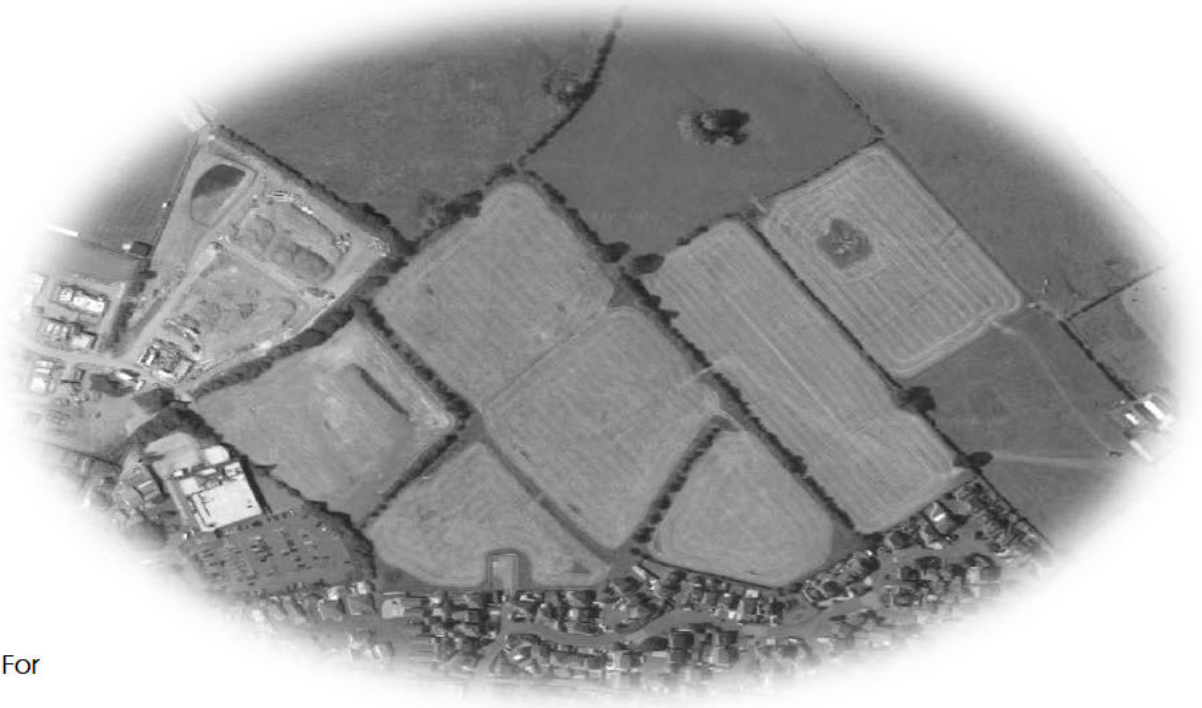
BETTS HYDRO
CONSULTING ENGINEERS

LAND OFF CHIPPING LANE
PHASE 2 & 3
LONGRIDGE

FLOOD RISK ASSESSMENT AND DRAINAGE MANAGEMENT STRATEGY



For

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BARRATT HOMES

NOVEMBER 2021

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EXECUTIVE SUMMARY

This Flood Risk Assessment and Drainage Management Strategy was commissioned by Barratt Homes referred to hereafter as 'the client'. This report has been prepared to support a full planning application for the construction of residential development on land to the east of Chipping Lane in Longridge. Phase 1 has planning approval (Ref: 3/2014/0764) and is supported by a separate, approved Flood Risk Assessment and Drainage Management Strategy (HYD068_CHIPPING.LANE_FRA&DMS).

This assessment therefore focuses on the residential development proposed as part of Phase 2 & 3 only. Phase 2 & 3 collectively cover 10.66ha, although the proposed development area covers a smaller portion at 6.24ha.

Flood Risk

The site is located wholly within Flood Zone 1 based on the Environment Agency Flood Map for Planning. The proposals are for a residential-led development, which is considered 'More Vulnerable' in Table 2: Flood Risk Vulnerability Classification within Planning Practice Guidance. This 'More Vulnerable' development is confirmed to be appropriate within Flood Zone 1, providing there is no increase in flood risk elsewhere due to the proposals.

Consultations with the Environment Agency, Ribble Valley Borough Council, Lancashire County Council and United Utilities have been undertaken and did not identify any historical incidents of flooding to the site or within the neighbouring areas. This assessment has considered all sources of flood risk. As part of Phase 1, hydraulic modelling of the Ordinary Watercourse was undertaken to determine the potential flow risks associated with the proposed culverting the Ordinary Watercourse for vehicular crossing as part of Phase 1. The full Hydraulic Assessment has been appended to this assessment for full details. To summarise the proposed Phase 2 & 3 development area will, following the implementation of mitigation measures remain flood free in all key storm events, including the 1 in 100-year (1% AEP) plus Climate Change event without having any impact on the neighbouring land/properties.

The primary source of flood risk is considered to be from surface water where the risk varies across the site from 'very low' to 'high' within the natural low-lying areas of site. The risks post-development from surface water will be effectively managed through implementation of the mitigation measures proposed within this assessment. To minimise flood risk from surface water it would also be recommended that natural drainage routes through the site be maintained within the proposals, including the existing Ordinary Watercourse, crossing the site from the southern boundary to the north.

Drainage Strategy

To ensure surface water flood risk to others does not increase, it is important to ensure surface water run-off is appropriately managed in accordance with the sustainable drainage hierarchy. Based on the ground conditions identified by the published online datasets, infiltration is not considered to provide a viable drainage solution for the development due to the impermeable strata. A ground investigation report (Ref: STN3505NM-G01) was also undertaken for Phase 1 and identified soakaways were not suitable to be used as a method for managing surface water run-off.

Assuming infiltration is not feasible, the next method in the drainage hierarchy should be discharge to a watercourse. Most of the site naturally drains to the Ordinary Watercourse

crossing the site at present and the proposals are therefore to mimic the existing situation, discharging surface water run-off from the site to the watercourse using the existing onsite features where practical. Detailed design will need to confirm feasibility of a site wide gravity solution, although this is anticipated as most of the site naturally drains in this manner at present.

In accordance with the SuDS Manual and the Non-Statutory Technical Standards for Sustainable Drainage Systems, all sites should endeavour to achieve as close to pre-development greenfield rates as viable. The proposals are to therefore discharge to the watercourse crossing the site mimicking pre-development greenfield situation, QBar is calculated to be 84.9l/s and will need to be proportioned between the multiple proposed points of outfall.

Restricting the discharge rates will generate a storage requirement during extreme storm events, this will need to be considered in terms of onsite attenuation as part of detailed design. It would be beneficial to implement SuDS features at the outfall location(s) such as ponds or basins for attenuation, conveyance and water quality benefits, although this will need to be considered during detailed design.

This Flood Risk Assessment and Drainage Management Strategy has been prepared in consultation with the relevant interested parties and incorporates their comments where possible. The report is considered to be commensurate with the scale and nature of the development proposals and in summary, the development can be considered appropriate in accordance with the Planning Practice Guidance.

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Figures & Tables

Specialist Software

- MicroDrainage WinDES (v.14.1) – Calculation of Greenfield run-off rates IH124/ICP-SUDS, Greenfield run-off volumes, rates of rainfall and stormwater storage estimates.
- Flood Estimation Handbook FEH – Determination of Catchment Descriptors and depths of rainfall.

Abbreviations & Acronyms

AEP	Annual Exceedance Probability
BGL	Below Ground Level
BGS	British Geological Survey
CC	Climate Change
CSAI	Cranfield Soil and Agrifood Institute
EA	Environment Agency
FEH	Flood Estimation Handbook
FRA	Flood Risk Assessment
LCC	Lancashire County Council
LLFA	Lead Local Flood Authority
LPA	Local Planning Authority
mAOD	Metres Above Ordnance Datum
NGR	National Grid Reference
NPPF	National Planning Policy Framework
NSRI	National Soil Resources Institute
OS	Ordnance Survey
PFRA	Preliminary Flood Risk Assessment
PPG	Planning Practice Guidance
QSE	Quick Storage Estimate
QBAR	Mean Annual Flood
RVBC	Ribble Valley Borough Council
SfA	Sewers for Adoption
SFRA	Strategic Flood Risk Assessment
SuDS	Sustainable Drainage Systems
TWL	Top Water Level
UU	United Utilities

1.0 INTRODUCTION

1.1 Planning Policy Context

1.1.1 All forms of flooding and their impact on the natural and built environment are material planning considerations. The revised National Planning Policy Framework (NPPF) sets out the Government's objectives for the planning system, and how planning should facilitate and promote sustainable patterns of development, avoiding flood risk and accommodating the impacts of climate change. Government policy with respect to development in flood risk areas is contained within the revised NPPF and the supporting Planning Practice Guidance (PPG) (refer to extracts in **Appendix A**).

1.1.2 A Flood Risk Assessment and Drainage Management Strategy (FRA&DMS) has been completed in accordance with the revised NPPF and the PPG to review all sources of flood risk both to and from the proposed development. The report also considers the most appropriate drainage options including the implementation of Sustainable Drainage Systems (SuDS) in line with national policy.

1.1.3 The proposals are considered to be predominantly 'residential' in nature and as such is classified as 'More Vulnerable' in Table 2: Flood Risk Vulnerability Classification, within the Planning Practice Guidance. The PPG confirms that this type of land use is appropriate for Flood Zone 1, providing there is no increase in flood risk elsewhere due to the proposals.

1.2 Site Context

1.2.1 This FRA&DMS has been prepared to support a full planning application for Phase 2 & 3 of the residential-led development, on land to the east of Chipping Lane in Longridge. This assessment is to support Phase 2 & 3 of the wider/residential-led scheme, Phase 2 and 3 will comprise of 198no. residential dwellings collectively with some land allocated for a new school. Phase 1 (for 363no. residential dwellings) already has planning approval (Ref: 3/2014/0764) and is supported by a separate, approved FRA&DMS (Ref: HYD068_CHIPPING.LANE_FRA&DMS).

1.3 Consultation

1.3.1 The preparation of this report has been undertaken in consultations with the following interested parties; the Environment Agency (EA), United Utilities (UU), Lancashire County Council (LCC) and Ribble Valley Borough Council (RVBC). Consultation responses can be seen in **Appendix B, C** and **D**. The NPPF advises that the LPA should consult with the EA who will provide advice and guidance on flood issues at a strategic level and in relation to planning applications.

2.0 EXISTING SITE LOCATION

2.1 Location

2.1.1 The proposed development site will be access via the access road for Phase 1 from Chipping Lane to the west. The Ordnance Survey National Grid Reference (OS NGR) for the site is E: 360405, N: 437794 and the nearest postcode is PR3 3HB (see Location Plan in **Appendix E**). Phase 1 of the wider scheme already has planning approval and is highlighted by the green line in **Figure 1**. This assessment however focuses on Phase 2 & 3 only, which is referred to as 'the site' and is outlined in red in **Figure 1**.

2.1.2 The total site area covers 10.66ha, although when the proposed public open space, recreational areas and the land allocated for the new school are considered, the actual residential development area will cover 6.24ha. The site is bounded to the north and east by undeveloped agricultural land and to the south lies residential dwellings off Redwood Dive. Phase 1 is located to the west of the site with neighbouring residential development, the site will also be accessed from the west through Phase 1.

Figure 1: Aerial Photograph of site (Bing Maps, 2018)

2.2 Existing and Historical Land Use

2.2.1 The preparation of this report has identified that the site is currently undeveloped agricultural land to the east of Chipping Lane in Longridge. The site comprises of low-density vegetation with taller shrubs along some field boundaries. There are existing onsite drainage features present including the Ordinary Watercourse flowing north into Higgin Brook. Historically the site was utilised for agricultural purposes and no other historical land uses have been determined during the preparation of this report.

2.3 Topography

2.3.1 The topographic levels naturally vary onsite given the land-use. The site generally falls towards the Ordinary Watercourse flowing adjacent to the northern field boundary and to the Ordinary Watercourse crossing the site. There is an overall fall from 121.50mAOD in the south to 106.41mAOD in the north. A full topographical survey has been carried out and is included in **Appendix F.**

3.0 DEVELOPMENT PROPOSALS

3.1 Nature of the development

3.1.1 This planning application is for the construction of 198no. residential dwellings on undeveloped land located to the east of Chipping Lane in Longridge (outlined in red within **Figure 2**). The proposals will be complete with access via the approved Phase 1 scheme, footpaths, car parking, external works lighting, landscaping, boundary walls/fencing, external services and drainage as shown on the illustrative masterplan in **Figure 2** (full layout in **Appendix G**).

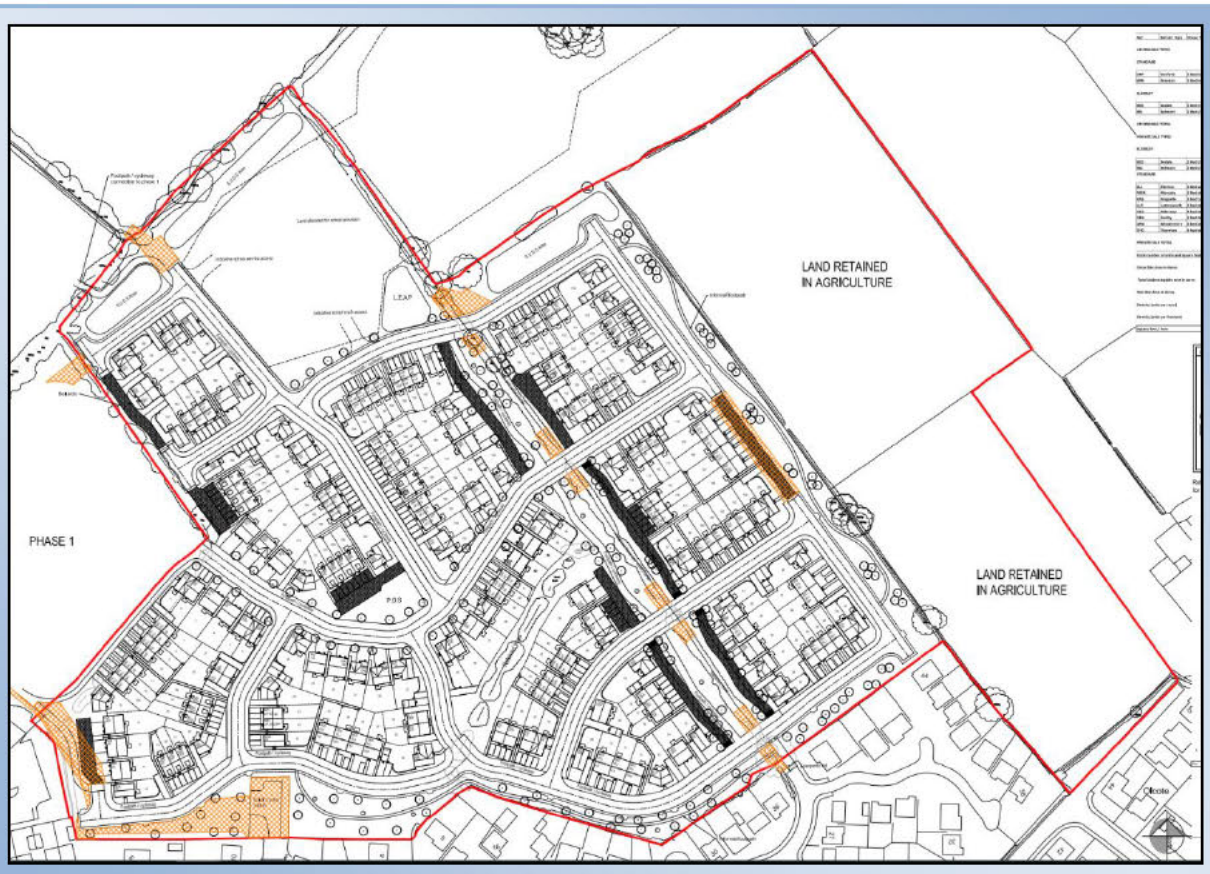

Figure 2: Illustrative Masterplan (2021)

3.1.2 The total site area covers 10.66ha and is considered to be 100% permeable at present. Due to the nature of the proposals, the proposed residential development area is smaller than the total site and covers 6.24ha. The development area excludes areas which are proposed to remain undeveloped, used for recreation and allocated for the new school. The post-development impermeable areas of the site will increase due to the nature of the development, to approximately 2.81ha which is 45% of the proposed development area.

3.1.3 There are Ordinary Watercourses present on and adjacent to the site which have been considered within the proposals. In accordance with Lancashire County Council (LLFA) there is a requirement to maintain easements from existing Ordinary Watercourses. LCC typically require an 8m easement to be maintained from the Top of Bank of the watercourses into the development area. The easement should provide clear and unimpeded access for future maintenance. This includes no fencing, walls or buildings should be present within the designated easement. Ordinary Watercourses are

required to remain open channel where possible however, culverting of the watercourse for crossing purposes is typically accepted by LCC. Culverting of the watercourse for vehicle crossing as with Phase 1 is allowed providing the culverting is kept to a minimum and follows LCC design requirements. Early discussion with LCC is advised to get approval of any culvert proposals.

3.1.4 In review of Untied Utilities (UU) sewer records, a foul water pumping station has been identified onsite adjacent to the southern boundary, this pumping station has been accounted for within the planning proposals. A public foul water sewer (375mm.dia) associated with the pumping station has also been identified onsite adjacent to the southern boundary. In addition, there is also a public surface water sewer (375mm.dia) which presently crosses the development site from the southern boundary towards Phase 1.

3.1.5 National and local policy identifies that Sustainable Drainage Systems (SuDS) should be incorporated into new development where at all feasible. As shown on the proposed planning layout there is scope to incorporate some SuDS features such as a pond/basin within the proposed open space/amenity areas. There is also a blue/green corridor shown on the planning layout to border the Ordinary Watercourse crossing the site. Detailed design will however be required to confirm the specific types, subject to ground investigations and detailed levels review.

4.0 SOURCES OF FLOOD RISK

4.1 Fluvial Flood Risk

4.1.1 Information relating to flood risk at the site has been obtained from the Environment Agency and from the Gov.uk website. The Flood Map for Planning shows that the site is wholly located within Flood Zone 1 as seen in **Figure 3**, the site is also identified to be at 'very low' risk of fluvial flooding based on the long-term fluvial flood risk mapping (refer to mapping in **Appendix B**).

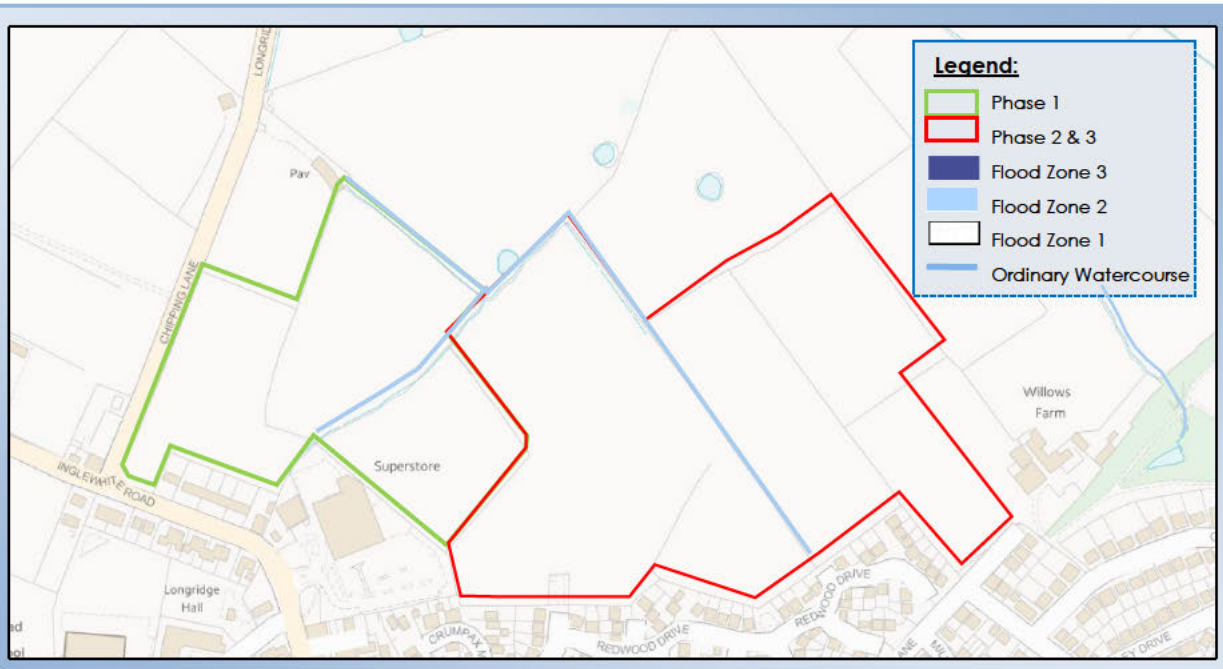

Figure 3: Fluvial/Tidal Flood Zone Map for Planning Extract (GOV.UK 2021)

4.1.2 There is an existing Ordinary Watercourse crossing the development site, which flows north until the watercourse outfalls into Higgin Brook approximately 1km to the north. Higgin Brook flows north and eventually outfalls into the River Loud (Main River) located approximately 1.2km north of site. Due to the distance of site to the nearest Main River, the risk associated is 'very low'.

