PRICE & MYERS

Manor Farm
Poyle, Slough

Flood Risk Assessment and Drainage Strategy Report

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Contents

Appendices:

Appendix A Topographical & Utility Survey
Appendix B Existing Falls & Drainage
Appendix C Site Investigation
Appendix D Thames Water Surcharging Correspondence
Appendix E Thames Water Asset Records
Appendix F Greenfield Run-Off Calculations
Appendix G Causeway Flow Calculations
Appendix H Below Ground Drainage Layouts
Appendix I Existing & Proposed Impermeable Areas
Appendix J SuDS Pro-Forma

Acronyms	
AOD	Above Ordnance Datum
BGS	British Geological Survey
BESS	Battery Energy Storage System
CIRIA	Construction Industry Research and Information Association
DCG	Design and Construction Guidance
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency
FRA	Flood Risk Assessment
LLFA	Lead Local Flood Authority
mbgl	Metres below ground level
NHBC	National House-Building Council
NPPF	National Planning Policy Framework
OS	Ordnance Survey
PPG	Planning Practice Guidance
SBC	Slough Borough Council
SFRA	Strategic Flood Risk Assessment
SWMP	Surface Water Management Plan
TW	Thames Water

1 Introduction

Price & Myers have been commissioned to undertake a Flood Risk Assessment (FRA) and produce the drainage strategy for the proposed development at Manor Farm, Poyle in the Borough of Slough.

The National Planning Policy Framework (NPPF) states that an appropriate FRA will be required for all development proposals of 1 ha or greater in Flood Zone 1 and for any development within Flood Zones 2 or 3.

The EA's indicative floodplain map shows that the site is in Flood Zone 1, however the total site area is greater than 1 ha. This assessment will therefore focus on the flood risk to the site from all sources and on surface water management. This report will also outline the proposed drainage strategy for the site including a detailed SuDS assessment.

1.1 Relevant Policy

This FRA has been carried out in accordance with the NPPF and the accompanying Planning Practice Guidance (PPG) 'Flood Risk and Coastal Change'. This FRA also incorporates advice and guidance from the Environment Agency (EA), the Slough Borough Council (SBC) Strategic Flood Risk Assessment (SFRA, 2021) and CIRIA documents.

The surface water drainage strategy is in accordance with:

- the Department for Environment, Food and Rural Affairs (DEFRA) 'Non-Statutory Technical Standards for Sustainable Drainage Systems'
- SBC's 'Flood Risk and Surface Water Drainage Planning Guidance' (2016)
- Building Regulations Part H
- Sewerage Sector Guidance – Appendix (2023)
- Tech UK guidance: 'The UK's Core Digital Infrastructure: Data Centres – Climate Change Adaption and Resilience' (2016).

2 Site Description and Location

The site is located approximately 6km to the southeast of Slough Town Centre and approximately 2km west of Heathrow Airport Terminal 5. The site's nearest postcode is SL3 0BL and the Ordnance Survey grid reference is TQ 02868 76149.

The Poyle Channel is located approximately 20m north of the development boundary and the Colne Brook is approximately 280m west of the development boundary. The site is bound by Poyle Road on the eastern boundary and woodlands form the southern boundary.

The site was formally used for landfill in the latter 20th Century. Approximately 80-90% of the ownership boundary was used for gravel extraction prior to being used for landfilling from the 1940's to 1980's. The waste disposed was inert, industrial, commercial, household, special and liquid sludge wastes.

Parcel A, as outlined in Figure 2.1, now houses commercial and industrial facilities and a service yard with designated parking areas. Parcel B is located approximately 280m south and comprises arable land. The parcels of development are connected via an existing track, which is west of the curtilage belonging to Poyle Farm House.

The development boundary is approximately 81,597m^2 and the adjacent ownership boundary is approximately 220,602m^2.

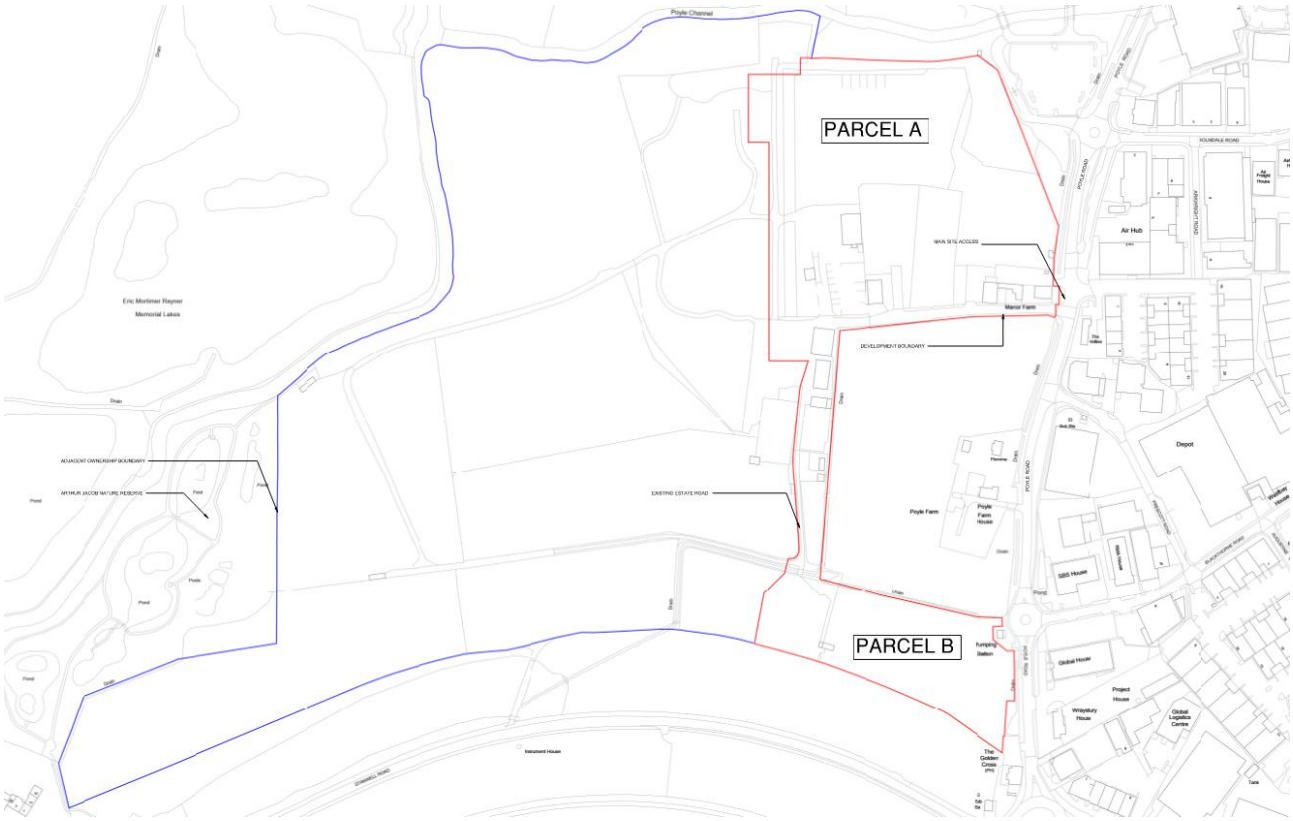


Figure 2.1: Existing site plan, showing development boundary (red) & ownership boundary (blue)

2.1 Topography

A detailed topographical survey was completed by TFT Consultants in December 2023. This survey shows that Parcel A is relatively flat, with a nominal fall from north-west to south-east. On the western boundary of this parcel there is a bund, which varies in height from 1.2m to 2.4m above ground level. Excluding this bund, the site is relatively flat and falls by approximately 1.83m across 338m, from a high point of 21.72mAOD (north-west) to a low point of 19.89mAOD (south-east).

Parcel B is approximately 280m wide by 50m long and the site levels are relatively consistent throughout, ranging from 20.61mAOD to 19.88mAOD in the central area. This central area of Parcel B is slightly elevated with the topography falling towards the boundary edges.

Appendix A contains a full topographic and utilities survey carried out by TFT Consultants in December 2023.

2.2 Geology

The British Geological Survey (BGS) maps shows that the majority of the site is underlain by Shepperton Gravel Member deposits, with Alluvium present in the eastern part of the site, and both overlying the London Clay Formation. Figure 2.2 and Figure 2.3 show the geology of the site and the surrounding area.

Figure 2.2: British Geological Survey bedrock geology map

Figure 2.3: British Geological Survey superficial deposits map

Various site investigation reports have been completed including a Ground Investigation report by Fugro (May 2020) and Borehole Recovery and Environmental Monitoring report by Ramboll (November 2023). The Fugro site investigation encountered Made Ground between 3.5m to 6.2m below ground level, underlain either by River Trace Deposits or London Clay validating the BGS information.

The site is not located in a Source Protection Zone (SPZ), however, the site is located in a sensitive position in relation to the underlying River Terrace Deposits, which are classified as a Principal Aquifer (shown in Figure 2.4). However, the Ramboll investigation notes "*this is anticipated to be limited with regards to resource potential due it being a shallow aquifer and given the landfilling both on and off-site*".

Ramboll also note "*connectivity between on-site groundwater and the adjacent Brook was expected to be present based on the geology of the site and depth to groundwater. However, whilst ammoniacal nitrogen was present in groundwater throughout the landfill and up to the boundary (to a maximum of 20,000 µg/l) it wasn't detected at elevated concentrations in the Colne Brook (25-26 µg/l). Elevated metal concentrations recorded in groundwater in the landfill were also not detected in the stream*".

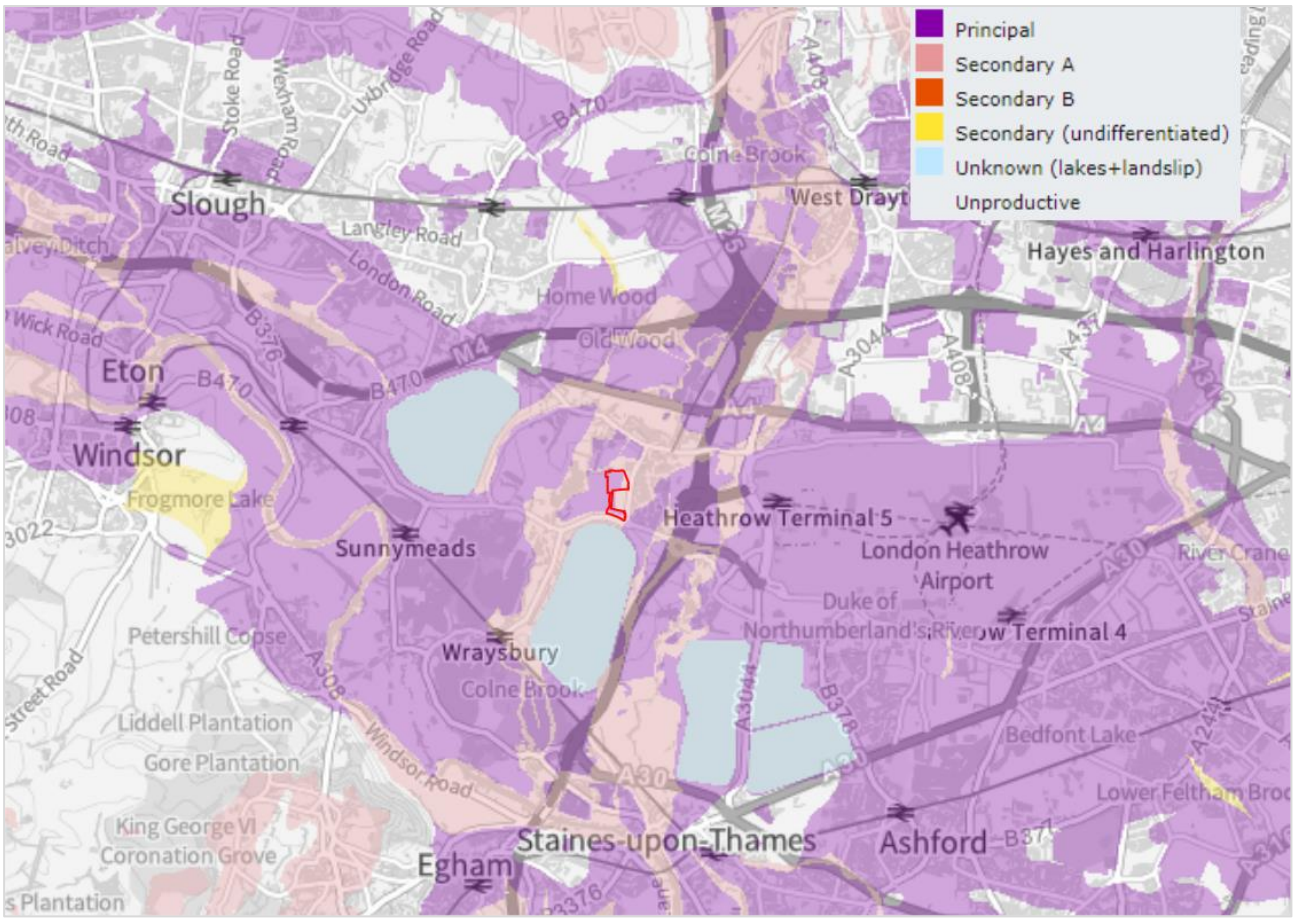


Figure 2.4: British Geological Survey aquifer designation map

2.3 Existing Drainage

The Poyle Channel is located approximately 20m north of Parcel A and the Colne Brook is located approximately 280m west of the development boundary.

The topographical survey and Ordnance Survey information shows a series of ditches, including a ditch network adjacent to Poyle Road, which is located east of the site. There is also a ditch following the northern and western boundary of Parcel B. This appears to route southwards and is assumed to connect to the Colne Brook, as shown in Figure 2.5.

The utility survey completed by TFT Consultants shows that in Parcel A some external areas drain at an unrestricted rate into the ditch networks. Surcharged soakaways were also identified in the GPR survey, suggesting that these structures have failed due to the presence of high groundwater and/or general poor infiltration. The remaining surface water run-off drains into the former development's piped drainage network and outfalls into the 300mm diameter sewer, which is located in Poyle Road. An area of approximately 1,500m^2 currently positively drains into this public sewer at an unrestricted rate.

This public sewer routes southwards before connecting into a Thames Water (TW) pumping station, which is sited adjacent to the Poyle Road/Blackthorne Road roundabout. During the December 2023 utility survey the public sewer network was surcharged, with a water level of 18.41mAOD in TW manhole 0101, suggesting that the downstream pumping station was not operational at this time. Price & Myers have reported this blockage to TW in manhole 0101 in 2024 and they have responded noting "*After investigating with our site internally they responded back that there were no issues at the pumping station, but was just a case of overload due to wet weather*".

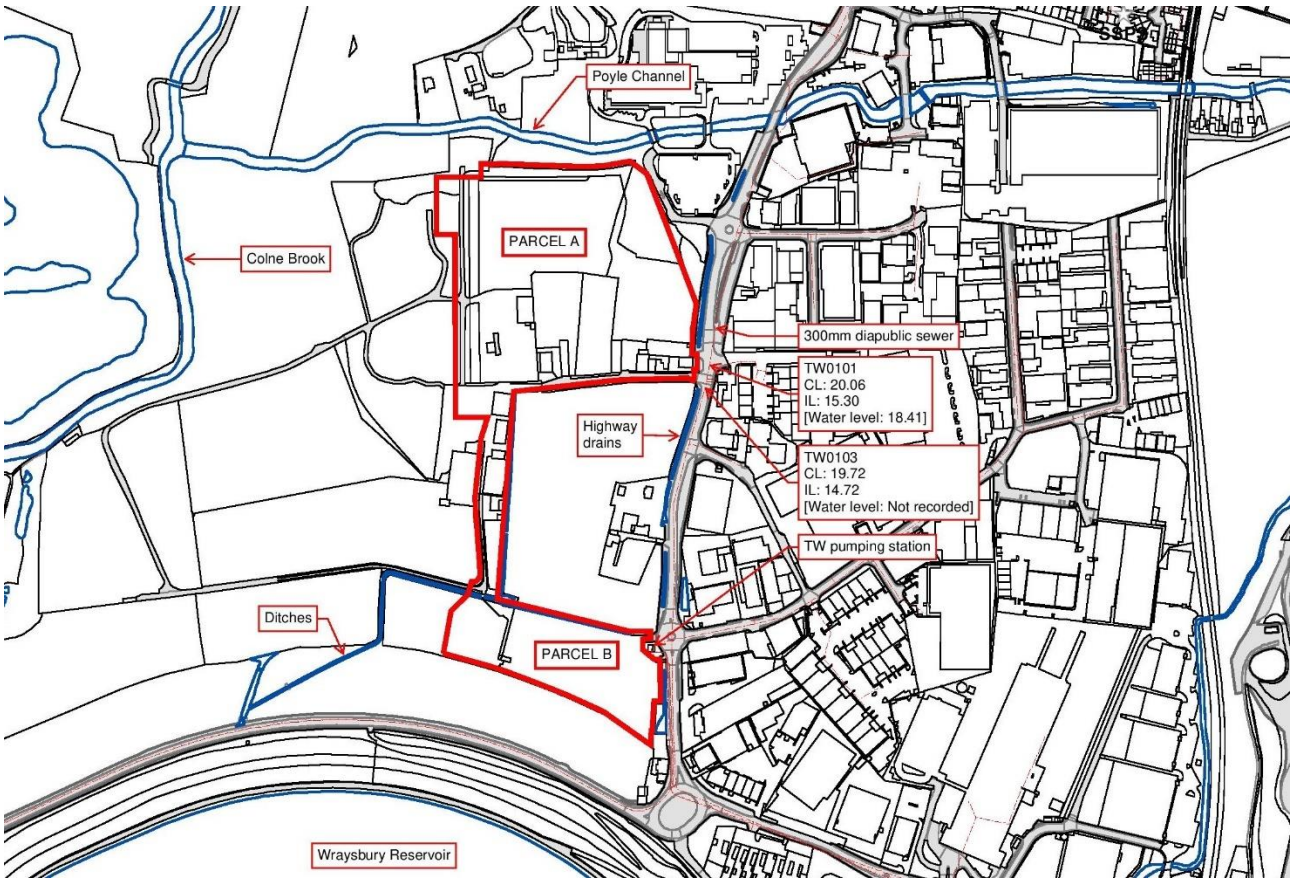


Figure 2.5: Thames Water asset location map extract – refer to Appendix E for full records.

Due to the arable nature of Parcel B, there is no existing drainage infrastructure, and it is assumed that this area of the site infiltrates into the ground, and/or flows into ditches at the eastern, southern and western boundaries.

3 Development Proposal

Demolition of existing buildings and the redevelopment to comprise a Data Centre (Use Class B8) and Battery Energy Storage System (BESS) with ancillary substation, welfare and guard buildings, offices, associated plant, emergency backup generators and associated fuel storage, landscaping, sustainable drainage systems, car and cycle parking, and new and amended vehicular and emergency access from Poyle Road.

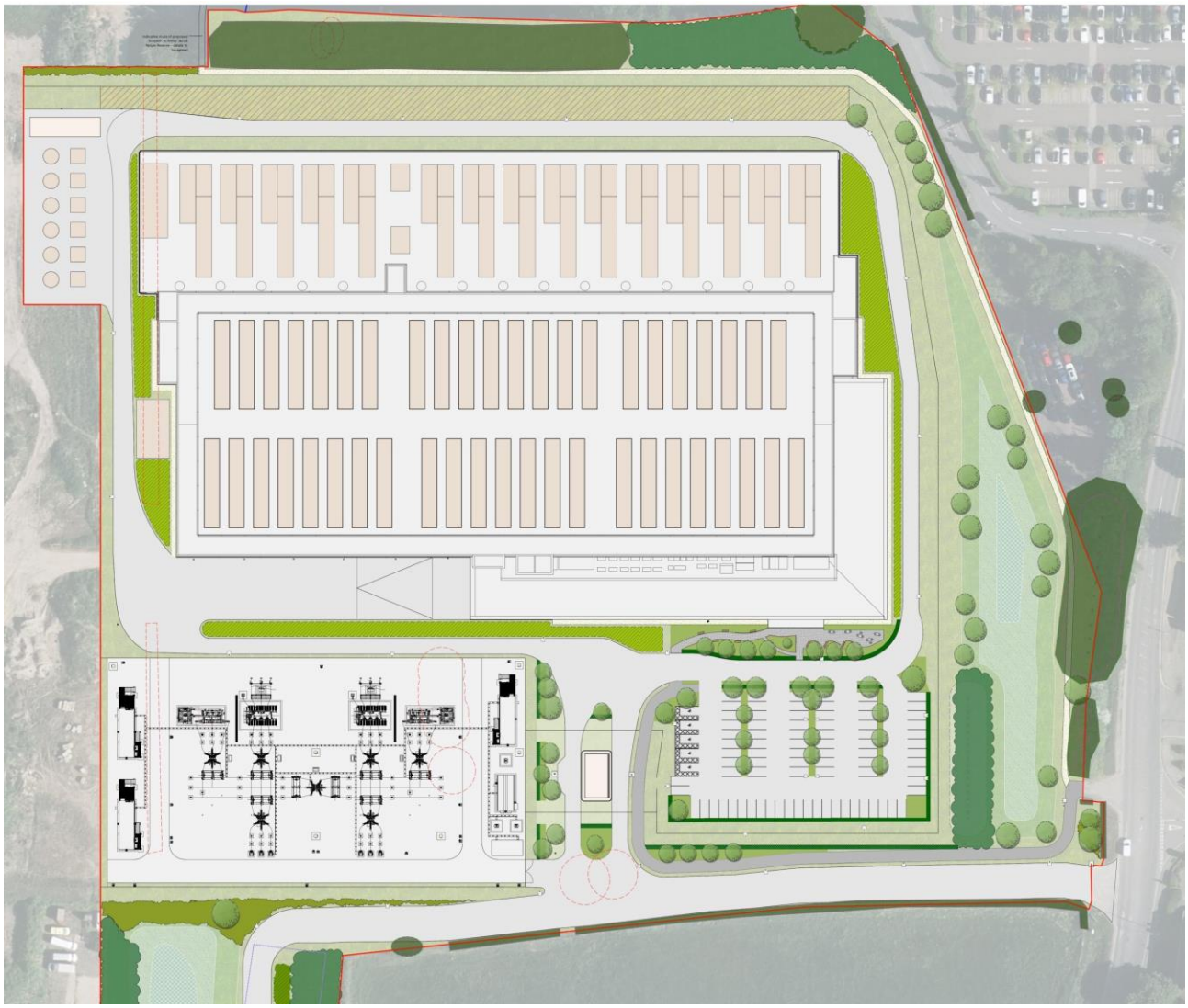


Figure 3.1: Proposed site layout – Parcel A

Figure 3.2: Proposed site layout – Parcel B

4 Flood Risk Assessment

4.1 Flood Risk from Watercourses and Tidal Flooding

The EA's flood map for planning (Figure 4.1) shows that the site is located in Flood Zone 1 and is at "very low" risk of flooding from watercourses or the sea. Developments in this flood zone do not have any restrictions, provided they do not increase the risk of flooding elsewhere.

The UK's Core Digital Infrastructure guidance for data centres notes that "*flood is at the top of the list of risk factors when choosing a location for data centres; although there is no agreed risk threshold, industry practitioners generally seek a risk below 1 in 1000*". The development boundary is in Flood Zone 1 and has an annual probably of less than 0.1%, meaning that there is less than a 1 in 1000 chance of flooding in any given year. Therefore, the proposed development location complies with Tech UK's report requirements, which was a voluntary submission to DEFRA on behalf of the information, communications and technology sector under the Adaptation Reporting Power (second round of reporting) as defined by the 2008 Climate Change Act.

Product 6 data from the EA does not provide quantify the 1 in 1000-year flood level, however, it does provide the 1 in 100-year plus 20% allowance for climate change fluvial flood level: 20.04mAOD. The EA data suggests that the 1 in 1000-year flood levels is less than the 1 in 100-year plus climate change allowance level and both are contained within the Poyle Channel banks.

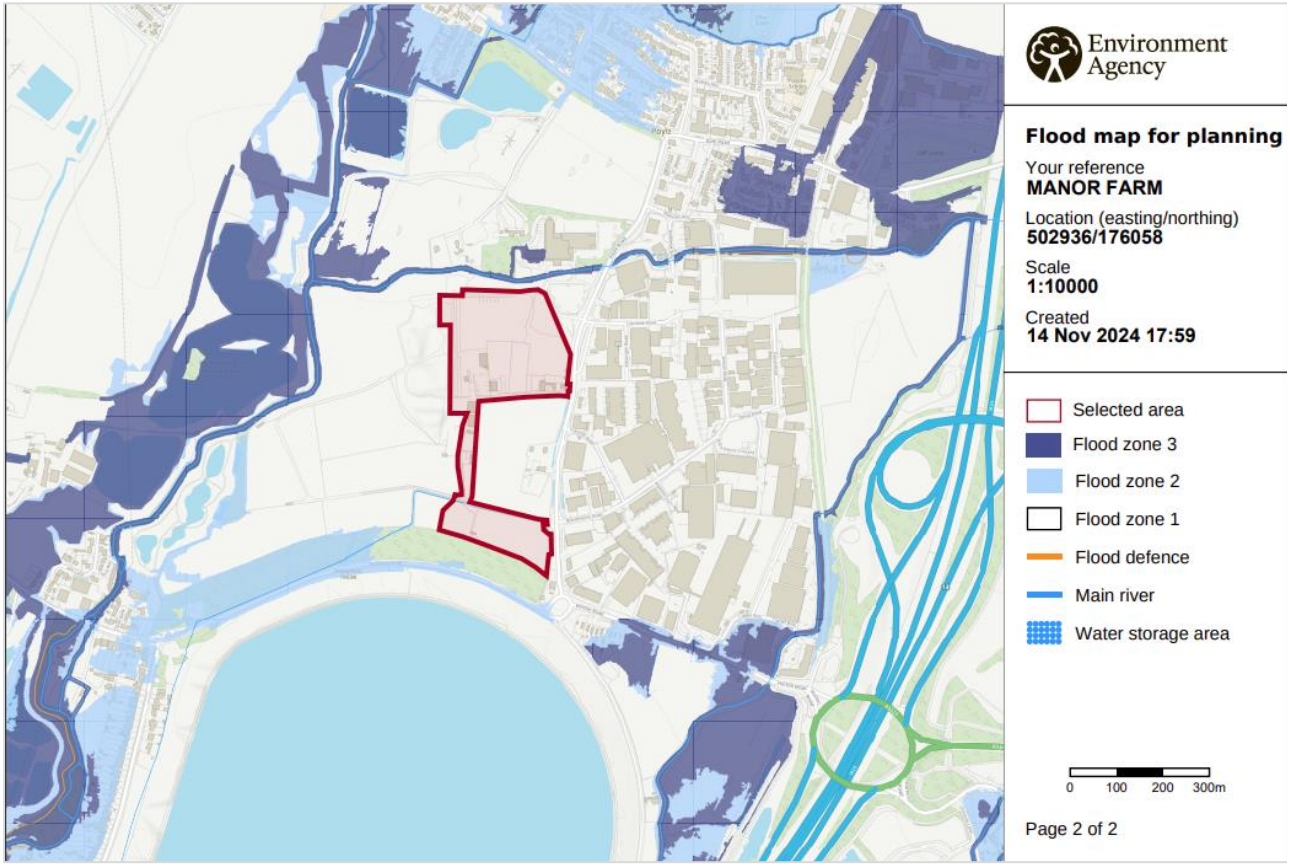


Figure 4.1: Environment Agency flood map for planning

4.1.1 Mitigation Measures for Watercourses and Tidal Flooding

The natural topography within Parcel A is sited above the Poyle Channel banks and the proposed finished floor level will be set well above this (21.40mAOD). This finished floor level is 1.36m above the 1 in 100-year plus 20% climate change allowance peak flood level and therefore it will provide sufficient protection from fluvial flooding.

4.2 Sequential and Exception Tests

In accordance with the NPPF, before planning permission can be granted the risk-based Sequential Test should be applied and accepted. This needs to be done for those developments in Zone 2 or 3, and for all but minor developments. The test's aim is to steer new development to areas at the lowest probability of flooding (Zone 1). Development should not be permitted if there are reasonably available sites to accommodate the proposed development in areas with a lower probability of flooding.

This development has a vulnerability classification of Essential Infrastructure under the PPG and so, as can be seen from Table 4.1, it is appropriate in Flood Zone 1 and the exception test will not be required. As the total site area is greater than 1 ha, the following FRA has been carried out to assess the flood risk to the site from all sources.

Flood Risk Vulnerability Classification		**Essential Infrastructure**	**Water Compatible**	**Highly Vulnerable**	**More Vulnerable**	**Less Vulnerable**
Flood Zone	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception test required	✓	✓
	Zone 3a	Exception test required	✓	×	Exception test required	✓
	Zone 3b Functional Floodplain	Exception test required	✓	×	×	×
Key: ✓ Development is appropriate. × Development should not be permitted.						

Table 4.1 Flood Risk Vulnerability and Flood Zone Compatibility from PPG "Flood Risk and Coastal Change" Table 3

4.3 Flood Risk from Groundwater

Groundwater flooding occurs when water originating from sub-surface permeable strata emerges from the ground, typically after prolonged rainfall.

The SFRA states that "*much of Colnbrook and Poyle is prone to groundwater flooding*" and goes on to say that "*there are large areas of the Slough Borough susceptible to groundwater flooding, with almost half of the Slough Borough identified with the potential for groundwater flooding to occur at surface*". This is shown in Figure 4.2 with a portion of the site being classified as having 'potential for groundwater flooding to occur at surface'.

The highlighted locations in Figure 4.2 show two areas known to experience groundwater flooding by SBC. These are both located more than 1km from the development site.

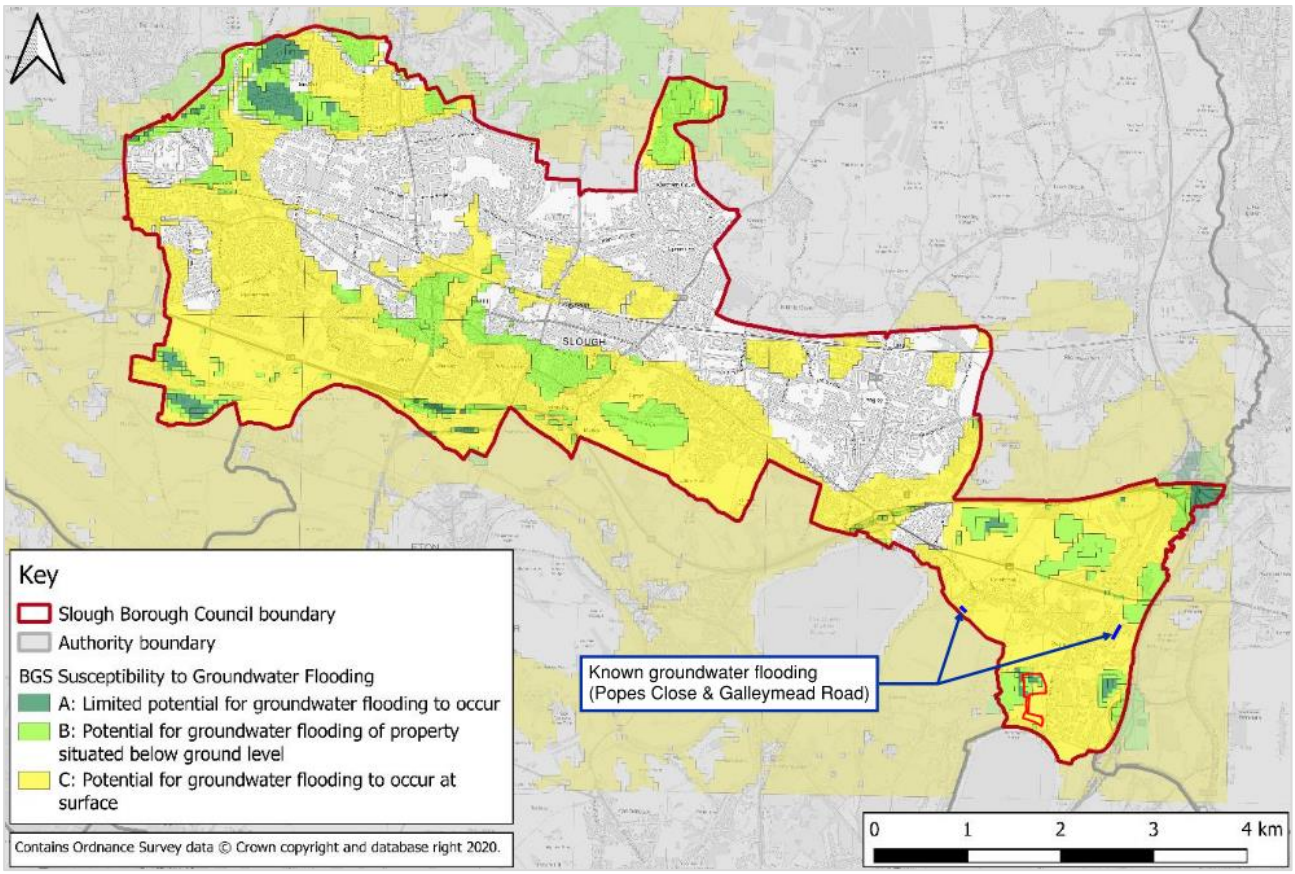


Figure 4.2: British Geological Survey susceptibility to groundwater flooding map

The site lies on the 'lower terrace' of the borough and the groundwater level is influenced by the permeability of the bedrock and the River Thames (3km to the southwest). This results in relatively high groundwater throughout the 'lower terrace' of the borough, with groundwater generally being located one to two metres below ground level. The superficial deposits may contain perched water tables as they overlay an impermeable clay bedrock.

The SFRA also highlights that groundwater flows in the Poyle area have been altered by the backfilling with waste of sites excavated for sand and gravel, as the development has been historically. The construction of the Wraysbury and Queen Mother reservoirs has also blocked partially or completely groundwater flows, thereby increasing the local rate of flow and level of groundwater. The SFRA states that "*it is essential that future development does not exacerbate this problem*".

The Ramboll site investigation shows that groundwater was present at depths of approximately 0.4m – 2.99m below ground level (mbgl) within the development site boundary. Extensive groundwater monitoring was completed in November 2023; however, groundwater levels would be expected to rise further throughout the winter and early spring period. These groundwater monitor wells are summarised in Table 4.2 below and a groundwater contour map is plotted in Figure 4.3.

