

Our ref: 7866_FCA

Flood Consequences Assessment
and Drainage Strategy

for

Upper Denbigh Road

St Asaph

Denbighshire

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

20 September 2021

Flood Consequences Assessment and Drainage Strategy
for Land Off Upper Denbigh Road, St Asaph

Document Verification

Project Title	Land Off Upper Denbigh Road, St Asaph
Project Number	7866
Document Title	Flood Consequences Assessment and Drainage Strategy
Document Number	7866_FCA
<p>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.</p>	

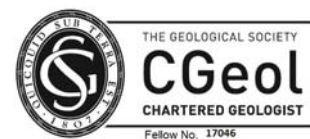
Prepared by

Checked and Approved




A Jones

P R Sykes

*Senior Infrastructure Engineer**BSc (Hons), MSc (Eng), CGeol, FGS***Document Revision**

Report Reference	Date	Description	Prepared	Checked and Approved
7866_FCA	20/09/2021	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.

Flood Consequences Assessment and Drainage Strategy for Land Off Upper Denbigh Road, St Asaph

Contents

<u>Section</u>	<u>Page No.</u>
1.0 Introduction.....	3
2.0 Site Characteristics.....	4
3.0 Sources of Flood Risk Information.....	5
4.0 Sources of Flood Risk.....	6
5.0 Surface Water Drainage.....	8
6.0 Conclusions and Recommendations.....	11

Figures

Figure 1	- Site Location	4
Figure 2	- Natural Resources Wales Flood Map (River and Sea)	5
Figure 3	- Natural Resources Wales Surface Water Flooding Map	6
Figure 4	- Natural Resources Wales Reservoir Flooding Map	8

List of Appendices

Appendix 1	- Reference Drawings
Appendix 2	- Infiltration Consideration
Appendix 3	- Correspondence
Appendix 4	- MicroDrainage Calculations

Flood Consequences Assessment and Drainage Strategy for Land Off Upper Denbigh Road, St Asaph

1.0 Introduction

Coopers (Chester) Ltd, (Coopers) have been appointed by Castle Green Homes Ltd to assess the risk of flooding and to provide a Drainage Strategy for a site off Upper Denbigh Road, St Asaph. Castle Green Homes Ltd are proposing a new housing development, comprising of approximately 124 No. dwellings.

Castle Green Homes Ltd are planning the construction of a mixture of semi-detached and detached residential properties with associated access road, parking, vehicular access and landscaping subject to conditions. It is understood the site does not currently benefit from any planning decision.

This flood consequences assessment (FCA) evaluates the proposals with regard 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 properties or the construction area is more than 100m². 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 acting in its SuDS Approving Body (SAB) role before construction work begins. The SAB will have a duty to adopt compliant systems.

Flood Consequences Assessment and Drainage Strategy for Land Off Upper Denbigh Road, St Asaph

2.0 Site Characteristics

2.1 Site Location

The site is a parcel of agricultural land in St Asaph. The site is situated off Upper Denbigh Road at approximate grid reference SJ043735

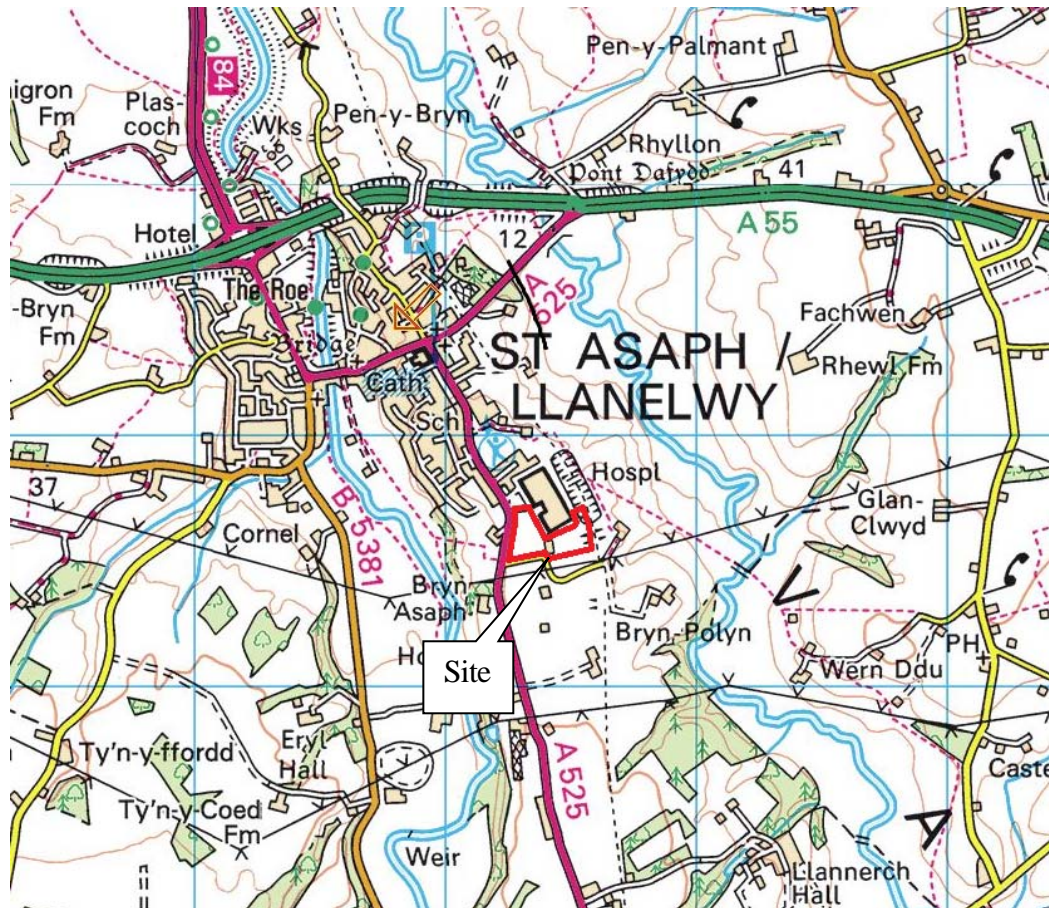


Figure 1 – Site Location

2.2 Site Description

The site covers an area of 4.90 Hectares and consists of two fields with a farmhouse and buildings separating the two.

The topography of site varies from a highpoint of 48.5m AOD at the existing farmhouse in the center of the site, with falls to 45.0m AOD to the east and 41.0m AOD to the west. Refer to topographical survey in Appendix 1.

Flood Consequences Assessment and Drainage Strategy for Land Off Upper Denbigh Road, St Asaph

3.0 Sources of Flood Risk Information

3.1 The Welsh Government Development Advice Map

The Welsh Government Development Advice Map shows the site is located within Flood Zone A – an area considered to be at little or no risk of fluvial or tidal flooding, with a less than 1 in 1000 (0.1%) annual probability of flooding in any given year.

The proposed residential development is considered to be ‘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.

3.2 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.

It should be noted that the Flood Map only covers flooding from rivers and the sea. 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.



Figure 2 – Natural Resources Wales Flood Map for Planning (River and Sea)

Flood Consequences Assessment and Drainage Strategy for Land Off Upper Denbigh Road, St Asaph

The Natural Resources Wales long term flood risk maps indicate the site has a low risk of flooding from Surface Water.



Figure 3 – Natural Resources Wales Surface Water Flooding Map

3.3 Denbighshire LLFA

The Denbighshire Council Local Flood Risk Management Strategy (June 2014) contains no records of any flooding at or near to the site. We have contacted Denbighshire Council for confirmation of any known historical flooding within the vicinity of the site and are currently waiting for a response.

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.

Flood Consequences Assessment and Drainage Strategy for Land Off Upper Denbigh Road, St Asaph

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 risk of flooding is considered as very 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 location to another via local road networks. Due to the topography of the site sloping to the southern end of the site and the road layout / proposed public open space, overland flow is not considered a significant risk. Overland flows from the site will be significantly reduced post development with the incorporation of positive drainage and an internal road network.

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 3, indicate that there are currently no existing adopted sewers located within the site boundary.

Welsh Water have confirmed that foul flows will be allowed to drain to the public foul sewer network to a 300mm diameter combined sewer in Upper Denbigh Road approximately 100m to the north of the site entrance at an unrestricted rate.

We have requested any information Welsh Water may have on any known flooding within the vicinity of the site and are currently waiting for a response.

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 site investigation trial pits have determined the site is underlain with clay. The trial pits were typically between 2.5 – 3.0m deep with no groundwater observed other than slight seepage.

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 sea and is therefore not at risk from tidal inundation.

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.

Flood Consequences Assessment and Drainage Strategy for Land Off Upper Denbigh Road, St Asaph

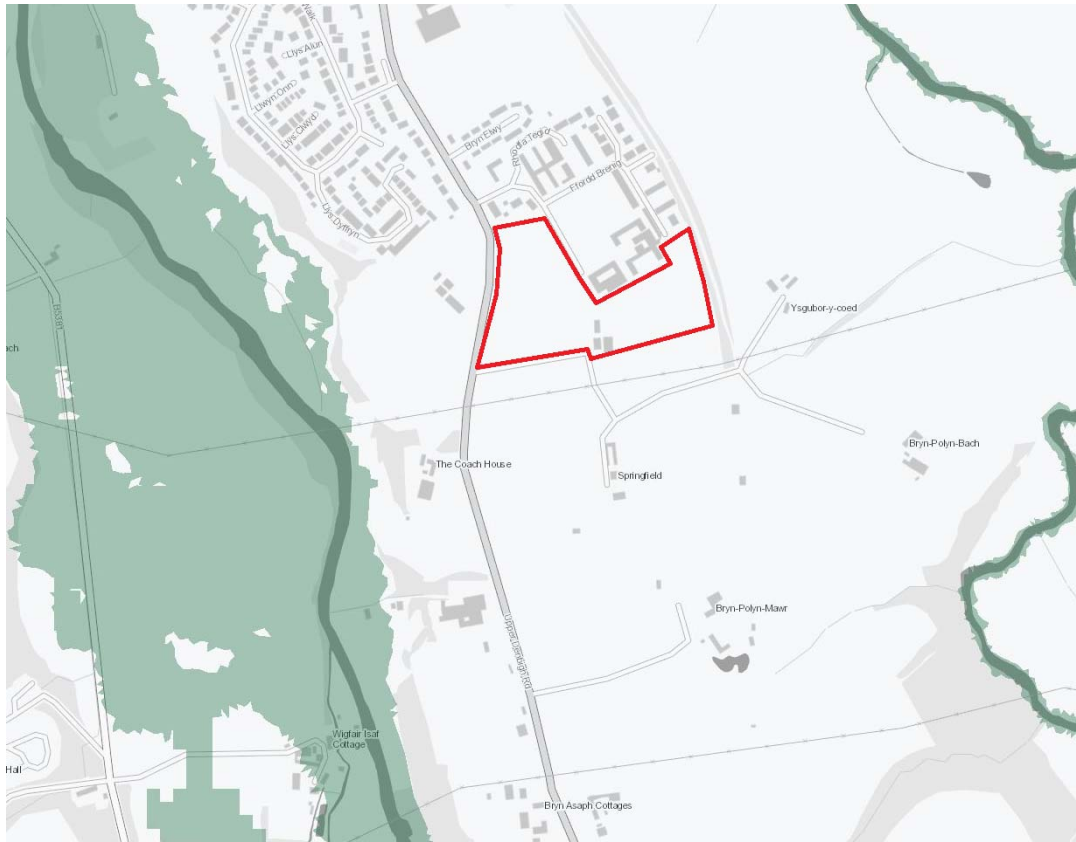


Figure 4 – Natural Resources Wales Reservoir Flooding Map

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.

Flood Consequences Assessment and Drainage Strategy for Land Off Upper Denbigh Road, St Asaph

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

The site does not benefit from any existing drainage and will rely on limited infiltration and surface water run-off to dispose of surface water flows. The flows will follow topography so as the centre of the site is the highpoint there will be a portion of the site flowing towards the east and a portion to the west. Both the eastern and western end of the development site are bounded by highways so the overland flows will flow onto the highway surface and ultimately into the highway drainage systems.

5.3 Existing Site Runoff

The greenfield run-off rates for the site has been calculated using the HR Wallingford Greenfield runoff rate estimation tool. As the site drains in 2 directions this has been calculated separately for the east and west

Western portion	= 13.88 l/s QBAR .
Eastern portion	= 10.66 l/s QBAR .

Refer to Appendix 4 for 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 are not proposing to incorporate rainwater harvesting within the development; however, they are proposing to install a water butt to each dwelling which will allow for water collection for garden re-use.

Priority Level 2

Site investigation has determined the site is underlain with clay and is therefore unsuitable for infiltration to dispose of surface water flows. However the infiltration tests did observe a drop in level in all 3 tests and whilst these slow rates will not be good enough to drain the site during a 100-year storm event they will potentially provide for slow infiltration SUDS components to deal with low flow events and provide for 5mm interception. Permeable paving (partial infiltration) and bioretention components such as tree pits and raingardens can be considered appropriate.

Priority Level 3

The nearest main rivers are the River Elwy approximately 230m west of the development site and the River Clwyd located approximately 530m east of the development site.

Flood Consequences Assessment and Drainage Strategy for Land Off Upper Denbigh Road, St Asaph

There are no watercourses within the vicinity of the site. The nearest ordinary watercourse allowing for a gravity connection is located approximately 100m south east of the site boundary. It is noted a connection into this watercourse would require third party consent.

Priority Level 4

A highway drain has been identified in Upper Denbigh Road to the west of the site. A drainage survey has confirmed this continues for approximately 130m south, then continues to flow west before ultimately discharging into the River Elwy.

Castle Green Homes Ltd have approached Denbighshire Highways for a potential connection into the highway asset and confirm initial discussions were positive. Therefore, a preliminary drainage strategy has been developed on this basis.

The surface water flow rate has been restricted to 13.8l/s. This is the greenfield rate for the western portion of the site only as it mimics the existing situation. It is appreciated the eastern portion of the site currently drains via overland flows to the east of the site so including this portion of the site within the calculation would potentially increase run-off into the highway drain.

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 properties or the construction area is more than 100m². 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 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;*

Flood Consequences Assessment and Drainage Strategy for Land Off Upper Denbigh Road, St Asaph

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.

The surface water strategy presented in Appendix 1 is providing all attenuation within a SUDS basin at the end of the network with a hydro brake flow control device to restrict the flows. This is considered to be a ‘end of pipe solution’ and whilst it complies with standards for quantity it provides limited compliance to other criteria such as water quality, amenity and biodiversity. Therefore, incorporation of additional source control SUDS components such as water butts, permeable paving and bio retention (tree pits and rain gardens) will need to be considered further at detailed design stage.

5.6 Foul Drainage

Welsh Water have responded to a pre-planning enquiry and have stated that foul flows can be accommodated within the 300mm diameter gravity combined public sewer in Upper Denbigh Road to the north of the development.

Topography and proposed site levels design will allow for a gravity network to serve the entire development without any need for a pumping station.

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 rivers, surface water, groundwater, sewers and climate change. Therefore, mitigation measures are not considered necessary for any future development at the site.

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 infiltration tests undertaken as part of the site investigation report have determined that the underlying soils have potentially low infiltration characteristics across the site. Therefore, surface water run-off from highways, roof and private drives will not discharge into the ground via infiltration techniques.

Flood Consequences Assessment and Drainage Strategy for Land Off Upper Denbigh Road, St Asaph

The development will increase the impermeable area of the site. This results in an increase in surface water runoff rates and volumes. In order to ensure the increase in runoff will not have an impact elsewhere flow restrictions and on-site attenuation will be incorporated into the design.

All surface water run-off from highways, roof and private drives will be collected into gravity piped networks, temporarily stored in a SUDS basin and will discharge at a restricted rate into the highway drain in Upper Denbigh Road at restricted flow rates.

Additional on-site source control components such as permeable paving and bioretention components (tree pits and raingardens) should be considered further at detailed design stage for compliance with the 5mm interception criteria.