4.1.3 In terms of the Ordinary Watercourse, consultations with the EA, RVBC and LCC also did not identify any historic flooding at the site and review of the topographic survey suggests that the existing site levels are 800mm above the bed levels of the Ordinary Watercourses crossing the site. Due to the nature and scale of the existing Ordinary Watercourse, the flood risk associated is considered to be 'very low'.

4.1.4 The LLFA (LCC) will require a maintenance easement to be maintained from the existing Ordinary Watercourse for future maintenance. The LCC typically require an 8m easement to be maintained from the Top of Bank of Ordinary Watercourses into the development area. The easement should provide clear and unimpeded access for future maintenance including no fencing, walls or buildings. Ordinary Watercourses are also required to remain open channel where possible. Culverting of the watercourse for crossing purposes however, is typically accepted by LCC as with Phase 1 of development, providing the culverting is kept to a minimum and follows LCC design

requirements. Early discussion with LCC is advised to get approval of any culvert proposals.

4.1.5 As part of the Phase 1 application, hydraulic modelling of the Ordinary Watercourse crossing the site was undertaken to determine the potential flow risks associated with the proposed part culverting the Ordinary Watercourse for crossing. The section below draws on outcomes of the modelling exercise to further evidence the risk to the proposals from the Ordinary Watercourse is low.

Hydraulic Assessment

4.1.6 For full details of the Ordinary Watercourse model build and parameters, refer to the full separate Hydraulic Assessment (HA) Report which has been included in **Appendix H**). This section of the Flood Risk Assessment will summarise the key findings of the separate report. The HA used The Flood Estimation Handbook (FEH) to obtain the catchment descriptors for Higgin Brook upstream of a point north of the development site. Three smaller sub-catchments (Sub A, Sub B and Sub C) upstream of the 600mm culvert located adjacent to Chipping Lane to the north of the site were identified using LiDAR data (see Hydraulic Assessment in **Appendix H** for full methodology).

4.1.7 The Revitalised Flood Hydrograph (ReFH) method was then applied for each sub-catchment based on catchment descriptors. The full hydrographs for all sub-catchments in all return periods are shown in **Appendix H**. The HA considered the following events:

- 1 in 5 year (20% AEP)
- 1 in 30 year (3.3% AEP)
- 1 in 100 year (1% AEP)
- 1 in 100 year (1% AEP) plus Climate Change (CC)

4.1.8 The results of the simulations have been presented in the form of longitudinal profile and cross sections (including peak water levels) included in **Appendix H**. The results show that water levels remain in bank for most of the Ordinary Watercourse reach in all Annual Exceedance Probabilities in the existing scenarios. In the proposed scenario a 600mm diameter pipe, approximately 26m long, was inserted upstream to simulate a proposed culvert crossing. Comparison of the existing and post development levels in the 1% AEP plus climate change event shows that peak levels remain largely unchanged, although with some small increases in places. These increases are relatively small and do not increase flood risk to the proposed development or neighbouring areas.

4.1.9 Sensitivity analysis was carried out on the model parameters and showed that water levels were not particularly sensitive to changes in channel roughness, therefore the impact of the proposed development on flood depths in vicinity of the site and the wider floodplain are low and within modelling tolerances. Overall, when the outcomes of the proposed scenario of the previously completed FRA are considered, the risk of the proposed development as part of Phase 2 & 3 is minimal.

Safe Access and Egress

4.1.10 The access road to site was previously approved as part of the Phase 1 application (Ref: 3/2014/0764). This is shown on the EA's Flood Zone Map for Planning, to also be

located within Flood Zone 1. Safe access and egress will therefore be maintained via Chipping Lane (through Phase 1).

4.2 Tidal Flood Risk

4.2.1 The coastline is located approximately 30km west of the proposed site and the Ribble Estuary is located approximately 20km west of site. Due to the distance from the coast, the associated flood risk from these sources is considered to be 'very low'. This is supported by the EA's Fluvial/Tidal Flood Zone Map for Planning as the site is shown to be located within Flood Zone 1.

4.3 Flood Risk Vulnerability Classification and Flood Zone Compatibility

4.3.1 The proposals are solely 'residential' in nature and as such is classified as 'More Vulnerable' in Table 2: Flood Risk Vulnerability Classification within the PPG. Table 3: Flood Risk Vulnerability and Flood Zone 'Compatibility' within the PPG confirms that this type of land use is appropriate for Flood Zone 1, providing there is no increase in flood risk elsewhere due to the proposals.

4.4 Surface Water Flood Risk

4.4.1 Surface water flooding occurs when rainwater is unable to drain away through the normal drainage systems or soak into the ground but lies on or flows over the ground instead. The risk associated with surface water run-off is indicated by the long-term flood mapping (extract shown in **Figure 4**).

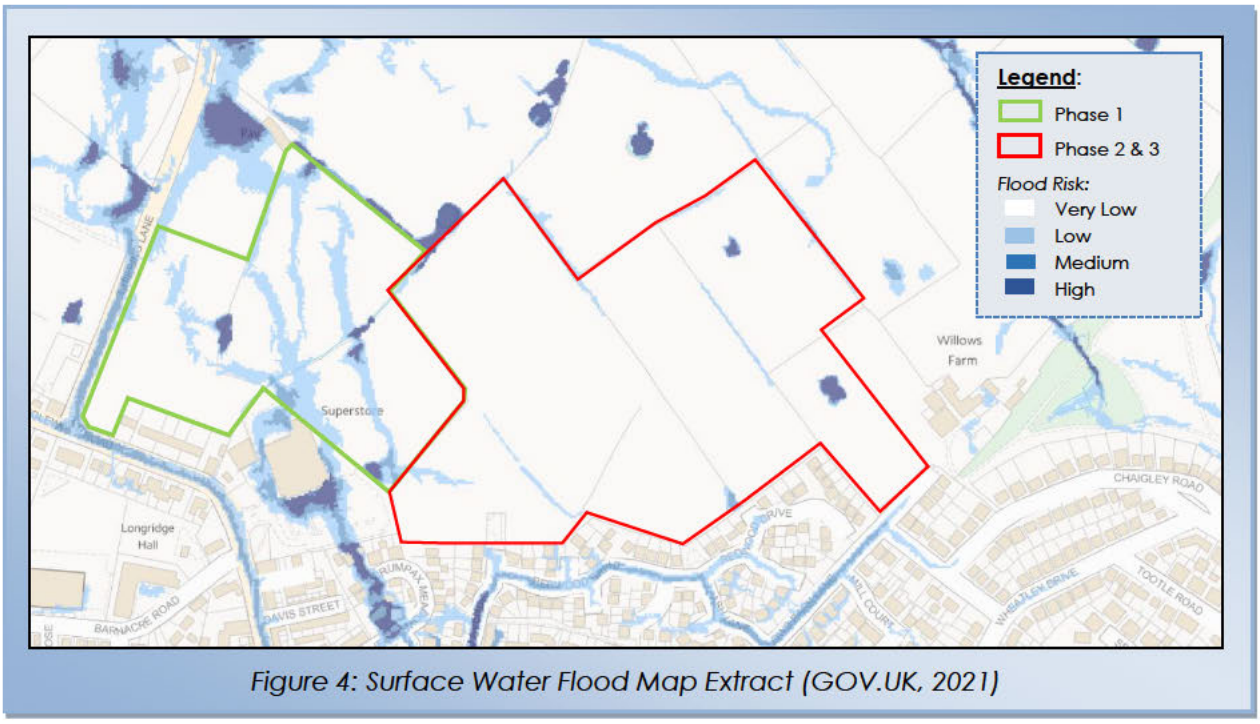

Figure 4: Surface Water Flood Map Extract (GOV.UK, 2021)

4.4.2 As indicated in **Figure 4**, the site is predominantly at 'very low' to 'low' risk from flooding associated with surface water. There are however some existing areas of 'medium' to 'high' risk shown onsite. A review of the existing topography shows that these higher flood risk areas are closely associated with the natural low-lying drainage ditches or

existing water bodies including the Ordinary Watercourse and existing pond features onsite. These low-lying areas would be susceptible to ponding in the extreme rainfall events as the surrounding ground levels are elevated in comparison (refer to **Appendix F** for topographic survey).

4.4.3 The flood risk to the proposals from surface water will be inherently reduced, post-development through the design and implementation of a sustainable surface water drainage regime onsite. Interception methods may be beneficial along any boundary where run-off can enter site or cause risk to others. For any residual risks it is advised that (following any re-grade of the site) FFL are raised above the external levels to provide overland flood routes for excess surface water run-off; this will help protect properties from excess surface water run-off.

Pluvial (Overland run-off) Flood Risk

4.4.4 Intense rainfall that is unable to soak into the ground or enter drainage systems can run-off land and result in flooding. Local topography and the land use can have a strong influence on the direction and depth of flow. The topography of the surrounding undeveloped areas means there is little potential for overland flows to impact on the site, as levels generally fall towards the existing watercourses.

4.4.5 The volume and rate of overland flow from land can be exacerbated, if development increases the percentage of impermeable area. Any overland flows generated by the development must be carefully controlled; safe avenues directing overland flow away from adjacent development is advised.

Sewer Flood Risk

4.4.6 In urban areas, rainwater is frequently drained into surface water sewers or sewers containing both surface and waste water known as 'combined sewers'. Foul water flooding often occurs in areas prone to overland flow and can result when the sewer is overwhelmed by heavy rainfall and will continue until the water drains away.

4.4.7 United Utilities (UU) records identify there to be a foul water pumping station onsite adjacent to the southern boundary (see sewer records in **Appendix C**). This pumping station has been accounted for within the planning proposals and a public foul water sewer (375mm.dia) associated with the pumping station has also been identified onsite adjacent to the southern boundary. In addition, there is also a public surface water sewer (375mm.dia) which presently crosses the development site from the southern boundary towards Phase 1. Consultation with UU, identified no recorded historical sewer flooding issues on or near to the proposed development site (see **Appendix C** for correspondence).

4.5 Groundwater Flood Risk

4.5.1 High groundwater levels are usually the key source of groundwater flooding, which occurs when excess water emerges at the grounds surface (or within manmade underground structures such as basements). Groundwater flooding is often more insistent than surface water flooding and would typically last for weeks/months rather than days meaning the result to property is often more severe.

4.5.2 In general terms groundwater flooding can occur from three main sources:

- If groundwater levels are naturally close to the surface, then this can present a flood risk during times of intense rainfall. No groundwater flood risk has been identified during consultation with the various interested parties.
- Seepage and percolation occur where embankments above ground level hold water. In these cases, water travels through the embankment material and emerges on the opposite side of the embankment. At present there are no reported problems with groundwater flooding.
- Groundwater recovery/rebound occurs where the water table has been artificially depressed by abstraction. When the abstraction stops the water table makes a recovery to its original level. There is the potential for groundwater flooding in low lying areas where groundwater levels have been depressed below their pre-pumping conditions, where these were at or close to ground level. As with the seepage scenario the likelihood of flooding from this source is low.

4.5.3 The mapping data for groundwater shows that the site is underlain by a Secondary A Bedrock Aquifer with Secondary 'Undifferentiated' Superficial Deposits (**Appendix B**). The site has been identified to be in a Low Groundwater Vulnerability Area to a Minor Aquifer.

4.5.4 No historical groundwater flooding of the site has been identified during consultation with the various interested parties. Irrespective, it is advised that external levels fall away from the property (where feasible) to minimise the flood risk from a variety of sources. By keeping the finished floor levels elevated relative to the externals, this should help create an overland flow route.

4.6 Artificial Sources of Flood Risk

4.6.1 National policy states that an FRA should consider the potential risks from a variety of other flood sources including artificial sources (such as risks from reservoirs and canals).

Reservoirs

4.6.2 The EA recognises reservoirs as bodies of water over 25,000cu.m, the site is not considered to be influenced by any flooding associated with a breach or failure in the neighbouring reservoirs.

4.6.3 There are a number of small bodies of water (less than 25,000cu.m) located to the north of the development site and are understood to aid in the natural drainage of the surrounding area. The risk they pose to site is considered to be 'low' due to the natural topography and the scale/nature of these small drainage features.

Canals

4.6.4 The nearest identified canal systems to the proposed development site is the Lancaster Canal located approximately 1km to the west of site. Due to the proximity and the local topography, the associated flood risk is considered to be 'low'.

4.6.5 Irrespective, it is advised that external levels fall away from the property (where feasible) to minimise the flood risk from a variety of sources. By keeping the Finished Floor Levels elevated relative to the externals, this should help create an overland flood

flow route in the event of a breach or any other source of flooding that could lead to overland flow.

4.7 Historical and Anecdotal Flooding Information

4.7.1 An internet-based search for flooding did not identify any historical flooding directly to the site however, the internet-based search did identify surface water flooding issues to the neighbouring Longridge area during extreme storm events. Furthermore, review of the Lancashire County Council's and Ribble Valley Borough Council's Preliminary Flood Risk Assessment and Strategic Flood Risk Assessment, did not highlight any historic flooding pertinent to this FRA.

4.7.2 Consultation with various interested parties including the EA also failed to highlight any historical flooding on the site. No historical sewer flooding issues onsite were highlighted by UU or within the wider area (correspondence in **Appendix B** and **C** respectively).

4.8 Flood Risk Mitigation Measures & Residual Risks

4.8.1 The site is located within Flood Zone 1 and considered to be at little risk of fluvial/tidal flooding. To observe a conservative approach however, mitigation measures have been proposed below to safeguard the development with regards to other potential residual sources of flood risk and to consider the uncertainties of climate change in accordance with the NPPF and PPG.

Mitigation Measures

4.8.2 For 'more vulnerable' development located within Flood Zone 1, it is typical to set the Finished Floor Levels (FFL) of residential dwellings to a minimum of 150mm above the existing ground levels. By ensuring the FFLs are raised sufficiently above the external levels (following any re-grade) should mitigate any risk of flooding from a variety of sources, including groundwater and surface water run-off risks at the proposed development.

4.8.3 Any overland flows generated by the development must be carefully controlled. Safe avenues directing overland flow way from any existing and proposed buildings are advised. Some areas of the site are shown to be at higher risk from surface water, these areas correspond with the existing drainage ditches and pond features. It would be recommended that the existing drainage features be retained where practical and/or mimicked within the development to make allowance for natural conveyance through the proposals.

4.8.4 In accordance with LCC there is a requirement to maintain an easement from the existing Ordinary Watercourse for future maintenance. The LCC typically require an 8m easement to be maintained from the Top of Bank of Ordinary Watercourses into the development area. The easement should provide clear and unimpeded access for future maintenance including no fencing, walls or buildings. Ordinary Watercourses are also required to remain open channel where possible. Culverting of the watercourse for crossing purposes however, is typically accepted by LCC as occurred on Phase 1 of development, providing the culverting is kept to a minimum and follows LCC design requirements. Early discussion with LCC is advised to get approval of any culvert proposals.

4.8.5 To minimise the flood risk to the neighbouring properties it is recommended that the surface water run-off generated by the proposals be managed effectively with the peak rates of run-off being restricted to the equivalent of the pre-development situation (with betterment). The proposed onsite surface water drainage system will need to be sized to contain the 1 in 30yr return period event below ground with exceedance from storm events up to and including the 1 in 100yr return period storm event with a 40% allowance for climate change being contained onsite.

4.8.6 As with any drainage system blockages within either the foul or surface water system have the potential to cause flooding or disruption. It is important that should any drainage systems not be offered for adoption to either the Water Company or the Local Authority then an appropriate maintenance regime should be scheduled with a suitably qualified management company for these private drainage systems.

Residual Risks

4.8.7 If an extreme rainfall event exceeds the design criteria for the drainage system it is likely that there will be some overland flows that are unable to enter the system, it is important that these potential overland flows are catered for within the development site if the capacity of the drainage system is exceeded.

5.0 SURFACE WATER MANAGEMENT

5.1 Pre-Development Surface Water Run-off

5.1.1 Phase 2 & 3 of the development covers 10.66ha. The proposed development area (excluding areas onsite such as the POS areas and the area allocated for a new school) and will cover 6.24ha based on the proposed planning proposals. At present the development area is 100% permeable and is understood to drain naturally to the onsite Ordinary Watercourse, which ultimately outfalls into Higgin Brook located to the north of the site.

5.1.2 The peak rates and volumes of run-off generated by Phase 2 & 3's development area has been calculated for the peak events shown in **Table 1** (full details **Appendix J**). The surface water run-off rates have been calculated using the FEH Statistical Method.

Site Area	Run-Off Rates				Run-Off Volumes	
	1 In 1 Year	1 In 30 Year	1 In 100 Year	QBar	1 In 1 Year	1 In 100 Year
6.236ha	73.8l/s	144.3l/s	176.5l/s	84.9l/s	710.7cu.m	2178.7cu.m

Table 1: Pre-Development Surface Water Run-Off Rates (Betts Hydro, 2021)

5.2 Post Development Surface Water Run-Off

5.2.1 At present the indicative proposals show the development area to cover 6.24ha of the wider site. Based on the planning layout we have estimated that the post-development impermeable areas will increase to approximately 45% of the development area. The unrestricted post-development run-off rates have been detailed in **Table 2**.

Site Area	Run-Off Rates		
	1 In 1 Yr	1 In 30 Yr	1 In 100 Yr +CC
2.806ha	150.2l/s	291.3l/s	488.5l/s

Table 2: Post-Development Un-Restricted Run-Off Rates (Betts Hydro, 2021)

5.2.2 In accordance with national and local planning policies it is necessary to restrict surface water run-off rates where at all practical to mimic a pre-development greenfield situation. The proposals will therefore be to discharge surface water run-off from site mimicking the pre-development greenfield situation (**Table 1**). Further details of proposed drainage strategy can be found in Section 5.6.

5.3 Sustainable Drainage Systems (SuDS)

5.3.1 Sustainable Drainage Systems (SuDS) can address the four key sustainability objectives including: water quantity, water quality, amenity and biodiversity. Peak surface water discharge rates to watercourses and sewers should be appropriately managed and where possible reduced. Preference should always be given to SuDS over the traditional methods of buried sewers wherever possible and practical.

5.3.2 It would be beneficial to implement wider green space/Public Open Space area(s) in one or more locations within site, where SuDS features could be implemented. Multiple

benefits to using SuDS include the improvement of bio-diversity, aesthetics, ecology and water quality. Opportunities should also be taken to provide soft landscaping where at all possible on site to assist in minimising surface water run-off.

5.3.3 Given the indicative layout, there may be the opportunity to incorporate SuDS methods such as swales and ponds (**Figure 5**) within the non-developed areas, to provide a degree of treatment before flows are carried offsite. It would also be recommended that permeable paving and bio-filtration be considered in non-adopted areas where at all feasible; to assist locally with surface water management (subject to optimum ground conditions). If infiltration is not feasible then a connection into the main drainage systems would be needed.

Figure 5: SuDS Photographs (SusDrain, 2012)

5.3.4 Promoting SuDS to deal with surface water at the source, will limit the required attenuation and in turn reduce the volume of surface water in the nearby watercourse and sewer infrastructure. There may be the potential to utilise SuDS features for conveyance/attenuation of surface water flows within the proposed drainage strategy, opposed to the traditional below ground storage methods. Detailed design should confirm whether this site would be suitable for incorporation of SuDS following more detailed analysis of levels, ground conditions and attenuation requirements.

5.4 Methods of Surface Water Management

5.4.1 At present the development area for Phase 2 & 3 covers 6.24ha and the proposed impermeable area is assumed to increase from 0% to 45%. There are three methods that have been reviewed for the management and discharge of surface water. These may be applied individually or collectively to form a complete strategy and should be applied in the order of priority listed below:

- Discharge via infiltration
- Discharge to watercourse
- Discharge to public sewerage system

5.5 Discharge via Infiltration

5.5.1 Any impermeable areas that can drain to soakaway or an alternative method of infiltration would significantly improve the sustainability of any surface water systems.

5.5.2 The Cranfield Soil and AgriFood Institute (CSAI), Soilscapes viewer identifies the soils to be slowly permeable, seasonally wet, slightly acid but base-rich loamy and clayey. The British Geology Survey (BGS) mapping data indicates that the bedrock geology consists of a mixture of Bowland Shale Formation (Mudstone) and Pendleside Sandstone Member (Sandstone) and has superficial deposits associated with Till and Devensian.

5.5.3 Based on the ground conditions identified by the published online datasets, it can be considered that infiltration would not likely provide a viable drainage solution for the development site due to the impermeable strata. A ground investigation report (Ref: STN3505NM-G01) was also undertaken for Phase 1 and identified soakaways were not suitable to be used as a method for managing surface water run-off. Infiltration rates however, vary on a site by site basis and therefore it would be recommended further investigation in the form of Soakaway Testing to BRE365, takes place within Phase 2 & 3 areas upon planning approval, to confirm these areas are also not suitable for an infiltration-based solution.

5.6 Discharge to Watercourse

5.6.1 Assuming infiltration is not suitable for managing all the surface water run-off generated by the development, the next method in the drainage hierarchy is discharge surface water to a watercourse. As previously mentioned, most of the site naturally drains into the Ordinary Watercourse crossing the development site.

