



UNIVERSITY OF
CAMBRIDGE

North West Cambridge

Future Phases of Eddington

March 2026



**Flood Risk Assessment and
Surface Water Drainage Strategy**

Flood Risk Assessment and Surface Water Drainage Strategy

North West Cambridge Masterplan

The University of Cambridge

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Glossary

Acronym	Description
AEP	Annual Probability of Exceedance
AOD	Above Ordnance Datum
BGS	British Geological Survey
EA	Environment Agency
FRA	Flood Risk Assessment
LLFA	Lead Local Flood Authority (i.e. LBBD)
m	metres
ha	hectare
mAOD	meter Above Ordnance Datum
LPA	Local Planning Authority
NPPF	National Planning Policy Framework
PPG	Planning Practice Guidance
SFRA	Strategic Flood Risk Assessment
SoP	Standard of Protection
SPZ	Source Protection Zones
SuDS	Sustainable (urban) Drainage System
SWMP	Surface Water Management Plan
FAS	Flood Alleviation Scheme
NWCM	North West Cambridge Masterplan
SWDS	Surface Water Drainage Strategy
OPA	Outline Planning Application
OPP	Outline Planning Permission
SPD	Supplementary Planning Document
REFH	Revitalised Flood Hydrograph method
PIMP	Percentage Impermeable

1. Executive Summary

This Flood Risk Assessment (FRA) has been prepared in accordance with the National Planning Policy Framework (NPPF), the accompanying Planning Practice Guidance including relevant planning policies. The FRA has assessed the Site in terms of topography, geology, hydrogeology and climate change by reviewing the available information and aims to identify the potential sources of flooding and how residual flood risk will be managed without causing flood risk elsewhere. The report has been updated to address comments raised by the Lead Local Flood Authority (LLFA) and the Environment Agency (EA) on the September 2025 assessment. Section 3.6, 5, 6.1, 6.2, 7.2.2 and 8 have been updated to address the comments in line with the responses discussed with the LLFA and the EA in November 2025 and January 2026 respectively. Copy of the presentation slides from the meeting and responses are included within Appendix H and M of this report.

The Site is predominantly within Flood Zone 1 with the north-west corner located partly in Flood Zone 2 and a small area adjacent to the Washpit Brook within Flood Zone 3. All residential units will be located within Flood Zone 1. The Site is classified as 'More Vulnerable' and as such the Exception Test is not required. Climate change impacts have been accounted for using the latest Environment Agency allowances, including a 40% uplift in rainfall intensity and 9% in river flow.

As part of the original consented scheme (2013), the Proposed Development was deemed to cause a potential increased risk of fluvial flooding to the downstream village of Girton. To address this, a Flood Alleviation Scheme (FAS) was designed and implemented during Phase 1 of the development. The FAS comprises a two-stage channel and flow control structure, which runs parallel to the existing watercourse, the Washpit Brook, within the Site and provides additional online storage during peak flows. This arrangement successfully reduces the volume of water passed downstream and mitigates flood risk both to and from the Site. The fluvial hydraulic modelling has been updated since to incorporate higher climate change allowances and ReFH2 rainfall-runoff method and the results confirm that the FAS continues to provide effective protection and ensures that the completed development in its entirety does not increase flood risk.

Other sources of flood risk have also been assessed. Surface water flood risk is concentrated in low-lying areas near the Washpit Brook; however, it will be managed through sustainable drainage systems (SuDS) in line with best practice and Environment Agency guidance. Groundwater flood risk is considered low, with some potential in localised areas that will be addressed through appropriate design measures. The Site is considered to be at low risk of sewer flooding. The Site is located outside the extent of potential reservoir flooding.

The SWDS proposes Sustainable Drainage Systems (SuDS) in line with the original consented scheme, maintaining the principle of discharging to the Washpit Brook at greenfield runoff rates. Surface water runoff from individual plots will be attenuated and restricted to greenfield runoff rates before discharging into the sitewide drainage network. Surface water attenuation will be provided on-plot and across the sitewide drainage network to limit the surface water run-off up to 1 in 100-year storm event plus 40% climate change allowance. Design parameters have been developed in consultation with the LLFA and are based on FEH rainfall data. Pollution control will be delivered through two stages of treatment using SuDS features or proprietary petrol interceptors. The LLFA has confirmed agreement in principle with the proposed strategy.

2. Introduction

AECOM has been commissioned by The University of Cambridge (“the Applicant”) to prepare a site-specific Flood Risk Assessment (“FRA”) and a Surface Water Drainage Strategy (“SWDS”) to support the Outline Planning Application (“OPA”) for the North West Cambridge Masterplan (“NWCM”) for a phased mixed-use development, including demolition of existing buildings and structures. Outline Planning Permission for Eddington was originally granted (application references 11/1114/OUT and S/1886/11) in February 2013 for a residential led mixed use development, and approximately 1,848 residential units (key workers and market homes) and 325 student accommodation units have been approved/delivered as part of the Phase 1 development under the original consented scheme. The ability to bring forward further residential dwellings under the original Outline Planning Permission (“OPP”), through Reserved Matters Applications, expired in 2023. As a result, the Applicant is seeking OPP for the future phases of the North West Cambridge Masterplan.

This FRA has assessed the Site in terms of topography, geology, hydrology and climate change by reviewing available information and aims to identify potential sources of flooding to and from the proposed development and how residual flood risk will be managed without causing flooding elsewhere.