The provision of trapped highway gullies, the SUDS detention basin and additional source control components will provide adequate treatment to surface water flows prior to discharge to the watercourse.

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.

This Flood Consequences Assessment and Drainage Strategy should be submitted to the Local Planning Authority 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 100m². 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 acting in its SuDS Approving Body (SAB) role before construction work begins. The SAB will have a duty to adopt compliant systems.

Flood Consequences Assessment and Drainage Strategy
for Land off Upper Denbigh Road, St Aspah

Appendix 1

Reference Drawings

<u>Drawing No.</u>	<u>Revision</u>	<u>Title</u>
7866 / L1	-	Site Location Plan
7866 / SK101	A	Drainage Strategy
7866 / SK103	-	Existing Surface Water Run-off

SCALE	1:25000@A4
DATE	08.07.21
DRAWN	OS
CHEK'D	AW

Upper Denbigh Road,
St Asaph.

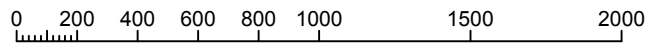
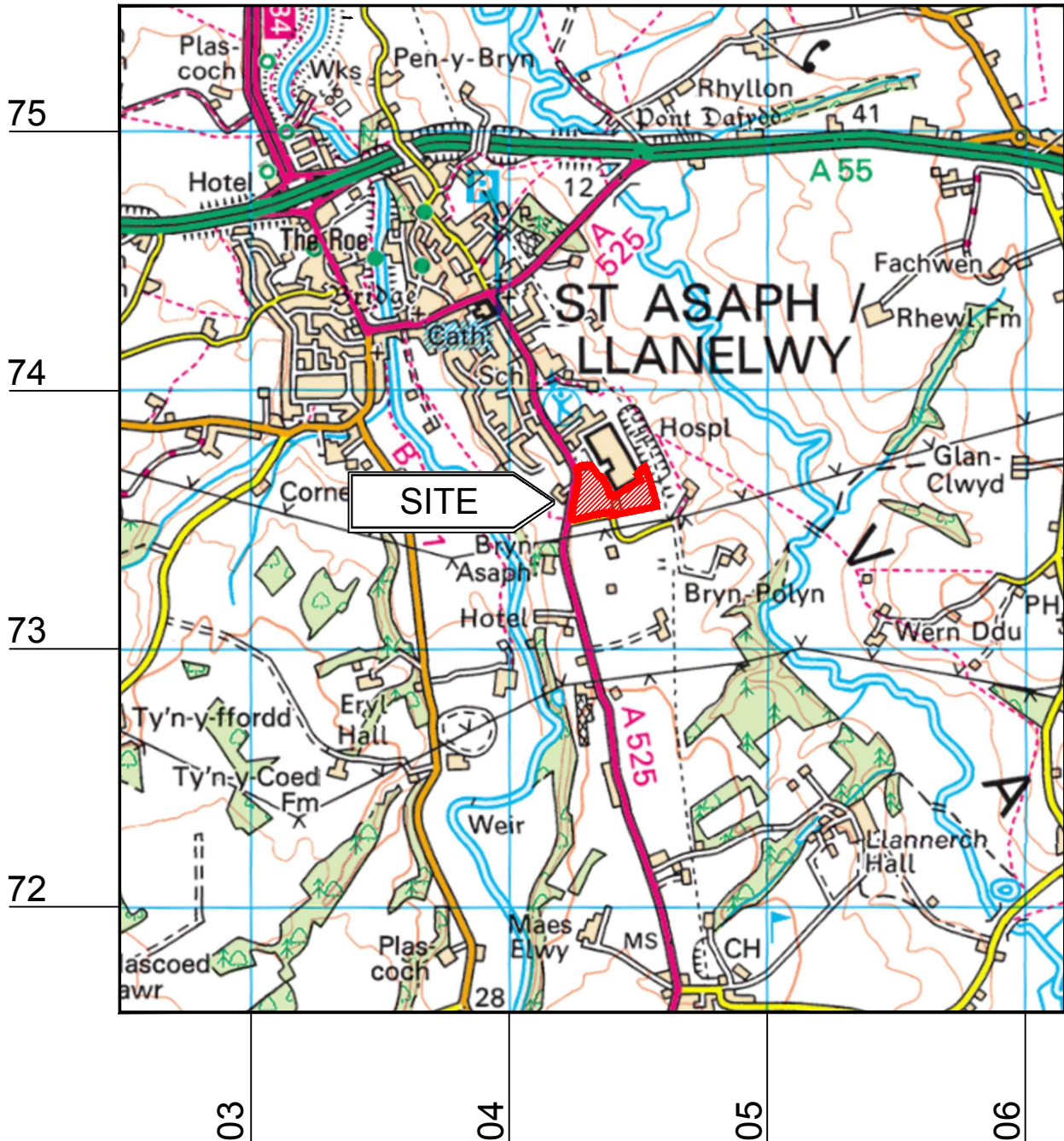
SITE LOCATION PLAN

Drg No: 7866 / L1

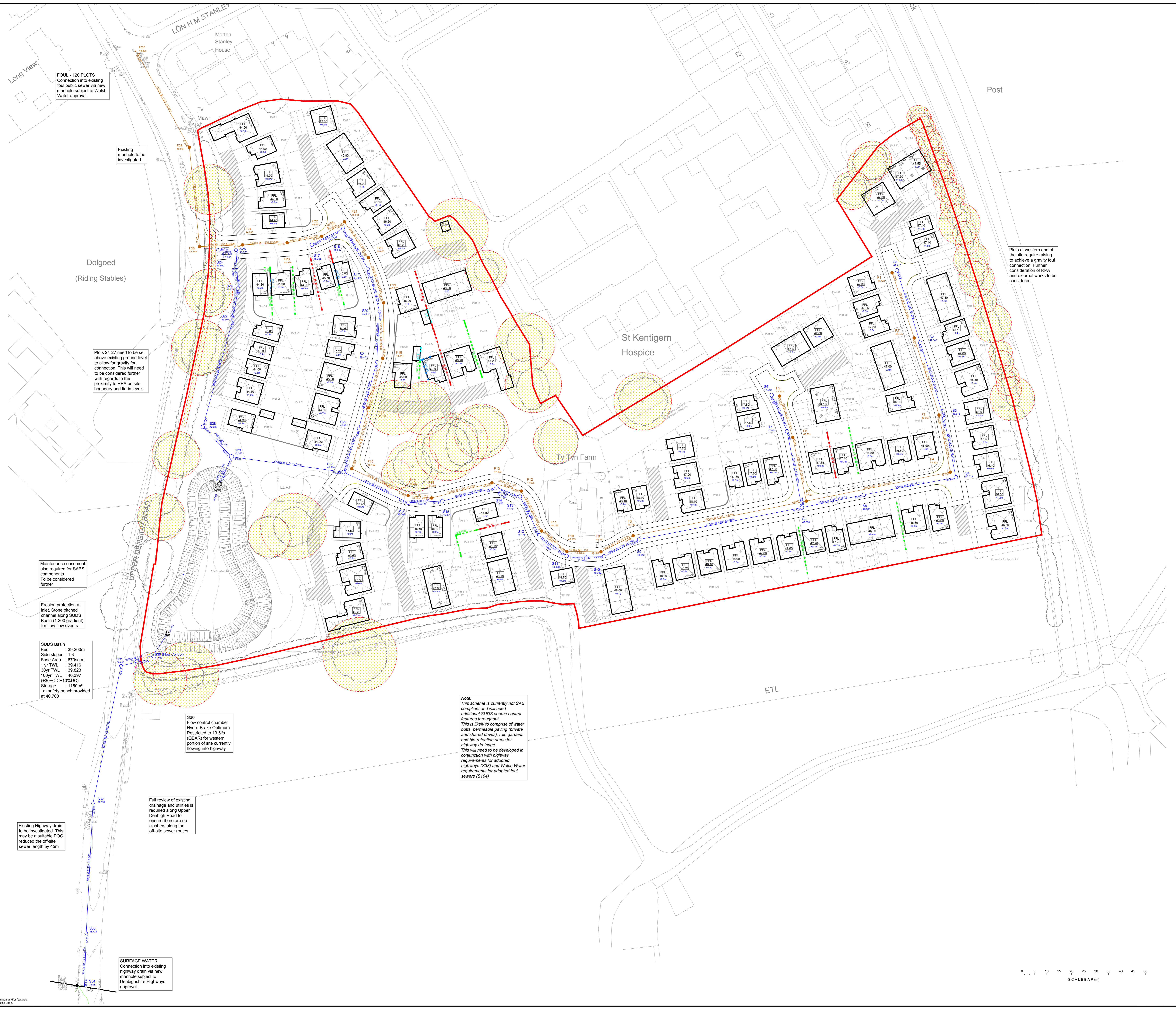
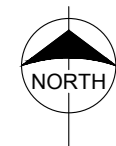


National Grid reference
of the proposed site.

SJ 043 735



SCALE BAR (m)



FOUL - 120 PLOTS
Connection into existing
foul public sewer via new
manhole subject to Welsh
Water approval.

Existing manhole to be
investigated

Dolgoed
(Riding Stables)

Plots 24-27 need to be set
above existing ground level
to allow for gravity foul
connection. This will need
to be considered further
with regards to the
proximity to RPA on site
boundary and tie-in levels

Maintenance easement
also required for SABS
components.
To be considered
further

Erosion protection at
inlet. Stone pitched
channel along SUDS
Basin (1:200 gradient)
for flow flow events

SUDS Basin
Bed : 39,200m
Side slopes : 1:3
Base Area : 670sq.m
1 yr TWL : 39,416
50yr TWL : 39,823
100yr TWL : 40,397
(+30%CC+10%LIC)
Storage : 1150m³
1m safety bench provided
at 40.700

S30
Flow control chamber
Hydro-Brake Optimum
Restricted to 13.5%
(QBAR) for western
portion of site currently
flowing into highway

Full review of existing
drainage and utilities is
required along Upper
Denbigh Road to
ensure there are no
clashes along the
off-site sewer routes

Existing Highway drain
to be investigated. This
may be a suitable POC
reduced the off-site
sewer length by 45m

SURFACE WATER
Connection into existing
highway drain via new
manhole subject to
Denbighshire Highways
approval.

Note:
This scheme is currently not SAB
compliant and will need
additional SUDS source control
features throughout.
This is likely to comprise of water
butts, permeable paving (private
and shared drives), rain gardens
and bio-retention areas for
highway drainage.
This will need to be developed in
conjunction with highway
requirements for adopted
highways (S30) and Welsh Water
requirements for adopted foul
sewers (S104)

Plots at western end of
the site require raising
to achieve a gravity foul
connection. Further
consideration of RPA
and external works to be
considered.

Legend

- Site Boundary
- Existing**
- Existing Combined Sewer
- Proposed**
- Adoptable Surface Water Sewer
- Adoptable Foul Sewer
- FFL 47.40 Slab Level
- Root Protection Area
- Wall
- Flag on Edge
- Underbuild
- Tanking

Note:
Retention of 300mm and above has been shown for
strategy stage. Small retaining features and underbuild
of up to 225mm will also be required at other locations
and will be shown at detailed design stage

STRATEGY

Rev. A	16.09.21	Updated to suit revised layout	PJN	AJ
Date		Revision	By	Appd.



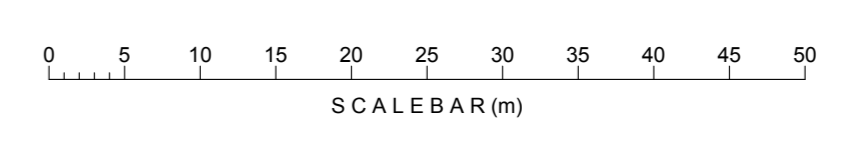
Tel: 01244 684910
Email: admin@coopers.co.uk
Web: http://coopers.co.uk

