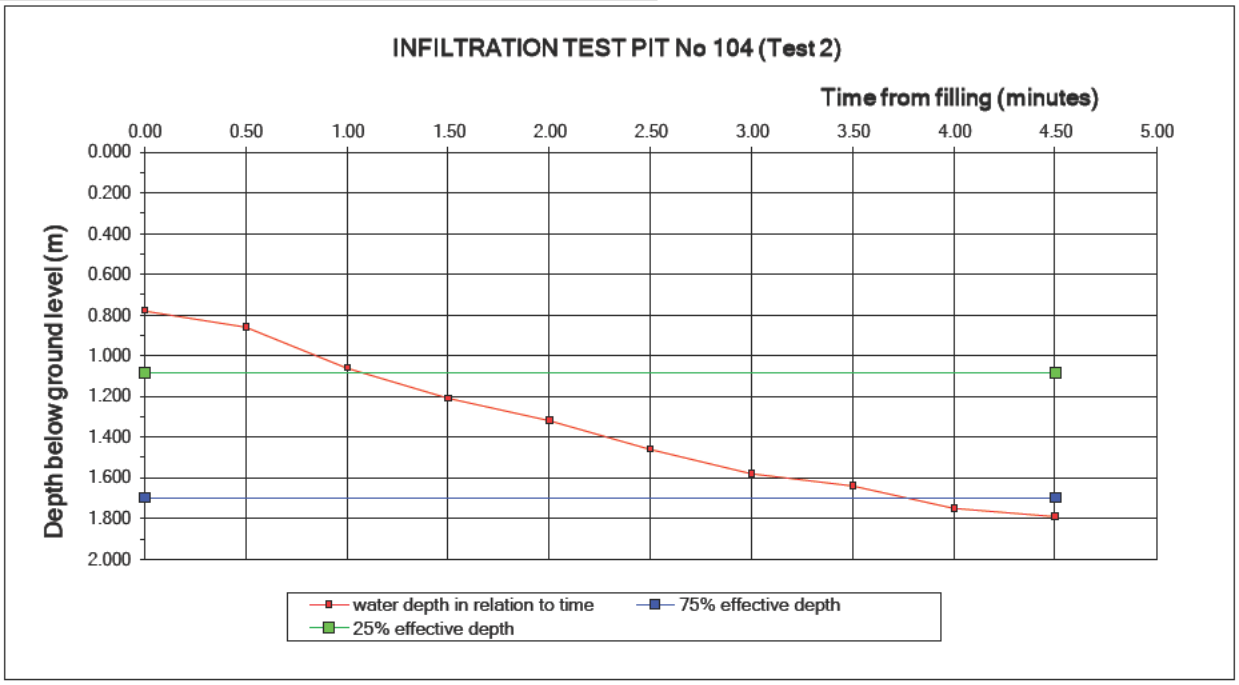
Test Pit Length	1.60	m
Test Pit Width	0.45	m
Test Pit Depth	2.00	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	1.220	m
Total Effective Depth	1.220	m
25% Depth	1.085	m
75% Depth	1.695	m
25% Time	1.08	min
75% Time	3.75	min
Free Volume	0.132	m^3
Surface Area	3.221	m^2
Time of Outflow	2.67	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**9.20E-01**	**m/hr**
	2.56E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 29 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 104 (Test 3)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.610
0	00	30	0.50	0.720
0	01	00	1.00	0.910
0	01	30	1.50	1.060
0	02	00	2.00	1.150
0	02	30	2.50	1.240
0	03	00	3.00	1.370
0	03	30	3.50	1.460
0	04	00	4.00	1.540
0	04	30	4.50	1.600
0	05	00	5.00	1.660
0	06	00	6.00	1.710

Test Pit Dimensions

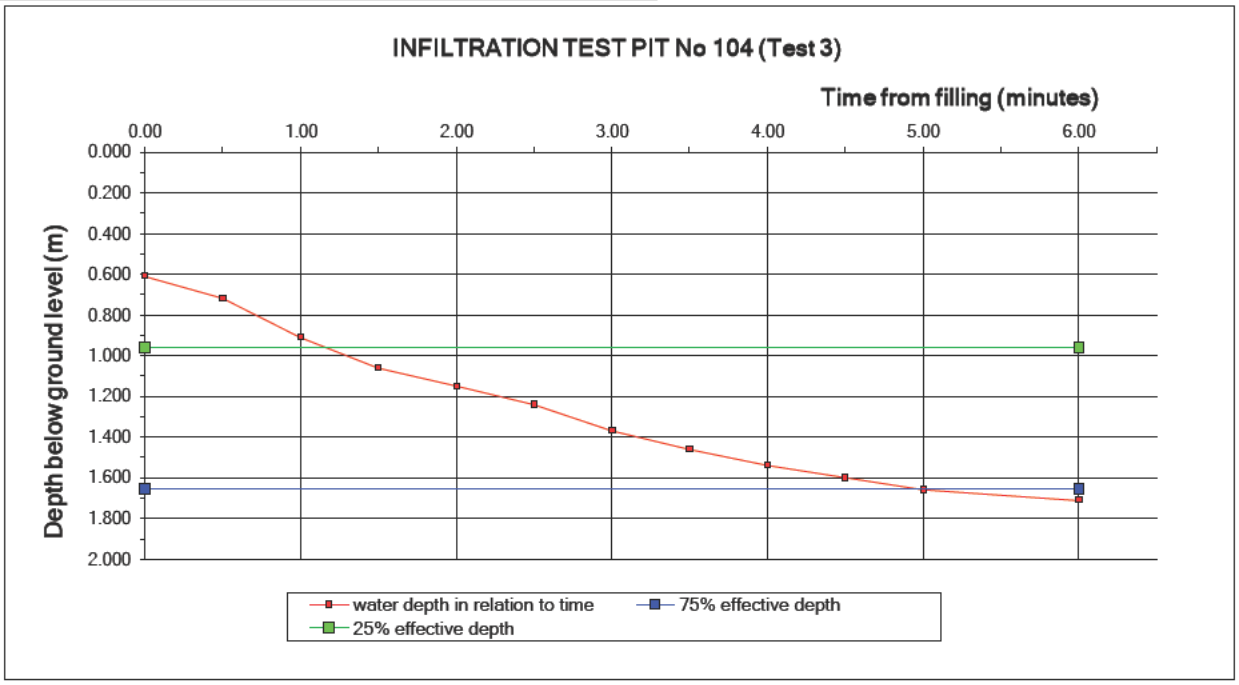
Test Pit Length	1.60	m
Test Pit Width	0.45	m
Test Pit Depth	2.00	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	1.390	m
Total Effective Depth	1.390	m
25% Depth	0.958	m
75% Depth	1.653	m
25% Time	1.16	min
75% Time	4.94	min
Free Volume	0.150	m^3
Surface Area	3.5695	m^2
Time of Outflow	3.78	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**6.68E-01**	**m/hr**
	1.85E-04	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 29 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 105 (Test 1)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.520
0	00	30	0.50	0.780
0	01	00	1.00	1.240
0	01	30	1.50	1.320
0	02	00	2.00	1.360
0	02	30	2.50	1.430
0	03	00	3.00	1.450
0	03	30	3.50	1.460
0	04	00	4.00	1.480
0	04	30	4.50	1.490
0	05	00	5.00	1.500
0	06	00	6.00	1.530
0	07	00	7.00	1.580
0	08	00	8.00	1.600
0	09	00	9.00	1.620
0	10	00	10.00	1.640

Test Pit Dimensions

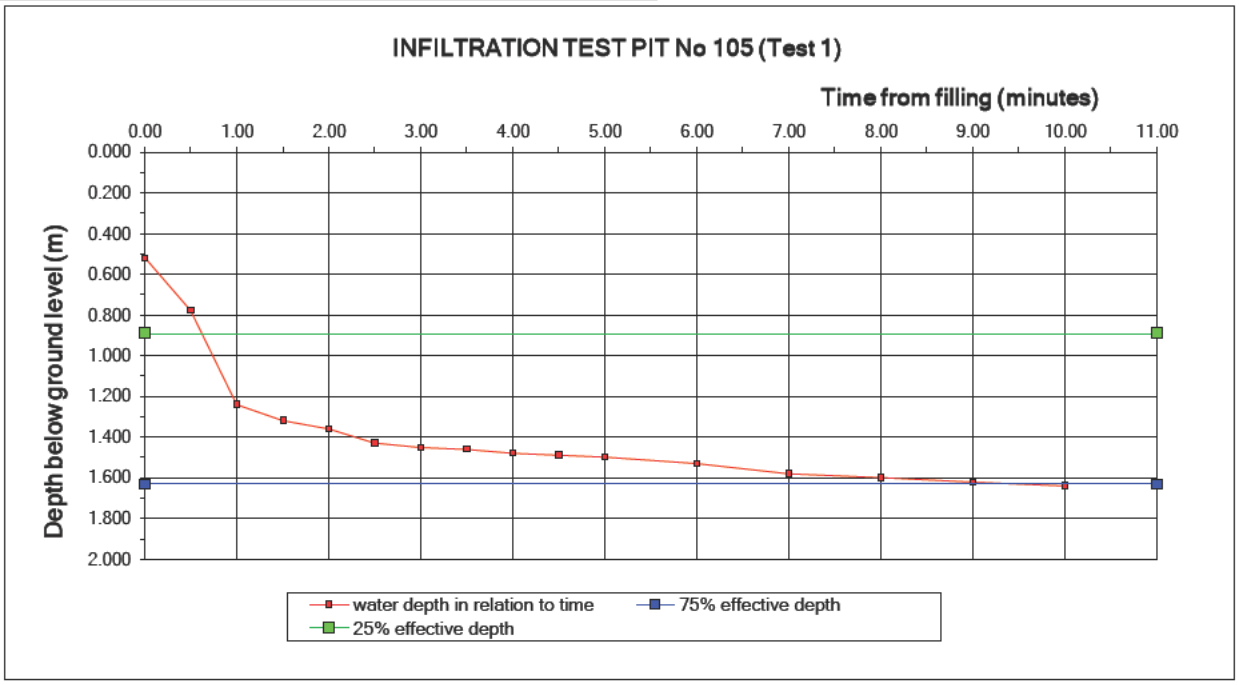
Test Pit Length	1.60	m
Test Pit Width	0.45	m
Test Pit Depth	2.00	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	1.480	m
Total Effective Depth	1.480	m
25% Depth	0.890	m
75% Depth	1.630	m
25% Time	0.62	min
75% Time	9.50	min
Free Volume	0.160	m^3
Surface Area	3.754	m^2
Time of Outflow	8.88	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**2.88E-01**	**m/hr**
	7.99E-05	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 29 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 105 (Test 2)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.500
0	00	30	0.50	0.560
0	01	00	1.00	0.660
0	01	30	1.50	0.740
0	02	00	2.00	0.760
0	02	30	2.50	0.780
0	03	00	3.00	0.910
0	03	30	3.50	0.940
0	04	00	4.00	0.990
0	04	30	4.50	1.020
0	05	00	5.00	1.050
0	06	00	6.00	1.120
0	07	00	7.00	1.170
0	08	00	8.00	1.210
0	09	00	9.00	1.250
0	10	00	10.00	1.280
0	15	00	15.00	1.480
0	20	00	20.00	1.600
0	25	00	25.00	1.690

Test Pit Dimensions

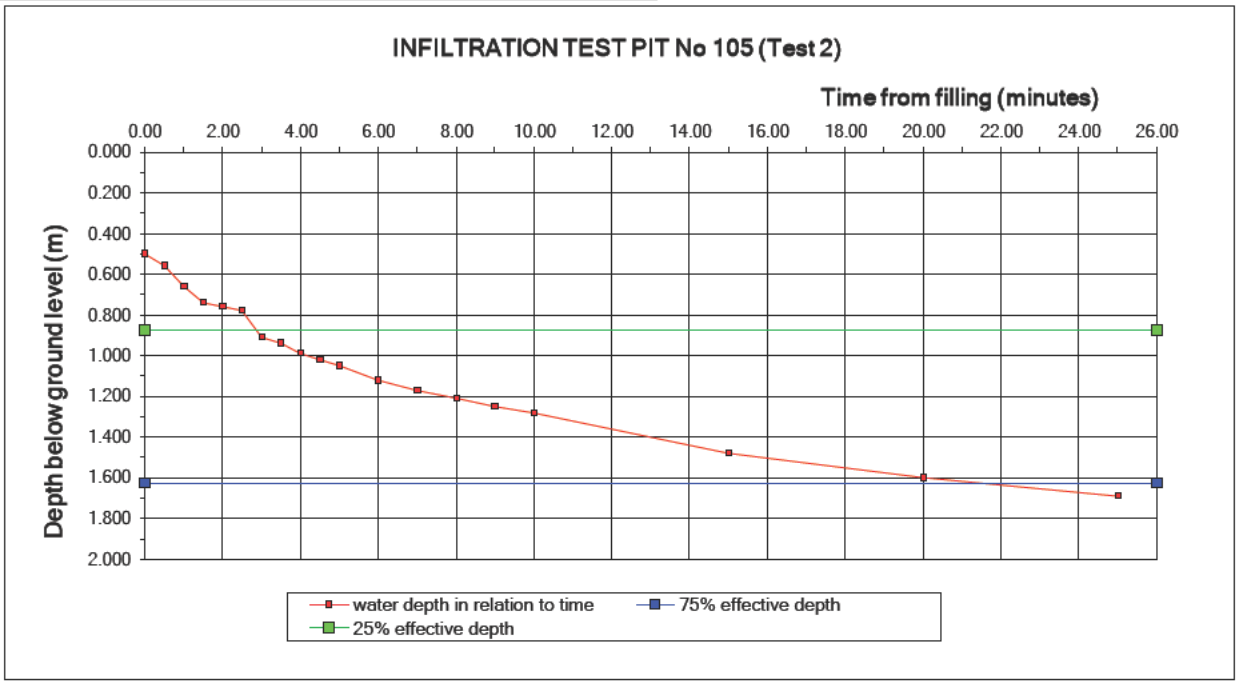
Test Pit Length	1.60	m
Test Pit Width	0.45	m
Test Pit Depth	2.00	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	1.500	m
Total Effective Depth	1.500	m
25% Depth	0.875	m
75% Depth	1.625	m
25% Time	2.87	min
75% Time	21.39	min
Free Volume	0.162	m^3
Surface Area	3.795	m^2
Time of Outflow	18.52	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**1.38E-01**	**m/hr**
	3.84E-05	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

coopers

chartered consulting engineers

Date of Test: 29 June 2026

Produced by: L Buxton

Project Ref: 8525

STANSTY CHAIN ROAD, WREXHAM

INFILTRATION TEST PIT No 105 (Test 3)

Time of reading			Absolute Time	Depth below Ground level
hrs	min	sec	mins	m
0	00	00	0.00	0.460
0	00	30	0.50	0.490
0	01	00	1.00	0.540
0	01	30	1.50	0.640
0	02	00	2.00	0.690
0	02	30	2.50	0.730
0	03	00	3.00	0.780
0	03	30	3.50	0.820
0	04	00	4.00	0.850
0	04	30	4.50	0.910
0	05	00	5.00	0.960
0	06	00	6.00	1.010
0	07	00	7.00	1.050
0	08	00	8.00	1.110
0	09	00	9.00	1.150
0	10	00	10.00	1.170
0	15	00	15.00	1.300
0	20	00	20.00	1.350
0	25	00	25.00	1.530
0	30	00	30.00	1.620
0	40	00	40.00	1.720

Test Pit Dimensions

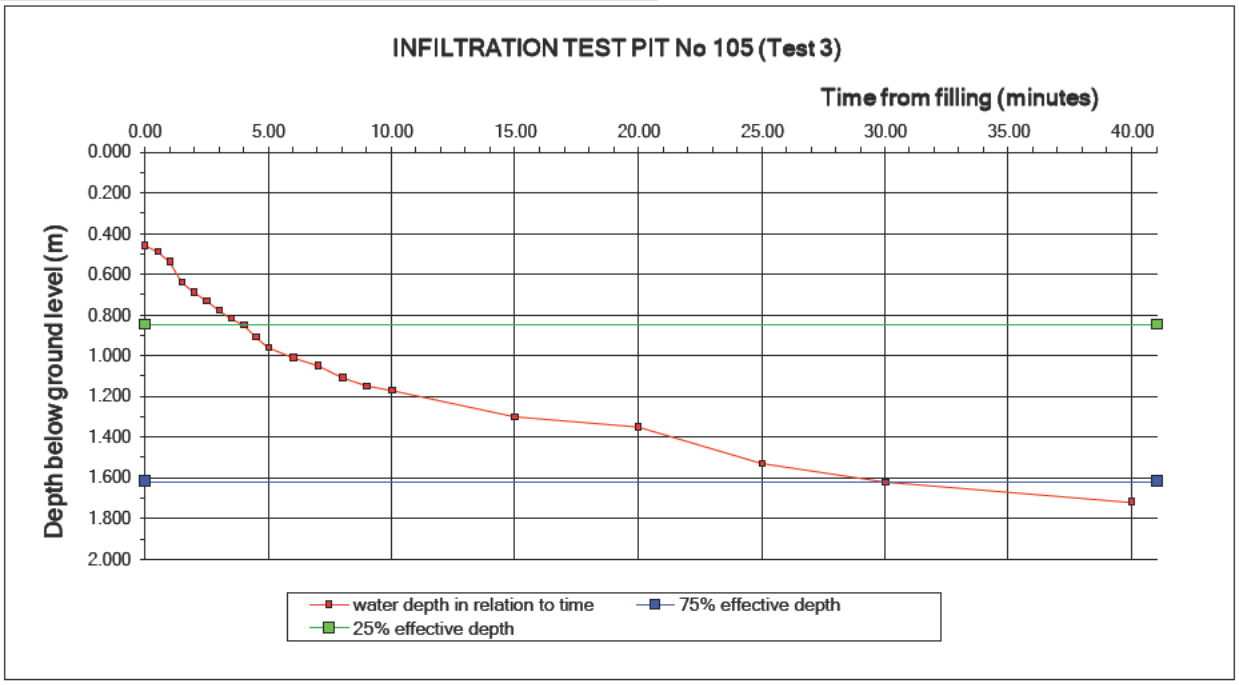
Test Pit Length	1.60	m
Test Pit Width	0.45	m
Test Pit Depth	2.00	m
Standing Water Level (during excavation)		m

Infiltration Parameters

Total Depth	1.540	m
Total Effective Depth	1.540	m
25% Depth	0.845	m
75% Depth	1.615	m
25% Time	3.92	min
75% Time	29.72	min
Free Volume	0.166	m^3
Surface Area	3.877	m^2
Time of Outflow	25.81	min

Calculation Parameters

Void Ratio (gravel)	0.30
TWL prior to 1st filling	No
Effective depth on TWL	Yes



Soil infiltration Rate	**9.97E-02**	**m/hr**
	2.77E-05	**m/sec**

Park House, Sandpiper Court,
Chester Business Park,
Chester, CH4 9QU

COOPERS is the trading name of Coopers (Chester) Limited.
Company registered in England & Wales.
Company number 09730429.

tel: 01244 684 910
web: www.coopers.co.uk
email: admin@coopers.co.uk

Appendix 4

Correspondence

Dwr Cymru Welsh Water

Wrexham County Borough Council

Natural Resources Wales

Andy Jones

From: Sewerage Services <Sewerage.Services@dwrcymru.com>
Sent: 02 June 2026 09:12
To: Andy Jones
Subject: Our reference: 3473759

Sensitivity: Confidential

You don't often get email from sewerage.services@dwrcymru.com. Learn why this is important

Good morning Andy,

Thank you for your enquiry regarding the land either side of Stansty Chain Road, Wrexham.

I have carried out a search of our records and can confirm that we do not hold any history of sewer flooding within this postcode area.

Please note we can only comment on flooding relating to our public sewer network, and we do not hold records for other sources of flooding.

I hope this information is helpful for your Flood Consequences Assessment. If you require anything further, please feel free to get in touch.

Kind regards,

Jennifer Thomas
Customer Care Officer | Dwr Cymru Welsh Water
Linea | Cardiff | www.dwrcymru.com

We take compliance with Data Protection seriously at Welsh Water. For more information on how we use your Personal Information please click here for our Privacy Notice www.dwrcymru.com/legal-privacy or call us on 0800 052 0145 to ask us to send you a copy in the post.

