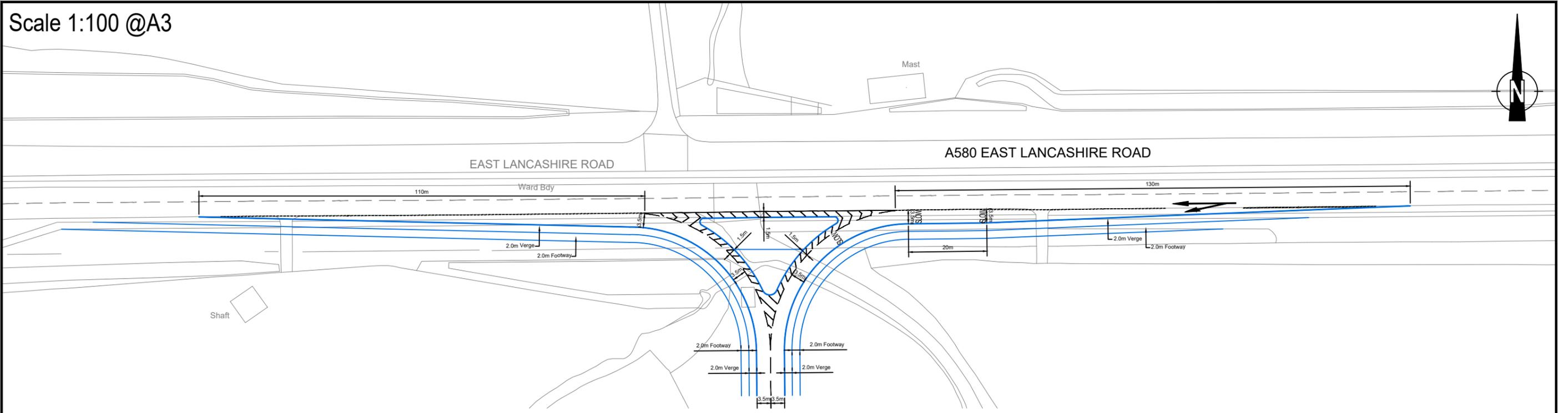


Plan 3

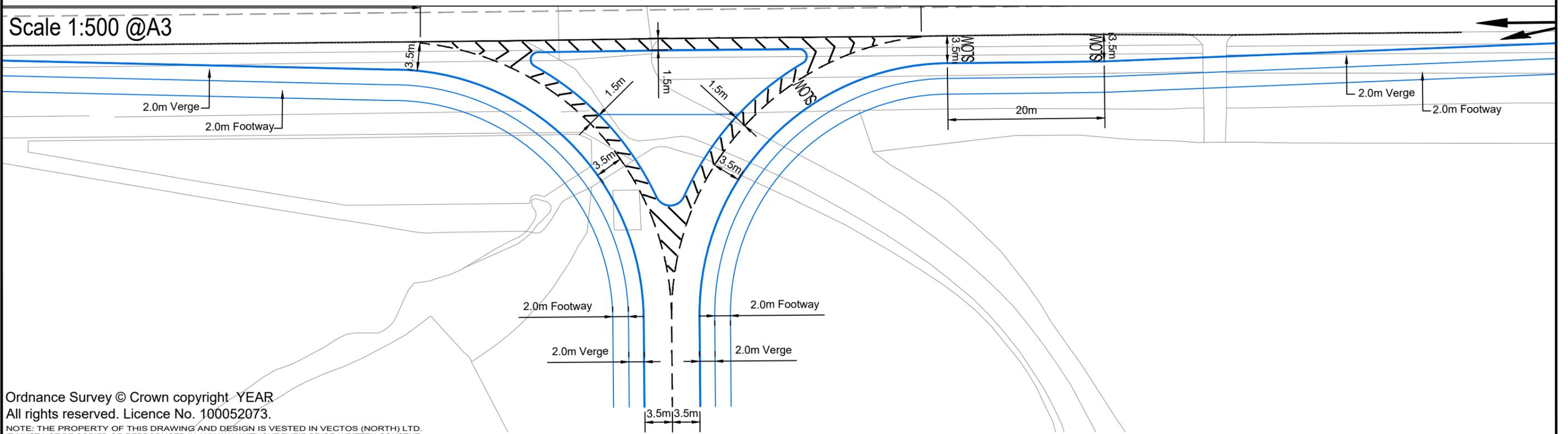
Proposed Site Access off A580

Scale 1:100 @A3



432

Scale 1:500 @A3



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REV.	DETAILS	DRAWN	CHECKED	DATE

Notes:

1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.

Florida Farm, Haydock

Proposed Left in - Left Out Arrangement

DRAWN: JC	CHECKED: DL	DATE: 13.06.2016	SCALES: AS SHOWN
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Barratt Homes



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DRAWING NUMBER: VN40349-D202	REVISION: .
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Plan 4

Proposed Emergency Access off Slag Lane

Plan 4

Notes:
1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.

Pedestrian, Cycle and Emergency Access.
Minimum 3.7m along length

3.70m

95

2

Slag Lane

Avery Road

1

102

3

REV.	DETAILS	DRAWN	CHECKED	DATE

CLIENT:
Barratt Homes

PROJECT:
Florida Farm

DRAWING TITLE:
Slag Lane Pedestrian, Cycle and Emergency Access

SCALES:
1:500 at A4

DRAWN: PJ CHECKED: DL DATE: 25.09.17



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DRAWING NUMBER: **VN40349-203** REVISION:

Appendix 2



**Florida Farm
Haydock
St Helens**

**Flood Risk Assessment and
Outline Drainage Strategy**

for



October 2017

Hydrock Ref: 07781-HYD-XX-XX-RP-D-001





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Client: Barratt Homes

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Hydrock Consultants Limited has prepared this report in accordance with the instructions of the above named Client for their sole and specific use. Any third parties who may use the information contained herein do so at their own risk.



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APPENDICES

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APPENDIX B: Statutory Authority Correspondence
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APPENDIX E: Drainage Strategy Layout



EXECUTIVE SUMMARY

This report assesses the Flood Risk and Drainage of a strategic site of approximately 600 dwellings (as indicated on the illustrative parameters masterplan, Rev K) and associated infrastructure on greenfield land at Florida Farm, Haydock, St Helens, WA11 0UZ. The site is approximately 21.57 ha, the net developable area is circa 12.94 ha.

Flood Risk

This report has considered the flood risk posed to the site from all sources, in accordance with NPPG and the local Strategic Flood Risk Assessment (SFRA).

The site itself is located predominantly within Flood Zone 1 i.e. land defined as having an annual probability of fluvial flooding of less than 1 in 1000 in any year (<0.1%) and at low risk of fluvial flooding. Part of the south-east corner is in Flood Zone 2. Based on an analysis of the flood zone extents and surface water flood map, this flood zone is associated with overland runoff from the north of the site (See Section 4.4). This will be significantly reduced by the development of neighbouring land to the north, which according to planning reference P/2016/0608/HYBR will provide restriction of run-off rates to the average annual event (QBar). The extents of Flood Zone 2 therefore, are likely to be significantly reduced, this will be discussed further with the Environment Agency (see Appendix B).

This assessment has also found the site to be at low risk of flooding from tidal, groundwater, sewers and artificial sources. There are some areas of medium-high surface water flooding, which, as discussed above will be significantly improved by the construction of the neighbouring site to the north.

The proposed development site will also provide significant betterment to downstream catchments by the restriction of run-off to the average annual event (QBar).

Surface Water Drainage Strategy

The entire site generally slopes south, in the direction of Clipsley Brook (Main River) situated along the southern site boundary. An ordinary watercourse also bisects the site, such that, land directly adjacent to the watercourse slopes to convey flows in this direction. See Appendix A for the topographical survey.

The drainage hierarchy has been considered to form the drainage strategy. The hierarchy promotes the use of drainage techniques in the following order: Infiltration, Outfall to Watercourse, Outfall to Sewer.

A review of the NSRI Soils map indicates that infiltration is **not** likely to be a viable option due to the presence of 'slowly permeable, seasonally wet, clayey soils' with 'impeded drainage'. Infiltration tests in accordance with BRE365 will be carried out at a later stage in order to confirm this assessment (if requested).