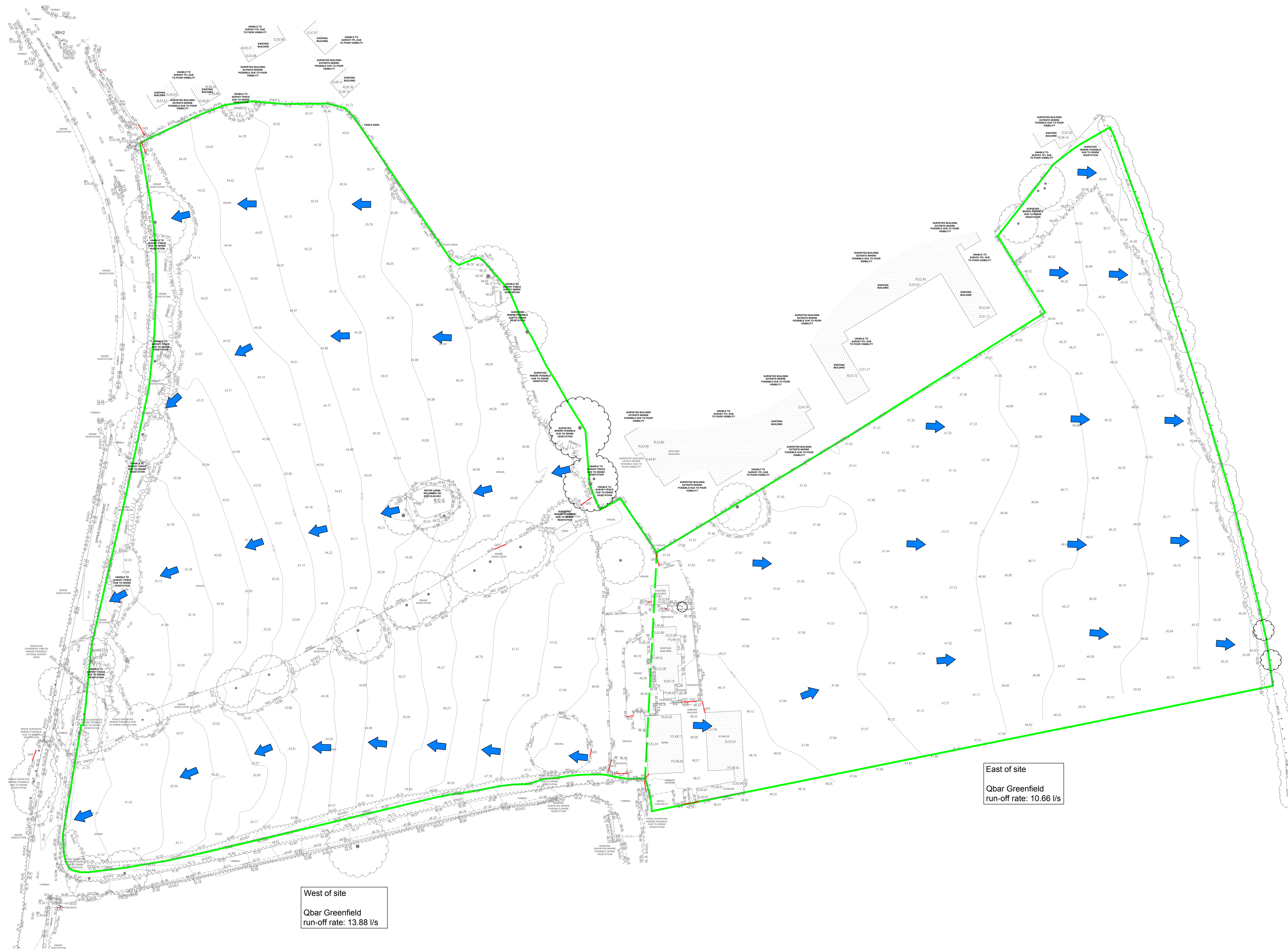
Client
CASTLE GREEN

Project
**Upper Denbigh Road,
St Asaph**

Title
Proposed Drainage Strategy

DRAWING NUMBER	SCALE at A0	1:500
7866 / SK101	DATE	09.09.21
	DRAWN	PJN
	CHECKED	AJ
	REVISION	A





Legend

- Site Boundary
- ← Direction of SW Run Off

STRATEGY



Tel: 01244 684910
 Email: admin@coopers.co.uk
 Web: http://coopers.co.uk

Park House
 Sandpaper Court
 Chester Business Park
 Chester
 CH4 5QU

Client: CASTLE GREEN

Project: Upper Denbigh Road, St Asaph

Title: Existing SW Run Off

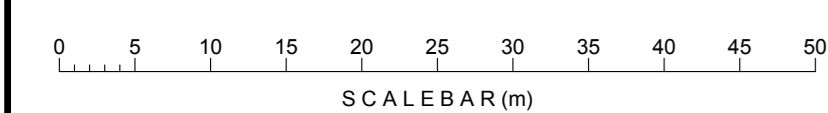
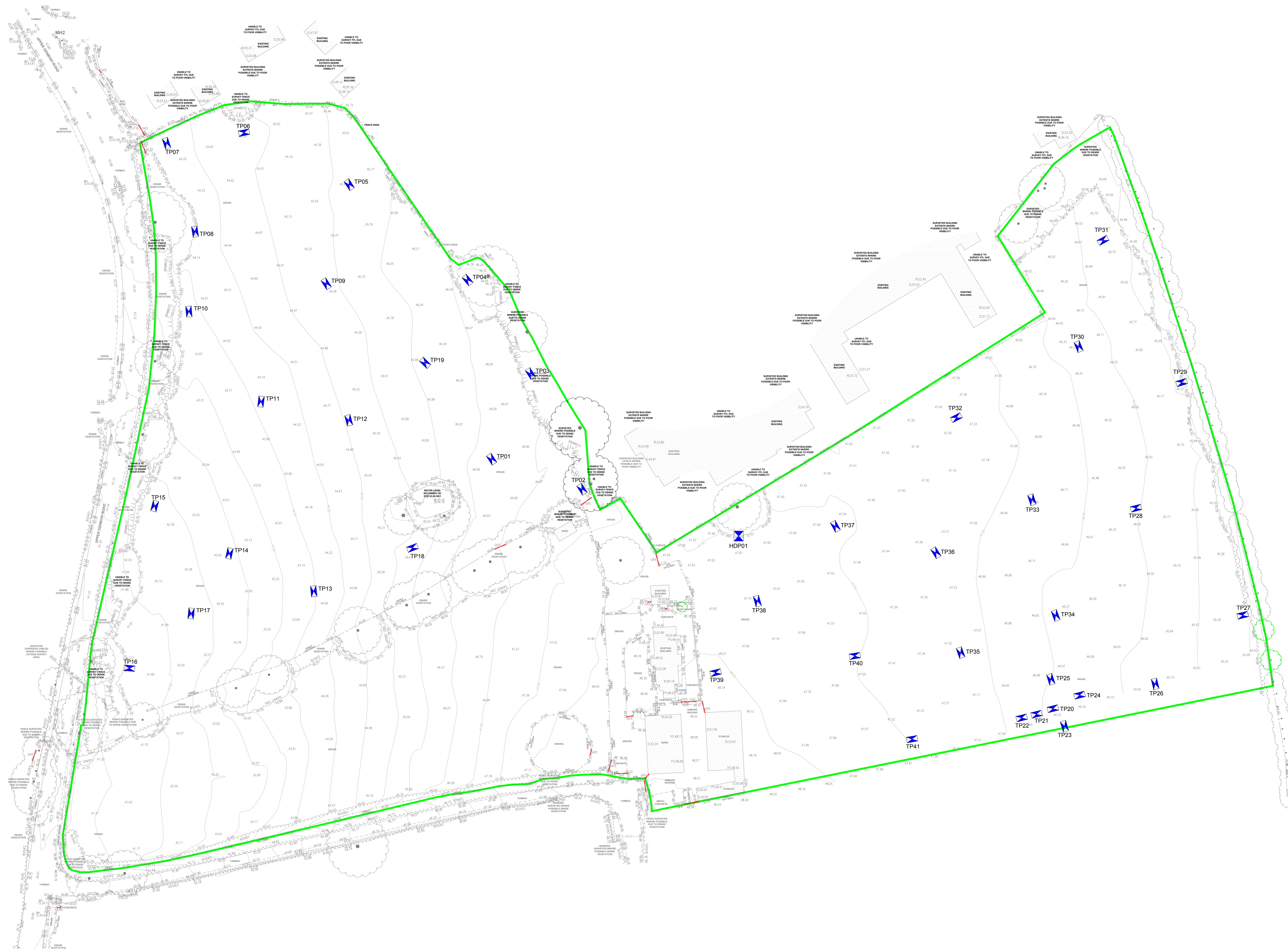
DRAWING NUMBER	SCALE at A0	1:500
7866 / SK103	DATE	17.09.21
	DRAWN	PW
	CHECKED	AJ
	REVISION	-

Flood Consequences Assessment and Drainage Strategy
for Land off Upper Denbigh Road, St Aspah

Appendix 2

Infiltration Consideration

Coopers Trial Pit Information



DRAFT



Park House
 Sandpiper Court
 Chester Business Park
 Chester
 CH4 9JL

Tel: 01244 684910
 Email: admin@coop.co.uk
 Web: http://coop.co.uk



Client
CASTLE GREEN

Project
**Upper Denbigh Road,
 St Asaph**

Title
**Site Investigation
 Trial Pit Locations**



DRAWING NUMBER	SCALE at A0	1:500
7866 / SK104	DATE	17.09.21
	DRAWN	PW
	CHECKED	AJ
	REVISION	-

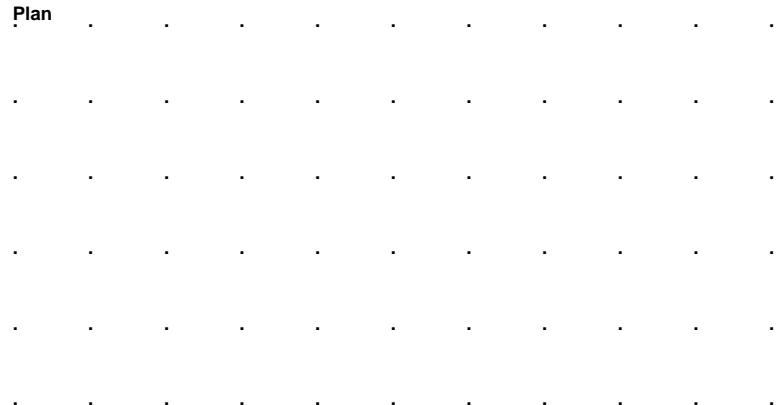
Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.90m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 16/08/2021	Engineer Coopers (Chester) Ltd	Sheet 1/1

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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.40	B				0.30	Stiff, 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.		
0.50	SV 110kPa							
1.00	SV 140kPa							
2.00	SV				(2.60)			
2.50	SV >250kPa							
2.70	B				2.90			
						Complete at 2.90m		






Plan .	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. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.80m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 16/08/2021	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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.80	SV >250kPa				0.30	Very stiff, 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.		
1.00	B							
1.50	B				(2.50)			
2.20	B				2.80	Complete at 2.80m		


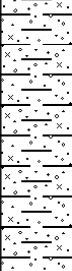
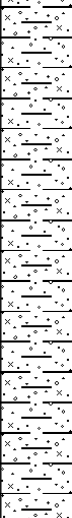
Plan 	Remarks Location CAT scanned prior to excavation. Sides stable during excavation. No groundwater encountered during excavation. Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy. Clay friable from 0.30-2.80m, unable to record shear vane as too stiff/friable. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.80m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 16/08/2021	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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.50	SV 138kPa				0.30	Very stiff, reddish brown mottled grey, slightly sandy, slightly gravelly, silty CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Low cobble content.		
0.60	B							
1.00	SV >250kPa					At 0.80m: Ceramic land drain, approximately 75mm in diameter, orientated ?? to ?? Dry		
1.50	B				(2.50)			
					2.80	Complete at 2.80m		








Plan .	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. Friable from 0.30m. Unable to take shear vanes below 0.40m as stiff and friable. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

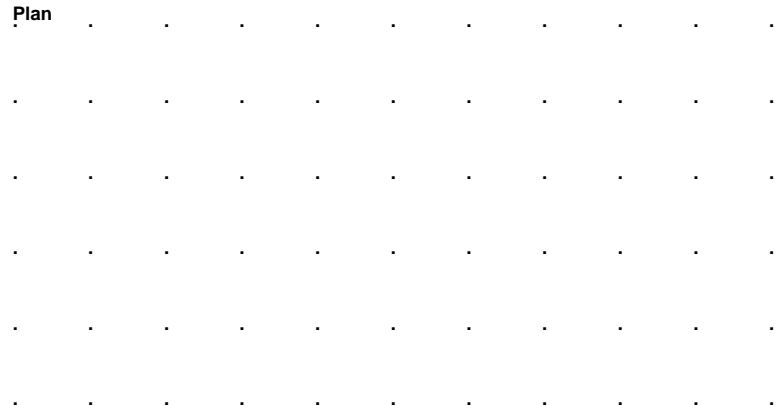
Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.90m	Ground Level (mOD)	Client Castle Green Homes Ltd	Job Number 7870
	Location (Observed measurements)	Dates 16/08/2021	Engineer Coopers (Chester) Ltd	Sheet 1/1

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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Very stiff, 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.		
0.60 0.70	SV 160kPa B							
1.20 1.40	SV >250kPa B				(2.70)			
2.80	B				2.90	Complete at 2.90m		







Plan .	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. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

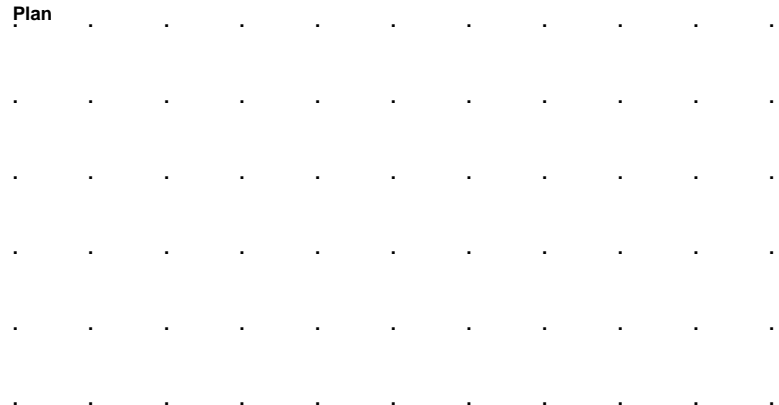
Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.90m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 16/08/2021	Engineer Coopers (Chester) Ltd	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	B				0.30	TOPSOIL. Grass over brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.50	SV 162kPa					Very stiff, 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.		
0.60	B							
1.00	SV 210kPa							
1.20	B							
1.50	SV >250kPa				(2.60)			
2.60	B				2.90	Complete at 2.90m		






Plan 	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. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 3.00m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 16/08/2021	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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.40	B					Very stiff, 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 125kPa							
1.00	SV 200kPa					At 0.80m: Slightly sandy		
1.40	B							
1.50	SV 240kPa				(2.80)			
2.00	SV >250kPa							
2.80	B				3.00	Complete at 3.00m		



Plan 	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. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.80m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 16/08/2021	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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.50	SV >250kPa				0.30	Very stiff, 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.		
0.70	B					At 0.60m: Ceramic land drain, approximately 75mm in diameter, orientated ?? to ??.		
1.50	B				(2.50)			
2.70	B				2.80	Complete at 2.80m		


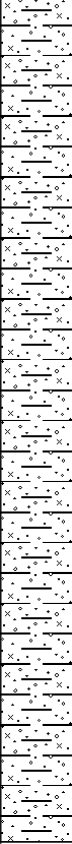
Plan .	Remarks Location CAT scanned prior to excavation. Sides stable during excavation. No groundwater encountered during excavation. Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy. From 0.30-0.80m; friable, very stiff, cannot read shear vanes. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

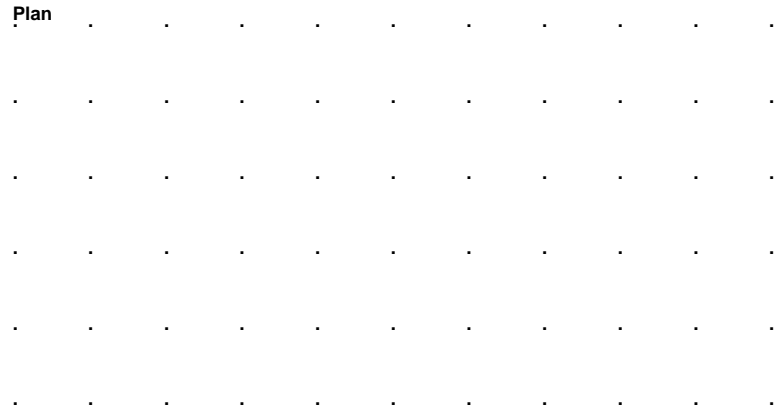
Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.80m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 16/08/2021	Engineer Coopers (Chester) Ltd	Sheet 1/1

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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.40	SV >250kPa				0.30	Very stiff, 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.		
0.50	B							
1.50	B				(2.50)			
2.80	B				2.80	Complete at 2.80m		








Plan .	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. From 0.40-2.80m; friable, too stiff to ??. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

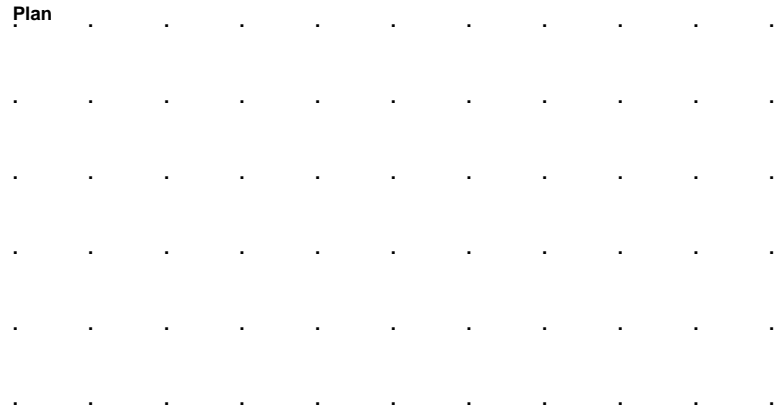
Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 3.00m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 16/08/2021	Engineer Coopers (Chester) Ltd	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	B				0.20	TOPSOIL. Grass over brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.40	SV 160kPa					Very stiff, 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.		
0.50	B							
1.00	SV 202kPa							
1.50	SV 228kPa			(2.80)				
1.70	B							
2.00	SV >250kPa							
2.50	B							
					3.00	Complete at 3.00m		









Plan 	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. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

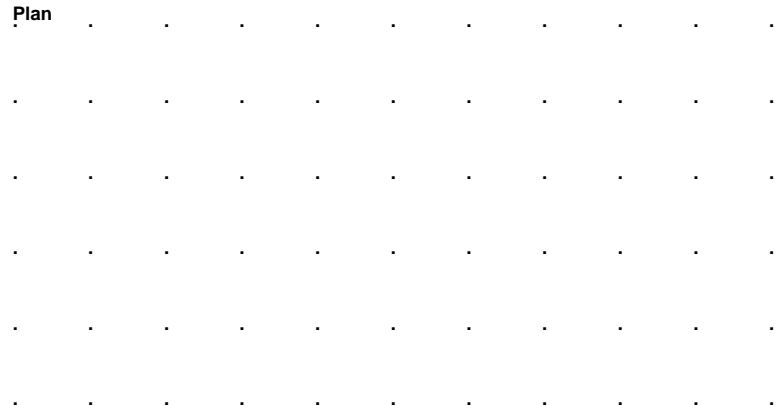
Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.80m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 16/08/2021	Engineer Coopers (Chester) Ltd	Sheet 1/1

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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.40	B				0.30	Very stiff, 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.		
0.50	SV 160kPa							
1.00	SV 230kPa							
1.40	B							
1.50	SV >250kPa				(2.50)	Below 1.50m: Low boulder content, measured example approximately 400mm diameter		
2.80	B				2.80	Complete at 2.80m		






Plan 	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. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