Monitoring Point	Response Zone Strata	Response Zone (mbgl)	Water Level (mbgl)
BH2484	Made Ground	1.2 – 3.7	0.98
BH2486	Made Ground	0.7 – 1.8	1.77
BH2488	Made Ground	1.2 – 3.0	2.11
BH2495	Made Ground	1.2 -3.0	2.99
BH2496	Made Ground	1.2 – 2.5	2.19
BH2496	Made Ground	1.0 – 2.0	1.84
BH2498	Made Ground	1.2 – 2.3	2.78
BH2499	Made Ground	0.5 – 1.2	0.83
BH2506	Made Ground	1.0 – 1.5	0.4

Table 4.2 Ramboll groundwater summary

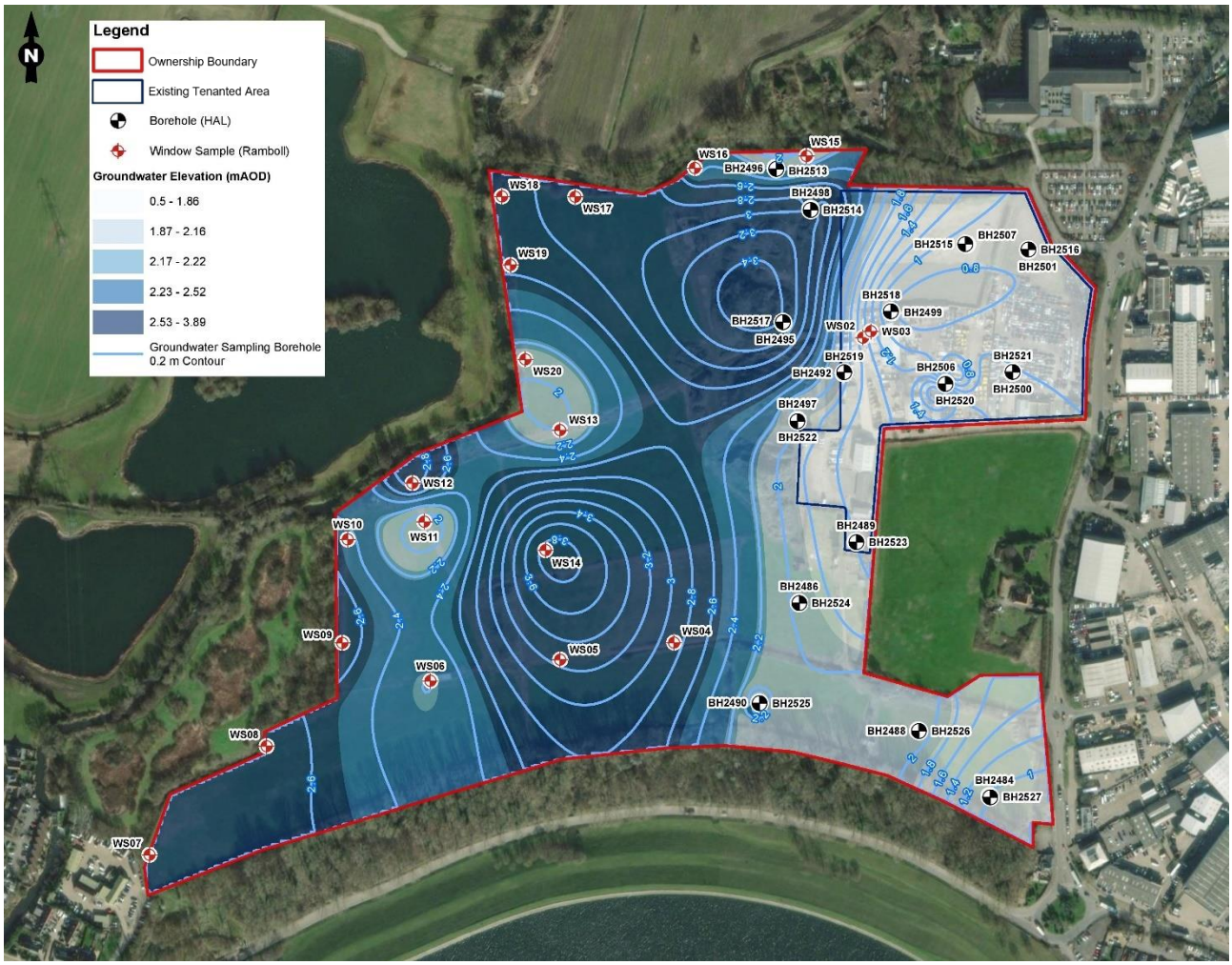


Figure 4.3 Ramboll groundwater contour plot

Ramboll's site investigation report states that "*groundwater flow was generally inferred to the west, with flow direction in the centre of the site less clear, likely due to the heterogeneous nature of the fill material*". This is expected to have hydrological connectivity with the Colne Brook to the west.

4.3.1 Mitigation Measures for Groundwater Flooding

The proposed development does not include any basement or lower ground levels which would increase the risk of elevated groundwater reaching surface level or change existing groundwater flow paths. Proposed strategic levels will also not include significant lowering of existing ground levels which would also increase possible pathways for groundwater to reach the surface.

Proposed SuDS features such as attenuation basins, rain gardens and permeable paving will be lined to ensure their capacity is not reduced due to the possible ingress of groundwater. The implementation of a new surface drainage system will also intercept and store surface water run-off on site which will reduce the ground saturation which can lead to groundwater flooding. Therefore, the risk of groundwater flooding will be mitigated.

4.4 Flood Risk from Surface Water and Overland Flows

Surface water flooding occurs when intense rainfall is unable to soak into the ground or enter a drainage system due to blockages or the capacity of the system being exceeded. Overland flows can also be generated by burst water mains, failed dams and any failure in a system storing or transferring water.

The EA's indicative Surface Water Flooding map, Figure 4.4, shows that the site is generally at 'low' risk of surface water flooding. There are some areas at 'medium' and 'high' risk of surface water flooding in Parcel A, however these areas represent low-lying points in the topography, as generated using LiDAR data. These areas at risk of surface water flooding are isolated low points and are not generated from flow paths from outside of the development. Figure 4.4 does suggest a small flow path from the ownership boundary into the site, however, this is inaccurate as the existing bunding on the western boundary prevents this. Therefore, the risk of flooding from surface water and overland flows in the proposed development are considered low.

Figure 4.4 Environment Agency surface water flood risk map

4.4.1 Mitigation Measures for Surface Water and Overland Flows

The site will incorporate substantial SuDS, which will manage and control surface water run-off generated on site. This will ensure that peak run-off rates are restricted to greenfield run-off rates for all storm events thereby reducing the impact on the receiving infrastructure.

As outlined in Section 2.3 a portion of the site currently drains unrestricted into the public sewer. The development proposals will reduce these run-off rates and therefore increase capacity within the receiving sewers. This will reduce flood risk on and off site. Section 5 outlines the proposed surface water drainage and SuDS proposals.

4.5 Flood Risk from Reservoirs

The EA provides information on flood risk from reservoirs. The map showing the maximum extent of flooding from reservoirs was updated in 2021 and now shows the combined effects of flooding from reservoirs and rivers. Figure 4.5 shows that the proposed development is at risk of reservoir flooding from the Wraysbury Reservoir and the Queen Mother Reservoir, which are owned by the EA. However, the EA's information states that reservoir flooding is extremely unlikely to happen and there has been no loss of life in the UK from reservoir flooding since 1925. The Reservoir Act of 1975 ensures that reservoirs are inspected regularly, and essential safety work is carried out.

Figure 4.5 Environment Agency risk of reservoir flooding map

4.5.1 Mitigation Measures for Reservoir Flooding

In the unlikely event that a reservoir dam fails a large volume of water would escape at once and flooding could happen with little or no warning. It is therefore recommended that building users seek refuge on the upper floors of the building and wait for advice from the emergency services.

4.6 Flood Risk from Sewers

Sewer flooding occurs when the flow entering the sewerage network is greater than the capacity of the sewers, or when blockages occur in the sewer network. The SFRA contains information on sewer flooding and notes that "*in most of Poyle and some of Colnbrook, there is the problem of infiltration of groundwater into the foul sewers which affects capacity and increases the likelihood of foul sewer flooding*". Occurrences of sewer flooding are limited in geographical area across SBC and are generally associated with storm water events when the sewer system is surcharged with surface water run-off.

Thames Water maintain a register of properties which are at risk of sewer flooding; this is called the DG5 register. According to this register there are no recorded incidents of internal or external flooding with the development site's postcode, as shown in Figure 4.6. However, as noted in Section 2.3 the TW sewer manholes were surcharged during TFT's utility survey investigation, with TW responding that this was overloaded due to wet weather.

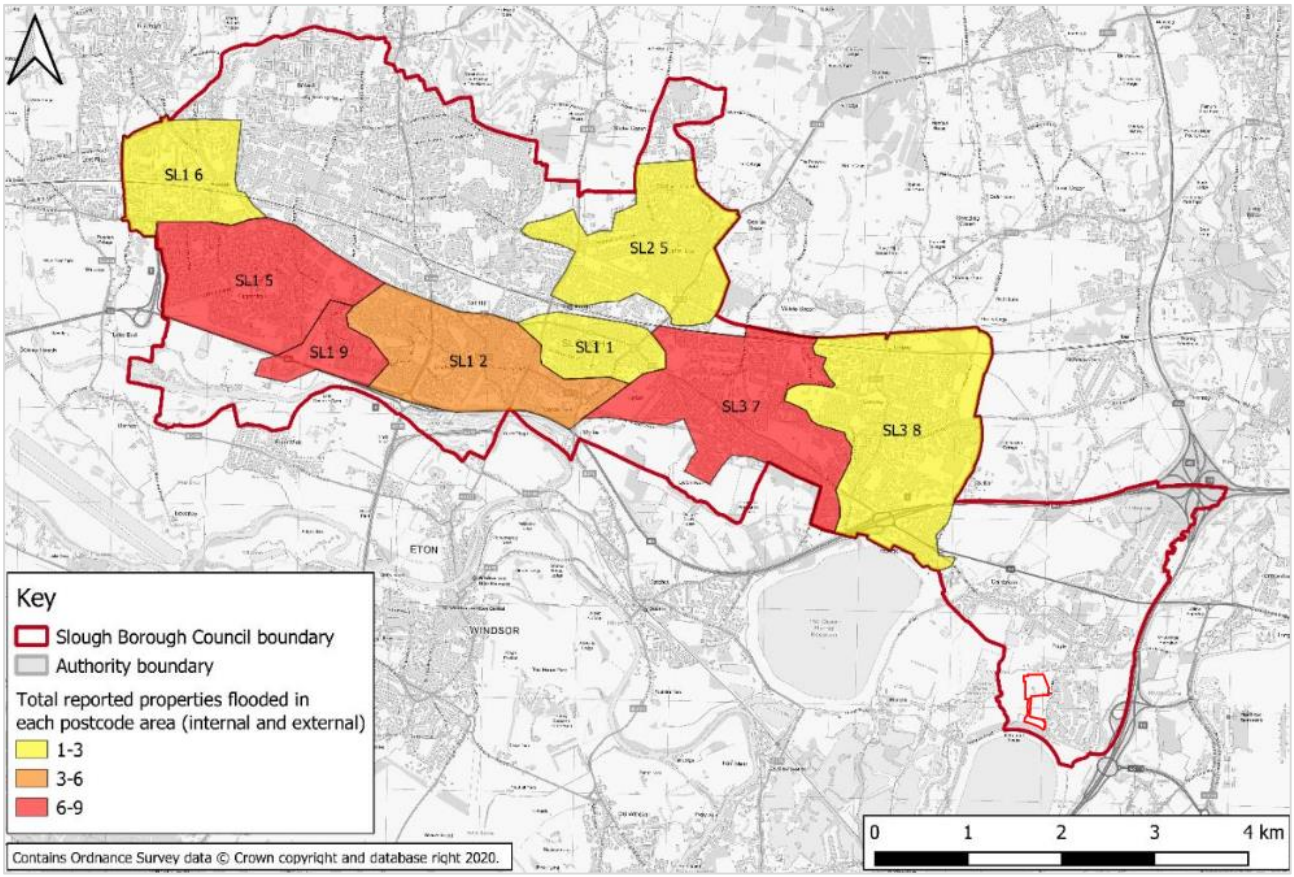


Figure 4.6: SFRA historic sewer flooding incidents

4.6.1 Mitigation Measures for Sewer Flooding

The proposed development will include a new surface water drainage network which will be designed for the extreme 1 in 100-year storm event plus 40% allowance for climate change. Refer to Section 5.2 for further details.

Additionally, the proposed SuDS features will reduce peak run-off rates into receiving sewers. External levels on site will be designed so that any exceedance events will be routed to low-risk areas and away from building thresholds.

4.7 Summary of Flood Mitigation Measures

Flood Risk from:	Mitigation Measure
Watercourses and Tidal Flooding	• Very low risk of watercourse or tidal flooding. • Proposed finished floor levels will be set above the 1 in 1000-year flood level.
Groundwater Flooding	• No basement or related lower ground floor levels are proposed. • Proposed site levels will be maintained or raised, excluding the proposed detention basins. • Proposed SuDS will be lined to prevent groundwater ingress, and the new surface water drainage system will intercept and store run-off, reducing ground saturation.
Surface Water and Overland Flows	• SuDS will manage and control surface water run-off generated on site; this will ensure that peak run-off rates are restricted to greenfield run-off rates.
Reservoir Flooding	• Very low risk of reservoir failure. • In the unlikely event of a reservoir failure, building users should seek refuge on the upper floors of the building and wait for advice from the emergency services.
Sewers	• SuDS proposed to reduce peak run-off rates from site to receiving Thames Water infrastructure.

Table 4.3 Summary of flood mitigation measures

5 Surface Water Run-off Assessment

5.1 Existing Run-off

As described in Section 2.3, some external areas from Parcel A drain at an unrestricted rate into a series of ditches surrounding the development boundary. A series of failed soakaways are also present; their infiltration potential is limited due to high groundwater levels in this parcel of land.

Approximately 1,500m^2 of hardstanding areas from Parcel A drain into the public sewer via a piped drainage network. The existing peak run-off rate into the Poyle Road public sewer for various design storm events was calculated using the modified rational method as shown below:

$Qx_{ex} = 2.78 \times A \times i$

Where 'x' is the return period in years, 'A' is the catchment area in ha and 'i' is the rainfall intensity in mm/hr provided by the FEH method.

$Q1_{ex}$ = 2.78 × 30.84 × 0.15 = 12.86 l/s
$Q30_{ex}$ = 2.78 × 72.46 × 0.15 = 30.22 l/s
$Q100_{ex}$ = 2.78 × 91.69 × 0.15 = 38.23 l/s

5.2 Design Criteria

The Defra Non-Statutory Technical Standards for sustainable drainage systems (NSTS) requires that the drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur:

- on any part of the site in a 1 in 30-year rainfall event;
- in any part of a building or in any utility plant susceptible to water, in a 1 in 100-year rainfall event.

The current EA guidance on ensuring that new development does not increase flood risk elsewhere gives values for climate change allowance on rainfall intensity based on the expected lifetime of the building and the location of the site.

For development with a lifetime beyond the year 2100, the "upper end" allowance must be used for the 2070s epoch, which covers the period 2061 to 2125.

The current EA guidance on climate change allowance states that new drainage systems must be designed to ensure that there is no increase in the rate of run-off discharged from the site for the "Upper End" allowance. The latest climate change allowances were published in 2022 and show new climate change allowances for peak rainfall. These upper end allowances are 35% and 40% for the 1 in 30-year and 1 in 100-year design storms respectively in the Maidenhead and Sudbury Management Catchment. These allowances will be used in the proposed surface water design.

The site is located within the Colne Management Catchment (Parcel A) and the Maidenhead and Sunbury Management Catchment (Parcel B). In both instances the upper end allowance for the 2070s epoch is 40%. This allowance has been applied to the 1 in 100-year rainfall intensity to carry out the drainage design.

5.3 Surface Water SuDS Strategy

In accordance with EA guidelines and CIRIA documents, surface water run-off should be managed as close to its source as possible. The Slough SFRA states that all developments must also consider other sources of flooding including groundwater, surface and foul sewer flooding, and apply a sequential approach to these risks if present. The following drainage hierarchy was therefore used to determine run-off destination:

5.3.1 Infiltration Into the Ground

An infiltration drainage system is the preferred method of surface water drainage for any new development as it mimics natural conditions and encourages the recharge of groundwater.

Falling head infiltration testing was completed in Parcel A by Fugro in May 2019. Table 5.1 summarises these results and the respective borehole locations are shown in Figure 4.3.

Test Location	Test Depth (mbgl)	Coefficient of Permeability (m/s)
BH2516 – Test 1	4.1 – 4.6	7.03×10^{-4}
BH2516 – Test 2	4.4 – 5.0	1.03×10^{-3}
BH2488 – Test 1	1.5 – 2.5	1.71×10^{-5}
BH2495 – Test 2	3.0 – 4.0	6.24×10^{-6}

Table 5.1 Fugro falling head test within boreholes results

These results suggest that the underlying soils are variable but exhibit fair infiltration properties. However, the presence of high groundwater in Parcel A restricts the opportunity for infiltration systems, as a minimum of 1m unsaturated zone must be provided between the base of infiltration systems and the groundwater. The risk of ground contamination also restricts the use of infiltration systems. Surface water infiltration is therefore not considered feasible within Parcel A as the extensive building footprint and road network would result in soakaways being sited within the groundwater table.

In Parcel B the development comprises a new gravel road and negligible areas of hardstanding from the associated battery yard equipment. It is therefore proposed to retain the existing drainage strategy here and allow this portion of the site to infiltrate naturally with levels being retained or raised above the existing profile. This will mitigate the risk of groundwater pathways meeting the surface and mimic the existing greenfield condition.

The SBC SFRA notes that *"soakaways cannot be used on sites where the land is contaminated"*. The Ramboll site investigation concludes that "*visual and olfactory evidence of contamination was noted in multiple boreholes and included organic, hydrocarbon, sulphurous, and leachate odours from both gas and groundwater monitoring wells*". However, Ramboll's preliminary data does not identify significant risk to surrounding groundwater or surface water receptors. As infiltration techniques are proposed within Parcel B, appropriate ground remedial measures will be implemented to protect the receiving groundwater and surface water receptors.

5.3.2 To a Surface Water Body

As noted in Section 2.3, a series of ditches are present on site, including a ditch adjacent to the link road between Parcel A and Parcel B and various ditches at the boundary to Parcel B. This ditch network is assumed to continue westward and connect into the Colne Brook.

As the existing topography falls from north-west to south-east, it is not practical to route, control and manage surface water run-off from the extensive data centre footprint (approximately 180m x 120m) and associated roads into this shallow ditch network.

5.3.3 To a Surface Water Sewer, Highway Drain, or Another Drainage System

Disposal of surface water run-off to surface water sewers is not viable as there are none in proximity to the site.

Road gullies from Poyle Road appear to drain into a ditch on the western side of this highway. As noted in Section 5.2.2, it is not practical to dispose of surface water from hardstanding areas into this shallow highway drain without extensive site reprofiling. Such reprofiling would be unsustainable and have negative visual repercussions to the surrounding developments.

Appendix B shows the existing drainage layout, including ditches in proximity to the site. The invert level of the ditch adjacent to the Parcel A entrance is approximately 19.048mAOD (1.4m deep). A max 380m surface water drain would be required to drain the north-western areas of Parcel A, whilst coordinating with the proposed building footprint. If this drain was laid at a 1:150 from the ditch invert level, the head of the surface water drainage run would have an invert level of 21.581mAOD. Pipework would then require a minimum of 1.2m cover to protect from vehicular trafficking. Ignoring pipe diameter, the minimum ground level would be 22.781mAOD, which is a significantly higher than the currently proposed finished floor level (21.40mAOD). The existing ditch south-west of Parcel A has a similar invert level (18.880mAOD) and therefore presents the same connectivity issue.

It is not considered appropriate, sustainable or realistic to integrate a surface water pumping station into the proposals to achieve a connection into this highway drain. There is also likely limited capacity available within this highway drain.

5.3.4 To a Combined Sewer

The SBC hierarchy of drainage options has been assessed and the only viable solution is to dispose of surface water run-off from the development into the existing combined water public sewer located in Poyle Road.

Currently, a portion of the site drains into this sewer at an unrestricted rate, as noted in Section 2.3, and the development proposals will provide a significant betterment of the existing drainage condition, relieving pressure on the TW public sewerage network. This drainage betterment is detailed further in Section 5.5.

5.4 Proposed SuDS

The possibility of implementing SuDS at the site was assessed using a hierarchy of preferred surface water management methods. The following paragraphs discuss the various proposed SuDS suitable for the proposed development.

5.4.1 Permeable Paving

Permeable pavements allow water to pass through the surface to the permeable fill, resulting in the infiltration, storage, and transport of water. The SuDS manual states that "*permeable pavements are often used for low trafficked roads*". In this instance, permeable paving has been maximised throughout the site and provided in the car parking areas, the substation access road and within Parcel B. These will provide additional attenuation storage, as well as water quality benefits. Due to the due to high groundwater, a tanked permeable system is proposed (System C in Figure 5.1).

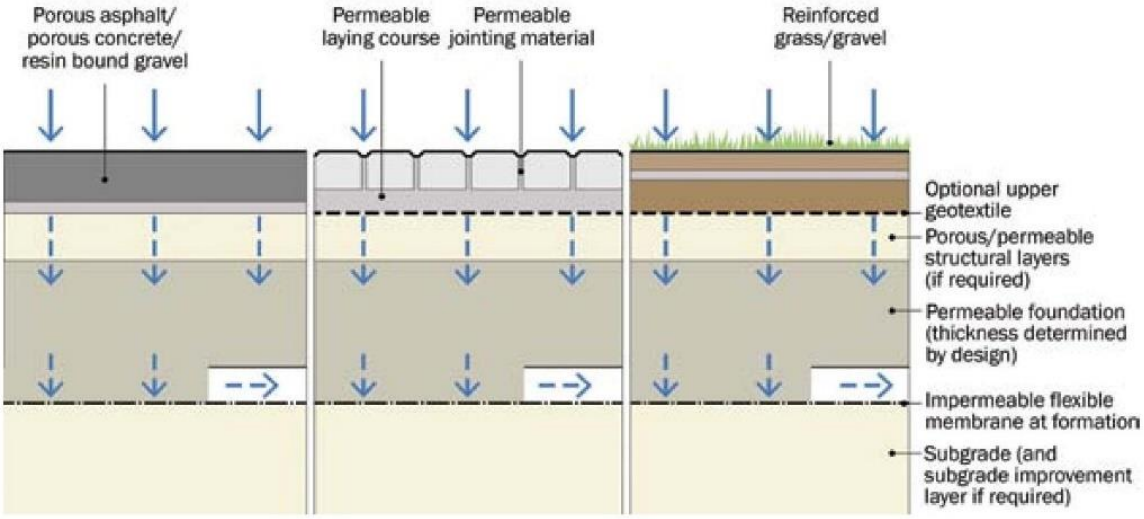


Figure 5.1: Lined permeable paving (SuDS Manual extract)

5.4.2 Rain Gardens

Rain gardens are proposed on the eastern and western elevations of the data centre and will drain a portion of the data centre roof area and the adjacent access road – pending detailed design and levels review. These are beneficial as they provide attenuation and are also effective in removing pollutants from surface water run-off. Similar to the permeable paving, these will be lined and discharge into the site-wide surface water drainage system via underdrain pipes.

5.4.3 Detention Basins

Attenuation in ponds or open water features are preferable to below ground storage tanks as these provide wider amenity, biodiversity, and water quality benefits. In this case two detention basins are proposed within Parcel A.

These basins will provide attenuation storage for storm events up to and including the 1 in 100-year storm event plus 40% allowance for climate change.

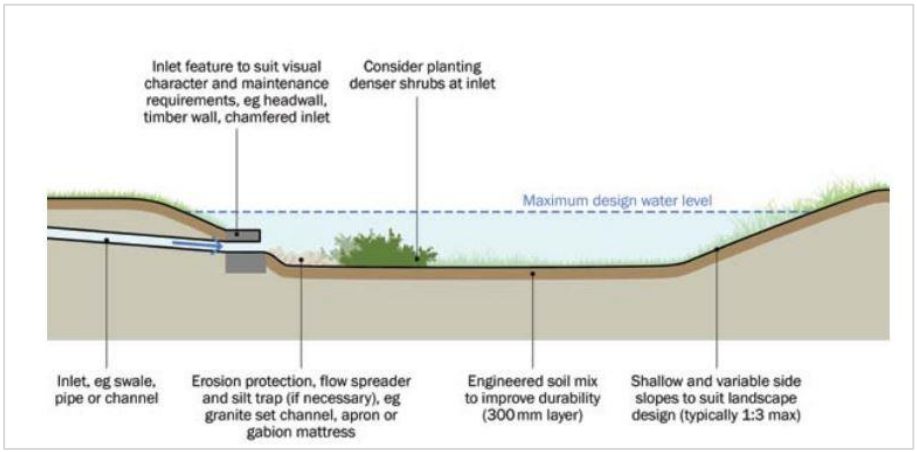


Figure 5.2: Typical detention basin – section (SuDS Manual extract)

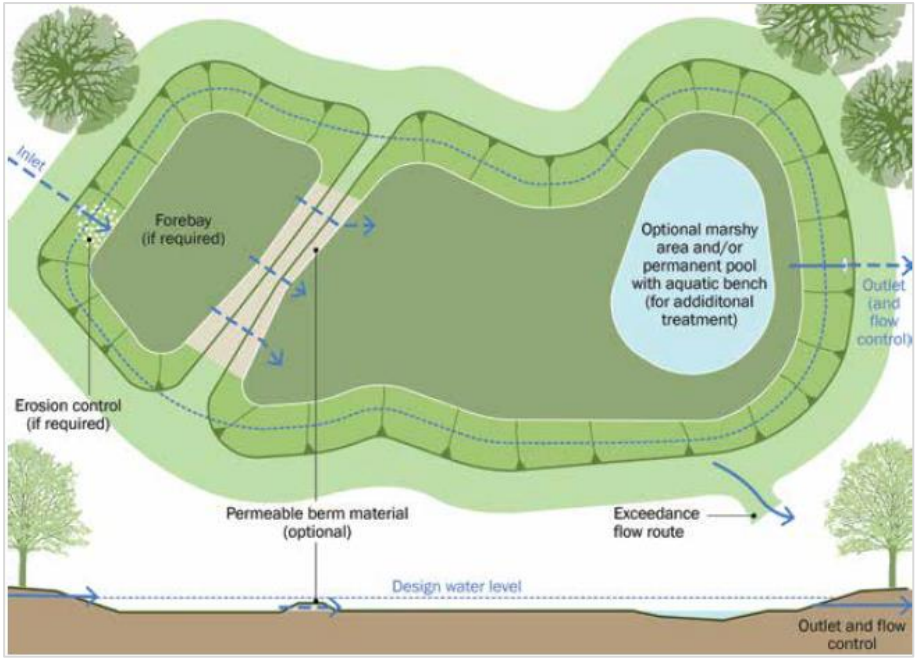


Figure 5.3: Typical detention basin – plan (SuDS Manual extract)

5.5 Proposed Discharge Rates and Attenuation Volume

The SFRA states that *"run-off from previously developed sites should aim to reduce run-off back to the original greenfield run-off rates"*. Therefore, the proposed run-off rate shall be restricted to greenfield rates, in accordance with DEFRA's Non-statutory Technical Standards for SuDS and the SBC SFRA.

The positively draining hardstanding areas in Parcel A are subject to detailed review, however, the provisional areas equal 33,330m^2 (or 3.333 ha). The existing greenfield run-off rates for storm events of several return periods were calculated using the greenfield run-off estimator tool from uksuds.com as shown in the below. Refer to Appendix G for calculations.

Q_{bar} = 5.24 l/s
Q_1 = 4.45 l/s
Q_{30} = 12.05 l/s
Q_{100} = 16.72l/s

The existing Q_1 greenfield run-off rate equals 1.335 l/s/ha and this will be the limit for all storm events up to and including the 1 in 100-year design storm event plus the 40% climate change allowance. This will also provide a significant reduction in run-off into the public sewer, relieving pressure on the TW public sewerage network.

The attenuation volume within Parcel A required to achieve these run-off rates is approximately 5280m^3, which is provided via a series of cascading SuDS, including rain gardens, permeable paving systems and detention basins. These are shown on the drainage strategy sketch in Appendix H.

Parcel B will continue to drain as per the existing greenfield condition.

A pre-planning enquiry has been submitted to TW to confirm capacity exists within the receiving public sewer. Their response has not yet been received.

5.6 Exceedance Routes and Overland Flows

Surface water exceedance and overland flows occur when intense rainfall is unable to either soak into the ground or enter a drainage system due to blockages or the capacity of the system being exceeded. Although drainage systems are currently designed for extreme storm events, it is not economical or sustainable to build large, oversized drainage networks for all types of extreme rainfall or scenarios. As a result, there will be occasions when surface water run-off will exceed the capacity of drains as outlined in CIRA 635 document 'Designing for exceedance in urban drainage good practice':

"*It is inevitable that as a result of extreme rainfall the capacities of sewers, covered watercourses and other drainage systems will be exceeded on occasion. Periods of exceedance occur when the rate of surface run-off exceeds the drainage system inlet capacity, when the pipe system becomes overloaded, or when the outfall becomes restricted due to flood levels in the receiving water*".

The TFT utility survey information shows that there is limited existing piped drainage within the site which would contribute to exceedance flows. Site levels within Parcel A generally route exceedance and overland flows to the site low points as highlighted in Figure 5.4: Existing exceedance and overland flow routes. In Parcel B, the topographical survey information shows that site levels route exceedance and overland flows to the bordering ditches.

Proposed site levels will generally be raised, but the topography in Parcel A will continue to fall to the south-east. The proposed layout also incorporates new areas of soft landscaping which will create areas of storage should exceedance flows be generated on site. In Parcel B, the exceedance routes will be retained with site levels continuing to fall to the bordering ditches.

The proposed SuDS have been designed so that there is no flooding within the site for up to and including the 1 in 30-year rainfall event, which is in line with current Design and Construction Guidance (DCG) for sewers offered for adoption. It should be noted that the proposed surface water drainage network has been designed not to flood for the 1 in 100-year plus 40% rainfall event.

Flows in rainfall events exceeding the design storm will be managed by exceedance routes, which will aim to divert and control exceedance flood flows along routes away from the building footprints and towards green spaces as shown in Figure 5.5: Proposed exceedance and overland flow routes. This will avoid hazards to end users and not increase risk on or off site.

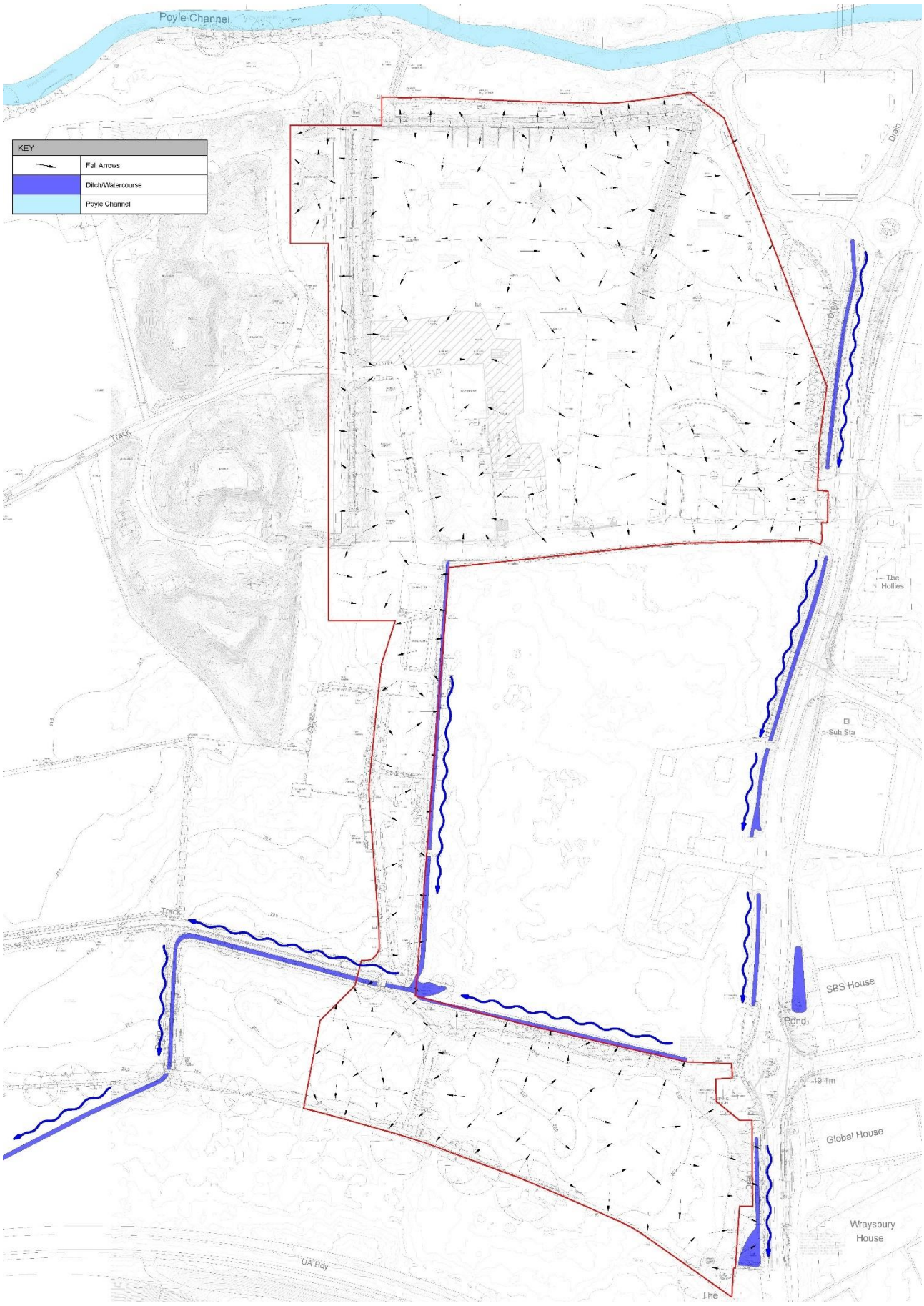


Figure 5.4: Existing exceedance and overland flow routes

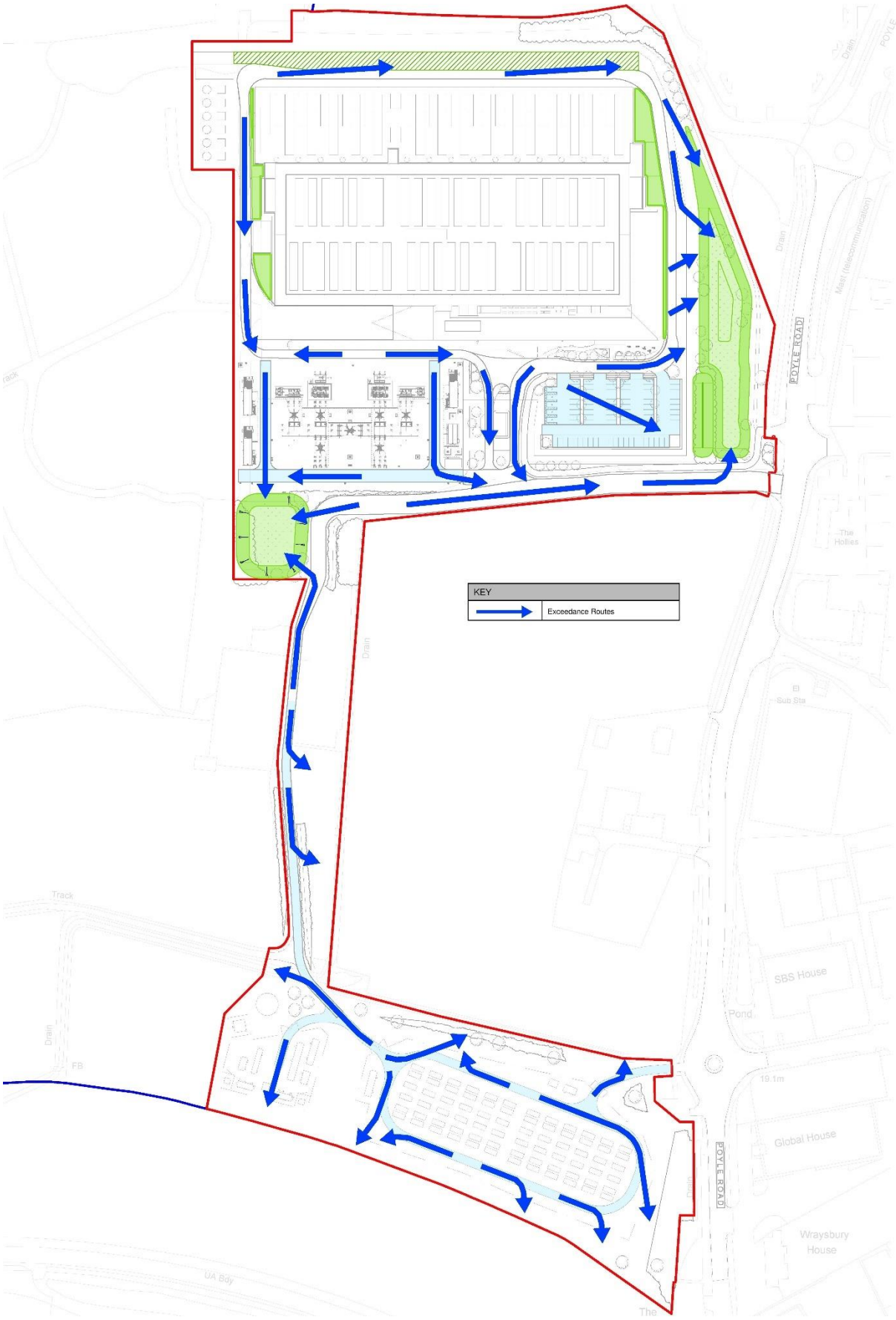


Figure 5.5: Proposed exceedance and overland flow routes

5.7 Water Quality

SuDS have the potential to provide water quality benefits to run-off entering the environment. The SuDS Manual states that SuDS should be designed to treat run-off to reduce the risk of environmental pollution. Chapter 26 of The SuDS Manual sets out the 'simple index approach' to water quality risk management. This approach has been used to quantify the benefits of the proposed SuDS scheme on water quality.