Therefore, the surface water drainage strategy will be to mimic the existing scenario and outfall to the on-site ordinary watercourse and, where necessary to Clipsley Brook.

The site is split into several land parcels, with each parcel containing its own potential for the utilisation of on-site SuDS. This will be discussed further in Section 5. See Appendix E for the drainage strategy layout.

As the site is predominantly 'greenfield', rates will be restricted to mimic the pre-development greenfield scenario. In order to provide **betterment** to downstream catchments for all storm events that exceed the average annual event up to and including the extreme 1 in 100 year (plus 40% climate change), run-off rates will be restricted to QBar prior to outfall.

The increase of impermeable area and restriction of run-off rates will generate storm-water storage volumes which will be attenuated on-site. This is discussed further in Section 5.

Foul Water Drainage Strategy

Foul water will outfall to the nearest public combined water sewer located in Vicarage Road to the south-west of the site. See Appendix C for the Sewer Records.

Due to the size and scale of the site, a pumped solution may be required from some development areas. This will be discussed further in Section 5.

An agreement in principle was provided by United Utilities regarding the capacity of the network within the area to receive additional foul flows. For a residential development, this is calculated at 4000 l/dwelling/day (SfA).

Correspondence with United Utilities may be found in Appendix B. Further investigation will be carried out when further site details are known.



1.0 **INTRODUCTION**

- 1.1 This report has been prepared by Hydrock Consultants Limited (Hydrock) on behalf of our client, Barratt Homes, to assist St Helen’s council in the allocation of development sites within the region. The proposed development is to be located at Florida Farm, Haydock, St Helens, WA11 0UZ.
- 1.2 Hydrock have previously carried out the flood risk assessment and drainage management strategy for the approved commercial development located to the north of the site (planning reference P/2016/0608/HYBR). This development is upstream of the proposed site and the restriction of run-off rates to QBar will provide a significant reduction of flood risk to the proposed site (this will be discussed further in Section 5.4).
- 1.2 Local Planning Authorities are advised by the Government’s National Planning Policy Guidance (*NPPG*) to consult the Environment Agency (EA) and Lead Local Flood Authority (LLFA) on development proposals in areas at risk of flooding and/or for sites greater than 1 hectare in area. This report has been prepared to assess the requirements of *NPPG* by:
- Providing an assessment of whether the site is likely to be affected by flooding and whether it would increase flood risk elsewhere;
 - Assessing whether the proposed development is appropriate in the suggested location;
 - Detailing any measures necessary to mitigate any flood risk identified, to ensure that the proposed development and occupants would be safe, and that flood risk would not be increased elsewhere.
- 1.3 The report considers the requirements for undertaking a Flood Risk Assessment as stipulated in *NPPG*. Only those requirements that are appropriate to a development of this nature have been considered in the compilation of this report.
- 1.4 This report has been prepared in accordance with current EA and LLFA policy. The EA’s and LLFA’s responses to the pre-development enquiries are included in the Appendices of this report.



2.0 **SITE DESCRIPTION**

2.1 **Site Description Summary**

2.1.1 The site is referenced in Table 1, and a location plan is provided in Figure 1. For an indication of the red line boundary see the development framework plan provided in Appendix A.

Table 1: Site Referencing Information

Item	Brief Description
Site name	Florida Farm, Haydock, St Helens
Site address and location	Florida Farm, Haydock, St Helens, WA11 0UZ
Council Area	St Helens Council
Water Company	United Utilities
Approximate Grid Reference	OS: 354678E, 397346N
General Locality	The site is predominantly greenfield land located to the south of East Lancashire Road (A580). Haydock is located approximately 3 miles north-east of St Helens.
Site Area	Gross site area: 21.57 ha. Net developable area: 12.94 ha (indicative).
Boundaries and Surrounding Land	East Lancashire Road (A580) forms the northern border. Clipsley Brook (main river) forms the southern border. Residential dwellings are present to the east, south and west of the site. An ordinary watercourse bisects the site flowing from north to south.
Existing Land Use and Access	The site is predominantly greenfield and can be accessed via Slag Lane, an access road which connects Haydock Lane from the east to East Lancashire Road to the north.
Elevation and Topography	Levels range from approximately 48-50m AOD in the north of the site to 33-35m AOD to the south. See Appendix A for a copy of the topographical survey.
Development Proposals	The proposed development is for the construction of approximately 600 new residential dwellings and associated infrastructure.



Figure 1: Location Plan (for the red line boundary see development framework plan included in Appendix A)



3.0 PLANNING POLICY AND CONSULTATION

3.1 National Planning Practice Guidance (NPPG)

- 3.1.1 The flood maps provided by the Environment Agency (EA) locate the site as being predominantly within Flood Zone 1, i.e. land defined as having an annual probability of fluvial flooding of less than 1 in 1000 in any year (<0.1%).
- 3.1.2 There is an area to the south-east of the site located within Flood Zone 2. This area of flood risk will be reduced by the development of the neighbouring site to the north (See Section 4.3).
- 3.1.3 Areas should, where possible, be developed away from Flood Zones 2 and 3 in accordance with the Sequential test. The proposal is residential and therefore classified as ‘More Vulnerable’. Thus, according to the criteria in Table 3 (Flood Risk Vulnerability and Flood Zone ‘Compatibility’), the development is considered to be ‘appropriate’ within Flood Zones 1 & 2.
- 3.1.4 Sequential and Exception tests are strategic level tests to be carried out by the Local Planning Authority to assist in informing where development should take place.

3.2 Strategic Flood Risk Assessment (SFRA)

- 3.2.1 SFRA’s assess the risk associated with all types of flooding and provide the information required to identify the amount of development permitted in an area, how drainage systems in the area should function and how risks in vulnerable areas can be reduced and/or mitigated. NPPG state that regional planning bodies (RPB’s) or local planning authorities should prepare SFRA’s in consultation with the EA.
- 3.2.2 The St Helens Council SFRA, written by JBA consulting (dated September 2014) was carried out in accordance with NPPG to assess and map all known sources of flood risk including tidal, fluvial, surface water, sewer, groundwater and all impounded water bodies, whilst taking into account future climate change predictions.
- 3.2.3 A summary of the main elements from the SFRA are detailed below. The full report can be obtained [here](#).
- The SFRA provides a detailed understanding of flood risk across all areas and from all sources. Full Sequential and Exception tests to be carried out (where applicable).
 - Part of the site is represented in the SFRA as ‘land north of Vicarage Road’ (p.43) this indicates flood risk from Clipsley Brook and reiterates that development is not permitted within the 8m easement area of the Brook. *This land has been assigned as POS as part of the development framework plan and therefore the flood risk will not be increased and flood extents will not affect any proposed dwellings.



3.3 Statutory Authority Correspondence

- 3.3.1 In compiling this report, the Environment Agency, Lead Local Flood Authority and United Utilities have been consulted. Their responses are summarised below and included in Appendix B.
- 3.3.2 St Helens Council – “LLFA comments and discussion will be covered in the DTA / Pre Application meetings with St Helens Council... Since the enactment of the Flood and Water Management Act 2010, we have no recorded flooding incidents with the development boundary”. Some downstream flooding was also recorded approximately 1km south-west of the site. *Discussions with the LLFA will be ongoing regarding flow rates and outfall locations/designs as the site progresses.*
- 3.3.3 The Environment Agency confirm that they have no records of flooding affecting the site. *Discussions with the EA will be ongoing regarding Environmental Permits to discharge into the designated Main River as the site progresses.*
- 3.3.4 United Utilities confirm that foul water flows emanating from the site would be allowed to discharge freely in to the 525mm section of public combined sewer located within Vicarage Road at approx. grid ref: 354284 – 397223. *Discussions with UU will be ongoing regarding adoption, S104 and S106 applications as the development site progresses.*



4.0 DEFINITION OF FLOOD HAZARD

4.1 Sources of information

4.1.1 NPPG requires the developer to consider the impact of runoff generated by the proposed development onto the downstream catchment, and to assess the risk of runoff from the surrounding district impacting on the developments footprint. The report is to consider flood risk from all other sources. The following section defines the flood risk receptors and anticipated flood risk which has been assessed using the Environment Agency Flood Risk Maps, the SFRA and United Utilities sewer records.