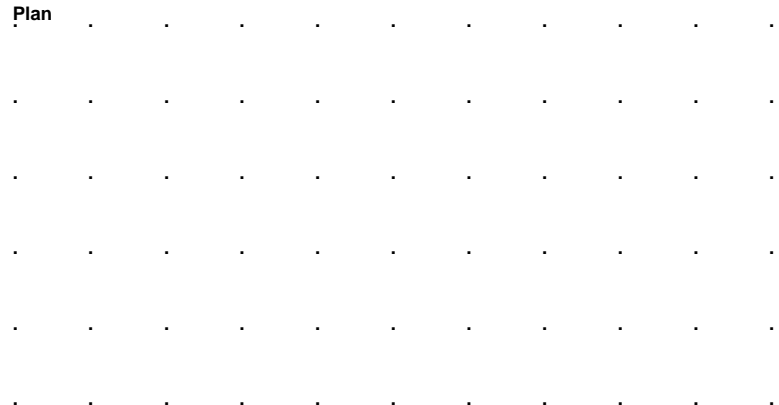
Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 3.20m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 16/08/2021	Engineer Coopers (Chester) Ltd	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.40	SV 128kPa				(0.30)	TOPSOIL. Grass over brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.60	B				0.30	Very stiff, 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.		
1.00	SV 140kPa							
1.50	SV 186kPa							
1.60	B				(2.90)			
2.00	SV 210kPa							
2.50	SV >250kPa							
3.00	B							
					3.20	Complete at 3.20m		




Plan 	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. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

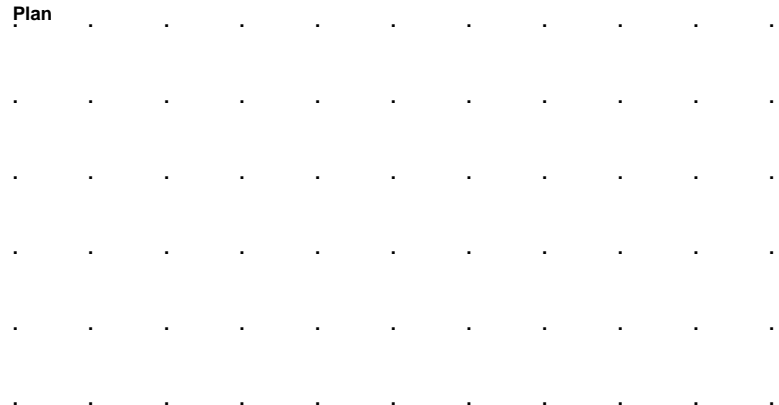
Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.70m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 16/08/2021	Engineer Coopers (Chester) Ltd	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	B				(0.30)	TOPSOIL. Grass over brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.50	SV 176kPa				0.30	Very stiff, 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. At 0.60m: Ceramic land drain, approximately 75mm in diameter, orientated north east to south west. Dry		
0.70	B							
1.00	SV 210kPa							
1.50	SV >250kPa				(2.40)			
					2.70	Complete at 2.70m		


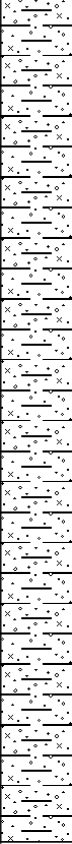
Plan 	Remarks Location CAT scanned prior to excavation. Sides stable during excavation. No groundwater encountered during excavation. Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

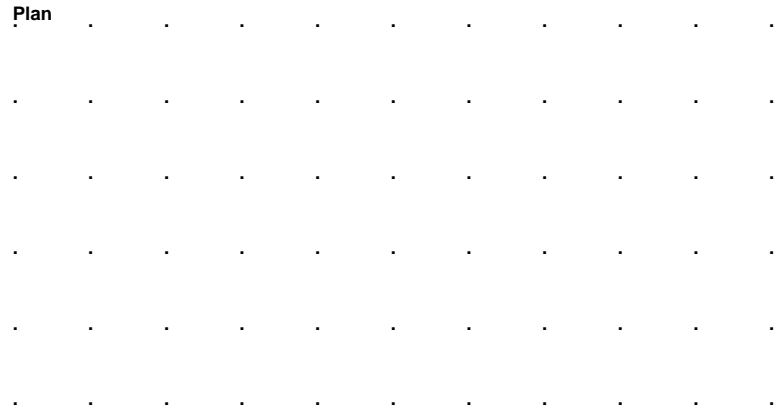
Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 3.00m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 16/08/2021	Engineer Coopers (Chester) Ltd	Sheet 1/1

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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.40	SV 158kPa				0.30	Very stiff, 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.		
0.50	B							
1.00	SV 220kPa							
1.50	SV >250kPa							
1.70	B				(2.70)			
3.00	B				3.00	Complete at 3.00m		









Plan 	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. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

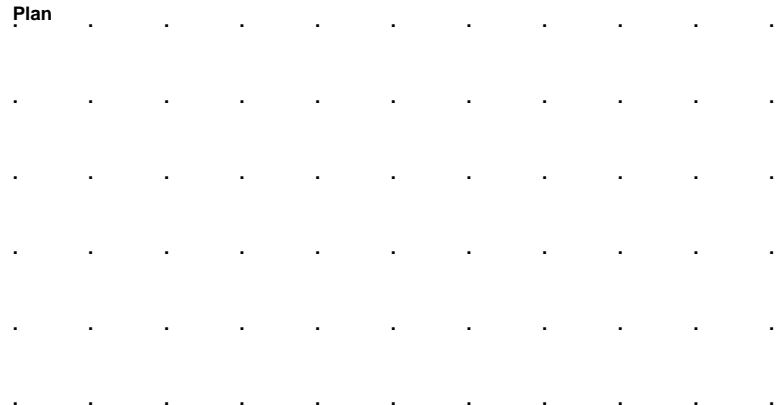
Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 3.00m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 16/08/2021	Engineer Coopers (Chester) Ltd	Sheet 1/1

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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.50	SV 190kPa					Very stiff, 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.		
0.60	B							
1.00	SV							
1.40 1.50	B SV			(2.80)				
2.50	B				3.00	Complete at 3.00m		



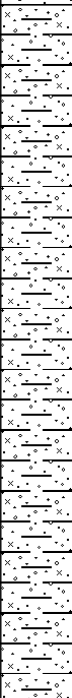
Plan 	Remarks Location CAT scanned prior to excavation. Sides stable during excavation. No groundwater encountered during excavation. Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 3.00m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 16/08/2021	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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.50	SV 142kPa				0.30	Very stiff, 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.		
0.60	B							
1.00	SV 190kPa					At 0.80m: Ceramic land drain, approximately 75mm in diameter, orientated north east to south west. Dry		
1.50	SV 240kPa							
1.70	B				(2.70)			
2.00	SV >250kPa							
2.70	B				3.00	Complete at 3.00m		


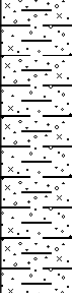



Plan 	Remarks Location CAT scanned prior to excavation. Sides stable during excavation. No groundwater encountered during excavation. Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

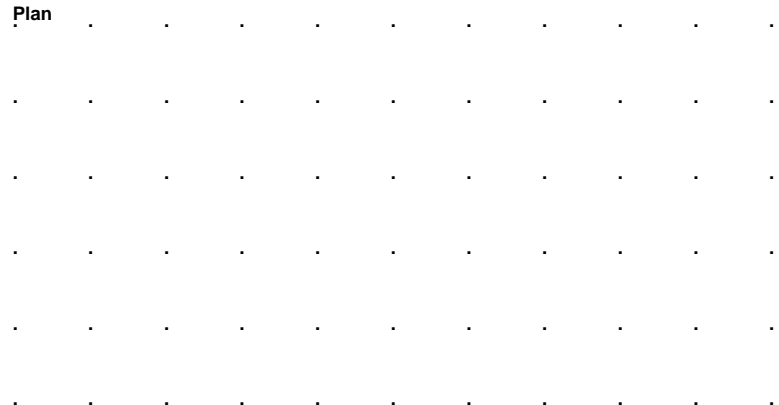
Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 3.20m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 16/08/2021	Engineer Coopers (Chester) Ltd	Sheet 1/1

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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.60 0.70	SV 122kPa B				(0.60)	Stiff, brown and grey, silty, sandy CLAY. Sand is fine to medium. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
1.00 1.10	SV 196kPa B				0.90	Very stiff, 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	SV >250kPa							
2.00	B				(2.30)			
3.00	B				3.20	Complete at 3.20m		









Plan .	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. At 0.90m; friable and unable to take shear vanes as either shatters or is too stiff. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 3.20m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 16/08/2021	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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.40	SV 184kPa					Very stiff, 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.		
0.50	B							
1.00	SV 212kPa					Below 1.20m: Grey mottled brown and reddish brown		
1.30	B							
1.50	SV >250kPa				(3.00)	Below 2.2m: Reddish brown mottled grey		
2.40	B							
3.00	B				3.20	Complete at 3.20m		



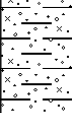
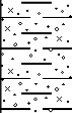
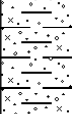
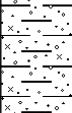
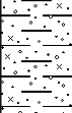
Plan 	Remarks Location CAT scanned prior to excavation. Sides stable during excavation. No groundwater encountered during excavation. Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy. Trial pit backfilled with arisings upon completion.			
	<table border="1"> <tr> <td>Scale (approx) 1:25</td> <td>Logged By ST</td> <td>Checked By</td> </tr> </table>	Scale (approx) 1:25	Logged By ST	Checked By
Scale (approx) 1:25	Logged By ST	Checked By		

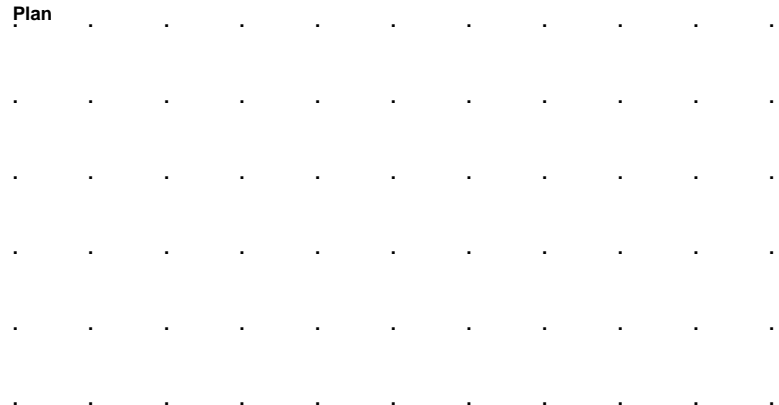
Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 3.20m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 16/08/2021	Engineer Coopers (Chester) Ltd	Sheet 1/1

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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.50	SV 156kPa				0.30	Very stiff, 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.		
0.60	B							
1.00	SV 222kPa							
1.50	SV >250kPa							
1.60	B				(2.90)			
2.60	B							
					3.20	Complete at 3.20m		

Plan .	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. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 3.20m	Ground Level (mOD)	Client Castle Green Homes Ltd	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.50	B				0.40	Very stiff, 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. At 0.60m: Ceramic land drain, approximately 70mm in diameter, orientated north east to south west. Dry		
0.60	SV 170kPa							
1.20	SV 194kPa							
1.80	SV 220kPa				(2.80)			
2.30	SV >250kPa							
					3.20	Complete at 3.20m		

Plan 	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. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.80m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is angular to sub-rounded, fine to coarse of various lithologies including brick fragments and masonry fragments. Low cobble content of brick.		
0.40	B				0.30	MADEGROUND. Firm, reddish brown, slightly gravelly, silty, sandy CLAY. Sand is fine to coarse. Gravel is angular to sub-rounded, fine to coarse of various lithologies including brick fragments and ceramic fragments.		
1.00	B		Moderate inflow(1) at 0.90m.		(0.60)	MADEGROUND. Soft, dark grey, slightly gravelly, clayey, sandy, organic SILT with frequent pockets of spongy, fibrous peat. Gravel is angular to sub-angular, fine to coarse of various lithologies including brick fragments, masonry fragments and timber. Moderate cobble and boulder content of tree branches/trunks. Distinct organic odour.		∇1
2.75	B				0.90			
2.80	B				(1.80)			
2.80	B				2.70 (0.10) 2.80	Very stiff, 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.		
						Complete at 2.80m		





Plan .	Remarks Location CAT scanned prior to excavation. Collapsed between 0.90-2.70m due to water ingress. Moderate inflow at 0.90m 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 backfilled with arisings upon completion.	
Scale (approx) 1:25	Logged By ST	Checked By

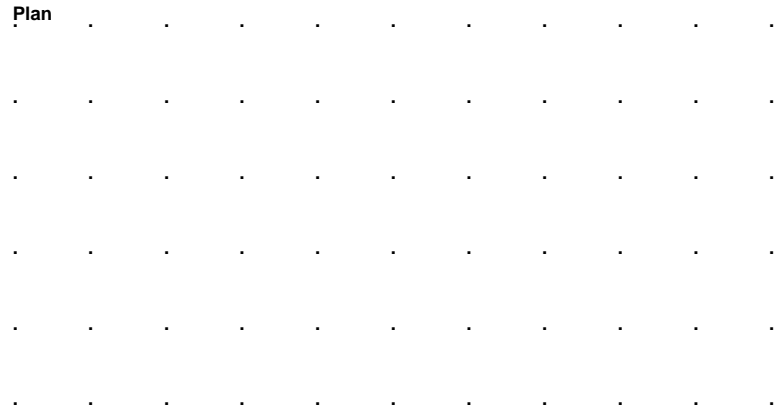
Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.50m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	Engineer Coopers (Chester) Ltd	Sheet 1/1

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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is angular to sub-rounded, fine to coarse of various lithologies including brick fragments and ceramic fragments. Low cobble content of brick.		
0.60	B				(1.00)	MADEGROUND. Brown, sandy GRAVEL and COBBLE of predominantly whole brick and sandstone. Low boulder content of sandstone. Sand is fine to coarse.		
			Groundwater seepage(1) at 1.30m.		1.30	MADEGROUND. Soft, dark grey, slightly gravelly, clayey, sandy SILT. Sand is fine to coarse. Gravel is angular to sub-angular, fine to coarse of various lithologies including brick.		▽1
					(1.10)			
2.50	SV 220kPa				2.40	Very stiff, 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.		
2.50	B				(0.10) 2.50			
						Complete at 2.50m		



Plan .	Remarks Location CAT scanned prior to excavation. Sides stable during excavation. Seepage at 1.30m 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 backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

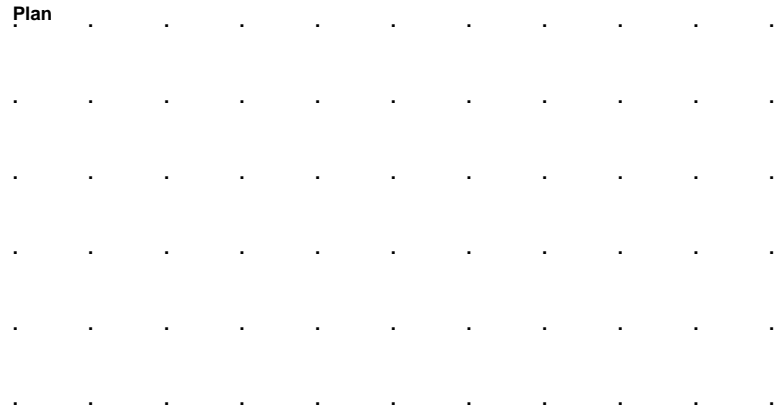
Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 1.50m	Ground Level (mOD)	Client Castle Green Homes Ltd	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	Engineer Coopers (Chester) Ltd	Sheet 1/1

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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies including brick.		
0.40	SV 170kPa				0.30	Very stiff, 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.		
					(1.20)			
1.40	SV 210kPa				1.50	Complete at 1.50m		


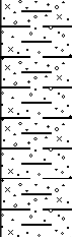
Plan 	Remarks Location CAT scanned prior to excavation. Sides stable during excavation. No groundwater encountered during excavation. Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