3. Site Description

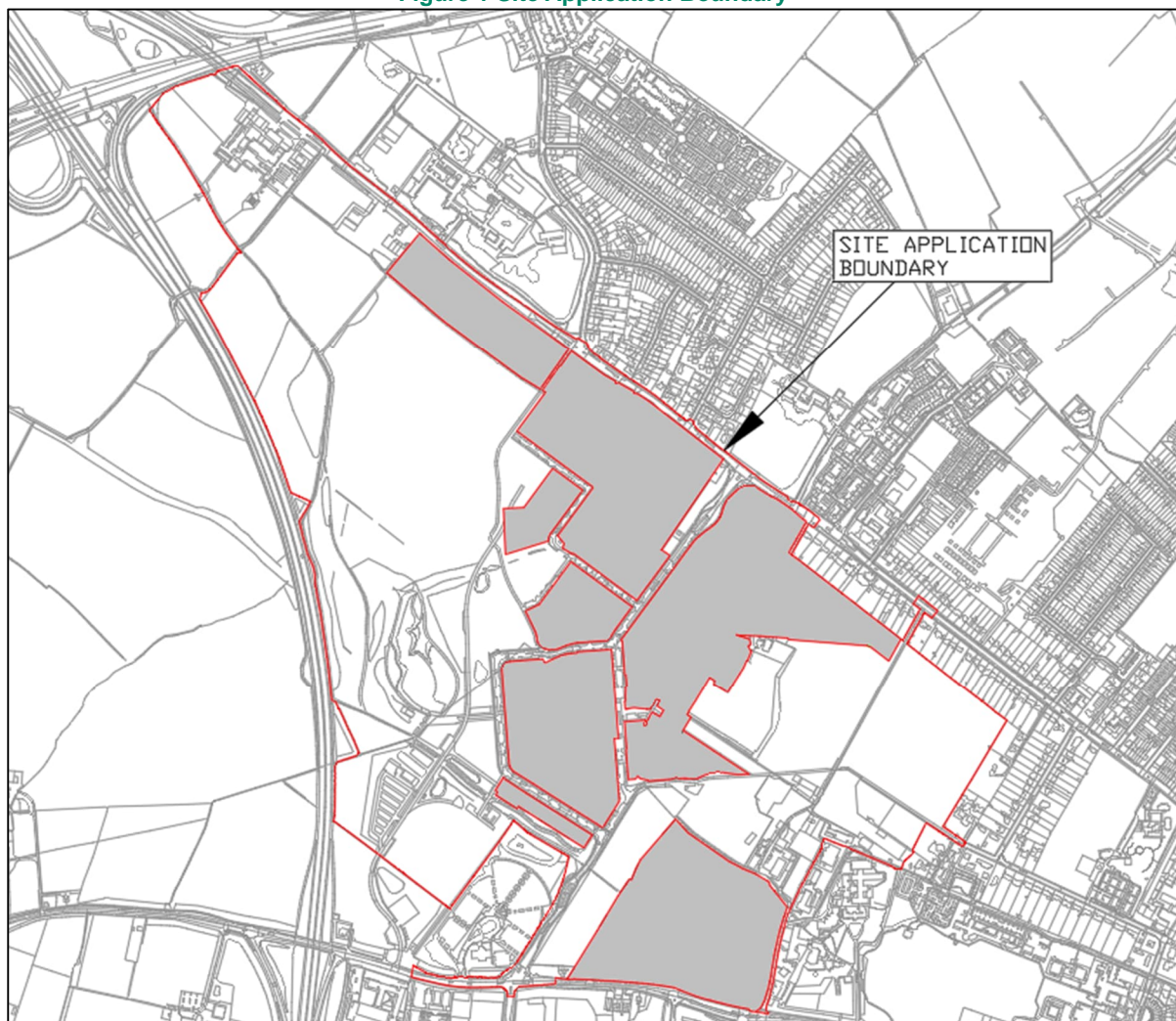
3.1 Site Location

The Site is located at Eddington on the north-western edge of the City of Cambridge, to the south and west of the village of Girton. The Site is bound by:

- a small portion of the A14 to the north, and Girton College, residential properties and agricultural fields which front onto Huntingdon Road (A1307) to the north and north-east;
- residential properties located along Huntingdon Road, Ascension Parish Burial Ground, Trinity Hall (University of Cambridge student accommodation) and Trinity Hall sports grounds to the east of the Site;
- Madingley Road Park and Ride, Madingley Road (A1303), and residential properties and buildings associated with the University of Cambridge to the south; and
- the M11 motorway to the west, beyond which lies agricultural fields.

Cambridge City Centre is located approximately 2km to the south-east of the Site at its nearest point. The Site forms part of the emerging settlement of Eddington. The total Site area is approximately 114 hectares (ha), with the red line boundary extent shown in Figure 1. Areas shown in grey hatch are excluded from the application as they are existing built development, and no material changes are proposed as part of this application.

Figure 1 Site Application Boundary



3.2 Topography

A site-specific topographical survey was initially carried out in August 2012 by Survey Operations (Drawing Ref: 12F126). This was subsequently updated in May 2017 by ASC (Surveys) Limited (Drawing Ref: ASC.17.283) to more accurately reflect existing Site levels and to capture localised spoil heaps across the Site. The two surveys have been combined into a single drawing, which is included in **Appendix A** of this report.

The topography of the development, located west of Phase 1 shows levels ranging from approximately 21m AOD at the eastern end to around 12m AOD along Brook Leys. There are localized spoil heaps with elevations reaching 30mAOD which do not cause blockages at the Site as it maintains to have a general fall towards Brook Leys – these spoil heaps are temporary in nature and will be removed as part of any future development. Levels on the eastern side of Phase 1 have high points around the central area of approximately 25.5mAOD and fall towards both the west and east, reaching low points of approximately 21m AOD on either side.

3.3 Proposed Development

The proposed development will comprise of:

- Living Uses, comprising residential floorspace (Class C3/C4, up to 3,800 dwellings), student accommodation (Sui Generis), Co-living (Sui Generis) and Senior Living (Class C2);
- Flexible Employment Floorspace (Class E(g) / Sui Generis research uses);
- Academic Floorspace (Class F1); and

- Floorspace for supporting retail, nursery, health and indoor sports and recreation uses (Class E (a) – E (f)).
- Public open space, public realm, sports facilities, amenity space, outdoor play, allotments and hard and soft landscaping works alongside supporting facilities;
- Car and cycle parking, formation of new pedestrian, cyclist and vehicular accesses and means of access and circulation routes within the Site;
- Highway works;
- Site clearance, preparation and enabling works;
- Supporting infrastructure, plant, drainage, utilities, earthworks and engineering works.

The illustrative masterplan of the proposed development can be found in an **Appendix B** of the report.