4.2 Risk of Flooding from the Sea (Tidal)

4.2.1 The site is not near a coastline or a tidally influenced river, therefore the risk of flooding from Tidal sources is **low**.

4.3 Risk of Flooding from Rivers (Fluvial)

4.3.1 Figure 2 shows the site on the Environment Agency's indicative floodplain map. The site is predominantly located within Flood Zone 1. Flood Zone 1 is land assessed as having a less than 1 in 1000 annual probability of river flooding (<0.1%).

4.3.2 There is one area in the south-east of the site located within Flood Zones 2 (See figure 2), which is associated with pluvial flooding from the north. There will be minimal development within these areas, with part of the area being dedicated to landscaping and POS. This area of flood risk will also decrease/be removed, by the development of the neighbouring land to the north (See Section 4.4).

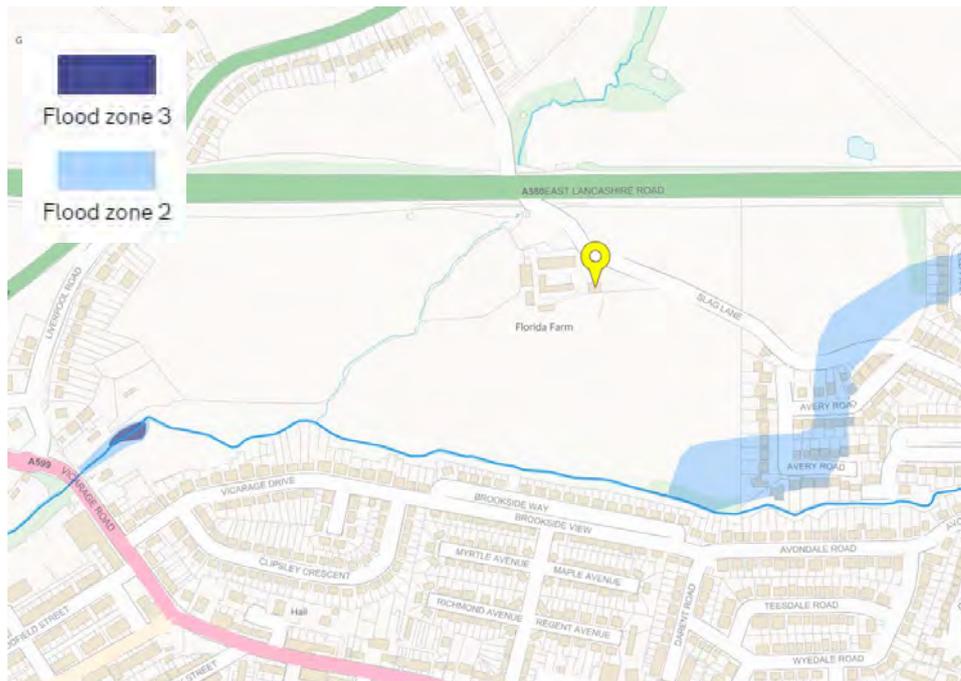


Figure 2: The Environment Agency's Indicative Floodplain Map

- 4.3.3 Clipseley Brook (Main River) is situated on the southern boundary which will require a maintenance easement of 8m. An unnamed ordinary watercourse is present flowing through the site from north to south which will require a maintenance easement of 3-5m. The provision and maintenance of these easements will further mitigate fluvial flood risk to the site.
- 4.3.4 Development within these maintenance easements, culverting/bridging and/or any works that have the potential to affect the flow of the ordinary watercourse will require ordinary watercourse consent. There will be no development within 8m of the Clipseley Brook however any proposed surface water outfalls will require an Environmental Permit from the EA. These will be carried out at detailed design.
- 4.3.5 Therefore, flood risk from fluvial sources is considered to be **low**.



4.4 Flooding from the Land (Surface Water)

4.4.1 A review of the EA Surface Water Flood map indicates that the site is predominantly at ‘Very low’ risk of surface water flooding (fig.3) with lines of medium and high risk running north to south as the land drains to Clipsley Brook situated on the southern border.



Figure 3: The Environment Agency's Indicative Surface Water Floodplain Map

- 4.4.2 Pluvial flooding associated with the on-site ordinary watercourse and Clipsley Brook (Main River) will be mitigated by the provision of maintenance easements as described in section 4.3.
- 4.4.3 Pluvial flooding across the site will also be significantly reduced by the development of neighbouring land to the north, which according to planning reference P/2016/0608/HYBR will provide restriction of run-off rates to the average annual event (QBar).
- 4.4.4 This will provide **significant betterment** for all storm events up to and including the 1 in 100 year event (+cc) that exceed the annual average event.
- 4.4.5 Therefore the risk of pluvial flooding is considered to be **low**.



4.5 Flooding from Groundwater

- 4.5.1 A review of the SFRA indicates the presence of the underlying clay soils, which will prevent the migration of groundwater ingress to the surface.
- 4.5.2 In light of these findings groundwater flood risk is considered to be **low**.

4.6 Flooding from Sewers/Highway Drains

- 4.6.1 A review of the United Utilities sewer records has indicated that there are no public United Utilities assets located on-site. Foul, combined and surface water sewers are located serving the existing residential estates which surround the site.
- 4.6.2 Proposed surface water and foul sewers will be designed as separate systems and in accordance with Sewers for Adoption. Sewers will be put up for adoption with United Utilities at detailed design.
- 4.6.3 Therefore, the risk of flooding from sewers and highway drains is considered to be **low**.

4.7 Flooding from Artificial Sources

- 4.7.1 There is no flood risk from reservoirs according to the online EA flood map. Therefore, the risk of flooding from artificial sources is considered to be **low**.

4.8 Summary of Flood Risk

- 4.8.1 Flood Risk to the site from **all sources** including tidal, fluvial, pluvial, groundwater, sewer related and from artificial sources is considered to be **low**.
- 4.8.2 Fluvial and pluvial flood risk will be mitigated by the provision of appropriate easements for both the on-site ordinary watercourse and Clipsley Brook.
- 4.8.3 The proposed development has the potential to provide **significant betterment** to the downstream catchment by restricting run-off rates to the average annual event (QBar) for all storm events up to an including the extreme 1 in 100 year (+40% climate change) event.



5.0 DRAINAGE STRATEGY

5.1 Existing Surface Water Runoff

5.1.1 The site is considered to be predominantly ‘greenfield’, therefore greenfield runoff rates apply. Surface water run-off is conveyed south before outfalling to Clipsley Brook (Main river) situated on the southern site boundary. Run-off also outfalls to the on-site ordinary watercourse which conveys flows from north to south before ultimately outfalling to Clipsley Brook.

5.1.2 Table 2 shows the existing greenfield rates for the major storm events up to and including the extreme 1 in 100 year event. The ICP SuDS method within Micro-Drainage Source Control was used to calculate the rates using FEH derived catchment characteristics. Due to the modular nature of the proposed site (development parcels) the below greenfield rates are provided **per hectare**.

Table 2: Greenfield Run-off Rates (ICP SuDS)

Q1 (l/s/ha)	QBar (l/s/ha)	Q30 (l/s/ha)	Q100 (l/s/ha)
5.4	6.2	10.5	12.8

5.1.3 It is best practice to mimic the existing drainage of greenfield sites and where possible provide betterment.

5.2 Infiltration and Geology

5.2.1 A review of the BGS and NSRI online maps indicates that infiltration is unlikely to be feasible at the site due to the underlying clay soils.

5.2.2 However, if requested, further infiltration testing in accordance with BRE365 may be required to confirm that soakaways are unsuitable.

5.3 Sustainable Drainage Systems

5.3.1 Sustainable Drainage Systems (SuDS) aim to manage the environmental risks resulting from runoff and contribute to environmental enhancement. Therefore, SuDS objectives are to minimise the impacts from the development on the quantity and quality of the runoff and maximise amenity and biodiversity opportunities (CIRIA C753, 2015).