5.6.2 The surface water run-off generated by the development is therefore proposed to mimic the existing situation and discharge into the existing Ordinary Watercourse crossing the development site, as illustrated in the preliminary drainage proposals plan (**Figure 6**). This approach is similar to that proposed and agreed for the earlier Phase 1 and mimics the existing situation through the current mechanisms of run-off management.

5.6.3 Detailed design will need to be carried out to confirm whether a site wide gravity solution can be achieved. Although, the site naturally drains to the Ordinary Watercourse at present, when the development proposed levels are considered and formal connections made. It is likely that multiple surface water outfalls will be required to accommodate the layout proposals, the specifics will be confirmed during detailed design.

5.6.4 Consents will be required from LCC who are the LLFA and responsible in part for Ordinary Watercourses in terms of proposed works. Consent would be required for any new outfall structures on the Ordinary Watercourse, and any culverting (to accommodate crossings shown on the layout). Agreement would also be required for the proposed rates of discharge to the Ordinary Watercourse, to ensure no increase risk to others result from the site.

5.6.5 In accordance with the LCC, there is a requirement to maintain an easement from existing Ordinary Watercourses and Main Rivers. The EA and LCC both require an 8m easement to be maintained from the Top of Bank of the watercourse into the development area. The easement should provide clear and unimpeded access for future maintenance no fencing, walls or buildings should be present within the designated easement as shown within the proposed planning layout.

Figure 6: Preliminary Proposed Drainage Plan extract (Betts Hydro, 2021)

5.6.6 In accordance with the SuDS Manual (CIRIA 753) and the Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) all sites should endeavour to achieve as close to pre-development greenfield rates as is viable. Based on the development area, the pre-development greenfield rate (QBar) is calculated to be 84.9l/s using the FEH Statistical Method (see summary in **Appendix J**). The proposals are therefore to restrict surface water run-off to mimic a pre-development greenfield situation. The overall rate of discharge would need to be proportioned between the number of outfalls where necessary. This will be confirmed during detailed design, when the drainage technical detailed are reviewed.

Impermeable Area (2.806ha)	1 In 1 Year	1 In 30 Year	1 In 100 Year + 30% CC
Restricted Run-Off Rate	84.9l/s	84.9l/s	84.9l/s
Estimated Stormwater Storage Volume	117cu.m-290cu.m	515cu.m-853cu.m	1113cu.m-1720cu.m

Table 4: Estimated Stormwater Storage Requirements (Betts Hydro, 2021)

5.6.7 It would be beneficial to implement SuDS features where at all feasible, subject to ground investigation and a detailed levels review. If designed appropriately the SuDS features such as a pond/basin could potentially aid in the attenuation requirements for the proposals (if located appropriately) and provide added benefits in terms of water

quality improvements. Detailed design will be required to confirm whether SuDS can be incorporated, at present indicative proposals allow for the inclusion of SuDS, including a pond/basin at multiple outfall points proposed.

5.7 Discharge to Public Sewer Network

5.7.1 UU sewer records identify there to be a public surface water sewer (375mm.dia) which presently crosses the development site from the southern boundary towards Phase 1. Should infiltration not be feasible then the surface water flows generated are proposed to discharge to the existing Ordinary Watercourse crossing the site and not the existing sewer network.

5.8 Climate Change

5.8.1 There are indications that the climate in the UK is changing significantly and it is widely believed that the nature of climate change will vary greatly by region. Current expert opinion indicates the likelihood that future climate change would produce more frequent short duration and high intensity rainfall events with the addition of more frequent periods of long duration rainfall. It is believed that the impact of climate change means there is likely to be a long-term increase in the average sea levels, with an expectation that sea levels will rise gradually. An increase in flood water levels means that future flooding events will occur more frequently and will have a greater impact.

5.8.2 In light of the future uncertainties Climate Change should be accounted for within the design of all new developments. The recently published Environment Agency document '*Adapting to Climate Change: Advice for Flood and Coastal Erosion Risk Management Authorities*' supersedes Defra's policy statement on Flood Risk and Coastal Erosion Risk Management (2009) and should be used for future proposals. Climate change factors have been considered and any increase in the level of flood risk (to the site) from climate change is likely to be related to the increase in rainfall intensity and duration and its impact upon the surface water drainage system.

5.8.3 The site is subject to an existing outline approval (Ref: 3/2014/0764) and the design of Phases 2 & 3 of this development will conform to the criteria already agreed and embedded in the approved planning documentation. The Climate Change factor that has been considered for an increase in rainfall intensity is 30%

6.0 FOUL WATER MANAGEMENT

6.1 Due to the existing land-use onsite, no existing foul water connections to the public sewer network are present. Review of the UU sewer records identifies a foul water pumping station onsite adjacent to the southern boundary. This pumping station has been accounted for within the planning proposals and a public foul water sewer (375mm.dia) associated with the pumping station has been identified onsite adjacent to the southern boundary (see sewer records in **Appendix C**).

6.2 Phase 1 has a separate approved drainage management strategy (REF: HYD068_CHIPPING.LANE_FRA&DMS) was detailed in the approved supporting FRA&DMS, which shows foul from this portion of development will outfall into the foul water system located within Inglewhite Road to the south-east of Phase 1 (**Appendix C**).

6.3 Based on the proposals for the construction of up to 198no. residential units for Phase 2 & 3, the approximate peak foul water flows generated by the development are 9.2l/s. This is based on 4000 litres per dwelling per 24 hours; the guidance contained within Sewers for Adoption (SfA).

6.4 The proposals are therefore to connect flows from Phase 2 & 3 to the foul water pumping station within Phase 1 which ultimately connects into the public sewer network within Inglewhite Road. The pumping station within Phase 1 has been designed to also accommodate flows from Phase 2 & 3 however, formal consent is still required from UU approving this connection, discussion with UU shown in **Appendix C**.

6.5 A pre-development enquiry was sent to UU in 2018, and an agreement in principle was confirmed allowing foul water to discharge at an unrestricted rate into the 300mm dia. public foul water sewer within Inglewhite Road. It is understood that this response has now expired and therefore a new pre-development enquiry has been sent to UU; however, a response is currently outstanding.

6.6 Detailed design will confirm the full technical details based on the engineering constraints. Consent from UU will be required for works to the public sewer infrastructure. It is recommended that early discussion is undertaken to confirm acceptance of the strategy and identify any additional considerations such as preferred point of connection and capacity constraints. Initial discussion has been carried out to get an agreement in principle at this time.

7.0 SUMMARY AND CONCLUSIONS

7.1 This Flood Risk Assessment and Drainage Management Strategy was commissioned by Barratt Homes referred to hereafter as 'the client'. This report has been prepared to support a full planning application for the construction of a residential development on land to the east of Chipping Lane in Longridge. Phase 1 has planning approval (Ref: 3/2014/0764) and is supported by a separate, approved Flood Risk Assessment and Drainage Management Strategy (HYD068_CHIPPING.LANE_FRA&DMS). This assessment therefore focuses on the residential development proposed as part of Phase 2 & 3 only. Phase 2 & 3 collectively cover 10.66ha, although the proposed development area covers a smaller portion at 6.24ha.

Flood Risk

7.2 The site is located wholly within Flood Zone 1 based on the Environment Agency Flood Map for Planning. The proposals are for a residential-led development, which is considered 'More Vulnerable' in Table 2: Flood Risk Vulnerability Classification within Planning Practice Guidance. This 'More Vulnerable' development is confirmed to be appropriate within Flood Zone 1, providing there is no increase in flood risk elsewhere due to the proposals.

7.3 Consultations with the Environment Agency, Ribble Valley Borough Council, Lancashire County Council and United Utilities have been undertaken and did not identify any historical incidents of flooding to the site or within the neighbouring areas. This assessment has considered all sources of flood risk, this includes the existing Ordinary Watercourse crossing the site which is understood to outfall into Higgin Brook 1km north of the site. As part of Phase 1, hydraulic modelling of the Ordinary Watercourse was undertaken to determine the potential flow risks associated with the proposed culverting the Ordinary Watercourse for vehicular crossing as part of Phase 1. The outcomes of the modelling exercise evidenced the risk to the proposals from the existing Ordinary Watercourse is low. The full Hydraulic Assessment has been appended to this assessment for full details. To summarise the proposed Phase 2 & 3 development area will, following the implementation of mitigation measures remain flood free in all key storm events, including the 1 in 100-year (1% AEP) plus Climate Change event without having any impact on the neighbouring land/properties.

7.4 The site is at 'very low' to 'low' flood risk from the reviewed sources of flooding. The primary source of flood risk is considered to be from surface water where the risk varies across the site from 'very low' to 'high' within the natural low-lying areas of site. The risks post-development from surface water will be effectively managed through implementation of the mitigation measures proposed within this assessment, including appropriate ground levels design and inclusion of a suitable surface water management infrastructure. To minimise flood risk from surface water it would also be recommended that natural drainage routes through the site be maintained within the proposals, including the existing Ordinary Watercourse, crossing the site from the southern boundary to the north.

Drainage Strategy

7.5 To ensure surface water flood risk to others does not increase, it is important to ensure surface water run-off is appropriately managed in accordance with the sustainable drainage hierarchy. Three methods have therefore been reviewed for the appropriate

management of surface water run-off. These have been applied in the order of priority being; discharge via infiltration, to a watercourse and finally to public sewerage system.

7.6 Based on the ground conditions identified by the published online datasets, infiltration is not considered to provide a viable drainage solution for the development due to the impermeable strata. A ground investigation report (Ref: STN3505NM-G01) was also undertaken for Phase 1 and identified soakaways were not suitable to be used as a method for managing surface water run-off. As infiltration rates can vary on a site by site basis, the Local Planning Authority may still require onsite Soakaway Testing to be undertaken to evidence this is true for Phase 2 & 3, prior to full commencement of works.

7.7 Assuming infiltration is not feasible, the next method in the drainage hierarchy should be discharge to a watercourse. Most of the site naturally drains to the Ordinary Watercourse crossing the site at present and the proposals are therefore to mimic the existing situation, discharging surface water run-off from the site to the watercourse using the existing onsite features where practical. Detailed design will need to confirm feasibility of a site wide gravity solution, although this is anticipated as most of the site naturally drains in this manner at present. It is assumed that multiple outfalls to the watercourse will be required given the scale of the development and formal consents will be required from Lancashire County Council for any works to the Ordinary Watercourse, including agreement of the proposed discharge rates and points of connection.

7.8 In accordance with the SuDS Manual and the Non-Statutory Technical Standards for Sustainable Drainage Systems, all sites should endeavour to achieve as close to pre-development greenfield rates as viable. The proposals are to therefore discharge to the watercourse crossing the site mimicking pre-development greenfield situation, QBar is calculated to be 84.9l/s and will need to be proportioned between the multiple proposed points of outfall. Restricting the rate of discharge will generate an onsite stormwater storage requirement which will be catered for on the site prior to discharge to the watercourse. It would be beneficial to implement SuDS features including permeable surfaces and bio-filtration where at all feasible (subject to ground investigation and contamination review). Given the scale of development it is proposed that pond/basin features be included onsite near to the proposed outfall location(s). If designed appropriately the SuDS features could potentially aid in the attenuation requirements for the proposals and provide added benefits in terms of water quality. Detailed design will be required to confirm whether SuDS can be incorporated.

7.9 This Flood Risk Assessment and Drainage Management Strategy has been prepared in consultation with the relevant interested parties and incorporates their comments where possible. The report is commensurate with the scale and nature of the development proposals and in summary, the development can be considered appropriate in accordance with the Planning Practice Guidance.

8.0 RECOMMENDATIONS

8.1 For 'more vulnerable' development located within Flood Zone 1, it is typical to set the Finished Floor Levels (FFL) of residential dwellings to a minimum of 150mm above the existing ground levels. By ensuring the FFLs are raised sufficiently above the external levels (following any re-grade) should mitigate any risk of flooding from a variety of sources, including groundwater and surface water run-off risks at the proposed development.

8.2 Any overland flows generated by the proposed development must be controlled, safe avenues directing overland flow away from any existing and proposed buildings are advised. As with any development it is also advised that external levels fall away from property to minimise the flood risk from a variety of sources.

8.3 In accordance with LCC there is a requirement to maintain an easement from the existing Ordinary Watercourse for future maintenance. The LCC typically require an 8m easement to be maintained from the Top of Bank of Ordinary Watercourses into the development area. The easement should provide clear and unimpeded access for future maintenance including no fencing, walls or buildings. Ordinary Watercourses are also required to remain open channel where possible. Culverting of the watercourse for crossing purposes however, is typically accepted by LCC as occurred on Phase 1 of development, providing the culverting is kept to a minimum and follows LCC design requirements. Early discussion with LCC is advised to get approval of any culvert proposals.

8.4 To minimise the flood risk to the neighbouring property and proposed dwellings it is proposed that the surface water run-off generated by the proposals be managed effectively with the peak rates of run-off being restricted to the equivalent of the pre-development situation

8.5 Detailed drainage design will be required to refine the drainage strategy following more in-depth levels and layout review. Early discussion with all relevant parties including the EA, LCC, RVBC and UU is advised for any proposed works. Consents will be required from LCC who are the LLFA and therefore in charge of the Ordinary Watercourses in terms of proposed works. Consent would be required for any new outfall structures on the Ordinary Watercourse, and any culverting (to accommodate crossings shown on the layout). Agreement would also be required to agree the proposed rates of discharge to the Ordinary Watercourse.

8.6 The proposed onsite surface water drainage system will need to be sized to contain the 30yr return period event wholly below ground with overland run-off from storm events up to and including the 1 in 100yr return period storm event with a 40% allowance for climate change being contained onsite.

8.7 It is important that should any drainage systems not be offered for adoption to either the United Utilities or Lancashire County Council then an appropriate maintenance regime should be scheduled with a suitably qualified management company for these private drainage systems.

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APPENDIX A: NPPF & PPG EXTRACTS

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14. Meeting the challenge of climate change, flooding and coastal change

152. The planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure.

Planning for climate change

153. Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures[53]. Policies should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts, such as providing space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure.

154. New development should be planned for in ways that:

a) avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure; and

b) can help to reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards.

155. To help increase the use and supply of renewable and low carbon energy and heat, plans should:

a) provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts);

b) consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and

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[53] In line with the objectives and provisions of the Climate Change Act 2008.

c) identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers.

156. Local planning authorities should support community-led initiatives for renewable and low carbon energy, including developments outside areas identified in local plans or other strategic policies that are being taken forward through neighbourhood planning.

157. In determining planning applications, local planning authorities should expect new development to:

a) comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and

b) take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.

158. When determining planning applications for renewable and low carbon development, local planning authorities should:

a) not require applicants to demonstrate the overall need for renewable or low carbon energy, and recognise that even small-scale projects provide a valuable contribution to cutting greenhouse gas emissions; and

b) approve the application if its impacts are (or can be made) acceptable[54]. Once suitable areas for renewable and low carbon energy have been identified in plans, local planning authorities should expect subsequent applications for commercial scale projects outside these areas to demonstrate that the proposed location meets the criteria used in identifying suitable areas.

Planning and flood risk

159. Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.

160. Strategic policies should be informed by a strategic flood risk assessment, and should manage flood risk from all sources. They should consider cumulative impacts in, or affecting, local areas susceptible to flooding, and take account of advice from the Environment Agency and other relevant flood risk management authorities, such as lead local flood authorities and internal drainage boards.

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[54] Except for applications for the repowering of existing wind turbines, a proposed wind energy development involving one or more turbines should not be considered acceptable unless it is in an area identified as suitable for wind energy development in the development plan; and, following consultation, it can be demonstrated that the planning impacts identified by the affected local community have been fully addressed and the proposal has their backing.

161. All plans should apply a sequential, risk-based approach to the location of development – taking into account all sources of flood risk and the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property. They should do this, and manage any residual risk, by:

a) applying the sequential test and then, if necessary, the exception test as set out below;

b) safeguarding land from development that is required, or likely to be required, for current or future flood management;

c) using opportunities provided by new development and improvements in green and other infrastructure to reduce the causes and impacts of flooding, (making as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management); and

d) where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to relocate development, including housing, to more sustainable locations.

162. The aim of the sequential test is to steer new development to areas with the lowest risk of flooding from any source. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding. The strategic flood risk assessment will provide the basis for applying this test. The sequential approach should be used in areas known to be at risk now or in the future from any form of flooding.

163. If it is not possible for development to be located in areas with a lower risk of flooding (taking into account wider sustainable development objectives), the exception test may have to be applied. The need for the exception test will depend on the potential vulnerability of the site and of the development proposed, in line with the Flood Risk Vulnerability Classification set out in Annex 3.

164. The application of the exception test should be informed by a strategic or site-specific flood risk assessment, depending on whether it is being applied during plan production or at the application stage. To pass the exception test it should be demonstrated that:

a) the development would provide wider sustainability benefits to the community that outweigh the flood risk; and

b) the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

165. Both elements of the exception test should be satisfied for development to be allocated or permitted.

166. Where planning applications come forward on sites allocated in the development plan through the sequential test, applicants need not apply the sequential test again. However, the exception test may need to be reapplied if relevant aspects of the proposal had not been considered when the test was applied at the plan-

making stage, or if more recent information about existing or potential flood risk should be taken into account.

167. When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment[55]. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;

b) the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;

c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;

d) any residual risk can be safely managed; and

e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.

168. Applications for some minor development and changes of use[56] should not be subject to the sequential or exception tests but should still meet the requirements for site-specific flood risk assessments set out in footnote 55.

169. Major developments should incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate. The systems used should:

a) take account of advice from the lead local flood authority;

b) have appropriate proposed minimum operational standards;

c) have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and

d) where possible, provide multifunctional benefits.

Coastal change

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[55] A site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.

[56] This includes householder development, small non-residential extensions (with a footprint of less than 250m^2) and changes of use; except for changes of use to a caravan, camping or chalet site, or to a mobile home or park home site, where the sequential and exception tests should be applied as appropriate.

170. In coastal areas, planning policies and decisions should take account of the UK Marine Policy Statement and marine plans. Integrated Coastal Zone Management should be pursued across local authority and land/sea boundaries, to ensure effective alignment of the terrestrial and marine planning regimes.

171. Plans should reduce risk from coastal change by avoiding inappropriate development in vulnerable areas and not exacerbating the impacts of physical changes to the coast. They should identify as a Coastal Change Management Area any area likely to be affected by physical changes to the coast, and:

a) be clear as to what development will be appropriate in such areas and in what circumstances; and

b) make provision for development and infrastructure that needs to be relocated away from Coastal Change Management Areas.

172. Development in a Coastal Change Management Area will be appropriate only where it is demonstrated that:

a) it will be safe over its planned lifetime and not have an unacceptable impact on coastal change;

b) the character of the coast including designations is not compromised;

c) the development provides wider sustainability benefits; and

d) the development does not hinder the creation and maintenance of a continuous signed and managed route around the coast[57].

173. Local planning authorities should limit the planned lifetime of development in a Coastal Change Management Area through temporary permission and restoration conditions, where this is necessary to reduce a potentially unacceptable level of future risk to people and the development.

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[57] As required by the Marine and Coastal Access Act 2009.

Revision date: 06 03 2014

What should be considered if bringing forward a Neighbourhood Development Order/Community Right to Build Order in an area at risk of flooding?

The general approach and requirements for site-specific flood risk assessments should be applied to developments in areas at risk of flooding to be permitted by Neighbourhood Development/ Community Right to Build Orders. This means that for any development proposals:

- in Flood Zone 2 or 3;
- or of at least 1 hectare;
- or in an area that has critical drainage problems (as notified to the local planning authority by the Environment Agency);
- or that may be subject to other sources of flood risk;

a site-specific flood risk assessment should support the draft Order. The flood risk assessment checklist may be helpful in this respect.

Where the neighbourhood planning area is in Flood Zone 2 or 3, or is in an area with critical drainage problems, advice on the scope of the flood risk assessment required should be sought from the Environment Agency. Where the area may be subject to other sources of flooding, it may be helpful to consult other bodies involved in flood risk management, as appropriate.

Where a Neighbourhood Development/Community Right to Build Order is under consideration for a site/area in Flood Zone 2 or 3, which has not been allocated in the development plan through the Sequential Test, and if necessary the Exception Test, it will be necessary for those proposing the development, in having regard to the National Planning Policy Framework's policies on flood risk, to demonstrate why the development cannot reasonably be located in areas of lower flood risk.

In all cases where new development is proposed, the sequential approach to locating development in areas of lower flood risk should still be applied within a neighbourhood planning area.

Neighbourhood Development/Community Right to Build Orders that propose new development that would be;

- contrary to the flood risk vulnerability and flood zone compatibility table (Table 3), or;
- within areas at risk of flooding where sequential testing shows there to be places at lower flood risk which are suitable and reasonably available for the development proposed,

should not be considered appropriate, having regard to the national policies on development and flood risk.