3.4 Geology

The British Geological Survey (BGS) holds mapping of geology across the UK. The mapping indicates the vast majority of the Site to be underlain by a bedrock of Gault Formation – Mudstone with a small portion located on the southeast side of the Site to be underlain by West Melbury Marly Chalk Formation – Chalk (see Figure 2). BGS map also shows the parts of the Site to be overlaid by superficial Head deposits – clay, silt sand and gravel, with River Terrace Deposits present east of the Site (see Figure 3).

Figure 2 Bedrock Geology

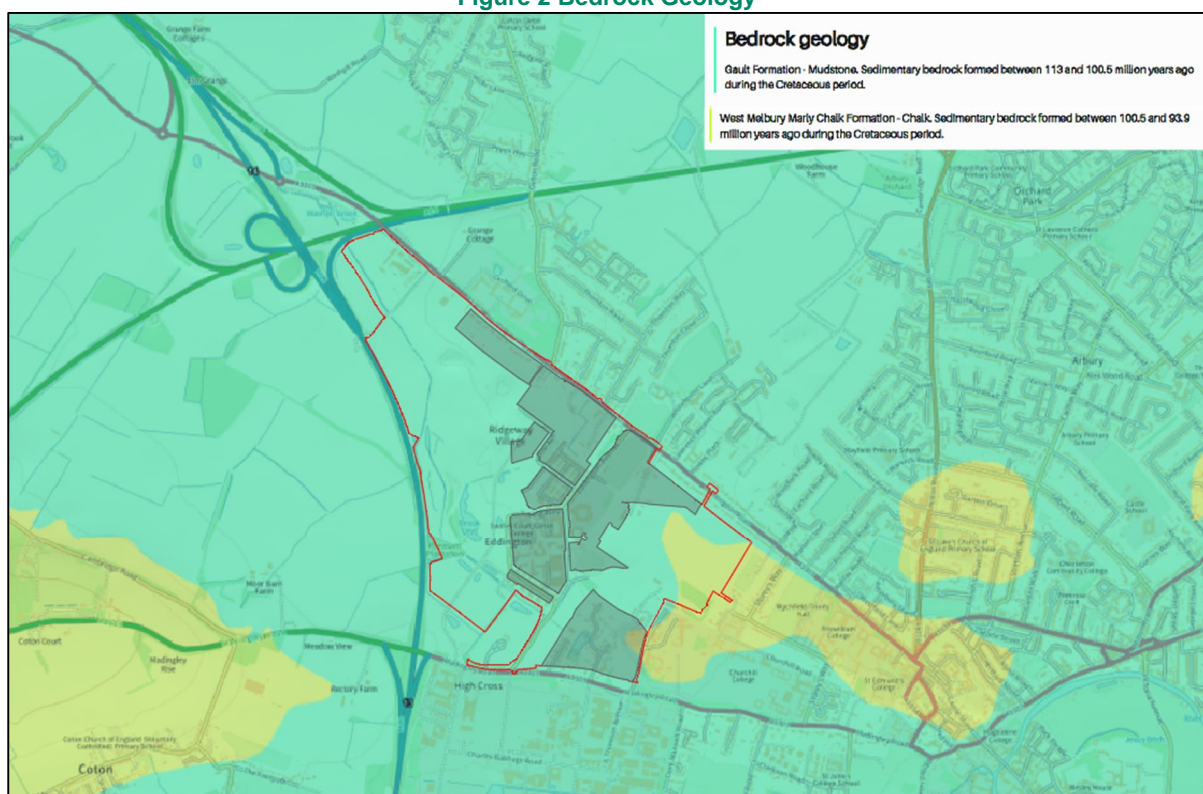
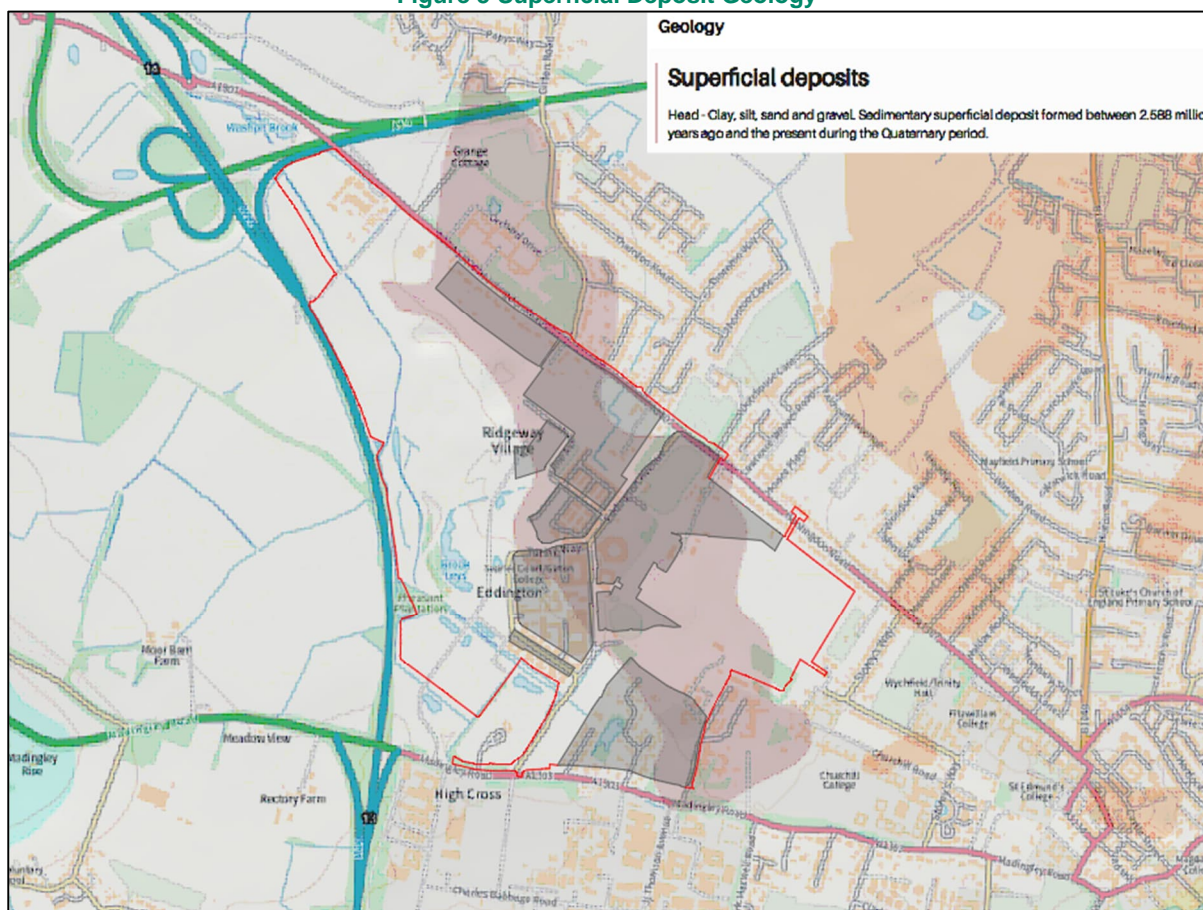