_____ Dwr Cymru Welsh Water is firmly committed to water conservation and promoting water efficiency. Please log on to our website www.dwrcymru.com/waterefficiency to find out how you can become water wise. Mae Dwr Cymru Welsh Water wedi ymrwymo i warchod adnoddau dwr a hyrwyddo defnydd dwr effeithiol. Mae cyngor i' ch helpu i ddefnyddio dwr yn ddoeth yn www.dwrcymru.com/waterefficiency

_____
********** This email and any file attached is confidential. If you are not a named recipient or believe you may have received this email in error please delete from your system and promptly inform the sender. Dwr Cymru Cyf (trading as Welsh Water) is a company registered in England and Wales, number 02366777, registered office Linea, Fortran Road, St Mellons, Cardiff CF3 0LT. Mae'r neges e-bost yma ac unrhyw ffeil sydd ynghlwm wrthi'n gyfrinachol. Os nad chi yw'r derbynnydd a enwir, neu os ydych chi'n credu eich bod wedi derbyn y neges yma ar gam, dylech ei dileu o'ch system ar unwaith a hysbysu'r anfonwr. Cwmni sydd wedi ei gofrestru yng Nghymru yw Dŵr Cymru Cyf (yn masnachu fel Dŵr Cymru), ei rif cofrestredig yw 02366777, ,, ac mae ei swyddfa gofrestredig yn Linea, Heol Fortran, Llaneirwg, Caerdydd, CF3 0LT. **********

Andy Jones

From: Andy Jones
Sent: 26 May 2026 16:36
To: SAB
Cc: JamesM Davies
Subject: FW: FCA – Flood Enquiry

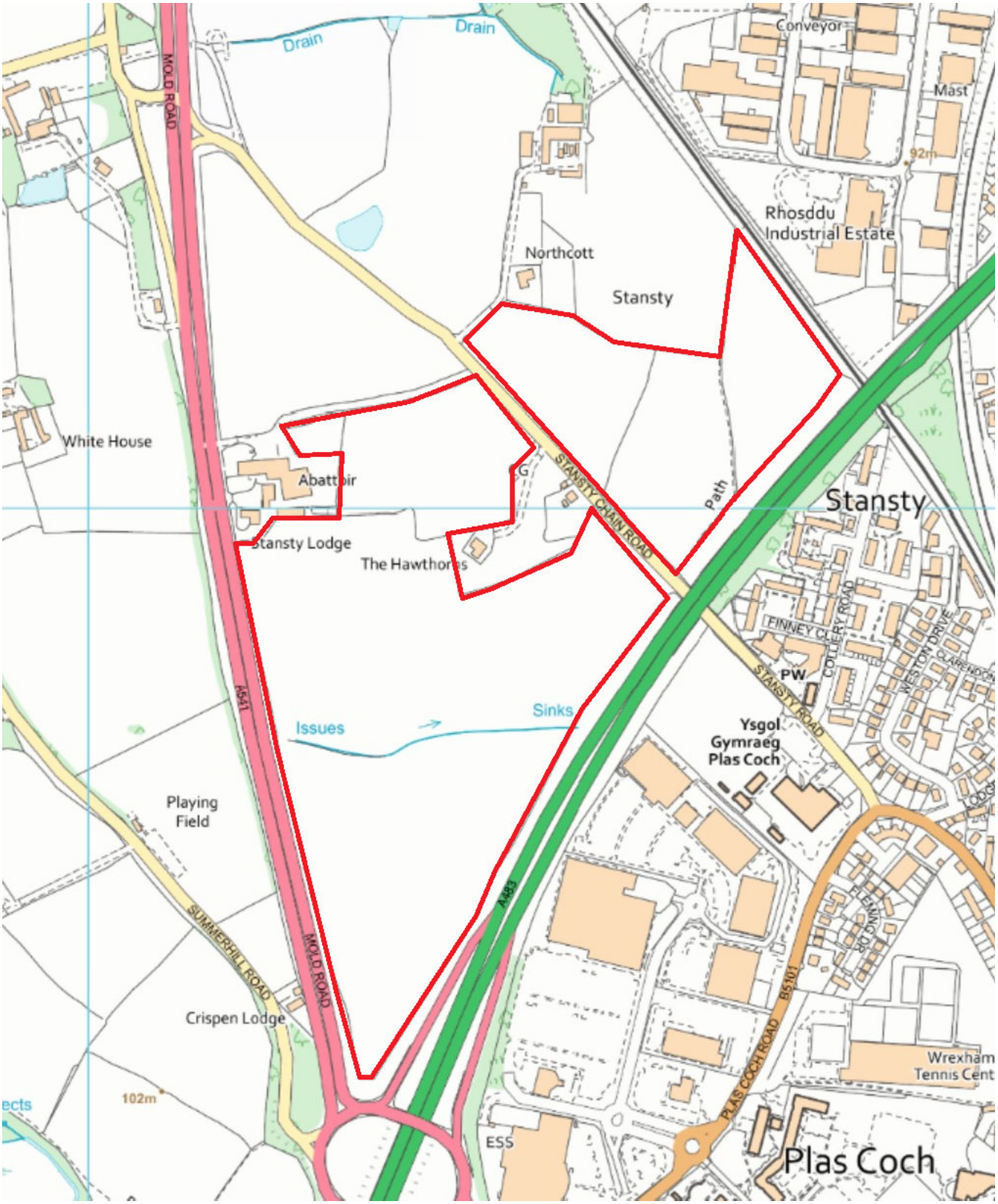
Land either side of Stansty Chain Road, Wrexham, LL11 4YF
FCA – Flood Enquiry

Grid Ref: SJ324519

To whom it may concern

We are undertaking a Flood Consequences Assessment (FCA) for a proposed residential development off Stansty Chain Road in Wrexham and request any information you may have in relation historical flooding or any information you may consider relevant to assist with the production of the FRA / Drainage Strategy report

Please let me know if you require any further information or please contact me on the details below should you want to discuss further.



Regards

Andy Jones
Principal Infrastructure Engineer
COOPERS
Park House, Sandpiper Court, Chester Business Park, Chester, CH4 9QU

☎: (01244) 684910 ☎: Direct Dial No. (01244) 684933

Andy Jones

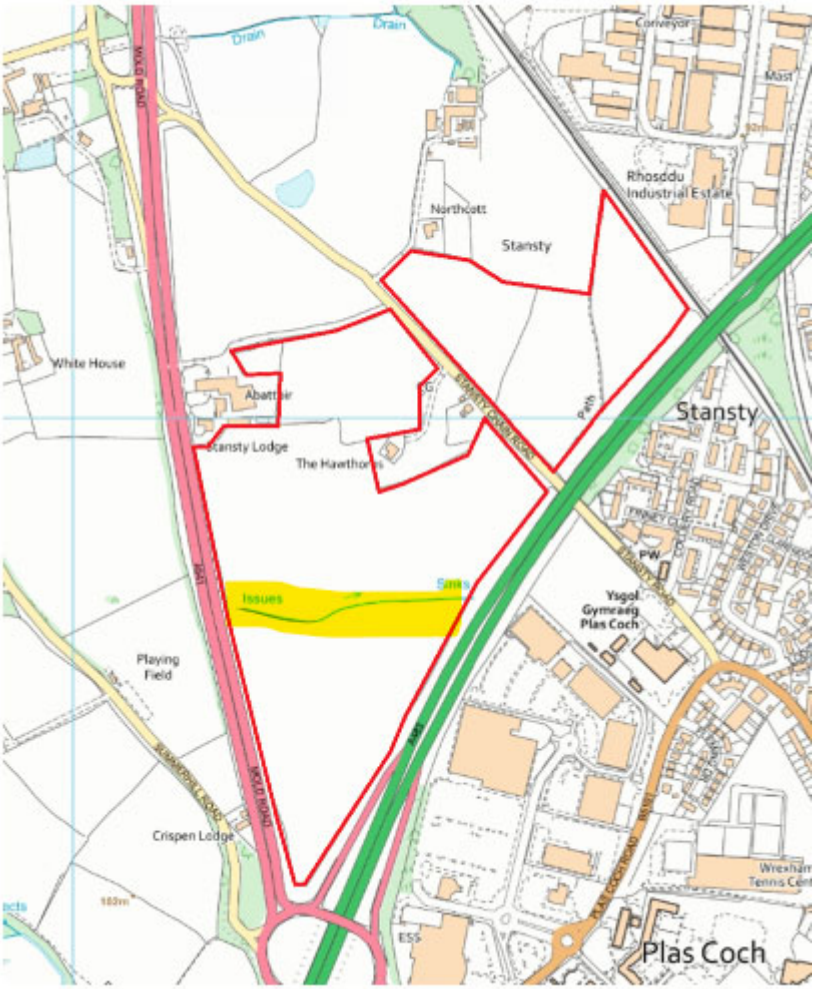
From: Data Distribution <datadistribution@cyfoethnaturiolcymru.gov.uk>
Sent: 05 June 2026 12:07
To: Andy Jones
Subject: ATI-29987a - Land either side of Stansty Chain Road, Wrexham, LL11 4YF

Dear Andy

Further to the below, I'm afraid we hold no detailed model information at this location.

We would strongly advise that you contact Wrexham CBC in its capacity as Lead Local Flood Authority who may hold relevant information for this location.

Historically, there have been flooding issues associated with the watercourse highlighted in yellow, which has resulted in flooding to Plas Coch Retail Parc.



I trust this information is of use to you.

Kind regards

Garin Fitter
Teitl swydd / Job title Data Licensing Officer

Cyswllt Cyfoeth / Customer Hub
Adran / Department Customer, Communications and Commercial
Dyddiau gweithio (os yn berthnasol) / Working days Mon-Fri
Yn Ardystiedig o ran Llythrennedd Carbon/Certified Carbon Literate

Cymraeg

Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi.
Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.



From: Data Distribution
Sent: 27 May 2026 09:21
To: Andy Jones <ajones@coopers.co.uk>
Subject: RE: FCA – Flood Enquiry

Dear Mr Jones

Thank you for your email concerning the above. Please see the attached documentation for further information on this.

We can provide if the data is available, the flood model report, (old product 5), which is free of charge. Also, the raw flood model output data, (old product 6), if available, which is also free of charge. You would need the appropriate software to analyse the results, more information on this is in the attached. We could also provide product 7, which is the full flood model, which is also free of charge.

Please also accept this as an acknowledgement that your request has been received.

It can take up to 20 working days to supply data that is not available online, therefore if you have any queries on your data request, please contact us.

For further information on what you can expect from us, please visit our website:

Natural Resources Wales / Contact us or call the Customer Hub on 0300 065 3000 (open 9am-5pm, Monday to Friday).

We will therefore be in touch in due course and provide if available, products 5 & 6 and advise on product 7.

Yours sincerely,

Garin Fitter
Teitl swydd / Job title Data Licensing Officer
Cyswllt Cyfoeth / Customer Hub
Adran / Department Customer, Communications and Commercial

Dyddiau gweithio (os yn berthnasol) / Working days Mon-Fri
Yn Ardystiedig o ran Llythrennedd Carbon/Certified Carbon Literate

Cymraeg

Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi.
Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.



From: Andy Jones <ajones@coopers.co.uk>
Sent: 26 May 2026 16:35
To: Data Distribution <datadistribution@cyfoethnaturiolcymru.gov.uk>
Subject: FCA – Flood Enquiry

Rhybudd: Deilliodd yr e-bost hwn o'r tu allan i'r sefydliad. Peidiwch â chlicio dolenni, atodiadau agored nac sganio codau QR oni bai eich bod yn cydnabod yr anfonwr ac yn gwybod bod y cynnwys yn ddiogel.

Caution: This email originated from outside of the organisation. Do not click links, open attachments or scan QR Codes unless you recognise the sender and know the content is safe.

Land either side of Stansty Chain Road, Wrexham, LL11 4YF
FCA – Flood Enquiry

Grid Ref: SJ324519

To whom it may concern

We are undertaking a Flood Consequences Assessment (FCA) for a proposed residential development off Stansty Chain Road in Wrexham and request any information you may have in relation historical flooding or any information you may consider relevant to assist with the production of the FRA / Drainage Strategy report

Please let me know if you require any further information or please contact me on the details below should you want to discuss further.

Appendix 5

Calculations

Source Control Greenfield Run-off Calculation

Surface Water Design - MicroDrainage Calculations

Greenfield runoff rate estimation tool

www.uksuds.com | Greenfield runoff rate estimation tool (https://www.uksuds.com/)

hrwallingford

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	05/06/2026
Calculated by	AJ (Coopers)
Reference	8562
Model version	2.2.3

Location

Site name	Stansty Chain Road
Site location	Wrexham



Site easting (British National Grid)	332462
Site northing (British National Grid)	351878

Site details

Total site area (ha)	21.47 ha

Greenfield runoff

Method

Method	IH124

IH124

	My value		Map value
SAAR (mm)	779 mm	⬭	779
How should SPR be derived?	WRAP soil type		
WRAP soil type	2	⬭	2
SPR	0.3		
QBar (IH124) (l/s)	44.3 l/s		

Growth curve factors

	My value		Map value
Hydrological region	9	⬭	9
1 year growth factor	0.88		
2 year growth factor	0.93		
10 year growth factor	1.42		
30 year growth factor	1.78		
100 year growth factor	2.18		
200 year growth factor	2.46		

Results

Method	IH124
Flow rate 1 year (l/s)	39.0 l/s
Flow rate 2 year (l/s)	41.2 l/s
Flow rate 10 years (l/s)	63.0 l/s
Flow rate 30 years (l/s)	78.9 l/s
Flow rate 100 years (l/s)	96.7 l/s
Flow rate 200 years (l/s)	109.1 l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at uksuds.com (https://www.uksuds.com/). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (https://www.uksuds.com/terms-conditions). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.300	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
101	0.144	5.00	86.667	1800	332433.569	352118.126	2.278	84.389
102	0.061	5.00	87.456	1800	332459.146	352143.454	3.157	84.299
103	0.047	5.00	88.083	1800	332467.383	352157.286	3.824	84.259
104	0.110	5.00	88.900	1800	332474.916	352184.282	4.711	84.189
105	0.063	5.00	89.260	1500	332502.895	352176.699	5.143	84.117
106	0.070	5.00	89.442	1500	332529.847	352163.842	5.400	84.042
107	0.126	5.00	88.431	1500	332512.567	352119.578	1.954	86.477
108	0.218	5.00	88.568	1500	332549.714	352096.880	2.997	85.571
109	0.083	5.00	89.031	1500	332559.733	352120.387	3.566	85.465
110	0.018	5.00	89.008	1500	332564.498	352157.178	5.054	83.954
111	0.042	5.00	87.212	1500	332655.453	352166.251	2.592	84.620
112	0.059	5.00	86.525	1500	332654.177	352145.337	2.103	84.422
113	0.057	5.00	86.785	1500	332624.871	352148.805	2.612	84.173
114	0.025	5.00	88.089	1500	332589.906	352153.634	4.199	83.890
115	0.061	5.00	88.606	1500	332586.562	352128.716	4.779	83.827
116	0.018	5.00	88.918	1500	332580.291	352101.676	5.160	83.758
117	0.034	5.00	88.280	1500	332599.965	352095.490	4.574	83.706
118	0.011	5.00	87.741	1500	332611.085	352092.585	4.064	83.677
119	0.031	5.00	87.034	1500	332625.369	352091.459	3.393	83.641
120	0.046	5.00	86.100	1500	332644.002	352092.898	2.581	83.519
121	0.143	5.00	85.050	1500	332670.739	352081.349	1.604	83.446
122	0.122	5.00	87.186	1500	332677.425	352208.005	1.425	85.761
123	0.045	5.00	87.451	1500	332691.525	352188.523	1.906	85.545
124	0.080	5.00	87.166	1500	332711.930	352166.967	1.796	85.370
125	0.110	5.00	86.758	1500	332723.071	352145.164	1.500	85.258
126	0.061	5.00	86.339	1500	332741.084	352119.707	1.500	84.839
127	0.103	5.00	86.423	1500	332704.632	352076.859	1.818	84.605
128	0.000		85.050	1500	332687.045	352067.275	1.392	83.658
129	0.000		85.050	1500	332677.672	352064.480	1.650	83.400
130	0.000		85.050	1500	332676.178	352057.057	0.219	84.831

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	101	102	35.996	0.600	84.389	84.299	0.090	400.0	450	5.59	49.3
1.001	102	103	16.099	0.600	84.299	84.259	0.040	400.0	450	5.86	48.4
1.002	103	104	28.027	0.600	84.259	84.189	0.070	400.0	450	6.32	46.9
1.003	104	105	28.988	0.600	84.189	84.117	0.072	400.0	450	6.80	45.4
1.004	105	106	29.862	0.600	84.117	84.042	0.075	400.0	450	7.29	44.1
1.005	106	110	35.286	0.600	84.042	83.954	0.088	400.0	450	7.88	42.6
2.000	107	108	43.533	0.600	86.477	85.646	0.831	52.4	225	5.40	50.0
2.001	108	109	25.553	0.600	85.571	85.465	0.106	240.0	300	5.82	48.5
2.002	109	110	37.098	0.600	85.465	85.004	0.461	80.5	300	6.17	47.3
1.006	110	114	25.654	0.600	83.954	83.890	0.064	400.0	450	8.30	41.6
3.000	111	112	20.953	0.600	84.620	84.497	0.123	170.0	225	5.35	50.0
3.001	112	113	29.510	0.600	84.422	84.248	0.174	170.0	300	5.76	48.7
3.002	113	114	35.297	0.600	84.173	83.965	0.208	170.0	375	6.18	47.3
1.007	114	115	25.141	0.600	83.890	83.827	0.063	400.0	450	8.71	40.6
1.008	115	116	27.758	0.600	83.827	83.758	0.069	400.0	450	9.17	39.7
1.009	116	117	20.624	0.600	83.758	83.706	0.052	400.0	450	9.51	39.0
1.010	117	118	11.493	0.600	83.706	83.677	0.029	400.0	450	9.70	38.6
1.011	118	119	14.328	0.600	83.677	83.641	0.036	400.0	450	9.94	38.2
1.012	119	120	18.688	0.600	83.641	83.594	0.047	400.0	450	10.25	37.6
1.013	120	121	29.125	0.600	83.519	83.446	0.073	400.0	525	10.68	36.8
1.014	121	129	18.238	0.600	83.446	83.400	0.046	400.0	525	10.95	36.4
4.000	122	123	24.049	0.600	85.761	85.620	0.141	170.0	225	5.40	50.0
4.001	123	124	29.682	0.600	85.545	85.370	0.175	169.6	300	5.81	48.5
4.002	124	125	24.485	0.600	85.370	85.258	0.112	218.6	300	6.20	47.3

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.010	160.7	19.2	1.828	2.707	0.144	0.0	104	0.688
1.001	1.010	160.7	26.9	2.707	3.374	0.205	0.0	123	0.756
1.002	1.010	160.7	32.0	3.374	4.261	0.252	0.0	136	0.795
1.003	1.010	160.7	44.6	4.261	4.693	0.362	0.0	161	0.868
1.004	1.010	160.7	50.8	4.693	4.950	0.425	0.0	174	0.900
1.005	1.010	160.7	57.1	4.950	4.604	0.495	0.0	185	0.928
2.000	1.811	72.0	17.1	1.729	2.697	0.126	0.0	74	1.489
2.001	1.010	71.4	45.2	2.697	3.266	0.344	0.0	174	1.068
2.002	1.754	124.0	54.8	3.266	3.704	0.427	0.0	140	1.703
1.006	1.010	160.7	105.9	4.604	3.749	0.940	0.0	268	1.076
3.000	1.000	39.7	5.7	2.367	1.803	0.042	0.0	58	0.715
3.001	1.203	85.0	13.3	1.803	2.237	0.101	0.0	80	0.883
3.002	1.386	153.1	20.3	2.237	3.749	0.158	0.0	91	0.970
1.007	1.010	160.7	123.7	3.749	4.329	1.123	0.0	298	1.110
1.008	1.010	160.7	127.3	4.329	4.710	1.184	0.0	304	1.115
1.009	1.010	160.7	127.0	4.710	4.124	1.202	0.0	303	1.115
1.010	1.010	160.7	129.4	4.124	3.614	1.236	0.0	307	1.118
1.011	1.010	160.7	129.0	3.614	2.943	1.247	0.0	306	1.118
1.012	1.010	160.7	130.2	2.943	2.056	1.278	0.0	309	1.120
1.013	1.114	241.0	132.2	2.056	1.079	1.324	0.0	278	1.138
1.014	1.114	241.0	144.6	1.079	1.125	1.467	0.0	294	1.162
4.000	1.000	39.7	16.5	1.200	1.606	0.122	0.0	101	0.953
4.001	1.204	85.1	22.0	1.606	1.496	0.167	0.0	103	1.014
4.002	1.059	74.9	31.6	1.496	1.200	0.247	0.0	136	1.017

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
4.003	125	126	31.185	0.600	85.258	84.839	0.419	74.4	300	6.48	46.4
4.004	126	127	56.256	0.600	84.839	84.605	0.234	240.0	300	7.41	43.8
4.005	127	128	20.029	0.600	84.605	83.658	0.947	21.1	300	7.51	43.5
4.006	128	129	9.781	0.600	83.658	83.625	0.033	300.0	300	7.69	43.1
1.015	129	130	7.572	0.600	84.850	84.831	0.019	398.5	150	11.21	36.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
4.003	1.824	128.9	44.9	1.200	1.200	0.357	0.0	122	1.667
4.004	1.010	71.4	49.6	1.200	1.518	0.418	0.0	184	1.088
4.005	3.433	242.7	61.4	1.518	1.092	0.521	0.0	102	2.877
4.006	0.902	63.8	60.8	1.092	1.125	0.521	0.0	235	1.022
1.015	0.497	8.8	194.2	0.050	0.069	1.988	0.0	150	0.507

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	35.996	400.0	450	Circular_Default Sewer Type	86.667	84.389	1.828	87.456	84.299	2.707
1.001	16.099	400.0	450	Circular_Default Sewer Type	87.456	84.299	2.707	88.083	84.259	3.374
1.002	28.027	400.0	450	Circular_Default Sewer Type	88.083	84.259	3.374	88.900	84.189	4.261
1.003	28.988	400.0	450	Circular_Default Sewer Type	88.900	84.189	4.261	89.260	84.117	4.693
1.004	29.862	400.0	450	Circular_Default Sewer Type	89.260	84.117	4.693	89.442	84.042	4.950
1.005	35.286	400.0	450	Circular_Default Sewer Type	89.442	84.042	4.950	89.008	83.954	4.604
2.000	43.533	52.4	225	Circular_Default Sewer Type	88.431	86.477	1.729	88.568	85.646	2.697
2.001	25.553	240.0	300	Circular_Default Sewer Type	88.568	85.571	2.697	89.031	85.465	3.266
2.002	37.098	80.5	300	Circular_Default Sewer Type	89.031	85.465	3.266	89.008	85.004	3.704
1.006	25.654	400.0	450	Circular_Default Sewer Type	89.008	83.954	4.604	88.089	83.890	3.749
3.000	20.953	170.0	225	Circular_Default Sewer Type	87.212	84.620	2.367	86.525	84.497	1.803
3.001	29.510	170.0	300	Circular_Default Sewer Type	86.525	84.422	1.803	86.785	84.248	2.237
3.002	35.297	170.0	375	Circular_Default Sewer Type	86.785	84.173	2.237	88.089	83.965	3.749
1.007	25.141	400.0	450	Circular_Default Sewer Type	88.089	83.890	3.749	88.606	83.827	4.329
1.008	27.758	400.0	450	Circular_Default Sewer Type	88.606	83.827	4.329	88.918	83.758	4.710