Step 1 of the simple index approach is to identify the pollution hazard indices for the proposed land use. The proposed development is considered to have a 'high' pollution hazard level in Parcel A and a 'medium 'pollution hazard level in Parcel B. Table 5.2 below shows the associated pollution hazard indices.

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Roofs	Low	0.3	0.2	0.05
Commercial yard and delivery areas, non-residential car parking with frequent change, all roads except low traffic roads and trunk roads/motorways	Medium	0.7	0.6	0.7
Sites with heavy pollution, sites where chemicals and fuels are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways	High	0.8	0.8	0.8

Table 5.2: Pollution Hazard Indices, taken from Table 26.2 of The SuDS Manual (CIRIA, 2015)

Step 2 of the simple index approach is to select SuDS with a total pollution mitigation index that equals or exceeds the pollution hazard index.

For Parcel A, the destination of the run-off is to the public sewer and there is no infiltration from the SuDS to groundwater. The indicative surface water pollution mitigation indices for the Parcel A SuDS are shown in Table 5.3 below:

Type of SuDS Component	TSS	Metals	Hydrocarbons
Rain Gardens	0.8	0.8	0.8
Permeable Pavement	0.7	0.6	0.7
Detention Basin	0.5	0.5	0.6
Full Retention Separator	0.7	0.5	0.9

Table 5.3 Surface water pollution mitigation indices, taken from Table 26.3 of The SuDS Manual

Provided that the mitigation indices of the treatment techniques are greater than or equal to the hazard indices for the proposed development then there should be no reduction in the overall water quality within the receiving public sewer.

$$\text{Total SuDS mitigation index} = \text{mitigation index}_1 + 0.5(\text{mitigation index}_2) + 0.5(\text{mitigation index}_3) + \cdots$$

Type of SuDS Component	TSS	Metals	Hydrocarbons
Total SuDS mitigation index	0.7 + 0.25 + 0.4 = 0.95	0.5 + 0.25 + 0.4 = 1.0	0.9 + 0.3 + 0.4 = 1.0

Table 5.4 Total SuDS mitigation indices from Parcel A

Full retention separators will be provided at the inlets to each detention basin. Therefore, the incorporation of a full retention separator, detention basins and rain gardens will provide suitable prevention from pollution to the TW public sewer.

For Parcel B, the destination of the run-off is to groundwater. The groundwater pollution mitigation indices should be used as shown in Table 5.5 below:

Characteristics of the material overlying the proposed infiltration surface, through which the run-off percolates	TSS	Metals	Hydrocarbons
A soil with good contaminant attenuation potential of at least 300mm in depth	0.4	0.3	0.3
Permeable pavement*	0.7	0.6	0.7
* All features to be underlain by a soil with good contaminant attenuation potential of at least 300mm in depth.			

Table 5.5 Groundwater pollution mitigation indices, taken from Table 26.4 of the SuDS Manual.

Provided that the mitigation indices of the treatment techniques are greater than or equal to the hazard indices for the proposed development then there should be no reduction in the overall water quality within the receiving watercourse or groundwater body.

$$\text{Total SuDS mitigation index} = \text{mitigation index}_1 + 0.5(\text{mitigation index}_2) + 0.5(\text{mitigation index}_3) + \cdots$$

Type of SuDS Component	TSS	Metals	Hydrocarbons
Total SuDS mitigation index	0.7	0.6	0.7

Table 5.6 Total SuDS mitigation indices from Parcel B

Therefore, the incorporation of permeable paving will provide suitable prevention from pollution to groundwater.

6 Surface Water Maintenance Strategy

The successful implementation and operation of a SuDS system depends on a robust and clear maintenance strategy being implemented. The following measures should form part of the site's proposed management plan.

The majority of the SuDS will be maintained by the site management company and will form part of the overall maintenance regime for the site.

SuDS Element	Maintenance		
	Activity	Required Action	Typical Frequency
Full Retention Separator	Monitoring / Inspections	Inspect for evidence of poor operation	Half yearly
		Inspect filter media and establish appropriate replacement frequencies	
		Inspect sediment accumulation rates and establish appropriate removal frequencies	Monthly during first half year of operation, then every six months
	Routine Maintenance	Remove litter and debris and inspect for sediment, oil and grease accumulation	Half yearly
		Change the filter media	As recommended by manufacturer
		Remove sediment, oil, grease and floatables	As necessary – indicated by system inspections or immediately following significant spill
	Remedial Actions	Replace malfunctioning parts or structures	As required
Rain Gardens	Monitoring / Inspections	Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrain to determine if maintenance is necessary	Quarterly
		Assess plants for disease infection, poor growth, invasive species etc. and replace as necessary	
		Inspect inlets and outlets for blockage	
		Check operation of underdrains by inspection of flows after rain	Annually
	Regular Maintenance	Remove litter and surface debris and weeds	Quarterly
		Replace any plants, to maintain planting density	As required
		Remove sediment, litter and debris build-up from around inlets or from forebays	Quarterly to half yearly
		Weed spray with environmentally friendly chemicals	Half yearly
		Plants to be pruned	Half yearly
	Occasional Maintenance	Infill any holes or scour in the filter medium, improve erosion protection if required	As required

SuDS Element	Maintenance		
	Activity	Required Action	Typical Frequency
		Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch	As required
	Remedial Actions	Remove and replace filter medium and vegetation above	As required but likely to be > 20 years
Permeable Paving	Monitoring / Inspections	Initial inspection	Monthly for three months after installation
		Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 hours after large storms in first six months
		Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
		Monitor inspection chambers	Annually
	Regular Maintenance	Brushing and vacuuming -standard cosmetic sweep over whole surface	Once a year after autumn leaf fall
		Rubbish and litter removal	As required
	Remedial Actions	Remediate any landscaping which through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving.	As required
		Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	
		Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required
Detention Basin	Regular Maintenance	Remove litter and debris	Monthly
		Cut grass – for spillways and access routes	Monthly during growing season, or as required
		Cut grass – meadow grass in and around basin	Half yearly – before nesting season in spring and in autumn
		Manage other vegetation and remove nuisance plants	Monthly at start, then as required
		Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly
		Inspect banksides, structures, pipework etc. for evidence of physical damage	Monthly
		Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly for first year, then annually or as required
		Check any penstocks and other mechanical devices	Annually
		Tidy all dead growth before start of growing season	Annually
		Remove sediment from inlets, outlet and forebay	Annually, or as required
		Manage wetland plants in outlet pool – where provided	Annually

SuDS Element	Maintenance		
	Activity	Required Action	Typical Frequency
	Occasional Maintenance	Reseed areas of poor vegetation growth	As required
		Prune and trim any trees and remove cuttings	Every 2 years, or as required
		Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required - likely to be minimal requirements where effective upstream source control is provided
	Remedial Actions	Repair erosion or other damage by reseeding or re-turfing	As required
		Realignment of rip-rap	
		Repair/rehabilitation of inlets, outlets and overflows	
		Relevel uneven surfaces and reinstate design levels	

Table 6.1 SuDS Maintenance Strategy as taken from The SuDS Manual

Effective SuDS design must assess all foreseeable risks during construction and maintenance. These must be mitigated during the detailed design stages where effective design will aim to avoid, reduce and mitigate risks.

This process will also require input from the principal contractor who will ensure the construction of SuDS components are carried out in a safe and sustainable manner.

7 Foul Water Assessment

The existing site connects to TW manhole 0101 in Poyle Road and as shown in Figure 2.5. It is proposed to reuse this connection, subject to Section 106 approval from TW. This consent from the water authority will be sought during the detailed design stage.

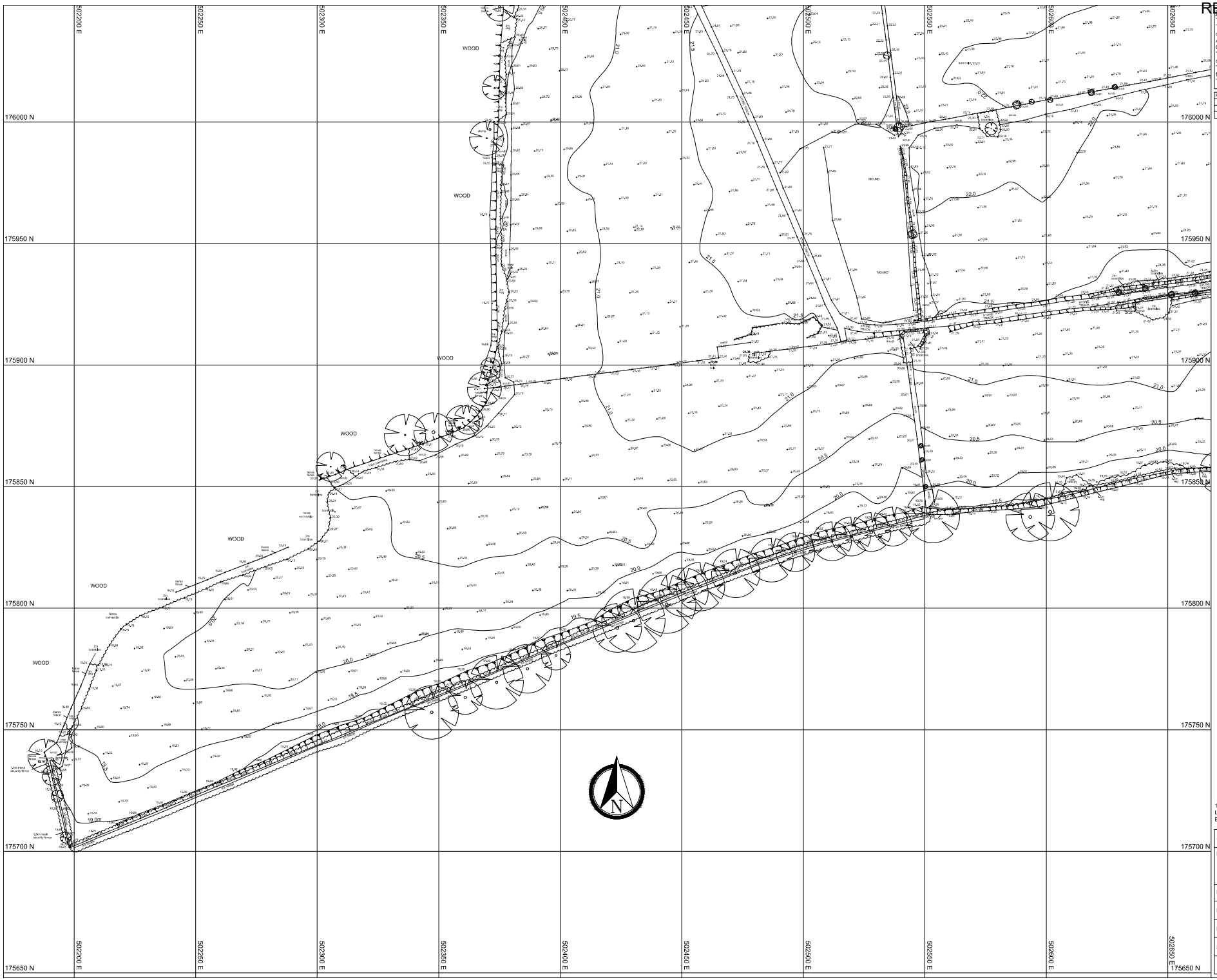
A pre-planning enquiry has been submitted to TW to confirm capacity exists within the receiving public sewer. Their response has not yet been received; however, it is anticipated that the receiving sewer in Poyle Road will have sufficient capacity on the basis that surface water run-off rates into the sewer network will be significantly reduced from the figures outlined in Section 5.1 to the Q_1 greenfield run-off rate (1.335 l/s/ha).

8 Conclusions

- The site falls within Flood Zone 1 – “areas with little or no potential risk of flooding" from fluvial / tidal sources.
- Elevated groundwater levels have been recorded on site; however, the implementation of a new surface drainage system will intercept and store surface water run-off on site, which will reduce the ground saturation which can lead to groundwater flooding. Proposed SuDS within Parcel A will be lined to ensure capacity is not reduced by groundwater ingress and site levels will generally be retained or raised. Therefore, the risk of groundwater flooding is considered low.
- The site is generally at low risk of surface water flooding, with isolated areas of medium-high risk at low points within the site’s topography. The proposed SuDS will reduce peak run-off rates from site to receiving sewers. Therefore, the risk of surface water flooding is considered low.
- The site is at risk of flooding from the Wraysbury and Queen Mother reservoirs; however, the risk of reservoir failure is extremely unlikely, and the flood risk is very low.
- The TW DG5 register has no recorded incidents of sewer flooding within the development site’s postcode. The introduction of extensive SuDS will also reduce peak run-off rates from the site and relieve pressure on the public sewerage network. The risk of sewer flooding is therefore considered low.
- Therefore, the proposed redevelopment has an acceptable flood risk within the terms and requirements of the NPPF.
- The proposed SuDS include permeable paving, rain gardens and detention basins. These SuDS will be designed to provide amenity and biodiversity gains, as well as sufficient water quality treatment to protect the receiving sewers and groundwater.
- Surface water run-off from the Parcel A will be restricted to the Q_1 greenfield run-off rate (1.335 l/s/ha) for all storm events up to and including the 1 in 100-year storm event plus 40% allowance for climate change.
- A pragmatic approach to the design of the surface water drainage for Parcel B is proposed and this will continue to drain as per the existing greenfield condition.
- Exceedance flows have been designed to route away from building thresholds and towards less vulnerable areas.
- A pre-planning enquiry has been submitted to TW to confirm capacity exists within the receiving public sewer. Their response has not yet been received.

Appendix A
Topographical & Utility Survey

SBC PLANNING
RECEIVED : 17.12.2024



REV	REVISION	DATE	PROD	CKD
-	-	-	-	-

LEGEND

DRAINAGE

cv	cover
dc	drainage channel
fd	foul drain
gy	gully
I.C.	inspection chamber
M.H.	manhole
re	rodding eye
rwp	rainwater pipe
sd	storm drain
svp	soil vent pipe

LEVELS

C.L.	Cover Level
F.L.	Floor Level
I.L.	Invert Level
OSBM	Ordnance Survey Bench Mark
T.L.	Threshold Level
W.L.	Water Level

SERVICES

bs	bus shelter
bt	British Telecom
catv	cable tv
ep	electricity pole
fh	fire hydrant
kl	keep left bollard
lp	lamp post
mkr	marker
ohc	overhead cable
pk	phone kiosk
sv	stop valve
sy	stay wire
tl	traffic lights
tp	telegraph pole

FENCES

ba	barrier
bw	barbed wire
cb	closeboard
ci	corrugated iron
cl	chainlink
cp	concrete post
gt	gate
l	bench top
mp	metal post
mr	metal rail
pa	palisade
pr	post & rail
pw	post & wire
wf	wood fence
wp	wood post

ROADS

dk	drop kerbs
ek	edging kerbs
rs	road sign
ts	tactile slabs
we	wood edging
se	setts
sf	setts flush
sr	setts raised

WALLS

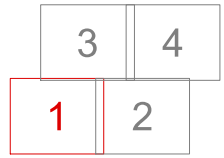
bk	brick wall
cw	concrete wall
es	edging stones
rst	retaining wall
sw	stone wall
tw	top of wall

SYMBOLS

tree
bush
hedge
oh — overhead cable
3.2m — fence
gate
control station

NOTE

GRID AND LEVELS TO ORDNANCE SURVEY. SCALE FACTOR NOT APPLIED.



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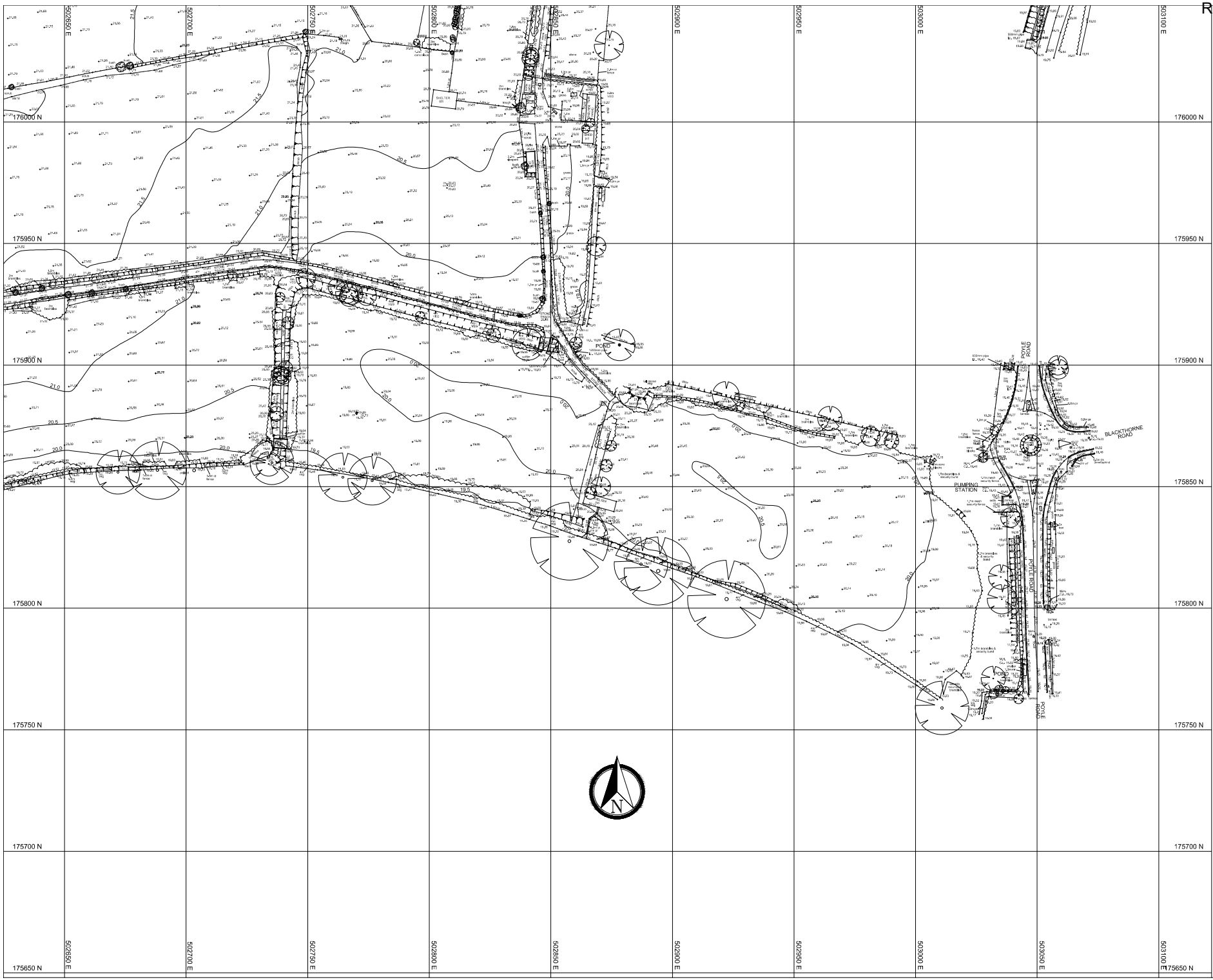
CLIENT			
PROJECT	Land at Manor Farm Poyle Road Slough SL3 0BL		
DRAWING	Site Survey		
DRW NO	2300199/01	REV	-
DATE	December 2023	DRAWN BY	L.B./S.P.T.
SCALE	1:500	SIZE	A0
■	AS BUILT		



REV	REVISION	DATE	PROD	CKD
-	-	-	-	-

LEGEND

DRAINAGE

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FENCES

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pw	post & wire
wf	wood fence
wp	wood post

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dk	drop kerbs
ek	edging kerbs
rs	road sign
ts	tactile slabs
we	wood edging
sa	setts
sf	setts flush
sr	setts raised

WALLS

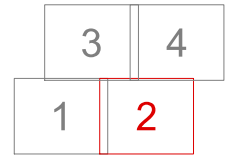
bk	brick wall
cw	concrete wall
es	edging stones
rsc	retaining wall
sw	stone wall
tw	top of wall

SYMBOLS

tree
bush
hedge
overhead cable
fence
gate
control station

NOTE

GRID AND LEVELS TO ORDNANCE SURVEY. SCALE FACTOR NOT APPLIED.



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CLIENT			
PROJECT	Land at Manor Farm Poyle Road Slough SL3 0BL		
DRAWING	Site Survey		
DRW NO	2300199/02	REV	-
DATE	December 2023	DRAWN BY	L.B./S.P.T.
SCALE	1:500	SIZE	A0
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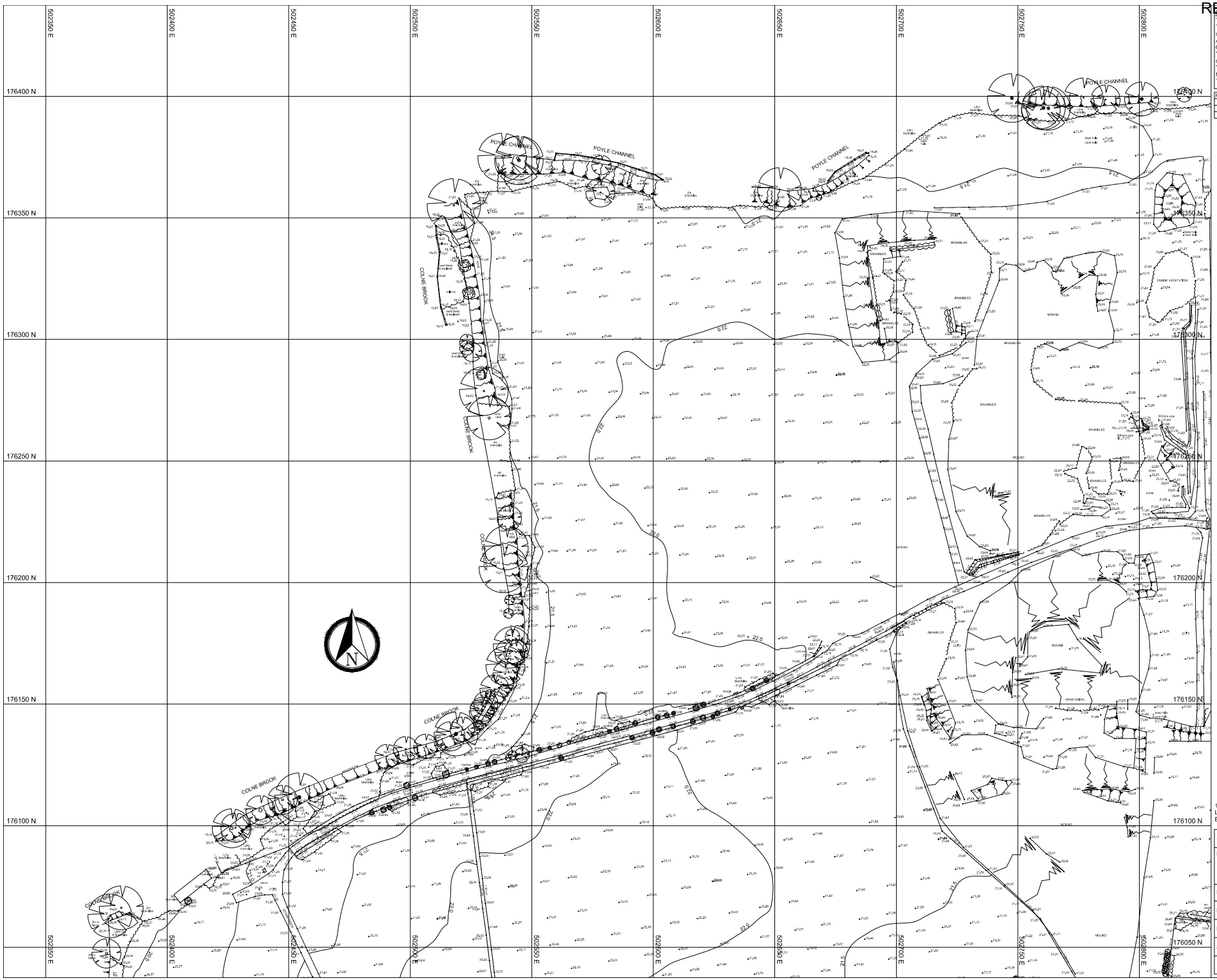
SBC PLANNING
RECEIVED : 17.12.2024



DISCLAIMER:
This drawing should not be scaled.
The contractor is to check all dimensions on site and inform the contract administrator/project manager of any discrepancies.
All work is to comply in every aspect with the Building Regulations, Codes of Practice and British Standards.
This drawing is to be read in conjunction with all other contract drawings and specifications.

REV	REVISION	DATE	PROD	CKD
-	-	-	-	-

LEGEND

DRAINAGE
- cv cover
- dc drainage channel
- fd foul drain
- gy gully
- I.C. inspection chamber
- M.H. manhole
- re rodding eye
- rwp rainwater pipe
- sd storm drain
- svp soil vent pipe

LEVELS
- C.L. Cover Level
- F.L. Floor Level
- I.L. Invert Level
- OSBM Ordnance Survey Bench Mark
- T.L. Threshold Level
- W.L. Water Level

SERVICES
- bs bus shelter
- bt British Telecom
- catv cable tv
- ep electricity pole
- fh fire hydrant
- kl keep left bollard
- lp lamp post
- mkr marker
- ohc overhead cable
- pk phone kiosk
- sv stop valve
- sy stay wire
- tl traffic lights
- tp telegraph pole

FENCES
- ba barrier
- bw barbed wire
- cb closeboard
- ci corrugated iron
- cl chainlink
- cp concrete post
- gt gate
- I bench top
- mp metal post
- mr metal rail
- pa palisade
- pr post & rail
- pw post & wire
- wf wood fence
- wp wood post

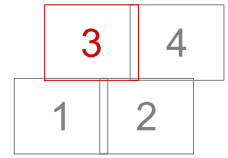
ROADS
- dk drop kerbs
- ek edging kerbs
- rs road sign
- ts tactile slabs
- we wood edging
- sb setts
- sf setts flush
- sr setts raised

WALLS
- bk brick wall
- cw concrete wall
- es edging stones
- rsr retaining wall
- sw stone wall
- tw top of wall

SYMBOLS
- tree
- bush
- hedge
- oh overhead cable
- 2.2m fence
- gate
- control station

NOTE

GRID AND LEVELS TO ORDNANCE SURVEY. SCALE FACTOR NOT APPLIED.



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CLIENT			
PROJECT	Land at Manor Farm Poyle Road Slough SL3 0BL		
DRAWING	Site Survey		
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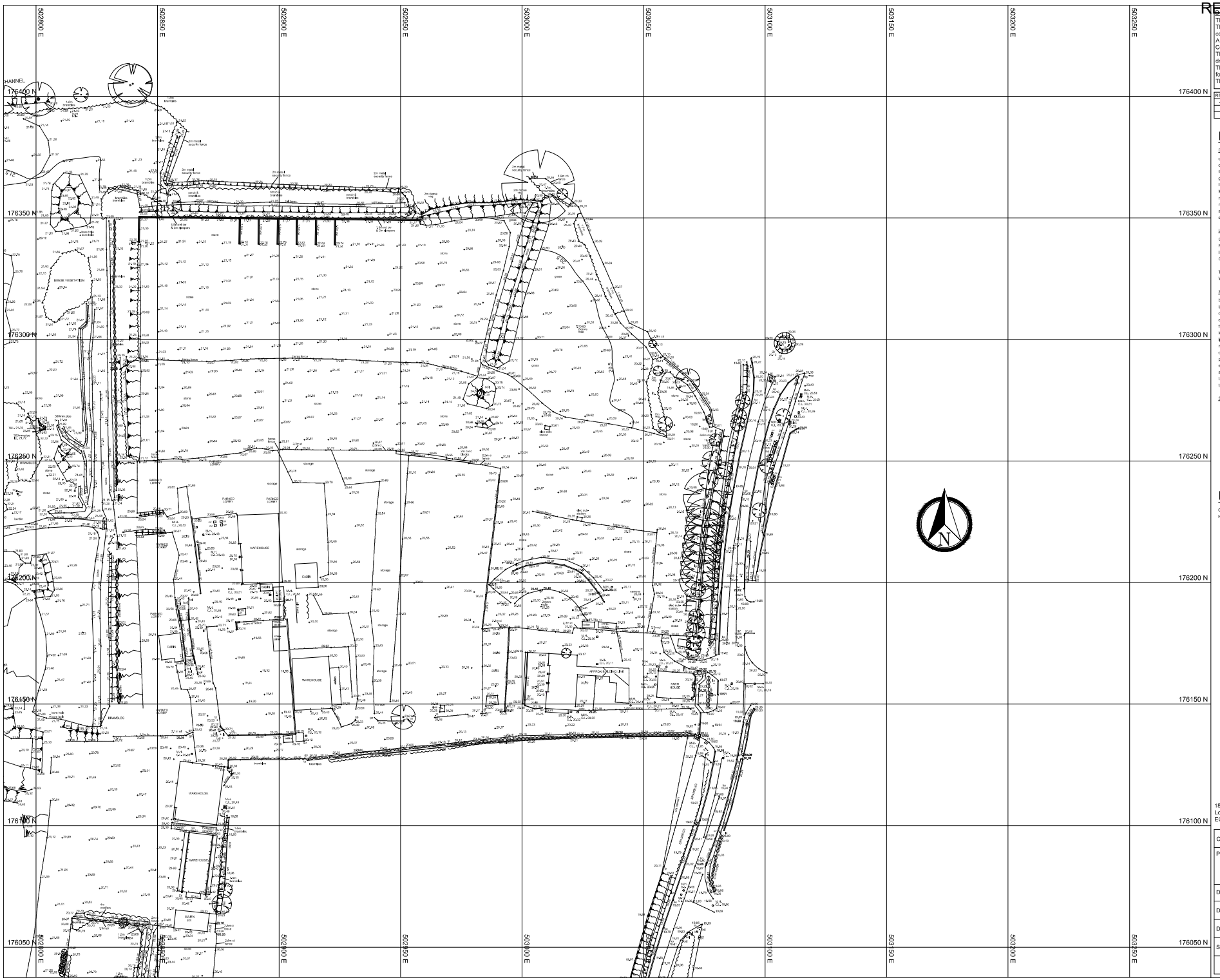
SCALE	1:500	SIZE	A0
■	AS BUILT		



REV	REVISION	DATE	PROD	CKD
-	-	-	-	-

LEGEND

DRAINAGE

cv	cover
dc	drainage channel
fd	foul drain
gy	gully
I.C.	inspection chamber
M.H.	manhole
re	rodding eye
rwp	rainwater pipe
sd	storm drain
svp	soil vent pipe

LEVELS

C.L.	Cover Level
F.L.	Floor Level
I.L.	Invert Level
OSBM	Ordnance Survey Bench Mark
T.L.	Threshold Level
W.L.	Water Level

SERVICES

bs	bus shelter
bt	British Telecom
catv	cable tv
ep	electricity pole
fh	fire hydrant
kl	keep left bollard
lp	lamp post
mkr	marker
ohc	overhead cable
pk	phone kiosk
sv	stop valve
sy	stay wire
tl	traffic lights
tp	telegraph pole

FENCES

ba	barrier
bw	barbed wire
cb	closeboard
ci	corrugated iron
cl	chainlink
cp	concrete post
gt	gate
l	larch lap
mp	metal post
mr	metal rail
pa	palisade
pr	post & rail
pw	post & wire
wf	wood fence
wp	wood post

ROADS

dk	drop kerbs
ek	edging kerbs
rs	road sign
ts	tactile slabs
we	wood edging
sa	setts
sf	setts flush
sr	setts raised

WALLS

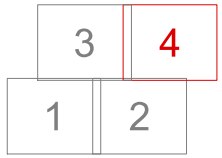
bk	brick wall
cw	concrete wall
es	edging stones
rsl	retaining wall
sw	stone wall
tw	top of wall

SYMBOLS

tree
bush
hedge
oh — overhead cable
2.2m — fence
gate
control station

NOTE

GRID AND LEVELS TO ORDNANCE SURVEY. SCALE FACTOR NOT APPLIED.



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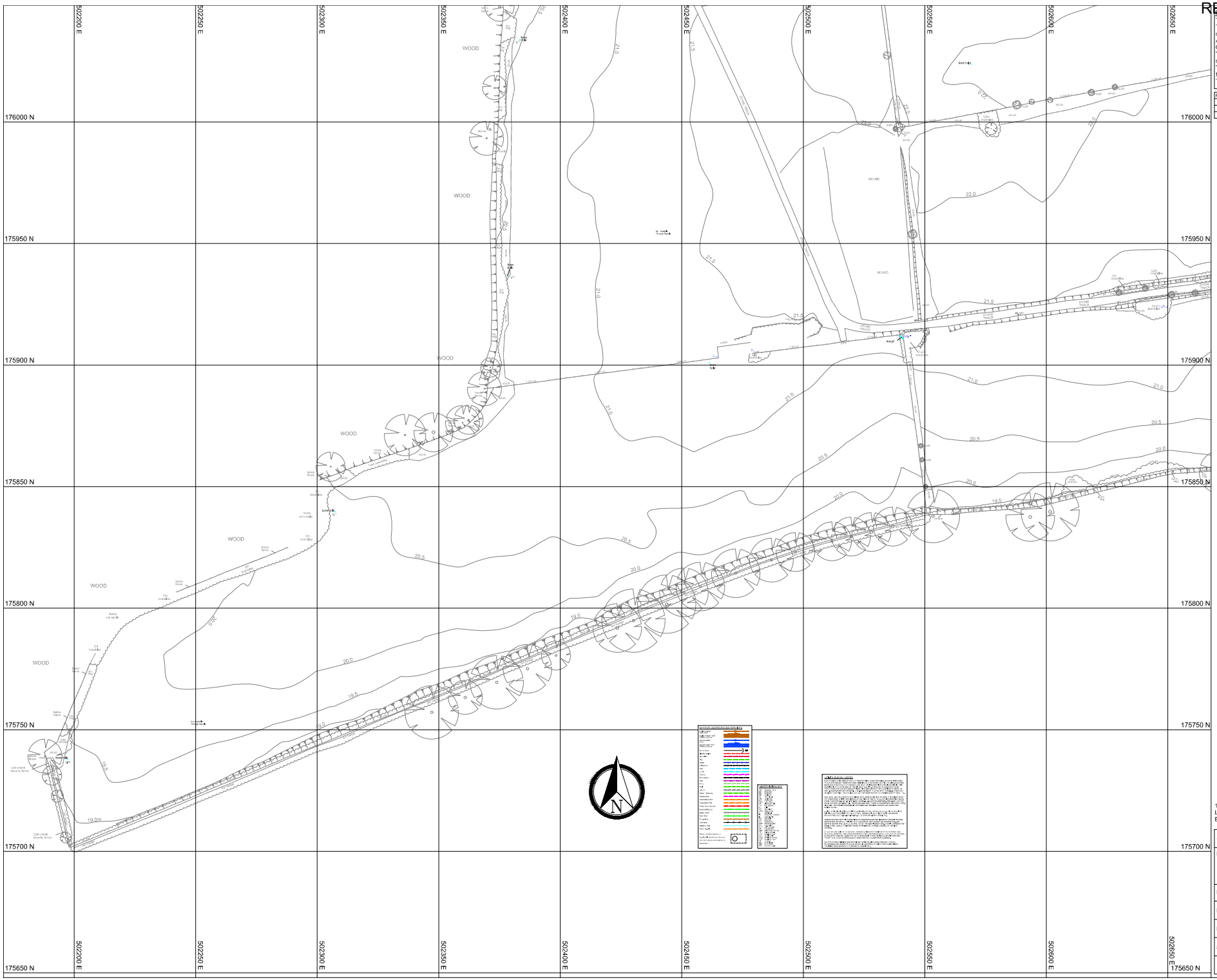
CLIENT			
PROJECT	Land at Manor Farm Poyle Road Slough SL3 0BL		
DRAWING	Site Survey		
DRW NO	2300199/04	REV	-
DATE	December 2023	DRAWN BY	L.B./S.P.T.
SCALE	1:500	SIZE	A0

■ AS BUILT



REV	REVISION	DATE	PROD	CKD
-	-	-	-	-

LEGEND

DRAINAGE

cv	cover
dc	drainage channel
fd	foul drain
gy	gully
I.C.	inspection chamber
M.H.	manhole
re	rodding eye
rwp	rainwater pipe
sd	storm drain
svp	soil vent pipe

LEVELS

C.L.	Cover Level
F.L.	Floor Level
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SERVICES

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catv	cable tv
ep	electricity pole
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lp	lamp post
mkr	marker
ohc	overhead cable
pk	phone kiosk
sv	stop valve
sy	stay wire
tl	traffic lights
tp	telegraph pole

FENCES

ba	barrier
bw	barbed wire
cb	closeboard
ci	corrugated iron
cl	chainlink
cp	concrete post
gt	gate
l	bench top
mp	metal post
mr	metal rail
pa	palisade
pr	post & rail
pw	post & wire
wf	wood fence
wp	wood post

ROADS

dk	drop kerbs
ek	edging kerbs
rs	road sign
ts	tactile slabs
we	wood edging
se	setts
sf	setts flush
sr	setts raised

WALLS

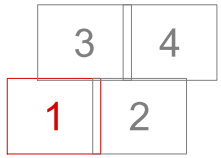
bk	brick wall
cw	concrete wall
es	edging stones
rsc	retaining wall
sw	stone wall
tw	top of wall

SYMBOLS

tree
bush
hedge
overhead cable
fence
gate
control station

NOTE

GRID AND LEVELS TO ORDNANCE SURVEY. SCALE FACTOR NOT APPLIED.