Figure 3 Superficial Deposit Geology



3.5 Hydrogeology

Groundwater used for drinking water is protected by the Environment Agency (EA). The EA classifies zones known as Source Protection Zones (SPZ) around potable groundwater abstraction points, designed to limit potentially polluting activities. The EA website shows that the Site does not overlay an SPZ.

The Head superficial deposits are classified as Secondary (undifferentiated) aquifers and the River Terrace Deposits located to the east of the Site are classified as Secondary A aquifers. The Gault Formation bedrock present is classified as an unproductive aquifer, while the West Melbury Chalk Formation is classified as a Principal aquifer.

The EA groundwater vulnerability maps show the vulnerability of groundwater to a pollution discharged at ground level based on hydrological, geological, hydrogeological and soil properties within a one-kilometre square grid. The EA classifies the areas into five risk categories; High, Medium-High, Medium, Medium-Low and Low which is based on the likelihood of a pollutant reaching the groundwater (i.e., vulnerability), the type of aquifers present, and the potential impact (i.e., the aquifer designation). The EA groundwater vulnerability map indicates eastern extent of the Site in an area of Medium – Low risk whilst the southwestern extent of the Site is in an area of Medium - High risk with soluble rock risk.

3.6 Hydrology

The Washpit Brook is the closest watercourse to the Site which runs through the Site from southeast to the northwest. It flows adjacent to the M11 motorway on the western boundary of the Site and through the northwestern corner of Girton. The extent of the Brook that runs across the Site is classed as ordinary watercourse with downstream section of the brook beyond the Site classed as an EA main river. Towards the upstream limit of the Washpit Brook, there is no single fixed channel, but a number of small field drains and/or local water bodies that eventually form the Washpit Brook.

As part of the Phase 1 works, a flood alleviation scheme comprising of two-stage channel structure running parallel to the Washpit Brook, approved under the original consented scheme, has been implemented within the Site to ensure the completed development in its entirety does not result in increased flooding. The scheme includes a flow control structure (a weir and a low flow pipe) and a two-stage channel upstream of the flow control structure to store excess floodwater during peak flow events. The two-stage channel falls towards a low flow channel along the undeveloped northern sections of Brook Leys to allow drainage of any stored floodwater back to the Washpit Brook.

3.7 Public Sewers

Anglian Water sewer record plans which can be found in an **Appendix C** of the report indicate that there are two separate foul drainage networks that fall in an easterly and westerly direction from the high point, which are situated adjacent to the Reston property on the west side of the Girton Road/Huntingdon Road junction. This existing sewer is formed using vitrified clay pipes with a diameter of 9". A 1200mm diameter foul trunk sewer is situated to the southeast of the Site, which accommodates the discharge from the 300mm diameter sewers situated below Madingley Road and Huntingdon Road. The existing drainage on the Site exists as part of the constructed Phase 1 works. The foul water drainage from previously constructed Phase 1 development drains to the publicly owned 1200mm foul trunk sewer in Madingley Road via an onsite foul pumping station. A copy of the Phase 1 onsite drainage can be found in **Appendix D**.

4. Planning Policy

The planning policies and guidance that are relevant to the proposed development with regard to flood risk and surface water management are outlined below.

4.1 National Policy and Relevant Legislation

- The 2024 revised National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance (PPG).
- Environment Agency Standing Advice.
- Environmental Planning Guidance: Flood Risk Assessments: Climate Change Allowances 2022.
- The Flood and Water Management Act 2010.
- Flood Risk Regulations 2009.

4.2 Regional Planning Policy

- Cam and Ely Ouse Management Catchment.
- Sustainable Design and Construction, Supplementary Planning Guidance (2014).

4.3 Local Planning Policy

- Cambridge Local Plan 2018
- South Cambridgeshire Local Plan 2018
- Cambridgeshire County Council Surface Water Management Plan
- Greater Cambridge Integrated Water Management Study Strategic Flood Risk Assessment I (July 2021).
- Cambridgeshire Flood Risk Management Strategy

4.4 Planning Policy Summary

Based on the above policies, the key requirements in relation to the flood risk assessment for the proposed development are considered to be as follows:

- National Planning Policy Framework (December 2024): “A site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.”
- Environment Agency Standing Advice: “The surface water management needs to meet requirements set out in either your local authority’s Surface Water Management Plan (SWMP), Strategic Flood Risk Assessment (SFRA), SuDS guidance, Local flood risk management strategy and Building Regulations Part H. The emergency escape plans for any parts of a building that are below the estimated flood level is required”.
- Flood risk assessments: climate change allowances 2022: “This guidance is for developers and their agents preparing flood risk assessments for planning applications and development consent orders for nationally significant infrastructure projects. Climate change allowances are predictions of anticipated change for: peak river flow, peak rainfall intensity, sea level rise & offshore wind speed and extreme wave height. To increase resilience to flooding and coastal change, you should make allowances for climate change in your flood risk assessment. Increased rainfall affects surface water flood risk and how you need to design drainage systems.”
- The Cambridge Local Plan 2018 Policy 31: “Integrated water management and the water cycle. Development will be permitted provided that: surface water is managed close to its source and on the surface where reasonably practicable to do so; priority is given to the use of nature services; water is seen as a resource and is re-used where practicable, offsetting potable water demand, and that a water sensitive approach is taken to the design of the development; the features that manage surface water are commensurate with the design of the development in terms of size, form and materials and make an active contribution to making places for people; surface water management features are multi-functional wherever possible in their land use; any flat roof is a green or brown roof, providing that it is acceptable in terms of its context in the historic environment of Cambridge (see Policy 61: Conservation and Enhancement of Cambridge’s Historic Environment) and the structural capacity of the roof if it is a refurbishment. Green or brown roofs should be widely used in large-scale new communities; there is no discharge from the developed site for rainfall depths up to 5 mm of any rainfall event; the run-off from all hard surfaces shall receive an appropriate level of treatment in accordance with Sustainable Drainage Systems guidelines, SUDS Manual (CIRIA C753), to minimise the risk of pollution; development adjacent to a water body actively seeks to enhance the water body in terms of its hydro morphology, biodiversity potential and setting; watercourses are not culverted and any opportunity to remove culverts is taken; and all hard surfaces are permeable surfaces where reasonably practicable, and having regard to groundwater protection.
- The Cambridge Local Plan 2018 Policy 32 Flood risk: “ Potential flood risk from the development. Development will be permitted providing it is demonstrated that: the peak rate of run-off over the lifetime of the development, allowing for climate change, is no greater for the developed site than it was for the undeveloped site; the post-development volume of run-off, allowing for climate change over the development lifetime, is no greater than it would have been for the undeveloped site. If this cannot be achieved then the limiting discharge is 2 litre/s/ha for all events up to the 100-year return period event; the development is designed so that the flooding of property in and adjacent to the development would not occur for a 1 in 100 year event, plus an allowance for climate change and in the event of local drainage system failure; the discharge locations have the capacity to receive all foul and surface water flows from the development, including discharge by infiltration, into water bodies and into sewers; there is a management and maintenance plan for the lifetime of the development, which shall include the arrangements for adoption by any public authority or statutory undertaker and any other arrangements to secure the operation of the scheme throughout its lifetime; and the destination of the discharge obeys the following priority order: firstly, to ground via infiltration; then, to a water body; then, to a surface water sewer. Discharge to a foul water or combined sewer is unacceptable.

- South Cambridgeshire Local Plan 2018 Policy CC/9 Managing Flood Risk. “In order to minimise flood risk, development will only be permitted where a) the sequential and exception tests established by the National Planning Policy Framework demonstrate the development is acceptable; b) floor levels are 300mm above the 1 in 100 year flood level plus an allowance for climate change where appropriate and where appropriate and practicable also 30mm above adjacent highway levels; c) suitable flood prevention / mitigation measures are incorporated as appropriate to the level and nature of flood risk, which can be satisfactorily implemented to ensure safe occupation, access and egress. Management and maintenance plans will be required, including arrangements for adoption by any public authority or statutory undertaker and any other arrangement to secure the operation of the scheme throughout its lifetime; d) there would be no increase to flood risk elsewhere and opportunities to reduce flood risk elsewhere have been explored and taken (where appropriate) including limiting discharge of surface water (post development volume and peak rate) to natural greenfield rates or lower, and 3) the destination of the discharge obeys the following priority order: firstly to the ground via infiltration, then to a water body, then to a surface water sewer, discharge to a foul water or combined sewer is unacceptable. Site specific Flood Risk Assessments (FRAs) appropriate to the scale and nature of the development and the risks involved and which takes account of future climate change will be required for the following, f) development proposals over 1ha in size; h) any other development proposals in flood zones 2 and 3; any other development proposals in flood zone 1 where evidence, in particular the Strategic Flood Risk Assessment or Surface Water Management Plans, indicates there are records of historic flooding or other sources of flooding, and / or a need for more detailed analysis. FRAs will need to meet national standards and local guidance (including recommendations of the South Cambridgeshire and Cambridge City Strategic Flood Risk Assessment (2010) and the Phase 1 and 2 Water Cycle Strategy or successor documents).
- The Greater Cambridge Integrated Water Management Study Level 1 Strategic Flood Risk Assessment (July 2021): “ Site-specific flood risk assessments (FRAs) are carried out by or on behalf of developers to assess the flood risk to and from a proposed development site from all sources. These assessments are submitted with planning applications and must demonstrate how flood risk will be managed over the development’s lifetime, taking into account climate change and the vulnerability of users. FRAs are required for any development proposals that meet the following criteria: all new developments, including minor developments and changes of use, in Flood Zones 2 and 3; proposals of 1 hectare or greater in Flood Zone 1; proposals of less than 1 hectare in Flood Zone 1 where there is a change of use to a more vulnerable class, or where the development could be affected by sources of flooding other than rivers and the sea (such as surface water); and proposals of less than 1 hectare in Flood Zone 1 located in areas with a critical drainage problem, as identified by the Local Planning Authority in consultation with the Environment Agency. Site-specific FRAs may also be required in the following situations: if the site may be at risk from the breach of a local flood defence, even if it is in Flood Zone 1; where the site is intended to discharge surface water runoff into the catchment or assets of a Risk Management Authority requiring an FRA; where the site could impact an Internal Drainage Board system; where the Local Planning Authority is aware of evidence of historical or recent flood events; or where the site is located in an area with significant surface water flood risk. All site-specific FRAs must adhere to the guidelines set out in the National Planning Policy Framework (NPPF), Planning Practice Guidance (PPG), Environment Agency, and Risk Management Authority guidance, including the Cambridgeshire Flood and Water Supplementary Planning Document (SPD). This guidance outlines a flood risk management hierarchy that focuses on assessing, avoiding, substituting, controlling, and mitigating flood risk.”
- The Greater Cambridge Integrated Water Management Study Level 1 Strategic Flood Risk Assessment (July 2021): “The development must provide wider sustainability benefits to the community that outweigh the flood risk. Additionally, the development must ensure safety for its lifetime, taking into account the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, should aim to reduce flood risk overall.”

5. Sequential Test

The NPPF aims to ensure that flood risk is considered at all stages of the planning process. To avoid inappropriate development in areas at risk of flooding and to direct development away from areas of highest risk, the Sequential Test encourages Local Planning Authorities (LPAs) to steer development to areas of lowest flood risk on a borough/district-wide level and only develop in flood risk areas where necessary.