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	101	1800	Manhole	Adoptable	102	1800	Manhole	Adoptable
1.001	102	1800	Manhole	Adoptable	103	1800	Manhole	Adoptable
1.002	103	1800	Manhole	Adoptable	104	1800	Manhole	Adoptable
1.003	104	1800	Manhole	Adoptable	105	1500	Manhole	Adoptable
1.004	105	1500	Manhole	Adoptable	106	1500	Manhole	Adoptable
1.005	106	1500	Manhole	Adoptable	110	1500	Manhole	Adoptable
2.000	107	1500	Manhole	Adoptable	108	1500	Manhole	Adoptable
2.001	108	1500	Manhole	Adoptable	109	1500	Manhole	Adoptable
2.002	109	1500	Manhole	Adoptable	110	1500	Manhole	Adoptable
1.006	110	1500	Manhole	Adoptable	114	1500	Manhole	Adoptable
3.000	111	1500	Manhole	Adoptable	112	1500	Manhole	Adoptable
3.001	112	1500	Manhole	Adoptable	113	1500	Manhole	Adoptable
3.002	113	1500	Manhole	Adoptable	114	1500	Manhole	Adoptable
1.007	114	1500	Manhole	Adoptable	115	1500	Manhole	Adoptable
1.008	115	1500	Manhole	Adoptable	116	1500	Manhole	Adoptable

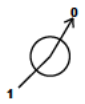
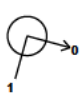
Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.009	20.624	400.0	450	Circular_Default Sewer Type	88.918	83.758	4.710	88.280	83.706	4.124
1.010	11.493	400.0	450	Circular_Default Sewer Type	88.280	83.706	4.124	87.741	83.677	3.614
1.011	14.328	400.0	450	Circular_Default Sewer Type	87.741	83.677	3.614	87.034	83.641	2.943
1.012	18.688	400.0	450	Circular_Default Sewer Type	87.034	83.641	2.943	86.100	83.594	2.056
1.013	29.125	400.0	525	Circular_Default Sewer Type	86.100	83.519	2.056	85.050	83.446	1.079
1.014	18.238	400.0	525	Circular_Default Sewer Type	85.050	83.446	1.079	85.050	83.400	1.125
4.000	24.049	170.0	225	Circular_Default Sewer Type	87.186	85.761	1.200	87.451	85.620	1.606
4.001	29.682	169.6	300	Circular_Default Sewer Type	87.451	85.545	1.606	87.166	85.370	1.496
4.002	24.485	218.6	300	Circular_Default Sewer Type	87.166	85.370	1.496	86.758	85.258	1.200
4.003	31.185	74.4	300	Circular_Default Sewer Type	86.758	85.258	1.200	86.339	84.839	1.200
4.004	56.256	240.0	300	Circular_Default Sewer Type	86.339	84.839	1.200	86.423	84.605	1.518
4.005	20.029	21.1	300	Circular_Default Sewer Type	86.423	84.605	1.518	85.050	83.658	1.092
4.006	9.781	300.0	300	Circular_Default Sewer Type	85.050	83.658	1.092	85.050	83.625	1.125
1.015	7.572	398.5	150	Circular_Default Sewer Type	85.050	84.850	0.050	85.050	84.831	0.069

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.009	116	1500	Manhole	Adoptable	117	1500	Manhole	Adoptable
1.010	117	1500	Manhole	Adoptable	118	1500	Manhole	Adoptable
1.011	118	1500	Manhole	Adoptable	119	1500	Manhole	Adoptable
1.012	119	1500	Manhole	Adoptable	120	1500	Manhole	Adoptable
1.013	120	1500	Manhole	Adoptable	121	1500	Manhole	Adoptable
1.014	121	1500	Manhole	Adoptable	129	1500	Manhole	Adoptable
4.000	122	1500	Manhole	Adoptable	123	1500	Manhole	Adoptable
4.001	123	1500	Manhole	Adoptable	124	1500	Manhole	Adoptable
4.002	124	1500	Manhole	Adoptable	125	1500	Manhole	Adoptable
4.003	125	1500	Manhole	Adoptable	126	1500	Manhole	Adoptable
4.004	126	1500	Manhole	Adoptable	127	1500	Manhole	Adoptable
4.005	127	1500	Manhole	Adoptable	128	1500	Manhole	Adoptable
4.006	128	1500	Manhole	Adoptable	129	1500	Manhole	Adoptable
1.015	129	1500	Manhole	Adoptable	130	1500	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
101	332433.569	352118.126	86.667	2.278	1800				
						0	1.000	84.389	450
102	332459.146	352143.454	87.456	3.157	1800		1	1.000	84.299	450
						0	1.001	84.299	450
103	332467.383	352157.286	88.083	3.824	1800		1	1.001	84.259	450
						0	1.002	84.259	450
104	332474.916	352184.282	88.900	4.711	1800		1	1.002	84.189	450
						0	1.003	84.189	450

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
105	332502.895	352176.699	89.260	5.143	1500	1	1.003	84.117	450
						0	1.004	84.117	450
106	332529.847	352163.842	89.442	5.400	1500	1	1.004	84.042	450
						0	1.005	84.042	450
107	332512.567	352119.578	88.431	1.954	1500	0	2.000	86.477	225
108	332549.714	352096.880	88.568	2.997	1500	1	2.000	85.646	225
						0	2.001	85.571	300
109	332559.733	352120.387	89.031	3.566	1500	1	2.001	85.465	300
						0	2.002	85.465	300
110	332564.498	352157.178	89.008	5.054	1500	1	2.002	85.004	300
						2	1.005	83.954	450
						0	1.006	83.954	450
111	332655.453	352166.251	87.212	2.592	1500	0	3.000	84.620	225
112	332654.177	352145.337	86.525	2.103	1500	1	3.000	84.497	225
						0	3.001	84.422	300
113	332624.871	352148.805	86.785	2.612	1500	1	3.001	84.248	300
						0	3.002	84.173	375
114	332589.906	352153.634	88.089	4.199	1500	1	3.002	83.965	375
						2	1.006	83.890	450
						0	1.007	83.890	450
115	332586.562	352128.716	88.606	4.779	1500	1	1.007	83.827	450
						0	1.008	83.827	450
116	332580.291	352101.676	88.918	5.160	1500	1	1.008	83.758	450
						0	1.009	83.758	450
117	332599.965	352095.490	88.280	4.574	1500	1	1.009	83.706	450
						0	1.010	83.706	450

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
118	332611.085	352092.585	87.741	4.064	1500	1	1.010	83.677	450
						0	1.011	83.677	450
119	332625.369	352091.459	87.034	3.393	1500	1	1.011	83.641	450
						0	1.012	83.641	450
120	332644.002	352092.898	86.100	2.581	1500	1	1.012	83.594	450
						0	1.013	83.519	525
121	332670.739	352081.349	85.050	1.604	1500	1	1.013	83.446	525
						0	1.014	83.446	525
122	332677.425	352208.005	87.186	1.425	1500	0	4.000	85.761	225
123	332691.525	352188.523	87.451	1.906	1500	1	4.000	85.620	225
						0	4.001	85.545	300
124	332711.930	352166.967	87.166	1.796	1500	1	4.001	85.370	300
						0	4.002	85.370	300
125	332723.071	352145.164	86.758	1.500	1500	1	4.002	85.258	300
						0	4.003	85.258	300
126	332741.084	352119.707	86.339	1.500	1500	1	4.003	84.839	300
						0	4.004	84.839	300
127	332704.632	352076.859	86.423	1.818	1500	1	4.004	84.605	300
						0	4.005	84.605	300
128	332687.045	352067.275	85.050	1.392	1500	1	4.005	83.658	300
						0	4.006	83.658	300
129	332677.672	352064.480	85.050	1.650	1500	1	4.006	83.625	300
						2	1.014	83.400	525
						0	1.015	84.850	150
130	332676.178	352057.057	85.050	0.219	1500	1	1.015	84.831	150

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	✓
Rainfall Events	Singular	Drain Down Time (mins)	240
FSR Region	England and Wales	Additional Storage (m³/ha)	20.0
M5-60 (mm)	17.000	Starting Level (m)	
Ratio-R	0.300	Check Discharge Rate(s)	✓
Summer CV	0.750	Check Discharge Volume	✓
Winter CV	0.840	100 year 360 minute (m³)	
Analysis Speed	Detailed		

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0
100	50	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.95
Greenfield Method	IH124	Growth Factor 100 year	2.48
Positively Drained Area (ha)		Betterment (%)	0
SAAR (mm)		QBar	
Soil Index	1	Q 1 year (l/s)	
SPR	0.10	Q 30 year (l/s)	
Region	1	Q 100 year (l/s)	
Growth Factor 1 year	0.85		

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)		Storm Duration (mins)	360
Soil Index	1	Betterment (%)	0
SPR	0.10	PR	
CWI		Runoff Volume (m³)	

Node 129 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.40320	Safety Factor	5.0	Invert Level (m)	83.100
Side Inf Coefficient (m/hr)	0.40320	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	412.0	412.0	0.600	603.0	608.9	1.200	814.0	827.3
0.200	473.0	474.8	0.800	670.0	678.2	1.400	889.0	905.1
0.400	537.0	540.7	1.000	741.0	751.7	1.600	966.0	985.1

Other (defaults)

Entry Loss (manhole)	0.250	Entry Loss (junction)	0.000	Apply Recommended Losses	x
Exit Loss (manhole)	0.250	Exit Loss (junction)	0.000	Flood Risk (m)	0.300

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.86%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	101	11	84.480	0.091	15.6	0.3477	0.0000	OK
15 minute winter	102	11	84.418	0.119	21.6	0.3474	0.0000	OK
15 minute winter	103	11	84.384	0.125	26.0	0.3495	0.0000	OK
15 minute winter	104	11	84.340	0.151	36.6	0.4553	0.0000	OK
15 minute winter	105	12	84.283	0.166	41.9	0.3335	0.0000	OK
15 minute winter	106	12	84.246	0.204	46.9	0.4127	0.0000	OK
15 minute winter	107	10	86.543	0.065	13.7	0.2002	0.0000	OK
15 minute winter	108	10	85.727	0.156	37.1	0.5019	0.0000	OK
15 minute winter	109	11	85.595	0.130	45.1	0.2897	0.0000	OK
15 minute winter	110	12	84.227	0.273	88.6	0.5016	0.0000	OK
15 minute winter	111	11	84.672	0.052	4.6	0.1078	0.0000	OK
15 minute winter	112	11	84.495	0.073	10.8	0.1692	0.0000	OK
15 minute winter	113	11	84.255	0.082	16.4	0.1804	0.0000	OK
15 minute winter	114	13	84.184	0.294	104.4	0.5536	0.0000	OK
15 minute winter	115	13	84.127	0.300	105.8	0.6069	0.0000	OK
15 minute winter	116	13	84.066	0.308	105.7	0.5664	0.0000	OK
15 minute winter	117	14	84.016	0.310	106.8	0.5942	0.0000	OK
15 minute winter	118	14	83.973	0.296	106.3	0.5390	0.0000	OK
15 minute winter	119	14	83.915	0.274	107.5	0.5339	0.0000	OK
15 minute winter	120	14	83.790	0.271	110.2	0.5751	0.0000	OK
15 minute winter	121	14	83.711	0.265	116.7	0.9418	0.0000	OK
15 minute winter	122	10	85.852	0.091	13.2	0.3150	0.0000	OK
15 minute winter	123	11	85.636	0.091	17.6	0.2048	0.0000	OK
15 minute winter	124	11	85.496	0.126	25.8	0.3342	0.0000	OK
15 minute winter	125	11	85.367	0.109	37.1	0.3529	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	101	1.000	102	15.0	0.549	0.094	1.0125	
15 minute winter	102	1.001	103	21.2	0.611	0.132	0.5574	
15 minute winter	103	1.002	104	25.4	0.617	0.158	1.1584	
15 minute winter	104	1.003	105	35.7	0.728	0.223	1.4414	
15 minute winter	105	1.004	106	41.0	0.714	0.255	1.8313	
15 minute winter	106	1.005	110	45.6	0.565	0.284	3.0039	
15 minute winter	107	2.000	108	13.4	1.256	0.186	0.4874	
15 minute winter	108	2.001	109	36.2	1.107	0.507	0.8402	
15 minute winter	109	2.002	110	45.3	1.598	0.365	1.0513	
15 minute winter	110	1.006	114	87.0	0.842	0.542	2.6836	
15 minute winter	111	3.000	112	4.4	0.659	0.112	0.1410	
15 minute winter	112	3.001	113	10.6	0.821	0.125	0.3808	
15 minute winter	113	3.002	114	16.5	0.677	0.107	1.4534	
15 minute winter	114	1.007	115	100.8	0.928	0.627	2.7884	
15 minute winter	115	1.008	116	104.6	0.935	0.651	3.1655	
15 minute winter	116	1.009	117	104.6	0.901	0.651	2.3948	
15 minute winter	117	1.010	118	105.6	0.933	0.657	1.3049	
15 minute winter	118	1.011	119	106.2	1.004	0.661	1.5152	
15 minute winter	119	1.012	120	108.2	1.188	0.673	1.7010	
15 minute winter	120	1.013	121	110.4	0.996	0.458	3.2273	
15 minute winter	121	1.014	129	116.6	1.173	0.484	1.8137	
15 minute winter	122	4.000	123	12.8	0.881	0.323	0.3499	
15 minute winter	123	4.001	124	17.6	0.764	0.206	0.6846	
15 minute winter	124	4.002	125	25.9	1.016	0.346	0.6258	
15 minute winter	125	4.003	126	37.1	1.139	0.288	1.0218	

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.86%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	126	11	85.013	0.174	43.3	0.4492	0.0000	OK
15 minute winter	127	11	84.699	0.094	52.8	0.2719	0.0000	OK
15 minute winter	128	12	83.871	0.213	52.1	0.3760	0.0000	OK
360 minute winter	129	280	83.485	0.085	40.8	181.6028	0.0000	OK
15 minute summer	130	1	84.831	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	126	4.004	127	42.2	1.405	0.592	1.7208	
15 minute winter	127	4.005	128	52.1	1.456	0.215	0.7219	
15 minute winter	128	4.006	129	52.3	1.078	0.820	0.4736	
360 minute winter	129	1.015	130	0.0	0.000	0.000	0.0000	0.0
360 minute winter	129	Infiltration		12.0				

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.91%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	101	14	84.749	0.360	62.6	1.3693	0.0000	OK
15 minute winter	102	13	84.787	0.488	52.8	1.4311	0.0000	SURCHARGED
15 minute winter	103	13	84.791	0.532	61.2	1.4842	0.0000	SURCHARGED
15 minute winter	104	13	84.746	0.557	85.4	1.6763	0.0000	SURCHARGED
15 minute winter	105	13	84.714	0.597	88.3	1.2011	0.0000	SURCHARGED
15 minute winter	106	13	84.677	0.635	90.4	1.2873	0.0000	SURCHARGED
15 minute winter	107	10	86.583	0.106	33.3	0.3236	0.0000	OK
15 minute winter	108	11	85.903	0.332	90.3	1.0681	0.0000	SURCHARGED
15 minute winter	109	11	85.700	0.235	108.4	0.5249	0.0000	OK
15 minute winter	110	13	84.636	0.682	149.7	1.2538	0.0000	SURCHARGED
15 minute winter	111	10	84.703	0.083	11.1	0.1732	0.0000	OK
15 minute winter	112	12	84.609	0.187	26.3	0.4360	0.0000	OK
15 minute winter	113	12	84.593	0.420	40.4	0.9263	0.0000	SURCHARGED
15 minute winter	114	12	84.571	0.681	172.0	1.2845	0.0000	SURCHARGED
15 minute winter	115	12	84.468	0.641	185.8	1.2965	0.0000	SURCHARGED
15 minute winter	116	14	84.343	0.585	185.6	1.0738	0.0000	SURCHARGED
15 minute winter	117	13	84.244	0.538	192.8	1.0306	0.0000	SURCHARGED
15 minute winter	118	13	84.168	0.491	195.9	0.8940	0.0000	SURCHARGED
15 minute winter	119	12	84.082	0.441	201.4	0.8605	0.0000	OK
360 minute winter	120	336	84.000	0.481	60.0	1.0224	0.0000	OK
360 minute winter	121	336	84.000	0.554	66.2	1.9674	0.0000	SURCHARGED
15 minute winter	122	10	85.920	0.159	32.2	0.5546	0.0000	OK
15 minute winter	123	10	85.696	0.151	42.8	0.3387	0.0000	OK
15 minute winter	124	11	85.598	0.228	63.1	0.6050	0.0000	OK
15 minute winter	125	12	85.495	0.237	90.0	0.7654	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	101	1.000	102	36.7	0.652	0.229	5.2822	
15 minute winter	102	1.001	103	48.8	0.694	0.304	2.5508	
15 minute winter	103	1.002	104	61.9	0.677	0.385	4.4407	
15 minute winter	104	1.003	105	76.0	0.800	0.473	4.5930	
15 minute winter	105	1.004	106	88.3	0.728	0.549	4.7314	
15 minute winter	106	1.005	110	103.0	0.680	0.641	5.5908	
15 minute winter	107	2.000	108	32.8	1.264	0.455	1.2649	
15 minute winter	108	2.001	109	87.8	1.276	1.229	1.6565	
15 minute winter	109	2.002	110	108.9	1.922	0.878	2.0995	
15 minute winter	110	1.006	114	146.6	0.925	0.913	4.0647	
15 minute winter	111	3.000	112	10.7	0.839	0.270	0.3258	
15 minute winter	112	3.001	113	25.4	1.035	0.299	1.7216	
15 minute winter	113	3.002	114	37.4	0.708	0.244	3.8932	
15 minute winter	114	1.007	115	173.1	1.093	1.078	3.9834	
15 minute winter	115	1.008	116	183.7	1.160	1.144	4.3981	
15 minute winter	116	1.009	117	189.2	1.194	1.178	3.2677	
15 minute winter	117	1.010	118	194.7	1.229	1.212	1.8210	
15 minute winter	118	1.011	119	196.6	1.241	1.224	2.2649	
15 minute winter	119	1.012	120	203.7	1.389	1.268	2.7277	
360 minute winter	120	1.013	121	59.6	0.816	0.247	6.1667	
360 minute winter	121	1.014	129	65.0	0.967	0.270	3.9400	
15 minute winter	122	4.000	123	31.2	1.083	0.785	0.6929	
15 minute winter	123	4.001	124	43.1	0.926	0.506	1.3787	
15 minute winter	124	4.002	125	62.1	1.217	0.830	1.4079	
15 minute winter	125	4.003	126	84.0	1.348	0.652	2.0276	

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.91%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	126	12	85.333	0.494	100.1	1.2737	0.0000	SURCHARGED
15 minute winter	127	12	84.759	0.154	118.9	0.4456	0.0000	OK
15 minute winter	128	12	84.081	0.423	117.9	0.7472	0.0000	SURCHARGED
360 minute winter	129	336	84.000	0.600	88.9	500.6974	0.0000	OK
15 minute summer	130	1	84.831	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	126	4.004	127	95.7	1.647	1.341	3.0019	
15 minute winter	127	4.005	128	117.9	1.938	0.486	1.0688	
15 minute winter	128	4.006	129	118.3	1.684	1.855	0.6647	
360 minute winter	129	1.015	130	0.0	0.000	0.000	0.0000	0.0
360 minute winter	129	Infiltration		16.0				

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	101	14	85.343	0.954	57.3	3.6322	0.0000	SURCHARGED
15 minute winter	102	13	85.346	1.047	67.6	3.0697	0.0000	SURCHARGED
15 minute winter	103	13	85.351	1.092	101.0	3.0480	0.0000	SURCHARGED
15 minute winter	104	13	85.336	1.147	94.9	3.4554	0.0000	SURCHARGED
15 minute winter	105	13	85.325	1.208	99.5	2.4314	0.0000	SURCHARGED
15 minute winter	106	13	85.293	1.251	98.5	2.5355	0.0000	SURCHARGED
15 minute winter	107	10	86.600	0.123	42.7	0.3752	0.0000	OK
15 minute winter	108	11	86.170	0.599	115.9	1.9310	0.0000	SURCHARGED
15 minute winter	109	11	85.867	0.402	134.3	0.8983	0.0000	SURCHARGED
15 minute winter	110	13	85.272	1.318	218.1	2.4227	0.0000	SURCHARGED
15 minute winter	111	13	85.163	0.543	19.5	1.1346	0.0000	SURCHARGED
15 minute winter	112	13	85.197	0.775	33.8	1.8042	0.0000	SURCHARGED
15 minute winter	113	13	85.169	0.996	46.5	2.1959	0.0000	SURCHARGED
15 minute winter	114	13	85.127	1.237	241.4	2.3322	0.0000	SURCHARGED
15 minute winter	115	13	84.923	1.096	246.7	2.2168	0.0000	SURCHARGED
15 minute winter	116	14	84.702	0.944	247.4	1.7346	0.0000	SURCHARGED
15 minute winter	117	14	84.519	0.813	253.5	1.5576	0.0000	SURCHARGED
15 minute winter	118	14	84.383	0.706	254.9	1.2852	0.0000	SURCHARGED
360 minute winter	119	344	84.243	0.602	74.8	1.1743	0.0000	SURCHARGED
360 minute winter	120	344	84.243	0.724	77.0	1.5374	0.0000	SURCHARGED
360 minute winter	121	344	84.243	0.797	83.7	2.8278	0.0000	SURCHARGED
15 minute winter	122	12	86.052	0.291	41.4	1.0140	0.0000	SURCHARGED
15 minute winter	123	12	85.939	0.394	54.7	0.8812	0.0000	SURCHARGED
15 minute winter	124	12	85.879	0.509	81.9	1.3518	0.0000	SURCHARGED
15 minute winter	125	12	85.769	0.511	101.0	1.6525	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	101	1.000	102	47.0	0.671	0.292	5.7033	
15 minute winter	102	1.001	103	56.4	0.709	0.351	2.5508	
15 minute winter	103	1.002	104	66.6	0.690	0.414	4.4407	
15 minute winter	104	1.003	105	83.4	0.809	0.519	4.5930	
15 minute winter	105	1.004	106	92.8	0.737	0.578	4.7314	
15 minute winter	106	1.005	110	109.5	0.724	0.681	5.5908	
15 minute winter	107	2.000	108	42.1	1.243	0.585	1.3475	
15 minute winter	108	2.001	109	106.2	1.508	1.487	1.7994	
15 minute winter	109	2.002	110	130.9	1.897	1.056	2.5503	
15 minute winter	110	1.006	114	222.4	1.404	1.384	4.0647	
15 minute winter	111	3.000	112	13.8	0.892	0.347	0.8333	
15 minute winter	112	3.001	113	33.0	1.058	0.388	2.0781	
15 minute winter	113	3.002	114	47.7	0.724	0.311	3.8932	
15 minute winter	114	1.007	115	234.8	1.482	1.461	3.9834	
15 minute winter	115	1.008	116	243.9	1.539	1.518	4.3981	
15 minute winter	116	1.009	117	247.1	1.560	1.538	3.2677	
15 minute winter	117	1.010	118	253.3	1.599	1.577	1.8210	
15 minute winter	118	1.011	119	256.3	1.618	1.595	2.2702	
360 minute winter	119	1.012	120	74.3	1.051	0.462	2.9610	
360 minute winter	120	1.013	121	75.2	0.842	0.312	6.2920	
360 minute winter	121	1.014	129	81.5	0.983	0.338	3.9400	
15 minute winter	122	4.000	123	39.4	1.143	0.992	0.9565	
15 minute winter	123	4.001	124	54.9	0.937	0.645	2.0902	
15 minute winter	124	4.002	125	66.0	1.188	0.882	1.7242	
15 minute winter	125	4.003	126	93.9	1.342	0.728	2.1960	