Paragraph: 064 Reference ID: 7-064-20140306

Revision date: 06 03 2014

Flood Zone and flood risk tables

- Table 1: Flood Zones
- Table 2: Flood risk vulnerability classification
- Table 3: Flood risk vulnerability and flood zone 'compatibility'

Table 1: Flood Zones

These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. They are shown on the Environment Agency's Flood Map for Planning (Rivers and Sea (https://flood-map-for-planning.service.gov.uk/)), available on the Environment Agency's web site, as indicated in the table below.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding.(Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Note: The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the Strategic Flood Risk Assessment when considering location and potential future flood risks to developments and land uses.

Paragraph: 065 Reference ID: 7-065-20140306

Revision date: 06 03 2014

Table 2: Flood risk vulnerability classification

Essential infrastructure

- Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk.
- Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood.
- Wind turbines.

Highly vulnerable

- Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding.
- Emergency dispersal points.
- Basement dwellings.
- Caravans, mobile homes and park homes intended for permanent residential use.
- Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure').

More vulnerable

- Hospitals
- Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.
- Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.
- Non–residential uses for health services, nurseries and educational establishments.
- Landfill* and sites used for waste management facilities for hazardous waste.
- Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

Less vulnerable

- Police, ambulance and fire stations which are not required to be operational during flooding.
- Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'more vulnerable' class; and assembly and leisure.
- Land and buildings used for agriculture and forestry.
- Waste treatment (except landfill* and hazardous waste facilities).
- Minerals working and processing (except for sand and gravel working).
- Water treatment works which do not need to remain operational during times of flood.
- Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place.

Water-compatible development

- Flood control infrastructure.
- Water transmission infrastructure and pumping stations.
- Sewage transmission infrastructure and pumping stations.
- Sand and gravel working.
- Docks, marinas and wharves.
- Navigation facilities.
- Ministry of Defence defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.
- Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.
- Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

" * " Landfill is as defined in Schedule 10 of the Environmental Permitting (England and Wales) Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/675/schedule/10/made).

Paragraph: 066 Reference ID: 7-066-20140306

Revision date: 06 03 2014

Table 3: Flood risk vulnerability and flood zone 'compatibility'

Table 3: flood risk vulnerability and flood zone ‘compatibility'
(https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/575184/Table_3_-_Flood_risk_vulnerability_and_flood_zone__compatibility_.pdf) (PDF, 58.1KB, 1 page)

Key:

✓ Development is appropriate

✗ Development should not be permitted.

Notes to table 3:

- This table does not show the application of the Sequential Test which should be applied first to guide development to Flood Zone 1, then Zone 2, and then Zone 3; nor does it reflect the need to avoid flood risk from sources other than rivers and the sea;
- The Sequential and Exception Tests do not need to be applied to minor developments and changes of use, except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site;
- Some developments may contain different elements of vulnerability and the highest vulnerability category should be used, unless the development is considered in its component parts.

† In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

” * “ In Flood Zone 3b (functional floodplain) essential infrastructure that has to be there and has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.

Paragraph: 067 Reference ID: 7-067-20140306

Revision date: 06 03 2014

Site-specific flood risk assessment: Checklist

1 - Development site and location

You can use this section to describe the site you are proposing to develop. It would be helpful to include, or make reference to, a location map which clearly indicates the development site.

a. Where is the development site located? (eg postal address or national grid reference)

b. What is the current use of the site? (eg undeveloped land, housing, shops, offices)

c. Which Flood Zone (for river or sea flooding) is the site within? (ie Flood Zone 1, Flood Zone 2, Flood Zone 3). As a first step, you should check the Flood Map for Planning (http://apps.environment-agency.gov.uk/wiyby/37837.aspx) (Rivers and Sea). It is also a good idea to check the Strategic Flood Risk Assessment for the area available from the local planning authority.

2 - Development proposals

APPENDIX B: EA INFORMATION & CORRESPONDENCE

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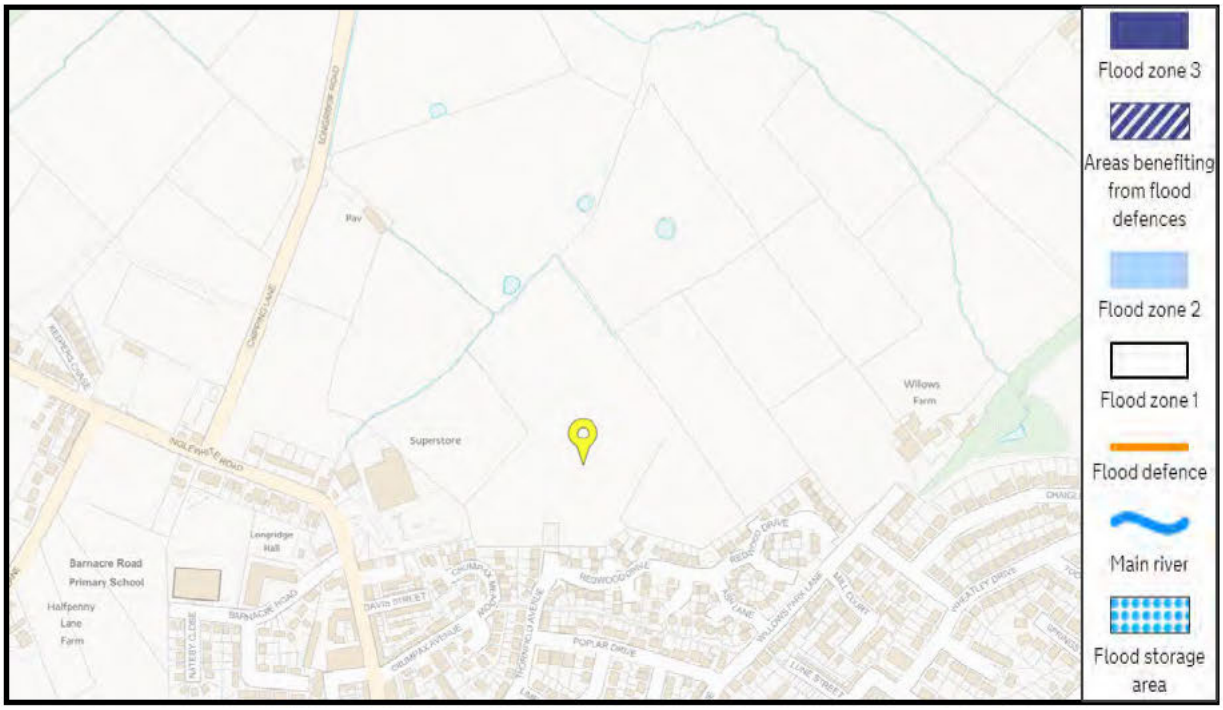
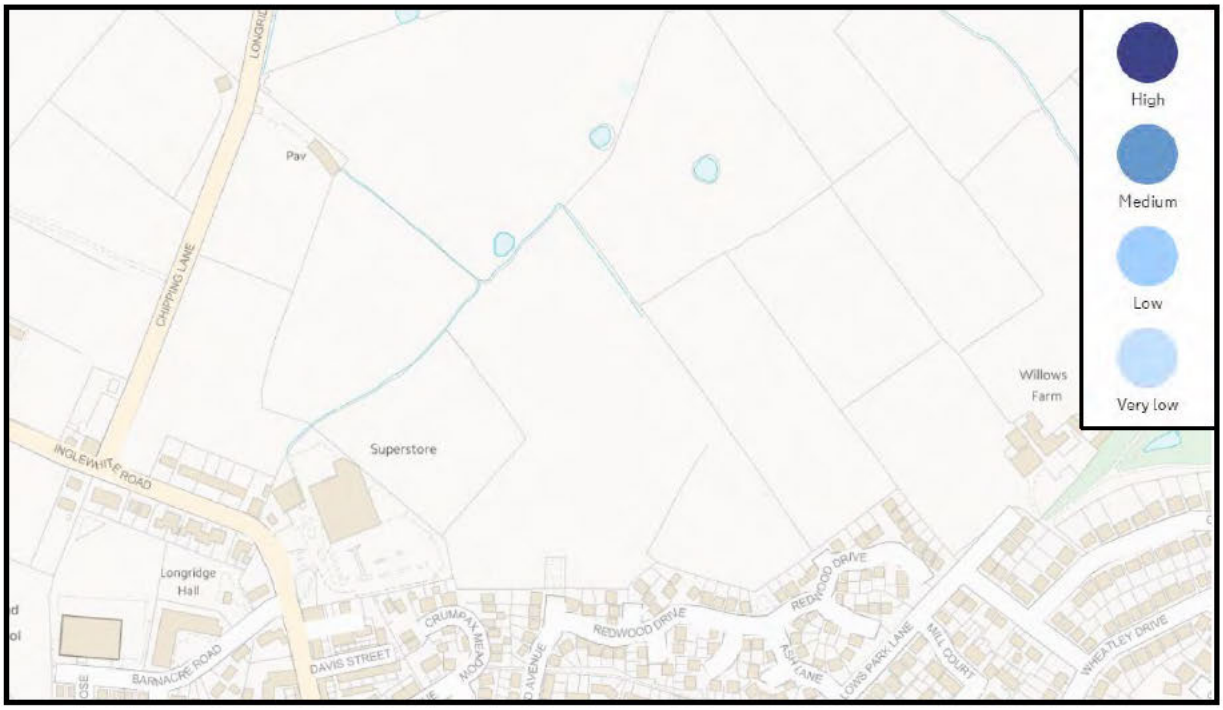
NATIONAL FLOOD MAPPING

BETTS HYDRO
CONSULTING ENGINEERS

Flood Map for Planning



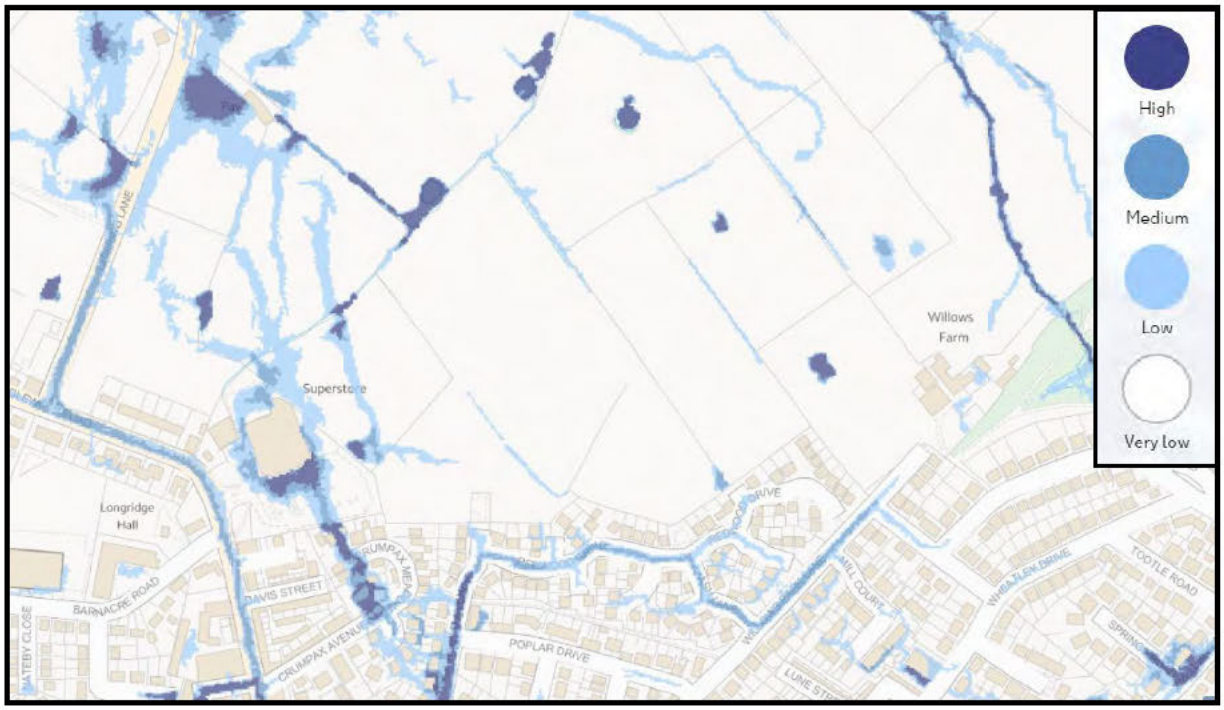
Long Term Flood Risk – Rivers or Sea



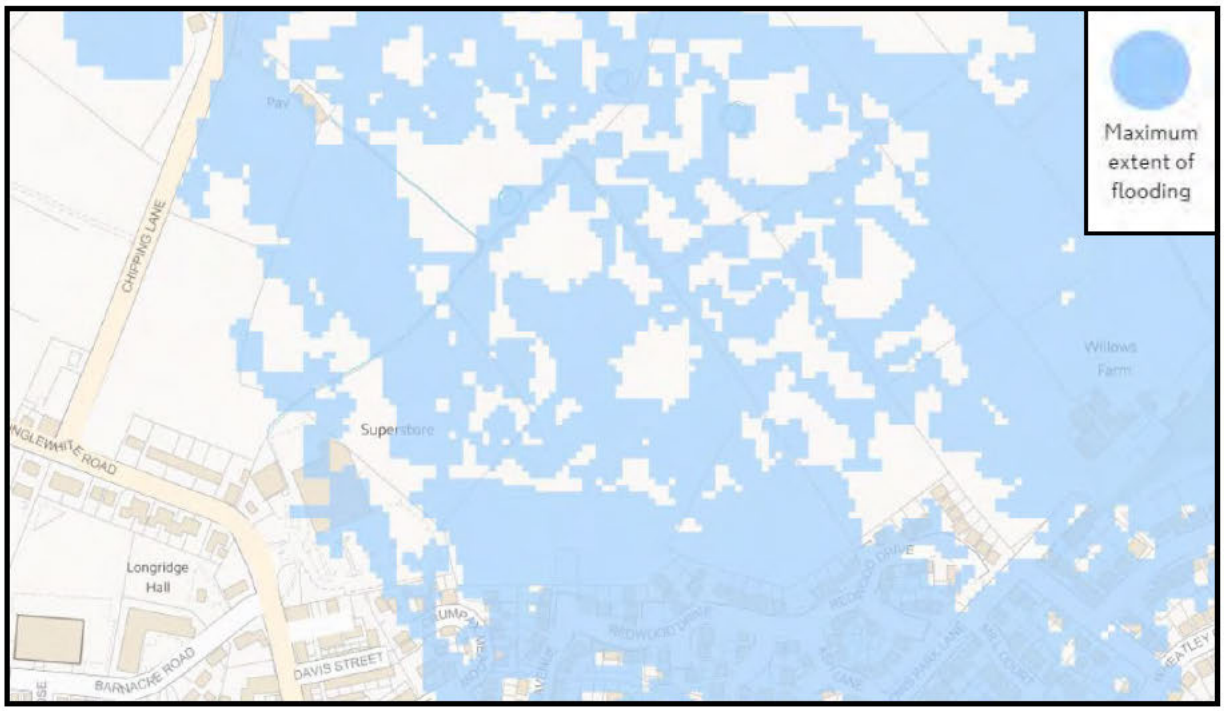
NATIONAL FLOOD MAPPING

BETTS HYDRO
CONSULTING ENGINEERS

Long Term Flood Risk – Surface Water



Long Term Flood Risk - Reservoirs



[redacted]

From: CMBLNC Info Requests <Inforequests.cmblnc@environment-agency.gov.uk>
Sent: 31 October 2018 11:41
To: Megan Berry
Subject: CL104827HR

Dear Megan

Enquiry regarding product 4 data for Chippings Lane, Longridge.

Thank you for your enquiry received today.

We respond under the Freedom of Information Act 2000 and Environment Regulations 2004.

The area you are looking at does not fall in a flood zone, as such we have no data to provide.

Please get in touch if you have any further queries or contact us within 2 months if you would like us to review the information we have sent.

Kind regards.

[redacted]
Customers and Engagement Officer, Cumbria and Lancashire
Environment Agency | Ghyll Mount, Gillan Way, Penrith 40 Business Park, Penrith, Cumbria, CA11 9BP

Creating a better place for people and wildlife

Friend of the LGBT+ network Environment Agency

Environment Agency

I'm a friend of the Environment Agency LGBT+ network because I want to encourage a friendly open workplace where everyone can be themselves.

Mental Health Network

Got a question or want to talk to someone about mental health?

Drop us an email or join the conversation on our 'Mental Health Support' Yammer Group Our Wellbeing Supporters can provide a listening ear from someone with a shared experience. To find out more e-mail the Mental Health Network.

HELP employee assistance – https://hereto.helpeap.com

From: Megan Berry [redacted]
Sent: 31 October 2018 11:22

To: CMBLNC Info Requests <Inforequests.cmblnc@environment-agency.gov.uk>
Subject: Historical Flood Information - Product 4

F.A.O Flood Risk, Drainage and/or Planning department

Please forward to the correct department/ office

To whom it may concern,

Chippings Lane, Longridge

Please could you confirm whether you have any information that you feel would be valuable to a Flood Risk Assessment and Drainage Management Strategy for the site above (see location plan attached), including details of historical flooding, predicted flood water levels and current drainage issues; this would be greatly appreciated. If there are any specific requirements that you require in a scope of works for this site please can you advise at this stage so that it can be fully incorporated into the proposals at an early stage.

Please do not hesitate to contact me on the details below to discuss further should you require additional information or clarification.

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

BETTS HYDRO
Specialists in Drainage and Flood Risk
Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire, CH5 2LY

CHESTER OFFICE - 01244 289041

[redacted]
www.betts-associates.co.uk

CIVIL | STRUCTURAL | GEO-ENVIRONMENTAL | HYDROLOGY | FLOOD RISK MANAGEMENT
SUDS | STRUCTURAL SURVEYS | PARTY WALL DUTIES | INFILTRATION | GEO-TECHNICAL


Please consider the environment before printing this email.

APPENDIX C: UU CORRESPONDENCE

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Megan Berry

From: [redacted] <[redacted]>
Sent: 14 November 2018 15:34
To: Megan Berry
Cc: Wastewater Developer Services
Subject: RE: Historical Sewer Flooding Information - GE1835

Good Afternoon

I can confirm that we have no current records of sewer flooding on our DG5 register within the vicinity of the proposed development. The DG5 register is a register of properties that have flooded as a result of hydraulic inadequacy of the public sewer network.

Please note that United Utilities Water Limited (UUW) can only record and check flooding events which are reported to us and we have to comply with our Regulators instructions on the qualification of flooding events to place on the register.

Our response does not include:

- any sewer flooding events caused by blockages or collapses which are the result of third party actions, natural events or other actions over which UUW has no control and not a facet of sewer capacity; or

- any historical sewer flooding events that have been removed from the register as a result of investment in our infrastructure.

As with all development sites, we recommend you liaise with our water and wastewater engineers by contacting our Developer Services team so the details of your development proposal can be considered further. Details can be found at the following link.

https://www.unitedutilities.com/services/builders-developers/

Should you require any further information please do not hesitate to contact me.

Kind regards

[redacted]
Assistant Developer Engineer
Developer Services and Planning
Network Delivery
United Utilities
T: 01925 679369 ([redacted])
unitedutilities.com

From: Megan Berry [redacted]
Sent: 31 October 2018 11:23
To: Wastewater Developer Services <WastewaterDeveloperServices@uuplc.co.uk>
Subject: Historical Sewer Flooding Information

F.A.O Flood Risk, Drainage and/or Planning department

Please forward to the correct department/ office

To whom it may concern,

Chippings Lane, Longridge

Please could you confirm whether you have any information that you feel would be valuable to a Flood Risk Assessment and Drainage Management Strategy for the site above (see location plan attached), including details of historical flooding, predicted flood water levels and current drainage issues; this would be greatly appreciated. If there are any specific requirements that you require in a scope of works for this site please can you advise at this stage so that it can be fully incorporated into the proposals at an early stage.

Please do not hesitate to contact me on the details below to discuss further should you require additional information or clarification.

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

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CHESTER OFFICE - 01244 289041

[redacted]
www.betts-associates.co.uk

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SUDS | STRUCTURAL SURVEYS | PARTY WALL DUTIES | INFILTRATION | GEO-TECHNICAL

Megan Berry

From: [redacted]
Sent: 10 February 2017 09:36
To: [redacted]
Cc: SewerAdoptions
Subject: *Ext: HOUSING DEVELOPMENT, CHIPPING LANE, LONGRIDGE, RIBBLE VALLEY – UU Ref 4200014205
Attachments: Pre-start form with Invoice.docx; mg_info.txt

Importance: High

Follow Up Flag: Follow up
Flag Status: Flagged

Dear [redacted]

HOUSING DEVELOPMENT, CHIPPING LANE, LONGRIDGE, RIBBLE VALLEY – UU Ref 4200014205

I refer to your correspondence dated **8th February 2017** and to the plans enclosed therewith, and would inform you that your submission is now satisfactory for incorporating into a Water Industry Act 1991, Section 104 Agreement, providing that the works can be constructed in full accordance with the acceptable drawings numbered as follows:-.