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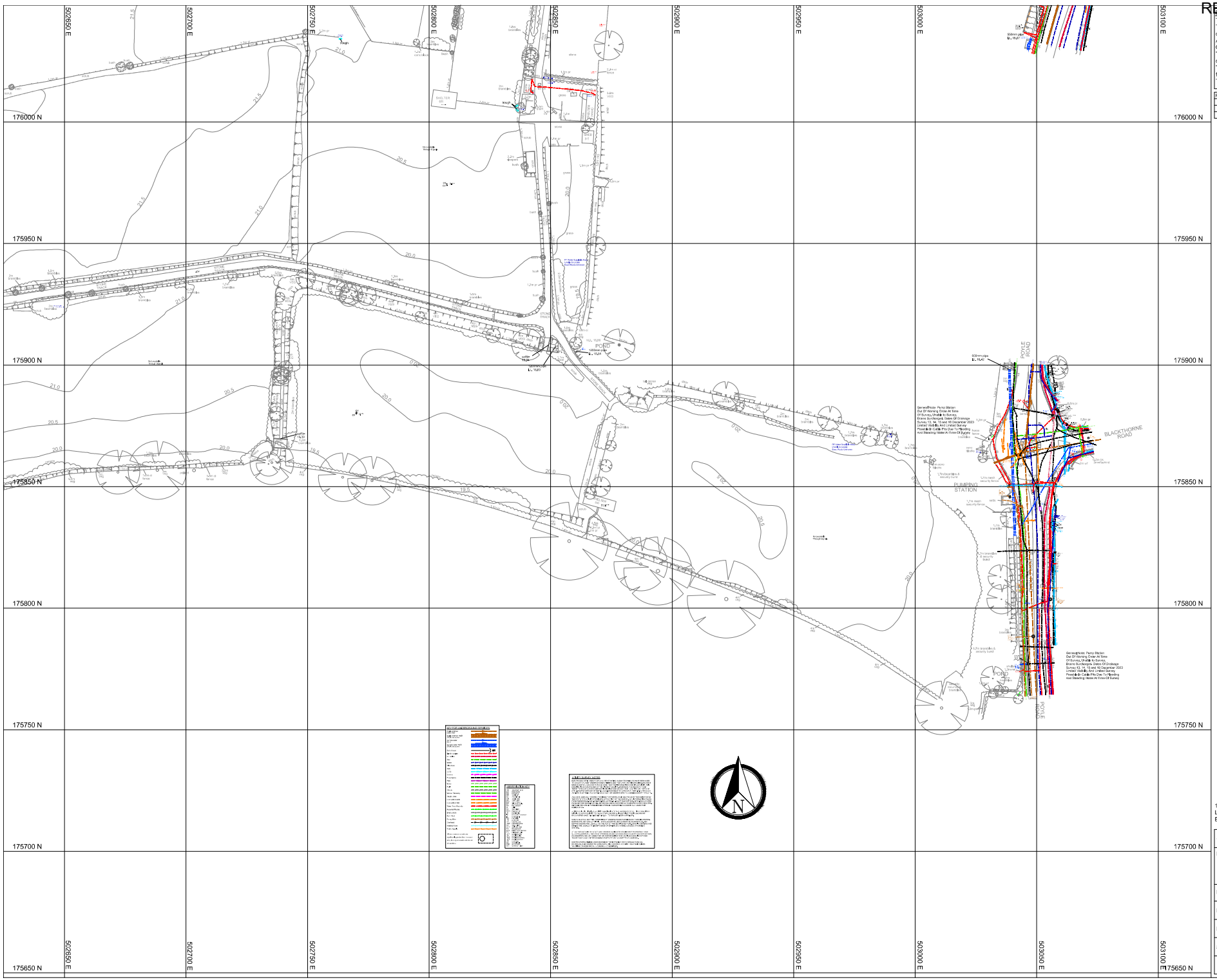
w: www.tftconsultants.com

CLIENT			
PROJECT	Land at Manor Farm Poyle Road Slough SL3 0BL		
DRAWING	Utilities Survey		
DRW NO	2300199/01U	REV	-
DATE	December 2023	DRAWN BY	L.B./S.P.T.
SCALE	1:500	SIZE	A0

■ AS BUILT



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All work is to comply in every aspect with the Building Regulations, Codes of Practice and British Standards.
This drawing is to be read in conjunction with all other contract drawings and specifications.

REV	REVISION	DATE	PROD	CKD
-	-	-	-	-

LEGEND

DRAINAGE

cv	cover
dc	drainage channel
fd	foul drain
gy	gully
I.C.	inspection chamber
M.H.	manhole
re	rodding eye
rwp	rainwater pipe
sd	storm drain
svp	soil vent pipe

LEVELS

C.L.	Cover Level
F.L.	Floor Level
I.L.	Invert Level
OSBM	Ordnance Survey Bench Mark
T.L.	Threshold Level
W.L.	Water Level

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lp	lamp post
mkr	marker
ohc	overhead cable
pk	phone kiosk
sv	stop valve
sy	stay wire
tl	traffic lights
tp	telegraph pole

FENCES

ba	barrier
bw	barbed wire
cb	closeboard
ci	corrugated iron
cl	chainlink
cp	concrete post
gt	gate
l	bench top
mp	metal post
mr	metal rail
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pr	post & rail
pw	post & wire
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wp	wood post

ROADS

dk	drop kerbs
ek	edging kerbs
rs	road sign
ts	tactile slabs
we	wood edging
se	setts
sf	setts flush
sr	setts raised

WALLS

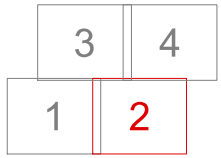
bk	brick wall
cw	concrete wall
es	edging stones
rsc	retaining wall
sw	stone wall
tw	top of wall

SYMBOLS

tree
bush
hedge
overhead cable
fence
gate
control station

NOTE

GRID AND LEVELS TO ORDNANCE SURVEY. SCALE FACTOR NOT APPLIED.



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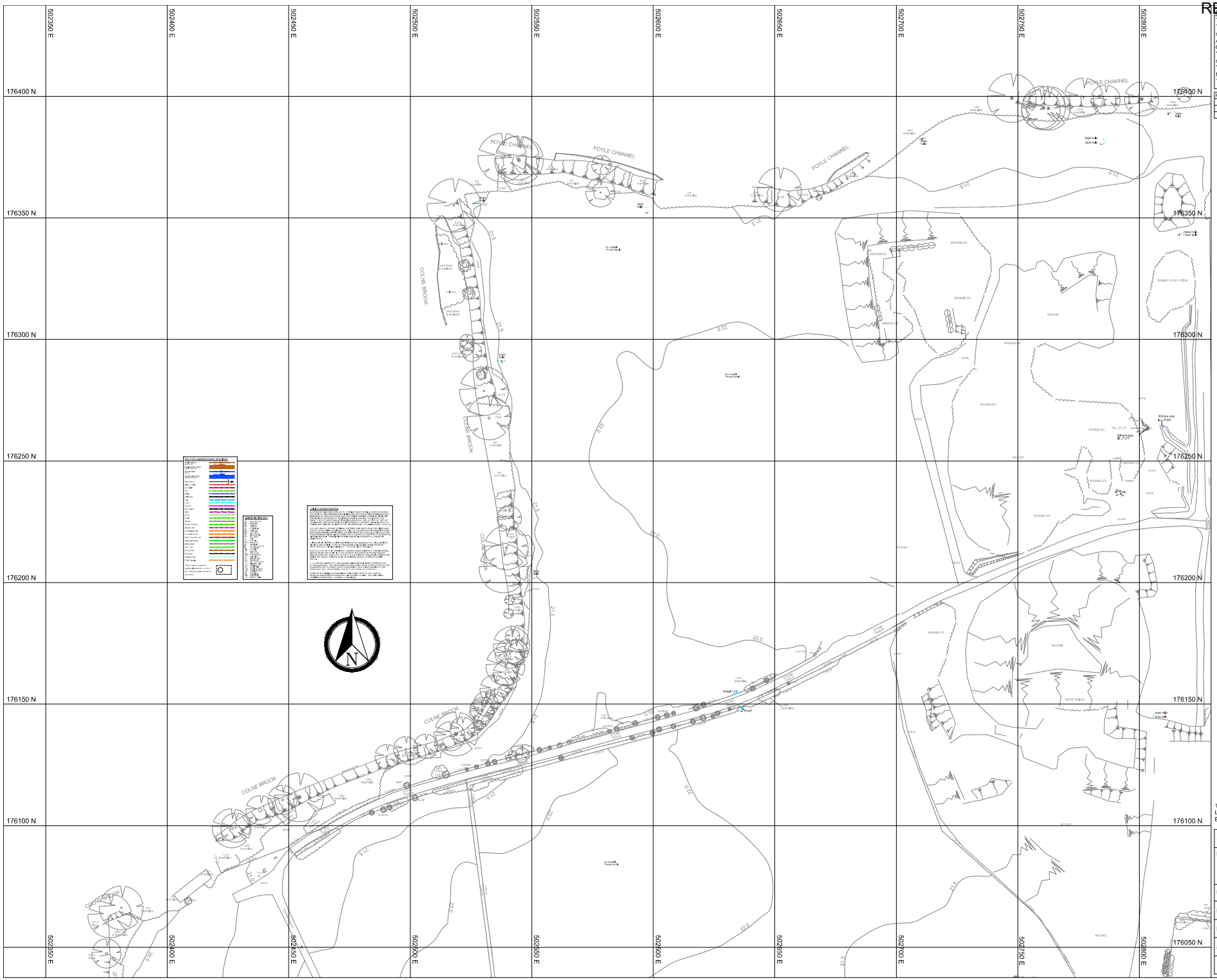
CLIENT			
PROJECT	Land at Manor Farm Poyle Road Slough SL3 0BL		
DRAWING	Utilities Survey		
DRW NO	2300199/02U	REV	-
DATE	December 2023	DRAWN BY	L.B./S.P.T.
SCALE	1:500	SIZE	A0

AS BUILT

SBC PLANNING
RECEIVED : 17.12.2024



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This drawing is to be read in conjunction with all other contract drawings and specifications.

REV	REVISION	DATE	PROD	CKD
-	-	-	-	-

LEGEND

DRAINAGE
- cv cover
- dc drainage channel
- fd foul drain
- gy gully
- I.C. inspection chamber
- M.H. manhole
- re rodding eye
- rwp rainwater pipe
- sd storm drain
- svp soil vent pipe

LEVELS
- C.L. Cover Level
- F.L. Floor Level
- I.L. Invert Level
- OSBM Ordnance Survey Bench Mark
- T.L. Threshold Level
- W.L. Water Level

SERVICES
- bs bus shelter
- bt British Telecom
- catv cable tv
- ep electricity pole
- fh fire hydrant
- kf keep left bollard
- lp lamp post
- mkr marker
- ohc overhead cable
- pk phone kiosk
- sv stop valve
- sy stay wire
- tl traffic lights
- tp telegraph pole

FENCES
- ba barrier
- bw barbed wire
- cb closeboard
- ci corrugated iron
- cl chainlink
- cp concrete post
- gt gate
- l bench top
- mp metal post
- mr metal rail
- pa palisade
- pr post & rail
- pw post & wire
- wf wood fence
- wp wood post

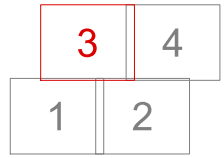
ROADS
- dk drop kerbs
- ek edging kerbs
- rs road sign
- ts tactile slabs
- we wood edging
- se setts
- sf setts flush
- sr setts raised

WALLS
- bk brick wall
- cw concrete wall
- es edging stones
- rsc retaining wall
- sw stone wall
- tw top of wall

SYMBOLS
- tree
- bush
- hedge
- overhead cable
- fence
- gate
- control station

NOTE

GRID AND LEVELS TO ORDNANCE SURVEY. SCALE FACTOR NOT APPLIED.



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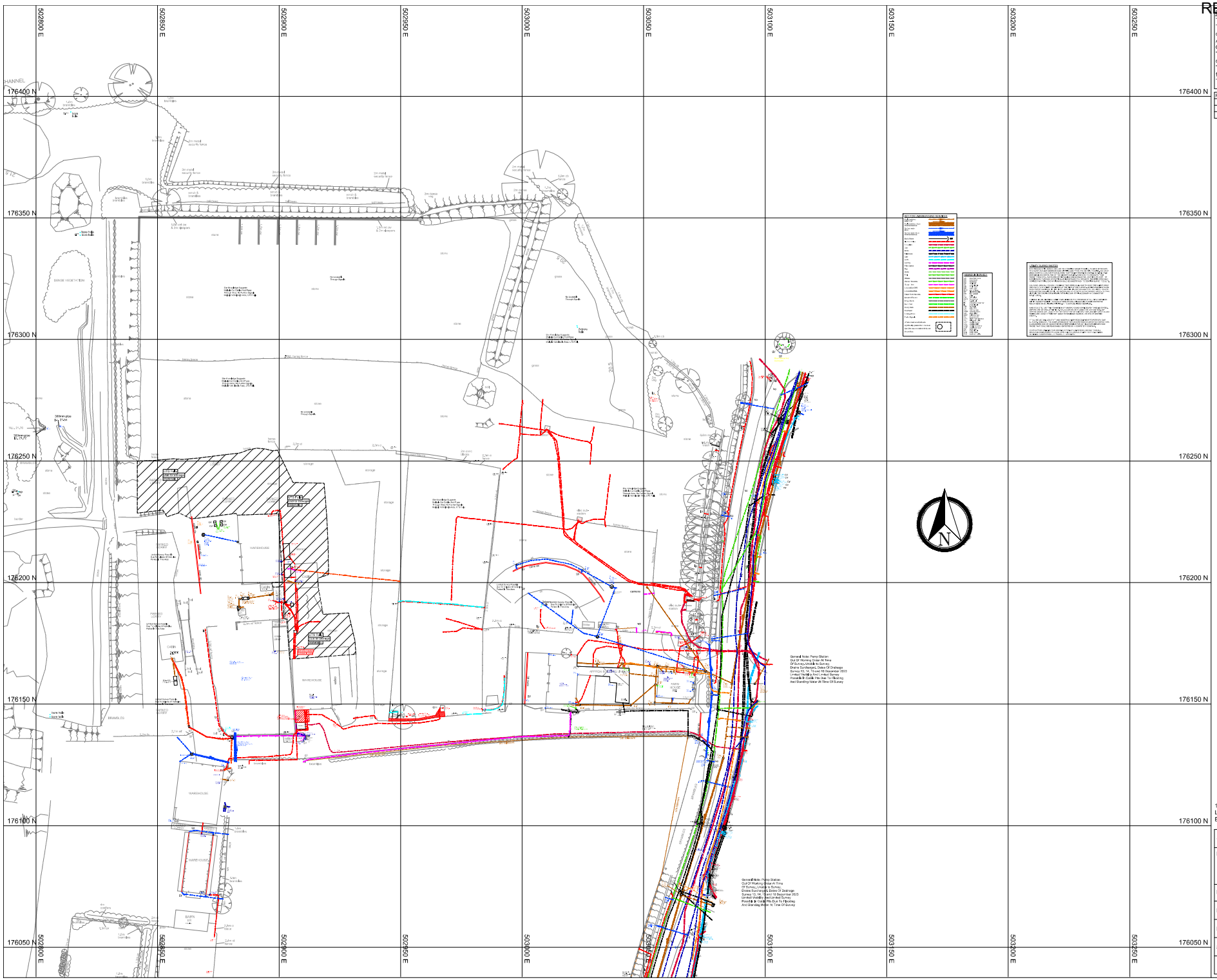
CLIENT			
PROJECT	Land at Manor Farm Poyle Road Slough SL3 0BL		
DRAWING	Utilities Survey		
DRW NO	2300199/03U	REV	-
DATE	December 2023	DRAWN BY	L.B./S.P.T.
SCALE	1:500	SIZE	A0

■ AS BUILT



REV	REVISION	DATE	PROD	CKD
-	-	-	-	-

LEGEND

DRAINAGE

cv	cover
dc	drainage channel
fd	foul drain
gy	gully
I.C.	inspection chamber
M.H.	manhole
re	rodding eye
rwp	rainwater pipe
sd	storm drain
svp	soil vent pipe

LEVELS

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I.L.	Invert Level
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kl	keep left bollard
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mkr	marker
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sy	stay wire
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FENCES

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bw	barbed wire
cb	closeboard
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cl	chainlink
cp	concrete post
gt	gate
I	bench lap
mp	metal post
mr	metal rail
pa	palisade
pr	post & rail
pw	post & wire
wf	wood fence
wp	wood post

ROADS

dk	drop kerbs
ek	edging kerbs
rs	road sign
ts	tactile slabs
we	wood edging
ss	setts
sf	setts flush
sr	setts raised

WALLS

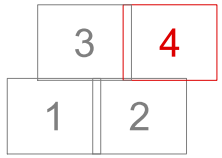
bk	brick wall
cw	concrete wall
es	edging stones
rsc	retaining wall
sw	stone wall
tw	top of wall

SYMBOLS

tree — overhead cable (oh.)
bush — fence (1.2m)
hedge — gate
control station

NOTE

GRID AND LEVELS TO ORDNANCE SURVEY. SCALE FACTOR NOT APPLIED.



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CLIENT			
PROJECT	Land at Manor Farm Poyle Road Slough SL3 0BL		
DRAWING	Utilities Survey		
DRW NO	2300199/04U	REV	-
DATE	December 2023	DRAWN BY	L.B./S.P.T.
SCALE	1:500	SIZE	A0
■	AS BUILT		

Appendix B
Existing Falls & Drainage

NOTES :

1. This drawing is to be read in conjunction with all relevant Architect's, Engineer's and specialists' drawings and specifications.
2. Do not scale from this drawing in either paper or digital form. Use written dimensions only. To check that this drawing has been printed to the intended scale this bar should be 50mm long @ A1 or 25mm long @ A3.
3. Health & Safety :
   All specific drawing notes are to be read in conjunction with the project "Information Pack" and "Site Rules".
4. Existing ditches plotted as according to Ordinance Survey.

KEY	
→	Fall Arrows
	Ditch/Watercourse
	Poyle Channel

DRAINAGE LEGEND	
Site Boundary	
Existing Surface Water Drain	
Existing Foul Water Drain	
Existing Surface Water Sewer	
Existing Foul Water Sewer	

Rev	Date	Drawn	Eng	Amendment
P02	29.11.24	SE	SRe	Issued for Planning
P01	01.11.24	SE	SRe	Issued for Information

MANOR FARM, POYLE ROAD

EXISTING DRAINAGE AND FALLS

Status
FOR PLANNING
NOT FOR CONSTRUCTION

Drawn	SE	Eng	SRe
Scales	1:1000 at A1		1:2000 at A3
Drawing No		Rev	
31567 / 7000		P02	

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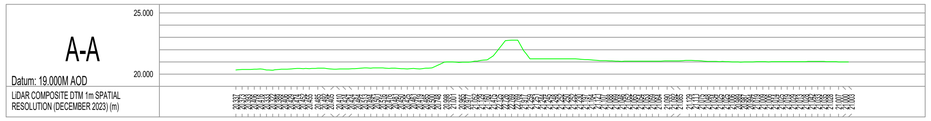

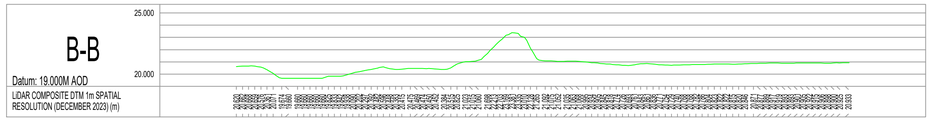

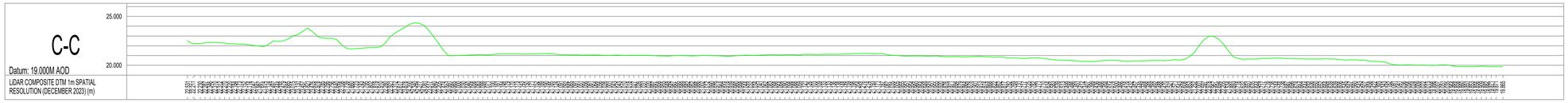

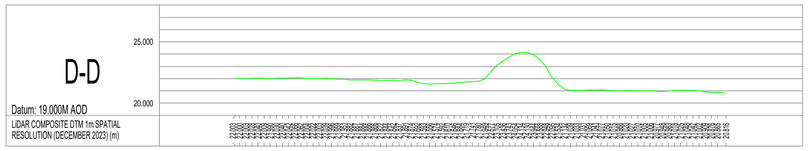

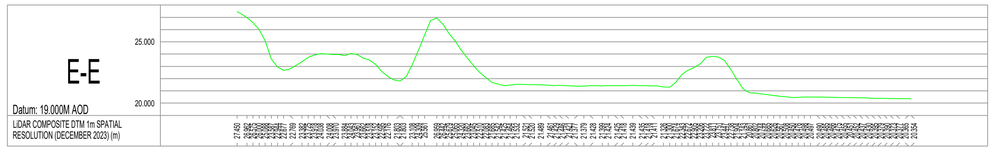

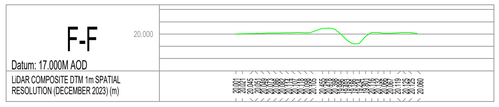

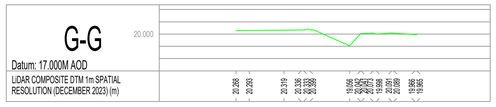

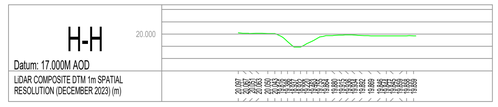

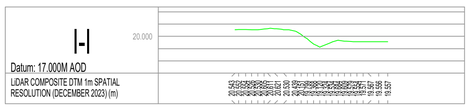

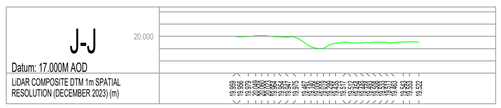

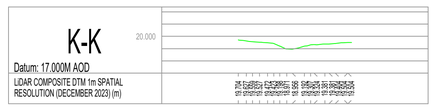

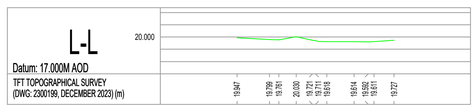

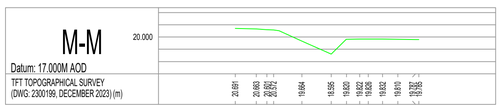

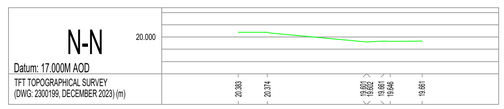

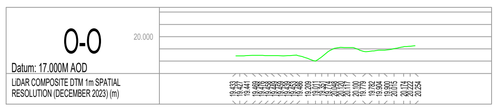

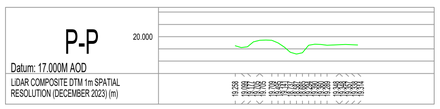

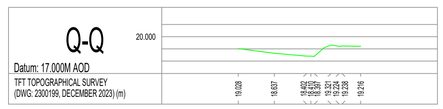

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3. Health & Safety :
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Rev	Date	Drawn	Eng	Amendment
P01	29.11.24	SE	SRe	Issued for Planning

MANOR FARM,
POYLE ROAD

EXISTING DRAINAGE AND FALLS

LONG SECTIONS

Status
FOR PLANNING
NOT FOR CONSTRUCTION

Drawn SE	Eng SRe
Scales H = 1:500	V = 1:1000
Drawing No 31567 / 7001	Rev P01

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mail@pricemyers.com
www.pricemyers.com

Appendix C
Site Investigation

Refer to Fugro 'Ground Investgation without Geotechnical Investgation' report. Reference: G190012U revision 04 (May 2020)

Refer to Ramboll 'Borehole Recovery and Environmental Monitoring' report. Reference: 1620016166 revision 01 (November 2023)

Appendix D

Thames Water Surcharging Correspondence

From: CUSTOMER.FEEDBACK@THAMESWATER.CO.UK
Sent: 29 October 2024 10:13
To: Toby Lloyd
Subject: Our Ref: 33539382

Thames Water
Customer Relations
PO Box 436
Swindon
SN38 1TU

Telephone: 0800 316 9800

Email: Customer.Feedback@thameswater.co.uk

29 October 2024

Our Ref: 33539382

Our Site

Dear Toby

Thank you for taking the time to contact us on 25 October, about Thames Water pumping station near SL3 0SB.

After investigating with our site internally they responded back that there were no issues at the pumping station, but was just a case of overload due to wet weather. If the survey works needs to done then it needs to be conducted during dry weather.

Feel free to contact us back in case of any further query.

Next steps

I trust you find the above information of assistance. It may be helpful to mention, if you've any further queries or need additional support, the quickest way to contact us is on Social Media or by phone, using the details below.

Please note, for all email contact, we aim to respond within 10 working days. For anything more urgent, please use the contact details below.

Contacting us in future

You may be interested to know, you can report some of the most common issues, such as blockages and leaks, on our website here. If no existing issues show up after searching your address, click on the map to start a new report.

For future reference, the quickest way to get in touch to report issues, or for any other advice, is to contact us on Twitter or Facebook. We're available 24 hours a day, 365 days a year. Alternatively, should you prefer to call us, our Customer Contact Centre is available on **0800 316 9800**. Lines are always open.

Yours sincerely

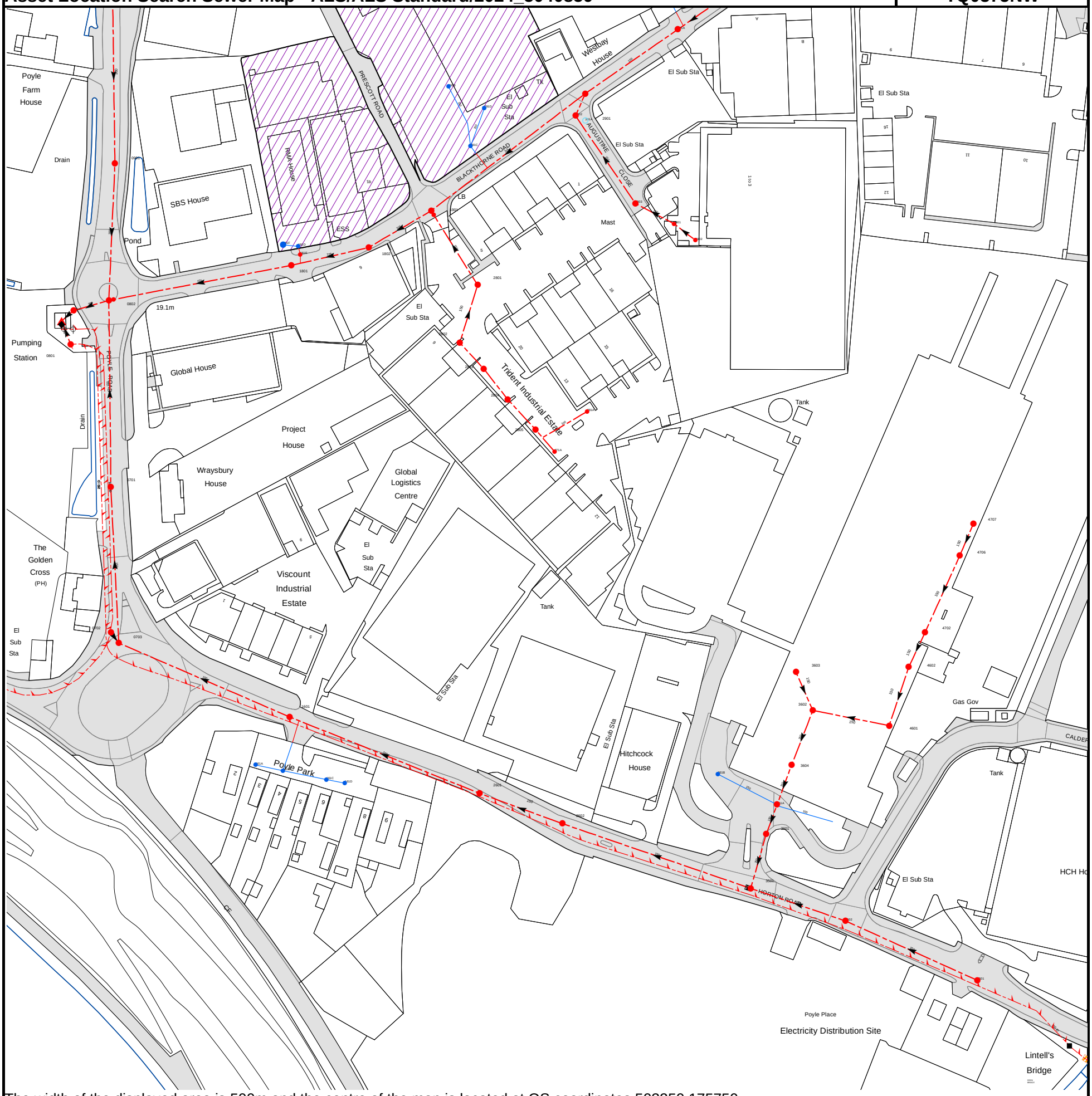
Manojit Biswas

Customer Relations

Appendix E
Thames Water Asset Records

Asset Location Search Sewer Map - ALS/ALS Standard/2024_5040859

TQ0375NW

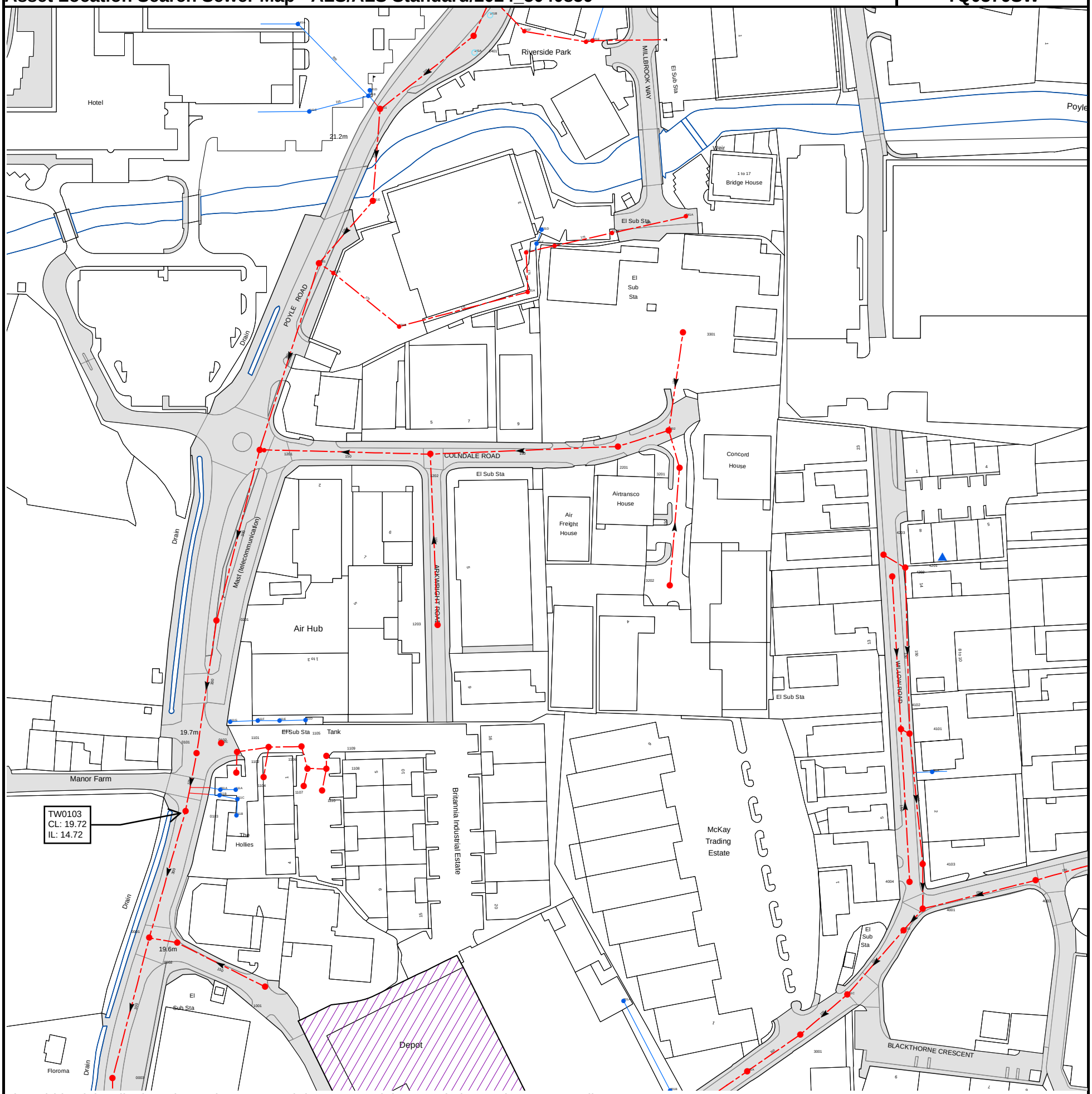


The width of the displayed area is 500m and the centre of the map is located at OS coordinates 503250,175750

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Asset Location Search Sewer Map - ALS/ALS Standard/2024_5040859

TQ0376SW



The width of the displayed area is 500m and the centre of the map is located at OS coordinates 503250,176250

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map with the sanction of the Controller of H.M Stationary Office License Number 10019345

ALS/ALS Standard/2024_5040859

0 45 90 180 270 360
Meters

Scale:	1:7160
Width:	2000m
Printed By:	Skrishna1
Print Date:	28/08/2024
Map Centre:	502824,175964
Grid Reference:	TQ0275NE

Comments:

Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

Foul Sewer: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water Sewer: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined Sewer: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

- Storm Sewer
- Sludge Sewer
- Foul Trunk Sewer
- Surface Trunk Sewer
- Combined Trunk Sewer
- Foul Rising Main
- Surface Water Rising Main
- Combined Rising Main
- Vacuum
- Thames Water Proposed
- Vent Pipe
- Gallery

Other Sewer Types (Not operated and maintained by Thames Water)

- Sewer
- Culverted Watercourse
- Proposed
- Decommissioned Sewer
- Content of this drainage network is currently unknown
- Ownership of this drainage network is currently unknown

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

- Air Valve
- Meter
- Dam Chase
- Vent
- Fitting

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

- Ancillary
- Drop Pipe
- Control Valve
- Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

- Inlet
- Outfall
- Undefined End

Other Symbols

Symbols used on maps which do not fall under other general categories.

- Change of Characteristic Indicator
- Public / Private Pumping Station
- Invert Level
- Summit

Areas

Lines denoting areas of underground surveys, etc.

- Agreement
- Chamber
- Operational Site

Ducts or Crossings

- Casement — Ducts may contain high voltage cables. Please check with Thames Water.
- Conduit Bridge
- Subway
- Tunnel

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plan are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
5) 'na' or '0' on a manhole indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.

Appendix F
Greenfield Run-Off Calculations

hr wallingford

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Steffan Rees
Site name:	31567
Site location:	Project Concorde - Parcel A

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	51.47595° N
Longitude:	0.51864° W
Reference:	2105174700
Date:	Oct 23 2024 13:29

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 3.333

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	2	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.3	0.3

Hydrological characteristics

	Default	Edited
SAAR (mm):	617	617
Hydrological region:	6	6
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

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

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

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

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

(3) Is SPR/SPRHOST ≤ 0.3?