The LPA should apply the Sequential Test based on the information presented in their Strategic Flood Risk Assessment (SFRA). According to the National Planning Policy Framework (NPPF) and its associated Flood Risk and Coastal Change Planning Practice Guidance, the proposed Site has a vulnerability classification of “More vulnerable” classification as it mainly comprises of residential units and non-residential spaces for health services, nurseries and educational establishments. The vast majority of the Site is located within Flood Zone 1 with only a small area in the northwest corner shown to be within Flood Zone 2 and 3. The Flood Zone 2 extent encroaches slightly into one of the proposed non-residential buildings, with use class “Less Vulnerable” and foul pumping station, with use class “Water compatible” which are deemed appropriate for development within Flood Zone 2. The Flood Zone 3 extent is immediately adjacent to the Washpit Brook and is to remain as open space similar to existing with existing levels retained. All residential units will be located within Flood Zone 1. Based on the Vulnerability and Flood Zone Compatibility shown in Figure 4, the proposed use of the Site is appropriate within this flood zone and an Exception Test is deemed not required. The Site is already consented for residential development via the extant planning permission.

Figure 4 Flood Risk Vulnerability and Flood Zone Compatibility

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	x	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	x	x	x

(Source: Ministry of Housing, Communities & Local Government (2022): Planning Practice Guidance: <https://www.gov.uk/government/collections/planning-practice-guidance>)

5.1 Climate Change

The “Flood Risk Assessments: Climate Change Allowances Guidance” published in February 2016 (updated in May 2022) by the EA indicates that climate change is currently expected to result in increased peak rainfall and rising sea levels.

According to the Environment Agency’s climate change guidance, a minimum design lifetime of 100 years should be assumed for residential developments. The proposed development comprises of residential units and therefore, assumed to have a minimum lifetime of 100 years. As the proposed development has a lifetime beyond 2100, climate change allowances for peak rainfall intensity should be used for both the 1% and 3.3% annual exceedance probability events for the 2070s epoch (2061 to 2125). The development should be designed so that for the upper end allowance in the 1% annual exceedance probability event:

- there is no increase in flood risk elsewhere
- the development will be safe from surface water flooding

Therefore, according to this latest guidance, the upper end allowances of 40% have been assessed.

Table 1 and Table 2 show anticipated changes in peak rainfall intensity within Cam and Ely Ouse Management Catchment where the Site falls within.

Table 1 Cam and Ely Ouse Management Catchment Peak Rainfall Allowances - 3.3% annual exceedance rainfall event

Cam and Ely Ouse Management Catchment peak rainfall allowances category	Total potential change anticipated for '2050s (2022 to 2060)'	Total potential change anticipated for '2070s (2061 to 2125)'
Upper End Allowance	35%	35%
Central Allowance	20%	20%

Source: Government Website [Climate change allowances for peak rainfall \(data.gov.uk\)](https://www.gov.uk/government/collections/climate-change-allowances-for-peak-rainfall)

Table 2 Cam and Ely Ouse Management Catchment Peak Rainfall Allowances - 1% annual exceedance rainfall event

Cam and Ely Ouse Management Catchment peak rainfall allowances category	Total potential change anticipated for '2050s (2022 to 2060)'	Total potential change anticipated for '2070s (2061 to 2125)'
Upper End Allowance	40%	40%
Central Allowance	20%	25%

Source: Government Website [Climate change allowances for peak rainfall \(data.gov.uk\)](https://www.gov.uk/government/collections/climate-change-allowances-for-peak-rainfall)

Table 3 presents the anticipated changes in peak river flow for the Cam and Ely Ouse Management Catchment. The river flow allowance is determined based on both the Flood Zone classification and the vulnerability category of the proposed development. The Site is primarily located within Flood Zone 1, with a small portion in Flood Zone 2. As the proposed development falls within both zones and is classified as "More Vulnerable," the central allowance is applied in accordance with the guidance. Given that the development's lifespan extends beyond 2100, the 2080s epoch is the most relevant for assessment. Consequently, the appropriate peak river flow allowance is 9%.

Table 3 Cam and Ely Ouse Management Catchment Peak River Flow Allowance

Cam and Ely Ouse Management Catchment peak river flow allowance category	Total potential change anticipated for '2020s'	Total potential change anticipated for '2050s'	Total potential change anticipated for '2080s'
Upper End Allowance	21%	22%	45%
Higher Central Allowance	7%	5%	19%
Central Allowance	2%	-2%	9%

Source: Government Website <https://environment.data.gov.uk/hydrology/climate-change-allowances>

(FAS) was proposed to reduce the flood risk to and from the Site which comprised of a two-stage channel with flow control structure, running parallel to the original Washpit Brook, providing additional online storage during peak flow events. The FAS also sought to reduce the amount of pass forward flow transmitted downstream of the Site, to reduce flood risk to the village of Girton. The FAS was implemented in full as part of the Phase 1 works to ensure the completed development in its entirety does not result in increased flooding.

The hydraulic model has been updated since to incorporate higher climate change allowance and ReFH2 rainfall-runoff method for 1 in 100 year + climate change (CC) flood event as the design flood event in accordance with the EA standing advice. Table 4 and Table 5 below include a summary of the peak flow estimates for the whole catchment to the downstream model limit and the individual inflow boundary locations. Location of the inflows (in blue) and sub-catchment extent (in green) are shown in Figure 6 below.