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	126	12	85.491	0.652	110.4	1.6824	0.0000	SURCHARGED
15 minute winter	127	12	84.789	0.184	139.2	0.5324	0.0000	OK
360 minute winter	128	344	84.243	0.585	31.0	1.0331	0.0000	SURCHARGED
360 minute winter	129	344	84.242	0.842	112.0	682.5714	0.0000	OK
15 minute summer	130	1	84.831	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	126	4.004	127	109.5	1.710	1.533	3.2516	
15 minute winter	127	4.005	128	137.9	2.147	0.568	1.1577	
360 minute winter	128	4.006	129	30.5	0.908	0.479	0.6888	
360 minute winter	129	1.015	130	0.0	0.000	0.000	0.0000	0.0
360 minute winter	129	Infiltration		18.0				

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 99.64%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	101	22	86.667	2.278	59.8	8.6751	0.0000	FLOOD RISK
30 minute winter	102	22	86.657	2.358	123.2	6.9101	0.0000	SURCHARGED
30 minute winter	103	22	86.648	2.389	77.9	6.6681	0.0000	SURCHARGED
30 minute winter	104	22	86.630	2.441	99.3	7.3534	0.0000	SURCHARGED
30 minute winter	105	22	86.596	2.479	113.2	4.9874	0.0000	SURCHARGED
15 minute winter	106	13	86.549	2.507	132.9	5.0801	0.0000	SURCHARGED
15 minute winter	107	13	87.814	1.337	64.0	4.0860	0.0000	SURCHARGED
15 minute winter	108	13	87.485	1.914	152.7	6.1674	0.0000	SURCHARGED
15 minute winter	109	13	87.158	1.693	177.5	3.7808	0.0000	SURCHARGED
15 minute winter	110	13	86.478	2.524	266.4	4.6392	0.0000	SURCHARGED
30 minute winter	111	22	86.291	1.671	31.0	3.4944	0.0000	SURCHARGED
30 minute winter	112	22	86.278	1.856	35.9	4.3201	0.0000	FLOOD RISK
30 minute winter	113	22	86.255	2.082	46.6	4.5884	0.0000	SURCHARGED
30 minute winter	114	22	86.234	2.344	308.9	4.4213	0.0000	SURCHARGED
30 minute winter	115	22	85.903	2.076	325.4	4.1974	0.0000	SURCHARGED
30 minute winter	116	22	85.509	1.751	330.1	3.2169	0.0000	SURCHARGED
15 minute winter	117	13	85.181	1.475	338.5	2.8269	0.0000	SURCHARGED
15 minute winter	118	13	84.937	1.260	342.2	2.2947	0.0000	SURCHARGED
480 minute winter	119	456	84.721	1.080	80.9	2.1059	0.0000	SURCHARGED
480 minute winter	120	456	84.720	1.201	83.9	2.5516	0.0000	SURCHARGED
480 minute winter	121	456	84.720	1.274	94.0	4.5224	0.0000	SURCHARGED
15 minute winter	122	13	87.090	1.329	62.0	4.6219	0.0000	FLOOD RISK
15 minute winter	123	13	86.905	1.360	63.4	3.0443	0.0000	SURCHARGED
15 minute winter	124	13	86.803	1.433	90.8	3.8095	0.0000	SURCHARGED
15 minute winter	125	12	86.618	1.360	130.7	4.3974	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute winter	101	1.000	102	59.2	0.655	0.369	5.7033	
30 minute winter	102	1.001	103	59.4	0.683	0.370	2.5508	
30 minute winter	103	1.002	104	70.2	0.661	0.437	4.4407	
30 minute winter	104	1.003	105	97.3	0.754	0.606	4.5930	
30 minute winter	105	1.004	106	114.1	0.720	0.710	4.7314	
15 minute winter	106	1.005	110	128.5	0.811	0.800	5.5908	
15 minute winter	107	2.000	108	46.5	1.300	0.646	1.7314	
15 minute winter	108	2.001	109	135.3	1.922	1.895	1.7994	
15 minute winter	109	2.002	110	169.5	2.407	1.367	2.6124	
15 minute winter	110	1.006	114	264.0	1.666	1.643	4.0647	
30 minute winter	111	3.000	112	15.1	0.846	0.380	0.8333	
30 minute winter	112	3.001	113	29.5	0.983	0.347	2.0781	
30 minute winter	113	3.002	114	43.1	0.675	0.281	3.8932	
30 minute winter	114	1.007	115	309.6	1.954	1.927	3.9834	
30 minute winter	115	1.008	116	325.7	2.056	2.027	4.3981	
30 minute winter	116	1.009	117	330.8	2.088	2.059	3.2677	
15 minute winter	117	1.010	118	340.0	2.146	2.116	1.8210	
15 minute winter	118	1.011	119	343.8	2.170	2.140	2.2702	
480 minute winter	119	1.012	120	80.6	1.025	0.502	2.9610	
480 minute winter	120	1.013	121	83.6	0.797	0.347	6.2920	
480 minute winter	121	1.014	129	93.5	0.921	0.388	3.9400	
15 minute winter	122	4.000	123	41.8	1.136	1.051	0.9565	
15 minute winter	123	4.001	124	58.3	0.944	0.686	2.0902	
15 minute winter	124	4.002	125	85.5	1.214	1.142	1.7242	
15 minute winter	125	4.003	126	122.5	1.739	0.950	2.1960	

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 99.64%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	126	12	86.157	1.318	145.1	3.4012	0.0000	FLOOD RISK
15 minute winter	127	12	85.091	0.486	184.3	1.4097	0.0000	SURCHARGED
480 minute winter	128	456	84.720	1.062	37.8	1.8766	0.0000	SURCHARGED
480 minute winter	129	456	84.720	1.320	130.6	1104.4000	0.0000	OK
15 minute summer	130	1	84.831	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	126	4.004	127	144.4	2.051	2.023	3.9615	
15 minute winter	127	4.005	128	182.7	2.594	0.753	1.4104	
480 minute winter	128	4.006	129	37.3	0.892	0.585	0.6888	
480 minute winter	129	1.015	130	0.0	0.000	0.000	0.0000	0.0
480 minute winter	129	Infiltration		22.1				

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.300	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
201	0.057	5.00	85.289	1500	332547.468	352008.685	1.425	83.864
202	0.025	5.00	86.783	1500	332551.244	352042.601	3.120	83.663
203	0.053	5.00	88.286	1500	332572.201	352080.954	1.725	86.561
204	0.018	5.00	87.522	1500	332561.231	352060.706	4.056	83.466
205	0.016	5.00	87.183	1500	332582.575	352048.932	3.819	83.364
206	0.041	5.00	86.931	1500	332598.779	352036.587	3.652	83.279
207	0.068	5.00	84.975	1500	332635.458	351999.570	1.913	83.062
208	0.024	5.00	85.762	1500	332644.713	352011.350	2.762	83.000
209	0.000		86.051	1500	332650.956	352017.769	1.588	84.463

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	201	202	34.126	0.600	83.864	83.663	0.201	170.0	225	5.57	49.4
1.001	202	204	20.677	0.600	83.663	83.541	0.122	170.0	225	5.91	48.2
2.000	203	204	23.029	0.600	86.561	85.041	1.520	15.2	225	5.11	50.0
1.002	204	205	24.376	0.600	83.466	83.364	0.102	240.0	300	6.32	46.9
1.003	205	206	20.371	0.600	83.364	83.279	0.085	240.0	300	6.65	45.9
1.004	206	207	52.111	0.600	83.279	83.062	0.217	240.0	300	7.51	43.5
1.005	207	208	14.981	0.600	83.062	83.000	0.062	240.0	300	7.76	42.9
1.006	208	209	8.954	0.600	84.500	84.463	0.037	242.0	300	7.91	42.5

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.000	39.7	7.6	1.200	2.895	0.057	0.0	66	0.773
1.001	1.000	39.7	10.7	2.895	3.756	0.082	0.0	80	0.851
2.000	3.378	134.3	7.2	1.500	2.256	0.053	0.0	35	1.802
1.002	1.010	71.4	19.4	3.756	3.519	0.153	0.0	107	0.865
1.003	1.010	71.4	21.0	3.519	3.352	0.169	0.0	111	0.881
1.004	1.010	71.4	24.8	3.352	1.613	0.210	0.0	122	0.921
1.005	1.010	71.4	32.3	1.613	2.462	0.278	0.0	142	0.986
1.006	1.006	71.1	34.8	0.962	1.288	0.302	0.0	148	1.000

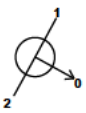
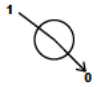
Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	34.126	170.0	225	Circular_Default Sewer Type	85.289	83.864	1.200	86.783	83.663	2.895
1.001	20.677	170.0	225	Circular_Default Sewer Type	86.783	83.663	2.895	87.522	83.541	3.756
2.000	23.029	15.2	225	Circular_Default Sewer Type	88.286	86.561	1.500	87.522	85.041	2.256
1.002	24.376	240.0	300	Circular_Default Sewer Type	87.522	83.466	3.756	87.183	83.364	3.519
1.003	20.371	240.0	300	Circular_Default Sewer Type	87.183	83.364	3.519	86.931	83.279	3.352
1.004	52.111	240.0	300	Circular_Default Sewer Type	86.931	83.279	3.352	84.975	83.062	1.613
1.005	14.981	240.0	300	Circular_Default Sewer Type	84.975	83.062	1.613	85.762	83.000	2.462
1.006	8.954	242.0	300	Circular_Default Sewer Type	85.762	84.500	0.962	86.051	84.463	1.288

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	201	1500	Manhole	Adoptable	202	1500	Manhole	Adoptable
1.001	202	1500	Manhole	Adoptable	204	1500	Manhole	Adoptable
2.000	203	1500	Manhole	Adoptable	204	1500	Manhole	Adoptable
1.002	204	1500	Manhole	Adoptable	205	1500	Manhole	Adoptable
1.003	205	1500	Manhole	Adoptable	206	1500	Manhole	Adoptable
1.004	206	1500	Manhole	Adoptable	207	1500	Manhole	Adoptable
1.005	207	1500	Manhole	Adoptable	208	1500	Manhole	Adoptable
1.006	208	1500	Manhole	Adoptable	209	1500	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
201	332547.468	352008.685	85.289	1.425	1500				
						0	1.000	83.864	225
202	332551.244	352042.601	86.783	3.120	1500		1	1.000	83.663	225
							0	1.001	83.663	225
203	332572.201	352080.954	88.286	1.725	1500				
						0	2.000	86.561	225
204	332561.231	352060.706	87.522	4.056	1500		1	2.000	85.041	225
							2	1.001	83.541	225
							0	1.002	83.466	300
205	332582.575	352048.932	87.183	3.819	1500		1	1.002	83.364	300
							0	1.003	83.364	300
206	332598.779	352036.587	86.931	3.652	1500		1	1.003	83.279	300
							0	1.004	83.279	300
207	332635.458	351999.570	84.975	1.913	1500		1	1.004	83.062	300
							0	1.005	83.062	300

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
208	332644.713	352011.350	85.762	2.762	1500	1	1.005	83.000	300
						0	1.006	84.500	300
209	332650.956	352017.769	86.051	1.588	1500	1	1.006	84.463	300





Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	✓
Rainfall Events	Singular	Drain Down Time (mins)	240
FSR Region	England and Wales	Additional Storage (m³/ha)	20.0
M5-60 (mm)	17.000	Starting Level (m)	
Ratio-R	0.300	Check Discharge Rate(s)	✓
Summer CV	0.750	Check Discharge Volume	✓
Winter CV	0.840	100 year 360 minute (m³)	
Analysis Speed	Detailed		

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	50	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.95
Greenfield Method	IH124	Growth Factor 100 year	2.48
Positively Drained Area (ha)		Betterment (%)	0
SAAR (mm)		QBar	
Soil Index	1	Q 1 year (l/s)	
SPR	0.10	Q 30 year (l/s)	
Region	1	Q 100 year (l/s)	
Growth Factor 1 year	0.85		

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)		Storm Duration (mins)	360
Soil Index	1	Betterment (%)	0
SPR	0.10	PR	
CWI		Runoff Volume (m³)	

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Node 208 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	1.58400	Invert Level (m)	83.000	Depth (m)	1.200
Side Inf Coefficient (m/hr)	1.58400	Time to half empty (mins)	96	Inf Depth (m)	1.200
Safety Factor	5.0	Pit Width (m)	4.000	Number Required	1
Porosity	0.95	Pit Length (m)	20.000		

Other (defaults)

Entry Loss (manhole)	0.250	Entry Loss (junction)	0.000	Apply Recommended Losses	x
Exit Loss (manhole)	0.250	Exit Loss (junction)	0.000	Flood Risk (m)	0.300

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.34%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	201	10	83.923	0.059	6.2	0.1503	0.0000	OK
15 minute winter	202	11	83.736	0.073	8.7	0.1401	0.0000	OK
15 minute winter	203	10	86.593	0.032	5.8	0.0762	0.0000	OK
15 minute winter	204	11	83.565	0.099	15.8	0.1838	0.0000	OK
15 minute winter	205	11	83.469	0.105	17.5	0.1951	0.0000	OK
15 minute winter	206	12	83.389	0.110	21.5	0.2191	0.0000	OK
15 minute winter	207	11	83.192	0.130	27.3	0.3233	0.0000	OK
60 minute winter	208	46	83.138	0.138	17.9	10.7870	0.0000	OK
15 minute summer	209	1	84.463	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	201	1.000	202	6.0	0.638	0.150	0.3283	
15 minute winter	202	1.001	204	8.5	0.788	0.214	0.2235	
15 minute winter	203	2.000	204	5.7	1.670	0.042	0.0783	
15 minute winter	204	1.002	205	15.9	0.754	0.223	0.5158	
15 minute winter	205	1.003	206	17.3	0.771	0.243	0.4585	
15 minute winter	206	1.004	207	21.0	0.800	0.294	1.3680	
15 minute winter	207	1.005	208	27.5	1.521	0.386	0.3297	
60 minute winter	208	1.006	209	0.0	0.000	0.000	0.0000	0.0
60 minute winter	208	Infiltration		7.6				

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.34%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	201	10	83.958	0.094	15.0	0.2414	0.0000	OK
15 minute winter	202	11	83.785	0.122	21.4	0.2342	0.0000	OK
15 minute winter	203	10	86.611	0.050	14.0	0.1188	0.0000	OK
15 minute winter	204	11	83.636	0.170	38.9	0.3149	0.0000	OK
15 minute winter	205	11	83.549	0.185	43.2	0.3426	0.0000	OK
15 minute winter	206	11	83.474	0.195	53.2	0.3885	0.0000	OK
60 minute winter	207	50	83.461	0.399	40.9	0.9884	0.0000	SURCHARGED
60 minute winter	208	53	83.460	0.460	40.8	35.8531	0.0000	OK
15 minute summer	209	1	84.463	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	201	1.000	202	14.8	0.796	0.371	0.6372	
15 minute winter	202	1.001	204	21.0	0.994	0.528	0.4368	
15 minute winter	203	2.000	204	13.8	2.159	0.103	0.1474	
15 minute winter	204	1.002	205	39.2	0.907	0.548	1.0565	
15 minute winter	205	1.003	206	43.0	0.913	0.602	0.9584	
15 minute winter	206	1.004	207	52.5	1.004	0.736	2.7762	
60 minute winter	207	1.005	208	37.2	1.118	0.521	1.0550	
60 minute winter	208	1.006	209	0.0	0.000	0.000	0.0000	0.0
60 minute winter	208	Infiltration		9.0				

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 99.54%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	201	12	84.235	0.371	29.0	0.9529	0.0000	SURCHARGED
15 minute winter	202	12	84.166	0.503	41.1	0.9700	0.0000	SURCHARGED
15 minute winter	203	10	86.631	0.070	27.0	0.1677	0.0000	OK
120 minute winter	204	98	84.135	0.669	29.8	1.2418	0.0000	SURCHARGED
120 minute winter	205	98	84.134	0.770	29.9	1.4255	0.0000	SURCHARGED
120 minute winter	206	98	84.133	0.854	35.7	1.7015	0.0000	SURCHARGED
120 minute winter	207	100	84.130	1.068	47.9	2.6462	0.0000	SURCHARGED
120 minute winter	208	100	84.128	1.128	51.2	87.8916	0.0000	OK
15 minute summer	209	1	84.463	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	201	1.000	202	28.4	0.893	0.715	1.3572	
15 minute winter	202	1.001	204	33.8	1.033	0.851	0.8223	
15 minute winter	203	2.000	204	26.7	2.588	0.199	0.2377	
120 minute winter	204	1.002	205	27.0	0.834	0.378	1.7165	
120 minute winter	205	1.003	206	27.9	0.832	0.391	1.4345	
120 minute winter	206	1.004	207	34.9	0.706	0.489	3.6696	
120 minute winter	207	1.005	208	46.6	1.137	0.652	1.0550	
120 minute winter	208	1.006	209	0.0	0.000	0.000	0.0000	0.0
120 minute winter	208	Infiltration		11.8				

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.300	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
301	0.178	5.00	91.329	1500	332177.126	351926.332	1.425	89.904
302	0.080	5.00	90.082	1500	332208.075	351932.119	1.500	88.582
303	0.092	5.00	88.941	1500	332244.498	351949.639	1.575	87.366
304	0.150	5.00	89.773	1500	332281.376	351950.929	2.530	87.243
305	0.081	5.00	91.199	1500	332318.393	351956.005	4.156	87.043
306	0.032	5.00	91.087	1500	332330.629	351948.048	4.080	87.007
307	0.055	5.00	90.957	1500	332337.342	351940.837	3.975	86.982
308	0.050	5.00	90.816	1500	332342.024	351930.838	3.862	86.954
309	0.055	5.00	90.566	1500	332345.540	351911.564	3.661	86.905
310	0.047	5.00	90.367	1500	332351.184	351896.013	3.503	86.864
311	0.149	5.00	89.087	1500	332299.076	351861.259	1.425	87.662
312	0.163	5.00	89.362	1500	332293.361	351889.206	2.018	87.344
313	0.087	5.00	88.911	1500	332235.565	351904.942	1.425	87.486
314	0.103	5.00	88.615	1500	332239.302	351878.358	1.575	87.040
315	0.120	5.00	88.939	1500	332187.351	351843.540	1.425	87.514
316	0.094	5.00	88.628	1500	332212.262	351849.017	1.500	87.128
317	0.078	5.00	88.319	1500	332244.217	351855.330	1.725	86.594
318	0.094	5.00	87.961	1500	332250.270	351827.349	1.650	86.311
319	0.082	5.00	87.658	1500	332252.213	351803.141	1.650	86.008
320	0.037	5.00	87.303	1500	332261.759	351776.542	1.650	85.653
321	0.156	5.00	87.415	1800	332258.438	351784.778	1.934	85.481
322	0.000		86.952	1800	332285.418	351794.096	2.145	84.807
323	0.164	5.00	86.890	1800	332349.027	351806.879	2.245	84.645
324	0.092	5.00	87.686	1800	332366.457	351810.423	3.085	84.601
325	0.018	5.00	89.239	1800	332360.406	351840.978	4.716	84.523
326	0.050	5.00	89.749	1800	332358.245	351857.456	5.268	84.481
327	0.045	5.00	89.966	1800	332360.155	351873.835	5.526	84.440
328	0.075	5.00	90.147	1800	332363.941	351883.599	5.733	84.414
329	0.019	5.00	89.988	1800	332376.921	351879.743	5.608	84.380
330	0.033	5.00	89.780	1800	332393.619	351881.731	5.442	84.338
331	0.028	5.00	89.790	1500	332428.089	351867.764	1.425	88.365
332	0.116	5.00	89.407	1800	332422.774	351888.134	5.144	84.263
333	0.017	5.00	89.047	1800	332437.903	351894.652	4.825	84.222
334	0.074	5.00	88.475	1800	332448.971	351903.655	4.289	84.186
335	0.131	5.00	86.419	1500	332522.810	351847.346	1.724	84.695
336	0.124	5.00	87.065	1500	332497.812	351869.823	2.454	84.611
337	0.018	5.00	87.574	1500	332473.145	351900.240	3.061	84.513
338	0.050	5.00	87.898	1800	332456.083	351913.189	3.742	84.156
339	0.045	5.00	87.052	1800	332465.480	351926.929	2.938	84.114
340	0.042	5.00	86.287	1800	332476.303	351937.580	2.211	84.076
341	0.077	5.00	86.037	1800	332493.188	351948.124	2.011	84.026

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
342	0.000	5.00	85.800	1800	332523.028	351969.137	2.054	83.746
343	0.019	5.00	85.661	1800	332529.872	351956.944	1.955	83.706
344	0.099	5.00	85.750	1800	332536.311	351945.047	2.078	83.672
345			85.750	1500	332542.634	351937.143	0.275	85.475