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

Greenfield runoff rates

	Default	Edited

Q_{BAR} (l/s):	5.24	5.24
1 in 1 year (l/s):	4.45	4.45
1 in 30 years (l/s):	12.05	12.05
1 in 100 year (l/s):	16.72	16.72
1 in 200 years (l/s):	19.6	19.6

Appendix G
Causeway Flow Calculations

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	x
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.184	5.00	21.562	1500	502826.222	176294.954	1.014
S2	0.223	5.00	21.088	1500	502826.703	176249.954	1.215
S3	0.009	5.00	20.737	1500	502828.150	176206.215	1.229
S4			21.000	1500	502820.967	176201.171	1.565
S5			20.200	1500	502820.967	176139.667	1.278
HW2			20.000	600	502828.690	176129.564	1.184
S6	0.043	5.00	20.628	1350	502889.965	176143.768	1.319
S7		5.00	20.736	1350	502834.264	176198.067	1.366
S8	0.037	5.00	20.167	1350	502834.265	176143.769	1.490
HW1			20.000	600	502834.265	176130.873	1.452
S9	0.025	5.00	20.592	1350	502851.313	176073.302	1.460
S10	0.034	5.00	20.296	1350	502858.506	176096.013	1.402
HW3			20.000	600	502847.151	176104.689	1.249
HW4			20.000	600	502848.643	176129.768	1.500
S11			20.331	1200	502858.506	176131.061	1.914
S12	0.031	5.00	20.468	1200	502870.662	176134.063	2.155
S13	0.043	5.00	20.305	1500	502907.095	176134.647	2.596
S14		5.00	20.798	1350	502916.057	176198.067	1.221
S15	0.048	5.00	20.460	1350	502916.057	176143.767	1.426
S16			20.366	1200	502940.527	176143.767	1.881
S17	0.095	5.00	20.920	1500	502952.845	176184.667	3.219
S18	0.055	5.00	20.354	1500	502952.845	176139.667	3.028
S19	0.090	5.00	20.552	1500	502998.304	176144.345	3.607
S20		5.00	21.072	1350	502982.370	176189.784	1.183
S21	0.061	5.00	20.925	1350	502982.370	176160.478	1.403
S22		5.00	21.193	1350	502999.670	176189.784	1.536
S23			20.887	1350	502999.670	176170.582	1.470
S24	0.060	5.00	20.770	1350	503000.974	176160.482	1.480
S25		5.00	21.154	1200	503017.270	176189.784	1.708
S26			20.746	1350	503017.270	176170.586	1.540
S27	0.058	5.00	20.630	1350	503017.773	176160.486	1.550
S28		5.00	21.078	1200	503029.470	176189.784	1.778
S29	0.035	5.00	20.500	1350	503029.470	176160.488	1.567
S56			20.299	1500	503029.470	176145.020	3.614
S30	0.010	5.00	20.104	1500	503052.770	176145.525	3.613
S31	0.115	5.00	21.934	1350	502808.922	176331.365	1.657
S32	0.041	5.00	21.847	1500	502818.574	176331.365	1.966
S33	0.182	5.00	21.600	1500	502863.574	176331.365	2.169
S34	0.179	5.00	21.200	1500	502908.574	176331.365	2.219
S35	0.179	5.00	20.700	1500	502953.574	176331.365	2.169
S36	0.182	5.00	20.200	1500	502998.574	176331.365	2.119
S37	0.018	5.00	20.100	1500	503023.167	176331.365	2.290

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S38		5.00	21.400	1350	502837.111	176294.954	1.714
S39	0.141	5.00	21.400	1500	502882.111	176294.954	2.464
S40	0.141	5.00	21.400	1500	502927.111	176294.954	2.914
S41	0.152	5.00	21.400	1500	502972.111	176294.954	3.364
S42			20.500	1500	503015.020	176294.954	2.893
S43			19.850	1500	503031.651	176294.954	2.409
HW5			19.800	600	503049.511	176246.732	2.873
S44	0.066	5.00	20.970	1500	502847.950	176206.215	2.540
S45	0.206	5.00	21.150	1500	502892.950	176206.215	3.095
S46	0.209	5.00	20.750	1500	502937.950	176206.215	3.070
S47	0.069	5.00	21.300	1500	502982.950	176206.215	3.995
S48	0.024	5.00	20.792	1200	502936.209	176197.485	2.762
S49	0.022	5.00	21.286	1200	502981.209	176197.485	3.631
S50	0.005	5.00	21.306	1500	503021.209	176197.485	4.284
S51	0.168	5.00	20.723	1200	503027.950	176267.765	2.980
S52	0.090	5.00	20.979	1200	503027.950	176236.990	3.493
S53			21.218	1500	503027.950	176206.215	4.288
S54			20.476	1500	503035.770	176206.215	3.612
HW6			19.800	600	503049.432	176209.258	2.982
HW7			19.800	600	503054.778	176209.095	3.000
S55			20.351	1500	503067.843	176163.488	4.056
C1			20.220	1200	503075.561	176163.488	4.023
TW0101			20.060	1200	503086.292	176158.417	4.760

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	S1	S2	45.003	0.600	20.548	20.173	0.375	120.0	300	5.52	50.0
1.001	S2	S3	43.763	0.600	19.873	19.508	0.365	119.9	600	5.85	50.0
1.002	S3	S4	8.777	0.600	19.508	19.435	0.073	120.2	600	5.92	50.0
1.003	S4	S5	61.503	0.600	19.435	18.922	0.513	119.9	600	6.38	50.0
1.004	S5	HW2	12.717	0.600	18.922	18.816	0.106	120.0	600	6.47	50.0
1.005	HW2	HW4	19.954	0.600	18.816	18.650	0.166	120.2	600	6.62	50.0
2.000	S6	S8	55.700	0.600	19.309	18.752	0.557	100.0	225	5.71	50.0
3.000	S7	S8	54.298	0.600	19.370	18.827	0.543	100.0	150	5.90	50.0
2.001	S8	HW1	12.896	0.600	18.677	18.548	0.129	100.0	300	6.04	50.0
2.002	HW1	HW4	14.420	0.600	18.548	18.500	0.048	300.4	300	6.30	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.434	101.4	33.2	0.714	0.615	0.184	0.0	118	1.289
1.001	2.223	628.4	73.4	0.615	0.629	0.406	0.0	137	1.509
1.002	2.219	627.5	75.1	0.629	0.965	0.415	0.0	139	1.518
1.003	2.223	628.4	75.1	0.965	0.678	0.415	0.0	139	1.520
1.004	2.222	628.2	75.1	0.678	0.584	0.415	0.0	139	1.520
1.005	2.220	627.6	75.1	0.584	0.750	0.415	0.0	139	1.518
2.000	1.307	52.0	7.7	1.094	1.190	0.043	0.0	58	0.944
3.000	1.005	17.8	0.0	1.216	1.190	0.000	0.0	0	0.000
2.001	1.572	111.1	14.4	1.190	1.152	0.080	0.0	72	1.093
2.002	0.902	63.7	14.4	1.152	1.200	0.080	0.0	96	0.731

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
4.000	S9	S10	23.823	0.600	19.132	18.894	0.238	100.1	300	5.25	50.0
4.001	S10	HW3	14.290	0.600	18.894	18.751	0.143	99.9	300	5.40	50.0
4.002	HW3	HW4	25.124	0.600	18.751	18.500	0.251	100.1	300	5.67	50.0
1.006	HW4	S11	9.947	0.600	18.500	18.417	0.083	119.8	300	6.74	50.0
1.007	S11	S12	12.522	0.600	18.417	18.313	0.104	120.4	300	6.88	50.0
1.008	S12	S13	36.437	0.600	18.313	18.009	0.304	119.9	300	7.31	50.0
1.009	S13	S18	46.025	0.600	17.709	17.326	0.383	120.2	600	7.65	50.0
5.000	S14	S15	54.300	0.600	19.577	19.034	0.543	100.0	150	5.90	50.0
5.001	S15	S16	24.469	0.600	19.034	18.485	0.549	44.6	150	6.17	50.0
5.002	S16	S18	12.983	0.600	18.485	17.776	0.709	18.3	150	6.26	50.0
6.000	S17	S18	45.000	0.600	17.701	17.326	0.375	120.0	600	5.34	50.0
1.010	S18	S19	45.699	0.600	17.326	16.945	0.381	119.9	600	8.00	50.0
1.011	S19	S56	31.173	0.600	16.945	16.685	0.260	119.9	600	8.23	50.0
7.000	S20	S21	29.306	0.600	19.889	19.522	0.367	79.9	150	5.43	50.0
7.001	S21	S24	18.604	0.600	19.522	19.290	0.232	80.2	150	5.71	50.0
8.000	S22	S23	19.202	0.600	19.657	19.417	0.240	80.0	150	5.28	50.0
8.001	S23	S24	10.183	0.600	19.417	19.290	0.127	80.2	150	5.44	50.0
7.002	S24	S27	16.800	0.600	19.290	19.080	0.210	80.0	150	5.96	50.0
9.000	S25	S26	19.198	0.600	19.446	19.206	0.240	80.0	150	5.28	50.0
9.001	S26	S27	10.112	0.600	19.206	19.080	0.126	80.3	150	5.43	50.0
7.003	S27	S29	11.696	0.600	19.080	18.933	0.147	79.6	150	6.13	50.0
10.000	S28	S29	29.295	0.600	19.300	18.933	0.367	79.8	150	5.43	50.0
7.004	S29	S56	15.468	0.600	18.933	17.135	1.798	8.6	450	6.17	50.0
1.012	S56	S30	23.305	0.600	16.685	16.491	0.194	120.1	600	8.41	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
4.000	1.571	111.1	4.6	1.160	1.102	0.025	0.0	41	0.783
4.001	1.573	111.2	10.8	1.102	0.949	0.060	0.0	62	1.004
4.002	1.571	111.1	10.8	0.949	1.200	0.060	0.0	62	1.003
1.006	1.435	101.4	100.2	1.200	1.614	0.555	0.0	245	1.626
1.007	1.431	101.2	100.2	1.614	1.855	0.555	0.0	245	1.622
1.008	1.435	101.4	105.8	1.855	1.996	0.585	0.0	262	1.617
1.009	2.220	627.7	113.5	1.996	2.428	0.628	0.0	171	1.704
5.000	1.005	17.8	0.0	1.071	1.276	0.000	0.0	0	0.000
5.001	1.511	26.7	8.6	1.276	1.731	0.048	0.0	58	1.347
5.002	2.365	41.8	8.6	1.731	2.428	0.048	0.0	46	1.866
6.000	2.222	628.2	17.3	2.619	2.428	0.095	0.0	67	0.992
1.010	2.222	628.3	149.4	2.428	3.007	0.827	0.0	198	1.836
1.011	2.223	628.4	165.6	3.007	3.014	0.916	0.0	209	1.887
7.000	1.126	19.9	0.0	1.033	1.253	0.000	0.0	0	0.000
7.001	1.123	19.9	10.9	1.253	1.330	0.061	0.0	79	1.149
8.000	1.125	19.9	0.0	1.386	1.320	0.000	0.0	0	0.000
8.001	1.123	19.9	0.0	1.320	1.330	0.000	0.0	0	0.000
7.002	1.125	19.9	21.8	1.330	1.400	0.121	0.0	150	1.146
9.000	1.125	19.9	0.0	1.558	1.390	0.000	0.0	0	0.000
9.001	1.123	19.8	0.0	1.390	1.400	0.000	0.0	0	0.000
7.003	1.128	19.9	32.4	1.400	1.417	0.179	0.0	150	1.149
10.000	1.126	19.9	0.0	1.628	1.417	0.000	0.0	0	0.000
7.004	6.962	1107.2	38.7	1.117	2.714	0.214	0.0	57	3.337
1.012	2.220	627.8	204.3	3.014	3.013	1.130	0.0	235	1.995

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.013	S30	S55	23.449	0.600	16.491	16.295	0.196	119.6	600	8.58	50.0
11.000	S31	S32	9.652	0.600	20.277	20.181	0.096	100.5	300	5.10	50.0
11.001	S32	S33	45.000	0.600	19.881	19.431	0.450	100.0	600	5.41	50.0
11.002	S33	S34	45.000	0.600	19.431	18.981	0.450	100.0	600	5.72	50.0
11.003	S34	S35	45.000	0.600	18.981	18.531	0.450	100.0	600	6.03	50.0
11.004	S35	S36	45.000	0.600	18.531	18.081	0.450	100.0	600	6.33	50.0
11.005	S36	S37	24.593	0.600	18.081	17.810	0.271	90.7	600	6.50	50.0
11.006	S37	S43	37.386	0.600	17.810	17.441	0.369	101.3	600	6.75	50.0
12.000	S38	S39	45.000	0.600	19.686	19.236	0.450	100.0	300	5.48	50.0
12.001	S39	S40	45.000	0.600	18.936	18.486	0.450	100.0	600	5.79	50.0
12.002	S40	S41	45.000	0.600	18.486	18.036	0.450	100.0	600	6.09	50.0
12.003	S41	S42	42.909	0.600	18.036	17.607	0.429	100.0	600	6.39	50.0
12.004	S42	S43	16.630	0.600	17.607	17.441	0.166	100.2	600	6.50	50.0
11.007	S43	HW5	51.423	0.600	17.441	16.927	0.514	100.0	600	7.10	50.0
11.008	HW5	HW7	38.003	0.600	16.927	16.800	0.127	299.2	600	7.56	50.0
13.000	S44	S45	45.000	0.600	18.430	18.055	0.375	120.0	600	5.34	50.0
13.001	S45	S46	45.000	0.600	18.055	17.680	0.375	120.0	600	5.68	50.0
13.002	S46	S47	45.000	0.600	17.680	17.305	0.375	120.0	600	6.01	50.0
13.003	S47	S53	45.000	0.600	17.305	16.930	0.375	120.0	600	6.35	50.0
14.000	S48	S49	45.000	0.600	18.030	17.655	0.375	120.0	300	5.52	50.0
14.001	S49	S50	40.000	0.600	17.655	17.322	0.333	120.1	300	5.99	50.0
14.002	S50	S53	11.030	0.600	17.022	16.930	0.092	119.9	600	6.07	50.0
15.000	S51	S52	30.775	0.600	17.743	17.486	0.257	119.7	300	5.36	50.0
15.001	S52	S53	30.775	0.600	17.486	17.230	0.256	120.2	300	5.72	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.013	2.225	629.1	206.2	3.013	3.456	1.141	0.0	235	2.001
11.000	1.568	110.8	20.8	1.357	1.366	0.115	0.0	88	1.210
11.001	2.435	688.5	28.3	1.366	1.569	0.156	0.0	82	1.227
11.002	2.435	688.5	61.2	1.569	1.619	0.338	0.0	119	1.531
11.003	2.435	688.5	93.4	1.619	1.569	0.517	0.0	148	1.727
11.004	2.435	688.5	125.7	1.569	1.519	0.696	0.0	172	1.872
11.005	2.557	722.9	158.6	1.519	1.690	0.877	0.0	190	2.068
11.006	2.419	683.9	161.9	1.690	1.809	0.896	0.0	197	1.996
12.000	1.572	111.1	0.0	1.414	1.864	0.000	0.0	0	0.000
12.001	2.435	688.5	25.5	1.864	2.314	0.141	0.0	78	1.189
12.002	2.435	688.5	50.9	2.314	2.764	0.282	0.0	109	1.451
12.003	2.435	688.4	78.4	2.764	2.293	0.434	0.0	135	1.642
12.004	2.433	687.8	78.4	2.293	1.809	0.434	0.0	135	1.641
11.007	2.434	688.3	240.3	1.809	2.273	1.330	0.0	244	2.227
11.008	1.402	396.5	240.3	2.273	2.400	1.330	0.0	338	1.466
13.000	2.222	628.2	11.9	1.940	2.495	0.066	0.0	57	0.892
13.001	2.222	628.2	49.2	2.495	2.470	0.272	0.0	112	1.348
13.002	2.222	628.2	87.0	2.470	3.395	0.482	0.0	149	1.582
13.003	2.222	628.2	99.4	3.395	3.688	0.550	0.0	160	1.642
14.000	1.434	101.4	4.3	2.462	3.331	0.024	0.0	42	0.721
14.001	1.433	101.3	8.3	3.331	3.684	0.046	0.0	58	0.874
14.002	2.223	628.4	9.2	3.684	3.688	0.051	0.0	50	0.821
15.000	1.435	101.5	30.3	2.680	3.193	0.168	0.0	112	1.259
15.001	1.433	101.3	46.6	3.193	3.688	0.258	0.0	143	1.403

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
13.004	S53	S54	7.820	0.600	16.930	16.864	0.066	118.5	600	6.41	50.0
13.005	S54	HW6	13.997	0.600	16.864	16.818	0.046	304.3	600	6.58	50.0
13.006	HW6	HW7	5.348	0.600	16.818	16.800	0.018	297.1	600	6.64	50.0
11.009	HW7	S55	47.442	0.600	16.800	16.331	0.469	101.2	600	7.88	50.0
1.014	S55	C1	7.719	0.600	16.295	16.197	0.098	78.8	300	8.65	50.0
1.015	C1	TW0101	11.868	0.600	16.197	15.300	0.897	13.2	300	8.70	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
13.004	2.236	632.2	155.2	3.688	3.012	0.859	0.0	201	1.864
13.005	1.390	393.1	155.2	3.012	2.382	0.859	0.0	262	1.312
13.006	1.407	397.9	155.2	2.382	2.400	0.859	0.0	260	1.324
11.009	2.421	684.5	395.5	2.400	3.420	2.189	0.0	328	2.504
1.014	1.773	125.3	601.6	3.756	3.723	3.329	0.0	300	1.796
1.015	4.344	307.1	601.6	3.723	4.460	3.329	0.0	300	4.400

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	45.003	120.0	300	Circular	21.562	20.548	0.714	21.088	20.173	0.615
1.001	43.763	119.9	600	Circular	21.088	19.873	0.615	20.737	19.508	0.629
1.002	8.777	120.2	600	Circular	20.737	19.508	0.629	21.000	19.435	0.965
1.003	61.503	119.9	600	Circular	21.000	19.435	0.965	20.200	18.922	0.678
1.004	12.717	120.0	600	Circular	20.200	18.922	0.678	20.000	18.816	0.584
1.005	19.954	120.2	600	Circular	20.000	18.816	0.584	20.000	18.650	0.750
2.000	55.700	100.0	225	Circular	20.628	19.309	1.094	20.167	18.752	1.190
3.000	54.298	100.0	150	Circular	20.736	19.370	1.216	20.167	18.827	1.190
2.001	12.896	100.0	300	Circular	20.167	18.677	1.190	20.000	18.548	1.152
2.002	14.420	300.4	300	Circular	20.000	18.548	1.152	20.000	18.500	1.200
4.000	23.823	100.1	300	Circular	20.592	19.132	1.160	20.296	18.894	1.102
4.001	14.290	99.9	300	Circular	20.296	18.894	1.102	20.000	18.751	0.949
4.002	25.124	100.1	300	Circular	20.000	18.751	0.949	20.000	18.500	1.200
1.006	9.947	119.8	300	Circular	20.000	18.500	1.200	20.331	18.417	1.614

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1	1500	Manhole	Adoptable	S2	1500	Manhole	Adoptable
1.001	S2	1500	Manhole	Adoptable	S3	1500	Manhole	Adoptable
1.002	S3	1500	Manhole	Adoptable	S4	1500	Manhole	Adoptable
1.003	S4	1500	Manhole	Adoptable	S5	1500	Manhole	Adoptable
1.004	S5	1500	Manhole	Adoptable	HW2	600	Manhole	Adoptable
1.005	HW2	600	Manhole	Adoptable	HW4	600	Manhole	Adoptable
2.000	S6	1350	Manhole	Adoptable	S8	1350	Manhole	Adoptable
3.000	S7	1350	Manhole	Adoptable	S8	1350	Manhole	Adoptable
2.001	S8	1350	Manhole	Adoptable	HW1	600	Manhole	Adoptable
2.002	HW1	600	Manhole	Adoptable	HW4	600	Manhole	Adoptable
4.000	S9	1350	Manhole	Adoptable	S10	1350	Manhole	Adoptable
4.001	S10	1350	Manhole	Adoptable	HW3	600	Manhole	Adoptable
4.002	HW3	600	Manhole	Adoptable	HW4	600	Manhole	Adoptable
1.006	HW4	600	Manhole	Adoptable	S11	1200	Manhole	Adoptable

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.007	12.522	120.4	300	Circular	20.331	18.417	1.614	20.468	18.313	1.855
1.008	36.437	119.9	300	Circular	20.468	18.313	1.855	20.305	18.009	1.996
1.009	46.025	120.2	600	Circular	20.305	17.709	1.996	20.354	17.326	2.428
5.000	54.300	100.0	150	Circular	20.798	19.577	1.071	20.460	19.034	1.276
5.001	24.469	44.6	150	Circular	20.460	19.034	1.276	20.366	18.485	1.731
5.002	12.983	18.3	150	Circular	20.366	18.485	1.731	20.354	17.776	2.428
6.000	45.000	120.0	600	Circular	20.920	17.701	2.619	20.354	17.326	2.428
1.010	45.699	119.9	600	Circular	20.354	17.326	2.428	20.552	16.945	3.007
1.011	31.173	119.9	600	Circular	20.552	16.945	3.007	20.299	16.685	3.014
7.000	29.306	79.9	150	Circular	21.072	19.889	1.033	20.925	19.522	1.253
7.001	18.604	80.2	150	Circular	20.925	19.522	1.253	20.770	19.290	1.330
8.000	19.202	80.0	150	Circular	21.193	19.657	1.386	20.887	19.417	1.320
8.001	10.183	80.2	150	Circular	20.887	19.417	1.320	20.770	19.290	1.330
7.002	16.800	80.0	150	Circular	20.770	19.290	1.330	20.630	19.080	1.400
9.000	19.198	80.0	150	Circular	21.154	19.446	1.558	20.746	19.206	1.390
9.001	10.112	80.3	150	Circular	20.746	19.206	1.390	20.630	19.080	1.400
7.003	11.696	79.6	150	Circular	20.630	19.080	1.400	20.500	18.933	1.417
10.000	29.295	79.8	150	Circular	21.078	19.300	1.628	20.500	18.933	1.417
7.004	15.468	8.6	450	Circular	20.500	18.933	1.117	20.299	17.135	2.714
1.012	23.305	120.1	600	Circular	20.299	16.685	3.014	20.104	16.491	3.013
1.013	23.449	119.6	600	Circular	20.104	16.491	3.013	20.351	16.295	3.456
11.000	9.652	100.5	300	Circular	21.934	20.277	1.357	21.847	20.181	1.366
11.001	45.000	100.0	600	Circular	21.847	19.881	1.366	21.600	19.431	1.569
11.002	45.000	100.0	600	Circular	21.600	19.431	1.569	21.200	18.981	1.619
11.003	45.000	100.0	600	Circular	21.200	18.981	1.619	20.700	18.531	1.569

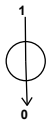
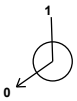
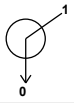
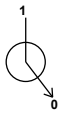
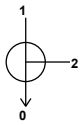
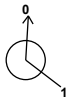
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.007	S11	1200	Manhole	Adoptable	S12	1200	Manhole	Adoptable
1.008	S12	1200	Manhole	Adoptable	S13	1500	Manhole	Adoptable
1.009	S13	1500	Manhole	Adoptable	S18	1500	Manhole	Adoptable
5.000	S14	1350	Manhole	Adoptable	S15	1350	Manhole	Adoptable
5.001	S15	1350	Manhole	Adoptable	S16	1200	Manhole	Adoptable
5.002	S16	1200	Manhole	Adoptable	S18	1500	Manhole	Adoptable
6.000	S17	1500	Manhole	Adoptable	S18	1500	Manhole	Adoptable
1.010	S18	1500	Manhole	Adoptable	S19	1500	Manhole	Adoptable
1.011	S19	1500	Manhole	Adoptable	S56	1500	Manhole	Adoptable
7.000	S20	1350	Manhole	Adoptable	S21	1350	Manhole	Adoptable
7.001	S21	1350	Manhole	Adoptable	S24	1350	Manhole	Adoptable
8.000	S22	1350	Manhole	Adoptable	S23	1350	Manhole	Adoptable
8.001	S23	1350	Manhole	Adoptable	S24	1350	Manhole	Adoptable
7.002	S24	1350	Manhole	Adoptable	S27	1350	Manhole	Adoptable
9.000	S25	1200	Manhole	Adoptable	S26	1350	Manhole	Adoptable
9.001	S26	1350	Manhole	Adoptable	S27	1350	Manhole	Adoptable
7.003	S27	1350	Manhole	Adoptable	S29	1350	Manhole	Adoptable
10.000	S28	1200	Manhole	Adoptable	S29	1350	Manhole	Adoptable
7.004	S29	1350	Manhole	Adoptable	S56	1500	Manhole	Adoptable
1.012	S56	1500	Manhole	Adoptable	S30	1500	Manhole	Adoptable
1.013	S30	1500	Manhole	Adoptable	S55	1500	Manhole	Adoptable
11.000	S31	1350	Manhole	Adoptable	S32	1500	Manhole	Adoptable
11.001	S32	1500	Manhole	Adoptable	S33	1500	Manhole	Adoptable
11.002	S33	1500	Manhole	Adoptable	S34	1500	Manhole	Adoptable
11.003	S34	1500	Manhole	Adoptable	S35	1500	Manhole	Adoptable

Pipeline Schedule

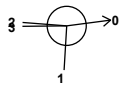
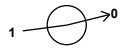
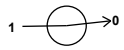
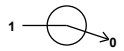
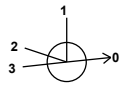
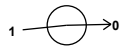
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
11.004	45.000	100.0	600	Circular	20.700	18.531	1.569	20.200	18.081	1.519
11.005	24.593	90.7	600	Circular	20.200	18.081	1.519	20.100	17.810	1.690
11.006	37.386	101.3	600	Circular	20.100	17.810	1.690	19.850	17.441	1.809
12.000	45.000	100.0	300	Circular	21.400	19.686	1.414	21.400	19.236	1.864
12.001	45.000	100.0	600	Circular	21.400	18.936	1.864	21.400	18.486	2.314
12.002	45.000	100.0	600	Circular	21.400	18.486	2.314	21.400	18.036	2.764
12.003	42.909	100.0	600	Circular	21.400	18.036	2.764	20.500	17.607	2.293
12.004	16.630	100.2	600	Circular	20.500	17.607	2.293	19.850	17.441	1.809
11.007	51.423	100.0	600	Circular	19.850	17.441	1.809	19.800	16.927	2.273
11.008	38.003	299.2	600	Circular	19.800	16.927	2.273	19.800	16.800	2.400
13.000	45.000	120.0	600	Circular	20.970	18.430	1.940	21.150	18.055	2.495
13.001	45.000	120.0	600	Circular	21.150	18.055	2.495	20.750	17.680	2.470
13.002	45.000	120.0	600	Circular	20.750	17.680	2.470	21.300	17.305	3.395
13.003	45.000	120.0	600	Circular	21.300	17.305	3.395	21.218	16.930	3.688
14.000	45.000	120.0	300	Circular	20.792	18.030	2.462	21.286	17.655	3.331
14.001	40.000	120.1	300	Circular	21.286	17.655	3.331	21.306	17.322	3.684
14.002	11.030	119.9	600	Circular	21.306	17.022	3.684	21.218	16.930	3.688
15.000	30.775	119.7	300	Circular	20.723	17.743	2.680	20.979	17.486	3.193
15.001	30.775	120.2	300	Circular	20.979	17.486	3.193	21.218	17.230	3.688
13.004	7.820	118.5	600	Circular	21.218	16.930	3.688	20.476	16.864	3.012
13.005	13.997	304.3	600	Circular	20.476	16.864	3.012	19.800	16.818	2.382
13.006	5.348	297.1	600	Circular	19.800	16.818	2.382	19.800	16.800	2.400
11.009	47.442	101.2	600	Circular	19.800	16.800	2.400	20.351	16.331	3.420
1.014	7.719	78.8	300	Circular	20.351	16.295	3.756	20.220	16.197	3.723
1.015	11.868	13.2	300	Circular	20.220	16.197	3.723	20.060	15.300	4.460

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
11.004	S35	1500	Manhole	Adoptable	S36	1500	Manhole	Adoptable
11.005	S36	1500	Manhole	Adoptable	S37	1500	Manhole	Adoptable
11.006	S37	1500	Manhole	Adoptable	S43	1500	Manhole	Adoptable
12.000	S38	1350	Manhole	Adoptable	S39	1500	Manhole	Adoptable
12.001	S39	1500	Manhole	Adoptable	S40	1500	Manhole	Adoptable
12.002	S40	1500	Manhole	Adoptable	S41	1500	Manhole	Adoptable
12.003	S41	1500	Manhole	Adoptable	S42	1500	Manhole	Adoptable
12.004	S42	1500	Manhole	Adoptable	S43	1500	Manhole	Adoptable
11.007	S43	1500	Manhole	Adoptable	HW5	600	Manhole	Adoptable
11.008	HW5	600	Manhole	Adoptable	HW7	600	Manhole	Adoptable
13.000	S44	1500	Manhole	Adoptable	S45	1500	Manhole	Adoptable
13.001	S45	1500	Manhole	Adoptable	S46	1500	Manhole	Adoptable
13.002	S46	1500	Manhole	Adoptable	S47	1500	Manhole	Adoptable
13.003	S47	1500	Manhole	Adoptable	S53	1500	Manhole	Adoptable
14.000	S48	1200	Manhole	Adoptable	S49	1200	Manhole	Adoptable
14.001	S49	1200	Manhole	Adoptable	S50	1500	Manhole	Adoptable
14.002	S50	1500	Manhole	Adoptable	S53	1500	Manhole	Adoptable
15.000	S51	1200	Manhole	Adoptable	S52	1200	Manhole	Adoptable
15.001	S52	1200	Manhole	Adoptable	S53	1500	Manhole	Adoptable
13.004	S53	1500	Manhole	Adoptable	S54	1500	Manhole	Adoptable
13.005	S54	1500	Manhole	Adoptable	HW6	600	Manhole	Adoptable
13.006	HW6	600	Manhole	Adoptable	HW7	600	Manhole	Adoptable
11.009	HW7	600	Manhole	Adoptable	S55	1500	Manhole	Adoptable
1.014	S55	1500	Manhole	Adoptable	C1	1200	Manhole	Adoptable
1.015	C1	1200	Manhole	Adoptable	TW0101	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1	502826.222	176294.954	21.562	1.014	1500		0 1.000	20.548	300
S2	502826.703	176249.954	21.088	1.215	1500		1 1.000 0 1.001	20.173 19.873	300 600
S3	502828.150	176206.215	20.737	1.229	1500		1 1.001 0 1.002	19.508 19.508	600 600
S4	502820.967	176201.171	21.000	1.565	1500		1 1.002 0 1.003	19.435 19.435	600 600
S5	502820.967	176139.667	20.200	1.278	1500		1 1.003 0 1.004	18.922 18.922	600 600
HW2	502828.690	176129.564	20.000	1.184	600		1 1.004 0 1.005	18.816 18.816	600 600
S6	502889.965	176143.768	20.628	1.319	1350		0 2.000	19.309	225
S7	502834.264	176198.067	20.736	1.366	1350		0 3.000	19.370	150
S8	502834.265	176143.769	20.167	1.490	1350		1 3.000 2 2.000 0 2.001	18.827 18.752 18.677	150 225 300
HW1	502834.265	176130.873	20.000	1.452	600		1 2.001 0 2.002	18.548 18.548	300 300
S9	502851.313	176073.302	20.592	1.460	1350		0 4.000	19.132	300
S10	502858.506	176096.013	20.296	1.402	1350		1 4.000 0 4.001	18.894 18.894	300 300
HW3	502847.151	176104.689	20.000	1.249	600		1 4.001 0 4.002	18.751 18.751	300 300

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
HW4	502848.643	176129.768	20.000	1.500	600		1	4.002	18.500	300
							2	2.002	18.500	300
							3	1.005	18.650	600
							0	1.006	18.500	300
S11	502858.506	176131.061	20.331	1.914	1200		1	1.006	18.417	300
							0	1.007	18.417	300
S12	502870.662	176134.063	20.468	2.155	1200		1	1.007	18.313	300
							0	1.008	18.313	300
S13	502907.095	176134.647	20.305	2.596	1500		1	1.008	18.009	300
							0	1.009	17.709	600
S14	502916.057	176198.067	20.798	1.221	1350		0	5.000	19.577	150
S15	502916.057	176143.767	20.460	1.426	1350		1	5.000	19.034	150
							0	5.001	19.034	150
S16	502940.527	176143.767	20.366	1.881	1200		1	5.001	18.485	150
							0	5.002	18.485	150
S17	502952.845	176184.667	20.920	3.219	1500		0	6.000	17.701	600
S18	502952.845	176139.667	20.354	3.028	1500		1	6.000	17.326	600
							2	5.002	17.776	150
							3	1.009	17.326	600
							0	1.010	17.326	600
S19	502998.304	176144.345	20.552	3.607	1500		1	1.010	16.945	600
							0	1.011	16.945	600
S20	502982.370	176189.784	21.072	1.183	1350		0	7.000	19.889	150
S21	502982.370	176160.478	20.925	1.403	1350		1	7.000	19.522	150
							0	7.001	19.522	150
S22	502999.670	176189.784	21.193	1.536	1350		0	8.000	19.657	150

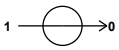
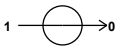
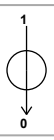
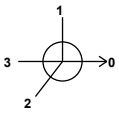
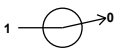
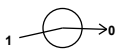
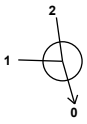
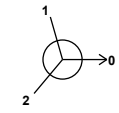
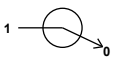
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S23	502999.670	176170.582	20.887	1.470	1350	1	8.000	19.417	150
						0	8.001	19.417	150
S24	503000.974	176160.482	20.770	1.480	1350	1	8.001	19.290	150
						2	7.001	19.290	150
						0	7.002	19.290	150
S25	503017.270	176189.784	21.154	1.708	1200	0	9.000	19.446	150
S26	503017.270	176170.586	20.746	1.540	1350	1	9.000	19.206	150
						0	9.001	19.206	150
S27	503017.773	176160.486	20.630	1.550	1350	1	9.001	19.080	150
						2	7.002	19.080	150
						0	7.003	19.080	150
S28	503029.470	176189.784	21.078	1.778	1200	0	10.000	19.300	150
S29	503029.470	176160.488	20.500	1.567	1350	1	10.000	18.933	150
						2	7.003	18.933	150
						0	7.004	18.933	450
S56	503029.470	176145.020	20.299	3.614	1500	1	7.004	17.135	450
						2	1.011	16.685	600
						0	1.012	16.685	600
S30	503052.770	176145.525	20.104	3.613	1500	1	1.012	16.491	600
						0	1.013	16.491	600
S31	502808.922	176331.365	21.934	1.657	1350	0	11.000	20.277	300
S32	502818.574	176331.365	21.847	1.966	1500	1	11.000	20.181	300
						0	11.001	19.881	600
S33	502863.574	176331.365	21.600	2.169	1500	1	11.001	19.431	600
						0	11.002	19.431	600
S34	502908.574	176331.365	21.200	2.219	1500	1	11.002	18.981	600
						0	11.003	18.981	600

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S35	502953.574	176331.365	20.700	2.169	1500	1	11.003	18.531	600
						0	11.004	18.531	600
S36	502998.574	176331.365	20.200	2.119	1500	1	11.004	18.081	600
						0	11.005	18.081	600
S37	503023.167	176331.365	20.100	2.290	1500	1	11.005	17.810	600
						0	11.006	17.810	600
S38	502837.111	176294.954	21.400	1.714	1350	0	12.000	19.686	300
S39	502882.111	176294.954	21.400	2.464	1500	1	12.000	19.236	300
						0	12.001	18.936	600
S40	502927.111	176294.954	21.400	2.914	1500	1	12.001	18.486	600
						0	12.002	18.486	600
S41	502972.111	176294.954	21.400	3.364	1500	1	12.002	18.036	600
						0	12.003	18.036	600
S42	503015.020	176294.954	20.500	2.893	1500	1	12.003	17.607	600
						0	12.004	17.607	600
S43	503031.651	176294.954	19.850	2.409	1500	1	12.004	17.441	600
						2	11.006	17.441	600
						0	11.007	17.441	600
HW5	503049.511	176246.732	19.800	2.873	600	1	11.007	16.927	600
						0	11.008	16.927	600
S44	502847.950	176206.215	20.970	2.540	1500	0	13.000	18.430	600
S45	502892.950	176206.215	21.150	3.095	1500	1	13.000	18.055	600
						0	13.001	18.055	600
S46	502937.950	176206.215	20.750	3.070	1500	1	13.001	17.680	600
						0	13.002	17.680	600