Drainage Layout – 459/ED/02 Rev L
1 in 20 Manholes Details – 459/ED/05 Rev B, 459/ED/09 Rev B, 459/ED/26 Rev C, 459/ED/16 (Flow control)
Long Sections – 459/ED/10 Rev E, 459/ED/11 Rev E, 459/ED/13 Rev B
A3 Land Transfer Plan – 459/ED/01/S104-2
A3 Site Plan - 459/ED/01/S104 Rev D
United Utilities Standard Construction Details (available for download via the following link http://www.unitedutilities.com/documents/developer-services-construction-details.pdf)

(Please note that the following drawings appear to be acceptable, however any works completed to the Pumping Station or Rising Main until the full M&E design is confirmed in writing to be Technically Accepted would be completed at risk. Pumping Station Designers submission now received and request for service to complete a review with UU M&E has been raised).
Pumping Station Civils - 459/ED/15 Rev E
Rising Main Long Section - 459/ED/27 Rev C

To enable the Section 104 Agreement to be completed and inspections to start on site, I would be grateful if you could now provide me with the following:

- **Cheque/payment** for the remainder of the S104 fees **£25,384.00**
- Sign and return the enclosed "Request for approval to commence construction of sewers before signing of agreement form"

Full details of this arrangement are in our 'Developers Guide' document a copy of which should already have been provided.

The Developer or his contractor is responsible for verifying all existing service positions and levels on site, including those of the existing public sewerage system, before work commences.

Any costs associated with service diversions required to enable the scheme to be carried in accordance with the acceptable drawings must be borne by the developer.

Where connections are to be made to existing public sewer manholes, the costs for rebuilding the manhole to United Utilities requirements, if deemed necessary by United Utilities, must be borne by the developer. If the works cannot be constructed in accordance with the acceptable plans, the developer must submit revised proposals for appraisal before continuing with the works.

The developer must also obtain specific permission to construct any new manhole or make any connections to the public sewerage system. Please visit our web-site where you will find the S106 Sewer Connection Application form. The form is in two parts but only the second part is required for this scheme which is called **'Request for permission to work on a public sewer'** application form, which the appointed contractor must complete and return to the address on the form. Here is the link to the form: http://www.unitedutilities.com/connecting-public-sewer.aspx

I look forward to receiving the drawings and information requested above at your earliest convenience, but should you require any further information in the meantime, please do not hesitate to contact me.

Regards,

[redacted]

Developer Engineer for Adoptions
Developer Services and Planning
Operational Services
United Utilities
T: 01925 679357 [redacted]
E: seweradoptions@uuplc.co.uk
unitedutilities.com

BARRATT	Barratt Manchester 4 Brindley Rd City Park Manchester M16 9HQ	Job No	**459**
		Date	**25.10.16**
		Designer	**CD**

Pumping Station Storage Calculations

Project	**Chipping Lane, Longridge - Pump Station with Online Storage Pipe**

Designed to Sewer for Adoption 6th Edition

Input

No. of Dwellings =	513	Units
Max. starts/hour =	15	
Wet Well Diameter =	3.00	m
Lowest Drag Out IL	103.150	m

Incoming Flow

Incoming flow = (4000L/dwelling/day) = 23.75 L/s

Estimate depth of stop/start storage required

Maximum No. of Starts/hour = 15.0

Duration of Incoming Flow = 4.00 mins

Volume of Incoming Flow /Cycle = 5.700 m^3

Cross-sectional area of wet well = 7.069 m^3

Depth of storage between starts = 0.806 m

Minimum height between start and stop levels = 806 mm

Set height between start/stop levels (duty start) to **850** mm

Check number of starts/hour

Volume of storage = 6.008 m^3

Time between starts = 4.22 mins

Number of starts/hour = 14.2

say 14 starts/hour

The number of starts is less than permissable, therefore OK

BARRATT

Barratt Manchester
4 Brindley Rd
City Park
Manchester
M16 9HQ

Job No	**459**
Date	**25.10.16**
Designer	**CD**

Pumping Station Storage Calculations

Project	**Chipping Lane, Longridge - Pump Station with Online Storage Pipe**

Volume & Depth of Emergency Storage required

Storage volume required based on 160L/dwelling = 82.08 m^3

Storage of Pipes Foul system upstream of wet well = 35.30 m^3

Length of 150dia pipe=	275.39
Length of 225dia pipe=	98.15
Length of 750dia pipe=	60.06

Manhole	F31	F32
Invert Lvl	102.524	102.12
Dia	1200	1200
Volume	0.708	1.165

Manhole	F29	F34	F30	F15	F16	F17	F18
Invert Lvl	102.017	102.581	101.918	101.688	101.585	101.503	101.373
Dia	1200	1200	1200	1350	1350	1200	1500
Volume	1.281	0.644	1.393	2.093	2.240	1.863	3.140

Manhole	F36	F37	F38	F39	F43	F19	Wet Well (HL alarm)
Invert Lvl	103.029	102.770	102.390	101.800	101.723	101.302	100.765
Dia	1200	1200	1350	1200	2100	2400	3000
Volume	0.137	0.430	1.088	1.527	4.943	8.360	16.858
Total							47.2

Total Volume provided = 82.46 m^3

The total storage provided is greater than storage required therefore OK

Sum of dists upto HL Alarm= 1.350

Sump level of wet well = 99.415

Cover level of wet well = 105.80

Depth of wet well = 6.385

Megan Berry

From: Megan Berry
Sent: 20 November 2018 11:08
To: 'Wastewater Developer Services'
Subject: UU Pre-Development Enquiry - Land off Chipping Lane, Longridge
Attachments: HYD371 Surface Water Run-off Calcs.pdf; Preliminary Drainage Situation for UU .pdf; UU-Wastewater_predevelopment_enquiry.pdf; LOCATION PLAN.pdf

UU PREDEVELOPMENT ENQUIRY. Pro-forma attached.

To Whom It May Concern,

We are currently preparing a Flood Risk Management Assessment and Drainage Management Strategy to support a residential planning application on land off Chipping Lane in Longridge. As part of the preparation, a drainage management strategy has been devised and at this stage we are seeking to begin discussions with UU with regards to the proposed foul water: attached is the pre-application advice form with supporting information as required.

Surface Water: The primary method of discharging surface water in accordance with the national drainage hierarchy should ideally be though infiltration; however Soakaway Testing has been recommended to confirm onsite characteristics. Assuming infiltration does not work on the site, the next approach would be to discharge to the nearest watercourse which has been located crossing site (see drainage strategy attached). Detailed design will be required and full consents to be obtained as the application progresses.

Foul Water: Foul water flows generated by the development are proposed to connect to nearest the public foul water sewer. Review of the UU sewer records identify there to be a foul water pumping station onsite adjacent to the southern boundary. This pumping station has been accounted for within the planning proposals and a public foul water sewer (375mm.dia) associated with the pumping station has been identified onsite adjacent to the southern boundary. Due to the existing land-use onsite, no existing foul water connections to the public sewer network are present. Based on the proposals for the construction of up to 184no. residential units for Phase 2 & 3, the approximate peak foul water flows generated by the development are 8.5l/s. This is based on 4000 litres per dwelling per 24 hours; the guidance contained within Sewers for Adoption (SfA).

Phase 1 has a separate drainage management strategy as detailed in the approved supporting FRA&DMS (REF: 3/2014/0764), which shows foul from this portion of development will outfall into the foul water system located within Inglewhite Road to the south-east of Phase 1. The proposals are therefore to connect into the nearest public foul water sewer onsite adjacent to the southern boundary or divert flows from Phase 2 & 3 towards the pumping station within Phase 1, subject to confirmation of capacity within this existing infrastructure, which ultimately connects into the public sewer network within Inglewhite Road. Detailed design will be required to confirm feasibility based on the topographic levels following further detailed investigation. At this stage however it is understood that a pumped solution may be required based on the existing topographic levels onsite.

We are ultimately seeking to identify United Utilities preferred points of connection(s) and to confirm any constraints. It is acknowledged that considerable offsite work will likely be required to achieve connection to the public sewer network. Hopefully the summary above and the attached are of assistance and allow agreement in principle to be given, do not hesitate to contact me on the details below should you require any further assistance.

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

BETTS HYDRO
Specialists in Drainage and Flood Risk
Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire, CH5 2LY

[redacted]

From: Megan Berry
Sent: 22 November 2021 10:08
To: [redacted]
Subject: FW: Pre Development Enquiry for Chipping Lane Longridge - Our ref - 4200023124
Attachments: Pre-Development Enquiry - Land off Chipping Lane, Longridge 4200023124 Due date 04-12-2018

Importance: High

From: [redacted]
Sent: 05 December 2018 11:54
To: [redacted]
Importance: High

Dear Sir

We have carried out an assessment of your application which is based on the information provided; this pre development advice will be valid for 12 months

Foul

Foul will be allowed to drain to the public combined/ foul sewer network. Our preferred point of discharge would be to the 300mm foul sewer on Inglewhite Rd at an unrestricted rate.

Surface Water

As stated in your enquiry surface water from this site should drain to either soak away or directly to watercourse. Discharge rates and consents must be discussed and agreed with all interested parties.

Connection Application

Although we may discuss and agree discharge points & rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below

http://www.unitedutilities.com/connecting-public-sewer.aspx

Sewer Adoption Agreement

You may wish to offer the proposed new sewers for adoption. United Utilities assess adoption application based on Sewers adoption 6th Edition and for any pumping stations our company addenda document. Please refer to link below to obtain further guidance and application pack:

http://www.unitedutilities.com/sewer-adoption.aspx

Existing Sewers Crossing the Site

A public sewer crosses this site and we will require unrestricted access to the sewer for maintenance purposes, we would ask that you maintain a minimum clearance of 6m which is measured 3m from the centre line of the pipe. If you cannot achieve this then you may wish to consider diverting the public sewer.

Please refer to the link below to obtain full details of the processes involved in sewer diversion.

http://www.unitedutilities.com/sewer-diversion.aspx

Please be aware that on site drainage must be designed in accordance with Building Regulations, National Planning Policy, and local flood authority guidelines, we would recommend that you speak and make suitable agreements with the relevant statutory bodies.

Please note, if you intend to put forward your wastewater assets for adoption by United Utilities, the proposed detail design will be subject to a technical appraisal by an Adoption Engineer as we need to be sure that the proposals meets the requirements of Sewers for adoption and United Utilities Asset Standards. The proposed design should give consideration to long term operability and give United Utilities a cost effective proposal for the life of the assets. Therefore, further to this enquiry should you wish to progress a Section 104 agreement, we strongly recommend that no construction commences until the detailed drainage design, submitted as part of the Section 104 agreement, has been assessed and accepted in writing by United Utilities. Any works carried out prior to the technical assessment being approved is done entirely at the developers own risk and could be subject to change.

Regards

[redacted]

Development Engineer
Developer Services and Planning
Business Operations
United Utilities

T: 01925 679405 ([redacted])
E: [redacted]
unitedutilities.com

this message by a third party.

United Utilities Group PLC, Haweswater House, Lingley Mere Business Park, Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP
Registered in England and Wales. Registered No 6559020

www.unitedutilities.com
www.unitedutilities.com/subsidiaries

[redacted]

From: [redacted]
Sent: 22 November 2021 12:35
To: 'Wastewater Developer Services'
Cc: Megan Berry
Subject: Pre-Planning Enquiry - Land off Chippings Lane, Longridge
Attachments: wastewater_predevelopment_enquiry (HB).pdf; HYD371 Surface Water Run-off Calcs 1.0.pdf; Preliminary Drainage Situation for UU .pdf; LOCATION PLAN.pdf

To whom it may concern,

We are currently preparing a Flood Risk Management Assessment and Drainage Management Strategy to support a residential planning application on land off Chipping Lane in Longridge. As part of the preparation, a drainage management strategy has been devised and at this stage we are seeking to begin discussions with UU with regards to the proposed foul water: attached is the pre-application advice form with supporting information as required.

Surface Water:
The primary method of discharging surface water in accordance with the national drainage hierarchy should ideally be though infiltration; however Soakaway Testing has been recommended to confirm onsite characteristics. Assuming infiltration does not work on the site, the next approach would be to discharge to the nearest watercourse which has been located crossing site (see drainage strategy attached). Detailed design will be required and full consents to be obtained as the application progresses.

Foul Water:
Foul water flows generated by the development are proposed to connect to nearest the public foul water sewer. Review of the UU sewer records identify there to be a foul water pumping station onsite adjacent to the southern boundary. This pumping station has been accounted for within the planning proposals and a public foul water sewer (375mm.dia) associated with the pumping station has been identified onsite adjacent to the southern boundary. Due to the existing land-use onsite, no existing foul water connections to the public sewer network are present. Based on the proposals for the construction of up to 198no. residential units for Phase 2 & 3, the approximate peak foul water flows generated by the development are **9.2l/s**. This is based on 4000 litres per dwelling per 24 hours; the guidance contained within Sewers for Adoption (SfA).

Phase 1 has a separate drainage management strategy as detailed in the approved supporting FRA&DMS (REF: 3/2014/0764), which shows foul from this portion of development will outfall into the foul water system located within Inglewhite Road to the south-east of Phase 1. The proposals are therefore to connect into the nearest public foul water sewer onsite adjacent to the southern boundary or divert flows from Phase 2 & 3 towards the pumping station within Phase 1, subject to confirmation of capacity within this existing infrastructure, which ultimately connects into the public sewer network within Inglewhite Road. Detailed design will be required to confirm feasibility based on the topographic levels following further detailed investigation. At this stage however it is understood that a pumped solution may be required based on the existing topographic levels onsite.

We are ultimately seeking to identify United Utilities preferred points of connection(s) and to confirm any constraints. It is acknowledged that considerable offsite work will likely be required to achieve connection to the public sewer network. Hopefully the summary above and the attached are of assistance and allow agreement in principle to be given, do not hesitate to contact me on the details below should you require any further assistance.

Kind Regards,

[redacted] B[redacted] *BSc (Hons) GradCIWEM*
Graduate Flood Risk Analyst

BETTS HYDRO
Consulting Engineers

Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire, CH5 2LY
Chester +44 (0)1244 289041

[redacted]
www.betts-associates.co.uk

CIVIL | STRUCTURAL | GEO-ENVIRONMENTAL | HYDROLOGY | FLOOD RISK MANAGEMENT
SUDS | STRUCTURAL SURVEYS | PARTY WALL DUTIES | INFILTRATION | GEOTECHNICAL

APPENDIX D: LPA/LLFA CORRESPONDENCE

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Megan Berry

From: [redacted]
Sent: 02 November 2018 15:15
To: Megan Berry
Subject: Request for Information (945.1747)PH Acknowledgement

Dear Ms Berry

Request for Information Under the Freedom of Information Act (2000) We are writing to acknowledge receipt of your enquiry of 31st October 2018, in which you request the disclosure of information.
We can confirm that your enquiry will now be assigned to an officer who will commence a search for the information you require and they will respond in due course. The deadline date for issuing you with a full response is 28th November 2018. We will endeavour to provide a response well in advance of this date, however, should we envisage any delays, or require more details from you, we will contact you immediately.

If you have any queries about the above, please do not hesitate to contact us, quoting ref. 945.1747.

Yours sincerely,

On Behalf of the Information Governance Team Lancashire County Council PO Box 78 County Hall Preston PR1 8XJ

From: Suds
Sent: 02 November 2018 10:29
To: [redacted]
Subject: Historical Flood Information - Freedom of Information

Good morning,

Please see below a request for flooding information under the Freedom of Information Act.

We will start investigating the query but will await your response before we reply. I have logged the query on HAMS under CRNo136238 but have had to log it as Chipping Road as Chipping Lane is not showing on HAMS.

Regards

[redacted]
Flood Risk Technical Support Officer
Community Services
Lancashire County Council
[redacted]
W: www.lancashire.gov.uk

From: Megan Berry [redacted]
Sent: 31 October 2018 11:22
To: Suds <suds@lancashire.gov.uk>
Subject: Historical Flood Information - Freedom of Information

F.A.O Flood Risk, Drainage and/or Planning department

Please forward to the correct department/ office

To whom it may concern,

Chippings Lane, Longridge

Please could you confirm whether you have any information that you feel would be valuable to a Flood Risk Assessment and Drainage Management Strategy for the site above (see location plan attached), including details of historical flooding, predicted flood water levels and current drainage issues; this would be greatly appreciated. If there are any specific requirements that you require in a scope of works for this site please can you advise at this stage so that it can be fully incorporated into the proposals at an early stage.

Please do not hesitate to contact me on the details below to discuss further should you require additional information or clarification.

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

BETTS HYDRO
Specialists in Drainage and Flood Risk
Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire, CH5 2LY

CHESTER OFFICE - 01244 289041

[redacted]
www.betts-associates.co.uk

CIVIL | STRUCTURAL | GEO-ENVIRONMENTAL | HYDROLOGY | FLOOD RISK MANAGEMENT
SUDS | STRUCTURAL SURVEYS | PARTY WALL DUTIES | INFILTRATION | GEO-TECHNICAL

Megan Berry

From: Megan Berry
Sent: 31 October 2018 11:22
To: [redacted]
Subject: Historical Flooding Information - Freedom of Information
Attachments: LOCATION PLAN.pdf

F.A.O Flood Risk, Drainage and/or Planning department

Please forward to the correct department/ office

To whom it may concern,

Chippings Lane, Longridge

Please could you confirm whether you have any information that you feel would be valuable to a Flood Risk Assessment and Drainage Management Strategy for the site above (see location plan attached), including details of historical flooding, predicted flood water levels and current drainage issues; this would be greatly appreciated. If there are any specific requirements that you require in a scope of works for this site please can you advise at this stage so that it can be fully incorporated into the proposals at an early stage.

Please do not hesitate to contact me on the details below to discuss further should you require additional information or clarification.

Kind Regards

Megan Berry BSc(Hons) GradCIWEM
Graduate Flood Risk Analyst

BETTS HYDRO
Specialists in Drainage and Flood Risk
Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire, CH5 2LY

CHESTER OFFICE - 01244 289041

[redacted]
www.betts-associates.co.uk

CIVIL | STRUCTURAL | GEO-ENVIRONMENTAL | HYDROLOGY | FLOOD RISK MANAGEMENT
SUDS | STRUCTURAL SURVEYS | PARTY WALL DUTIES | INFILTRATION | GEO-TECHNICAL

APPENDIX E: LOCATION PLAN

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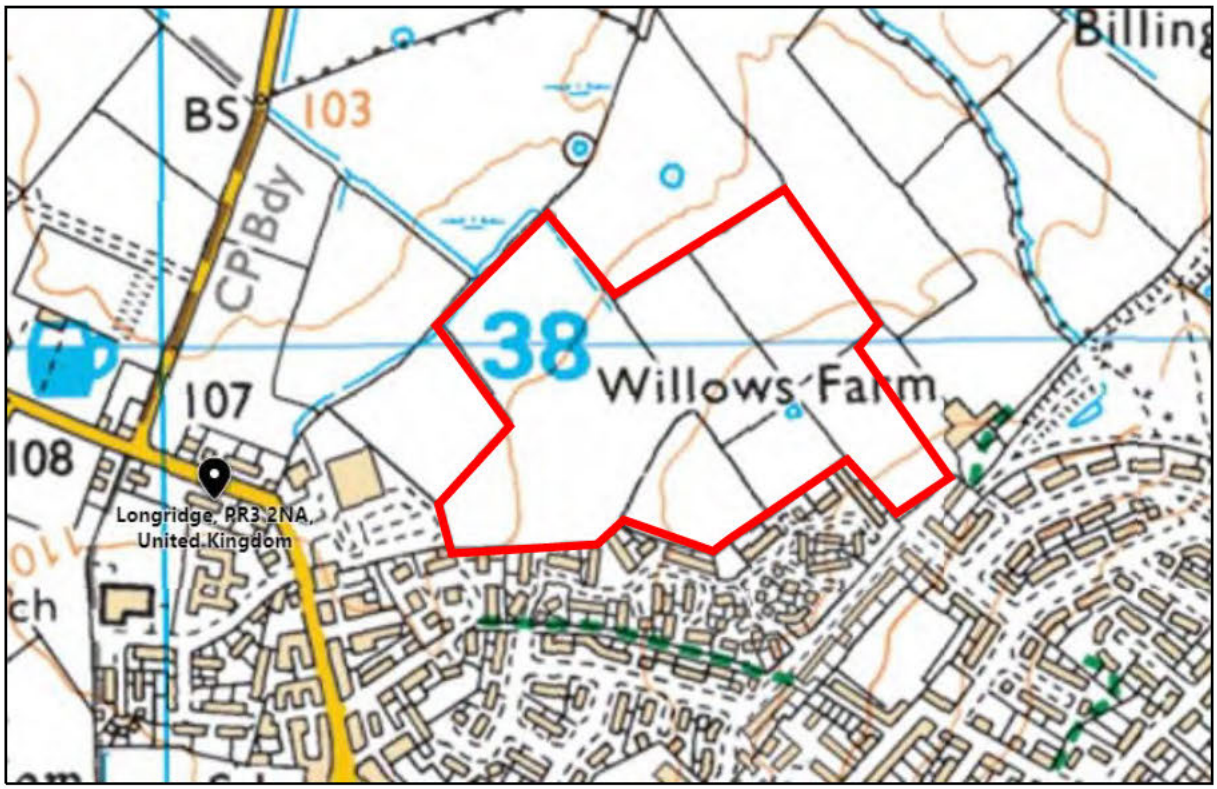
LOCATION PLAN