- 5.3.2 A strong design theme is essential if maximum aesthetic benefits are to be gained from the SuDS approach. At a more local scale SuDS should link with the individual plot structure, planting and amenity areas, gaining multiple benefits from a limited area of land.
- 5.3.3 As this is a strategic site proposal, there is a unique opportunity to provide a cohesive and large scale SuDS plan that encourages a multitude of different conveyance and attenuation systems. The use of ponds, basins, swales and bioretention areas should all be encouraged throughout the design and planning stages to promote amenity, biodiversity and improve water quality.
- 5.3.4 The ‘Management Train Approach’ should be central to the surface water drainage strategy of a proposed site. The main objective is the treatment and control of runoff as near to source as possible, thus protecting downstream habitats and further enhancing the amenity of the site. This concept uses a hierarchy of drainage techniques to incrementally reduce pollution, flow rates and volumes of storm water discharge from the site, and is as follows:
1. **Prevention** – The use of good site design and housekeeping measures to prevent runoff and pollution (e.g. rainwater harvesting).
 2. **Source Controls** – Control of runoff at source or as close to source as possible (e.g. filter drains, green roofs, pervious pavements).
 3. **Site Control** – Management of water in a localised area (e.g. a pond, basin or below ground storage).
 4. **Regional Control** – Management of water from a site or various sites and can include wetlands and balancing ponds.
- 5.3.5 The drainage techniques for any development should seek to include at least two types of control and two levels of treatment; based on the site proposals, both source control (tbc) and site control methods will be utilised.
- 5.3.6 The inclusion of SuDS within the overall development is a key driver in providing both amenity and habitat creation and assist in offsetting the loss of pre-developed natural habitat. Maintenance plans will be prepared for all SuDS devices.
- 5.3.7 On this site, the proposed SuDS to be used include attenuation ponds, detention basins and/or bio-retention ponds. Due to some site constraints, some of the development parcels will have to utilise geocellular storage and/or more traditional oversized pipes, however this will be reviewed at detailed design.
- 5.3.8 It is proposed that areas of public amenity (POS) are designed to remain dry for the majority of time and then utilised to provide storage for extreme storms that exceed the 30 year event. Ponds will be provided to accommodate the smaller and more frequent events (tbc).



5.4 Surface Water Drainage Strategy

- 5.4.1 Surface water arising from a developed site should be managed in a sustainable manner to mimic the pre-development scenario, while reducing the flood risk to the site itself and elsewhere, taking climate change into account. This is in-line with current guidance and recommendations from the EA and LLFA.
- 5.4.2 Run-off from areas of hardstanding will be conveyed via an adoptable surface water sewer network to on-site attenuation ponds prior to outfall at a restricted run-off rate. The total restricted run-off rate will not exceed the existing greenfield rate for the annual average event (QBar) and storage will be provided for all events up to and including the extreme 100 year (+40% cc) thereby providing **significant betterment** to the existing scenario.
- 5.4.3 Ponds/basins will be incorporated throughout the site and will outfall either directly to the unnamed on-site watercourse, to Clipsley Brook or to proposed adoptable surface water sewers (tbc) located beneath proposed adoptable highways.
- 5.4.4 Aside from the overall rate restriction and provision of storm-water storage volumes, all other details will be discussed as more site specific information becomes available.
- 5.4.5 The SuDS management train approach will be incorporated by utilising both Source (tbc) and Site control methods to retain runoff. Infiltration is not a viable option for the site, to be confirmed following further infiltration tests (if requested). Runoff will be directed through prevention measures such as silt traps (tbc). Swales and/or drainage ditches may be used to convey flows, prior to outfall.
- 5.4.6 The approximate storage volumes for the entire site are shown in Table 3. These storage volumes will be split between several land parcels. The volumes per parcel will be outlined in more detail as the phased development progresses and further site details become available.

Table 3: Quick Storage Estimates

Storm Event	Q1	Q30	Q100 +20%*
Volume Required (Impermeable area ~ 9 ha)	763m ³ – 1393m ³	2720m ³ – 4152m ³	5160m ³ - 7491m ³

- 5.4.7 The impermeable area used to calculate the above volumes is based on 70% of the net developable area. This is a conservative figure which has been used to accommodate for additional impermeable area provided by infrastructure outside of the net developable area (such as access roads, footpaths etc).



- 5.4.8 At detailed design, a hydraulic model will be created using drainage design software which will define pipe sizes through the site and attenuation volumes.
- 5.4.9 *In line with recent EA guidelines regarding climate change, all drainage infrastructure will be designed to accommodate the 100 year storm (plus 20%) on-site without flooding. An upper band of **40%** should be assessed at detailed design. This upper tolerance may result in some flooding of external areas, highways, etc. This is classed as exceedance flooding and will be directed away from dwellings as water levels recede. Exceedance flows will be prevented from exiting the site through the use of external works and strategically located gullies.
- 5.4.10 The proposed drainage layout will be designed in accordance with Sewers for Adoption 7th Edition (SfA). SuDS guidance will be taken from Ciria C753. Maintenance plans will be provided for all SuDS methods implemented.
- 5.4.11 The above strategy is indicative of best practices in accordance with NPPG and EA guidelines, this indicative strategy is subject to change at the full planning stage and at detailed design, where more site specific information will be made available.

5.5 Pollution Control

- 5.5.1 Surface water runoff from roofs and external areas is considered to be generally clean and with limited contamination, and may be discharged directly to the existing drainage infrastructure and new SuDS Facilities. Silt is to be prevented from entering the drainage system by the use of trapped gullies, channels with silt traps, or by the use of sustainable drainage techniques.

5.6 Foul Water Drainage Strategy

- 5.6.1 Foul water from the proposed development will outfall to the nearest available public foul water sewer. Foul flows can be calculated to a peak rate of approximately 24 l/s (4000 l/dwelling/day).
- 5.6.2 Based on site levels, some areas of the development may require a pumped solution. This will be explored further as more site specific information is made available.
- 5.6.3 An agreement in principle has been provided by United Utilities for foul flows to discharge freely in to the 525mm section of public combined sewer located within Vicarage Road at approx. grid ref: 354284 – 397223 (Vicarage Road).
- 5.6.4 Correspondence with United Utilities may be found in Appendix B. Further investigation will be carried out when further site details are known.



6.0 MANAGEMENT MEASURES, OFF SITE IMPACTS AND RESIDUAL RISK

6.1 Flood Risk Management Measures

- 6.1.1 The report has identified the site as having **low risk** of flooding from all sources including tidal, fluvial, surface water, groundwater, sewers and artificial sources. The extents of Flood Zone 2 in the south-east corner are minimal, and will be significantly reduced by the development proposals situated to the north of the site.
- 6.1.2 The surface water drainage strategy for the new development is to direct all surface water runoff from the proposed development to new surface water networks that outfall to the on-site unnamed watercourse and Clipsley Brook, designated 'main river' located near on the southern site boundary. Rates will be restricted to mimic the existing greenfield run-off rate for the average annual event (providing significant betterment for all storms that exceed this event), and storm-water attenuation will be provided in the form of SuDS. Attenuation will be provided for all events up to and including the extreme 100 year storm event (plus 40% accommodation for climate change).
- 6.1.3 Foul water will outfall to the nearest public foul water sewer located to the south-west of the site within Vicarage Road. See Appendix C for the Sewer Records.

6.2 Off Site Impacts

- 6.2.1 The report has justified that the risk of flooding to the new development layout is low.
- 6.2.2 Incorporating SuDS into the drainage system has the potential to reduce surface water flooding to the local area and downstream catchments. As discussed, the development would provide significant betterment to flood risk in the downstream catchment.