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S47	502982.950	176206.215	21.300	3.995	1500		1	13.002	17.305	600
							0	13.003	17.305	600
S48	502936.209	176197.485	20.792	2.762	1200		0	14.000	18.030	300
S49	502981.209	176197.485	21.286	3.631	1200		1	14.000	17.655	300
							0	14.001	17.655	300
S50	503021.209	176197.485	21.306	4.284	1500		1	14.001	17.322	300
							0	14.002	17.022	600
S51	503027.950	176267.765	20.723	2.980	1200		0	15.000	17.743	300
S52	503027.950	176236.990	20.979	3.493	1200		1	15.000	17.486	300
							0	15.001	17.486	300
S53	503027.950	176206.215	21.218	4.288	1500		1	15.001	17.230	300
							2	14.002	16.930	600
							3	13.003	16.930	600
							0	13.004	16.930	600
S54	503035.770	176206.215	20.476	3.612	1500		1	13.004	16.864	600
							0	13.005	16.864	600
HW6	503049.432	176209.258	19.800	2.982	600		1	13.005	16.818	600
							0	13.006	16.818	600
HW7	503054.778	176209.095	19.800	3.000	600		1	13.006	16.800	600
							2	11.008	16.800	600
							0	11.009	16.800	600
S55	503067.843	176163.488	20.351	4.056	1500		1	11.009	16.331	600
							2	1.013	16.295	600
							0	1.014	16.295	300
C1	503075.561	176163.488	20.220	4.023	1200		1	1.014	16.197	300
							0	1.015	16.197	300
TW0101	503086.292	176158.417	20.060	4.760	1200		1	1.015	15.300	300

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	Additional Storage (m³/ha)	0.0
Summer CV	1.000	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	1.000	Drain Down Time (mins)	7200	Check Discharge Volume	x

Storm Durations

60	180	360	600	960	2160	4320	7200
120	240	480	720	1440	2880	5760	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
100	0	0	0
100	40	0	0

Node S11 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	18.417	Product Number	CTL-SHE-0091-4400-1580-4400
Design Depth (m)	1.580	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	4.4	Min Node Diameter (mm)	1200

Node S55 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	16.295	Product Number	CTL-SHE-0075-4400-3500-4400
Design Depth (m)	3.500	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	4.4	Min Node Diameter (mm)	1200

Node S29 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.710	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	134.0		
Invert Level (m)	18.933	Diameter (m)	0.225		

Node S8 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.490	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	56.0		
Invert Level (m)	18.677	Diameter (m)	0.150		

Node HW4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	18.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	6060

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	590.1	0.0	0.400	743.7	0.0	0.800	914.2	0.0	1.200	1100.7	0.0
0.100	626.5	0.0	0.500	784.9	0.0	0.900	959.3	0.0	1.300	1149.9	0.0
0.200	664.6	0.0	0.600	827.0	0.0	1.000	1005.5	0.0	1.400	1200.0	0.0
0.300	703.6	0.0	0.700	870.1	0.0	1.100	1052.6	0.0	1.500	1251.2	0.0

Node HW7 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	16.800
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	199.4	0.0	0.800	444.0	0.0	1.600	1233.9	0.0	2.400	1841.8	0.0
0.100	225.1	0.0	0.900	480.4	0.0	1.700	1307.2	0.0	2.500	1921.2	0.0
0.200	252.5	0.0	1.000	518.0	0.0	1.800	1381.2	0.0	2.600	2001.4	0.0
0.300	281.3	0.0	1.100	556.9	0.0	1.900	1456.1	0.0	2.700	2082.4	0.0
0.400	311.3	0.0	1.200	597.0	0.0	2.000	1531.7	0.0	2.800	2164.1	0.0
0.500	342.6	0.0	1.300	638.5	0.0	2.100	1608.1	0.0	2.900	2246.6	0.0
0.600	375.1	0.0	1.400	681.2	0.0	2.200	1685.2	0.0	3.000	2329.9	0.0
0.700	408.9	0.0	1.500	725.1	0.0	2.300	1763.1	0.0			

Node S29 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	20.150	Slope (1:X)	150.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.350
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	0.30	Length (m)	29.000		

Node S27 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	20.282	Slope (1:X)	150.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	6	Depth (m)	0.350
Safety Factor	2.0	Width (m)	14.000	Inf Depth (m)	
Porosity	0.30	Length (m)	29.000		

Node S24 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	20.422	Slope (1:X)	150.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	20	Depth (m)	0.350
Safety Factor	2.0	Width (m)	14.000	Inf Depth (m)	
Porosity	0.30	Length (m)	29.000		

Node S21 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	20.577	Slope (1:X)	150.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	21	Depth (m)	0.350
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	0.30	Length (m)	29.000		

Node S8 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	19.817	Slope (1:X)	80.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.350
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	109.000		

Node S15 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	20.110	Slope (1:X)	120.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.350
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.30	Length (m)	54.000		

Other (defaults)

Entry Loss (manhole)	0.250	Entry Loss (junction)	0.000	Apply Recommended Losses	x
Exit Loss (manhole)	0.250	Exit Loss (junction)	0.000	Flood Risk (m)	0.300

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	S1	33	20.642	0.094	21.1	0.1667	0.0000	OK
60 minute summer	S2	33	19.984	0.111	46.6	0.1954	0.0000	OK
60 minute summer	S3	33	19.631	0.123	47.6	0.2171	0.0000	OK
60 minute summer	S4	33	19.546	0.111	47.4	0.1954	0.0000	OK
60 minute summer	S5	34	19.042	0.120	47.5	0.2127	0.0000	OK
60 minute summer	HW2	34	18.933	0.117	47.5	0.0330	0.0000	OK
60 minute summer	S6	33	19.355	0.046	4.9	0.0663	0.0000	OK
60 minute summer	S7	1	19.370	0.000	0.0	0.0000	0.0000	OK
60 minute summer	S8	33	18.808	0.131	9.2	0.1871	0.0000	OK
360 minute summer	HW1	280	18.666	0.118	4.0	0.0333	0.0000	OK
60 minute summer	S9	33	19.165	0.033	2.9	0.0476	0.0000	OK
60 minute summer	S10	33	18.946	0.052	6.8	0.0737	0.0000	OK
60 minute summer	HW3	33	18.803	0.052	6.8	0.0149	0.0000	OK
360 minute summer	HW4	280	18.666	0.166	28.6	102.7875	0.0000	OK
480 minute summer	S11	360	18.683	0.266	12.2	0.3010	0.0000	OK
2160 minute winter	S12	2100	18.400	0.087	3.7	0.0983	0.0000	OK
2160 minute winter	S13	2100	18.400	0.691	3.8	1.2209	0.0000	SURCHARGED
60 minute summer	S14	1	19.577	0.000	0.0	0.0000	0.0000	OK
60 minute summer	S15	33	19.083	0.049	5.5	0.0699	0.0000	OK
60 minute summer	S16	33	18.523	0.038	5.5	0.0427	0.0000	OK
2160 minute winter	S17	2100	18.400	0.699	0.8	1.2350	0.0000	SURCHARGED
2160 minute winter	S18	2100	18.400	1.074	4.8	1.8976	0.0000	SURCHARGED
2160 minute winter	S19	2100	18.400	1.455	4.9	2.5709	0.0000	SURCHARGED
60 minute summer	S20	1	19.889	0.000	0.0	0.0000	0.0000	OK
60 minute summer	S21	33	19.583	0.061	7.0	0.0878	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	S1	1.000	S2	21.0	1.131	0.208	0.8370	
60 minute summer	S2	1.001	S3	46.6	1.213	0.074	1.6846	
60 minute summer	S3	1.002	S4	47.4	1.233	0.076	0.3379	
60 minute summer	S4	1.003	S5	47.5	1.256	0.076	2.3293	
60 minute summer	S5	1.004	HW2	47.5	1.207	0.076	0.5002	
60 minute summer	HW2	1.005	HW4	47.3	1.289	0.075	0.7325	
60 minute summer	S6	2.000	S8	4.9	0.786	0.094	0.3766	
60 minute summer	S7	3.000	S8	0.0	0.000	0.000	0.0000	
60 minute summer	S8	2.001	HW1	9.0	0.760	0.081	0.1540	
360 minute summer	HW1	2.002	HW4	3.9	0.536	0.061	0.4718	
60 minute summer	S9	4.000	S10	2.9	0.479	0.026	0.1461	
60 minute summer	S10	4.001	HW3	6.8	0.836	0.061	0.1163	
60 minute summer	HW3	4.002	HW4	6.8	1.004	0.062	0.2604	
360 minute summer	HW4	1.006	S11	11.9	0.399	0.117	0.5256	
480 minute summer	S11	1.007	S12	3.8	0.681	0.038	0.0737	
2160 minute winter	S12	1.008	S13	3.5	0.671	0.035	1.5910	
2160 minute winter	S13	1.009	S18	4.4	0.496	0.007	12.9642	
60 minute summer	S14	5.000	S15	0.0	0.000	0.000	0.1349	
60 minute summer	S15	5.001	S16	5.5	1.304	0.205	0.1033	
60 minute summer	S16	5.002	S18	5.5	1.606	0.131	0.0442	
2160 minute winter	S17	6.000	S18	0.7	0.158	0.001	12.6755	
2160 minute winter	S18	1.010	S19	4.6	0.446	0.007	12.8724	
2160 minute winter	S19	1.011	S56	4.6	0.309	0.007	8.7807	
60 minute summer	S20	7.000	S21	0.0	0.000	0.000	0.0992	
60 minute summer	S21	7.001	S24	7.0	0.772	0.352	0.1682	

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	S22	1	19.657	0.000	0.0	0.0000	0.0000	OK
60 minute summer	S23	1	19.417	0.000	0.0	0.0000	0.0000	OK
60 minute summer	S24	34	19.383	0.093	13.9	0.1328	0.0000	OK
60 minute summer	S25	1	19.446	0.000	0.0	0.0000	0.0000	OK
60 minute summer	S26	35	19.282	0.076	2.2	0.1085	0.0000	OK
60 minute summer	S27	35	19.281	0.201	20.5	0.2879	0.0000	SURCHARGED
60 minute summer	S28	1	19.300	0.000	0.0	0.0000	0.0000	OK
60 minute summer	S29	34	19.106	0.173	22.8	0.2482	0.0000	OK
2160 minute winter	S56	2100	18.400	1.715	6.3	3.0303	0.0000	SURCHARGED
2160 minute winter	S30	2100	18.400	1.909	6.3	3.3731	0.0000	SURCHARGED
60 minute summer	S31	33	20.352	0.075	13.3	0.1070	0.0000	OK
60 minute summer	S32	33	19.947	0.066	18.0	0.1163	0.0000	OK
60 minute summer	S33	33	19.526	0.095	38.9	0.1674	0.0000	OK
60 minute summer	S34	33	19.099	0.118	59.2	0.2087	0.0000	OK
60 minute summer	S35	33	18.669	0.138	79.4	0.2436	0.0000	OK
2160 minute winter	S36	2100	18.400	0.319	6.8	0.5644	0.0000	OK
2160 minute winter	S37	2040	18.400	0.590	8.5	1.0418	0.0000	OK
60 minute summer	S38	1	19.686	0.000	0.0	0.0000	0.0000	OK
60 minute summer	S39	33	18.999	0.063	16.2	0.1105	0.0000	OK
60 minute summer	S40	33	18.573	0.087	32.4	0.1532	0.0000	OK
2160 minute winter	S41	2100	18.400	0.364	3.4	0.6436	0.0000	OK
2160 minute winter	S42	2040	18.400	0.793	4.3	1.4013	0.0000	SURCHARGED
2160 minute winter	S43	2040	18.400	0.959	15.8	1.6943	0.0000	SURCHARGED
2160 minute winter	HW5	2040	18.399	1.472	9.0	0.4167	0.0000	SURCHARGED
60 minute summer	S44	33	18.476	0.046	7.6	0.0808	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	S22	8.000	S23	0.0	0.000	0.000	0.0000	
60 minute summer	S23	8.001	S24	0.0	0.000	0.000	0.0582	
60 minute summer	S24	7.002	S27	13.8	0.919	0.696	0.2440	
60 minute summer	S25	9.000	S26	0.0	0.000	0.000	0.0857	
60 minute summer	S26	9.001	S27	-2.2	-0.191	-0.113	0.1342	
60 minute summer	S27	7.003	S29	19.1	1.086	0.959	0.2059	
60 minute summer	S28	10.000	S29	0.0	0.000	0.000	0.2579	
60 minute summer	S29	7.004	S56	22.7	2.747	0.021	1.1998	
2160 minute winter	S56	1.012	S30	6.2	0.391	0.010	6.5645	
2160 minute winter	S30	1.013	S55	6.2	0.057	0.010	6.6051	
60 minute summer	S31	11.000	S32	13.3	1.022	0.120	0.1257	
60 minute summer	S32	11.001	S33	18.0	0.805	0.026	1.0147	
60 minute summer	S33	11.002	S34	38.7	1.150	0.056	1.5198	
60 minute summer	S34	11.003	S35	58.9	1.343	0.086	1.9771	
60 minute summer	S35	11.004	S36	78.8	1.463	0.115	2.4383	
2160 minute winter	S36	11.005	S37	8.4	0.801	0.012	5.3233	
2160 minute winter	S37	11.006	S43	7.3	0.650	0.011	10.5100	
60 minute summer	S38	12.000	S39	0.0	0.000	0.000	0.0000	
60 minute summer	S39	12.001	S40	16.2	0.806	0.024	0.9116	
60 minute summer	S40	12.002	S41	32.2	1.071	0.047	1.3600	
2160 minute winter	S41	12.003	S42	4.3	0.639	0.006	9.8835	
2160 minute winter	S42	12.004	S43	8.7	0.374	0.013	4.6843	
2160 minute winter	S43	11.007	HW5	9.0	0.474	0.013	14.4847	
2160 minute winter	HW5	11.008	HW7	8.8	0.391	0.022	10.7046	
60 minute summer	S44	13.000	S45	7.6	0.439	0.012	0.8047	

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2160 minute winter	S45	2100	18.400	0.345	2.1	0.6095	0.0000	OK
2160 minute winter	S46	2100	18.400	0.720	3.8	1.2721	0.0000	SURCHARGED
2160 minute winter	S47	2100	18.400	1.095	4.1	1.9348	0.0000	SURCHARGED
2160 minute winter	S48	2100	18.400	0.370	0.2	0.4186	0.0000	SURCHARGED
2160 minute winter	S49	2100	18.400	0.745	0.5	0.8426	0.0000	SURCHARGED
2160 minute winter	S50	2100	18.400	1.378	0.4	2.4348	0.0000	SURCHARGED
2160 minute winter	S51	2100	18.400	0.657	1.3	0.7430	0.0000	SURCHARGED
2160 minute winter	S52	2100	18.400	0.914	2.0	1.0337	0.0000	SURCHARGED
2160 minute winter	S53	2100	18.400	1.470	5.2	2.5974	0.0000	SURCHARGED
2160 minute winter	S54	2100	18.400	1.536	7.3	2.7140	0.0000	SURCHARGED
2160 minute winter	HW6	2100	18.400	1.582	5.1	0.4477	0.0000	SURCHARGED
2160 minute winter	HW7	2100	18.400	1.600	16.4	755.8109	0.0000	SURCHARGED
2160 minute winter	S55	2100	18.400	2.105	6.2	3.7194	0.0000	SURCHARGED
2160 minute winter	C1	2100	16.220	0.023	3.4	0.0258	0.0000	OK
2160 minute winter	TW0101	2100	15.322	0.022	3.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2160 minute winter	S45	13.001	S46	2.1	0.417	0.003	10.1095	
2160 minute winter	S46	13.002	S47	3.6	0.527	0.006	12.6755	
2160 minute winter	S47	13.003	S53	3.2	0.364	0.005	12.6755	
2160 minute winter	S48	14.000	S49	0.2	0.247	0.002	3.1689	
2160 minute winter	S49	14.001	S50	0.4	0.313	0.004	2.8168	
2160 minute winter	S50	14.002	S53	0.6	0.026	0.001	3.1069	
2160 minute winter	S51	15.000	S52	1.3	0.408	0.013	2.1672	
2160 minute winter	S52	15.001	S53	1.9	0.474	0.019	2.1672	
2160 minute winter	S53	13.004	S54	7.2	0.367	0.011	2.2027	
2160 minute winter	S54	13.005	HW6	5.1	0.312	0.013	3.9426	
2160 minute winter	HW6	13.006	HW7	5.1	0.333	0.013	1.5064	
2160 minute winter	HW7	11.009	S55	3.3	0.195	0.005	13.3633	
2160 minute winter	S55	1.014	C1	3.4	0.948	0.028	0.0286	
2160 minute winter	C1	1.015	TW0101	3.4	1.439	0.011	0.0284	1373.1

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	S1	33	20.728	0.180	63.9	0.3175	0.0000	OK
60 minute summer	S2	33	20.073	0.200	141.4	0.3537	0.0000	OK
60 minute summer	S3	33	19.736	0.228	144.5	0.4023	0.0000	OK
60 minute summer	S4	33	19.633	0.198	144.3	0.3501	0.0000	OK
60 minute summer	S5	34	19.147	0.225	144.1	0.3981	0.0000	OK
60 minute summer	HW2	34	19.030	0.214	144.3	0.0605	0.0000	OK
60 minute summer	S6	33	19.391	0.082	14.8	0.1167	0.0000	OK
60 minute summer	S7	1	19.370	0.000	0.0	0.0000	0.0000	OK
60 minute summer	S8	35	19.057	0.380	27.7	0.5445	0.0000	SURCHARGED
4320 minute winter	HW1	4260	18.988	0.440	0.7	0.1245	0.0000	SURCHARGED
60 minute summer	S9	33	19.189	0.057	8.9	0.0815	0.0000	OK
4320 minute winter	S10	4200	18.988	0.094	0.5	0.1344	0.0000	OK
4320 minute winter	HW3	4260	18.988	0.237	0.5	0.0670	0.0000	OK
4320 minute winter	HW4	4260	18.988	0.488	8.3	333.3133	0.0000	SURCHARGED
4320 minute winter	S11	4260	18.988	0.571	11.8	0.6458	0.0000	SURCHARGED
2160 minute winter	S12	2100	18.998	0.685	4.2	0.7746	0.0000	SURCHARGED
2160 minute winter	S13	2100	18.998	1.289	4.6	2.2775	0.0000	SURCHARGED
60 minute summer	S14	1	19.577	0.000	0.0	0.0000	0.0000	OK
60 minute summer	S15	33	19.126	0.092	16.6	0.1323	0.0000	OK
2160 minute winter	S16	2100	18.998	0.513	0.7	0.5801	0.0000	SURCHARGED
2160 minute winter	S17	2100	18.998	1.297	1.5	2.2916	0.0000	SURCHARGED
2160 minute winter	S18	2100	18.998	1.672	7.7	2.9543	0.0000	SURCHARGED
2160 minute winter	S19	2100	18.998	2.053	9.1	3.6275	0.0000	SURCHARGED
60 minute summer	S20	37	20.606	0.717	6.5	1.0262	0.0000	SURCHARGED
60 minute summer	S21	36	20.597	1.075	21.1	1.6301	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	S1	1.000	S2	63.9	1.497	0.630	1.9206	
60 minute summer	S2	1.001	S3	141.4	1.570	0.225	3.9442	
60 minute summer	S3	1.002	S4	144.3	1.613	0.230	0.7859	
60 minute summer	S4	1.003	S5	144.1	1.630	0.229	5.4389	
60 minute summer	S5	1.004	HW2	144.3	1.547	0.230	1.1865	
60 minute summer	HW2	1.005	HW4	144.5	1.728	0.230	1.6692	
60 minute summer	S6	2.000	S8	14.8	0.784	0.284	1.4687	
60 minute summer	S7	3.000	S8	0.0	0.000	0.000	0.4780	
60 minute summer	S8	2.001	HW1	24.8	0.902	0.223	0.5555	
4320 minute winter	HW1	2.002	HW4	0.7	0.260	0.011	1.0154	
60 minute summer	S9	4.000	S10	8.9	0.647	0.080	0.3321	
4320 minute winter	S10	4.001	HW3	0.5	0.398	0.004	0.5610	
4320 minute winter	HW3	4.002	HW4	0.5	0.141	0.005	1.6343	
4320 minute winter	HW4	1.006	S11	11.8	0.369	0.116	0.7005	
4320 minute winter	S11	1.007	S12	3.4	0.663	0.033	0.8818	
2160 minute winter	S12	1.008	S13	3.9	0.682	0.039	2.5659	
2160 minute winter	S13	1.009	S18	4.7	0.483	0.007	12.9642	
60 minute summer	S14	5.000	S15	0.0	0.000	0.000	0.3092	
60 minute summer	S15	5.001	S16	16.6	1.709	0.621	0.2372	
2160 minute winter	S16	5.002	S18	0.7	0.795	0.017	0.2286	
2160 minute winter	S17	6.000	S18	1.5	0.172	0.002	12.6755	
2160 minute winter	S18	1.010	S19	7.7	0.482	0.012	12.8724	
2160 minute winter	S19	1.011	S56	9.0	0.332	0.014	8.7807	
60 minute summer	S20	7.000	S21	-6.5	-0.385	-0.327	0.5159	
60 minute summer	S21	7.001	S24	14.2	0.808	0.717	0.3275	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	S22	37	20.467	0.810	5.2	1.1595	0.0000	SURCHARGED
60 minute summer	S23	37	20.462	1.045	8.2	1.4956	0.0000	SURCHARGED
60 minute summer	S24	38	20.458	1.168	33.5	2.0827	0.0000	SURCHARGED
60 minute summer	S25	36	20.038	0.592	3.6	0.6700	0.0000	SURCHARGED
60 minute summer	S26	36	20.038	0.832	6.0	1.1905	0.0000	SURCHARGED
60 minute summer	S27	36	20.037	0.957	43.3	1.3694	0.0000	SURCHARGED
60 minute summer	S28	1	19.300	0.000	0.0	0.0000	0.0000	OK
60 minute summer	S29	35	19.267	0.334	49.8	0.4777	0.0000	OK
2160 minute winter	S56	2100	18.998	2.313	12.2	4.0869	0.0000	SURCHARGED
2160 minute winter	S30	2100	18.998	2.507	12.1	4.4297	0.0000	SURCHARGED
60 minute summer	S31	33	20.416	0.139	40.1	0.1988	0.0000	OK
60 minute summer	S32	33	19.993	0.112	54.4	0.1976	0.0000	OK
60 minute summer	S33	33	19.601	0.170	117.7	0.2997	0.0000	OK
60 minute summer	S34	33	19.198	0.217	180.0	0.3830	0.0000	OK
2160 minute winter	S35	2100	18.998	0.467	10.8	0.8250	0.0000	OK
2160 minute winter	S36	2100	18.998	0.917	13.6	1.6202	0.0000	SURCHARGED
2160 minute winter	S37	2100	18.998	1.188	19.1	2.0990	0.0000	SURCHARGED
60 minute summer	S38	1	19.686	0.000	0.0	0.0000	0.0000	OK
60 minute summer	S39	33	19.042	0.106	49.0	0.1879	0.0000	OK
2160 minute winter	S40	2100	18.998	0.512	4.4	0.9046	0.0000	OK
2160 minute winter	S41	2100	18.998	0.962	6.8	1.6997	0.0000	SURCHARGED
2160 minute winter	S42	2100	18.998	1.391	15.5	2.4577	0.0000	SURCHARGED
2160 minute winter	S43	2100	18.998	1.557	19.5	2.7511	0.0000	SURCHARGED
2160 minute winter	HW5	2100	18.998	2.071	18.8	0.5861	0.0000	SURCHARGED
2160 minute winter	S44	2100	18.998	0.568	1.0	1.0035	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	S22	8.000	S23	-5.2	-0.381	-0.263	0.3380	
60 minute summer	S23	8.001	S24	-8.2	-0.464	-0.412	0.1793	
60 minute summer	S24	7.002	S27	27.3	1.552	1.375	0.2958	
60 minute summer	S25	9.000	S26	-3.6	-0.233	-0.182	0.3380	
60 minute summer	S26	9.001	S27	-6.0	-0.343	-0.304	0.1780	
60 minute summer	S27	7.003	S29	40.1	2.278	2.013	0.2059	
60 minute summer	S28	10.000	S29	0.0	0.000	0.000	0.2579	
60 minute summer	S29	7.004	S56	49.7	2.488	0.045	1.3321	
2160 minute winter	S56	1.012	S30	11.9	0.435	0.019	6.5645	
2160 minute winter	S30	1.013	S55	12.0	0.053	0.019	6.6051	
60 minute summer	S31	11.000	S32	40.1	1.355	0.362	0.2858	
60 minute summer	S32	11.001	S33	54.4	1.083	0.079	2.2836	
60 minute summer	S33	11.002	S34	117.8	1.504	0.171	3.5330	
60 minute summer	S34	11.003	S35	179.9	1.731	0.261	4.6852	
2160 minute winter	S35	11.004	S36	10.8	0.825	0.016	11.6319	
2160 minute winter	S36	11.005	S37	18.8	0.860	0.026	6.9273	
2160 minute winter	S37	11.006	S43	14.1	0.629	0.021	10.5308	
60 minute summer	S38	12.000	S39	0.0	0.000	0.000	0.0000	
60 minute summer	S39	12.001	S40	49.0	1.093	0.071	2.0358	
2160 minute winter	S40	12.002	S41	4.4	0.538	0.006	12.1002	
2160 minute winter	S41	12.003	S42	8.3	0.655	0.012	12.0865	
2160 minute winter	S42	12.004	S43	-10.2	0.373	-0.015	4.6843	
2160 minute winter	S43	11.007	HW5	18.8	0.542	0.027	14.4847	
2160 minute winter	HW5	11.008	HW7	18.7	0.451	0.047	10.7046	
2160 minute winter	S44	13.000	S45	1.0	0.235	0.002	12.5484	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2160 minute winter	S45	2100	18.998	0.943	4.2	1.6661	0.0000	SURCHARGED
2160 minute winter	S46	2100	18.998	1.318	6.7	2.3288	0.0000	SURCHARGED
2160 minute winter	S47	2100	18.998	1.693	7.6	2.9914	0.0000	SURCHARGED
2160 minute winter	S48	2100	18.998	0.968	0.4	1.0947	0.0000	SURCHARGED
2160 minute winter	S49	2100	18.998	1.343	0.7	1.5188	0.0000	SURCHARGED
2160 minute winter	S50	2100	18.998	1.976	0.7	3.4914	0.0000	SURCHARGED
2160 minute winter	S51	2100	18.998	1.255	2.6	1.4193	0.0000	SURCHARGED
2160 minute winter	S52	2100	18.998	1.512	4.0	1.7100	0.0000	SURCHARGED
2160 minute winter	S53	2100	18.998	2.068	12.1	3.6540	0.0000	SURCHARGED
2160 minute winter	S54	2100	18.998	2.134	12.0	3.7706	0.0000	SURCHARGED
2160 minute winter	HW6	2100	18.998	2.180	12.0	0.6169	0.0000	SURCHARGED
2160 minute winter	HW7	2100	18.998	2.198	39.1	1626.9170	0.0000	SURCHARGED
2160 minute winter	S55	2100	18.998	2.703	12.0	4.7760	0.0000	SURCHARGED
2160 minute winter	C1	2100	16.221	0.024	3.9	0.0273	0.0000	OK
2160 minute winter	TW0101	2100	15.324	0.024	3.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2160 minute winter	S45	13.001	S46	3.6	0.430	0.006	12.6755	
2160 minute winter	S46	13.002	S47	6.5	0.505	0.010	12.6755	
2160 minute winter	S47	13.003	S53	7.5	0.412	0.012	12.6755	
2160 minute winter	S48	14.000	S49	0.4	0.247	0.004	3.1689	
2160 minute winter	S49	14.001	S50	0.6	0.313	0.006	2.8168	
2160 minute winter	S50	14.002	S53	0.7	0.086	0.001	3.1069	
2160 minute winter	S51	15.000	S52	2.6	0.408	0.025	2.1672	
2160 minute winter	S52	15.001	S53	3.9	0.447	0.039	2.1672	
2160 minute winter	S53	13.004	S54	12.0	0.463	0.019	2.2027	
2160 minute winter	S54	13.005	HW6	12.0	0.367	0.030	3.9426	
2160 minute winter	HW6	13.006	HW7	11.9	0.344	0.030	1.5064	
2160 minute winter	HW7	11.009	S55	-8.5	0.143	-0.012	13.3633	
2160 minute winter	S55	1.014	C1	3.9	0.982	0.031	0.0311	
2160 minute winter	C1	1.015	TW0101	3.9	1.492	0.013	0.0308	1957.5

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	S1	33	20.765	0.217	82.8	0.3827	0.0000	OK
60 minute summer	S2	33	20.106	0.233	183.2	0.4115	0.0000	OK
60 minute summer	S3	33	19.773	0.265	187.4	0.4685	0.0000	OK
60 minute summer	S4	33	19.664	0.229	187.2	0.4055	0.0000	OK
4320 minute summer	S5	4380	19.192	0.270	6.7	0.4770	0.0000	OK
4320 minute summer	HW2	4380	19.192	0.376	10.7	0.1064	0.0000	OK
60 minute summer	S6	33	19.403	0.094	19.2	0.1344	0.0000	OK
60 minute summer	S7	1	19.370	0.000	0.0	0.0000	0.0000	OK
60 minute summer	S8	35	19.254	0.577	35.9	0.8256	0.0000	SURCHARGED
4320 minute summer	HW1	4380	19.192	0.644	1.3	0.1822	0.0000	SURCHARGED
60 minute summer	S9	33	19.197	0.065	11.5	0.0925	0.0000	OK
4320 minute summer	S10	4380	19.192	0.298	1.0	0.4264	0.0000	OK
4320 minute summer	HW3	4380	19.192	0.441	1.0	0.1248	0.0000	SURCHARGED
4320 minute summer	HW4	4380	19.192	0.692	8.9	501.2054	0.0000	SURCHARGED
4320 minute summer	S11	4380	19.192	0.775	8.0	0.8764	0.0000	SURCHARGED
1440 minute winter	S12	1410	19.216	0.903	4.6	1.0217	0.0000	SURCHARGED
1440 minute winter	S13	1410	19.216	1.507	5.4	2.6637	0.0000	SURCHARGED
60 minute summer	S14	1	19.577	0.000	0.0	0.0000	0.0000	OK
1440 minute winter	S15	1410	19.216	0.182	1.3	0.2611	0.0000	SURCHARGED
1440 minute winter	S16	1410	19.216	0.731	1.3	0.8273	0.0000	SURCHARGED
1440 minute winter	S17	1410	19.216	1.515	2.6	2.6778	0.0000	SURCHARGED
1440 minute winter	S18	1410	19.216	1.890	10.3	3.3404	0.0000	SURCHARGED
1440 minute winter	S19	1410	19.216	2.271	12.6	4.0137	0.0000	SURCHARGED
60 minute summer	S20	39	20.691	0.802	8.9	1.1479	0.0000	SURCHARGED
60 minute summer	S21	38	20.685	1.163	28.5	4.3127	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	S1	1.000	S2	82.8	1.574	0.817	2.3662	
60 minute summer	S2	1.001	S3	183.3	1.659	0.292	4.8373	
60 minute summer	S3	1.002	S4	187.2	1.709	0.298	0.9615	
60 minute summer	S4	1.003	S5	186.9	1.721	0.297	6.6821	
4320 minute summer	S5	1.004	HW2	6.8	0.730	0.011	1.9624	
4320 minute summer	HW2	1.005	HW4	6.7	0.735	0.011	4.5253	
60 minute summer	S6	2.000	S8	19.2	0.782	0.369	1.5442	
60 minute summer	S7	3.000	S8	0.0	0.000	0.000	0.4780	
60 minute summer	S8	2.001	HW1	32.0	0.932	0.288	0.7668	
4320 minute summer	HW1	2.002	HW4	1.2	0.341	0.019	1.0154	
60 minute summer	S9	4.000	S10	11.5	0.691	0.104	0.4020	
4320 minute summer	S10	4.001	HW3	1.0	0.490	0.009	1.0057	
4320 minute summer	HW3	4.002	HW4	1.0	0.138	0.009	1.7692	
4320 minute summer	HW4	1.006	S11	8.0	0.378	0.078	0.7005	
4320 minute summer	S11	1.007	S12	3.6	0.631	0.036	0.8818	
1440 minute winter	S12	1.008	S13	4.4	0.708	0.043	2.5659	
1440 minute winter	S13	1.009	S18	5.1	0.512	0.008	12.9642	
60 minute summer	S14	5.000	S15	0.0	0.000	0.000	0.3862	
1440 minute winter	S15	5.001	S16	1.3	0.874	0.049	0.4308	
1440 minute winter	S16	5.002	S18	1.3	0.882	0.031	0.2286	
1440 minute winter	S17	6.000	S18	2.5	0.220	0.004	12.6755	
1440 minute winter	S18	1.010	S19	10.2	0.490	0.016	12.8724	
1440 minute winter	S19	1.011	S56	12.5	0.400	0.020	8.7807	
60 minute summer	S20	7.000	S21	-8.9	-0.512	-0.446	0.5159	
60 minute summer	S21	7.001	S24	14.7	0.837	0.742	0.3275	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	S22	38	20.550	0.893	6.2	1.2777	0.0000	SURCHARGED
60 minute summer	S23	38	20.548	1.131	10.3	1.6178	0.0000	SURCHARGED
60 minute summer	S24	39	20.546	1.256	42.8	6.6854	0.0000	FLOOD RISK
60 minute summer	S25	35	20.245	0.799	3.4	0.9038	0.0000	SURCHARGED
60 minute summer	S26	35	20.245	1.039	7.0	1.4865	0.0000	SURCHARGED
60 minute summer	S27	35	20.244	1.164	50.2	1.6652	0.0000	SURCHARGED
60 minute summer	S28	35	19.342	0.042	1.3	0.0473	0.0000	OK
60 minute summer	S29	35	19.339	0.406	58.1	0.5811	0.0000	OK
1440 minute winter	S56	1410	19.216	2.531	18.5	4.4731	0.0000	SURCHARGED
1440 minute winter	S30	1410	19.216	2.725	18.6	4.8159	0.0000	SURCHARGED
60 minute summer	S31	33	20.440	0.163	52.0	0.2331	0.0000	OK
60 minute summer	S32	33	20.008	0.127	70.5	0.2244	0.0000	OK
60 minute summer	S33	33	19.628	0.197	152.6	0.3474	0.0000	OK
60 minute summer	S34	33	19.234	0.253	233.3	0.4479	0.0000	OK
1440 minute winter	S35	1410	19.216	0.685	19.1	1.2112	0.0000	SURCHARGED
1440 minute winter	S36	1410	19.216	1.135	24.1	2.0063	0.0000	SURCHARGED
1440 minute winter	S37	1410	19.216	1.406	26.9	2.4852	0.0000	SURCHARGED
60 minute summer	S38	1	19.686	0.000	0.0	0.0000	0.0000	OK
1440 minute winter	S39	1410	19.217	0.281	3.9	0.4957	0.0000	OK
1440 minute winter	S40	1410	19.216	0.730	7.8	1.2907	0.0000	SURCHARGED
1440 minute winter	S41	1410	19.216	1.180	11.6	2.0858	0.0000	SURCHARGED
1440 minute winter	S42	1410	19.216	1.609	13.6	2.8439	0.0000	SURCHARGED
1440 minute winter	S43	1410	19.216	1.775	52.8	3.1372	0.0000	SURCHARGED
1440 minute winter	HW5	1410	19.216	2.289	33.0	0.6479	0.0000	SURCHARGED
1440 minute winter	S44	1410	19.216	0.786	1.8	1.3897	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	S22	8.000	S23	-6.2	-0.350	-0.310	0.3380	
60 minute summer	S23	8.001	S24	-10.3	-0.586	-0.520	0.1793	
60 minute summer	S24	7.002	S27	31.2	1.774	1.572	0.2958	
60 minute summer	S25	9.000	S26	-3.4	-0.254	-0.170	0.3380	
60 minute summer	S26	9.001	S27	-7.0	-0.398	-0.353	0.1780	
60 minute summer	S27	7.003	S29	43.4	2.464	2.177	0.2059	
60 minute summer	S28	10.000	S29	-1.3	-0.120	-0.067	0.3166	
60 minute summer	S29	7.004	S56	57.3	2.551	0.052	1.3431	
1440 minute winter	S56	1.012	S30	18.3	0.470	0.029	6.5645	
1440 minute winter	S30	1.013	S55	18.5	0.100	0.029	6.6051	
60 minute summer	S31	11.000	S32	52.0	1.441	0.469	0.3482	
60 minute summer	S32	11.001	S33	70.5	1.153	0.102	2.7815	
60 minute summer	S33	11.002	S34	152.8	1.593	0.222	4.3505	
60 minute summer	S34	11.003	S35	233.6	1.906	0.339	6.9221	
1440 minute winter	S35	11.004	S36	19.1	0.944	0.028	12.6755	
1440 minute winter	S36	11.005	S37	26.4	0.994	0.037	6.9273	
1440 minute winter	S37	11.006	S43	24.1	0.731	0.035	10.5308	
60 minute summer	S38	12.000	S39	0.0	0.000	0.000	0.0000	
1440 minute winter	S39	12.001	S40	3.9	0.515	0.006	9.2451	
1440 minute winter	S40	12.002	S41	7.4	0.633	0.011	12.6755	
1440 minute winter	S41	12.003	S42	13.6	0.695	0.020	12.0865	
1440 minute winter	S42	12.004	S43	28.7	0.423	0.042	4.6843	
1440 minute winter	S43	11.007	HW5	33.0	0.645	0.048	14.4847	
1440 minute winter	HW5	11.008	HW7	34.3	0.598	0.087	10.7046	
1440 minute winter	S44	13.000	S45	1.6	0.248	0.003	12.6755	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	S45	1410	19.216	1.161	7.0	2.0523	0.0000	SURCHARGED
1440 minute winter	S46	1410	19.216	1.536	11.9	2.7150	0.0000	SURCHARGED
1440 minute winter	S47	1410	19.216	1.911	13.7	3.3776	0.0000	SURCHARGED
1440 minute winter	S48	1410	19.217	1.186	0.7	1.3419	0.0000	SURCHARGED
1440 minute winter	S49	1410	19.217	1.561	1.2	1.7661	0.0000	SURCHARGED
1440 minute winter	S50	1410	19.217	2.194	1.3	3.8777	0.0000	SURCHARGED
1440 minute winter	S51	1410	19.217	1.474	4.6	1.6665	0.0000	SURCHARGED
1440 minute winter	S52	1410	19.217	1.731	7.0	1.9572	0.0000	SURCHARGED
1440 minute winter	S53	1410	19.217	2.286	21.8	4.0402	0.0000	SURCHARGED
1440 minute winter	S54	1410	19.216	2.352	21.7	4.1569	0.0000	SURCHARGED
1440 minute winter	HW6	1410	19.216	2.398	21.6	0.6788	0.0000	SURCHARGED
1440 minute winter	HW7	1410	19.216	2.416	69.3	2013.6390	0.0000	SURCHARGED
1440 minute winter	S55	1410	19.216	2.921	18.5	5.1622	0.0000	SURCHARGED
1440 minute winter	C1	1410	16.222	0.025	4.0	0.0277	0.0000	OK
1440 minute winter	TW0101	1410	15.324	0.024	4.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute winter	S45	13.001	S46	6.2	0.487	0.010	12.6755	
1440 minute winter	S46	13.002	S47	11.8	0.547	0.019	12.6755	
1440 minute winter	S47	13.003	S53	13.6	0.478	0.022	12.6755	
1440 minute winter	S48	14.000	S49	0.6	0.248	0.006	3.1689	
1440 minute winter	S49	14.001	S50	1.2	0.313	0.012	2.8168	
1440 minute winter	S50	14.002	S53	1.2	0.077	0.002	3.1069	
1440 minute winter	S51	15.000	S52	4.5	0.450	0.045	2.1672	
1440 minute winter	S52	15.001	S53	7.0	0.511	0.069	2.1672	
1440 minute winter	S53	13.004	S54	21.7	0.517	0.034	2.2027	
1440 minute winter	S54	13.005	HW6	21.6	0.410	0.055	3.9426	
1440 minute winter	HW6	13.006	HW7	21.6	0.546	0.054	1.5064	
1440 minute winter	HW7	11.009	S55	-14.8	0.164	-0.022	13.3633	
1440 minute winter	S55	1.014	C1	4.0	0.993	0.032	0.0319	
1440 minute winter	C1	1.015	TW0101	4.0	1.509	0.013	0.0316	1911.3