Chipping Lane, Longridge



OS X (Eastings)	360405
OS Y (Northings)	437794
Nearest Post Code	PR3 3HB
Lat (WGS84)	N53:50:06 (53.834883)
Long (WGS84)	W2:36:11 (-2.603137)
Lat,Long	53.834883,-2.603137
Nat Grid	SD604377 / SD6040537794
mX	-289779
mY	7104425

APPENDIX F: TOPOGRAPHIC SURVEY

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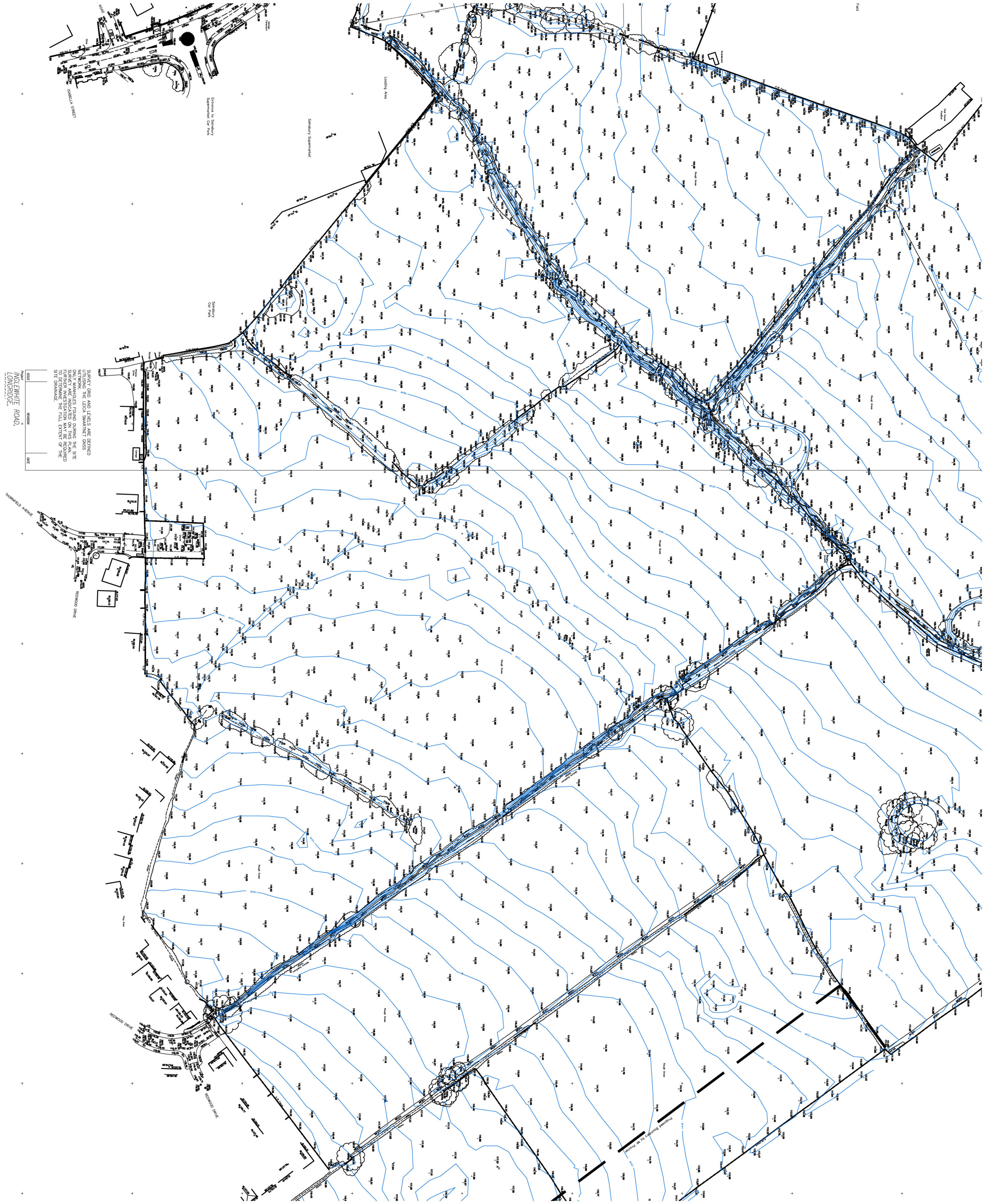
SURVEY GRID AND LEVELS ARE DEFINED UTILISING THE LEICA SMARTNET GNSS NETWORK.
ONLY MANHOLES FOUND DURING THE SITE SURVEY ARE INDICATED ON THIS PLAN. FURTHER INVESTIGATION MAY BE REQUIRED TO DETERMINE THE FULL EXTENT OF THE SITE DRAINAGE.
ISSUE
REVISION
DATE
Project
INGLEWHITE ROAD, LONGRIDGE,
ISABELLA STREET
Entrance to Sainsbury Supermarket Car Park
Sainsbury Supermarket
Loading Area
Sainsbury Car Park
THORNFIELD AVENUE
REDWOOD DRIVE
Field
Club House Pavilion
Scoreboard
Rough Grass
Pond
Play Area
Mature Hawthorn Hedge
Proposed Boundary by Mr Procter

APPENDIX G: PROPOSED PLANNING LAYOUT

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SCHEDULE OF ACCOMMODATION

Ref	Barratt Type	House Type	Sqft	No	Total Sqft
AFFORDABLE TYPES					
STANDARD					
DNF	Denford	2 Bedroom affordable mews	624	19	11856
BRN	Brandon	3 Bedroom affordable mews	706	25	17650
ELDERLEY					
BED	Bedale	2 Bed LTH Bungalow	594	7	4158
BEL	Belmont	2 Bed LTH House	731	8	5848
AFFORDABLE TOTAL				59	39512
PRIVATE SALE TYPES					
ELDERLEY					
BED	Bedale	2 Bed LTH Bungalow	594	7	4158
BEL	Belmont	2 Bed LTH House	731	8	5848
STANDARD					
ELL	Ellerton	3 Bed semi-detached house	830	33	27390
MOR	Moresby	3 Bed dual aspect semi-detached house	854	25	21350
KNS	Kingsville	3 bed townhouse	1072	21	22512
LUT	Lutterworth	3 bed detached house	1001	5	5005
ALD	Alderney	4 bed dual aspect detached house	1225	12	14700
DEN	Denby	3 bed detached house	880	8	7040
WIN	Windermere	4 bed detached house	1073	19	20387
THO	Thornton	4 bed detached house	1202	1	1202
PRIVATE SALE TOTAL				139	129592
Total number of units and square footage				**198**	**169104**
Gross Site Area in Acres					**26.11**
Total Undevelopable area in acres					**14.15**
Net Site Area in Acres					**11.96**
Density (units per acre)					**17**
Density (units per hectare)					**41**
Square foot / Acre					**14,139**

DRAWING KEY

- (AF) AFFORDABLE DWELLINGS
- (EL) DWELLING FOR THE ELDERLY
- (T) PROPOSED TRIM TRAIL ITEM
- TREE/ HEDGE TO BE REMOVED
- TREE/ HEDGE TO BE RETAINED
- BLOCK PAVIORS (RED)
- PROPOSED INDICATIVE TREE PLANTING
- 1800mm TIMBER GATE

Refer to engineers highway surfacing drawing for details of surfacing to adoptable areas

PHASE 1

LAND RETAINED IN AGRICULTURE

Footpath / cycleway connection to phase 1

Land allocated for school provision

Indicative school service access

Indicative school main access

S.U.D.S Area

L.E.A.P

P.O.S

Play Area

Existing pump station

Bollards

Informal footpath

Emergency link

Retained trees

Retained hedge and watercourse

Olcote

The Laurels

SCALE
Scale Bar
0m 5m 10m 15m 20m 25m 30m 35m 40m 45m 50m 60m 70m 80m 90m 100m

Rev	Description	Date	Drawn	Chk'd
A	Amended wall of plot 124, amended path for plot 123.	20/10/21	GB	

BARRATT HOMES
MANCHESTER

Barratt Homes Manchester
(A division of BDW Trading Ltd)
4 Brindley Road
City Park
Manchester
M16 9HQ
Tel: 0161 872 0161
Fax: 0161 855 2828

Job: CHIPPING LANE LONGRIDGE			
Title: PHASE 2 / 3 PLANNING LAYOUT			
Design By: AA	Date: 10-10-18	Drawing Number: 459-PL06	Rev: A
Drawn By: AA	Scale @ A0: 1:500		

APPENDIX H: HYDRAULIC ASSESSMENT

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BETTS HYDRO
CONSULTING ENGINEERS

LAND AT CHIPPING LANE, LONGRIDGE

HYDRAULIC ASSESSMENT

For
Barratt Homes Manchester
4 Brindley Road,
City Park,
Manchester,
M16 9HQ.

July 2016

APPENDIX M: TYPICAL SUDS DETAILS

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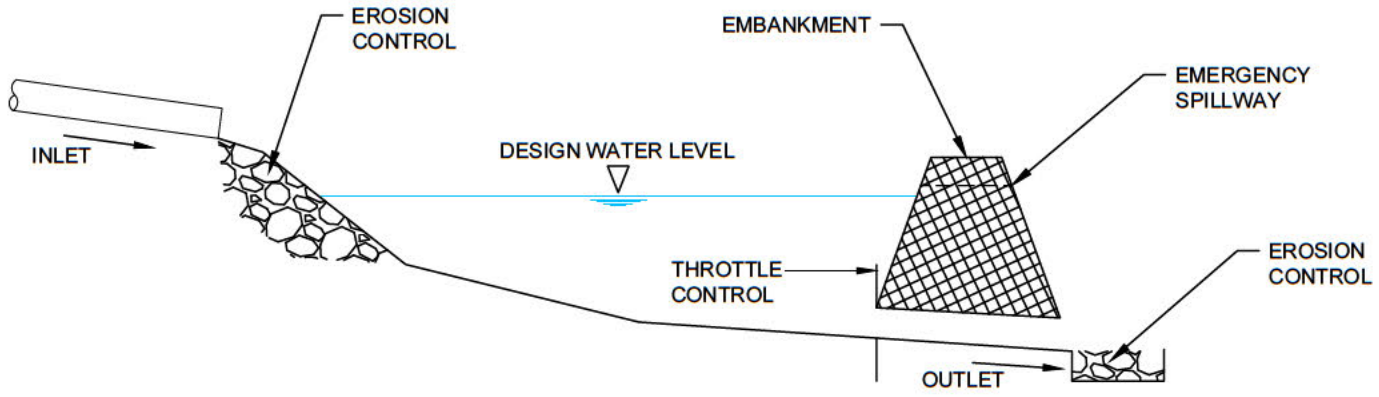
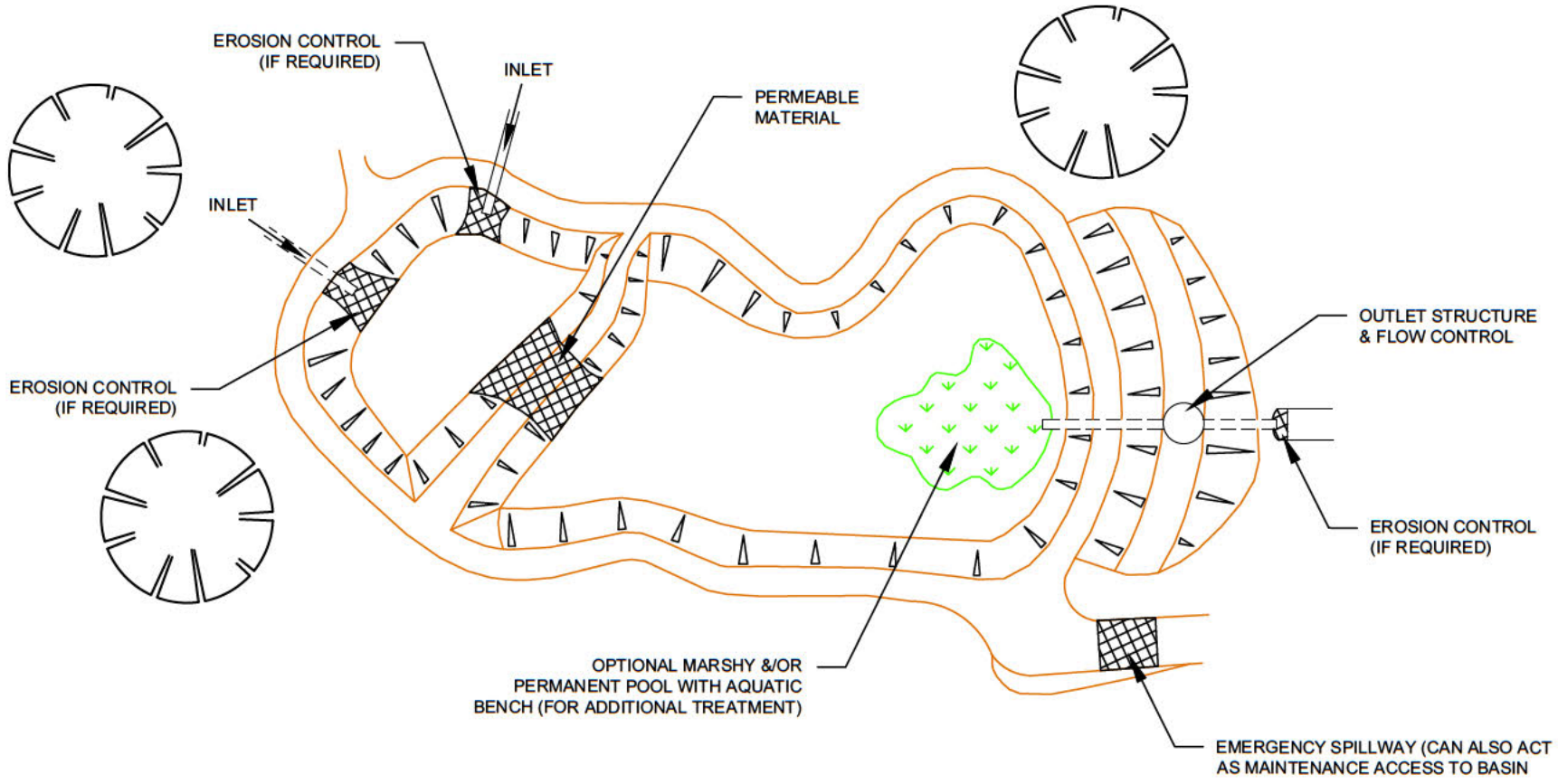
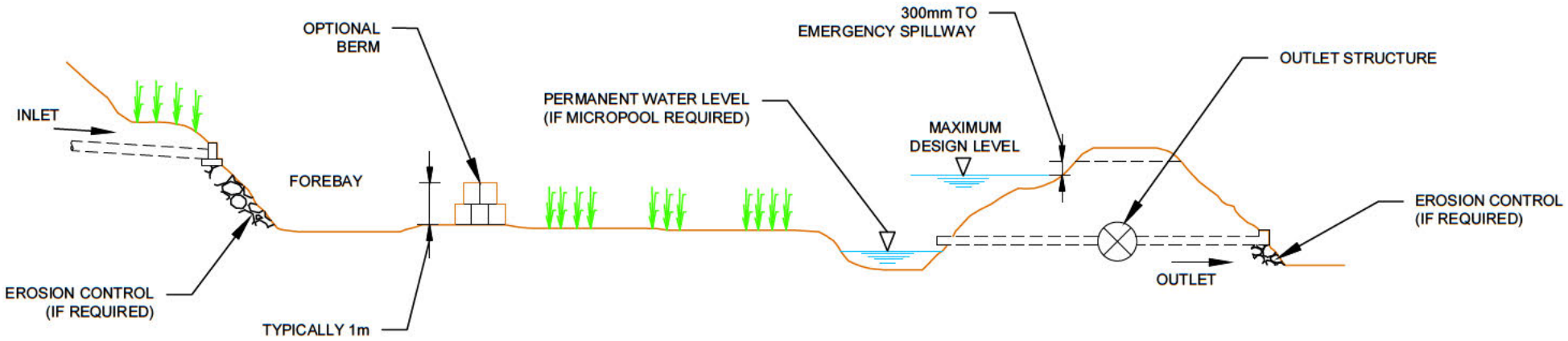
DO NOT SCALE



SCHEMATIC OF DETENTION BASIN PROFILE



PLAN VIEW



ELEVATION

REV	DATE	BY	DESCRIPTION	CHK

DRAWING STATUS: PRELIMINARY

BETTS ASSOCIATES
CIVIL AND STRUCTURAL ENGINEERS
Unit 6, Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire CH5 2LY
Tel: 01244 288178 Fax: 01244 288516 enquiries@betts-associates.co.uk