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	301	302	31.485	0.600	89.904	88.657	1.247	25.2	225	5.20	50.0
1.001	302	303	40.418	0.600	88.582	87.441	1.141	35.4	300	5.45	49.8
1.002	303	304	36.901	0.600	87.366	87.243	0.123	300.0	375	6.05	47.8
1.003	304	305	37.363	0.600	87.243	87.118	0.125	300.0	375	6.64	45.9
1.004	305	306	14.596	0.600	87.043	87.007	0.036	400.0	450	6.89	45.2
1.005	306	307	9.852	0.600	87.007	86.982	0.025	400.0	450	7.05	44.7
1.006	307	308	11.041	0.600	86.982	86.954	0.028	400.0	450	7.23	44.2
1.007	308	309	19.592	0.600	86.954	86.905	0.049	400.0	450	7.55	43.4
1.008	309	310	16.544	0.600	86.905	86.864	0.041	400.0	450	7.83	42.7
1.009	310	328	17.800	0.600	86.864	86.214	0.650	27.4	450	7.90	42.5
2.000	311	312	28.525	0.600	87.662	87.494	0.168	170.0	225	5.48	49.7
2.001	312	314	55.137	0.600	87.344	87.040	0.304	181.4	375	6.16	47.4
3.000	313	314	26.845	0.600	87.486	87.190	0.296	90.7	225	5.33	50.0
2.002	314	317	23.547	0.600	87.040	86.669	0.371	63.5	375	6.33	46.8
4.000	315	316	25.506	0.600	87.514	87.203	0.311	82.0	225	5.29	50.0
4.001	316	317	32.573	0.600	87.128	86.744	0.384	84.8	300	5.61	49.2
2.003	317	318	28.628	0.600	86.594	86.311	0.283	101.2	450	6.57	46.1
2.004	318	319	24.286	0.600	86.311	86.008	0.303	80.2	450	6.75	45.6
2.005	319	321	19.389	0.600	86.008	85.653	0.355	54.6	450	6.86	45.3

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	2.614	103.9	24.1	1.200	1.200	0.178	0.0	73	2.137
1.001	2.650	187.3	34.8	1.200	1.200	0.258	0.0	87	2.041
1.002	1.041	114.9	45.3	1.200	2.155	0.350	0.0	164	0.982
1.003	1.041	114.9	62.2	2.155	3.706	0.500	0.0	197	1.060
1.004	1.010	160.7	71.2	3.706	3.630	0.581	0.0	210	0.981
1.005	1.010	160.7	74.3	3.630	3.525	0.613	0.0	215	0.991
1.006	1.010	160.7	80.1	3.525	3.412	0.668	0.0	225	1.009
1.007	1.010	160.7	84.5	3.412	3.211	0.718	0.0	232	1.022
1.008	1.010	160.7	89.5	3.211	3.053	0.773	0.0	240	1.037
1.009	3.896	619.7	94.5	3.053	3.483	0.820	0.0	118	2.855
2.000	1.000	39.7	20.1	1.200	1.643	0.149	0.0	113	1.001
2.001	1.342	148.2	40.1	1.643	1.200	0.312	0.0	133	1.147
3.000	1.373	54.6	11.8	1.200	1.200	0.087	0.0	71	1.100
2.002	2.277	251.5	63.7	1.200	1.275	0.502	0.0	128	1.910
4.000	1.445	57.4	16.3	1.200	1.200	0.120	0.0	81	1.244
4.001	1.708	120.7	28.6	1.200	1.275	0.214	0.0	99	1.405
2.003	2.021	321.4	99.3	1.275	1.200	0.794	0.0	171	1.789
2.004	2.272	361.3	109.8	1.200	1.200	0.888	0.0	169	2.001
2.005	2.755	438.2	119.0	1.200	1.312	0.970	0.0	160	2.358

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
5.000	320	321	8.880	0.600	85.653	85.631	0.022	400.0	450	5.15	50.0
2.006	321	322	28.544	0.600	85.481	84.957	0.524	54.5	600	7.01	44.9
2.007	322	323	64.881	0.600	84.807	84.645	0.162	400.0	750	7.78	42.8
2.008	323	324	17.787	0.600	84.645	84.601	0.044	400.0	750	8.00	42.3
2.009	324	325	31.148	0.600	84.601	84.523	0.078	400.0	750	8.37	41.4
2.010	325	326	16.619	0.600	84.523	84.481	0.042	400.0	750	8.57	41.0
2.011	326	327	16.490	0.600	84.481	84.440	0.041	400.0	750	8.77	40.5
2.012	327	328	10.472	0.600	84.440	84.414	0.026	400.0	750	8.89	40.3
1.010	328	329	13.541	0.600	84.414	84.380	0.034	400.0	750	9.05	39.9
1.011	329	330	16.816	0.600	84.380	84.338	0.042	400.0	750	9.26	39.5
1.012	330	332	29.850	0.600	84.338	84.263	0.075	400.0	750	9.61	38.8
6.000	331	332	21.052	0.600	88.365	86.521	1.844	11.4	225	5.09	50.0
1.013	332	333	16.473	0.600	84.263	84.222	0.041	401.8	750	9.81	37.7
1.014	333	334	14.267	0.600	84.222	84.186	0.036	396.3	750	9.98	38.1
1.015	334	338	11.894	0.600	84.186	84.156	0.030	396.5	750	10.12	37.8
7.000	335	336	33.617	0.600	84.695	84.611	0.084	400.0	450	5.55	49.4
7.001	336	337	39.162	0.600	84.611	84.513	0.098	400.0	450	6.20	47.3
7.002	337	338	21.419	0.600	84.513	84.459	0.054	400.0	450	6.55	46.2
1.016	338	339	16.646	0.600	84.156	84.114	0.042	396.3	750	10.32	37.5
1.017	339	340	15.185	0.600	84.114	84.076	0.038	399.6	750	10.50	37.1
1.018	340	341	19.907	0.600	84.076	84.026	0.050	398.1	750	10.74	36.7
1.019	341	343	37.729	0.600	84.026	83.706	0.320	117.9	750	10.98	36.3
8.000	342	343	13.982	0.600	83.746	83.711	0.035	400.0	750	5.17	50.0
1.020	343	344	13.528	0.600	83.706	83.672	0.034	397.9	750	11.14	36.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
5.000	1.010	160.7	5.0	1.200	1.334	0.037	0.0	54	0.465
2.006	3.304	934.1	141.4	1.334	1.395	1.163	0.0	156	2.414
2.007	1.393	615.3	134.9	1.395	1.495	1.163	0.0	237	1.127
2.008	1.393	615.3	152.1	1.495	2.335	1.327	0.0	252	1.163
2.009	1.393	615.3	159.3	2.335	3.966	1.419	0.0	259	1.178
2.010	1.393	615.3	159.5	3.966	4.518	1.437	0.0	259	1.178
2.011	1.393	615.3	163.3	4.518	4.776	1.487	0.0	263	1.186
2.012	1.393	615.3	167.2	4.776	4.983	1.532	0.0	266	1.193
1.010	1.393	615.3	262.6	4.983	4.858	2.427	0.0	342	1.340
1.011	1.393	615.3	261.9	4.858	4.692	2.446	0.0	341	1.339
1.012	1.393	615.3	260.6	4.692	4.394	2.479	0.0	340	1.338
6.000	3.894	154.8	3.8	1.200	2.661	0.028	0.0	24	1.658
1.013	1.390	613.9	267.8	4.394	4.075	2.623	0.0	346	1.344
1.014	1.399	618.2	272.5	4.075	3.539	2.640	0.0	348	1.357
1.015	1.399	618.0	278.2	3.539	2.992	2.714	0.0	353	1.364
7.000	1.010	160.7	17.6	1.274	2.004	0.131	0.0	100	0.671
7.001	1.010	160.7	32.7	2.004	2.611	0.255	0.0	137	0.798
7.002	1.010	160.7	34.2	2.611	2.989	0.273	0.0	140	0.808
1.016	1.399	618.2	308.4	2.992	2.188	3.037	0.0	375	1.399
1.017	1.393	615.6	310.2	2.188	1.461	3.082	0.0	377	1.396
1.018	1.396	616.7	311.0	1.461	1.261	3.124	0.0	377	1.399
1.019	2.576	1138.0	315.1	1.261	1.205	3.201	0.0	268	2.220
8.000	1.393	615.3	0.0	1.304	1.200	0.000	0.0	0	0.000
1.020	1.396	616.9	314.6	1.205	1.328	3.220	0.0	380	1.403

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.021	344	345	10.122	0.600	85.500	85.475	0.025	404.9	150	11.49	33.5

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.021	0.493	8.7	301.0	0.100	0.125	3.319	0.0	150	0.503

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	31.485	25.2	225	Circular_Default Sewer Type	91.329	89.904	1.200	90.082	88.657	1.200
1.001	40.418	35.4	300	Circular_Default Sewer Type	90.082	88.582	1.200	88.941	87.441	1.200
1.002	36.901	300.0	375	Circular_Default Sewer Type	88.941	87.366	1.200	89.773	87.243	2.155
1.003	37.363	300.0	375	Circular_Default Sewer Type	89.773	87.243	2.155	91.199	87.118	3.706
1.004	14.596	400.0	450	Circular_Default Sewer Type	91.199	87.043	3.706	91.087	87.007	3.630
1.005	9.852	400.0	450	Circular_Default Sewer Type	91.087	87.007	3.630	90.957	86.982	3.525
1.006	11.041	400.0	450	Circular_Default Sewer Type	90.957	86.982	3.525	90.816	86.954	3.412
1.007	19.592	400.0	450	Circular_Default Sewer Type	90.816	86.954	3.412	90.566	86.905	3.211
1.008	16.544	400.0	450	Circular_Default Sewer Type	90.566	86.905	3.211	90.367	86.864	3.053
1.009	17.800	27.4	450	Circular_Default Sewer Type	90.367	86.864	3.053	90.147	86.214	3.483
2.000	28.525	170.0	225	Circular_Default Sewer Type	89.087	87.662	1.200	89.362	87.494	1.643
2.001	55.137	181.4	375	Circular_Default Sewer Type	89.362	87.344	1.643	88.615	87.040	1.200
3.000	26.845	90.7	225	Circular_Default Sewer Type	88.911	87.486	1.200	88.615	87.190	1.200
2.002	23.547	63.5	375	Circular_Default Sewer Type	88.615	87.040	1.200	88.319	86.669	1.275
4.000	25.506	82.0	225	Circular_Default Sewer Type	88.939	87.514	1.200	88.628	87.203	1.200
4.001	32.573	84.8	300	Circular_Default Sewer Type	88.628	87.128	1.200	88.319	86.744	1.275
2.003	28.628	101.2	450	Circular_Default Sewer Type	88.319	86.594	1.275	87.961	86.311	1.200
2.004	24.286	80.2	450	Circular_Default Sewer Type	87.961	86.311	1.200	87.658	86.008	1.200
2.005	19.389	54.6	450	Circular_Default Sewer Type	87.658	86.008	1.200	87.415	85.653	1.312

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	301	1500	Manhole	Adoptable	302	1500	Manhole	Adoptable
1.001	302	1500	Manhole	Adoptable	303	1500	Manhole	Adoptable
1.002	303	1500	Manhole	Adoptable	304	1500	Manhole	Adoptable
1.003	304	1500	Manhole	Adoptable	305	1500	Manhole	Adoptable
1.004	305	1500	Manhole	Adoptable	306	1500	Manhole	Adoptable
1.005	306	1500	Manhole	Adoptable	307	1500	Manhole	Adoptable
1.006	307	1500	Manhole	Adoptable	308	1500	Manhole	Adoptable
1.007	308	1500	Manhole	Adoptable	309	1500	Manhole	Adoptable
1.008	309	1500	Manhole	Adoptable	310	1500	Manhole	Adoptable
1.009	310	1500	Manhole	Adoptable	328	1800	Manhole	Adoptable
2.000	311	1500	Manhole	Adoptable	312	1500	Manhole	Adoptable
2.001	312	1500	Manhole	Adoptable	314	1500	Manhole	Adoptable
3.000	313	1500	Manhole	Adoptable	314	1500	Manhole	Adoptable
2.002	314	1500	Manhole	Adoptable	317	1500	Manhole	Adoptable
4.000	315	1500	Manhole	Adoptable	316	1500	Manhole	Adoptable
4.001	316	1500	Manhole	Adoptable	317	1500	Manhole	Adoptable
2.003	317	1500	Manhole	Adoptable	318	1500	Manhole	Adoptable
2.004	318	1500	Manhole	Adoptable	319	1500	Manhole	Adoptable
2.005	319	1500	Manhole	Adoptable	321	1800	Manhole	Adoptable

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

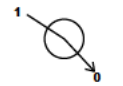
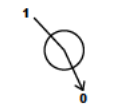
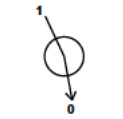
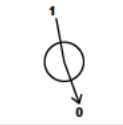
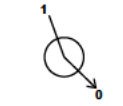
Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
5.000	8.880	400.0	450	Circular_Default Sewer Type	87.303	85.653	1.200	87.415	85.631	1.334
2.006	28.544	54.5	600	Circular_Default Sewer Type	87.415	85.481	1.334	86.952	84.957	1.395
2.007	64.881	400.0	750	Circular_Default Sewer Type	86.952	84.807	1.395	86.890	84.645	1.495
2.008	17.787	400.0	750	Circular_Default Sewer Type	86.890	84.645	1.495	87.686	84.601	2.335
2.009	31.148	400.0	750	Circular_Default Sewer Type	87.686	84.601	2.335	89.239	84.523	3.966
2.010	16.619	400.0	750	Circular_Default Sewer Type	89.239	84.523	3.966	89.749	84.481	4.518
2.011	16.490	400.0	750	Circular_Default Sewer Type	89.749	84.481	4.518	89.966	84.440	4.776
2.012	10.472	400.0	750	Circular_Default Sewer Type	89.966	84.440	4.776	90.147	84.414	4.983
1.010	13.541	400.0	750	Circular_Default Sewer Type	90.147	84.414	4.983	89.988	84.380	4.858
1.011	16.816	400.0	750	Circular_Default Sewer Type	89.988	84.380	4.858	89.780	84.338	4.692
1.012	29.850	400.0	750	Circular_Default Sewer Type	89.780	84.338	4.692	89.407	84.263	4.394
6.000	21.052	11.4	225	Circular_Default Sewer Type	89.790	88.365	1.200	89.407	86.521	2.661
1.013	16.473	401.8	750	Circular_Default Sewer Type	89.407	84.263	4.394	89.047	84.222	4.075
1.014	14.267	396.3	750	Circular_Default Sewer Type	89.047	84.222	4.075	88.475	84.186	3.539
1.015	11.894	396.5	750	Circular_Default Sewer Type	88.475	84.186	3.539	87.898	84.156	2.992
7.000	33.617	400.0	450	Circular_Default Sewer Type	86.419	84.695	1.274	87.065	84.611	2.004
7.001	39.162	400.0	450	Circular_Default Sewer Type	87.065	84.611	2.004	87.574	84.513	2.611
7.002	21.419	400.0	450	Circular_Default Sewer Type	87.574	84.513	2.611	87.898	84.459	2.989
1.016	16.646	396.3	750	Circular_Default Sewer Type	87.898	84.156	2.992	87.052	84.114	2.188
1.017	15.185	399.6	750	Circular_Default Sewer Type	87.052	84.114	2.188	86.287	84.076	1.461
1.018	19.907	398.1	750	Circular_Default Sewer Type	86.287	84.076	1.461	86.037	84.026	1.261
1.019	37.729	117.9	750	Circular_Default Sewer Type	86.037	84.026	1.261	85.661	83.706	1.205
8.000	13.982	400.0	750	Circular_Default Sewer Type	85.800	83.746	1.304	85.661	83.711	1.200
1.020	13.528	397.9	750	Circular_Default Sewer Type	85.661	83.706	1.205	85.750	83.672	1.328
1.021	10.122	404.9	150	Circular_Default Sewer Type	85.750	85.500	0.100	85.750	85.475	0.125

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
5.000	320	1500	Manhole	Adoptable	321	1800	Manhole	Adoptable
2.006	321	1800	Manhole	Adoptable	322	1800	Manhole	Adoptable
2.007	322	1800	Manhole	Adoptable	323	1800	Manhole	Adoptable
2.008	323	1800	Manhole	Adoptable	324	1800	Manhole	Adoptable
2.009	324	1800	Manhole	Adoptable	325	1800	Manhole	Adoptable
2.010	325	1800	Manhole	Adoptable	326	1800	Manhole	Adoptable
2.011	326	1800	Manhole	Adoptable	327	1800	Manhole	Adoptable
2.012	327	1800	Manhole	Adoptable	328	1800	Manhole	Adoptable
1.010	328	1800	Manhole	Adoptable	329	1800	Manhole	Adoptable
1.011	329	1800	Manhole	Adoptable	330	1800	Manhole	Adoptable
1.012	330	1800	Manhole	Adoptable	332	1800	Manhole	Adoptable
6.000	331	1500	Manhole	Adoptable	332	1800	Manhole	Adoptable
1.013	332	1800	Manhole	Adoptable	333	1800	Manhole	Adoptable
1.014	333	1800	Manhole	Adoptable	334	1800	Manhole	Adoptable
1.015	334	1800	Manhole	Adoptable	338	1800	Manhole	Adoptable
7.000	335	1500	Manhole	Adoptable	336	1500	Manhole	Adoptable
7.001	336	1500	Manhole	Adoptable	337	1500	Manhole	Adoptable
7.002	337	1500	Manhole	Adoptable	338	1800	Manhole	Adoptable
1.016	338	1800	Manhole	Adoptable	339	1800	Manhole	Adoptable
1.017	339	1800	Manhole	Adoptable	340	1800	Manhole	Adoptable
1.018	340	1800	Manhole	Adoptable	341	1800	Manhole	Adoptable
1.019	341	1800	Manhole	Adoptable	343	1800	Manhole	Adoptable
8.000	342	1800	Manhole	Adoptable	343	1800	Manhole	Adoptable
1.020	343	1800	Manhole	Adoptable	344	1800	Manhole	Adoptable
1.021	344	1800	Manhole	Adoptable	345	1500	Manhole	Adoptable

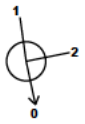
Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
301	332177.126	351926.332	91.329	1.425	1500		0 1.000	89.904	225
302	332208.075	351932.119	90.082	1.500	1500		1 1.000 0 1.001	88.657 88.582	225 300
303	332244.498	351949.639	88.941	1.575	1500		1 1.001 0 1.002	87.441 87.366	300 375
304	332281.376	351950.929	89.773	2.530	1500		1 1.002 0 1.003	87.243 87.243	375 375
305	332318.393	351956.005	91.199	4.156	1500		1 1.003 0 1.004	87.118 87.043	375 450
306	332330.629	351948.048	91.087	4.080	1500		1 1.004 0 1.005	87.007 87.007	450 450
307	332337.342	351940.837	90.957	3.975	1500		1 1.005 0 1.006	86.982 86.982	450 450
308	332342.024	351930.838	90.816	3.862	1500		1 1.006 0 1.007	86.954 86.954	450 450
309	332345.540	351911.564	90.566	3.661	1500		1 1.007 0 1.008	86.905 86.905	450 450
310	332351.184	351896.013	90.367	3.503	1500		1 1.008 0 1.009	86.864 86.864	450 450
311	332299.076	351861.259	89.087	1.425	1500		0 2.000	87.662	225
312	332293.361	351889.206	89.362	2.018	1500		1 2.000 0 2.001	87.494 87.344	225 375
313	332235.565	351904.942	88.911	1.425	1500		0 3.000	87.486	225

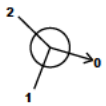
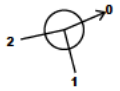
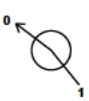
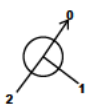
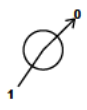
Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
314	332239.302	351878.358	88.615	1.575	1500		1	3.000	87.190	225
							2	2.001	87.040	375
							0	2.002	87.040	375
315	332187.351	351843.540	88.939	1.425	1500		0	4.000	87.514	225
316	332212.262	351849.017	88.628	1.500	1500		1	4.000	87.203	225
							0	4.001	87.128	300
317	332244.217	351855.330	88.319	1.725	1500		1	4.001	86.744	300
							2	2.002	86.669	375
							0	2.003	86.594	450
318	332250.270	351827.349	87.961	1.650	1500		1	2.003	86.311	450
							0	2.004	86.311	450
319	332252.213	351803.141	87.658	1.650	1500		1	2.004	86.008	450
							0	2.005	86.008	450
320	332261.759	351776.542	87.303	1.650	1500		0	5.000	85.653	450
321	332258.438	351784.778	87.415	1.934	1800		1	5.000	85.631	450
							2	2.005	85.653	450
							0	2.006	85.481	600
322	332285.418	351794.096	86.952	2.145	1800		1	2.006	84.957	600
							0	2.007	84.807	750
323	332349.027	351806.879	86.890	2.245	1800		1	2.007	84.645	750
							0	2.008	84.645	750
324	332366.457	351810.423	87.686	3.085	1800		1	2.008	84.601	750
							0	2.009	84.601	750
325	332360.406	351840.978	89.239	4.716	1800		1	2.009	84.523	750
							0	2.010	84.523	750
326	332358.245	351857.456	89.749	5.268	1800		1	2.010	84.481	750
							0	2.011	84.481	750