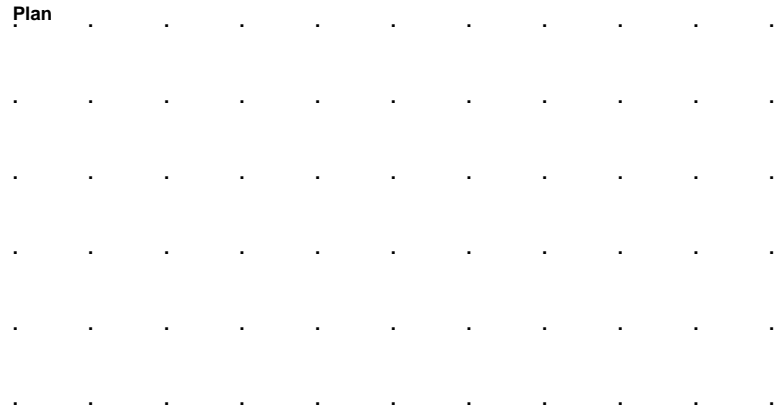
Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 1.00m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	Engineer Coopers (Chester) Ltd	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	B				(0.50)	MADEGROUND (similar to topsoil). Grass over dark brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is angular to sub-rounded, fine to coarse of various lithologies including brick. Low cobble content of brick.		
0.60	SV 210kPa				(0.50)	Very stiff, 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.		
					1.00	Complete at 1.00m		


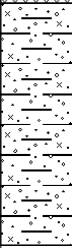
Plan 	Remarks Location CAT scanned prior to excavation. Sides stable during excavation. No groundwater encountered during excavation. Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy. Trial pit backfilled with arisings upon completion.		
	Scale (approx) 1:25	Logged By ST	Checked By

Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 1.30m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	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				(0.50)	MADEGROUND (similar to topsoil). Grass over brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies. Low cobble content of brick.		
0.60	SV 198kPa				(0.80)	Very stiff, 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.		
					1.30	Complete at 1.30m		



Plan 	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. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 1.10m	Ground Level (mOD)	Client Castle Green Homes Ltd	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is angular to sub-rounded, fine to coarse of various lithologies including brick. Low cobble content of brick.		
0.50	SV 194kPa				0.30 (0.80)	Very stiff, 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.		
					1.10	Complete at 1.10m		




Plan .	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. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.80m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.40	SV 170kPa				0.30	Very stiff, 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.		
1.00	B							
1.10	SV 190kPa							
1.60	SV 234kPa				(2.50)			
2.20	SV >250kPa				2.80	Complete at 2.80m		







Plan .	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. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.50m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.50	SV >250kPa				0.30	Very stiff, 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				(2.20)	At 0.60m: Ceramic land drain, approximately 70mm in diameter, orientated north east to south west. Dry		
					2.50	Complete at 2.50m		







Plan .	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. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.50m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.50	SV 208kPa				0.30	Very stiff, 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.		
0.60	B							
1.00	SV 220kPa							
1.70	SV >250kPa				(2.20)			
2.50	B				2.50	Complete at 2.50m		



Plan .	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. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

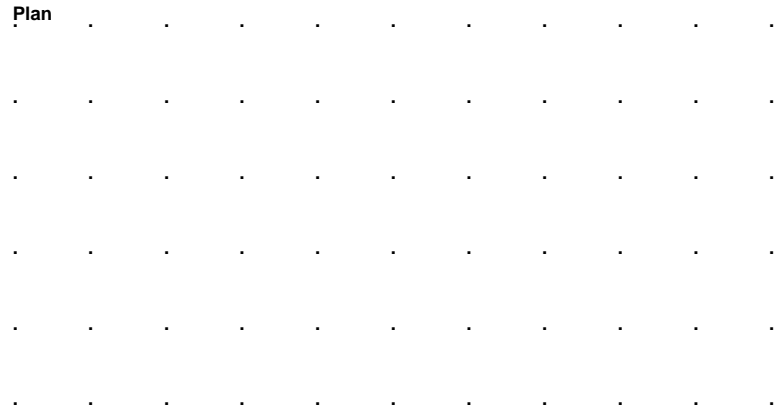
Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.50m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	Engineer Coopers (Chester) Ltd	Sheet 1/1

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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.60	SV 174kPa				0.35	Very stiff, 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.		
0.90	B							
1.00	SV 232kPa							
1.60	SV >250kPa				(2.15)			
					2.50	Complete at 2.50m		


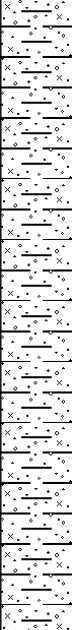
Plan .	Remarks Location CAT scanned prior to excavation. Sides stable during excavation. No groundwater encountered during excavation. Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.90m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.50	SV 190kPa				0.30	Very stiff, 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.		
1.00	SV 214kPa							
1.30	B							
1.50	SV >250kPa				(2.60)			
					2.90	Complete at 2.90m		


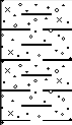
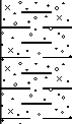
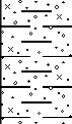

Plan 	Remarks Location CAT scanned prior to excavation. Sides stable during excavation. No groundwater encountered during excavation. Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

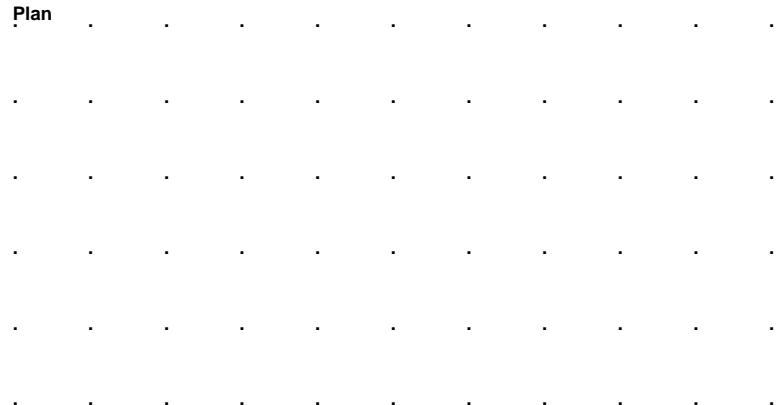
Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.60m	Ground Level (mOD)	Client Castle Green Homes Ltd	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	Engineer Coopers (Chester) Ltd	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10	B				(0.50)	TOPSOIL. Grass over brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.60	SV 200kPa				0.50	Very stiff, 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.		
1.00	B							
1.50	SV >250kPa				(2.10)			
					2.60	Complete at 2.60m		


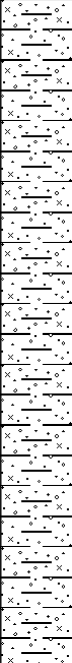
Plan .	Remarks Location CAT scanned prior to excavation. Sides stable during excavation. No groundwater encountered during excavation. Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

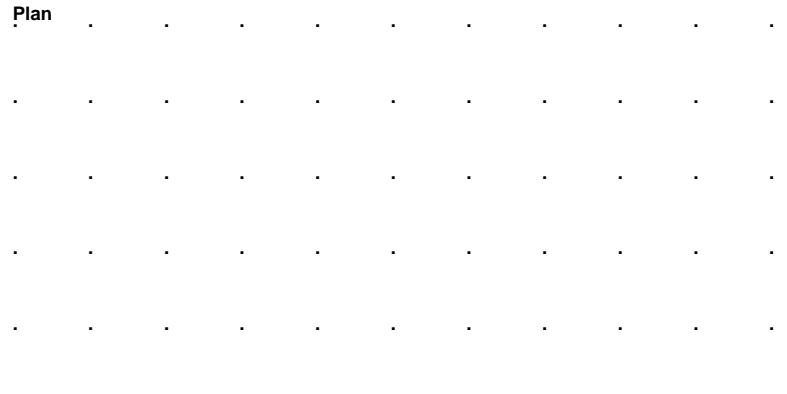
Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.60m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	Engineer Coopers (Chester) Ltd	Sheet 1/1

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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.50	B				0.40	Very stiff, 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.		
0.80	SV 229kPa							
1.40	SV >250kPa				(2.20)			
2.60	B				2.60	Complete at 2.60m		


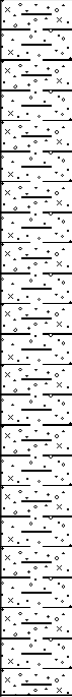
Plan 	Remarks Location CAT scanned prior to excavation. Sides stable during excavation. No groundwater encountered during excavation. Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy. Trial pit backfilled with arisings upon completion.		
	Scale (approx) 1:25	Logged By ST	Checked By

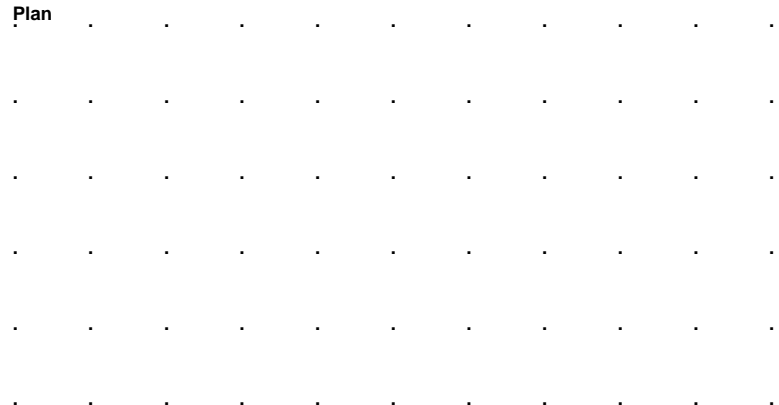
Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.60m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	Engineer Coopers (Chester) Ltd	Sheet 1/1

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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.50	SV 160kPa				0.40	Very stiff, 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.		
1.30 1.40	SV 214kPa B				(2.20)			
1.80	SV >250kPa							
2.50	B				2.60	Complete at 2.60m		


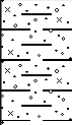
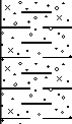
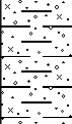

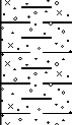
Plan 	Remarks Location CAT scanned prior to excavation. Sides stable during excavation. No groundwater encountered during excavation. Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.70m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.50	SV 140kPa				0.40	Very stiff, 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.		
1.10 1.20	B SV 180kPa				(2.30)			
1.80	SV 224kPa							
2.40 2.50	SV >250kPa B				2.70	Complete at 2.70m		







Plan 	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. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.70m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.50	SV 180kPa				0.40	Very stiff, 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.		
0.80	B							
1.00	SV 232kPa							
1.50	SV >250kPa				(2.30)			
2.60	B				2.70	Complete at 2.70m		






Plan .	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. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.70m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.50	SV 210kPa				0.40	Very stiff, 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.		
0.60	B							
1.00	SV >250kPa							
1.10	B				(2.30)			
2.60	B				2.70	Complete at 2.70m		


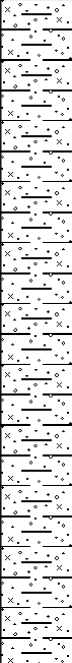
Plan .	Remarks Location CAT scanned prior to excavation. Sides stable during excavation. No groundwater encountered during excavation. Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

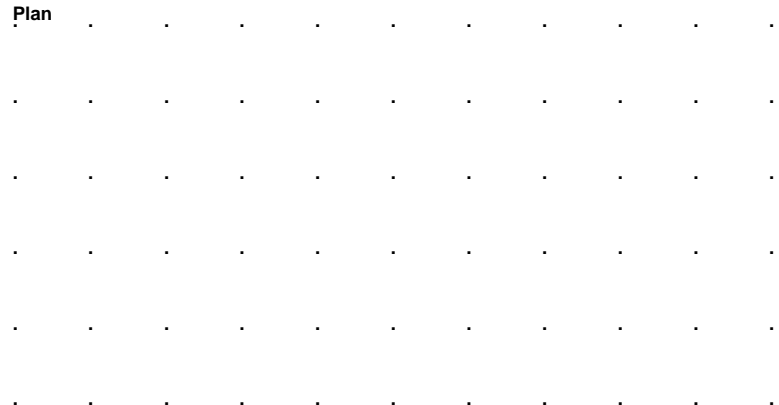
Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 3.00m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	Engineer Coopers (Chester) Ltd	Sheet 1/1

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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.40	B				0.30	Very stiff, 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.		
0.50	SV 190kPa							
1.00	B							
1.10	SV 210kPa							
1.60	SV >250kPa				(2.70)			
2.80	B				3.00	Complete at 3.00m		


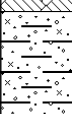

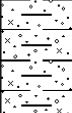

Plan .	Remarks Location CAT scanned prior to excavation. Sides stable during excavation. No groundwater encountered during excavation. Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.60m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.50	B				0.40	Very stiff, 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.		
0.60	SV 204kPa							
1.20	SV 238kPa				(2.20)			
2.00	B				2.60	Complete at 2.60m		


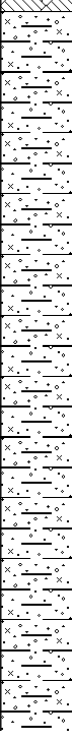
Plan 	Remarks Location CAT scanned prior to excavation. Sides stable during excavation. No groundwater encountered during excavation. Please note that discolouration of photographs may occur when viewed on screen as a PDF, or when printed as a hard copy. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

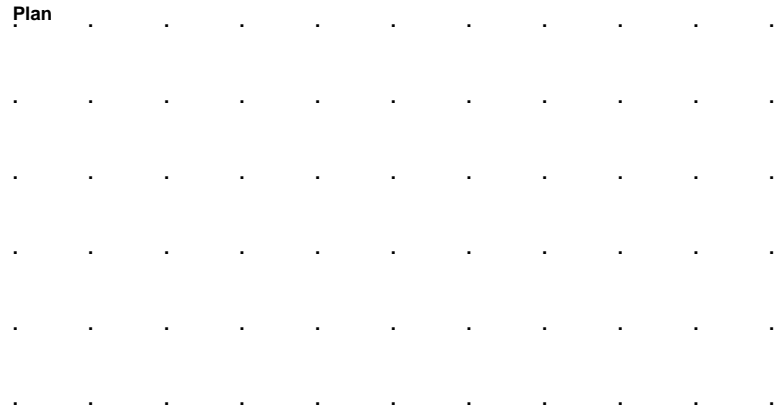
Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.50m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	Engineer Coopers (Chester) Ltd	Sheet 1/1

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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.50	SV 120kPa				0.40	Very stiff, 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.		
0.60	B							
1.10	SV 140kPa				(2.10)	At 1.10m: Very stiff		
1.20	B							
1.60	SV 196kPa							
2.10	SV 234kPa							
2.40	B				2.50	Complete at 2.50m		










Plan .	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. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					


Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 2.80m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.50	SV 170kPa				0.40	Very stiff, 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.		
1.00	SV 186kPa							
1.50	B				(2.40)			
1.60	SV 210kPa							
2.00	SV 234kPa							
2.50	B				2.80	Complete at 2.80m		

Plan 	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. Trial pit backfilled with arisings upon completion.		
	Scale (approx) 1:25	Logged By ST	Checked By

Machine : 13 Tonne Tracked Excavator Method : Mechanical Excavation	Dimensions ?? x ?? x 3.20m	Ground Level (mOD)	Client Castle Green Homes Lts	Job Number 7870
	Location (Observed measurements)	Dates 17/08/2021	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 brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is sub-angular to sub-rounded, fine to coarse of various lithologies.		
0.50	SV 170kPa				0.30	Very stiff, 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.		
0.80	B							
1.00	SV 182kPa							
1.50	SV 220kPa				(2.90)			
2.00	B							
2.10	SV >250kPa							
						Below 2.50m: Light reddish brown sand lenses		
3.00	B				3.20	Complete at 3.20m		

Plan 	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. Trial pit backfilled with arisings upon completion.					
	<table border="1"> <tr> <td>Scale (approx)</td> <td>Logged By</td> <td>Checked By</td> </tr> <tr> <td>1:25</td> <td>ST</td> <td></td> </tr> </table>	Scale (approx)	Logged By	Checked By	1:25	ST
Scale (approx)	Logged By	Checked By				
1:25	ST					

Flood Consequences Assessment and Drainage Strategy
for Land off Upper Denbigh Road, St Aspah

Appendix 3

Correspondence

Dwr Cymru Welsh Water Pre Development Sewerage Enquiry

Dwr Cymru Welsh Water Historical Flooding

Denbighshire County Council Historical Flooding

Natural Resources Wales Historical Flooding

From: Rhodri Perry <Rhodri.Perry@dwrcymru.com>
Sent: 10 September 2021 11:37
To: Michael Ollier <michael.ollier@castlegreenhomes.uk>
Cc: Norman Kelly <norman.kelly@castlegreenhomes.uk>
Subject: RE: Upper Denbigh Road, St. Asaph

Hi Michael,

Sorry I missed your call,

We can confirm that we can accommodate flows into the sewerage network as well as the catchment's waste water treatment works, upon further reviewing I can also confirm that this treatment works is not within the Special Areas of Conversation (SAC) , therefore phosphate treatment is not an issue for this site.