PROJECT: TYPICAL SUDS DETAIL

TITLE: DETENTION BASINS

DATE:	SCALE @ SIZE:	DRAWN:	CHECKED:
SEP 2014	@ A3	CP	RDN

PROJECT No:	DRAWING No:	REV:
BETTS	110	A

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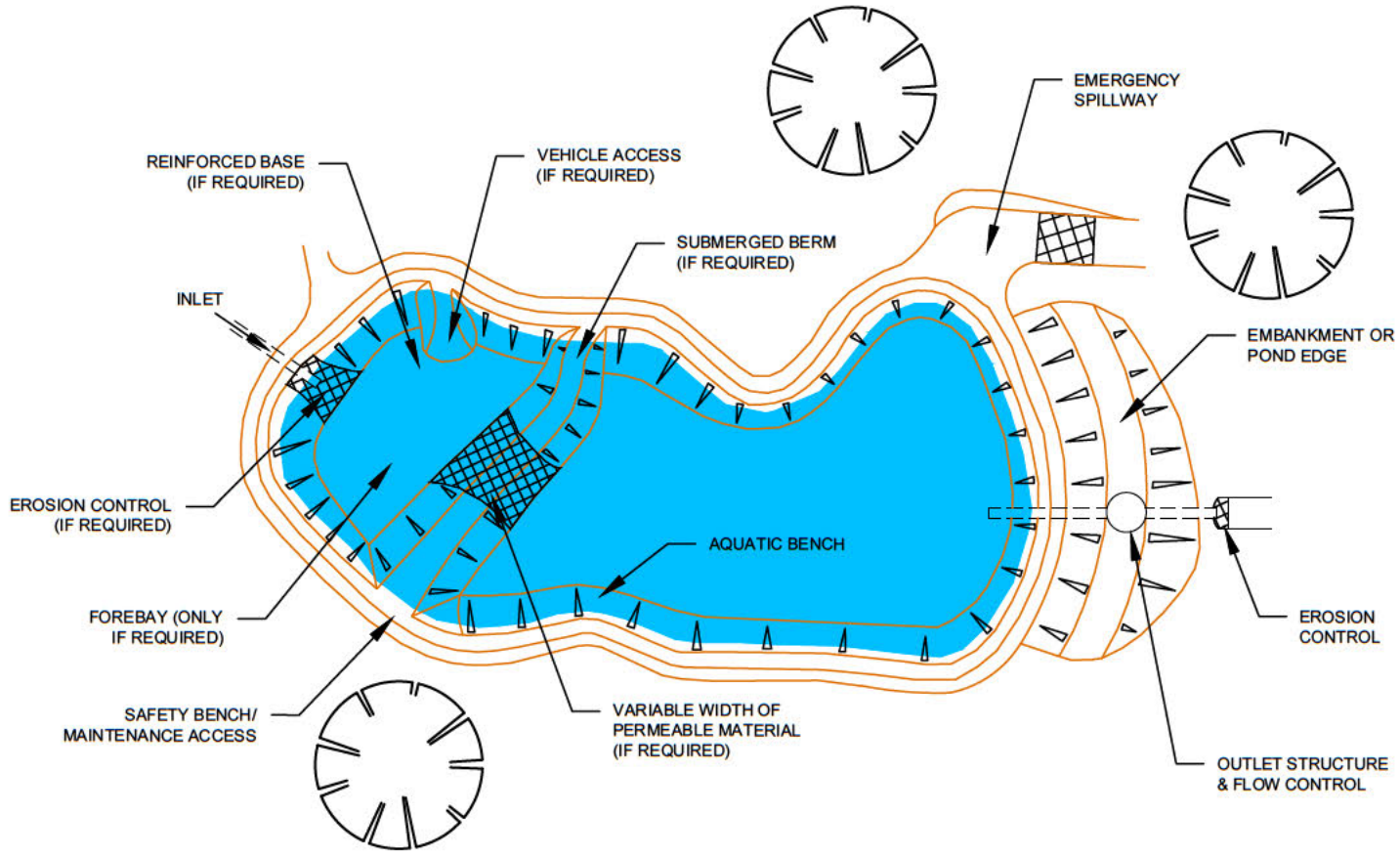
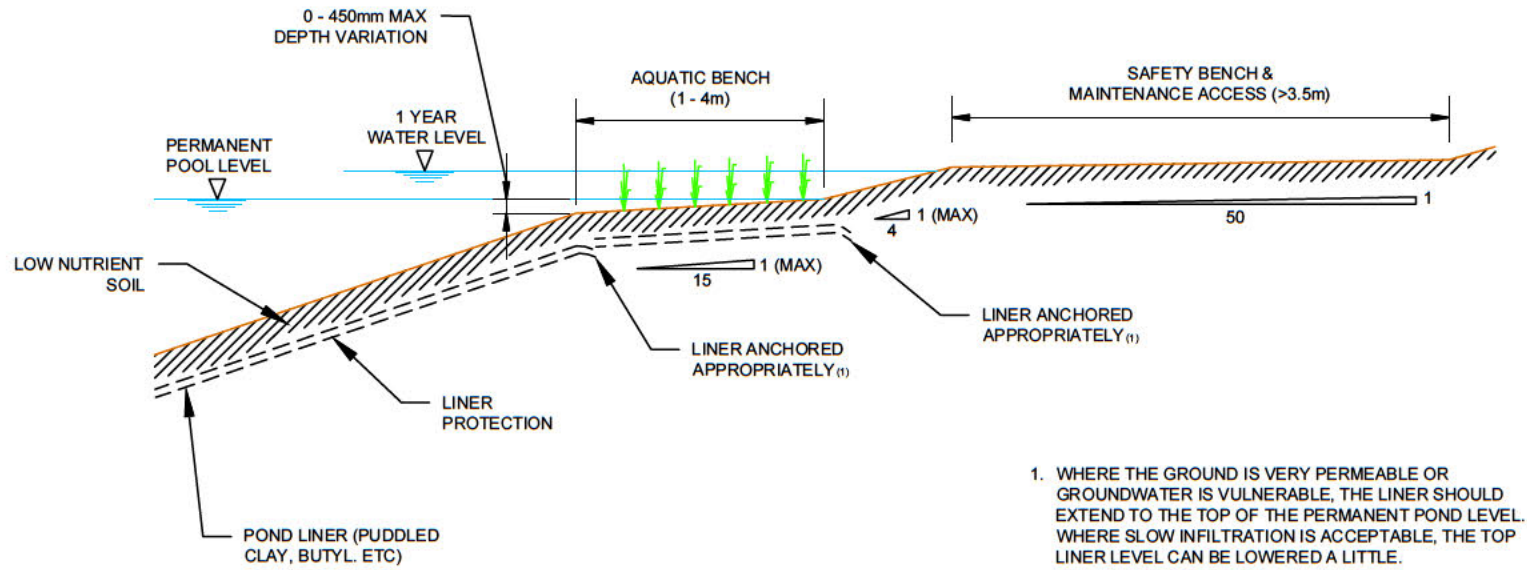
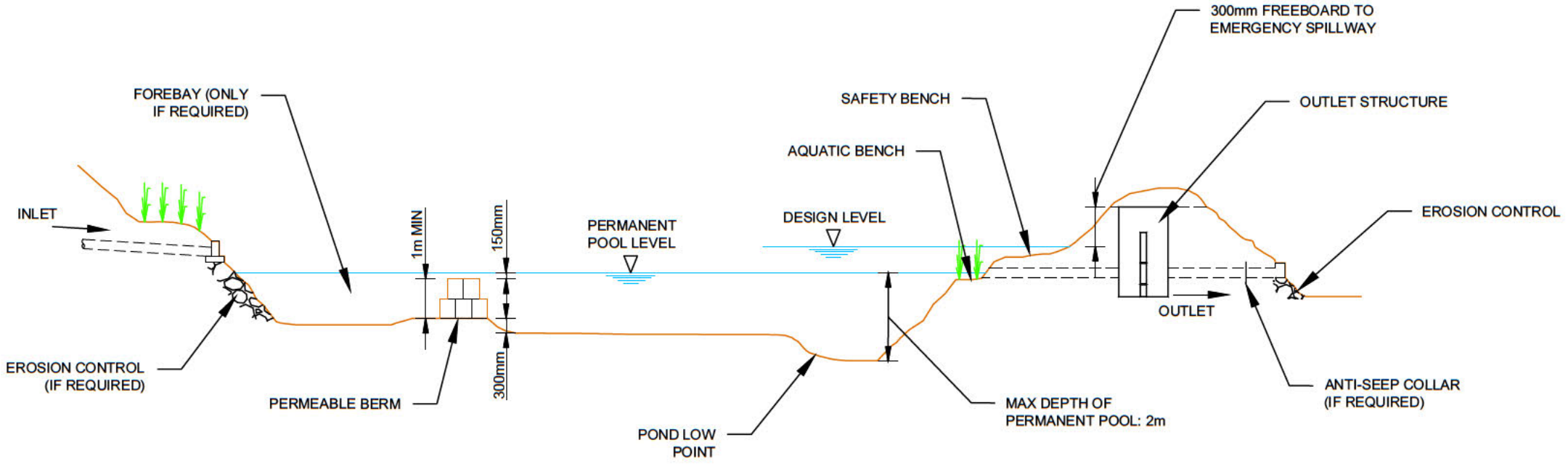


PLAN VIEW



1. WHERE THE GROUND IS VERY PERMEABLE OR GROUNDWATER IS VULNERABLE, THE LINER SHOULD EXTEND TO THE TOP OF THE PERMANENT POND LEVEL. WHERE SLOW INFILTRATION IS ACCEPTABLE, THE TOP LINER LEVEL CAN BE LOWERED A LITTLE.

TYPICAL POND EDGE GEOMETRY



PROFILE

REV	DATE	BY	DESCRIPTION	CHK

DRAWING STATUS: PRELIMINARY

BETTS ASSOCIATES
CIVIL AND STRUCTURAL ENGINEERS
Unit 6, Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire CH5 2LY
Tel: 01244 288178 Fax: 01244 288516 enquiries@betts-associates.co.uk

PROJECT: TYPICAL SUDS DETAIL

TITLE: WET PONDS

DATE:	SCALE @ SIZE:	DRAWN:	CHECKED:
SEP 2014	@ A3	CP	RDN

PROJECT No:	DRAWING No:	REV:
BETTS	111	A

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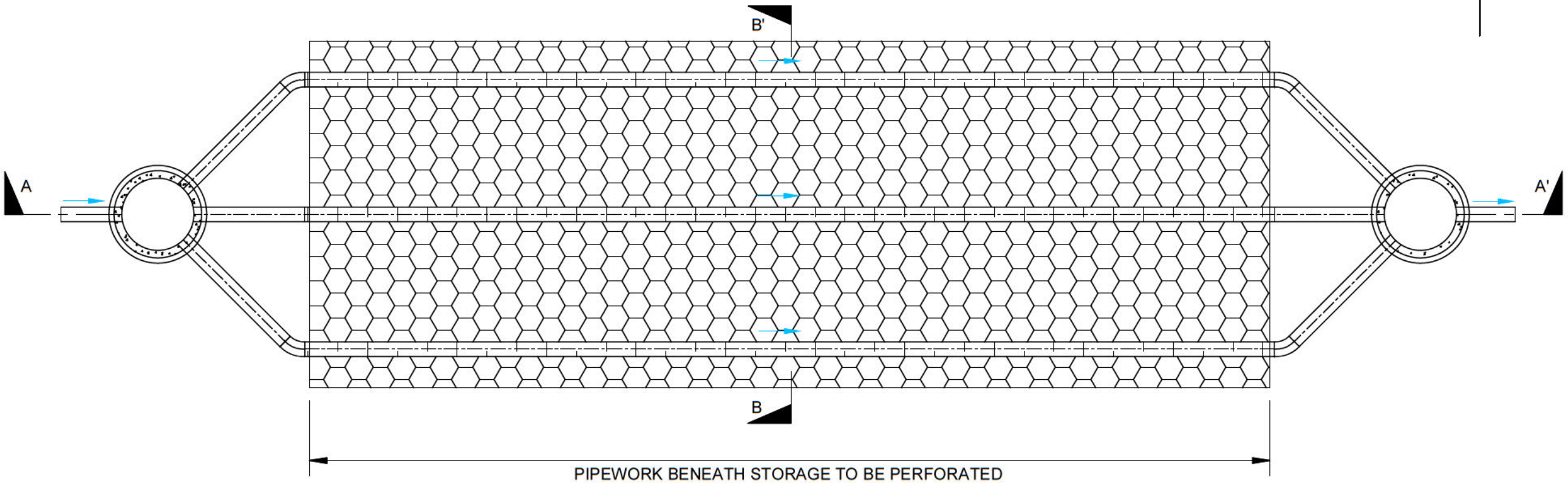
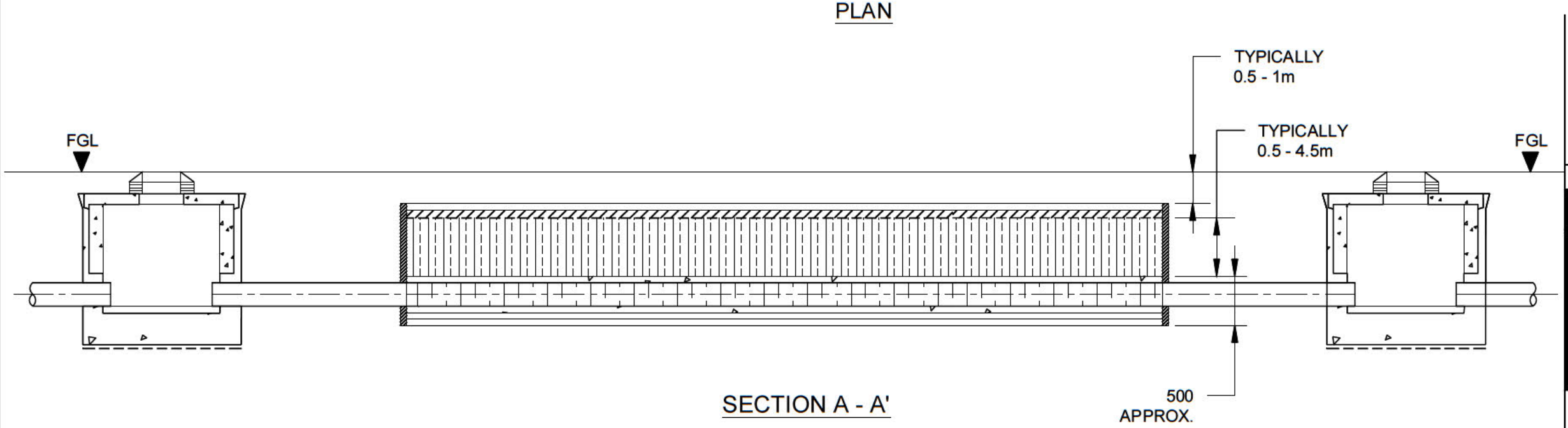
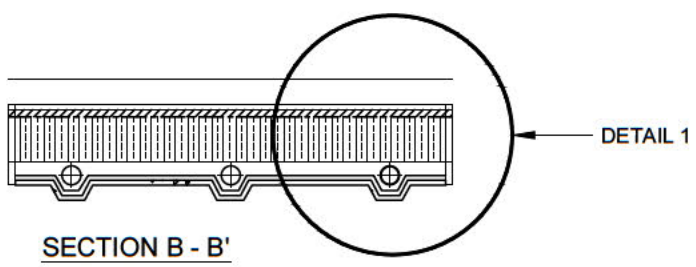


PLAN

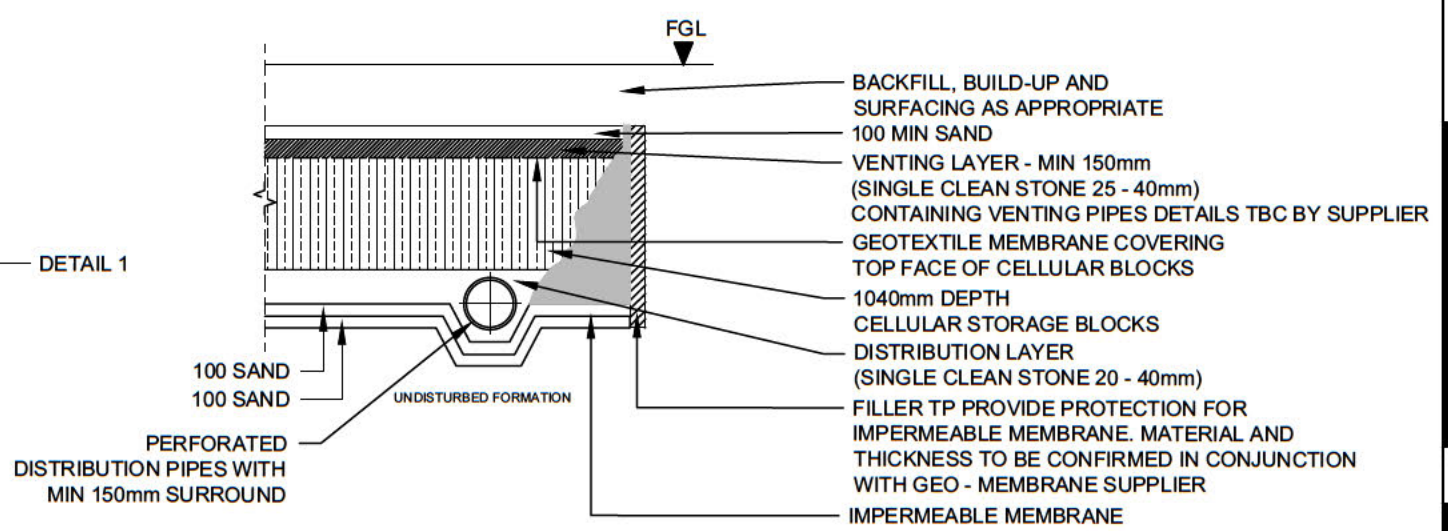


SECTION A - A'

ALL DIMENSIONS AND DEPTHS DEPENDENT ON REQUIRED VOLUME AND LOCAL GROUND CONDITIONS



SECTION B - B'



DETAIL 1

REV	DATE	BY	DESCRIPTION	CHK

DRAWING STATUS: PRELIMINARY

BETTS ASSOCIATES
CIVIL AND STRUCTURAL ENGINEERS
Unit 6, Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire CH5 2LY
Tel: 01244 288178 Fax: 01244 288516 enquiries@betts-associates.co.uk

PROJECT: TYPICAL SUDS DETAIL

TITLE: CELLULAR STORAGE

DATE:	SCALE @ SIZE:	DRAWN:	CHECKED:
SEP 2014	@ A3	CP	RDN

PROJECT No:	DRAWING No:	REV:
BETTS	113	A

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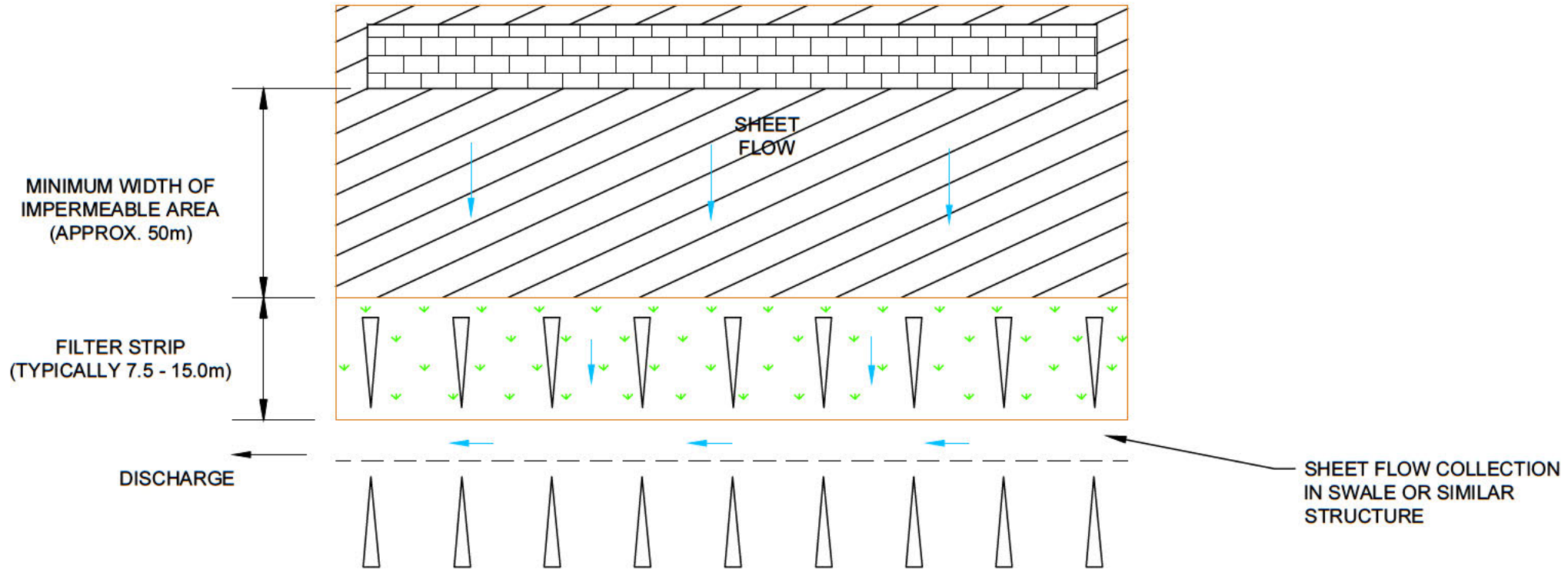
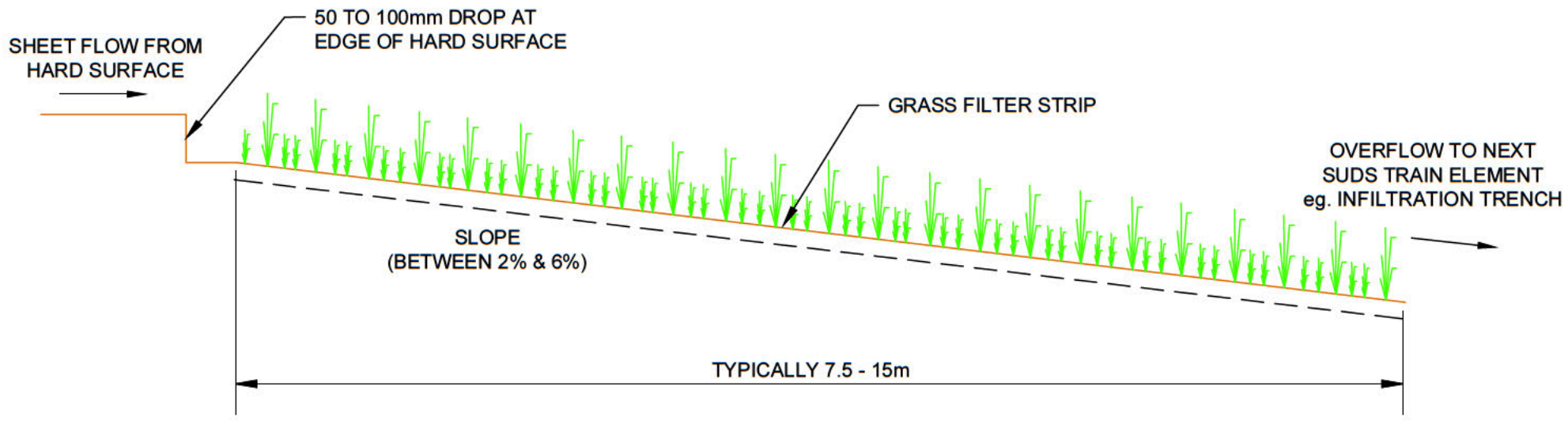


PLAN



ELEVATION

REV	DATE	BY	DESCRIPTION	CHK

DRAWING STATUS: PRELIMINARY

BETTS ASSOCIATES
CIVIL AND STRUCTURAL ENGINEERS
Unit 6, Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire CH5 2LY
Tel: 01244 288178 Fax: 01244 288516 enquiries@betts-associates.co.uk