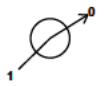
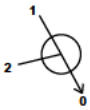
Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
327	332360.155	351873.835	89.966	5.526	1800	 1	2.011	84.440	750
						0	2.012	84.440	750
328	332363.941	351883.599	90.147	5.733	1800	 1	2.012	84.414	750
						2	1.009	86.214	450
						0	1.010	84.414	750
329	332376.921	351879.743	89.988	5.608	1800	 1	1.010	84.380	750
						0	1.011	84.380	750
330	332393.619	351881.731	89.780	5.442	1800	 1	1.011	84.338	750
						0	1.012	84.338	750
331	332428.089	351867.764	89.790	1.425	1500				
						0	6.000	88.365	225
332	332422.774	351888.134	89.407	5.144	1800	 1	6.000	86.521	225
						2	1.012	84.263	750
						0	1.013	84.263	750
333	332437.903	351894.652	89.047	4.825	1800	 1	1.013	84.222	750
						0	1.014	84.222	750
334	332448.971	351903.655	88.475	4.289	1800	 1	1.014	84.186	750
						0	1.015	84.186	750
335	332522.810	351847.346	86.419	1.724	1500				
						0	7.000	84.695	450
336	332497.812	351869.823	87.065	2.454	1500	 1	7.000	84.611	450
						0	7.001	84.611	450
337	332473.145	351900.240	87.574	3.061	1500	 1	7.001	84.513	450
						0	7.002	84.513	450
338	332456.083	351913.189	87.898	3.742	1800	 1	7.002	84.459	450
						2	1.015	84.156	750
						0	1.016	84.156	750
339	332465.480	351926.929	87.052	2.938	1800	 1	1.016	84.114	750
						0	1.017	84.114	750

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
340	332476.303	351937.580	86.287	2.211	1800	1	1.017	84.076	750
									
						0	1.018	84.076	750
341	332493.188	351948.124	86.037	2.011	1800	1	1.018	84.026	750
									
						0	1.019	84.026	750
342	332523.028	351969.137	85.800	2.054	1800				
						0	8.000	83.746	750
343	332529.872	351956.944	85.661	1.955	1800	1	8.000	83.711	750
							2	1.019	83.706	750
						0	1.020	83.706	750
344	332536.311	351945.047	85.750	2.078	1800	1	1.020	83.672	750
									
						0	1.021	85.500	150
345	332542.634	351937.143	85.750	0.275	1500	1	1.021	85.475	150
									

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	✓
Rainfall Events	Singular	Drain Down Time (mins)	240
FSR Region	England and Wales	Additional Storage (m³/ha)	20.0
M5-60 (mm)	17.000	Starting Level (m)	
Ratio-R	0.300	Check Discharge Rate(s)	✓
Summer CV	0.750	Check Discharge Volume	✓
Winter CV	0.840	100 year 360 minute (m³)	
Analysis Speed	Detailed		

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0
100	50	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	SPR	0.10
Greenfield Method	IH124	Region	1
Positively Drained Area (ha)		Growth Factor 1 year	0.85
SAAR (mm)		Growth Factor 30 year	1.95
Soil Index	1	Growth Factor 100 year	2.48

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Pre-development Discharge Rate

Betterment (%)	0	Q 30 year (l/s)	
QBar		Q 100 year (l/s)	
Q 1 year (l/s)			

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)		Storm Duration (mins)	360
Soil Index	1	Betterment (%)	0
SPR	0.10	PR	
CWI		Runoff Volume (m^3)	

Node 344 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.37440	Safety Factor	5.0	Invert Level (m)	83.500
Side Inf Coefficient (m/hr)	0.37440	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)
0.000	478.0	478.0	0.600	649.0	656.3	1.200	840.0	855.9	1.800	1052.0	1077.7
0.200	532.0	534.3	0.800	710.0	720.0	1.400	908.0	927.0	2.000	1127.0	1156.3
0.400	590.0	594.7	1.000	774.0	786.8	1.600	979.0	1001.3	2.200	1204.0	1237.0

Node 342 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.37440	Safety Factor	5.0	Invert Level (m)	83.500
Side Inf Coefficient (m/hr)	0.37440	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)
0.000	165.0	165.0	0.600	267.0	271.6	1.200	390.0	400.5	1.800	535.0	552.5
0.200	197.0	198.4	0.800	307.0	313.4	1.400	436.0	448.7	2.000	588.0	608.1
0.400	231.0	233.9	1.000	348.0	356.4	1.600	485.0	500.0	2.200	643.0	665.8

Other (defaults)

Entry Loss (manhole)	0.250	Entry Loss (junction)	0.000	Apply Recommended Losses	x
Exit Loss (manhole)	0.250	Exit Loss (junction)	0.000	Flood Risk (m)	0.300

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.93%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	301	10	89.970	0.066	19.3	0.2835	0.0000	OK
15 minute winter	302	11	88.660	0.078	27.6	0.2223	0.0000	OK
15 minute winter	303	11	87.514	0.148	36.9	0.4352	0.0000	OK
15 minute winter	304	11	87.425	0.182	52.5	0.5384	0.0000	OK
15 minute winter	305	12	87.268	0.225	59.6	0.4843	0.0000	OK
15 minute winter	306	12	87.240	0.233	62.1	0.4485	0.0000	OK
15 minute winter	307	12	87.213	0.231	66.5	0.4732	0.0000	OK
15 minute winter	308	12	87.176	0.222	71.2	0.4500	0.0000	OK
15 minute winter	309	12	87.104	0.199	76.4	0.4114	0.0000	OK
15 minute winter	310	12	86.981	0.117	80.6	0.2388	0.0000	OK
15 minute winter	311	11	87.763	0.101	16.2	0.3884	0.0000	OK
15 minute winter	312	11	87.465	0.121	33.1	0.4094	0.0000	OK
15 minute winter	313	10	87.550	0.064	9.4	0.1898	0.0000	OK
15 minute winter	314	11	87.163	0.123	52.5	0.3773	0.0000	OK
15 minute winter	315	10	87.588	0.074	13.0	0.2547	0.0000	OK
15 minute winter	316	11	87.218	0.090	22.8	0.2715	0.0000	OK
15 minute winter	317	11	86.759	0.165	83.3	0.4398	0.0000	OK
15 minute winter	318	11	86.477	0.166	93.1	0.4833	0.0000	OK
15 minute winter	319	11	86.168	0.160	101.4	0.4411	0.0000	OK
15 minute winter	320	10	85.703	0.050	4.0	0.1098	0.0000	OK
15 minute winter	321	11	85.634	0.153	120.5	0.6367	0.0000	OK
15 minute winter	322	11	85.033	0.226	119.6	0.5757	0.0000	OK
15 minute winter	323	12	84.915	0.270	134.5	1.0803	0.0000	OK
15 minute winter	324	13	84.873	0.272	139.2	0.8530	0.0000	OK
15 minute winter	325	13	84.836	0.313	136.6	0.8201	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	301	1.000	302	18.9	1.968	0.182	0.3024	
15 minute winter	302	1.001	303	27.2	1.887	0.145	0.5826	
15 minute winter	303	1.002	304	37.2	0.799	0.324	1.7274	
15 minute winter	304	1.003	305	51.3	1.039	0.447	1.8584	
15 minute winter	305	1.004	306	58.8	0.733	0.366	1.1815	
15 minute winter	306	1.005	307	61.8	0.749	0.385	0.8129	
15 minute winter	307	1.006	308	67.0	0.837	0.417	0.8837	
15 minute winter	308	1.007	309	71.7	0.985	0.446	1.4253	
15 minute winter	309	1.008	310	76.6	1.541	0.477	0.8305	
15 minute winter	310	1.009	328	80.5	2.597	0.130	0.5521	
15 minute winter	311	2.000	312	15.7	0.933	0.394	0.4791	
15 minute winter	312	2.001	314	32.9	1.062	0.222	1.7094	
15 minute winter	313	3.000	314	9.1	1.014	0.167	0.2416	
15 minute winter	314	2.002	317	52.7	1.760	0.210	0.7055	
15 minute winter	315	4.000	316	12.6	1.147	0.220	0.2816	
15 minute winter	316	4.001	317	22.6	1.302	0.187	0.5646	
15 minute winter	317	2.003	318	83.5	1.580	0.260	1.5125	
15 minute winter	318	2.004	319	92.9	1.796	0.257	1.2573	
15 minute winter	319	2.005	321	100.7	2.138	0.230	0.9134	
15 minute winter	320	5.000	321	3.9	0.467	0.024	0.0742	
15 minute winter	321	2.006	322	119.6	2.227	0.128	1.5347	
15 minute winter	322	2.007	323	120.6	0.955	0.196	8.2425	
15 minute winter	323	2.008	324	131.4	0.931	0.213	2.5292	
15 minute winter	324	2.009	325	135.1	0.922	0.220	4.9462	
15 minute winter	325	2.010	326	133.2	0.770	0.216	3.0279	

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.93%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	326	13	84.816	0.335	136.3	0.9173	0.0000	OK
15 minute winter	327	13	84.800	0.360	137.2	0.9749	0.0000	OK
15 minute winter	328	13	84.786	0.372	217.1	1.0447	0.0000	OK
15 minute winter	329	14	84.744	0.364	216.8	0.9519	0.0000	OK
15 minute winter	330	14	84.699	0.361	216.2	0.9634	0.0000	OK
15 minute winter	331	10	88.387	0.022	3.0	0.0472	0.0000	OK
15 minute winter	332	14	84.651	0.388	220.2	1.1638	0.0000	OK
15 minute winter	333	14	84.613	0.391	220.3	1.0228	0.0000	OK
15 minute winter	334	14	84.576	0.390	222.7	1.1262	0.0000	OK
15 minute winter	335	11	84.782	0.087	14.2	0.2867	0.0000	OK
15 minute winter	336	11	84.737	0.126	27.2	0.3513	0.0000	OK
15 minute winter	337	12	84.643	0.130	28.6	0.2442	0.0000	OK
15 minute winter	338	14	84.536	0.380	245.0	1.0684	0.0000	OK
15 minute winter	339	14	84.474	0.360	246.0	1.0251	0.0000	OK
15 minute winter	340	14	84.396	0.320	246.5	0.9348	0.0000	OK
15 minute winter	341	15	84.281	0.255	249.0	0.8443	0.0000	OK
360 minute winter	342	288	83.936	0.190	26.6	87.8948	0.0000	OK
15 minute winter	343	15	83.985	0.279	251.4	0.7635	0.0000	OK
360 minute winter	344	288	83.936	0.264	51.4	235.4728	0.0000	OK
15 minute summer	345	1	85.475	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	326	2.011	327	134.4	0.673	0.218	3.2931	
15 minute winter	327	2.012	328	136.6	0.644	0.222	2.2355	
15 minute winter	328	1.010	329	215.6	1.018	0.350	2.9027	
15 minute winter	329	1.011	330	214.1	1.041	0.348	3.5487	
15 minute winter	330	1.012	332	213.8	0.990	0.348	6.5677	
15 minute winter	331	6.000	332	3.0	1.520	0.019	0.0411	
15 minute winter	332	1.013	333	219.6	0.958	0.358	3.8078	
15 minute winter	333	1.014	334	219.4	0.947	0.355	3.3044	
15 minute winter	334	1.015	338	221.7	0.980	0.359	2.7051	
15 minute winter	335	7.000	336	13.7	0.483	0.085	0.9744	
15 minute winter	336	7.001	337	26.8	0.725	0.167	1.4501	
15 minute winter	337	7.002	338	28.0	0.811	0.174	0.7393	
15 minute winter	338	1.016	339	244.1	1.129	0.395	3.5982	
15 minute winter	339	1.017	340	244.7	1.266	0.397	2.9409	
15 minute winter	340	1.018	341	246.8	1.594	0.400	3.0884	
15 minute winter	341	1.019	343	250.8	1.787	0.220	5.2978	
360 minute winter	342	8.000	343	-26.6	-0.485	-0.043	1.3873	
360 minute winter	342	Infiltration		5.0				
15 minute winter	343	1.020	344	163.9	1.202	0.266	1.8457	
360 minute winter	344	1.021	345	0.0	0.000	0.000	0.0000	0.0
360 minute winter	344	Infiltration		12.6				

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	301	10	90.014	0.110	47.0	0.4672	0.0000	OK
15 minute winter	302	10	88.705	0.123	67.3	0.3474	0.0000	OK
15 minute winter	303	12	87.673	0.307	90.9	0.9023	0.0000	OK
15 minute winter	304	11	87.616	0.373	124.8	1.1023	0.0000	OK
15 minute winter	305	11	87.478	0.435	137.7	0.9383	0.0000	OK
15 minute winter	306	11	87.436	0.429	145.1	0.8263	0.0000	OK
15 minute winter	307	11	87.396	0.414	158.2	0.8465	0.0000	OK
15 minute winter	308	11	87.339	0.385	170.0	0.7806	0.0000	OK
15 minute winter	309	11	87.227	0.322	182.7	0.6660	0.0000	OK
15 minute winter	310	11	87.059	0.195	193.6	0.3959	0.0000	OK
15 minute winter	311	11	87.849	0.187	39.3	0.7208	0.0000	OK
15 minute winter	312	10	87.545	0.201	80.2	0.6815	0.0000	OK
15 minute winter	313	10	87.591	0.105	23.0	0.3125	0.0000	OK
15 minute winter	314	11	87.247	0.207	127.8	0.6373	0.0000	OK
15 minute winter	315	10	87.638	0.124	31.7	0.4277	0.0000	OK
15 minute winter	316	10	87.277	0.149	55.7	0.4490	0.0000	OK
15 minute winter	317	11	86.884	0.290	203.3	0.7748	0.0000	OK
15 minute winter	318	11	86.604	0.293	227.9	0.8526	0.0000	OK
15 minute winter	319	11	86.288	0.280	248.9	0.7733	0.0000	OK
15 minute winter	320	11	85.743	0.090	9.8	0.1987	0.0000	OK
15 minute winter	321	11	85.736	0.255	296.6	1.0584	0.0000	OK
15 minute winter	322	13	85.237	0.430	296.5	1.0940	0.0000	OK
15 minute winter	323	13	85.221	0.576	325.7	2.3064	0.0000	OK
15 minute winter	324	13	85.206	0.605	308.7	1.8997	0.0000	OK
15 minute winter	325	13	85.188	0.665	288.6	1.7434	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	301	1.000	302	46.2	2.484	0.444	0.5856	
15 minute winter	302	1.001	303	66.7	1.953	0.356	1.7189	
15 minute winter	303	1.002	304	85.2	0.896	0.741	3.8129	
15 minute winter	304	1.003	305	117.6	1.130	1.023	4.0903	
15 minute winter	305	1.004	306	137.1	0.876	0.853	2.2828	
15 minute winter	306	1.005	307	144.5	0.936	0.899	1.5197	
15 minute winter	307	1.006	308	157.5	1.059	0.981	1.6402	
15 minute winter	308	1.007	309	169.0	1.270	1.052	2.6048	
15 minute winter	309	1.008	310	181.9	1.941	1.132	1.5470	
15 minute winter	310	1.009	328	192.2	3.213	0.310	1.0689	
15 minute winter	311	2.000	312	38.0	1.146	0.956	0.9434	
15 minute winter	312	2.001	314	79.8	1.302	0.539	3.3800	
15 minute winter	313	3.000	314	22.4	1.283	0.410	0.4696	
15 minute winter	314	2.002	317	128.9	2.063	0.512	1.5048	
15 minute winter	315	4.000	316	30.9	1.436	0.538	0.5503	
15 minute winter	316	4.001	317	55.0	1.639	0.455	1.0925	
15 minute winter	317	2.003	318	204.4	1.881	0.636	3.1120	
15 minute winter	318	2.004	319	228.4	2.144	0.632	2.5875	
15 minute winter	319	2.005	321	248.4	2.631	0.567	1.8298	
15 minute winter	320	5.000	321	9.3	0.542	0.058	0.2231	
15 minute winter	321	2.006	322	296.5	2.725	0.317	3.2191	
15 minute winter	322	2.007	323	284.9	1.096	0.463	20.2343	
15 minute winter	323	2.008	324	285.8	1.024	0.464	6.6100	
15 minute winter	324	2.009	325	284.9	0.994	0.463	12.3552	
15 minute winter	325	2.010	326	272.6	0.779	0.443	6.9601	

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.67%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	326	13	85.173	0.692	283.0	1.8933	0.0000	OK
15 minute winter	327	13	85.158	0.718	282.2	1.9431	0.0000	OK
15 minute winter	328	13	85.143	0.729	478.7	2.0455	0.0000	OK
15 minute winter	329	13	85.098	0.718	474.6	1.8755	0.0000	OK
15 minute winter	330	13	85.049	0.711	476.9	1.8949	0.0000	OK
15 minute winter	331	10	88.399	0.034	7.4	0.0730	0.0000	OK
15 minute winter	332	13	84.985	0.722	497.5	2.1624	0.0000	OK
15 minute winter	333	13	84.929	0.707	498.6	1.8487	0.0000	OK
15 minute winter	334	13	84.873	0.687	508.7	1.9866	0.0000	OK
15 minute winter	335	11	84.843	0.148	34.6	0.4856	0.0000	OK
15 minute winter	336	11	84.819	0.208	65.8	0.5771	0.0000	OK
15 minute winter	337	13	84.812	0.299	69.7	0.5636	0.0000	OK
15 minute winter	338	13	84.814	0.658	555.2	1.8505	0.0000	OK
15 minute winter	339	13	84.723	0.609	561.4	1.7366	0.0000	OK
15 minute winter	340	13	84.607	0.531	566.8	1.5539	0.0000	OK
480 minute winter	341	400	84.497	0.471	119.7	1.5580	0.0000	OK
480 minute winter	342	400	84.497	0.751	47.7	252.4529	0.0000	SURCHARGED
480 minute winter	343	400	84.497	0.791	120.3	2.1656	0.0000	SURCHARGED
480 minute winter	344	400	84.497	0.825	85.5	621.6833	0.0000	OK
15 minute summer	345	1	85.475	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	326	2.011	327	277.5	0.676	0.451	7.0771	
15 minute winter	327	2.012	328	286.4	0.690	0.465	4.5570	
15 minute winter	328	1.010	329	470.7	1.158	0.765	5.8935	
15 minute winter	329	1.011	330	471.8	1.156	0.767	7.2754	
15 minute winter	330	1.012	332	475.2	1.097	0.772	12.9311	
15 minute winter	331	6.000	332	7.3	1.987	0.047	0.0774	
15 minute winter	332	1.013	333	496.0	1.147	0.808	7.1252	
15 minute winter	333	1.014	334	497.5	1.168	0.805	6.0846	
15 minute winter	334	1.015	338	508.0	1.222	0.822	4.9491	
15 minute winter	335	7.000	336	33.2	0.577	0.207	1.9623	
15 minute winter	336	7.001	337	65.2	0.898	0.406	3.5340	
15 minute winter	337	7.002	338	62.6	0.996	0.390	2.6345	
15 minute winter	338	1.016	339	554.6	1.398	0.897	6.5961	
15 minute winter	339	1.017	340	560.3	1.565	0.910	5.4404	
15 minute winter	340	1.018	341	565.0	1.919	0.916	5.8918	
480 minute winter	341	1.019	343	119.6	1.268	0.105	13.7895	
480 minute winter	342	8.000	343	-47.7	-0.579	-0.078	6.1516	
480 minute winter	342	Infiltration		7.4				
480 minute winter	343	1.020	344	81.8	0.880	0.133	5.9540	
480 minute winter	344	1.021	345	0.0	0.000	0.000	0.0000	0.0
480 minute winter	344	Infiltration		16.3				

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.90%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	301	10	90.032	0.128	60.3	0.5469	0.0000	OK
15 minute winter	302	10	88.723	0.141	86.5	0.4001	0.0000	OK
15 minute winter	303	11	88.072	0.706	116.9	2.0707	0.0000	SURCHARGED
15 minute winter	304	11	87.936	0.693	155.0	2.0476	0.0000	SURCHARGED
15 minute winter	305	11	87.662	0.619	178.1	1.3361	0.0000	SURCHARGED
15 minute winter	306	11	87.585	0.578	186.7	1.1120	0.0000	SURCHARGED
15 minute winter	307	11	87.516	0.534	203.2	1.0911	0.0000	SURCHARGED
15 minute winter	308	11	87.430	0.476	218.2	0.9640	0.0000	SURCHARGED
15 minute winter	309	11	87.285	0.380	234.8	0.7850	0.0000	OK
15 minute winter	310	11	87.092	0.228	247.9	0.4631	0.0000	OK
15 minute winter	311	11	87.947	0.285	50.5	1.1009	0.0000	SURCHARGED
15 minute winter	312	11	87.580	0.236	101.3	0.7978	0.0000	OK
15 minute winter	313	10	87.608	0.122	29.5	0.3642	0.0000	OK
15 minute winter	314	11	87.288	0.248	162.7	0.7620	0.0000	OK
15 minute winter	315	10	87.661	0.147	40.7	0.5059	0.0000	OK
15 minute winter	316	10	87.302	0.174	71.6	0.5253	0.0000	OK
15 minute winter	317	11	86.949	0.355	259.1	0.9479	0.0000	OK
15 minute winter	318	11	86.668	0.357	290.4	1.0380	0.0000	OK
15 minute winter	319	11	86.344	0.336	317.4	0.9267	0.0000	OK
15 minute winter	320	13	85.794	0.141	12.6	0.3117	0.0000	OK
15 minute winter	321	13	85.800	0.319	378.6	1.3273	0.0000	OK
15 minute winter	322	13	85.773	0.966	378.3	2.4582	0.0000	SURCHARGED
15 minute winter	323	13	85.741	1.096	391.5	4.3889	0.0000	SURCHARGED
15 minute winter	324	13	85.715	1.114	355.6	3.4983	0.0000	SURCHARGED
15 minute winter	325	13	85.674	1.151	359.6	3.0163	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	301	1.000	302	59.4	2.632	0.571	0.7105	
15 minute winter	302	1.001	303	85.8	1.977	0.458	2.0815	
15 minute winter	303	1.002	304	108.0	0.979	0.940	4.0701	
15 minute winter	304	1.003	305	152.5	1.383	1.327	4.1210	
15 minute winter	305	1.004	306	176.5	1.114	1.099	2.3126	
15 minute winter	306	1.005	307	186.1	1.175	1.159	1.5610	
15 minute winter	307	1.006	308	202.2	1.276	1.258	1.7494	
15 minute winter	308	1.007	309	217.1	1.399	1.352	2.9496	
15 minute winter	309	1.008	310	233.3	2.064	1.452	1.8450	
15 minute winter	310	1.009	328	247.7	3.400	0.400	1.2972	
15 minute winter	311	2.000	312	48.1	1.228	1.209	1.0599	
15 minute winter	312	2.001	314	101.3	1.349	0.683	4.1413	
15 minute winter	313	3.000	314	28.8	1.363	0.527	0.5686	
15 minute winter	314	2.002	317	164.0	2.068	0.652	1.9484	
15 minute winter	315	4.000	316	39.7	1.517	0.691	0.6698	
15 minute winter	316	4.001	317	70.7	1.638	0.586	1.5110	
15 minute winter	317	2.003	318	260.4	1.936	0.810	3.8506	
15 minute winter	318	2.004	319	291.1	2.224	0.806	3.1781	
15 minute winter	319	2.005	321	317.0	2.755	0.723	2.2244	
15 minute winter	320	5.000	321	13.5	0.635	0.084	0.4295	
15 minute winter	321	2.006	322	378.3	2.743	0.405	6.1944	
15 minute winter	322	2.007	323	339.1	1.107	0.551	28.5555	
15 minute winter	323	2.008	324	336.0	1.052	0.546	7.8284	
15 minute winter	324	2.009	325	356.1	1.010	0.579	13.7089	
15 minute winter	325	2.010	326	361.6	0.822	0.588	7.3144	