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	S1	33	20.955	0.407	116.0	0.7186	0.0000	SURCHARGED
60 minute summer	S2	33	20.160	0.287	255.9	0.5062	0.0000	OK
60 minute summer	S3	33	19.833	0.325	261.4	0.5739	0.0000	OK
60 minute summer	S4	33	19.715	0.280	260.5	0.4948	0.0000	OK
7200 minute winter	S5	7080	19.645	0.723	10.8	1.2771	0.0000	SURCHARGED
7200 minute winter	HW2	7080	19.645	0.829	8.6	0.2345	0.0000	SURCHARGED
60 minute summer	S6	34	19.667	0.358	26.9	0.5117	0.0000	SURCHARGED
7200 minute winter	S7	7020	19.645	0.275	0.1	0.3937	0.0000	SURCHARGED
7200 minute winter	S8	7020	19.645	0.968	0.8	1.3849	0.0000	SURCHARGED
7200 minute winter	HW1	7020	19.645	1.097	0.8	0.3103	0.0000	SURCHARGED
7200 minute winter	S9	7020	19.645	0.513	0.3	0.7339	0.0000	SURCHARGED
7200 minute winter	S10	7080	19.645	0.751	0.6	1.0744	0.0000	SURCHARGED
7200 minute winter	HW3	7020	19.645	0.894	1.1	0.2530	0.0000	SURCHARGED
7200 minute winter	HW4	7020	19.645	1.145	19.6	939.8585	0.0000	SURCHARGED
7200 minute winter	S11	7020	19.645	1.228	8.4	1.3885	0.0000	SURCHARGED
2160 minute winter	S12	2100	19.656	1.343	4.3	1.5189	0.0000	SURCHARGED
2160 minute winter	S13	2100	19.656	1.947	4.9	3.4412	0.0000	SURCHARGED
2160 minute winter	S14	2100	19.657	0.080	0.0	0.1139	0.0000	OK
2160 minute winter	S15	2100	19.657	0.623	1.3	0.8908	0.0000	SURCHARGED
2160 minute winter	S16	2100	19.657	1.172	1.3	1.3251	0.0000	SURCHARGED
2160 minute winter	S17	2100	19.656	1.955	2.6	3.4553	0.0000	SURCHARGED
2160 minute winter	S18	2100	19.656	2.330	8.9	4.1180	0.0000	SURCHARGED
2160 minute winter	S19	2100	19.657	2.711	10.8	4.7912	0.0000	SURCHARGED
60 minute summer	S20	40	20.779	0.890	8.8	1.2741	0.0000	FLOOD RISK
60 minute summer	S21	40	20.775	1.253	38.7	10.5959	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	S1	1.000	S2	115.3	1.644	1.138	3.0455	
60 minute summer	S2	1.001	S3	255.7	1.773	0.407	6.3119	
60 minute summer	S3	1.002	S4	260.5	1.831	0.415	1.2489	
60 minute summer	S4	1.003	S5	259.8	1.836	0.413	8.7113	
7200 minute winter	S5	1.004	HW2	8.2	0.631	0.013	3.5821	
7200 minute winter	HW2	1.005	HW4	15.8	0.616	0.025	5.6206	
60 minute summer	S6	2.000	S8	24.7	0.787	0.475	2.2152	
7200 minute winter	S7	3.000	S8	0.1	0.005	0.005	0.9559	
7200 minute winter	S8	2.001	HW1	0.8	0.345	0.007	0.9081	
7200 minute winter	HW1	2.002	HW4	0.8	0.214	0.012	1.0154	
7200 minute winter	S9	4.000	S10	0.3	0.265	0.003	1.6776	
7200 minute winter	S10	4.001	HW3	1.1	0.398	0.010	1.0063	
7200 minute winter	HW3	4.002	HW4	0.8	0.139	0.007	1.7692	
7200 minute winter	HW4	1.006	S11	8.4	0.370	0.083	0.7005	
7200 minute winter	S11	1.007	S12	-3.0	0.637	-0.030	0.8818	
2160 minute winter	S12	1.008	S13	4.1	0.681	0.040	2.5659	
2160 minute winter	S13	1.009	S18	4.8	0.514	0.008	12.9642	
2160 minute winter	S14	5.000	S15	0.0	0.002	0.001	0.7357	
2160 minute winter	S15	5.001	S16	1.3	0.807	0.049	0.4308	
2160 minute winter	S16	5.002	S18	1.2	0.743	0.029	0.2286	
2160 minute winter	S17	6.000	S18	2.5	0.192	0.004	12.6755	
2160 minute winter	S18	1.010	S19	8.8	0.449	0.014	12.8724	
2160 minute winter	S19	1.011	S56	10.7	0.375	0.017	8.7807	
60 minute summer	S20	7.000	S21	-8.8	-0.502	-0.444	0.5159	
60 minute summer	S21	7.001	S24	14.8	0.840	0.745	0.3275	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	S22	41	20.640	0.983	5.7	1.4063	0.0000	SURCHARGED
60 minute summer	S23	42	20.639	1.222	11.5	1.7486	0.0000	FLOOD RISK
60 minute summer	S24	42	20.639	1.349	52.6	16.6037	0.0000	FLOOD RISK
60 minute summer	S25	36	20.372	0.926	3.9	1.0472	0.0000	SURCHARGED
60 minute summer	S26	36	20.370	1.164	8.3	1.6653	0.0000	SURCHARGED
60 minute summer	S27	36	20.366	1.286	55.5	4.0804	0.0000	FLOOD RISK
2160 minute winter	S28	2100	19.657	0.357	0.1	0.4038	0.0000	SURCHARGED
2160 minute winter	S29	2100	19.657	0.724	5.7	1.0366	0.0000	SURCHARGED
2160 minute winter	S56	2100	19.657	2.972	15.6	5.2507	0.0000	SURCHARGED
2160 minute winter	S30	2100	19.657	3.165	15.7	5.5934	0.0000	SURCHARGED
60 minute summer	S31	33	20.480	0.203	72.8	0.2911	0.0000	OK
60 minute summer	S32	36	20.117	0.236	98.8	0.4176	0.0000	OK
60 minute summer	S33	36	20.113	0.682	215.6	1.2050	0.0000	SURCHARGED
60 minute summer	S34	36	20.080	1.099	332.7	1.9420	0.0000	SURCHARGED
60 minute summer	S35	36	20.003	1.472	400.0	2.6019	0.0000	SURCHARGED
60 minute summer	S36	36	19.860	1.779	448.5	3.1434	0.0000	SURCHARGED
60 minute summer	S37	36	19.709	1.899	460.5	3.3554	0.0000	SURCHARGED
60 minute summer	S38	1	19.686	0.000	0.0	0.0000	0.0000	OK
2160 minute winter	S39	2100	19.657	0.721	3.8	1.2733	0.0000	SURCHARGED
2160 minute winter	S40	2100	19.657	1.171	7.6	2.0684	0.0000	SURCHARGED
2160 minute winter	S41	2100	19.657	1.621	10.6	2.8636	0.0000	SURCHARGED
2160 minute winter	S42	2100	19.657	2.050	10.9	3.6216	0.0000	SURCHARGED
2160 minute winter	S43	2100	19.657	2.216	33.5	3.9149	0.0000	FLOOD RISK
2160 minute winter	HW5	2100	19.657	2.730	33.4	0.7725	0.0000	FLOOD RISK
2160 minute winter	S44	2100	19.657	1.227	1.8	2.1673	0.0000	SURCHARGED

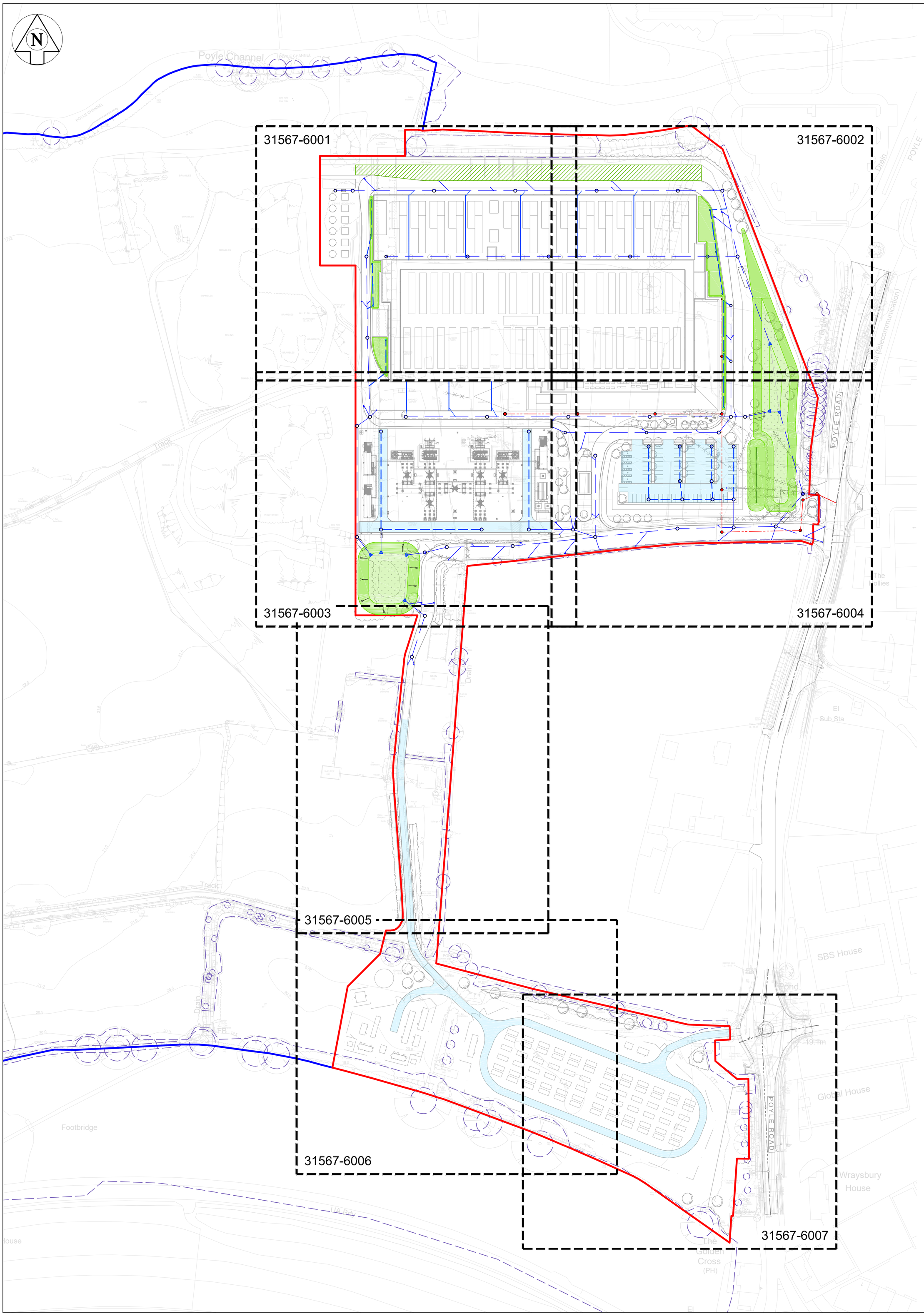
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	S22	8.000	S23	-5.7	-0.327	-0.286	0.3380	
60 minute summer	S23	8.001	S24	-11.5	-0.656	-0.581	0.1793	
60 minute summer	S24	7.002	S27	32.7	1.856	1.644	0.2958	
60 minute summer	S25	9.000	S26	-3.9	-0.235	-0.194	0.3380	
60 minute summer	S26	9.001	S27	-8.3	-0.471	-0.418	0.1780	
60 minute summer	S27	7.003	S29	46.0	2.611	2.306	0.2059	
2160 minute winter	S28	10.000	S29	0.1	0.006	0.004	0.5157	
2160 minute winter	S29	7.004	S56	5.7	1.136	0.005	2.4508	
2160 minute winter	S56	1.012	S30	15.5	0.114	0.025	6.5645	
2160 minute winter	S30	1.013	S55	15.6	0.055	0.025	6.6051	
60 minute summer	S31	11.000	S32	72.8	1.555	0.657	0.4514	
60 minute summer	S32	11.001	S33	100.7	1.232	0.146	8.6564	
60 minute summer	S33	11.002	S34	219.9	1.627	0.319	12.6755	
60 minute summer	S34	11.003	S35	293.0	1.821	0.426	12.6755	
60 minute summer	S35	11.004	S36	351.2	1.848	0.510	12.6755	
60 minute summer	S36	11.005	S37	448.9	2.075	0.621	6.9273	
60 minute summer	S37	11.006	S43	461.0	1.762	0.674	10.5308	
60 minute summer	S38	12.000	S39	0.0	0.000	0.000	1.5845	
2160 minute winter	S39	12.001	S40	3.8	0.468	0.006	12.6755	
2160 minute winter	S40	12.002	S41	6.5	0.543	0.010	12.6755	
2160 minute winter	S41	12.003	S42	10.5	0.604	0.015	12.0865	
2160 minute winter	S42	12.004	S43	10.4	0.374	0.015	4.6843	
2160 minute winter	S43	11.007	HW5	33.4	0.623	0.049	14.4847	
2160 minute winter	HW5	11.008	HW7	33.4	0.511	0.084	10.7046	
2160 minute winter	S44	13.000	S45	1.7	0.226	0.003	12.6755	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2160 minute winter	S45	2100	19.657	1.602	7.2	2.8300	0.0000	SURCHARGED
2160 minute winter	S46	2100	19.657	1.977	12.7	3.4926	0.0000	SURCHARGED
2160 minute winter	S47	2100	19.657	2.352	14.4	4.1552	0.0000	SURCHARGED
2160 minute winter	S48	2100	19.657	1.627	0.6	1.8396	0.0000	SURCHARGED
2160 minute winter	S49	2100	19.657	2.002	1.2	2.2638	0.0000	SURCHARGED
2160 minute winter	S50	2100	19.657	2.635	1.2	4.6553	0.0000	SURCHARGED
60 minute summer	S51	34	19.676	1.933	106.0	2.1861	0.0000	SURCHARGED
2160 minute winter	S52	2100	19.657	2.171	6.9	2.4549	0.0000	SURCHARGED
2160 minute winter	S53	2100	19.657	2.727	22.3	4.8178	0.0000	SURCHARGED
2160 minute winter	S54	2100	19.657	2.793	22.3	4.9345	0.0000	SURCHARGED
2160 minute winter	HW6	2100	19.657	2.839	22.2	0.8033	0.0000	FLOOD RISK
2160 minute winter	HW7	2100	19.657	2.857	64.7	2907.7880	0.0000	FLOOD RISK
2160 minute winter	S55	2100	19.657	3.362	15.6	5.9398	0.0000	SURCHARGED
2160 minute winter	C1	2100	16.222	0.025	4.3	0.0286	0.0000	OK
2160 minute winter	TW0101	2100	15.325	0.025	4.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2160 minute winter	S45	13.001	S46	7.1	0.417	0.011	12.6755	
2160 minute winter	S46	13.002	S47	12.6	0.520	0.020	12.6755	
2160 minute winter	S47	13.003	S53	14.4	0.456	0.023	12.6755	
2160 minute winter	S48	14.000	S49	0.6	0.221	0.006	3.1689	
2160 minute winter	S49	14.001	S50	1.1	0.313	0.011	2.8168	
2160 minute winter	S50	14.002	S53	1.1	0.076	0.002	3.1069	
60 minute summer	S51	15.000	S52	104.0	1.477	1.025	2.1672	
2160 minute winter	S52	15.001	S53	6.8	0.488	0.067	2.1672	
2160 minute winter	S53	13.004	S54	22.3	0.510	0.035	2.2027	
2160 minute winter	S54	13.005	HW6	22.2	0.390	0.056	3.9426	
2160 minute winter	HW6	13.006	HW7	22.2	0.372	0.056	1.5064	
2160 minute winter	HW7	11.009	S55	-12.0	0.097	-0.017	13.3633	
2160 minute winter	S55	1.014	C1	4.3	1.013	0.034	0.0334	
2160 minute winter	C1	1.015	TW0101	4.3	1.541	0.014	0.0331	2207.3

Appendix H
Below Ground Drainage Layouts



NOTES :

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DRAINAGE KEY	
	Permeable Paving
	Rain Garden
	Detention Basin
	Bund (1.5m height)

DRAINAGE LEGEND	
Site Boundary	
Ownership Boundary	
Surface Water Drain	
Foul Water Drain	
Existing Foul Water Sewer	
Drainage to be Demolished	
Tree Root Protection Zone	

Rev	Date	Drawn	Eng	Amendment
P02	20.11.24	SE	SRe	Issued for Planning
P01	01.11.24	SE	SRe	Issued for Information

MANOR FARM, POYLE ROAD

BELOW GROUND DRAINAGE LAYOUT

KEY PLAN

Status
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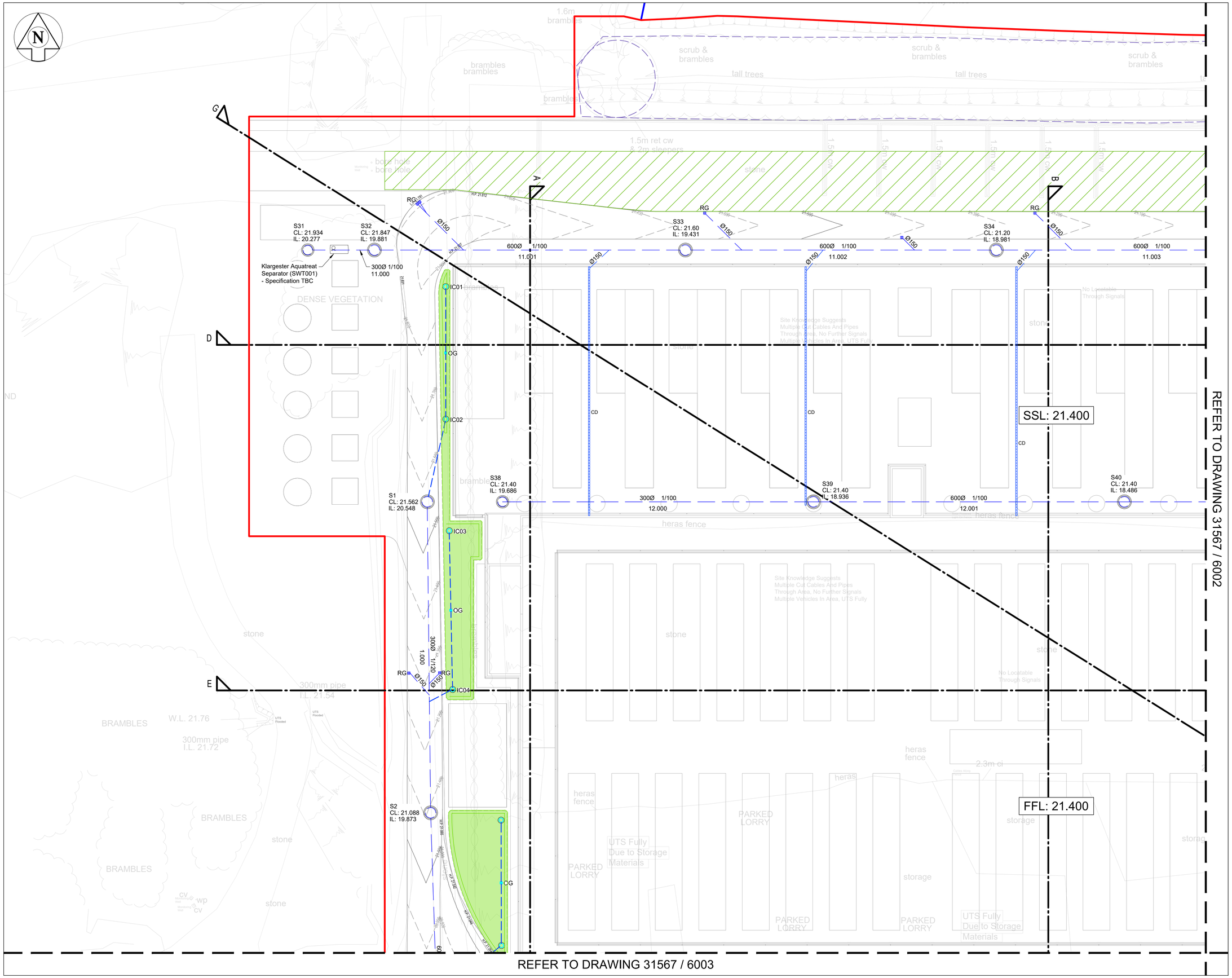

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DRAINAGE LEGEND

- Site Boundary
- Ownership Boundary
- Surface Water Drain
- Tree Root Protection Zone
- Drainage to be Demolished
- Major Contour
- Minor Contour

DRAINAGE KEY

S1	Surface Water Manhole Chamber
IC1	Rain Garden Inspection Chamber
F1	Foul Water Manhole Chamber
CD	Channel Drain
RG	Road Gully
OG	Overflow Gully
	Permeable Paving
	Reinforced Grass
	Rain Garden

ABBREVIATIONS

IL	- Invert Level
CL	- Cover Level
RA	- Above Ground Rodding Access
REIL	- Rodding Eye Invert Level
BDIL	- Backdrop Invert Level
FCMH	- Flow Control Manhole

Rev	Date	Drawn	Eng	Amendment
P02	20.11.24	SE	SRe	Issued for Planning
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MANOR FARM, POYLE ROAD

BELOW GROUND DRAINAGE LAYOUT

SHEET 1

Status
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DRAINAGE LEGEND

- Site Boundary
- Surface Water Drain
- Foul Water Drain
- Existing Surface Water Drain
- Existing Foul Water Sewer
- Tree Root Protection Zone
- Drainage to be Demolished

DRAINAGE KEY

S1	Surface Water Manhole Chamber
IC1	Rain Garden Inspection Chamber
F1	Foul Water Manhole Chamber
	Permeable Paving
	Reinforced Grass
	Petrol Interceptor
HW	Headwall
CD	Channel Drain
RG	Road Gully
OG	Overflow Gully
	Rain Garden
	Detention Basin

ABBREVIATIONS

IL	- Invert Level
CL	- Cover Level
RA	- Above Ground Rodding Access
REIL	- Rodding Eye Invert Level
BDIL	- Backdrop Invert Level
FCMH	- Flow Control Manhole

Rev	Date	Drawn	Eng	Amendment
P02	20.11.24	SE	SRe	Issued for Planning
P01	01.11.24	SE	SRe	Issued for Information

MANOR FARM,
POYLE ROAD

BELOW GROUND
DRAINAGE LAYOUT

SHEET 2

Status
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Road design and contours to be reviewed at detailed design

Base of loading dock ramp not at risk of flooding during the peak storm event. S44-45 peak water level during 1:100+40%: 19.613.

S3
CL: 20.737
IL: 19.508

S4
CL: 21.00
IL: 19.435

S44
CL: 20.97
IL: 18.430

S45
CL: 21.15
IL: 18.055

F1
CL: 21.10
IL: 19.95

S46
CL: 20.75
IL: 17.680

S48
CL: 20.792
IL: 18.030

S7
CL: 20.736
IL: 19.370

S14
CL: 20.798
IL: 19.577

S8 (150mm Orifice plate)
CL: 20.167
IL: 18.677

S6
CL: 20.628
IL: 19.309

S15
CL: 20.460
IL: 19.034

S5 (CP)
CL: 20.20
IL: 18.922

Klargester Aquatreat Separator (SWT009) - Specification TBC

Klargester Aquatreat Separator (SWT001) - Specification TBC

S12
CL: 20.468
IL: 18.313

S13
CL: 20.305
IL: 17.709

HW1
IL: 18.548

HW2
IL: 18.816

HW3
IL: 18.751

HW4
IL: 18.50

S11 (FCMH1)
CL: 20.331
IL: 18.417
Discharge rate: 4.4l/s
SHE-0091-4400-1580-4400

S10 (CP)
CL: 20.296
IL: 18.894

Detention Basin 1
Top of bank: 20.000
Basin base: 18.500
1:100-yr + 40% flood level: 19.573

Klargester Aquatreat Separator (SWT001) - Specification TBC

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DRAINAGE LEGEND

- Site Boundary
- Surface Water Drain
- Foul Water Drain
- Combined Water Drain
- Surface Water Perforated Pipe
- Tree Root Protection Zone
- Drainage to be Demolished

DRAINAGE KEY

S1	Surface Water Manhole Chamber
F1	Foul Water Manhole Chamber
	Permeable Paving
	Petrol Interceptor
HW	Headwall
RG	Road Gully
	Detention Basin

ABBREVIATIONS

IL	- Invert Level
CL	- Cover Level
RA	- Above Ground Rodding Access
REIL	- Rodding Eye Invert Level
BDIL	- Backdrop Invert Level
FCMH	- Flow Control Manhole

Rev	Date	Drawn	Eng	Amendment
P02	20.11.24	SE	SRe	Issued for Planning
P01	01.11.24	SE	SRe	Issued for Information

MANOR FARM, POYLE ROAD

BELOW GROUND DRAINAGE LAYOUT

SHEET 3

Status
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N

F2
CL: 20.80
IL: 19.45

F3
CL: 21.30
IL: 18.912

F6
CL: 21.25
IL: 18.45

S46
CL: 20.75
IL: 17.680

S47
CL: 21.30
IL: 17.305

S48
CL: 20.792
IL: 18.030

S49
CL: 21.286
IL: 17.655

S50
CL: 21.306
IL: 17.022

S53
CL: 21.218
IL: 16.930

S54
CL: 20.476
IL: 16.864

HW6
IL: 16.818

HW7
IL: 16.80

Proposed planting to be relocated to coordinate with drainage

Klargester Aquatreat Separator (SWT011) - Specification TBC

S17
CL: 20.920
IL: 17.701

S20
CL: 21.073
IL: 19.889

S22
CL: 21.193
IL: 19.657

S25
CL: 21.155
IL: 19.446

S28
CL: 21.077
IL: 19.300

S23
CL: 20.868
IL: 19.417

S26
CL: 20.748
IL: 19.206

F7
CL: 20.707
IL: 17.925

S21
CL: 20.927
IL: 19.522

S24
CL: 20.772
IL: 19.290

S27
CL: 20.632
IL: 19.080

S29 (225mm Orifice plate)
CL: 20.50
IL: 18.933

S55 (FCMH2)
CL: 20.351
IL: 16.295
Discharge rate: 4.4l/s
SHE-0075-4400-3500-4400

C1
CL: 20.220
IL: 16.197

F8
CL: 20.312
IL: 16.879

TW0101
CL: 20.060
IL: 15.30

Existing chamber removed and replaced with C1

All existing redundant drainage to be removed and replaced with clean fill material

Existing connection to TW0101 to be reused. Proposal subject to Section 106 from Thames Water

S16
CL: 20.366
IL: 18.485

S18
CL: 20.354
IL: 17.326

S19
CL: 20.552
IL: 16.945

S56
CL: 20.299
IL: 16.685

F9
CL: 20.416
IL: 17.632

S30
CL: 20.104
IL: 16.491

F10
CL: 20.050
IL: 17.089

Klargester Aquatreat Separator (SWT008) - Specification TBC

Proposed planting to be relocated to coordinate with drainage

POYLE ROAD

Ex Ø300 FW Public Sewer

Ex Ø225 FW Public Sewer

Ex Ø300 FW Public Sewer

APPROX BUILDING LINE

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DRAINAGE LEGEND

- Site Boundary
- Surface Water Drain
- Foul Water Drain
- Combined Water Drain
- Surface Water Perforated Pipe
- Existing Surface Water Drain
- Existing Foul Water Drain
- Existing Surface Water Sewer
- Existing Foul Water Sewer
- Tree Root Protection Zone
- Drainage to be Demolished

DRAINAGE KEY

S1	Surface Water Manhole Chamber
IC1	Rain Garden Inspection Chamber
F1	Foul Water Manhole Chamber
C1	Combined Water Manhole Chamber
	Permeable Paving
	Petrol Interceptor
HW	Headwall
RG	Road Gully
	Detention Basin
	Bund (1.5 height)

ABBREVIATIONS

IL	- Invert Level
CL	- Cover Level
RA	- Above Ground Rodding Access
REIL	- Rodding Eye Invert Level
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FCMH	- Flow Control Manhole

Rev	Date	Drawn	Eng	Amendment
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MANOR FARM,
POYLE ROAD

BELOW GROUND DRAINAGE LAYOUT

SHEET 4

Status
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DRAINAGE LEGEND	
Site Boundary	
Surface Water Drain	
Tree Root Protection Zone	

ABBREVIATIONS	
IL	- Invert Level
CL	- Cover Level
RA	- Above Ground Rodding Access
REIL	- Rodding Eye Invert Level
BDIL	- Backdrop Invert Level
FCMH	- Flow Control Manhole

DRAINAGE KEY	
S1	Surface Water Manhole Chamber
RG	Road Gully
	Permeable Paving

Rev	Date	Drawn	Eng	Amendment
P02	20.11.24	SE	SRe	Issued for Planning
P01	01.11.24	SE	SRe	Issued for Information

MANOR FARM,
POYLE ROAD

BELOW GROUND DRAINAGE LAYOUT

SHEET 5

Status
FOR PLANNING
NOT FOR CONSTRUCTION

Drawn	SE	Eng	SRe
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Drawing No		Rev	
31567 / 6005		P02	

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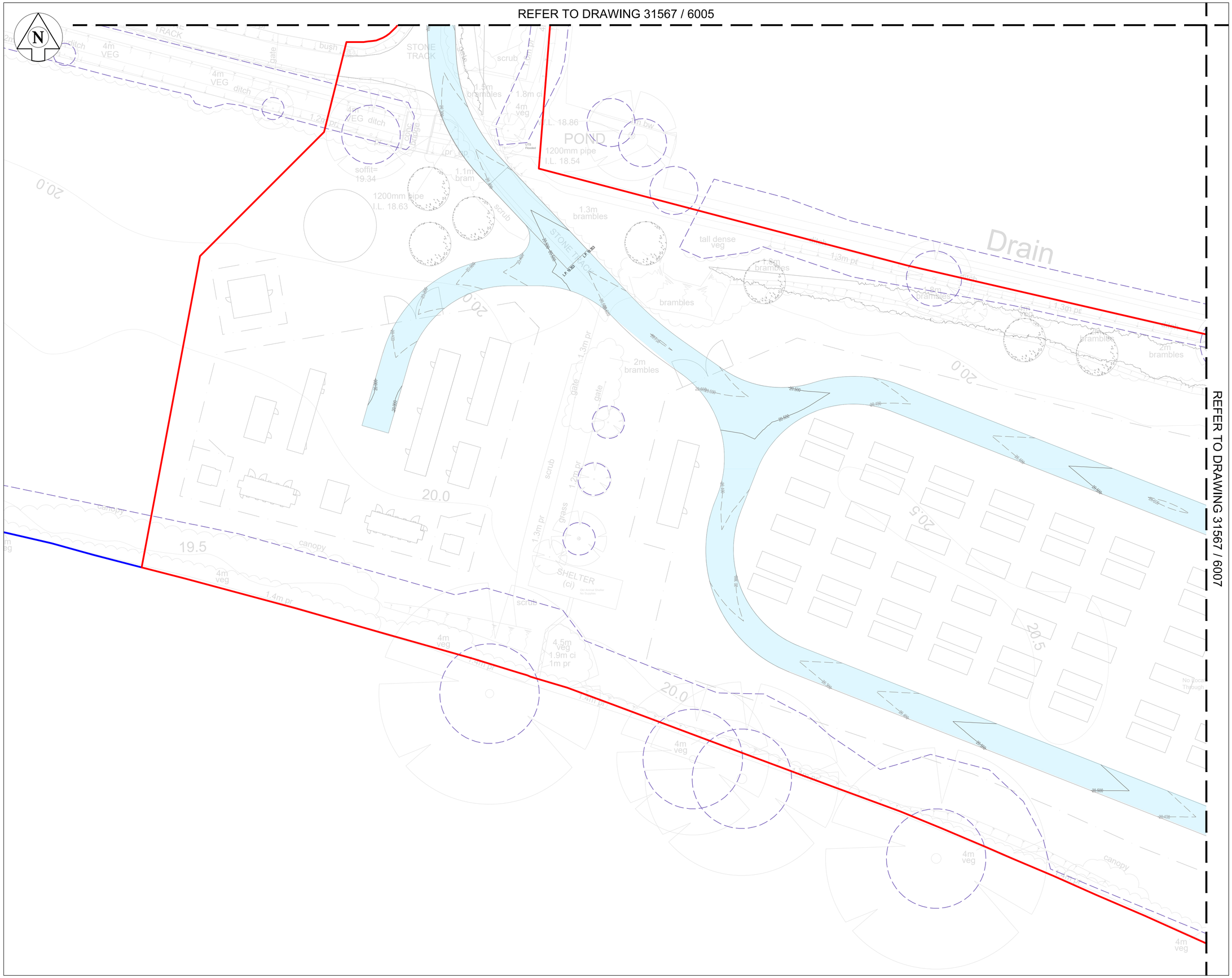