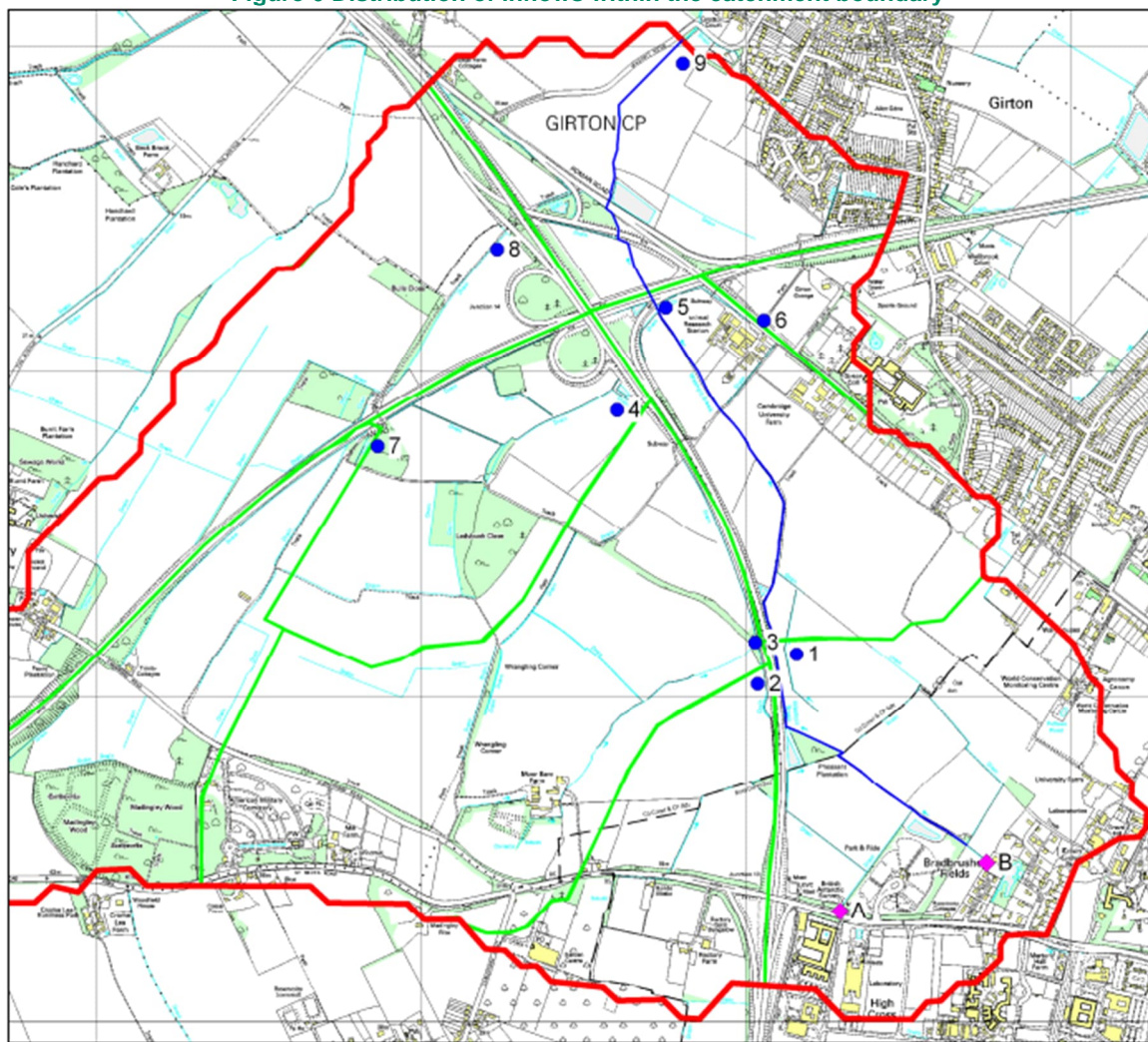
Table 4 ReFH2 peak flow estimates and sub-catchment distribution

Peak Flow Estimation Method	Peak Flows (m3/s)				
	5% AEP	1% AEP	1% AEP + 20% CC	1% AEP + 25% CC	0.1% AEP
ReFH2	4.38	6.85	8.22	8.22	12.08

Table 5 ReFH2 peak flow estimates and sub-catchment distribution

Model Boundary	Area (km ²)	Fraction	ReFH2 Peak Flows (m3/s)			
			5% AEP	1%AEP	1% AEP + 25% CC	0.1% AEP
Downstream BDY	7.16	1.00	4.38	6.85	8.57	12.08
1A	1.01	0.14	0.61	0.96	1.20	1.70
1B	0.10	0.02	0.06	0.10	0.12	0.18
2	0.53	0.07	0.32	0.50	0.63	0.89
3	1.38	0.19	0.85	1.32	1.65	2.33
4	0.68	0.09	0.41	0.65	0.81	1.14
5	0.70	0.10	0.43	0.67	0.84	1.18
6	0.14	0.02	0.08	0.13	0.16	0.23
7	0.80	0.11	0.49	0.77	0.96	1.35
8	1.11	0.15	0.68	1.06	1.32	1.87
9	0.73	0.10	0.45	0.70	0.87	1.23

Figure 6 Distribution of inflows within the catchment boundary



The model includes an allowance of 25% climate change which is higher than 9% climate change allowance required for the Site as discussed in the Climate Changes section of the report. Table 6 below includes a summary of the water level at key locations along the Washpit Brook based on the updated ReFH2 and 25% climate change parameters. The Table represents the existing (pre implementation of FAS) scenario versus scenario with the implementation of the FAS (with scheme). The results show that the FAS is still shown to provide reduction in downstream water levels and flood extent (See **Appendix E** of the report for flood extents).

Table 6 Impact of Updated Climate Change allowances on Water Levels along Washpit Brook during the 1% AEP plus CC event

Node	ReFH2 - 1% AEP + 25% CC (mAOD) - Existing	ReFH2 - 1% AEP + 25% CC (mAOD) – With Scheme
WSH-3018	15.73	15.71
WSH-2598	13.88	13.78
WSH-2505	13.63	13.19
WSH-2437	13.44	13.02
WSH-2195	13.02	13.01
WSH-2150	13.01	13.01
WSH-2060	13	13.01
WSH-1744	13	13
WSH-1606	12.99	12.74
WSH-1036	12.67	12.64
WSH-0808	11.99	11.99
WSH-0000	10.56	10.54

The results from the updated assessment demonstrate that even with this increased allowance, the proposed development does not contribute to any increase in downstream flood risk and the implemented FAS continues to provide improvements in managing downstream flood risk.