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.90%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	326	13	85.640	1.159	371.4	3.1704	0.0000	SURCHARGED
15 minute winter	327	13	85.603	1.163	380.3	3.1506	0.0000	SURCHARGED
15 minute winter	328	13	85.573	1.159	617.2	3.2513	0.0000	SURCHARGED
15 minute winter	329	13	85.489	1.109	617.7	2.8968	0.0000	SURCHARGED
15 minute winter	330	13	85.396	1.058	622.5	2.8200	0.0000	SURCHARGED
15 minute winter	331	10	88.403	0.038	9.5	0.0826	0.0000	OK
15 minute winter	332	13	85.265	1.002	653.7	3.0017	0.0000	SURCHARGED
15 minute winter	333	13	85.164	0.942	666.6	2.4620	0.0000	SURCHARGED
15 minute winter	334	13	85.066	0.880	688.1	2.5427	0.0000	SURCHARGED
15 minute winter	335	14	85.023	0.328	44.4	1.0779	0.0000	OK
15 minute winter	336	14	84.989	0.378	84.0	1.0493	0.0000	OK
15 minute winter	337	13	84.975	0.462	87.1	0.8717	0.0000	SURCHARGED
15 minute winter	338	13	84.969	0.813	706.4	2.2859	0.0000	SURCHARGED
15 minute winter	339	13	84.856	0.742	718.5	2.1142	0.0000	OK
480 minute winter	340	448	84.748	0.672	149.8	1.9670	0.0000	OK
480 minute winter	341	448	84.748	0.722	152.6	2.3910	0.0000	OK
480 minute winter	342	448	84.748	1.002	46.5	347.0653	0.0000	SURCHARGED
480 minute winter	343	448	84.748	1.042	150.2	2.8543	0.0000	SURCHARGED
480 minute winter	344	448	84.748	1.076	105.7	827.2924	0.0000	OK
15 minute summer	345	1	85.475	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	326	2.011	327	371.5	0.844	0.604	7.2576	
15 minute winter	327	2.012	328	381.0	0.866	0.619	4.6089	
15 minute winter	328	1.010	329	614.0	1.395	0.998	5.9597	
15 minute winter	329	1.011	330	616.0	1.400	1.001	7.4011	
15 minute winter	330	1.012	332	625.1	1.420	1.016	13.1376	
15 minute winter	331	6.000	332	9.4	2.134	0.061	0.0925	
15 minute winter	332	1.013	333	663.3	1.507	1.080	7.2501	
15 minute winter	333	1.014	334	673.6	1.531	1.090	6.2792	
15 minute winter	334	1.015	338	695.5	1.580	1.125	5.2348	
15 minute winter	335	7.000	336	42.5	0.592	0.265	4.4682	
15 minute winter	336	7.001	337	81.4	0.936	0.507	5.8800	
15 minute winter	337	7.002	338	75.8	0.998	0.472	3.3937	
15 minute winter	338	1.016	339	709.8	1.613	1.148	7.3196	
15 minute winter	339	1.017	340	720.6	1.694	1.171	6.3993	
480 minute winter	340	1.018	341	148.9	1.452	0.241	8.4734	
480 minute winter	341	1.019	343	149.3	1.254	0.131	16.5092	
480 minute winter	342	8.000	343	-46.5	-0.622	-0.076	6.1538	
480 minute winter	342	Infiltration		8.6				
480 minute winter	343	1.020	344	100.9	0.883	0.164	5.9540	
480 minute winter	344	1.021	345	0.0	0.000	0.000	0.0000	0.0
480 minute winter	344	Infiltration		18.2				

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 99.79%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	301	12	90.171	0.267	90.5	1.1369	0.0000	SURCHARGED
15 minute winter	302	12	89.399	0.817	127.6	2.3167	0.0000	SURCHARGED
15 minute winter	303	12	88.941	1.575	152.2	4.6212	0.0000	FLOOD RISK
15 minute winter	304	11	88.694	1.451	215.2	4.2837	0.0000	SURCHARGED
15 minute winter	305	11	88.184	1.141	246.5	2.4617	0.0000	SURCHARGED
15 minute winter	306	11	88.038	1.031	258.3	1.9844	0.0000	SURCHARGED
15 minute winter	307	11	87.908	0.926	282.0	1.8926	0.0000	SURCHARGED
15 minute winter	308	11	87.743	0.789	303.5	1.5982	0.0000	SURCHARGED
15 minute winter	309	11	87.474	0.569	328.0	1.1764	0.0000	SURCHARGED
15 minute winter	310	11	87.152	0.288	348.8	0.5853	0.0000	OK
15 minute winter	311	12	88.595	0.933	75.7	3.5980	0.0000	SURCHARGED
15 minute winter	312	13	88.240	0.896	148.1	3.0311	0.0000	SURCHARGED
15 minute winter	313	13	88.167	0.681	44.3	2.0339	0.0000	SURCHARGED
15 minute winter	314	13	88.074	1.034	215.5	3.1788	0.0000	SURCHARGED
15 minute winter	315	13	88.163	0.649	61.0	2.2409	0.0000	SURCHARGED
15 minute winter	316	13	88.004	0.876	98.7	2.6455	0.0000	SURCHARGED
15 minute winter	317	13	87.859	1.265	331.6	3.3791	0.0000	SURCHARGED
15 minute winter	318	13	87.615	1.304	363.8	3.7907	0.0000	SURCHARGED
15 minute winter	319	13	87.343	1.335	399.5	3.6849	0.0000	SURCHARGED
15 minute winter	320	13	87.065	1.412	22.1	3.1291	0.0000	FLOOD RISK
15 minute winter	321	13	87.069	1.588	487.6	6.6045	0.0000	SURCHARGED
15 minute winter	322	13	86.942	2.135	438.0	5.4331	0.0000	FLOOD RISK
15 minute winter	323	13	86.868	2.223	460.6	8.9042	0.0000	FLOOD RISK
15 minute winter	324	13	86.823	2.222	451.3	6.9798	0.0000	SURCHARGED
15 minute winter	325	13	86.754	2.231	452.6	5.8466	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	301	1.000	302	86.9	2.785	0.836	1.2522	
15 minute winter	302	1.001	303	110.9	1.980	0.592	2.8462	
15 minute winter	303	1.002	304	149.6	1.357	1.302	4.0701	
15 minute winter	304	1.003	305	208.5	1.891	1.814	4.1210	
15 minute winter	305	1.004	306	243.2	1.535	1.514	2.3126	
15 minute winter	306	1.005	307	258.1	1.629	1.607	1.5610	
15 minute winter	307	1.006	308	282.2	1.781	1.757	1.7494	
15 minute winter	308	1.007	309	304.1	1.919	1.893	3.1042	
15 minute winter	309	1.008	310	328.3	2.256	2.043	2.1955	
15 minute winter	310	1.009	328	350.8	3.624	0.566	2.1756	
15 minute winter	311	2.000	312	65.3	1.642	1.643	1.1345	
15 minute winter	312	2.001	314	126.9	1.359	0.856	6.0814	
15 minute winter	313	3.000	314	39.5	1.368	0.723	1.0677	
15 minute winter	314	2.002	317	198.5	1.956	0.789	2.5972	
15 minute winter	315	4.000	316	52.9	1.570	0.922	1.0144	
15 minute winter	316	4.001	317	95.8	1.597	0.793	2.2938	
15 minute winter	317	2.003	318	316.0	1.995	0.983	4.5359	
15 minute winter	318	2.004	319	357.9	2.259	0.990	3.8480	
15 minute winter	319	2.005	321	392.8	2.814	0.896	3.0721	
15 minute winter	320	5.000	321	17.6	0.771	0.109	1.4070	
15 minute winter	321	2.006	322	438.0	2.774	0.469	8.0402	
15 minute winter	322	2.007	323	383.4	1.135	0.623	28.5555	
15 minute winter	323	2.008	324	420.3	1.075	0.683	7.8284	
15 minute winter	324	2.009	325	448.9	1.032	0.730	13.7089	
15 minute winter	325	2.010	326	462.1	1.050	0.751	7.3144	

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 99.79%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	326	13	86.704	2.223	470.9	6.0800	0.0000	SURCHARGED
15 minute winter	327	13	86.652	2.212	489.2	5.9899	0.0000	SURCHARGED
15 minute winter	328	13	86.605	2.191	829.0	6.1489	0.0000	SURCHARGED
15 minute winter	329	13	86.456	2.076	836.3	5.4228	0.0000	SURCHARGED
15 minute winter	330	13	86.290	1.952	846.7	5.2029	0.0000	SURCHARGED
15 minute winter	331	10	88.412	0.047	14.2	0.1012	0.0000	OK
15 minute winter	332	13	86.058	1.795	889.9	5.3777	0.0000	SURCHARGED
15 minute winter	333	13	85.870	1.648	895.7	4.3087	0.0000	SURCHARGED
15 minute winter	334	13	85.690	1.504	918.5	4.3457	0.0000	SURCHARGED
15 minute winter	335	13	85.570	0.875	66.6	2.8757	0.0000	SURCHARGED
15 minute winter	336	13	85.545	0.934	125.1	2.5948	0.0000	SURCHARGED
15 minute winter	337	13	85.527	1.014	111.3	1.9106	0.0000	SURCHARGED
15 minute winter	338	13	85.513	1.357	1023.6	3.8157	0.0000	SURCHARGED
15 minute winter	339	13	85.264	1.150	1039.0	3.2785	0.0000	SURCHARGED
600 minute winter	340	555	85.249	1.173	174.9	3.4316	0.0000	SURCHARGED
600 minute winter	341	555	85.249	1.223	177.6	4.0478	0.0000	SURCHARGED
600 minute winter	342	570	85.249	1.502	57.1	578.8037	0.0000	SURCHARGED
600 minute winter	343	570	85.248	1.542	176.2	4.2249	0.0000	SURCHARGED
600 minute winter	344	570	85.248	1.576	124.4	1301.1430	0.0000	OK
15 minute summer	345	1	85.475	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	326	2.011	327	482.9	1.097	0.785	7.2576	
15 minute winter	327	2.012	328	502.0	1.141	0.816	4.6089	
15 minute winter	328	1.010	329	830.8	1.888	1.350	5.9597	
15 minute winter	329	1.011	330	837.0	1.902	1.360	7.4011	
15 minute winter	330	1.012	332	847.2	1.925	1.377	13.1376	
15 minute winter	331	6.000	332	14.1	2.398	0.091	0.1234	
15 minute winter	332	1.013	333	890.6	2.024	1.451	7.2501	
15 minute winter	333	1.014	334	896.8	2.038	1.451	6.2792	
15 minute winter	334	1.015	338	920.3	2.091	1.489	5.2348	
15 minute winter	335	7.000	336	62.1	0.608	0.386	5.3264	
15 minute winter	336	7.001	337	102.8	0.992	0.640	6.2050	
15 minute winter	337	7.002	338	91.4	1.022	0.569	3.3937	
15 minute winter	338	1.016	339	1025.9	2.331	1.660	7.3262	
15 minute winter	339	1.017	340	1040.5	2.364	1.690	6.6832	
600 minute winter	340	1.018	341	172.9	1.400	0.280	8.7615	
600 minute winter	341	1.019	343	175.0	1.129	0.154	16.6053	
600 minute winter	342	8.000	343	-57.1	-0.541	-0.093	6.1538	
600 minute winter	342	Infiltration		11.2				
600 minute winter	343	1.020	344	118.3	0.786	0.192	5.9540	
600 minute winter	344	1.021	345	0.0	0.000	0.000	0.0000	0.0
600 minute winter	344	Infiltration		22.0				

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.300	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
401	0.262	5.00	92.142	1500	332282.568	352093.949	1.575	90.567
402	0.047	5.00	92.916	1500	332288.088	352053.664	2.485	90.431
403	0.067	5.00	92.779	1500	332286.793	352034.105	2.413	90.366
404	0.094	5.00	92.591	1500	332286.072	352009.618	2.307	90.284
405	0.039	5.00	92.853	1500	332301.428	352009.803	2.620	90.233
406	0.059	5.00	93.166	1500	332320.333	352008.186	2.996	90.170
407	0.057	5.00	91.763	1500	332360.371	352005.231	1.913	89.850
408	0.080	5.00	90.651	1500	332377.135	352006.414	1.650	89.001
409	0.027	5.00	92.076	1500	332373.320	352046.928	3.177	88.899
410	0.113	5.00	91.261	1500	332372.628	352085.101	2.457	88.804
411	0.000		91.024	1500	332372.440	352095.456	0.250	90.774

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	401	402	40.661	0.600	90.567	90.431	0.136	300.0	375	5.65	49.1
1.001	402	403	19.602	0.600	90.431	90.366	0.065	300.0	375	5.97	48.0
1.002	403	404	24.498	0.600	90.366	90.284	0.082	300.0	375	6.36	46.8
1.003	404	405	15.357	0.600	90.284	90.233	0.051	300.0	375	6.60	46.0
1.004	405	406	18.974	0.600	90.233	90.170	0.063	300.0	375	6.91	45.1
1.005	406	407	40.147	0.600	90.170	89.850	0.320	125.5	375	7.32	44.0
1.006	407	408	16.806	0.600	89.850	89.076	0.774	21.7	375	7.39	43.8
1.007	408	409	40.693	0.600	89.001	88.899	0.102	400.0	450	8.06	42.1
1.008	409	410	38.179	0.600	88.899	88.804	0.095	400.0	450	8.69	40.7
1.009	410	411	10.357	0.600	90.800	90.774	0.026	398.3	150	9.04	39.7

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.041	114.9	34.9	1.200	2.110	0.262	0.0	141	0.915
1.001	1.041	114.9	40.2	2.110	2.038	0.309	0.0	153	0.951
1.002	1.041	114.9	47.7	2.038	1.932	0.376	0.0	168	0.993
1.003	1.041	114.9	58.6	1.932	2.245	0.470	0.0	190	1.046
1.004	1.041	114.9	62.3	2.245	2.621	0.509	0.0	197	1.060
1.005	1.616	178.5	67.7	2.621	1.538	0.568	0.0	160	1.509
1.006	3.903	431.0	74.2	1.538	1.200	0.625	0.0	104	2.946
1.007	1.010	160.7	80.5	1.200	2.727	0.705	0.0	225	1.011
1.008	1.010	160.7	80.7	2.727	2.007	0.732	0.0	225	1.011
1.009	0.497	8.8	91.0	0.311	0.100	0.845	0.0	150	0.507

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	40.661	300.0	375	Circular_Default Sewer Type	92.142	90.567	1.200	92.916	90.431	2.110
1.001	19.602	300.0	375	Circular_Default Sewer Type	92.916	90.431	2.110	92.779	90.366	2.038
1.002	24.498	300.0	375	Circular_Default Sewer Type	92.779	90.366	2.038	92.591	90.284	1.932
1.003	15.357	300.0	375	Circular_Default Sewer Type	92.591	90.284	1.932	92.853	90.233	2.245
1.004	18.974	300.0	375	Circular_Default Sewer Type	92.853	90.233	2.245	93.166	90.170	2.621
1.005	40.147	125.5	375	Circular_Default Sewer Type	93.166	90.170	2.621	91.763	89.850	1.538
1.006	16.806	21.7	375	Circular_Default Sewer Type	91.763	89.850	1.538	90.651	89.076	1.200
1.007	40.693	400.0	450	Circular_Default Sewer Type	90.651	89.001	1.200	92.076	88.899	2.727
1.008	38.179	400.0	450	Circular_Default Sewer Type	92.076	88.899	2.727	91.261	88.804	2.007
1.009	10.357	398.3	150	Circular_Default Sewer Type	91.261	90.800	0.311	91.024	90.774	0.100

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	401	1500	Manhole	Adoptable	402	1500	Manhole	Adoptable
1.001	402	1500	Manhole	Adoptable	403	1500	Manhole	Adoptable
1.002	403	1500	Manhole	Adoptable	404	1500	Manhole	Adoptable
1.003	404	1500	Manhole	Adoptable	405	1500	Manhole	Adoptable
1.004	405	1500	Manhole	Adoptable	406	1500	Manhole	Adoptable
1.005	406	1500	Manhole	Adoptable	407	1500	Manhole	Adoptable
1.006	407	1500	Manhole	Adoptable	408	1500	Manhole	Adoptable
1.007	408	1500	Manhole	Adoptable	409	1500	Manhole	Adoptable
1.008	409	1500	Manhole	Adoptable	410	1500	Manhole	Adoptable
1.009	410	1500	Manhole	Adoptable	411	1500	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
401	332282.568	352093.949	92.142	1.575	1500	0	1.000	90.567	375
402	332288.088	352053.664	92.916	2.485	1500	1 0	1.000	90.431	375
							1.001	90.431	375
403	332286.793	352034.105	92.779	2.413	1500	1 0	1.001	90.366	375
							1.002	90.366	375
404	332286.072	352009.618	92.591	2.307	1500	1 0	1.002	90.284	375
							1.003	90.284	375
405	332301.428	352009.803	92.853	2.620	1500	1 0	1.003	90.233	375
							1.004	90.233	375
406	332320.333	352008.186	93.166	2.996	1500	1 0	1.004	90.170	375
							1.005	90.170	375

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
407	332360.371	352005.231	91.763	1.913	1500	1	1.005	89.850	375
									
						0	1.006	89.850	375
408	332377.135	352006.414	90.651	1.650	1500	1	1.006	89.076	375
									
						0	1.007	89.001	450
409	332373.320	352046.928	92.076	3.177	1500	1	1.007	88.899	450
									
						0	1.008	88.899	450
410	332372.628	352085.101	91.261	2.457	1500	1	1.008	88.804	450
									
						0	1.009	90.800	150
411	332372.440	352095.456	91.024	0.250	1500	1	1.009	90.774	150
									

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	✓
Rainfall Events	Singular	Drain Down Time (mins)	240
FSR Region	England and Wales	Additional Storage (m³/ha)	20.0
M5-60 (mm)	17.000	Starting Level (m)	
Ratio-R	0.300	Check Discharge Rate(s)	✓
Summer CV	0.750	Check Discharge Volume	✓
Winter CV	0.840	100 year 360 minute (m³)	
Analysis Speed	Detailed		

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0
100	50	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.95
Greenfield Method	IH124	Growth Factor 100 year	2.48
Positively Drained Area (ha)		Betterment (%)	0
SAAR (mm)		QBar	
Soil Index	1	Q 1 year (l/s)	
SPR	0.10	Q 30 year (l/s)	
Region	1	Q 100 year (l/s)	
Growth Factor 1 year	0.85		

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)		Storm Duration (mins)	360
Soil Index	1	Betterment (%)	0
SPR	0.10	PR	
CWI		Runoff Volume (m^3)	

Node 410 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.92520	Safety Factor	5.0	Invert Level (m)	88.500
Side Inf Coefficient (m/hr)	0.92520	Porosity	1.00	Time to half empty (mins)	44

Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)
0.000	68.5	68.5	0.800	196.0	199.9	1.600	360.0	370.5	2.400	562.0	581.4
0.200	97.0	97.7	1.000	234.0	239.3	1.800	408.0	420.5	2.600	619.0	641.0
0.400	128.0	129.6	1.200	274.0	280.9	2.000	457.0	471.7			
0.600	161.0	163.7	1.400	316.0	324.6	2.200	509.0	525.9			

Other (defaults)

Entry Loss (manhole)	0.250	Entry Loss (junction)	0.000	Apply Recommended Losses	x
Exit Loss (manhole)	0.250	Exit Loss (junction)	0.000	Flood Risk (m)	0.300

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.80%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	401	10	90.693	0.126	28.4	0.6442	0.0000	OK
15 minute winter	402	11	90.579	0.148	32.8	0.3177	0.0000	OK
15 minute winter	403	11	90.528	0.162	39.4	0.3754	0.0000	OK
15 minute winter	404	11	90.471	0.187	48.6	0.4823	0.0000	OK
15 minute winter	405	12	90.414	0.181	51.6	0.3737	0.0000	OK
15 minute winter	406	12	90.326	0.156	56.7	0.3374	0.0000	OK
15 minute winter	407	12	89.946	0.096	62.0	0.2258	0.0000	OK
15 minute winter	408	12	89.217	0.216	69.2	0.5904	0.0000	OK
15 minute winter	409	13	89.112	0.213	71.8	0.4125	0.0000	OK
180 minute winter	410	140	89.046	0.242	26.6	60.1897	0.0000	OK
15 minute summer	411	1	90.774	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	401	1.000	402	27.8	0.777	0.242	1.4711	
15 minute winter	402	1.001	403	32.6	0.760	0.284	0.8415	
15 minute winter	403	1.002	404	38.9	0.777	0.339	1.2277	
15 minute winter	404	1.003	405	47.6	0.888	0.414	0.8245	
15 minute winter	405	1.004	406	51.6	1.075	0.449	0.9107	
15 minute winter	406	1.005	407	57.2	1.766	0.321	1.3141	
15 minute winter	407	1.006	408	62.3	2.185	0.145	0.5027	
15 minute winter	408	1.007	409	69.5	0.942	0.432	3.0188	
15 minute winter	409	1.008	410	70.3	1.047	0.438	2.5646	
180 minute winter	410	1.009	411	0.0	0.000	0.000	0.0000	0.0
180 minute winter	410	Infiltration		7.9				