6.3 Residual Risk

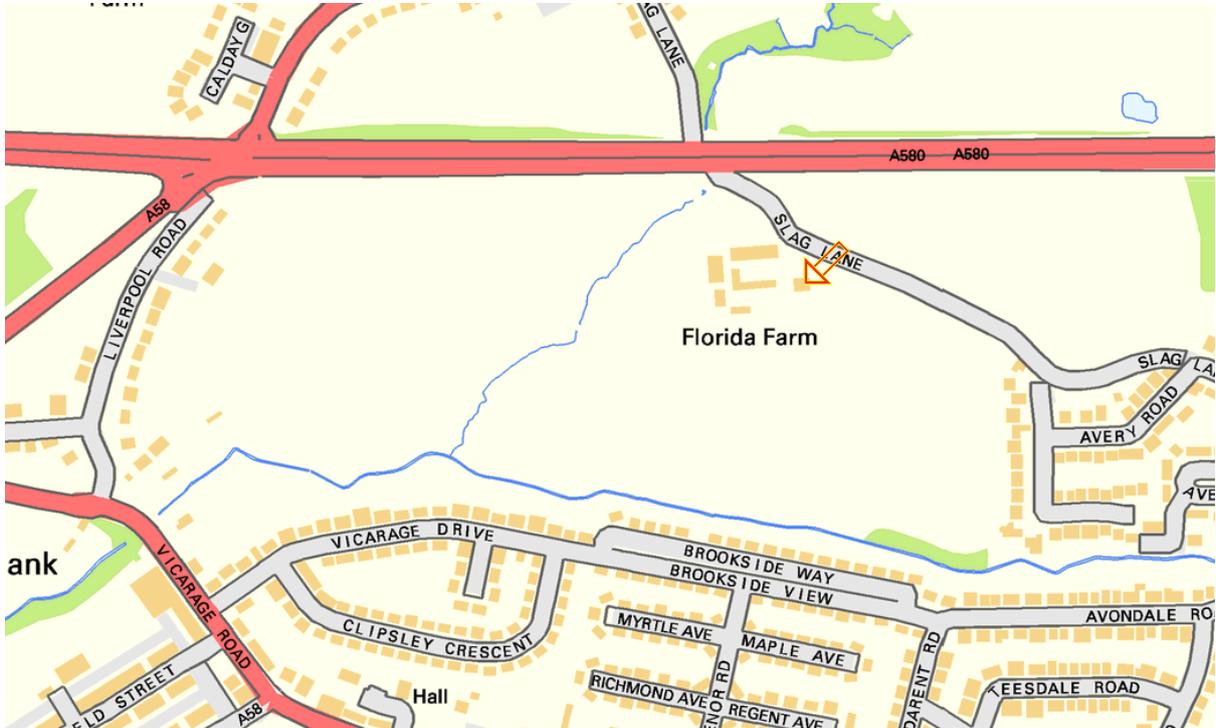
- 6.3.1 Flood risk to people and property can be managed but it can never be completely removed; a residual risk remains after flood management or mitigation measures have been put in place. This relates to a rainfall event beyond what can be fully quantified. Should this happen then some out of chamber flooding could occur.



Appendix A – Strategic Plans

CONTENTS	
Identifier	Name
Hydrock	Location Plan
eSCAPE	Strategic Site Plan
Survey & Design Ltd	Topographical Survey

LOCATION PLAN



OS X (Easting)	354678
OS Y (Northing)	397346
Nearest Post Code	WA11 0UQ
Lat (WGS84)	N53:28:15 (53.470886)
Long (WGS84)	W2:41:03 (-2.684239)
Lat, Long	53.470886, -2.684239
Nat Grid	SJ546973 / SJ5467897346

Key

-  Site Boundary
-  Existing Watercourses
-  Village Streets
-  Existing Trees
-  Green Infrastructure/Blue Infrastructure
-  Village Lanes
-  Existing Hedgerows
-  Development Parcels
-  Footpath/Cycleways

Illustrative Development Statistics:

Gross Site Area: 21.57 hectares.
 Net Developable: 12.94 hectares.
 Green Infrastructure: 8.63 hectares.
 New Homes: 526 (@ an average net density of 41 units/ha).

Approved Employment Development



Parcel 1: 0.22ha, 12 Units @ 55/ha

Parcel 2: 0.30ha, 14 Units @ 45/ha

Parcel 3: 2.65ha, 106 Units @ 40/ha

Parcel 4: 0.55ha, 25 Units @ 45/ha

Parcel 5: 0.72ha, 25 Units @ 35/ha

Parcel 6: 1.0ha, 40 Units @ 40/ha

Parcel 7: 0.65ha, 26 Units @ 40/ha

Parcel 8: 0.40ha, 16 Units @ 40/ha

Parcel 9: 0.26ha, 10 Units @ 40/ha

Parcel 10: 0.72ha, 32 Units @ 45/ha

Parcel 11: 1.20ha, 48 Units @ 40/ha

Parcel 12: 0.60ha, 27 Units @ 45/ha

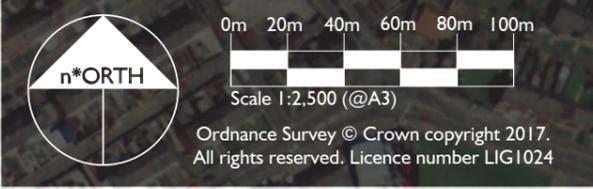
Parcel 13: 0.52ha, 23 Units @ 45/ha

Parcel 14: 0.36ha, 14 Units @ 40/ha

Parcel 15: 0.31ha, 11 Units @ 35/ha

Parcel 16: 0.38ha, 13 Units @ 35/ha

Parcel 17: 2.10ha, 84 Units @ 40/ha



e*SCAPE
 urbanists

Project Title
 Florida Farm, Haydock

e*SCAPE Job No.
 014-003

Client
 Barratt Homes

Drawing Number
 014-003-P003b

Revision
 REV K

Drawing Title
 Illustrative Parameters Masterplan:
 Site Wide

Scale
 1:2,500 @ A3

Date
 August '17



Appendix B – Statutory Authority Correspondence

CONTENTS	
Identifier	Name
Environment Agency	Pre-development Enquiry Response
St Helens Council	Pre-development Enquiry Response
United Utilities	Pre-development Enquiry Response

Heather Palmer-Jones

From: Matthew Catherall/envpro/STHMBC [REDACTED]
Sent: 23 August 2017 13:39
To: Heather Palmer-Jones
Cc: Melanie Hale/urbreg/STHMBC
Subject: Re: Pre-development Flood Risk Enquiry - East Lancashire Road, St Helens WA11 0UZ
Attachments: pic20426.gif; Catherall_Matthew.vcf; pic14606.gif; pic26173.gif; pic24429.jpg

Good Afternoon Heather

Thank you for your email and query.

In terms of standards for the sustainable drainage of the development and in relation to the following (potential release Green belt allocation, Draft Local Plan Allocation, Sankey Valley Catchment Project and significant downstream flood issues) LLFA comments and discussion will be covered in the DTA / Pre Application meetings with St Helens Council. Please contact the Council Planning Department to discuss the arrangement of a DTA / Pre Application meeting if none has currently been arranged.

Since the enactment of the Flood and Water Management Act 2010, we have no recorded flooding incidents with the development boundary, provided in your email dated 16/08/2017 16:00.

In terms of flooding records, we have the following significant downstream incidents at West End Road / Blackbrook Road: (October 2000 - limited detail, September 2012 - internal and external flooding, September 2013 - external flooding, Boxing Day 2015 - significant event - internal and external flooding from Storm Eva).

Kind Regards

Matthew Catherall
Engineering Technician (Flood Risk)

[REDACTED]
Tel: 01744 676651

Flood Campaign
[REDACTED]
01234 567890

(Embedded image moved to file: pic20426.gif)(See attached file: Catherall_Matthew.vcf)

Heather Palmer-Jones

From: Lunt, John [REDACTED]
Sent: 06 September 2017 15:59
To: Heather Palmer-Jones
Cc: Wastewater Developer Services
Subject: (UU Ref: PDE 4200018180) Florida Farm, Haydock, St Helens

Hi Heather,

In reply and firstly in relation to the surface water element, I can confirm that UU will not adopt pipes between interlocking ponds at all, UU would adopt the upstream pipe to a pond (singular) along with the outfall pipe to a watercourse albeit on the proviso that the outfall pipe is not exceptionally long.....

With regard to the foul water element, I can confirm that the foul water flows emanating from the site would be allowed to discharge freely in to the 525mm section of public combined sewer located within Vicarage Road at approx. grid ref: 354284 – 397223.

If you have any further queries or comments at all then please don't hesitate to get in touch.

Regards,

John

John Lunt

Developer Query Engineer
Developer Services and Planning
Operational Services
T: 01925 679411 (Int; 79411)
E-mail: [REDACTED]
United Utilities.com

From: Heather Palmer-Jones [REDACTED]
Sent: 23 August 2017 17:29
To: Wastewater Developer Services <[REDACTED]>
Subject: C-07781-Barratt Homes, Florida Farm, Haydock, St Helens

Good afternoon,

Please see the attached pre-development enquiry form. Please also see further notes below. Thanks.