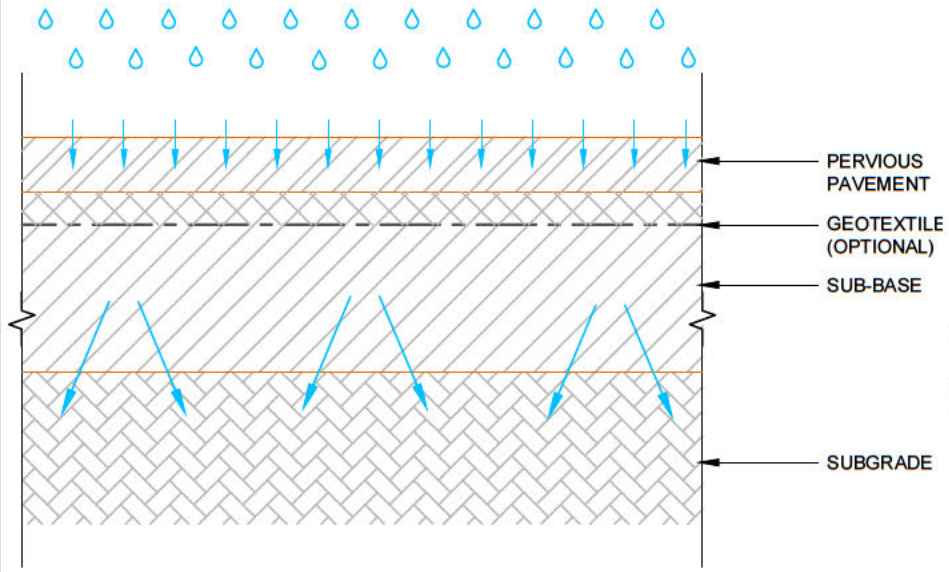
PROJECT: TYPICAL SUDS DETAIL

TITLE: FILTER STRIPS

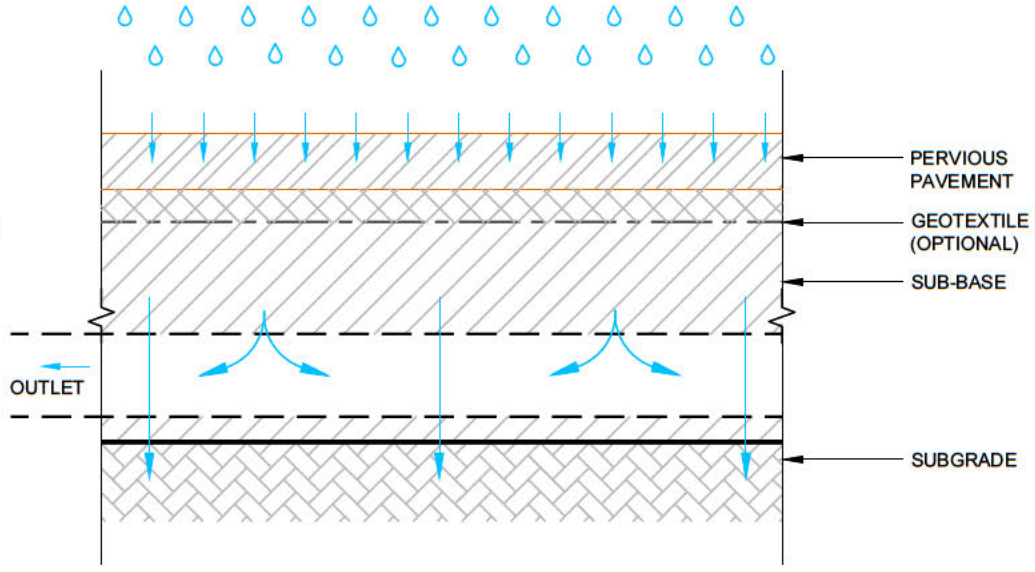
DATE:	SCALE @ SIZE:	DRAWN:	CHECKED:
SEP 2014	@ A3	CP	RDN

PROJECT No:	DRAWING No:	REV:
BETTS	107	A

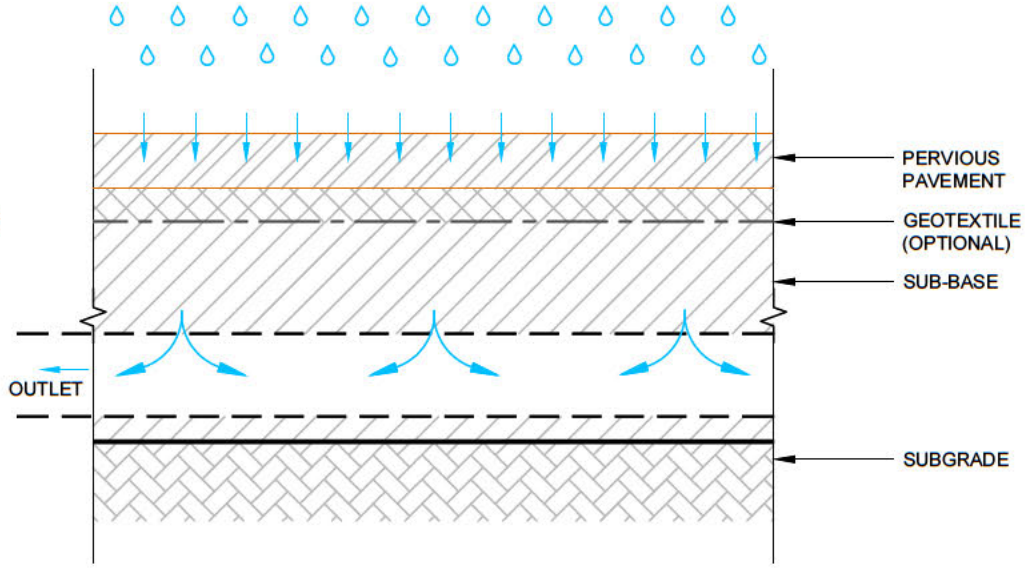
DO NOT SCALE



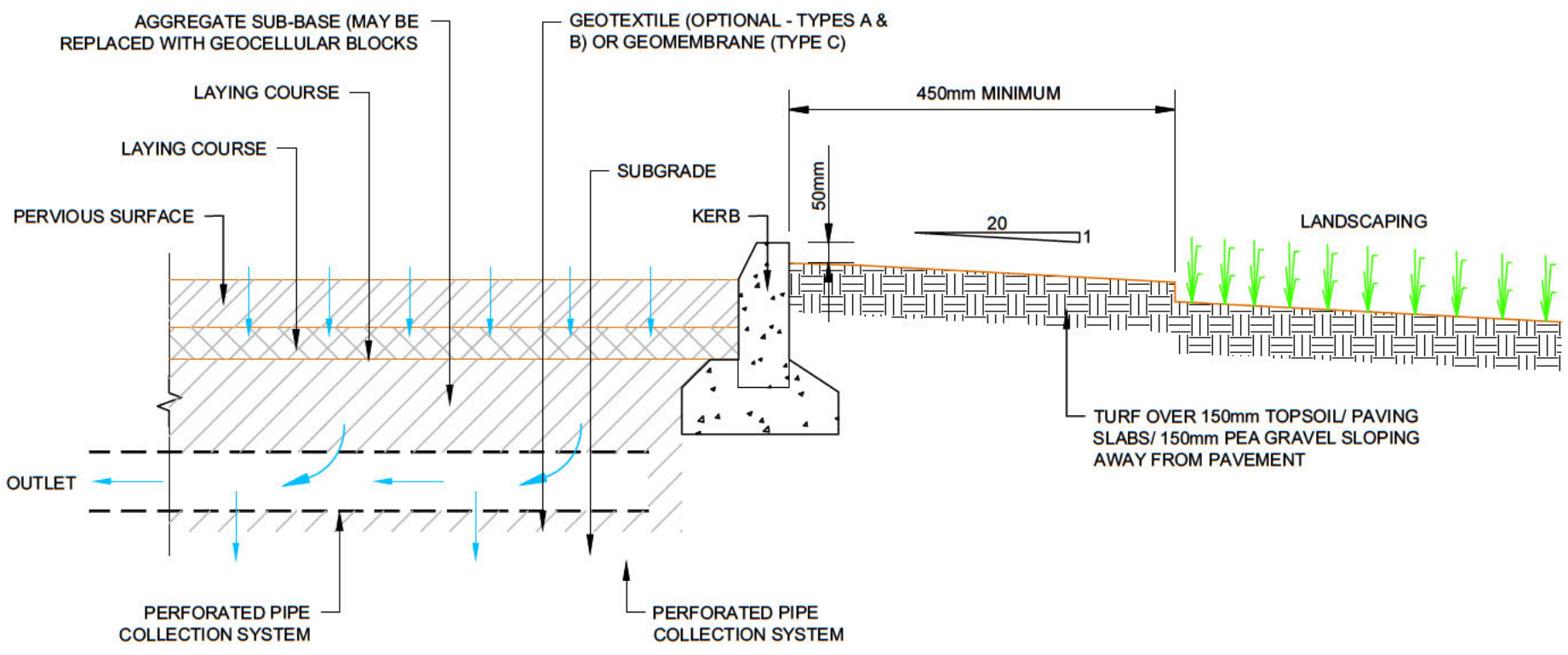
TYPE A: TOTAL INFILTRATIPN



TYPE B: PARTIAL INFILTRATION



TYPE C: NO INFILTRATION



LANDSCAPING DETAIL

REV	DATE	BY	DESCRIPTION	CHK

DRAWING STATUS: PRELIMINARY

BETTS ASSOCIATES
CIVIL AND STRUCTURAL ENGINEERS
Unit 6, Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire CH5 2LY
Tel: 01244 288178 Fax: 01244 288516 enquiries@betts-associates.co.uk

PROJECT: TYPICAL SUDS DETAIL

TITLE: PERVIOUS PAVEMENTS

DATE:	SCALE @ SIZE:	DRAWN:	CHECKED:
SEP 2014	@ A3	CP	RDN

PROJECT No:	DRAWING No:	REV:
BETTS	105	A

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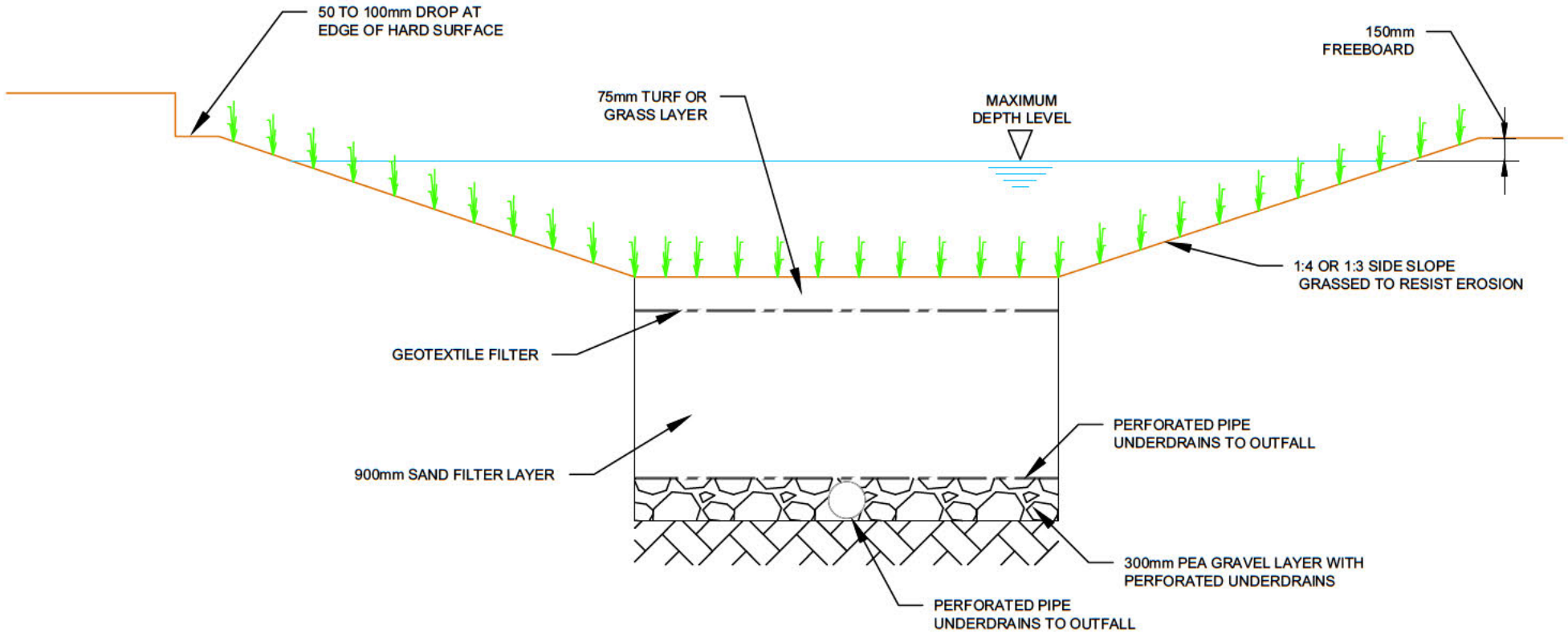
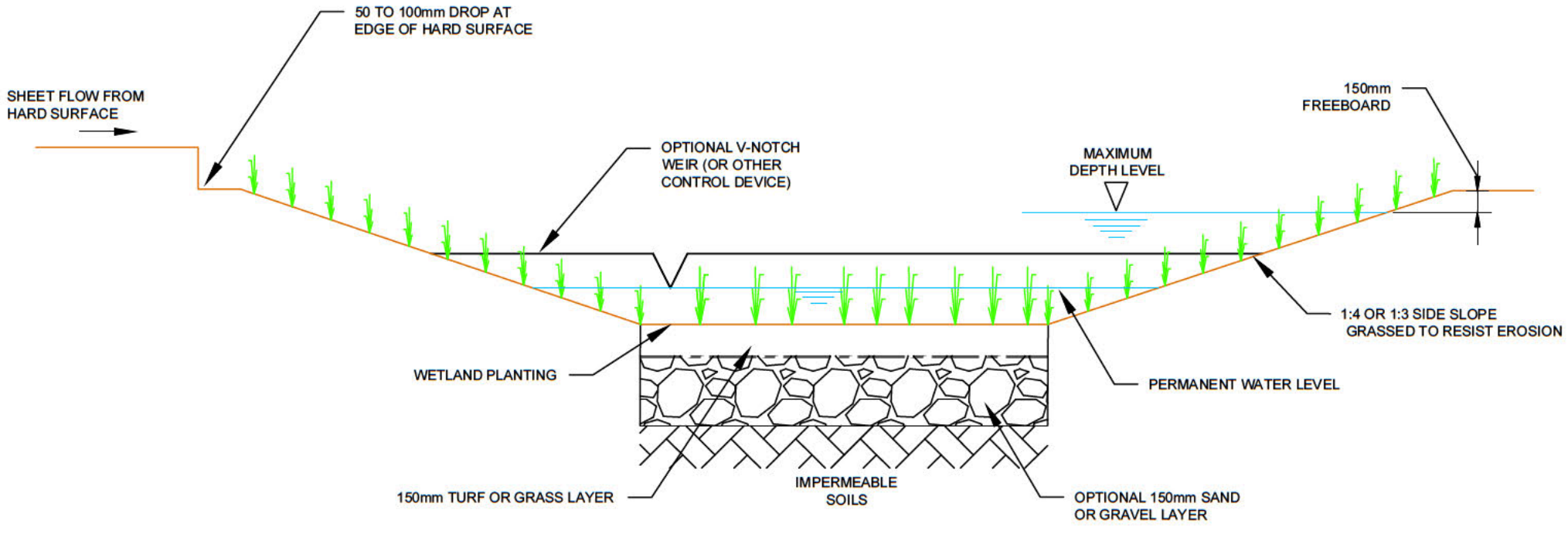


DRY SWALE



WET SWALE

REV	DATE	BY	DESCRIPTION	CHK

DRAWING STATUS: PRELIMINARY

BETTS ASSOCIATES
CIVIL AND STRUCTURAL ENGINEERS
Unit 6, Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire CH5 2LY
Tel: 01244 288178 Fax: 01244 288516 enquiries@betts-associates.co.uk

PROJECT: TYPICAL SUDS DETAIL

TITLE: SWALES (1 of 2)

DATE:	SCALE @ SIZE:	DRAWN:	CHECKED:
SEP 2014	@ A3	CP	RDN

PROJECT No:	DRAWING No:	REV:
BETTS	103	A

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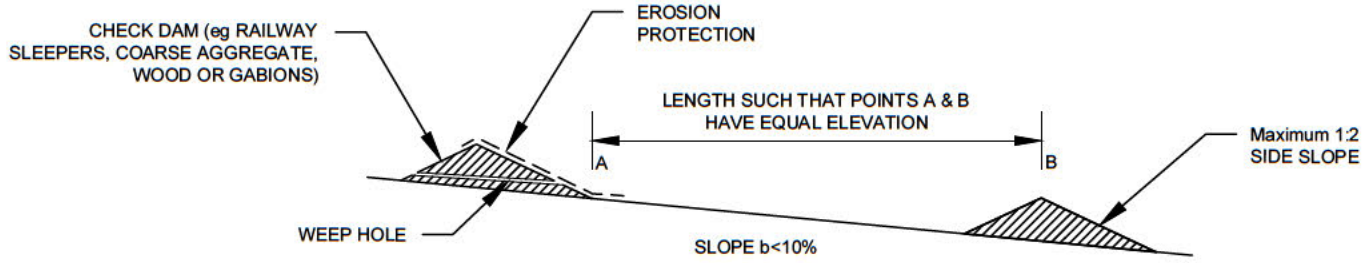
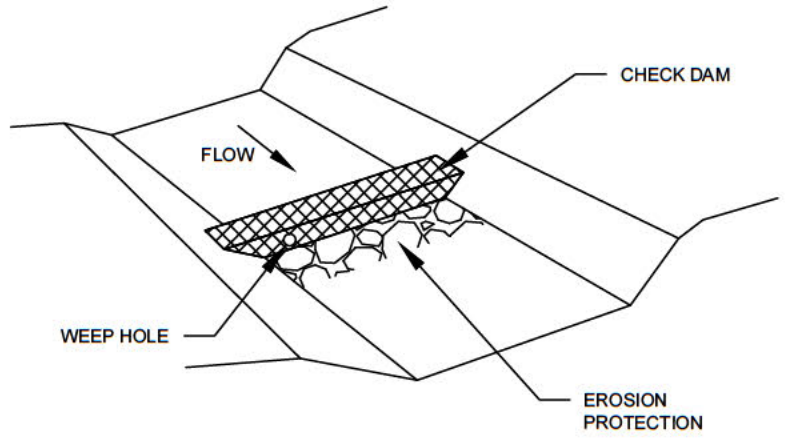
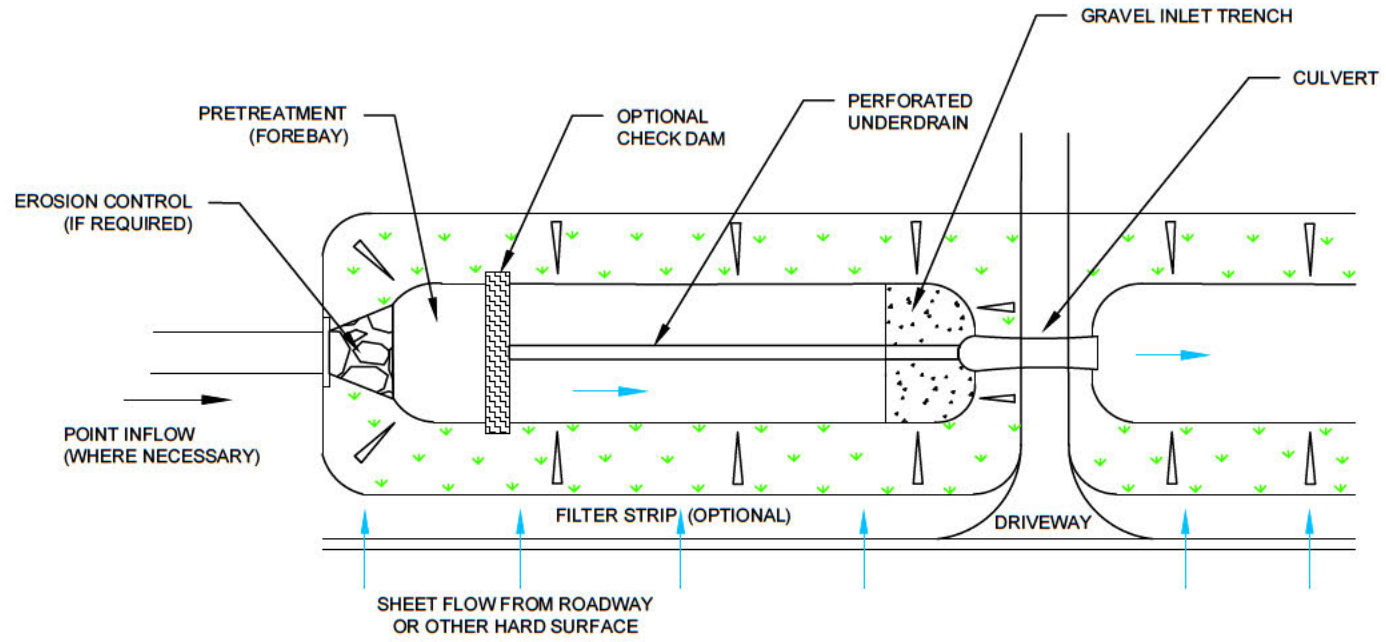


ELEVATION



SCHEMATIC

CHECK DAM



ENHANCED DRY SWALE

REV	DATE	BY	DESCRIPTION	CHK

DRAWING STATUS: PRELIMINARY

BETTS ASSOCIATES
CIVIL AND STRUCTURAL ENGINEERS
Unit 6, Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire CH5 2LY
Tel: 01244 288178 Fax: 01244 288516 enquiries@betts-associates.co.uk

PROJECT: TYPICAL SUDS DETAIL

TITLE: SWALES (2 of 2)

DATE:	SCALE @ SIZE:	DRAWN:	CHECKED:
SEP 2014	@ A3	CP	RDN

PROJECT No:	DRAWING No:	REV:
BETTS	104	A

APPENDIX N: NOTES OF LIMITATIONS

The data essentially comprised a study of available documented information from various sources together with discussions with relevant authorities and other interested parties. There may also be circumstances at the site that are not documented. The information reviewed is not exhaustive and has been accepted in good faith as providing representative and true data pertaining to site conditions. If additional information becomes available which might impact our conclusions, we request the opportunity to review the information, reassess the potential concerns, and modify our opinion if warranted.

It should be noted that any risks identified in this report are perceived risks based on the available information.

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