My water colleagues are yet to confirm if we can supply an adequate water supply to this site, given the pre planning was submitted on Monday my water colleagues are still within their service level agreement (SLA) to complete comments.

We will get comments over to you regarding water supply as soon as we can.

Thank you,

Rhodri



Rhodri Perry

Development Control Officer | Developer Services
Dŵr Cymru Welsh Water



W: dwrcymru.com



E: developer.services@dwrcymru.com



T: 0800 917 2652 | M: 07557 849514



A: PO Box 3146, Cardiff, CF30 0EH



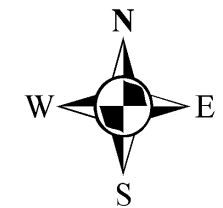
Before you print please think about the **ENVIRONMENT**

If we've gone the extra mile to provide you with excellent service, let us know. You can nominate an individual or team for a Diolch award through our [website](#)



Dŵr Cymru
Welsh Water

Upper Denbigh Road



LEGEND(Representative of most common features)

Waste network:	
	Foul chamber
	Surface water chamber
	Combined chamber
	Special purpose chamber
	Treatment works
	Pumping station
	Private sewer subject to Sect. 104 adoption agreement
	Private Sewer Transfer
	Lamphole
	Storm Overflow
	Rising main
	Gravity sewer
	Private sewer
	Private sewer subject to Sect. 104 adoption agreement
	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.

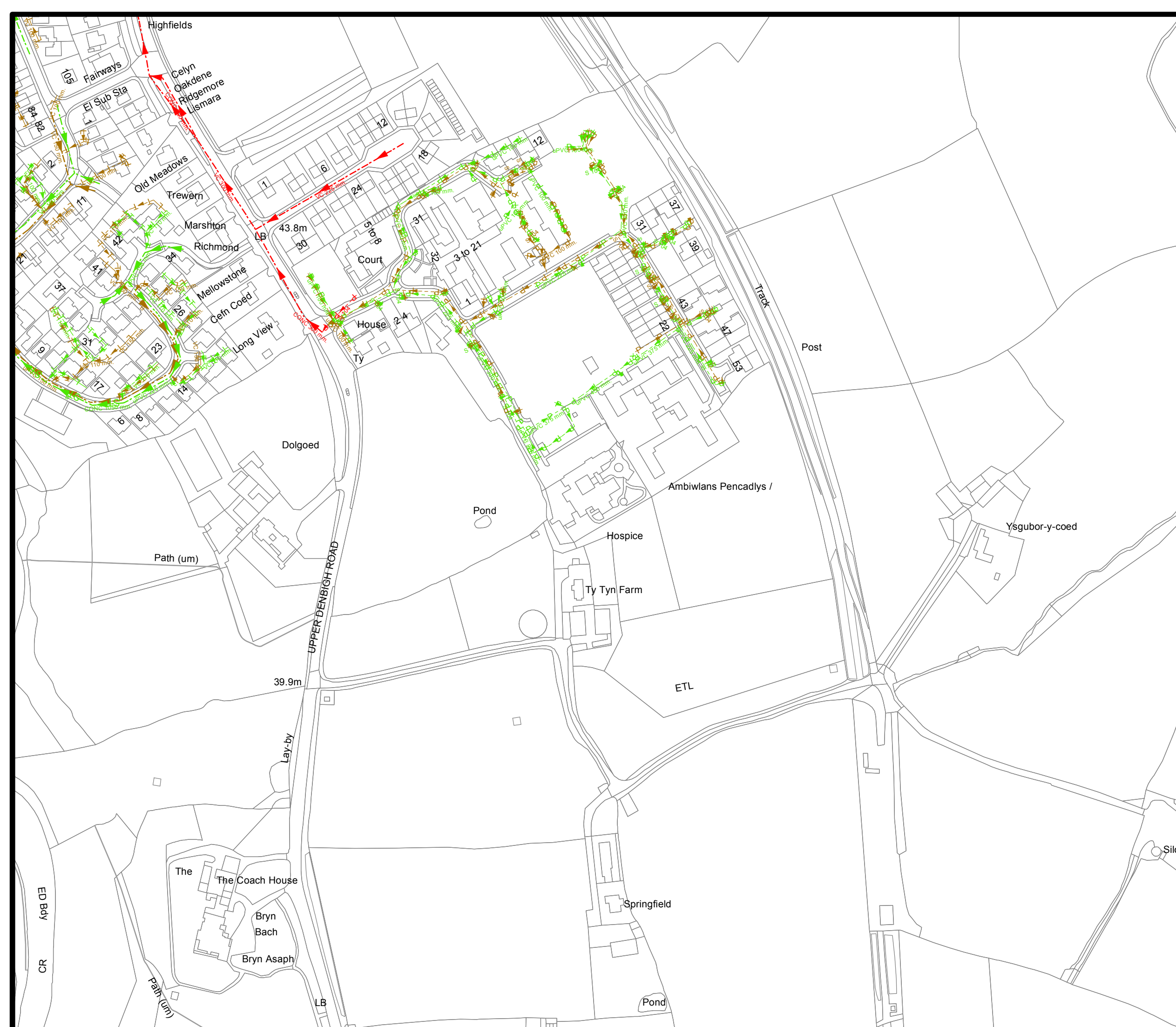
Dŵr Cymru Cyfyngedig ('the Company') gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus. The onus of locating apparatus before carrying out any excavations rests entirely on you. The information which is supplied by the Company, is done so in accordance with statutory requirements of sections 198 and 199 of the Water Industry Act 1991 which is based upon the best information available and, in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a water main, service pipe, sewer, lateral drain or disposal main and any associated apparatus laid before 1 September 1989, or, if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and 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 the Ordnance Survey on behalf of HMSO. © Crown copyright and database right 2017. All rights reserved. Ordnance Survey Licence number 100019534

Map Ref: 304430,373609
Map scale: 1:2500
Printed by: Emma John
Printed on: 29 Jun 2021



Andy Jones

From: Andy Jones
Sent: 20 September 2021 12:46
To: sewerage.services@dwrwymru.com
Subject: FCA Upper Denbigh Road, St Asaph
Attachments: 7866_L1.pdf

7866 Upper Denbigh Road, St Asaph FCA Historical Flood Information

To whom it may concern

We are undertaking a Flood Consequences Assessment and Drainage Strategy for the above site (see attached Site Location Plan) and request any information you may have in relation to historical flooding or any information you may consider relevant to assist with the production of the FCA 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
Senior Infrastructure Engineer
COOPERS
Park House, Sandpiper Court, Chester Business Park, Chester, CH4 9QU

☎: (01244) 684910 ☎: Direct Dial No. (01244) 684933
📠: (01244) 684911
✉: ajones@coopers.co.uk
Web: <http://www.coopers.co.uk>

Andy Jones

From: Andy Jones
Sent: 20 September 2021 12:47
To: yourvoice@denbighshire.gov.uk
Subject: FCA Upper Denbigh Road, St Asaph [Filed 20 Sep 2021 12:47]
Attachments: 7866_L1.pdf

7866 Upper Denbigh Road, St Asaph FCA Historical Flood Information

To whom it may concern

We are undertaking a Flood Consequences Assessment and Drainage Strategy for the above site (see attached Site Location Plan) and request any information you may have in relation to historical flooding or any information you may consider relevant to assist with the production of the FCA 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
Senior Infrastructure Engineer
COOPERS
Park House, Sandpiper Court, Chester Business Park, Chester, CH4 9QU

☎: (01244) 684910 ☎: Direct Dial No. (01244) 684933
☎: (01244) 684911
✉: ajones@coopers.co.uk
Web: <http://www.coopers.co.uk>

Andy Jones

From: Andy Jones
Sent: 20 September 2021 12:49
To: datadistribution@cyfoethnaturiolcymru.gov.uk
Subject: FCA Upper Denbigh Road, St Asaph [Filed 20 Sep 2021 12:49]
Attachments: 7866_L1.pdf

7866 Upper Denbigh Road, St Asaph FCA Historical Flood Information

To whom it may concern

We are undertaking a Flood Consequences Assessment and Drainage Strategy for the above site (see attached Site Location Plan) and request any information you may have in relation to historical flooding or any information you may consider relevant to assist with the production of the FCA 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
Senior Infrastructure Engineer
COOPERS
Park House, Sandpiper Court, Chester Business Park, Chester, CH4 9QU

☎: (01244) 684910 ☎: Direct Dial No. (01244) 684933
📠: (01244) 684911
✉: ajones@coopers.co.uk
Web: <http://www.coopers.co.uk>

Flood Consequences Assessment and Drainage Strategy
for Land off Upper Denbigh Road, St Aspah

Appendix 4

MicroDrainage Calculation

Source Control Greenfield Run-off Calculation

Preliminary Surface Water Design

Calculated by:

Site name:

Site location:

Site Details

Latitude:

Longitude:

Reference:

Date:

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.

Runoff estimation approach

Site characteristics

Total site area (ha):

Methodology

Q_{BAR} estimation method:

SPR estimation method:

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics

	Default	Edited
SAAR (mm):	725	725
Hydrological region:	9	9
Growth curve factor 1 year:	0.88	0.88
Growth curve factor 30 years:	1.78	1.78
Growth curve factor 100 years:	2.18	2.18
Growth curve factor 200 years:	2.46	2.46

Notes
(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q _{BAR} (l/s):	10.66	10.66
1 in 1 year (l/s):	9.38	9.38
1 in 30 years (l/s):	18.98	18.98
1 in 100 year (l/s):	23.25	23.25
1 in 200 years (l/s):	26.23	26.23

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at 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 www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of 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, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

Calculated by:

Site name:

Site location:

Site Details

Latitude:

Longitude:

Reference:

Date:

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.

Runoff estimation approach

Site characteristics

Total site area (ha):

Methodology

Q_{BAR} estimation method:

SPR estimation method:

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics

	Default	Edited
SAAR (mm):	725	725
Hydrological region:	9	9
Growth curve factor 1 year:	0.88	0.88
Growth curve factor 30 years:	1.78	1.78
Growth curve factor 100 years:	2.18	2.18
Growth curve factor 200 years:	2.46	2.46

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?


Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q _{BAR} (l/s):	13.88	13.88
1 in 1 year (l/s):	12.22	12.22
1 in 30 years (l/s):	24.71	24.71
1 in 100 year (l/s):	30.27	30.27
1 in 200 years (l/s):	34.15	34.15

Coopers		Page 1
Park House Sandpiper Court Chester CH4 9QU	Upper Denbigh Road, St Asaph DRAFT SW Design	
Date 15/09/2021 File 7866 SW01.MDX	Designed by Coopers Checked by AJ	
Micro Drainage	Network 2018.1.1	

STORM SEWER DESIGN by the Modified Rational Method
















Design Criteria for 7866 SW01.SWS

Pipe Sizes 7866 SW01 Manhole Sizes 7866 SW01

FSR Rainfall Model - England and Wales			
Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	17.000	Add Flow / Climate Change (%)	0
Ratio R	0.350	Minimum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	0	Maximum Backdrop Height (m)	0.000
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	400

Designed with Level Soffits

Network Design Table for 7866 SW01.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	30.736	0.375	82.0	0.084	5.00	0.0	0.600	o	300	Pipe/Conduit	
1.001	32.110	0.399	80.5	0.078	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.002	24.292	0.145	167.5	0.078	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.003	37.911	0.255	148.7	0.078	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.004	25.557	0.106	241.1	0.078	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.000	15.945	0.094	169.6	0.084	5.00	0.0	0.600	o	225	Pipe/Conduit	
2.001	31.421	0.218	144.1	0.078	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.005	67.048	0.326	205.7	0.078	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.006	15.767	0.105	150.2	0.078	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.007	15.163	0.101	150.1	0.078	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.008	13.882	0.093	149.3	0.078	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.009	17.523	0.117	149.8	0.078	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.010	10.136	0.068	149.1	0.078	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.011	22.664	0.151	150.1	0.078	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.012	13.667	0.091	150.2	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	0.00	5.29	45.500	0.084	0.0	0.0	0.0	1.74	122.9	0.0
1.001	0.00	5.60	45.125	0.162	0.0	0.0	0.0	1.75	124.0	0.0
1.002	0.00	5.89	44.651	0.240	0.0	0.0	0.0	1.40	154.3	0.0
1.003	0.00	6.32	44.506	0.318	0.0	0.0	0.0	1.48	163.9	0.0
1.004	0.00	6.68	44.251	0.396	0.0	0.0	0.0	1.16	128.4	0.0
2.000	0.00	5.27	46.187	0.084	0.0	0.0	0.0	1.00	39.8	0.0
2.001	0.00	5.75	46.093	0.162	0.0	0.0	0.0	1.09	43.2	0.0
1.005	0.00	7.57	44.145	0.636	0.0	0.0	0.0	1.26	139.1	0.0
1.006	0.00	7.73	43.819	0.714	0.0	0.0	0.0	1.66	263.5	0.0
1.007	0.00	7.88	43.714	0.792	0.0	0.0	0.0	1.66	263.5	0.0
1.008	0.00	8.02	43.613	0.870	0.0	0.0	0.0	1.66	264.3	0.0
1.009	0.00	8.20	43.520	0.948	0.0	0.0	0.0	1.66	263.9	0.0
1.010	0.00	8.30	43.403	1.026	0.0	0.0	0.0	1.66	264.5	0.0
1.011	0.00	8.52	43.335	1.104	0.0	0.0	0.0	1.66	263.6	0.0
1.012	0.00	8.66	43.184	1.104	0.0	0.0	0.0	1.66	263.5	0.0



Network Design Table for 7866 SW01.SWS

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section	Type	Auto Design
1.013	29.036	0.710	40.9	0.078	0.00	0.0	0.600	o	450	Pipe/Conduit		
3.000	14.160	0.083	170.6	0.084	5.00	0.0	0.600	o	300	Pipe/Conduit		
3.001	19.369	0.116	167.3	0.078	0.00	0.0	0.600	o	300	Pipe/Conduit		
3.002	17.616	0.105	167.1	0.078	0.00	0.0	0.600	o	300	Pipe/Conduit		
3.003	20.499	0.800	25.6	0.078	0.00	0.0	0.600	o	300	Pipe/Conduit		
3.004	27.938	0.116	241.9	0.078	0.00	0.0	0.600	o	300	Pipe/Conduit		
3.005	18.637	0.077	241.9	0.078	0.00	0.0	0.600	o	300	Pipe/Conduit		
1.014	45.715	1.876	24.4	0.078	0.00	0.0	0.600	o	450	Pipe/Conduit		
4.000	7.126	0.042	169.7	0.084	5.00	0.0	0.600	o	225	Pipe/Conduit		
4.001	15.695	0.093	169.7	0.078	0.00	0.0	0.600	o	225	Pipe/Conduit		
4.002	12.372	0.158	78.3	0.078	0.00	0.0	0.600	o	300	Pipe/Conduit		
4.003	45.308	1.079	42.0	0.078	0.00	0.0	0.600	o	300	Pipe/Conduit		
4.004	16.773	0.070	239.6	0.078	0.00	0.0	0.600	o	375	Pipe/Conduit		
1.015	15.379	0.042	366.2	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit		
1.016	72.858	0.364	200.2	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit		
1.017	12.111	0.733	16.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
1.018	56.795	0.777	73.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
1.019	52.602	0.323	162.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		
1.020	21.416	0.641	33.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit		