Surface Water

- We will be outfalling at an overall greenfield rate of QBar in order to provide significant betterment. Split between the parcels this comes to around 5 l/s per parcel. Not yet depicted in the attached planning layout, it is proposed the parcels have their own ponds to keep pipes beneath the highway as small as possible. Some of the parcels (3,10, 17 and 14) will have to outfall to a proposed adoptable surface water sewer which will be built as part of the highway design. The site is currently only at scoping stage however I'd like to know if you SuDS policy has been updated yet? Specifically, would you have any concerns adopting the proposed system both upstream and downstream of an attenuation pond?

Foul Water

- Our only available option is to outfall to the existing public combined sewer located within Vicarage Road, OS Sheet No: SJ5497SW, node number 3116. Part of the site may require a pumped solution. I notice that upstream of the public pump station are network storage tanks... would we need to provide network storage tanks given that our proposed system will be entirely separate (only foul)?

Kind regards,

Heather

Heather Palmer-Jones
Infrastructure Engineer

Hydrock

St Baldred's Hall, 239 Ashley Road, Hale, Cheshire WA15 9NE
Office: 0161 233 0746

www.hydrock.com



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Registered in England and Wales. Registered No 6559020

www.unitedutilities.com

Heather Palmer-Jones

From: GMMC Info Requests <Inforequests.gmmc@environment-agency.gov.uk>
Sent: 11 September 2017 10:57
To: Heather Palmer-Jones
Subject: GMMC57399AB Response attached from the Environment Agency
Attachments: LOCATION PLAN.DOCX; 014_003_003b_RevJ_Parameters_Site_Wide_Lowres.pdf; 57399AB DFM.PDF; 57399AB Table.pdf

Dear Heather,

Thank you for your enquiry which was received on 16/8/17.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

I enclose the data you have requested. We have no records of flooding affecting the site. However, this does not mean flooding has not occurred in the past or that it will not flood in future. You may also wish to contact your local authority or internal drainage board to ask about surface water flooding or if they have other relevant local flood information.

There are no flood defences in the vicinity of the site.

Please refer to the [Open Government Licence](#) which explains the permitted use of this information.

Please get in touch if you have any further queries or contact us within two months if you'd like us to review the information we have sent.

Kind regards,

Anne Ball
Customer and Engagement Officer
Greater Manchester, Merseyside and Cheshire
Internal: 721 2937
External: 020 302 51232
Email: Inforequests.gmmc@environment-agency.gov.uk

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Appendix C – Sewer Records

CONTENTS	
Identifier	Name
United Utilities	Sewer Records



**Hydrock
St Baldred's Hall
239 Ashley Road
Hale
Cheshire
WA15 9NE**

FAO: Heather Palmer-Jones

Dear Sirs

Location:

I acknowledge with thanks your request dated 16/08/17 for information on the location of our services.

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

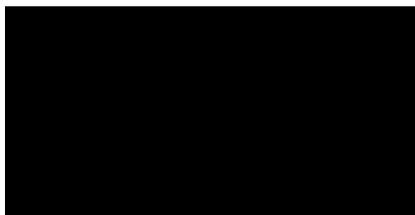
The enclosed plans are being provided to you subject to the United Utilities terms and conditions for both the wastewater and water distribution plans which are shown attached.

If you are planning works anywhere in the North West, please read our access statement before you start work to check how it will affect our network.

<http://www.unitedutilities.com/work-near-asset.aspx>

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

If you have any queries regarding this matter please telephone us on 0370 7510101.



Karen McCormack
Property Searches Manager

United Utilities Water Limited

Property Searches
Ground Floor Grasmere House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP

Telephone 0370 751 0101

Property.searches@uuplc.co.uk

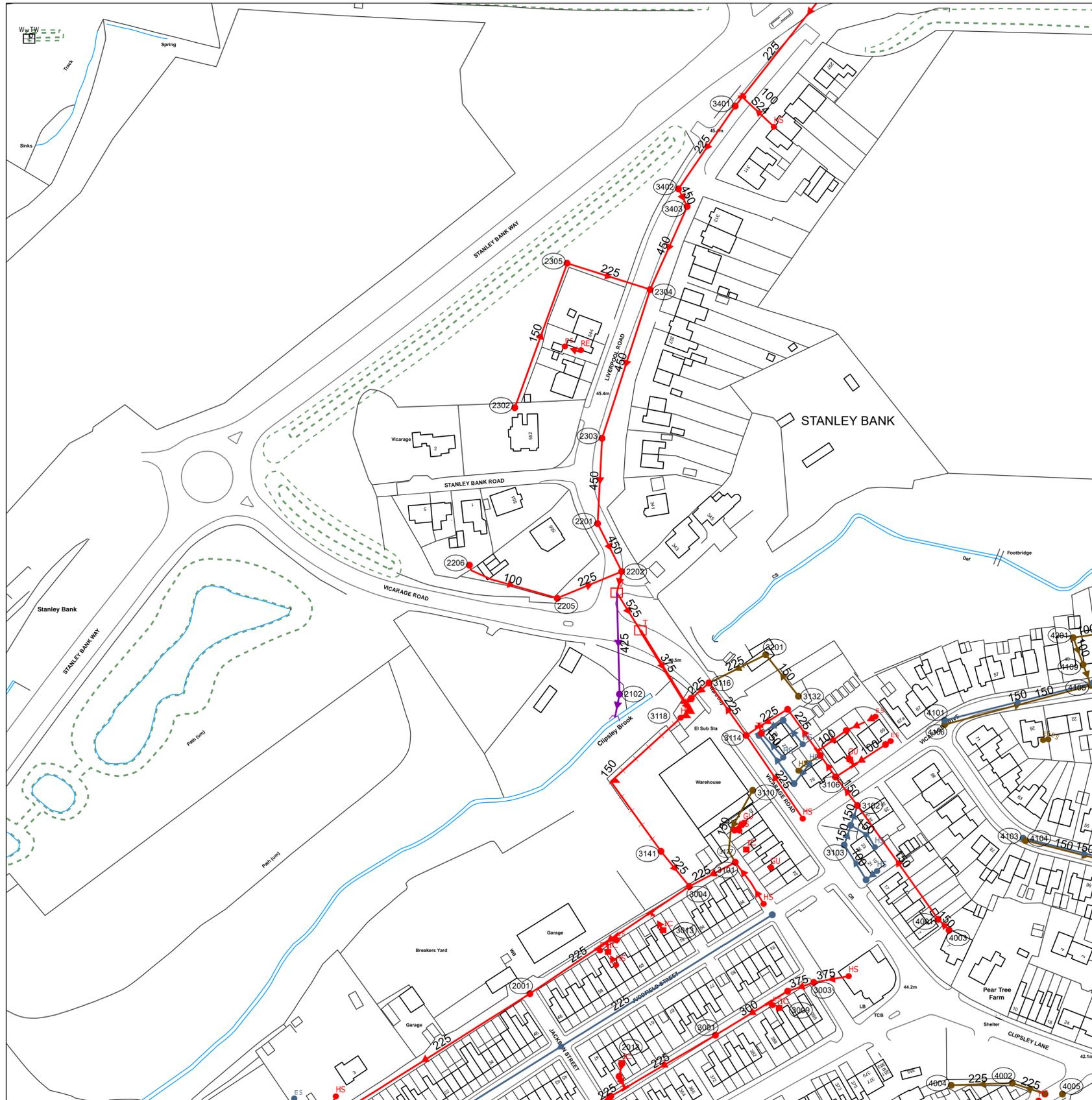
Your Ref: C-07781 ST HELENS
Our Ref: 1319132
Date: 23/8/2017