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DRAINAGE LEGEND	
Site Boundary	
Ownership Boundary	
Tree Root Protection Zone	

DRAINAGE KEY	
	Permeable Paving

ABBREVIATIONS	
IL	- Invert Level
CL	- Cover Level
RA	- Above Ground Rodding Access
REIL	- Rodding Eye Invert Level
BDIL	- Backdrop Invert Level
FCMH	- Flow Control Manhole

Rev	Date	Drawn	Eng	Amendment
P02	20.11.24	SE	SRe	Issued for Planning
P01	01.11.24	SE	SRe	Issued for Information

MANOR FARM, POYLE ROAD

BELOW GROUND DRAINAGE LAYOUT

SHEET 6

Status
FOR PLANNING
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Drawn	SE	Eng	SRe
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Drawing No		Rev	
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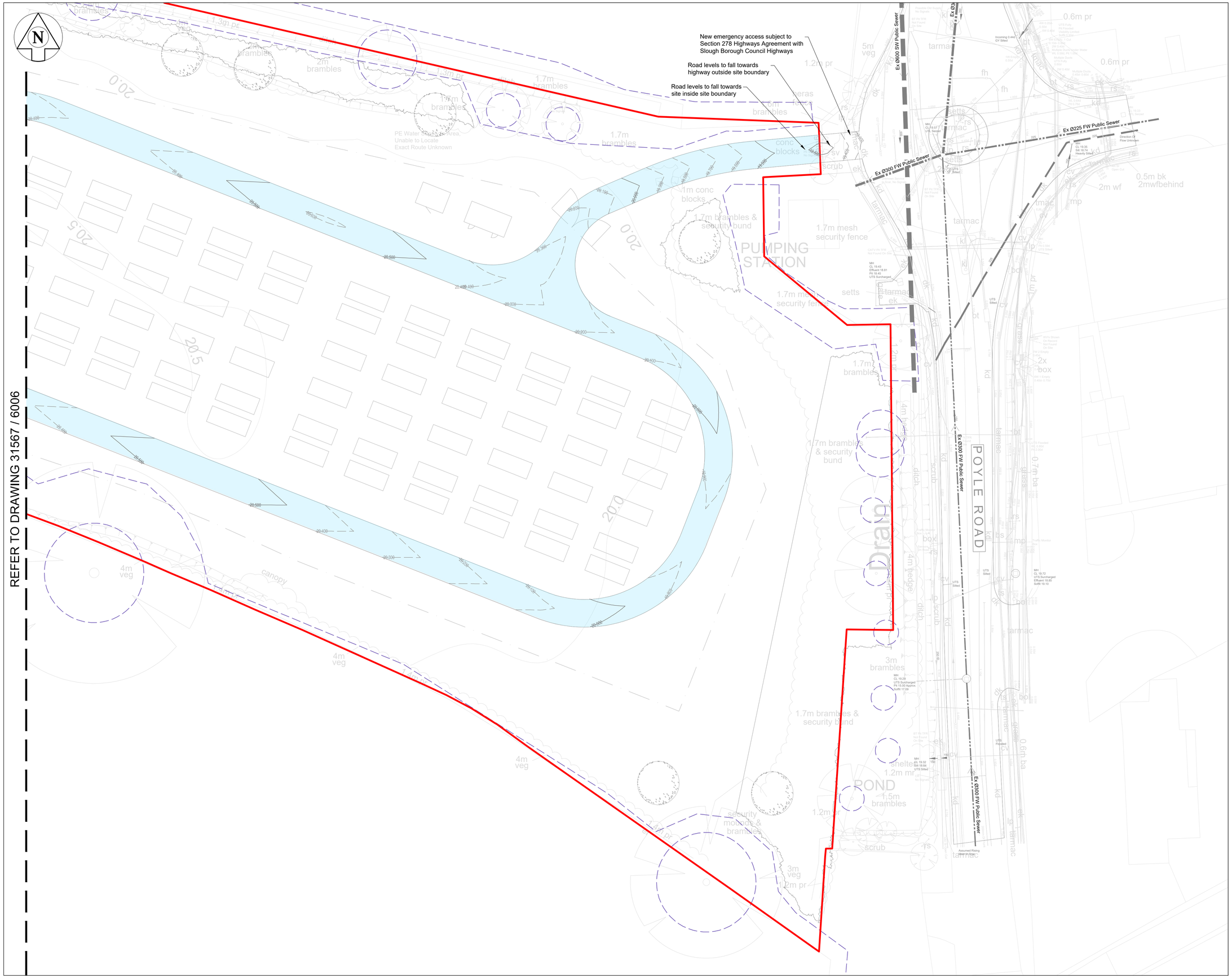

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DRAINAGE LEGEND

Site Boundary	
Existing Surface Water Drain	
Existing Foul Water Drain	
Existing Surface Water Sewer	
Existing Foul Water Sewer	
Tree Root Protection Zone	
Drainage to be Demolished	

DRAINAGE KEY

	Permeable Paving

ABBREVIATIONS

IL	- Invert Level
CL	- Cover Level
RA	- Above Ground Rodding Access
REIL	- Rodding Eye Invert Level
BDIL	- Backdrop Invert Level
FCMH	- Flow Control Manhole

Rev	Date	Drawn	Eng	Amendment
P02	20.11.24	SE	SRe	Issued for Planning
P01	01.11.24	SE	SRe	Issued for Information

MANOR FARM, POYLE ROAD

BELOW GROUND DRAINAGE LAYOUT

SHEET 7

Status
FOR PLANNING
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Drawing No		Rev	
31567 / 6007		P02	

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Rev	Date	Drawn	Eng	Amendment
P02	20.11.24	SE	SRe	Issued for Planning
P01	01.11.24	SE	SRe	Issued for Information

MANOR FARM, POYLE ROAD

SITE SECTIONS

KEY PLAN

Status
FOR PLANNING
NOT FOR CONSTRUCTION

Drawn	SE	Eng	SRe
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Drawing No		Rev	
31567 / 6150		P02	

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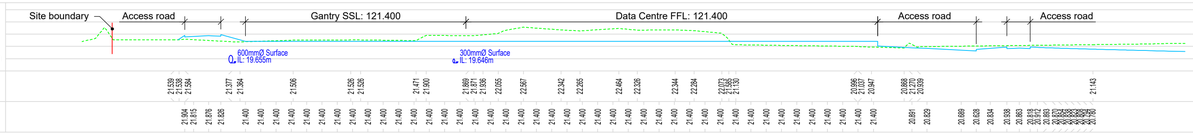
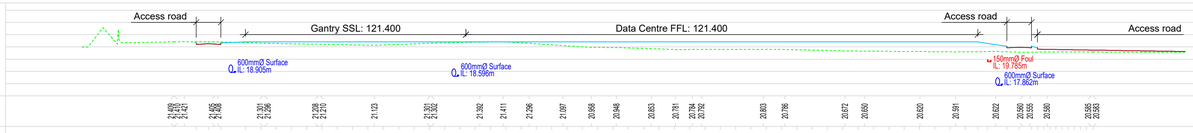
A-A

Datum: 19.000M AOD



B-B

Datum: 17.000M AOD



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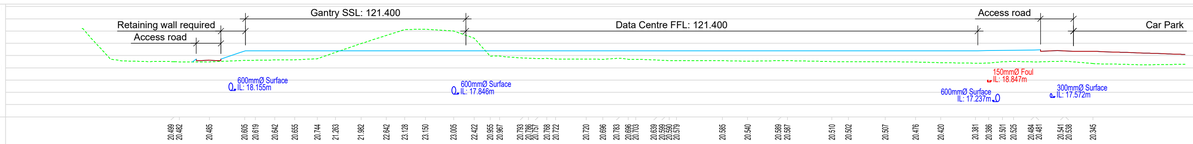

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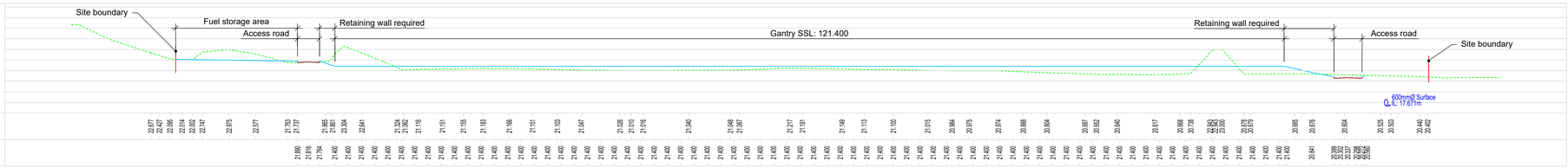

E-E

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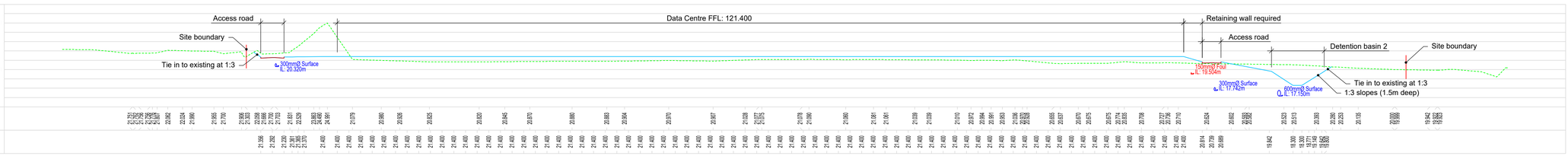

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KEY	
Existing Ground	
Proposed Ground	
Proposed Road	

Rev	Date	Drawn	Eng	Amendment
P02	20.11.24	SE	SRe	Issued for Planning
P01	01.11.24	SE	SRe	Issued for Information

MANOR FARM, POYLE ROAD

SITE SECTIONS

SHEET 1

Status
FOR PLANNING
NOT FOR CONSTRUCTION

Drawn	SE	Eng	SRe
Scales	H = 1:500 at A1		V = 1:250 at A1
Drawing No		Rev	
31567 / 6151		P02	

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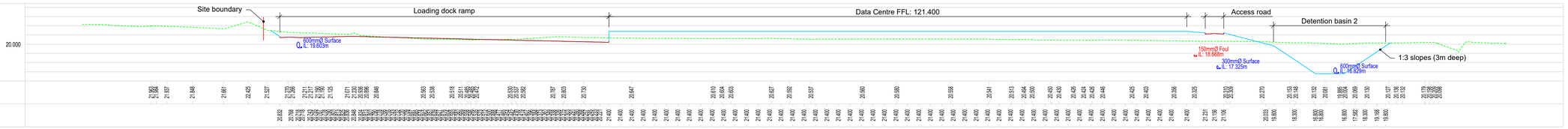
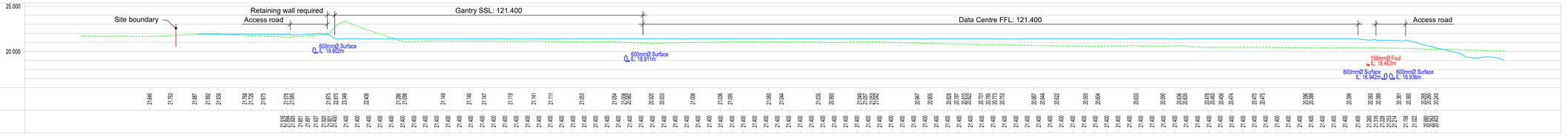
F-F



G-G



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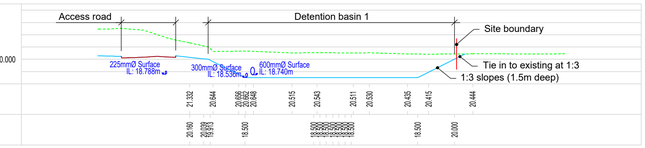

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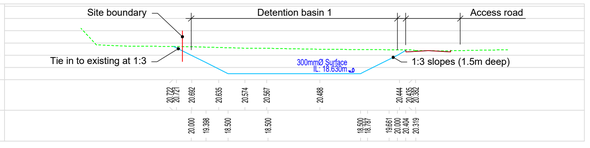

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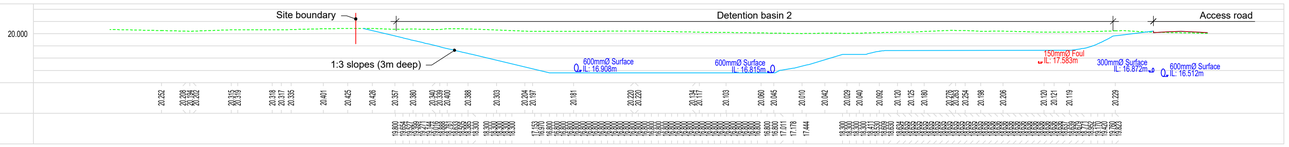
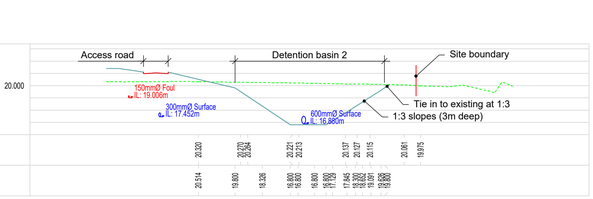
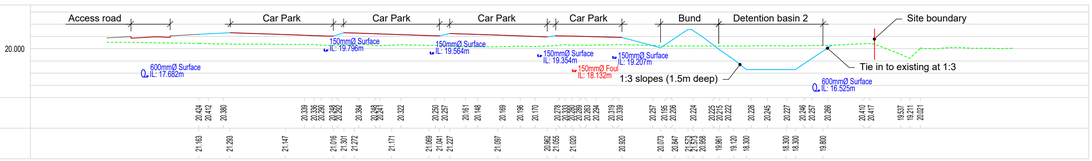


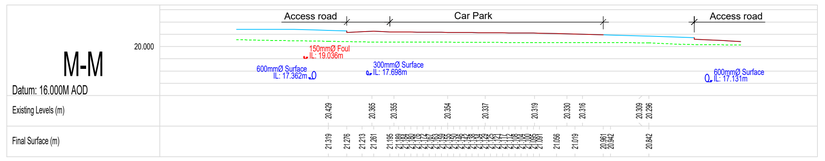
K-K



L-L



M-M



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3. Health & Safety :
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KEY
Existing Ground
Proposed Ground
Proposed Road

Rev	Date	Drawn	Eng	Amendment
P02	20.11.24	SE	SRe	Issued for Planning
P01	01.11.24	SE	SRe	Issued for Information

MANOR FARM,
POYLE ROAD

SITE SECTIONS

SHEET 2

Status
FOR PLANNING
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Drawing No		Rev	
31567 / 6152		P02	

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Appendix I

Existing & Proposed Impermeable Areas

Areas positively drains to the public sewer (approx. 1500m^2)

NOTES :

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3. Health & Safety :
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IMPERMEABLE AREAS

Hardstanding =	47,785m^2
Roofs =	2,842m^2
Total =	50,627m^2
Site Area =	86,621m^2
Site Impermeability =	58.45%

LEGEND

- Site Boundary
- Hardstanding
- Roofs

Rev	Date	Drawn	Eng	Amendment
P03	20.11.24	SE	SRe	Issued for Planning
P02	07.11.24	SE	SRe	Issued for Information
P01	01.11.24	SE	SRe	Issued for Information

MANOR FARM, POYLE ROAD

EXISTING IMPERMEABLE AREAS

Status
FOR PLANNING
NOT FOR CONSTRUCTION

Drawn	SE
Eng	SRe
Scales	1:1000 at A1 / 1:2000 at A3
Drawing No	31567 / 7010
Rev	P03

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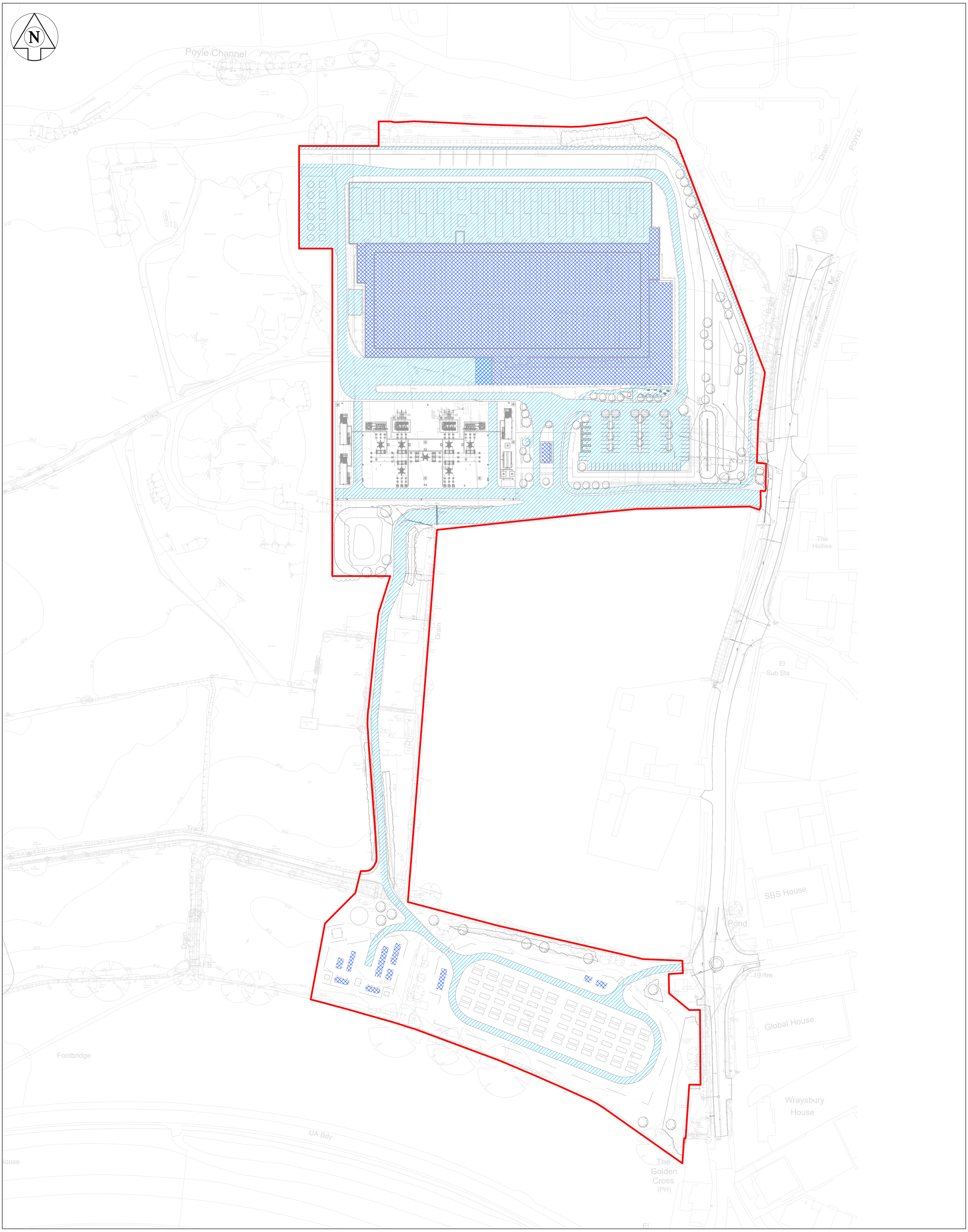

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IMPERMEABLE AREAS

Hardstanding =	22,142m^2
Roofs =	14,711m^2
Total =	36,617m^2
Site Area =	86,621m^2
Site Impermeability =	42.27%

LEGEND

- Site Boundary
- Hardstanding
- Roofs

Rev	Date	Drawn	Eng	Amendment
P03	20.11.24	SE	SRe	Issued for Planning
P02	07.11.24	SE	SRe	Issued for Information
P01	01.11.24	SE	SRe	Issued for Information

MANOR FARM, POYLE ROAD

PROPOSED IMPERMEABLE AREAS

Status
FOR PLANNING
NOT FOR CONSTRUCTION

Drawn	SE	Eng	SRe
Scales	1:1000 at A1		1:2000 at A3
Drawing No		Rev	
31567 / 7020		P03	

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Appendix J
SuDS Pro-Forma

Slough Borough Council Surface Water Drainage Pro-Forma

This pro-forma accompanies Slough Borough Council's developer guide. It should be completed for all **major** planning applications and submitted to the Local Planning Authority, referencing from where in their submission documents this information is taken. The pro-forma is supported by the Defra/EA guidance on Rainfall Runoff Management. Developers are encouraged to use the tools available at www.UKsuds.com when completing the pro-forma. The tools available at www.UKsuds.com helps developers to comply with the requirements of the National Planning Policy Framework and provides a quick tool for assessing storage requirements. The quick tool should only be used at the outline planning stage to assist with estimating indicative volumes. Detailed design, which must be carried out at the full planning application stage, will always require the use of suitable software to confirm or modify the storage proposals as well as address conveyance and the many other aspects of drainage design.

This pro-forma is based upon current industry standard practice (National Non-statutory Technical Standards, CIRIA SUDS Manual 697 and Site Construction Handbook CIRIA 698).

1. Site Details

Site	Manor Farm
Address & post code or LPA reference	Manor Farm, Poyle, Slough, SL3 0BL
Grid reference	TQ 02868 76149
Is the existing site developed or Greenfield?	Brownfield
Total Site Area served by drainage system (excluding open space) (Ha)*	0.333 ha (Total site area = 8.160 ha)
Topographical survey plan showing existing site layout, site levels and existing drainage system	31567 PM FRA & Drainage Strategy report Appendix A

* The Greenfield runoff off rate from the development which is to be used for assessing the requirements for limiting discharge flow rates and attenuation storage from a site should be calculated for the area that forms the drainage network for the site whatever size of site and type of drainage technique. Please refer to the Rainfall Runoff Management document or CIRIA manual for detail on this.

All page numbers refer to P&M document:
'31567 PM FRA & Drainage Strategy'

2. Impermeable Area

	Existing	Proposed	Difference (Proposed-Existing)	Location of evidence – document and page no	Notes for developers & Local Authorities
Impermeable area (ha) **(areas to be shown on a plan)**	50627m^2	36617m^2	-4010m^2	Appendix I	If the proposed amount of impermeable surface is greater, then runoff rates and volumes will increase. Section 6 must be filled in. If proposed impermeability is equal or less than existing, then section 6 can be skipped & section 7 filled in.
Drainage Method (infiltration/sewer/watercourse)	Sewer (1500m^2)	Sewer (33330m^2)	+31830m^2	Page 10, 22-24, 26, Appendix I	If different from the existing, please fill in section 3. If existing drainage is by infiltration and the proposed is not, discharge volumes may increase. Fill in section 6.

PPG Paragraph 080

3a. Proposing to discharge surface water via

	Yes	No	Evidence / Location of evidence – document and page no	Notes for developers & Local Authorities
Micro Drainage calculations of the existing and proposed drainage systems	X		Appendix G (Causeway Flow modelling)	Please provide Micro Drainage calculations of existing and proposed run-off rates and volumes in accordance with a recognised methodology or the results of a full infiltration test (see line below) if infiltration is proposed.
Infiltration	X	X	Pages 10, 15-18, 23-24*	e.g. soakage tests. Section 7 (infiltration) must be filled in if infiltration is proposed.
To watercourse		X	Page 23	e.g. Is there a watercourse nearby? Please provide details of any watercourse to which the site drains including cross-sections of any adjacent water courses for appropriate distance upstream and downstream of the discharge point (as agreed with the LLFA and/or EA)
To surface water sewer		X	Page 24	Confirmation from sewer provider that sufficient capacity exists for this connection.
Combination of above		X	Page 23-26	e.g. part infiltration part discharge to sewer or watercourse. Provide evidence above.

Parcel A is proposed to discharge to the sewer. Parcel B will continue to drain as per the existing greenfield condition*

3b. Additional drainage strategy information

	Yes	No	Evidence / Location of evidence – document and page no	Notes for developers & Local Authorities
Has the drainage proposal had regard to the SuDS hierarchy?	X		Pages 22-26	Evidence must be provided to demonstrate that the proposed Sustainable Drainage proposal has had regard to the SuDS hierarchy.
Drainage layout plan including; location of data collection points (eg infiltration points); sustainable drainage infrastructure; significant utility plant and trees; and drainage structures (proposed & existing)	X		Appendix H. Reference drawings 6000-6007	Please provide plan reference numbers for the site layout showing where the sustainable drainage infrastructure will be located on the site. If the development is to be constructed in phases this should be shown on a separate plan and confirmation should be provided that the sustainable drainage proposal for each phase can be constructed and can operate independently and is not reliant on any later phase of development.
Exceedance flow paths **(flow paths to be shown on a plan)**	X		Pages 27-29	

Technical Standards S2 and S3

4a. Peak Discharge Rates – Greenfield Sites – This is the maximum flow rate at which surface water runoff leaves the site during a particular storm event.

	Existing Rates (l/s)	Proposed Rates (l/s)	Difference (l/s) (Proposed-Existing)	Location of evidence – document and page no	Notes for developers & Local Authorities
Greenfield QBAR		N/A	N/A		Mean annual Greenfield peak flow - QBAR is approx. 1 in 2 storm events. Use that figure in Section 7a.
1 in 1					Proposed discharge rates (with mitigation) should be no greater than existing rates for all corresponding storm events. e.g. discharging all flow from site at the existing 1 in 100 event increases flood risk during smaller events.
1 in 30					
1in 100					
1 in 100 plus climate change	N/A				To mitigate for climate change the proposed 1 in 100 +CC must be no greater than the existing 1 in 100 runoff rate. If not, flood risk increases under climate change. 20% should be added to the peak rainfall intensity for commercial and 30% should be added for residential properties.

4b. Peak Discharge Rates – Brownfield Sites – This is the maximum flow rate at which surface water runoff leaves the site during a particular storm event. Proposed drainage need to be reduced as per the Local Policy.

	Existing Rates (l/s)	Proposed Rates (l/s)	Difference (l/s) Proposed % reduction	Location of evidence – document and page no	Notes for developers & Local Authorities
Drainage peak discharge rates	Q_1 = 12.86 Q_{30} = 30.22 Q_{100} = 38.23	Q_1 = 4.45 Q_{30} = 4.45 Q_{100} = 4.45	Q_1 = 65% Q_{30} = 85% Q_{100} = 88%	Page 22, 26, Appendix I	Existing peak discharge rate cannot be greater than the capacity of the receiving system. Actual % reductions will be subject to the characteristics of the catchment.

Technical Standards S4 to S9

The Q1 greenfield runoff rate equals to 1.335l/s/ha and this will be the limit for all storm events up to and including the 1:100+40% climate change. The hardstanding areas are subject to detailed design*

5. Calculate Discharge Volumes – The total volume of water leaving the development site for a particular rainfall event. Introducing new impermeable surfaces increases surface water runoff and may increase flood risk outside the development.

	Existing Rates (l/s)	Proposed Rates (l/s)	Difference (l/s) (Proposed-Existing)	Location of evidence – document and page no	Notes for developers & Local Authorities
Greenfield QBAR	5.24	N/A	N/A	Page 26, Appendix F	Proposed discharge volumes (without mitigation) should be no greater than existing volumes for all corresponding storm events. Any increase in volume increases flood risk elsewhere. Where volumes are increased section 6 must be filled in.
1 in 1	4.45	4.45*	0	Page 26, Appendix F	
1 in 30	12.05	4.45*	7.6	Page 26, Appendix F	
1in 100	16.72	4.45*	12.27	Page 26, Appendix F	
1 in 100 plus climate change	N/A	4.45*	N/A	Page 26, Appendix F	To mitigate for climate change the volume discharged from the site must be no greater than the existing 1 in 100 storm event. If not, flood risk increases under climate change.

6. Calculate attenuation storage – In order to minimise the negative impact on flood risk resulting from increased volumes of runoff from the proposed development, storage must be provided.

	Location of evidence – document and page no	Notes for developers & Local Authorities
Storage volume required to retain discharge rates as existing (m^3) $5280m^3$ attenuation storage required to accommodate the 1 in 100 year storm plus 40% allowance for climate change	Page 26, Appendix G, Appendix H	Volume of water to attenuate on site if discharging at existing rates. Can't be used where discharge volumes are increasing.
Where will the storage be provided on site? - Permeable paving (car parking areas, substation access road, Parcel B) - Rain gardens (eastern & western elevations of the data centre) - x2 detention basins	Page 24-26, Appendix H	

7a. How is Storm Water stored on site? – Storage is required for the additional volume from site but also for holding back water to slow down the rate from the site. This is known as attenuation storage and long term storage. The intention is to not discharge that volume into the watercourses so as not to increase flood risk elsewhere.

		Location of evidence – document and page no	Notes for developers & Local Authorities
Infiltration	**State the Site's Geology/drift material overlaying)**	Pages 7-9	Avoid infiltrating in made ground.
	Does the site have a high ground water table? Yes/No?	Yes. Pages 15-18, 23-24	If yes, please provide details of the site's hydrology.
	Is the site within a known Source Protection Zones (SPZ)? Yes/No?	No. Page 8	Refer to the Environment Agency website to identify source protection zones (SPZ). However the aquifers are multi-layered in Slough and local knowledge may prevail.
	Are infiltration rates suitable?	No in Parcel A. Yes in Parcel B. Page 23	Permeability tests (BRE 365) must be taken at the depth and location of significant infiltration features. Infiltration rates should be no lower than $1x10^{-6}$ m/s.
	Is the site contaminated? If yes, consider advice from others on whether infiltration can happen.	Yes. Page 23	Water should not be infiltrated through land that is contaminated. The Environment Agency may provide bespoke advice in planning consultations for contaminated sites that should be considered.

	State the distance between a proposed infiltration device base and the ground water (GW) level	N/A in Parcel A. Min 1m will be achieved in Parcel B - please see Figure 4.3 (Ramboll groundwater contour plot). Pages 15-18	Need 1metre (min) between the base of the infiltration device & the water table to protect Groundwater quality & ensure GW doesn't enter infiltration devices. Avoid infiltration where this isn't possible. If groundwater is found to be 1.5 metres from any significant drainage element, a log of groundwater levels must be provided for a suitable period of time (dependent on prevailing weather conditions/regional water levels).
	Were infiltration rates obtained by desk study or infiltration test?	Yes. Page 23, Appendix C	Infiltration rates MUST be obtained by infiltration tests in accordance with BRE365. Note, Thames Water will not allow the use of a back-up attenuation scheme that overflows via pipe into the surface water sewer.
	What factor of safety has been used?	N/A	State what factor of safety has been used, and whether it is adequate. Typically a factor >2 should be used increasing up to 10 on a sloping site where there is flood risk from exceedance.
Is infiltration feasible?	**Yes/No?**	No in Parcel A. Yes in Parcel B. Pages 15-18, 23-26	If infiltration is not feasible how will the additional volume be stored?. The applicant should then consider the following options in the next section.

7b. Storage requirements – Where infiltration is not possible, then the developer must confirm that either of the two options below will be implemented for dealing with the amount of water that needs to be stored on site.

Option 1 Simple – Store both the additional volume and attenuation volume in order to make a final discharge to the surface water sewer from site at **QBAR**. This is preferred if no infiltration can be made on site. This very simply satisfies the runoff rates and volume criteria.

Option 2 Complex – If some of the additional volume of water can be infiltrated back into the ground, the remainder can be discharged to the surface water sewer at a very low rate of 2 l/sec/hectare. A combined storage calculation using the partial permissible rate of 2 l/sec/hectare and the attenuation rate used to slow the runoff from site.

	Location of evidence – document and page no	**Notes for developers & Local Authorities**
Please confirm what option has been chosen and how much storage is required on site.	Option 1. 5280m^3 attenuation storage. Pages 24-26, Appendix G, Appendix H	The developer at this stage should understand the site characteristics and be able to explain what the storage requirements are on site and how it will be achieved.

8. SuDS for Roads – If SuDS for roads has been proposed, details of these SuDS elements should be specified.

	Location of evidence – document and page no	Notes for developers & Local Authorities
Which SuDS elements are used for road drainage?	N/A - private ownership	Has this proposal been agreed with the Highway Authority?
Will that part of the SuDS be adopted?	N/A - private ownership	Agree adoption requirement with the Highway Authority or detail maintenance agreement in Section 12.

9. Additional considerations to comply with the Technical Standards and PPG

	Evidence / Location of evidence – document and page no	Notes for developers & Local Authorities
Which SuDS elements have been used? **Are there alternative more suitable SuDS solutions for the site?**	Page 24-26, Appendix H	SuDS can be adapted for most situations even where infiltration isn't feasible e.g. impermeable liners beneath some SUDS devices allows treatment but not infiltration. See CIRIA SUDS Manual C753 or equivalent.
How will exceedance events be catered on site without increasing flood risks (both on site and outside the development)?	Pages 27-29	**Safely:** not causing property flooding or posing a hazard to site users i.e. no deeper than 300mm on roads/footpaths
How are rates being restricted?	Page 26	Hydrobrakes must not be used for flow rates lower than 5 l/s. Pipes with flows < 5 l/s are prone to blockage.
Drainage during construction period	Page 30-34	Provide details of how drainage will be managed during the construction period including any necessary connections, impacts, diversions, erosion control, and what measures will be put in place to prevent pollution.
Key Drainage components / Features and Consequences	Pages 27-29	Which component if blocked (even partial) will lead to flooding and how will that be managed? Where will the exceedance flows go?
Level of treatments provided if required	Pages 30-31	Depending on diffuse pollution risk from the proposed sites, adequate level of treatment is required to mitigate against pollution

Technical Standards S10 to S12

10. Management and Maintenance of SuDS – Details are required to be provided of the management and maintenance plan for the SuDS, including for the individual plots in perpetuity.

	Evidence / Location of evidence – document and page no	**Notes for developers & Local Authorities**
How is the entire drainage system to be maintained in perpetuity? **Please provide Maintenance Plan and Regime for the site.** **Include how maintenance is to be recorded.**	Pages 32-34	Clear details of the maintenance proposals of all elements of the proposed drainage system must be provided to show that all parts of SuDS are effective and robust. Provide a management plan to describe the SuDS scheme and set out the management objectives for the site. It should consider how the SuDS will perform and develop over time anticipating any additional maintenance tasks to ensure the system continues to perform as designed. — Specification notes that describe how work is to be undertaken and the materials to be used. — A maintenance schedule describes what work is to be done and when it is to be done using frequency and performance requirements as appropriate. — A site plan showing maintenance areas, control points and outfalls. Responsibility for the management and maintenance of each element of the SuDS scheme will also need to be detailed within the Management Plan. Where open water is involved please provide a health and safety plan within the management plan. A proposed method for recording maintenance activities must also be produced.
Please confirm the owners/adopters of the entire drainage systems throughout the development. Please list all the owners.	Pages 4, 32-34	If these are multiple owners then a drawing illustrating exactly what features will be within each owner's remit must be submitted with this Pro-forma. Please give details of each feature and how it will be managed in accordance with the details in the management plan.
Please provide details demonstrating that any third party agreements required using land outside the application site have been secured.	N/A	

The above form should be completed using evidence from information which should be appended to this form. The information being submitted should be proportionate to the site conditions, flood risks and magnitude of development. It should serve as a summary of the drainage proposals and should clearly show that the proposed discharge rate and volume as a result of development will not be increasing. Where there is an increase in discharge rate or volume, then the relevant section of this form must be completed with clear evidence demonstrating how the requirements will be met.

This form is completed using factual information and can be used as a summary of the surface water drainage strategy on this site.

Form completed by: Steffan Rees

Qualification of person responsible for signing off this pro-forma: Civil Engineer - MEng

Company: Price & Myers

On behalf of (client's details): Manor Farm Propco Limited

Date: 20.11.24