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.013	0.00	8.81	43.093	1.182	0.0	0.0	0.0	3.19	506.8	0.0
3.000	0.00	5.20	43.831	0.084	0.0	0.0	0.0	1.20	84.9	0.0
3.001	0.00	5.46	43.748	0.162	0.0	0.0	0.0	1.21	85.7	0.0
3.002	0.00	5.70	43.632	0.240	0.0	0.0	0.0	1.21	85.8	0.0
3.003	0.00	5.81	43.527	0.318	0.0	0.0	0.0	3.12	220.4	0.0
3.004	0.00	6.28	42.727	0.396	0.0	0.0	0.0	1.01	71.1	0.0
3.005	0.00	6.59	42.611	0.474	0.0	0.0	0.0	1.01	71.1	0.0
1.014	0.00	9.00	42.383	1.734	0.0	0.0	0.0	4.13	657.2	0.0
4.000	0.00	5.12	42.175	0.084	0.0	0.0	0.0	1.00	39.8	0.0
4.001	0.00	5.38	42.133	0.162	0.0	0.0	0.0	1.00	39.8	0.0
4.002	0.00	5.50	41.966	0.240	0.0	0.0	0.0	1.78	125.7	0.0
4.003	0.00	5.81	41.808	0.318	0.0	0.0	0.0	2.43	172.0	0.0
4.004	0.00	6.05	40.654	0.396	0.0	0.0	0.0	1.17	128.8	0.0
1.015	0.00	9.22	40.434	2.130	0.0	0.0	0.0	1.16	252.1	0.0
1.016	0.00	9.99	39.500	2.130	0.0	0.0	0.0	1.58	341.9	0.0
1.017	0.00	10.05	39.136	2.130	0.0	0.0	0.0	3.24	128.6	0.0
1.018	0.00	10.67	38.403	2.130	0.0	0.0	0.0	1.53	60.9	0.0
1.019	0.00	11.53	37.626	2.130	0.0	0.0	0.0	1.02	40.6	0.0
1.020	0.00	11.68	37.303	2.130	0.0	0.0	0.0	2.27	90.3	0.0

Park House
Sandpiper Court
Chester CH4 9QU

Upper Denbigh Road, St Asaph
DRAFT
SW Design



Date 15/09/2021
File 7866 SW01.MDX

Designed by Coopers
Checked by AJ

Micro Drainage

Network 2018.1.1

Manhole Schedules for 7866 SW01.SWS

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., I*W (mm)	Pipe Out			Pipes In			Backdrop (mm)
					PN	Invert Level (m)	Diameter (mm)	PN	Invert Level (m)	Diameter (mm)	
1	47.417	1.917	Open Manhole	1500	1.000	45.500	300				
2	47.042	1.917	Open Manhole	1500	1.001	45.125	300	1.000	45.125	300	
3	46.643	1.992	Open Manhole	1500	1.002	44.651	375	1.001	44.726	300	
4	46.623	2.117	Open Manhole	1500	1.003	44.506	375	1.002	44.506	375	
5	46.986	2.735	Open Manhole	1500	1.004	44.251	375	1.003	44.251	375	
6	47.612	1.425	Open Manhole	1500	2.000	46.187	225				
7	47.574	1.481	Open Manhole	1500	2.001	46.093	225	2.000	46.093	225	
8	47.300	3.155	Open Manhole	1500	1.005	44.145	375	1.004	44.145	375	
								2.001	45.875	225	1580
9	48.143	4.324	Open Manhole	1500	1.006	43.819	450	1.005	43.819	375	
10	48.332	4.618	Open Manhole	1500	1.007	43.714	450	1.006	43.714	450	
11	48.369	4.756	Open Manhole	1500	1.008	43.613	450	1.007	43.613	450	
12	48.176	4.656	Open Manhole	1500	1.009	43.520	450	1.008	43.520	450	
13	47.731	4.328	Open Manhole	1500	1.010	43.403	450	1.009	43.403	450	
14	47.460	4.125	Open Manhole	1500	1.011	43.335	450	1.010	43.335	450	
15	46.831	3.647	Open Manhole	1500	1.012	43.184	450	1.011	43.184	450	
16	46.306	3.213	Open Manhole	1500	1.013	43.093	450	1.012	43.093	450	
17	45.256	1.425	Open Manhole	1500	3.000	43.831	300				
18	45.669	1.921	Open Manhole	1200	3.001	43.748	300	3.000	43.748	300	
19	45.822	2.190	Open Manhole	1200	3.002	43.632	300	3.001	43.632	300	
20	45.687	2.160	Open Manhole	1200	3.003	43.527	300	3.002	43.527	300	
21	45.428	2.701	Open Manhole	1200	3.004	42.727	300	3.003	42.727	300	
22	45.122	2.511	Open Manhole	1200	3.005	42.611	300	3.004	42.611	300	
23	45.184	2.801	Open Manhole	1500	1.014	42.383	450	1.013	42.383	450	
								3.005	42.534	300	1
24	43.600	1.425	Open Manhole	1500	4.000	42.175	225				
25	43.950	1.817	Open Manhole	1200	4.001	42.133	225	4.000	42.133	225	
26	43.672	1.706	Open Manhole	1500	4.002	41.966	300	4.001	42.041	225	
27	43.307	1.499	Open Manhole	1500	4.003	41.808	300	4.002	41.808	300	
28	42.228	1.574	Open Manhole	1500	4.004	40.654	375	4.003	40.729	300	
29	42.336	1.902	Open Manhole	1800	1.015	40.434	525	1.014	40.507	450	
								4.004	40.584	375	
30	41.984	2.484	Junction		1.016	39.500	525	1.015	40.392	525	892
31	41.089	1.953	Open Manhole	2400	1.017	39.136	225	1.016	39.136	525	
32	39.828	1.425	Open Manhole	1200	1.018	38.403	225	1.017	38.403	225	
33	39.051	1.425	Open Manhole	1200	1.019	37.626	225	1.018	37.626	225	
34	38.728	1.426	Open Manhole	1200	1.020	37.303	225	1.019	37.303	225	
35	38.087	1.425	Open Manhole	0		OUTFALL		1.020	36.662	225	

PIPELINE SCHEDULES for 7866 SW01.SWS

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	300	1	47.417	45.500	1.617	Open Manhole	1500
1.001	o	300	2	47.042	45.125	1.617	Open Manhole	1500
1.002	o	375	3	46.643	44.651	1.617	Open Manhole	1500
1.003	o	375	4	46.623	44.506	1.742	Open Manhole	1500
1.004	o	375	5	46.986	44.251	2.360	Open Manhole	1500
2.000	o	225	6	47.612	46.187	1.200	Open Manhole	1500
2.001	o	225	7	47.574	46.093	1.256	Open Manhole	1500
1.005	o	375	8	47.300	44.145	2.780	Open Manhole	1500
1.006	o	450	9	48.143	43.819	3.874	Open Manhole	1500
1.007	o	450	10	48.332	43.714	4.168	Open Manhole	1500
1.008	o	450	11	48.369	43.613	4.306	Open Manhole	1500
1.009	o	450	12	48.176	43.520	4.206	Open Manhole	1500
1.010	o	450	13	47.731	43.403	3.878	Open Manhole	1500
1.011	o	450	14	47.460	43.335	3.675	Open Manhole	1500
1.012	o	450	15	46.831	43.184	3.197	Open Manhole	1500
1.013	o	450	16	46.306	43.093	2.763	Open Manhole	1500
3.000	o	300	17	45.256	43.831	1.125	Open Manhole	1500
3.001	o	300	18	45.669	43.748	1.621	Open Manhole	1200
3.002	o	300	19	45.822	43.632	1.890	Open Manhole	1200
3.003	o	300	20	45.687	43.527	1.860	Open Manhole	1200
3.004	o	300	21	45.428	42.727	2.401	Open Manhole	1200
3.005	o	300	22	45.122	42.611	2.211	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	30.736	82.0	2	47.042	45.125	1.617	Open Manhole	1500
1.001	32.110	80.5	3	46.643	44.726	1.617	Open Manhole	1500
1.002	24.292	167.5	4	46.623	44.506	1.742	Open Manhole	1500
1.003	37.911	148.7	5	46.986	44.251	2.360	Open Manhole	1500
1.004	25.557	241.1	8	47.300	44.145	2.780	Open Manhole	1500
2.000	15.945	169.6	7	47.574	46.093	1.256	Open Manhole	1500
2.001	31.421	144.1	8	47.300	45.875	1.200	Open Manhole	1500
1.005	67.048	205.7	9	48.143	43.819	3.949	Open Manhole	1500
1.006	15.767	150.2	10	48.332	43.714	4.168	Open Manhole	1500
1.007	15.163	150.1	11	48.369	43.613	4.306	Open Manhole	1500
1.008	13.882	149.3	12	48.176	43.520	4.206	Open Manhole	1500
1.009	17.523	149.8	13	47.731	43.403	3.878	Open Manhole	1500
1.010	10.136	149.1	14	47.460	43.335	3.675	Open Manhole	1500
1.011	22.664	150.1	15	46.831	43.184	3.197	Open Manhole	1500
1.012	13.667	150.2	16	46.306	43.093	2.763	Open Manhole	1500
1.013	29.036	40.9	23	45.184	42.383	2.351	Open Manhole	1500
3.000	14.160	170.6	18	45.669	43.748	1.621	Open Manhole	1200
3.001	19.369	167.3	19	45.822	43.632	1.890	Open Manhole	1200
3.002	17.616	167.1	20	45.687	43.527	1.860	Open Manhole	1200
3.003	20.499	25.6	21	45.428	42.727	2.401	Open Manhole	1200
3.004	27.938	241.9	22	45.122	42.611	2.211	Open Manhole	1200
3.005	18.637	241.9	23	45.184	42.534	2.350	Open Manhole	1500



PIPELINE SCHEDULES for 7866 SW01.SWS

Upstream Manhole


PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.014	o	450	23	45.184	42.383	2.351	Open Manhole	1500
4.000	o	225	24	43.600	42.175	1.200	Open Manhole	1500
4.001	o	225	25	43.950	42.133	1.592	Open Manhole	1200
4.002	o	300	26	43.672	41.966	1.406	Open Manhole	1500
4.003	o	300	27	43.307	41.808	1.199	Open Manhole	1500
4.004	o	375	28	42.228	40.654	1.199	Open Manhole	1500
1.015	o	525	29	42.336	40.434	1.377	Open Manhole	1800
1.016	o	525	30	41.984	39.500	1.959	Junction	
1.017	o	225	31	41.089	39.136	1.728	Open Manhole	2400
1.018	o	225	32	39.828	38.403	1.200	Open Manhole	1200
1.019	o	225	33	39.051	37.626	1.200	Open Manhole	1200
1.020	o	225	34	38.728	37.303	1.201	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.014	45.715	24.4	29	42.336	40.507	1.379	Open Manhole	1800
4.000	7.126	169.7	25	43.950	42.133	1.592	Open Manhole	1200
4.001	15.695	169.7	26	43.672	42.041	1.407	Open Manhole	1500
4.002	12.372	78.3	27	43.307	41.808	1.199	Open Manhole	1500
4.003	45.308	42.0	28	42.228	40.729	1.199	Open Manhole	1500
4.004	16.773	239.6	29	42.336	40.584	1.377	Open Manhole	1800
1.015	15.379	366.2	30	41.984	40.392	1.067	Junction	
1.016	72.858	200.2	31	41.089	39.136	1.428	Open Manhole	2400
1.017	12.111	16.5	32	39.828	38.403	1.200	Open Manhole	1200
1.018	56.795	73.1	33	39.051	37.626	1.200	Open Manhole	1200
1.019	52.602	162.9	34	38.728	37.303	1.201	Open Manhole	1200
1.020	21.416	33.4	35	38.087	36.662	1.200	Open Manhole	0

Free Flowing Outfall Details for 7866 SW01.SWS

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.020	35	38.087	36.662	0.000	0	0

Coopers		Page 6
Park House Sandpiper Court Chester CH4 9QU	Upper Denbigh Road, St Asaph DRAFT SW Design	
Date 15/09/2021 File 7866 SW01.MDX	Designed by Coopers Checked by AJ	
Micro Drainage	Network 2018.1.1	


Simulation Criteria for 7866 SW01.SWS

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	17.000	Storm Duration (mins)	30
Ratio R	0.350		

Coopers		Page 7
Park House Sandpiper Court Chester CH4 9QU	Upper Denbigh Road, St Asaph DRAFT SW Design	
Date 15/09/2021 File 7866 SW01.MDX	Designed by Coopers Checked by AJ	
Micro Drainage	Network 2018.1.1	

Online Controls for 7866 SW01.SWS


Hydro-Brake® Optimum Manhole: 31, DS/PN: 1.017, Volume (m³): 24.3

Unit Reference	MD-SHE-0164-1350-1200-1350
Design Head (m)	1.200
Design Flow (l/s)	13.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	164
Invert Level (m)	39.136
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	13.5	Kick-Flo®	0.796	11.1
Flush-Flo™	0.360	13.5	Mean Flow over Head Range	-	11.6

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.9	0.800	11.2	2.000	17.2	4.000	24.0	7.000	31.4
0.200	12.7	1.000	12.4	2.200	18.0	4.500	25.4	7.500	32.4
0.300	13.4	1.200	13.5	2.400	18.8	5.000	26.7	8.000	33.5
0.400	13.5	1.400	14.5	2.600	19.5	5.500	27.9	8.500	34.5
0.500	13.3	1.600	15.5	3.000	20.9	6.000	29.1	9.000	35.4
0.600	12.9	1.800	16.4	3.500	22.5	6.500	30.3	9.500	36.4


Coopers		Page 8
Park House Sandpiper Court Chester CH4 9QU	Upper Denbigh Road, St Asaph DRAFT SW Design	
Date 15/09/2021 File 7866 SW01.MDX	Designed by Coopers Checked by AJ	
Micro Drainage	Network 2018.1.1	

Storage Structures for 7866 SW01.SWS

Tank or Pond Manhole: 31, DS/PN: 1.017

Invert Level (m) 39.136

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	670.0	1.200	1240.0	2.400	0.0	3.600	0.0	4.800	0.0
0.200	760.0	1.400	1350.0	2.600	0.0	3.800	0.0	5.000	0.0
0.400	850.0	1.401	0.0	2.800	0.0	4.000	0.0		
0.600	940.0	1.800	0.0	3.000	0.0	4.200	0.0		
0.800	1040.0	2.000	0.0	3.200	0.0	4.400	0.0		
1.000	1140.0	2.200	0.0	3.400	0.0	4.600	0.0		

Coopers		Page 9
Park House Sandpiper Court Chester CH4 9QU	Upper Denbigh Road, St Asaph DRAFT SW Design	
Date 15/09/2021 File 7866 SW01.MDX	Designed by Coopers Checked by AJ	
Micro Drainage		Network 2018.1.1