TERMS AND CONDITIONS - WASTERWATER & WATER DISTRIBUTION PLANS

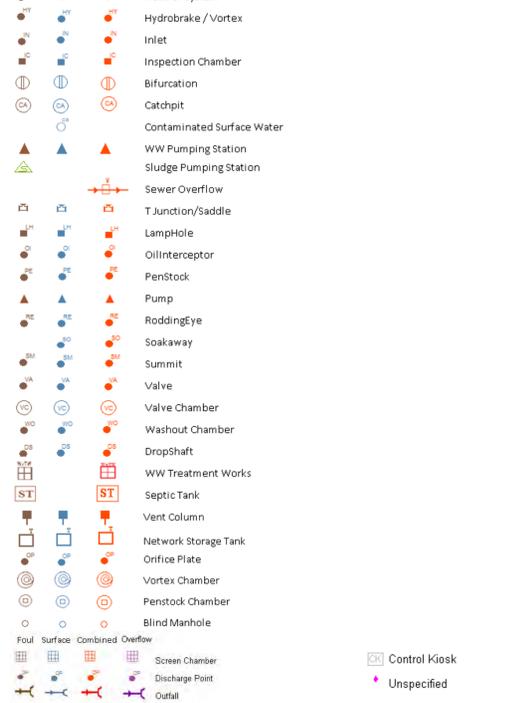
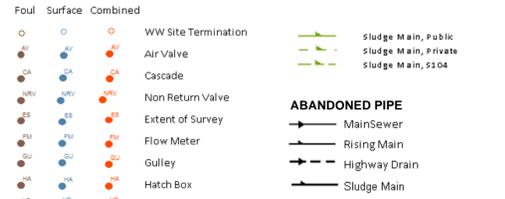
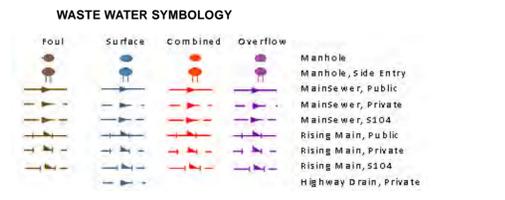
These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self-construction of water mains) (UUWL apparatus)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

TERMS AND CONDITIONS:

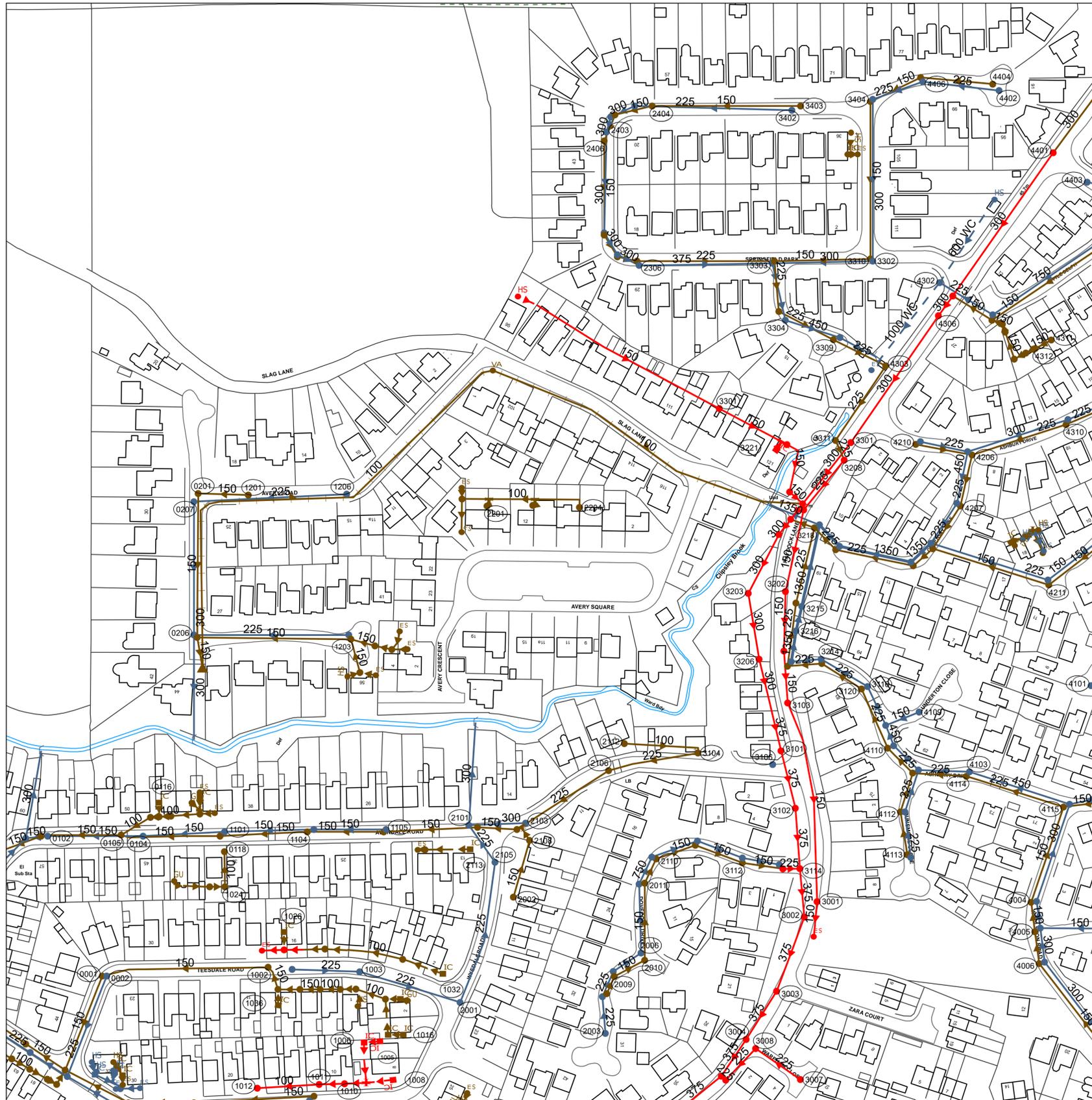
1. This Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
2. This Map and any information supplied with it is provided for general guidance only and no representation, undertaking or warranty as to its accuracy, completeness or being up to date is given or implied.
3. In particular, the position and depth of any UUWL apparatus shown on the Map are approximate only and given in accordance with the best information available. The nature of the relevant system and/or its actual position may be different from that shown on the plan and UUWL is not liable for any damage caused by incorrect information provided save as stated in section 199 of the Water Industry Act 1991. UUWL strongly recommends that a comprehensive survey is undertaken in addition to reviewing this Map to determine and ensure the precise location of any UUWL apparatus. The exact location, positions and depths should be obtained by excavation trial holes.
4. The location and position of private drains, private sewers and service pipes to properties are not normally shown on this Map but their presence must be anticipated and accounted for and you are strongly advised to carry out your own further enquiries and investigations in order to locate the same.
5. The position and depth of UUWL apparatus is subject to change and therefore this Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the Map have been made subsequent to issue and prior to any works being carried out.
6. This Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) in the vicinity of UUWL apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.
7. No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUWL apparatus by reason of the actual position and/or depths of UUWL apparatus being different from those shown on the Map and any information supplied with it.
8. If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
9. This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent UUWL from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.