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.70%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	401	10	90.784	0.217	69.1	1.1046	0.0000	OK
15 minute winter	402	11	90.725	0.294	79.4	0.6313	0.0000	OK
15 minute winter	403	11	90.690	0.324	92.0	0.7534	0.0000	OK
15 minute winter	404	11	90.634	0.350	113.5	0.9049	0.0000	OK
15 minute winter	405	11	90.559	0.326	121.8	0.6731	0.0000	OK
15 minute winter	406	11	90.431	0.261	135.3	0.5635	0.0000	OK
15 minute winter	407	11	90.005	0.155	148.0	0.3668	0.0000	OK
240 minute winter	408	188	89.577	0.576	42.8	1.5755	0.0000	SURCHARGED
240 minute winter	409	188	89.576	0.677	41.8	1.3115	0.0000	SURCHARGED
240 minute winter	410	188	89.575	0.771	46.2	166.9581	0.0000	OK
15 minute summer	411	1	90.774	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	401	1.000	402	67.0	0.905	0.583	3.2266	
15 minute winter	402	1.001	403	75.3	0.834	0.655	1.9029	
15 minute winter	403	1.002	404	90.0	0.865	0.783	2.5544	
15 minute winter	404	1.003	405	112.0	1.070	0.975	1.6041	
15 minute winter	405	1.004	406	120.6	1.312	1.049	1.7411	
15 minute winter	406	1.005	407	134.6	2.157	0.754	2.5060	
15 minute winter	407	1.006	408	147.5	2.171	0.342	1.2183	
240 minute winter	408	1.007	409	40.2	0.771	0.250	6.4475	
240 minute winter	409	1.008	410	39.6	0.776	0.246	6.0492	
240 minute winter	410	1.009	411	0.0	0.000	0.000	0.0000	0.0
240 minute winter	410	Infiltration		13.1				

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.64%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	401	11	90.984	0.417	88.8	2.1258	0.0000	SURCHARGED
15 minute winter	402	12	90.904	0.473	91.9	1.0151	0.0000	SURCHARGED
15 minute winter	403	12	90.847	0.481	110.1	1.1168	0.0000	SURCHARGED
15 minute winter	404	12	90.746	0.462	136.5	1.1937	0.0000	SURCHARGED
15 minute winter	405	12	90.635	0.402	147.9	0.8304	0.0000	SURCHARGED
15 minute winter	406	12	90.475	0.305	164.7	0.6584	0.0000	OK
15 minute winter	407	12	90.044	0.194	182.2	0.4590	0.0000	OK
240 minute winter	408	188	89.817	0.816	56.0	2.2340	0.0000	SURCHARGED
240 minute winter	409	188	89.816	0.917	57.0	1.7768	0.0000	SURCHARGED
240 minute winter	410	192	89.816	1.012	65.4	233.2290	0.0000	OK
15 minute summer	411	1	90.774	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	401	1.000	402	76.9	0.921	0.669	4.4848	
15 minute winter	402	1.001	403	90.9	0.838	0.791	2.1620	
15 minute winter	403	1.002	404	110.8	1.005	0.964	2.7021	
15 minute winter	404	1.003	405	137.6	1.247	1.197	1.6938	
15 minute winter	405	1.004	406	149.0	1.383	1.296	1.9563	
15 minute winter	406	1.005	407	167.0	2.185	0.936	3.0813	
15 minute winter	407	1.006	408	182.5	2.200	0.423	1.4108	
240 minute winter	408	1.007	409	54.9	0.770	0.341	6.4475	
240 minute winter	409	1.008	410	56.5	0.781	0.352	6.0492	
240 minute winter	410	1.009	411	0.0	0.000	0.000	0.0000	0.0
240 minute winter	410	Infiltration		15.7				

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 99.43%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	401	12	91.884	1.317	133.2	6.7075	0.0000	FLOOD RISK
15 minute winter	402	12	91.750	1.319	132.6	2.8293	0.0000	SURCHARGED
15 minute winter	403	12	91.643	1.277	158.1	2.9658	0.0000	SURCHARGED
15 minute winter	404	12	91.458	1.174	195.4	3.0316	0.0000	SURCHARGED
15 minute winter	405	12	91.250	1.017	204.1	2.1007	0.0000	SURCHARGED
15 minute winter	406	12	90.969	0.799	224.5	1.7269	0.0000	SURCHARGED
15 minute winter	407	12	90.346	0.496	247.0	1.1716	0.0000	SURCHARGED
240 minute winter	408	192	90.231	1.230	84.1	3.3664	0.0000	SURCHARGED
240 minute winter	409	192	90.229	1.330	86.0	2.5768	0.0000	SURCHARGED
240 minute winter	410	196	90.228	1.424	98.9	375.8416	0.0000	OK
15 minute summer	411	1	90.774	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	401	1.000	402	110.1	0.998	0.958	4.4848	
15 minute winter	402	1.001	403	126.0	1.142	1.096	2.1620	
15 minute winter	403	1.002	404	150.4	1.364	1.309	2.7021	
15 minute winter	404	1.003	405	185.9	1.685	1.617	1.6938	
15 minute winter	405	1.004	406	201.0	1.823	1.749	2.0928	
15 minute winter	406	1.005	407	224.2	2.128	1.256	4.4281	
15 minute winter	407	1.006	408	247.2	2.242	0.574	1.8537	
240 minute winter	408	1.007	409	82.8	0.756	0.515	6.4475	
240 minute winter	409	1.008	410	85.4	0.734	0.532	6.0492	
240 minute winter	410	1.009	411	0.0	0.000	0.000	0.0000	0.0
240 minute winter	410	Infiltration		20.7				

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.300	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
501	0.064	5.00	89.226	1500	332398.249	352010.617	1.425	87.801
502	0.047	5.00	87.304	1500	332427.762	352020.915	1.425	85.879
503	0.047	5.00	86.622	1500	332431.140	352054.790	1.425	85.197
504	0.058	5.00	86.608	1500	332437.578	352065.394	1.484	85.124
505	0.000		86.750	1500	332447.338	352066.578	2.100	84.650
506	0.000		86.750	1500	332451.365	352071.838	0.889	85.861

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	501	502	31.258	0.600	87.801	85.879	1.922	16.3	225	5.16	50.0
1.001	502	503	34.043	0.600	85.879	85.197	0.682	49.9	225	5.47	49.7
1.002	503	504	12.405	0.600	85.197	85.124	0.073	170.0	225	5.67	49.0
1.003	504	505	9.832	0.600	85.124	84.650	0.474	20.7	225	5.73	48.8
1.004	505	506	6.625	0.600	85.900	85.861	0.039	169.9	225	5.84	48.1

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	3.260	129.6	8.7	1.200	1.200	0.064	0.0	39	1.869
1.001	1.855	73.8	15.0	1.200	1.200	0.111	0.0	68	1.458
1.002	1.000	39.7	21.0	1.200	1.259	0.158	0.0	116	1.014
1.003	2.885	114.7	28.6	1.259	1.875	0.216	0.0	76	2.403
1.004	1.000	39.8	28.2	0.625	0.664	0.216	0.0	140	1.083

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	31.258	16.3	225	Circular_Default Sewer Type	89.226	87.801	1.200	87.304	85.879	1.200
1.001	34.043	49.9	225	Circular_Default Sewer Type	87.304	85.879	1.200	86.622	85.197	1.200
1.002	12.405	170.0	225	Circular_Default Sewer Type	86.622	85.197	1.200	86.608	85.124	1.259
1.003	9.832	20.7	225	Circular_Default Sewer Type	86.608	85.124	1.259	86.750	84.650	1.875

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	501	1500	Manhole	Adoptable	502	1500	Manhole	Adoptable
1.001	502	1500	Manhole	Adoptable	503	1500	Manhole	Adoptable
1.002	503	1500	Manhole	Adoptable	504	1500	Manhole	Adoptable
1.003	504	1500	Manhole	Adoptable	505	1500	Manhole	Adoptable

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.004	6.625	169.9	225	Circular_Default Sewer Type	86.750	85.900	0.625	86.750	85.861	0.664

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.004	505	1500	Manhole	Adoptable	506	1500	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
501	332398.249	352010.617	89.226	1.425	1500	0	1.000	87.801	225
502	332427.762	352020.915	87.304	1.425	1500	1 0	1.000 1.001	85.879 85.879	225 225
503	332431.140	352054.790	86.622	1.425	1500	1 0	1.001 1.002	85.197 85.197	225 225
504	332437.578	352065.394	86.608	1.484	1500	1 0	1.002 1.003	85.124 85.124	225 225
505	332447.338	352066.578	86.750	2.100	1500	1 0	1.003 1.004	84.650 85.900	225 225
506	332451.365	352071.838	86.750	0.889	1500	1	1.004	85.861	225

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	✓
Rainfall Events	Singular	Drain Down Time (mins)	240
FSR Region	England and Wales	Additional Storage (m³/ha)	20.0
M5-60 (mm)	17.000	Starting Level (m)	
Ratio-R	0.300	Check Discharge Rate(s)	✓
Summer CV	0.750	Check Discharge Volume	✓
Winter CV	0.840	100 year 360 minute (m³)	
Analysis Speed	Detailed		

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	50	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.95
Greenfield Method	IH124	Growth Factor 100 year	2.48
Positively Drained Area (ha)		Betterment (%)	0
SAAR (mm)		QBar	
Soil Index	1	Q 1 year (l/s)	
SPR	0.10	Q 30 year (l/s)	
Region	1	Q 100 year (l/s)	
Growth Factor 1 year	0.85		

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)		Storm Duration (mins)	360
Soil Index	1	Betterment (%)	0
SPR	0.10	PR	
CWI		Runoff Volume (m^3)	

Node 505 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.92520	Invert Level (m)	84.650	Depth (m)	1.200
Side Inf Coefficient (m/hr)	0.92520	Time to half empty (mins)	160	Inf Depth (m)	1.200
Safety Factor	5.0	Pit Width (m)	7.500	Number Required	1
Porosity	0.95	Pit Length (m)	10.000		

Other (defaults)

Entry Loss (manhole)	0.250	Entry Loss (junction)	0.000	Apply Recommended Losses	x
Exit Loss (manhole)	0.250	Exit Loss (junction)	0.000	Flood Risk (m)	0.300

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.07%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	501	10	87.836	0.035	6.9	0.0932	0.0000	OK
15 minute winter	502	11	85.939	0.060	11.9	0.1457	0.0000	OK
15 minute winter	503	11	85.302	0.105	16.6	0.2552	0.0000	OK
15 minute winter	504	10	85.201	0.077	22.5	0.1975	0.0000	OK
60 minute winter	505	48	84.789	0.139	13.1	10.1369	0.0000	OK
15 minute summer	506	1	85.861	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	501	1.000	502	6.8	1.119	0.052	0.1934	
15 minute winter	502	1.001	503	11.6	0.887	0.157	0.4540	
15 minute winter	503	1.002	504	16.6	1.139	0.418	0.1858	
15 minute winter	504	1.003	505	22.9	2.645	0.200	0.1129	
60 minute winter	505	1.004	506	0.0	0.000	0.000	0.0000	0.0
60 minute winter	505	Infiltration		4.1				

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.54%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	501	10	87.855	0.054	16.9	0.1451	0.0000	OK
15 minute winter	502	10	85.976	0.097	29.1	0.2343	0.0000	OK
15 minute winter	503	11	85.380	0.183	40.9	0.4437	0.0000	OK
15 minute winter	504	10	85.247	0.123	55.1	0.3130	0.0000	OK
120 minute winter	505	98	85.133	0.483	21.0	35.2822	0.0000	OK
15 minute summer	506	1	85.861	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	501	1.000	502	16.7	1.433	0.129	0.3696	
15 minute winter	502	1.001	503	28.5	1.106	0.387	0.8628	
15 minute winter	503	1.002	504	40.7	1.437	1.023	0.3508	
15 minute winter	504	1.003	505	55.6	2.867	0.484	0.2824	
120 minute winter	505	1.004	506	0.0	0.000	0.000	0.0000	0.0
120 minute winter	505	Infiltration		4.7				

Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	501	10	87.877	0.076	32.6	0.2033	0.0000	OK
15 minute winter	502	12	86.065	0.186	56.2	0.4507	0.0000	OK
180 minute winter	503	148	85.788	0.591	22.9	1.4340	0.0000	SURCHARGED
180 minute winter	504	148	85.787	0.663	30.7	1.6888	0.0000	SURCHARGED
180 minute winter	505	156	85.785	1.135	29.0	82.8418	0.0000	OK
15 minute summer	506	1	85.861	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	501	1.000	502	32.3	1.652	0.249	0.7229	
15 minute winter	502	1.001	503	52.7	1.386	0.714	1.2738	
180 minute winter	503	1.002	504	22.3	1.247	0.561	0.4934	
180 minute winter	504	1.003	505	29.0	1.938	0.253	0.3910	
180 minute winter	505	1.004	506	0.0	0.000	0.000	0.0000	0.0
180 minute winter	505	Infiltration		5.9				

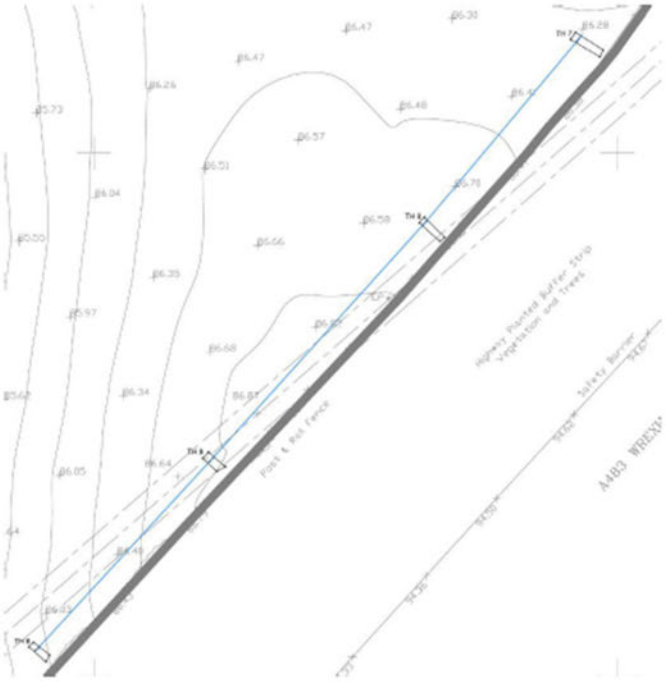
Flow+ v16.0 Copyright © 1988-2026 Causeway Technologies Ltd

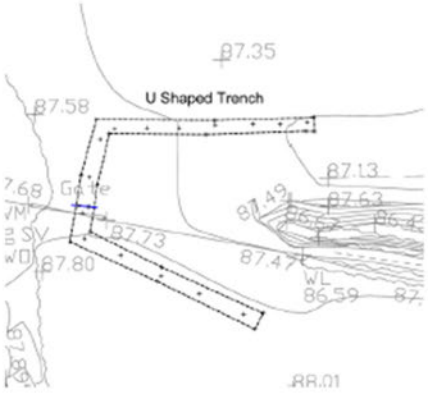
Appendix 6

S19 Flood Investigation Report

Drainage Surveys (2026)

Location Plan for Trial Holes





J Wilson Contractors Ltd were commissioned to undertake trial excavations at the proposed development site at Land off Mold Road. Prior to excavation, each area was scanned using a CAT and Genny to detect underground services. The excavations were carried out using vacuum excavation techniques to minimise risk. During the process, data was collected from each trial hole, documenting the depth and characteristics of the utility materials encountered. The locations of the trial holes followed the layout shown in the supplied location plan. All measurements and depths were captured using GPS equipment and are detailed in the accompanying CAD drawing.

J Wilson Contractors Ltd, 6 Pinecroft, Penycae, Wrexham, LL14 2PF

Area B – Field Drain (Northern Parcel)

A specialist contractor was appointed to undertake a slip trench, in a U-shaped alignment, around the field drain located within the northern parcel of the development. The purpose of this investigation was to establish whether there is any incoming pipework from beneath the A451 connecting to the field drain.

Following completion of the excavation works, it can be confirmed that there is no incoming pipework connected to the field drain from this direction.

Please refer to the photographs provided below by our contractor, James Wilson, for further clarification.

'U' Shaped Trial Hole

Trial Hole Length – 5783mm, Trial Hole Width – 826mm

Utilities	Depth of Utility
1 x 25mm Water Pipe	570mm deep

'U' Shaped Trial Hole – Photos








Castle Green

JW Contractors Ltd

'U' Shaped Trial Hole – Photos










J Wilson Contractors Ltd, 6 Pinecroft, Penycae, Wrexham, LL14 2PF

JW Contractors Ltd

Area A Stansty Road flooding

It has been reported that there is a history of flooding in Stansty Road, particularly around and beneath the A483.

We have employed a drainage contractor to undertake CCTV inspections of the 150mm carrier drain and associated gully pots along the highway, with the aim of identifying the causes of this localised flooding. Following several site visits, we have identified four previously buried manholes within the grass verges. These manholes were found to be heavily silted, which has prevented effective drainage from the gully pots along Stansty Road.

The drainage lines have now been cleared, and we have also located the outfall pipework (225mm), which runs beneath adjacent bungalows and connects to further drainage chambers within a garden area on Finney Close.

Please find attached photographs below confirming the direction of flow and the location of the outfall pipework.

Photo Re erences



Photo 001 - Manhole 3



Photo 002 – Manhole 3





Photo 003 & 004 –Water poured down gully's to show flow to MH 4



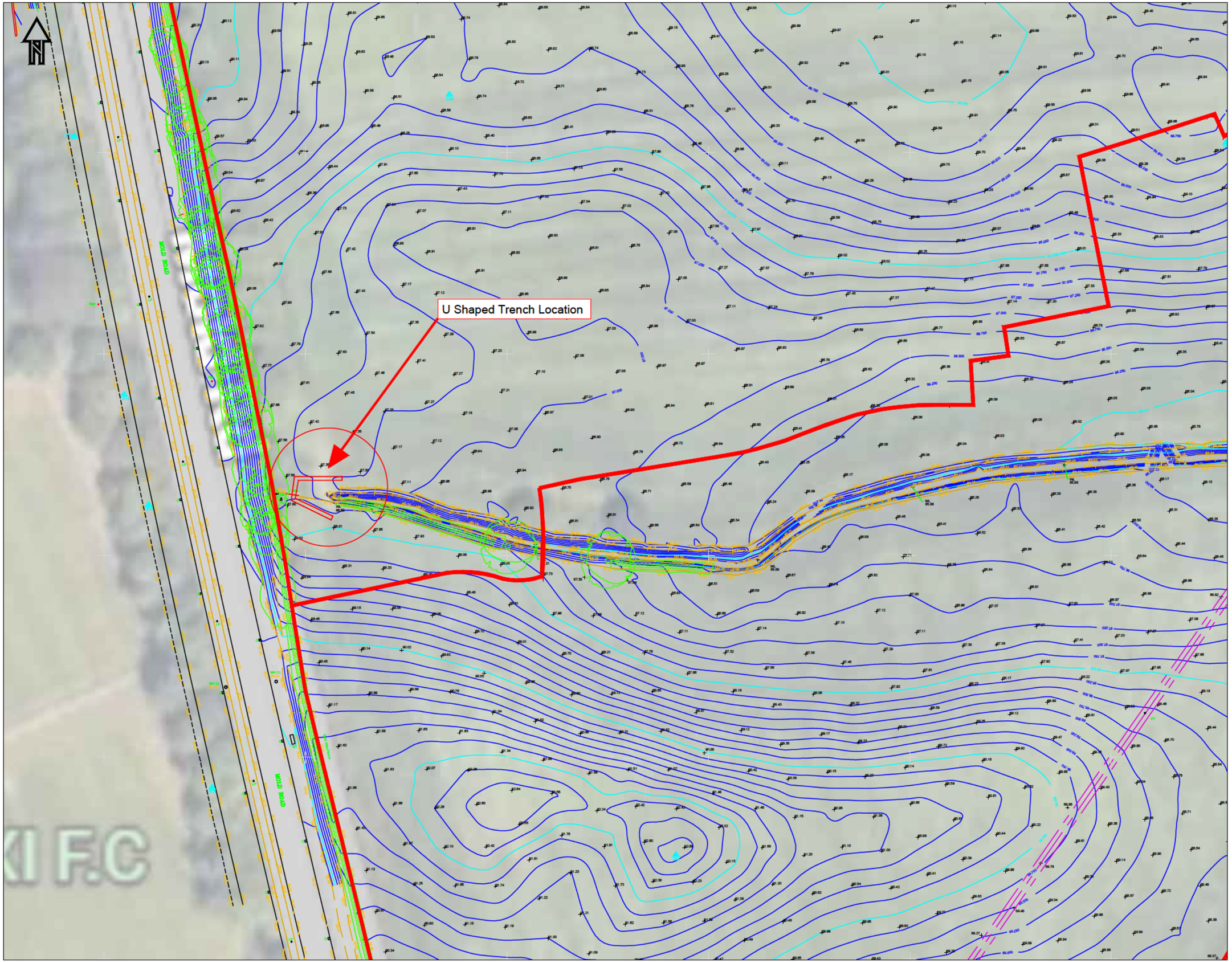
Photo 005- Flow at MH 4 from near 5



Photo 006 – Flow at MH 4 from near MH 3



Photo 007 – Shows 9-inch pipe heading towards Finney close



Castle Green

Castle Green,
Unit 20,
St. Asaph Business Park,
St Asaph,
Denbighshire. LL17 0LJ.
Tel. 01745 536677

Site:
Stansty Chain Road, Wrexham

Title:
U Shaped Trench Location

Scale:
-

Date:
01.05.26

Ref:
STA-CHA-RD

Rev:
A

Key :

Existing 225Ø Highway Drain Location

Photo reference (In report)

Photo XX

Stansty House - Fairways

Castle Green,
Unit 20,
St. Asaph Business Park,
St Asaph,
Denbighshire. LL17 0LJ.
Tel. 01745 536677

Site: Stansty Chain Road, Wrexham

Title: Existing Highway Drain Location

Scale: -

Date: 01.05.26

Ref: STA-CHA-RD

Rev: A