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7866 SW01.SWS

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 17.000 Cv (Summer) 0.750
Region England and Wales Ratio R 0.350 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years) 1, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)
1.000	1	15 Winter	1	+0%	100/15 Summer				45.559	-0.241	0.000
1.001	2	15 Winter	1	+0%	100/15 Summer				45.202	-0.223	0.000
1.002	3	15 Winter	1	+0%	100/15 Summer				44.759	-0.267	0.000
1.003	4	15 Winter	1	+0%	100/15 Summer				44.622	-0.259	0.000
1.004	5	15 Winter	1	+0%	30/15 Summer				44.402	-0.224	0.000
2.000	6	15 Winter	1	+0%	100/15 Summer				46.266	-0.146	0.000
2.001	7	15 Winter	1	+0%	30/15 Winter				46.194	-0.124	0.000
1.005	8	15 Winter	1	+0%	30/15 Summer				44.324	-0.196	0.000
1.006	9	15 Winter	1	+0%	30/15 Summer				44.004	-0.265	0.000
1.007	10	15 Winter	1	+0%	30/15 Summer				43.910	-0.254	0.000
1.008	11	15 Winter	1	+0%	30/15 Summer				43.823	-0.240	0.000
1.009	12	15 Winter	1	+0%	30/15 Summer				43.724	-0.246	0.000
1.010	13	15 Winter	1	+0%	30/15 Summer				43.632	-0.221	0.000
1.011	14	15 Winter	1	+0%	30/15 Winter				43.539	-0.246	0.000
1.012	15	15 Winter	1	+0%	30/15 Summer				43.420	-0.214	0.000
1.013	16	15 Winter	1	+0%	100/15 Winter				43.237	-0.306	0.000
3.000	17	15 Winter	1	+0%	100/15 Summer				43.904	-0.227	0.000
3.001	18	15 Winter	1	+0%	100/15 Summer				43.845	-0.203	0.000
3.002	19	15 Winter	1	+0%	100/15 Summer				43.750	-0.182	0.000
3.003	20	15 Winter	1	+0%	100/15 Summer				43.607	-0.219	0.000
3.004	21	15 Winter	1	+0%	30/15 Summer				42.895	-0.132	0.000
3.005	22	15 Winter	1	+0%	30/15 Summer				42.802	-0.109	0.000
1.014	23	15 Winter	1	+0%	100/15 Summer				42.532	-0.301	0.000
4.000	24	15 Winter	1	+0%	30/15 Summer				42.265	-0.135	0.000
4.001	25	15 Winter	1	+0%	30/15 Summer				42.243	-0.115	0.000
4.002	26	15 Winter	1	+0%	100/15 Summer				42.066	-0.200	0.000
4.003	27	15 Winter	1	+0%	100/15 Summer				41.898	-0.210	0.000
4.004	28	15 Winter	1	+0%	30/15 Summer				40.907	-0.122	0.000

Coopers		Page 10
Park House Sandpiper Court Chester CH4 9QU	Upper Denbigh Road, St Asaph DRAFT SW Design	
Date 15/09/2021 File 7866 SW01.MDX	Designed by Coopers Checked by AJ	
Micro Drainage	Network 2018.1.1	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7866 SW01.SWS

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	0.08		9.3	OK	
1.001	2	0.15		16.8	OK	
1.002	3	0.18		24.1	OK	
1.003	4	0.21		30.9	OK	
1.004	5	0.34		37.6	OK	
2.000	6	0.26		9.3	OK	
2.001	7	0.42		16.8	OK	
1.005	8	0.45		58.8	OK	
1.006	9	0.35		64.6	OK	
1.007	10	0.39		70.2	OK	
1.008	11	0.44		75.4	OK	
1.009	12	0.42		81.2	OK	
1.010	13	0.51		86.7	OK	
1.011	14	0.42		91.9	OK	
1.012	15	0.54		91.5	OK	
1.013	16	0.22		96.2	OK	
3.000	17	0.13		9.4	OK	
3.001	18	0.23		16.8	OK	
3.002	19	0.33		24.1	OK	
3.003	20	0.16		31.3	OK	
3.004	21	0.59		38.0	OK	
3.005	22	0.73		44.9	OK	
1.014	23	0.24		141.8	OK	
4.000	24	0.31		9.3	OK	
4.001	25	0.48		16.7	OK	
4.002	26	0.24		24.1	OK	
4.003	27	0.20		31.4	OK	
4.004	28	0.35		36.8	OK	

Coopers		Page 11
Park House Sandpiper Court Chester CH4 9QU		Upper Denbigh Road, St Asaph DRAFT SW Design
Date 15/09/2021 File 7866 SW01.MDX		Designed by Coopers Checked by AJ
Micro Drainage		Network 2018.1.1



1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7866 SW01.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)
1.015	29	15 Winter	1	+0%	30/15 Summer				40.873	-0.086	0.000
1.016	30	15 Winter	1	+0%	30/15 Summer				39.762	-0.263	0.000
1.017	31	360 Winter	1	+0%	1/120 Summer				39.416	0.056	0.000
1.018	32	360 Winter	1	+0%					38.473	-0.155	0.000
1.019	33	360 Winter	1	+0%					37.713	-0.138	0.000
1.020	34	360 Winter	1	+0%					37.361	-0.167	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.015	29	1.00		170.5	OK	
1.016	30	0.50		170.4	OK*	
1.017	31	0.11		12.6	SURCHARGED	
1.018	32	0.21		12.6	OK	
1.019	33	0.32		12.6	OK	
1.020	34	0.15		12.6	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7866 SW01.SWS

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 17.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.350 Cv (Winter) 0.840

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


Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)
1.000	1 15	Winter	30	+0%	100/15	Summer			45.593	-0.207	0.000
1.001	2 15	Winter	30	+0%	100/15	Summer			45.258	-0.167	0.000
1.002	3 15	Winter	30	+0%	100/15	Summer			44.862	-0.164	0.000
1.003	4 15	Winter	30	+0%	100/15	Summer			44.815	-0.066	0.000
1.004	5 15	Winter	30	+0%	30/15	Summer			44.750	0.124	0.000
2.000	6 15	Winter	30	+0%	100/15	Summer			46.369	-0.043	0.000
2.001	7 15	Winter	30	+0%	30/15	Winter			46.327	0.009	0.000
1.005	8 15	Winter	30	+0%	30/15	Summer			44.666	0.146	0.000
1.006	9 15	Winter	30	+0%	30/15	Summer			44.363	0.094	0.000
1.007	10 15	Winter	30	+0%	30/15	Summer			44.245	0.081	0.000
1.008	11 15	Winter	30	+0%	30/15	Summer			44.116	0.053	0.000
1.009	12 15	Winter	30	+0%	30/15	Summer			44.006	0.036	0.000
1.010	13 15	Winter	30	+0%	30/15	Summer			43.888	0.035	0.000
1.011	14 15	Winter	30	+0%	30/15	Winter			43.785	0.000	0.000
1.012	15 15	Winter	30	+0%	30/15	Summer			43.652	0.018	0.000
1.013	16 15	Winter	30	+0%	100/15	Winter			43.319	-0.224	0.000
3.000	17 15	Winter	30	+0%	100/15	Summer			43.957	-0.174	0.000
3.001	18 15	Winter	30	+0%	100/15	Summer			43.920	-0.128	0.000
3.002	19 15	Winter	30	+0%	100/15	Summer			43.859	-0.073	0.000
3.003	20 15	Winter	30	+0%	100/15	Summer			43.671	-0.155	0.000
3.004	21 15	Winter	30	+0%	30/15	Summer			43.453	0.426	0.000
3.005	22 15	Winter	30	+0%	30/15	Summer			43.142	0.231	0.000
1.014	23 15	Winter	30	+0%	100/15	Summer			42.636	-0.197	0.000
4.000	24 15	Winter	30	+0%	30/15	Summer			42.462	0.062	0.000
4.001	25 15	Winter	30	+0%	30/15	Summer			42.404	0.046	0.000
4.002	26 15	Winter	30	+0%	100/15	Summer			42.146	-0.120	0.000
4.003	27 15	Winter	30	+0%	100/15	Summer			41.966	-0.142	0.000
4.004	28 15	Winter	30	+0%	30/15	Summer			41.314	0.285	0.000

Coopers		Page 13
Park House Sandpiper Court Chester CH4 9QU	Upper Denbigh Road, St Asaph DRAFT SW Design	
Date 15/09/2021 File 7866 SW01.MDX	Designed by Coopers Checked by AJ	
Micro Drainage	Network 2018.1.1	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7866 SW01.SWS

PN	US/MH Name	Flow / Cap.	Overflow (1/s)	Pipe Flow (1/s)	Status	Level Exceeded
1.000	1	0.20		22.8	OK	
1.001	2	0.40		44.8	OK	
1.002	3	0.50		66.1	OK	
1.003	4	0.56		83.7	OK	
1.004	5	0.79		87.6	SURCHARGED	
2.000	6	0.63		22.1	OK	
2.001	7	1.03		41.7	SURCHARGED	
1.005	8	1.05		137.7	SURCHARGED	
1.006	9	0.78		142.6	SURCHARGED	
1.007	10	0.84		151.3	SURCHARGED	
1.008	11	0.94		161.3	SURCHARGED	
1.009	12	0.89		172.0	SURCHARGED	
1.010	13	1.07		181.3	SURCHARGED	
1.011	14	0.88		191.7	SURCHARGED	
1.012	15	1.14		193.9	SURCHARGED	
1.013	16	0.49		212.1	OK	
3.000	17	0.33		22.9	OK	
3.001	18	0.60		44.9	OK	
3.002	19	0.90		66.3	OK	
3.003	20	0.45		87.4	OK	
3.004	21	1.64		105.2	SURCHARGED	
3.005	22	1.99		122.5	SURCHARGED	
1.014	23	0.59		351.5	OK	
4.000	24	0.77		22.9	SURCHARGED	
4.001	25	1.24		43.5	SURCHARGED	
4.002	26	0.64		64.1	OK	
4.003	27	0.53		85.2	OK	
4.004	28	0.97		101.8	SURCHARGED	

Coopers		Page 14
Park House Sandpiper Court Chester CH4 9QU	Upper Denbigh Road, St Asaph DRAFT SW Design	
Date 15/09/2021 File 7866 SW01.MDX	Designed by Coopers Checked by AJ	
Micro Drainage	Network 2018.1.1	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7866 SW01.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)
1.015	29	15 Winter	30	+0%	30/15 Summer				41.230	0.271	0.000
1.016	30	15 Winter	30	+0%	30/15 Summer				40.253	0.228	0.000
1.017	31	360 Winter	30	+0%	1/120 Summer				39.823	0.463	0.000
1.018	32	1440 Winter	30	+0%					38.475	-0.153	0.000
1.019	33	1440 Summer	30	+0%					37.716	-0.135	0.000
1.020	34	1440 Summer	30	+0%					37.363	-0.165	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.015	29	2.62		447.2	SURCHARGED	
1.016	30	1.28		437.5	SURCHARGED*	
1.017	31	0.12		13.3	SURCHARGED	
1.018	32	0.23		13.3	OK	
1.019	33	0.34		13.3	OK	
1.020	34	0.16		13.3	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7866 SW01.SWS

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 17.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.350 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged	Flooded
									Level (m)	Depth (m)	Volume (m ³)
1.000	1 15	Winter	100	+40%	100/15	Summer			46.588	0.788	0.000
1.001	2 15	Winter	100	+40%	100/15	Summer			46.531	1.106	0.000
1.002	3 15	Winter	100	+40%	100/15	Summer			46.385	1.359	0.000
1.003	4 15	Winter	100	+40%	100/15	Summer			46.269	1.388	0.000
1.004	5 15	Winter	100	+40%	30/15	Summer			46.142	1.516	0.000
2.000	6 15	Winter	100	+40%	100/15	Summer			46.899	0.487	0.000
2.001	7 15	Winter	100	+40%	30/15	Winter			46.788	0.470	0.000
1.005	8 15	Winter	100	+40%	30/15	Summer			46.044	1.524	0.000
1.006	9 15	Winter	100	+40%	30/15	Summer			45.377	1.108	0.000
1.007	10 15	Winter	100	+40%	30/15	Summer			45.243	1.079	0.000
1.008	11 15	Winter	100	+40%	30/15	Summer			45.071	1.008	0.000
1.009	12 15	Winter	100	+40%	30/15	Summer			44.873	0.903	0.000
1.010	13 15	Winter	100	+40%	30/15	Summer			44.636	0.783	0.000
1.011	14 15	Winter	100	+40%	30/15	Winter			44.352	0.567	0.000
1.012	15 15	Winter	100	+40%	30/15	Summer			44.016	0.382	0.000
1.013	16 15	Winter	100	+40%	100/15	Winter			43.688	0.145	0.000
3.000	17 15	Winter	100	+40%	100/15	Summer			44.926	0.795	0.000
3.001	18 15	Winter	100	+40%	100/15	Summer			44.845	0.797	0.000
3.002	19 15	Winter	100	+40%	100/15	Summer			44.758	0.825	0.000
3.003	20 15	Winter	100	+40%	100/15	Summer			44.606	0.779	0.000
3.004	21 15	Winter	100	+40%	30/15	Summer			44.316	1.289	0.000
3.005	22 15	Winter	100	+40%	30/15	Summer			43.788	0.877	0.000
1.014	23 15	Winter	100	+40%	100/15	Summer			43.241	0.408	0.000
4.000	24 15	Winter	100	+40%	30/15	Summer			43.029	0.629	0.000
4.001	25 15	Winter	100	+40%	30/15	Summer			42.969	0.611	0.000
4.002	26 15	Winter	100	+40%	100/15	Summer			42.634	0.368	0.000
4.003	27 15	Winter	100	+40%	100/15	Summer			42.481	0.373	0.000
4.004	28 15	Winter	100	+40%	30/15	Summer			41.863	0.834	0.000

Coopers		Page 16
Park House Sandpiper Court Chester CH4 9QU	Upper Denhigh Road, St Asaph DRAFT SW Design	
Date 15/09/2021 File 7866 SW01.MDX	Designed by Coopers Checked by AJ	
Micro Drainage	Network 2018.1.1	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7866 SW01.SWS

PN	US/MH Name	Flow / Cap.	Overflow (1/s)	Pipe Flow (1/s)	Status	Level Exceeded
1.000	1	0.33		36.9	SURCHARGED	
1.001	2	0.62		70.6	SURCHARGED	
1.002	3	0.60		79.6	FLOOD RISK	
1.003	4	0.62		91.3	SURCHARGED	
1.004	5	1.00		111.7	SURCHARGED	
2.000	6	1.10		38.6	SURCHARGED	
2.001	7	1.76		71.0	SURCHARGED	
1.005	8	1.46		191.1	SURCHARGED	
1.006	9	1.16		211.0	SURCHARGED	
1.007	10	1.29		230.5	SURCHARGED	
1.008	11	1.49		256.3	SURCHARGED	
1.009	12	1.46		282.1	SURCHARGED	
1.010	13	1.82		307.5	SURCHARGED	
1.011	14	1.53		332.4	SURCHARGED	
1.012	15	1.94		330.2	SURCHARGED	
1.013	16	0.79		343.6	SURCHARGED	
3.000	17	0.46		32.1	SURCHARGED	
3.001	18	0.79		59.1	SURCHARGED	
3.002	19	1.21		88.6	SURCHARGED	
3.003	20	0.62		118.7	SURCHARGED	
3.004	21	2.30		147.5	SURCHARGED	
3.005	22	2.88		177.3	SURCHARGED	
1.014	23	0.89		527.1	SURCHARGED	
4.000	24	1.21		36.2	SURCHARGED	
4.001	25	1.92		67.5	SURCHARGED	
4.002	26	0.97		97.0	SURCHARGED	
4.003	27	0.80		128.3	SURCHARGED	
4.004	28	1.48		155.8	SURCHARGED	

Coopers		Page 17
Park House Sandpiper Court Chester CH4 9QU		Upper Denbigh Road, St Asaph DRAFT SW Design
Date 15/09/2021 File 7866 SW01.MDX		Designed by Coopers Checked by AJ
Micro Drainage		Network 2018.1.1



100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for 7866 SW01.SWS

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)
1.015	29	15 Winter	100	+40%	30/15 Summer				41.741	0.782	0.000
1.016	30	15 Winter	100	+40%	30/15 Summer				40.917	0.892	0.000
1.017	31	600 Winter	100	+40%	1/120 Summer				40.397	1.036	0.000
1.018	32	600 Winter	100	+40%					38.476	-0.151	0.000
1.019	33	600 Winter	100	+40%					37.718	-0.133	0.000
1.020	34	600 Winter	100	+40%					37.364	-0.163	0.000

PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.015	29	3.88		662.4	SURCHARGED	
1.016	30	1.92		657.8	SURCHARGED*	
1.017	31	0.13		13.8	SURCHARGED	
1.018	32	0.24		13.8	OK	
1.019	33	0.35		13.8	OK	
1.020	34	0.17		13.8	OK	