Refno	Cover	Func	Invert	Size	Size	Shape	Mat	Length	Grad	Refno	Cover	Func	Invert	Size	Size	Shape	Mat	Length	Grad
2001	41.86	CO	40.13	225		CI	VC	114.59	54										
2002	42.78	CO	41.13	225		CI	VC	3.61	3										
2012																			
2013																			
2102		OV	0	100		CI	VC	6.02											
2201		CO	0	425		CI	CO	11.01											
2202		CO	0	450		CI	CO	24.6											
2206		CO																	
2206		CO	0	100		CI	VC	44.03											
2302		CO	0	150		CI	VC	70.23											
2303	45.02	CO	40.22	450		CI	CO	39.95	87										
2304	45.41	CO	41.05	450		CI	CO	71.47											
2305		CO																	
3001		CO	0	300		CI	BR	38.59											
3002		CO	41.36	375		CI	VC	12.65											
3003	44.26	CO																	
3004	43.04	CO																	
3006		SW																	
3009		CO																	
3101		CO	0	225		CI	VC	23.71											
3102		CO																	
3103		SW																	
3104		CO	0	100		CI	VC	3.61											
3105		SW																	
3106		CO	0	225		CI	VC	25.81											
3107		CO	40.15	150		CI	VC	3.16											
3108	41.47	CO	40.24	100		CI	VC	1.41	24										
3109	41.49	SW																	
3110		FO	0	150		CI	VC	36.47											
3111		SW																	
3112		SW	0	225		CI	VC	22.48											
3113		SW																	
3114	41.02	CO																	
3116		SW	0	100		CI	VC	11.86											
3118	40.33	CO	36.71	225		CI	CO	10.63											
3119		CO	0	150		CI	PE	82.59											
3127		CO																	
3132		CO	0	150		CI	VC	24.21											
3134		CO																	
3141		CO																	
3201		FO	0	225		CI	VC	46.04											
3401		CO	44.95	450		CI	CO	8.94	58										
3402	44.96	CO	41.8	450		CI	CO	41.63											
4001		FO																	
4002		FO																	
4003		FO																	
4004		FO																	
4005		FO																	
4006		FO	0	150		CI	VC	70.09											
4101		SW	40.87	225		CI	VC	58.42											
4102	43.44	SW	42.41	150		CI	VC	58.69	51										
4103	43.96	SW	42.46	150		CI	VC	56.75	48										
4104	43.9	FO	0	150		CI	VC	60.41											
4105	43.51	FO	0	150		CI	VC	69.38											
4106		FO	0	150		CI	VC	27.28											
4107		FO	0	100		CI	VC	10.15											
4109		FO	0	100		CI	VC	13.16											
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1002		CO																	
2003		CO																	
2006		CO																	
2011		CO	0	300		CI	VC	11.66											
2016		CO	0	375		CI	VC	16.28											
3005		CO																	
3007		CO																	
3008		CO																	
3120		CO	0	100		CI	VC	9.29											
3122		SW	0	100		CI	VC	6.4											
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3121		CO																	
3123		CO																	
3140		CO																	
3146		CO																	
3405		CO																	
0400		CO	36.35	625		CI	CO	20.31											
2203		CO																	
2204		CO	0	150		CI	PE	5.47											
3117		CO																	



The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown. Crown copyright and database rights [2016] Ordnance Survey 100022432.



Ratio	Cover	Func	Invert	Size	Shape	Mat	Length	Grad	Ratio	Cover	Func	Invert	Size	Shape	Mat	Length	Grad	Ratio	Cover	Func	Invert	Size	Shape	Mat	Length	Grad
0001	42.46	FO	41.44	225	CI	VC	49.4	145	3217	FO	CO	41.58	300	CI	CO	35.61										
0002	42.5	SW							3218	FO	CO	43.25	300	CI	CO	46.01	121									
0003	42.6	SW							3219	FO	CO	42.54	450	CI	CO	26.25	292									
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0005	42.6	SW							3221	CO																
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0037	41.99	FO	100		CI	VC	7.5		3332	44.29	SW	43.25	300	CI	CO	46.01	121									
0038	41.99	FO	100		CI	VC	7.5		3333	44.29	SW	43.25	300	CI	CO	46.01	121									
0039	41.99	FO	100		CI	VC	7.5		3334	44.29	SW	43.25	300	CI	CO	46.01	121									
0040	41.99	FO	100		CI	VC	7.5		3335	44.29	SW	43.25	300	CI	CO	46.01	121									
0041	41.99	FO	100		CI	VC	7.5		3336	44.29	SW	43.25	300	CI	CO	46.01	121									
0042	41.99	FO	100		CI	VC	7.5		3337	44.29	SW	43.25	300	CI	CO	46.01	121									
0043	41.99	FO	100		CI	VC	7.5		3338	44.29	SW	43.25	300	CI	CO	46.01	121									
0044	41.99	FO	100		CI	VC	7.5		3339	44.29	SW	43.25	300	CI	CO	46.01	121									
0045	41.99	FO	100		CI	VC	7.5		3340	44.29	SW	43.25	300	CI	CO	46.01	121									
0046	41.99	FO	100		CI	VC	7.5		3341	44.29	SW	43.25	300	CI	CO	46.01	121									
0047	41.99	FO	100		CI	VC	7.5		3342	44.29	SW	43.25	300	CI	CO	46.01	121									
0048	41.99	FO	100		CI	VC	7.5		3343	44.29	SW	43.25	300	CI	CO	46.01	121									
0049	41.99	FO	100		CI	VC	7.5		3344	44.29	SW	43.25	300	CI	CO	46.01	121									
0050	41.99	FO	100		CI	VC	7.5		3345	44.29	SW	43.25	300	CI	CO	46.01	121									
0051	41.99	FO	100		CI	VC	7.5		3346	44.29	SW	43.25	300	CI	CO	46.01	121									
0052	41.99	FO	100		CI	VC	7.5		3347	44.29	SW	43.25	300	CI	CO	46.01	121									
0053	41.99	FO	100		CI	VC	7.5		3348	44.29	SW	43.25	300	CI	CO	46.01	121									
0054	41.99	FO	100		CI	VC	7.5		3349	44.29	SW	43.25	300	CI	CO	46.01	121									
0055	41.99	FO	100		CI	VC	7.5		3350	44.29	SW	43.25	300	CI	CO	46.01	121									
0056	41.99	FO	100		CI	VC	7.5		3351	44.29	SW	43.25	300	CI	CO	46.01	121									
0057	41.99	FO	100		CI	VC	7.5		3352	44.29	SW	43.25	300	CI	CO	46.01	121									
0058	41.99	FO	100		CI	VC	7.5		3353	44.29	SW	43.25	300	CI	CO	46.01	121									
0059	41.99	FO	100		CI	VC	7.5		3354	44.29	SW	43.25	300	CI	CO	46.01	121									
0060	41.99	FO	100		CI	VC	7.5		3355	44.29	SW	43.25	300	CI												



Appendix D – Hydrock Hydraulic Calculations

CONTENTS	
Identifier	Name
Hydrock	ICP SuDS Greenfield Run-off Rates (per hectare)
Hydrock	Quick Storage Estimates

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Date 29/08/2017 14:43

Designed by heatherpjones

File

Checked by

XP Solutions

Source Control 2016.1.1

ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.450
Area (ha)	1.000	Urban	0.000
SAAR (mm)	936	Region Number	Region 10

Results 1/s

QBAR Rural 6.2
QBAR Urban 6.2

Q1 year 5.4

Q1 year 5.4
Q30 years 10.5
Q100 years 12.8

Variables

FEH Rainfall		Cv (Summer)	0.750		
Return Period (years)	100	Cv (Winter)	0.840		
Version	1999	Impermeable Area (ha)	9.000		
Site	GB 354700 397250 SJ 54700 97250	Maximum Allowable Discharge (l/s)	55.8		
C (1km)	-0.024	D3 (1km)	0.298	Infiltration Coefficient (m/hr)	0.00000
D1 (1km)	0.330	E (1km)	0.295	Safety Factor	2.0
D2 (1km)	0.352	F (1km)	2.495	Climate Change (%)	20

Results

Global Variables require approximate storage of between 5160 m³ and 7491 m³.

These values are estimates only and should not be used for design purposes.

Variables

FEH Rainfall		Cv (Summer)	0.750		
Return Period (years)	30	Cv (Winter)	0.840		
Version	1999	Impermeable Area (ha)	9.000		
Site	GB 354700 397250 SJ 54700 97250	Maximum Allowable Discharge (l/s)	55.8		
C (1km)	-0.024	D3 (1km)	0.298	Infiltration Coefficient (m/hr)	0.00000
D1 (1km)	0.330	E (1km)	0.295	Safety Factor	2.0
D2 (1km)	0.352	F (1km)	2.495	Climate Change (%)	0

Results

Global Variables require approximate storage of between 2720 m³ and 4152 m³.

These values are estimates only and should not be used for design purposes.

Variables

FEH Rainfall		Cv (Summer)	0.750		
Return Period (years)	1	Cv (Winter)	0.840		
Version	1999	Impermeable Area (ha)	9.000		
Site	GB 354700 397250 SJ 54700 97250	Maximum Allowable Discharge (l/s)	55.8		
C (1km)	-0.024	D3 (1km)	0.298	Infiltration Coefficient (m/hr)	0.00000
D1 (1km)	0.330	E (1km)	0.295	Safety Factor	2.0
D2 (1km)	0.352	F (1km)	2.495	Climate Change (%)	0

Results

Global Variables require approximate storage of between 763 m³ and 1393 m³.

These values are estimates only and should not be used for design purposes.



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