A small extent within the northwestern corner of the Site is shown to be within the 1 in 100 year +25% CC modelled flood extent with slight encroachment into one of the proposed non-residential buildings and foul pumping station location. The flood extent is based on a conservative estimate with significantly higher climate change allowance beyond the required value (9%) and the proposed plot arrangement is a reference scheme which will be developed further at Reserved Matters Application stage where the plot layout can be amended so the buildings are outside of the 1 in 100 year +25% CC flood extent. Additional mitigation measures are proposed:

- Proposed plot arrangement to be developed further at Reserved Matters Application stage to ensure all built development and land raising are outside of the 1 in 100 year + 25% CC modelled extent. Alternatively, flood compensation to be provided for any built development or land raising within the 1 in 100 year +25% CC modelled flood extent.
- Safe access to buildings within Flood Zone 2 in the northwestern extent will be from area in flood Zone 1 where proposed levels are at least 300mm above the nearest 100 year + 25% CC modelled flood level (12.64mAOD). EA standing advice suggests freeboard could be reduced to 300mm if there is certainty in the estimated flood level. Given the flood level is estimated based on 25% CC allowance which is considered conservative, the above is deemed suitable. Alternatively, the plot arrangement is subject to further development at reserved matters stage where the plot layout can be amended so the buildings are outside of the Flood Zone 2 flood extent.
- Further resilient and resistant measures are to be incorporated for buildings within Flood Zone 2 and 1 in 100 year +25% climate change extent:
 - Any electrical control equipment to be water resistant and located outside of the Flood Zone 2 and 1 in 100 year +25% climate change extent;
 - Cover level of foul pumping station to be raised to be above surrounding ground level to provide further resilience;
 - Using flood resistant and resilient materials for proposed buildings; and

- Raising all sensitive electrical equipment, wiring, and sockets to be at least 600mm above the estimated 100 year + 25% CC flood level within the Washpit Brook

Based on above, fluvial flood risk is considered to be **low**.

Given the Site's inland location, tidal flooding is not considered a risk to the proposed development and has not been further assessed in this report.

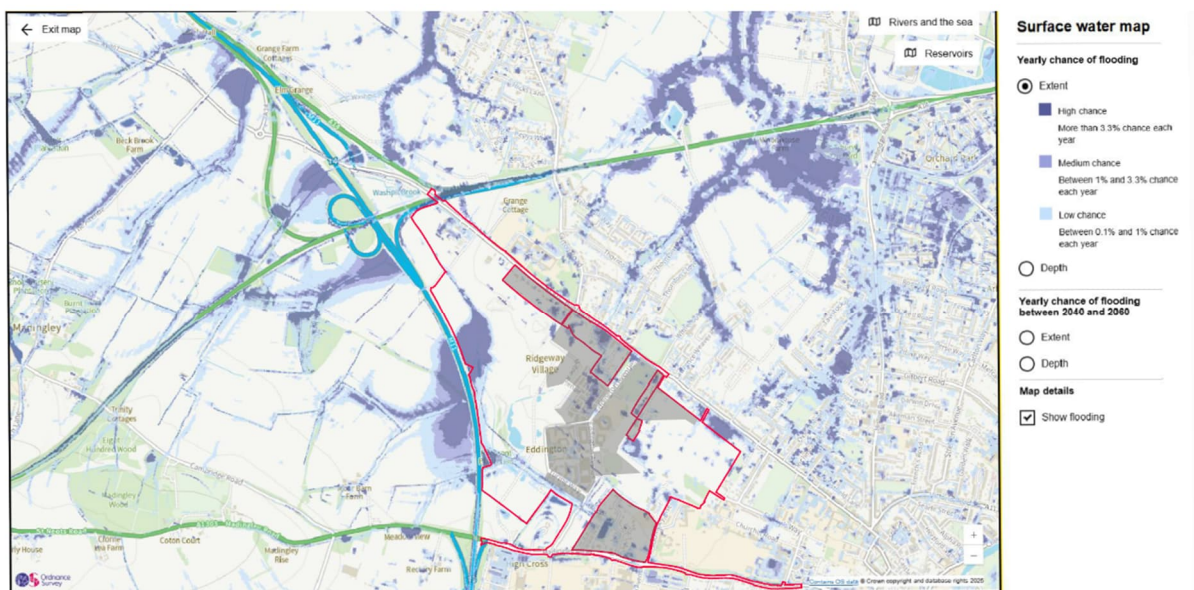
6.2 Surface Water

The EA map for Surface Water flooding indicates that certain portions of the Site are varying from low chance (between 0.1% and 1% chance each year) to high chance (more than 3.3% chance each year) in any given year, see Figure 7. The highest risk of surface water flooding is around Washpit Brook, where flood depths could reach up to 900mm. However, these depths are associated with a very low chance of flooding (less than 0.1% chance each year). There are several localized low-lying areas across the Site which may experience surface water flooding up to 900mm, however, these are in areas where existing drainage system is in place and localised low points in Site topography.

The Surface Water EA mapping climate change allowance shows the period between 2040 to 2060. As the development's lifetime is beyond 2060, it is anticipated that the flood extent could increase due to ongoing climate change effects.

Sitewide levels are being rationalised as part of the proposed development where plot levels will be raised, outside of the Washpit Brook floodplain, to facilitate reuse of localised stockpiles of arisings within the Site and limit excavations. A surface water drainage strategy will be in place to restrict the surface water runoff to greenfield rates by implementing Sustainable Drainage System (SuDS) as agreed with the Lead Local Flood Authority (LLFA). Site levels will be further developed at detailed design to ensure levels fall away from buildings. Based on the above, the Site is considered to be in **low risk** of surface water flooding.

Figure 7 EA Surface Water Flood Map



6.3 Sewer Flooding

The Greater Cambridge Integrated Water Management Study Level 1 SFRA notes that information from the Anglian Water DG5 register has been used to map incidents of sewer flood risk by postcode. The postcode 'CB3' has 3 recorded sewer flood incidents. **Appendix F** of the report shows sewer mapping incidents.

The proposed foul water drainage from the Site remain as per the previously consented strategy where foul water is proposed to discharge to a foul pumping station within the Site which has been constructed as part of Phase 1 works before being pumped to the 1200mm diameter trunk sewer located in Madingley Road. The discharge rate from the Phase 1 foul pumping station is as per the previously agreed rate with Anglian Water and the foul drainage

from the proposed development as part of the new OPA will be restricted to comply with the discharge rates allowed for the future phases of the development within Phase 1 foul drainage network. The proposals would therefore not impact the previously agreed point of connection and discharge rates. Additionally, a preplanning application was submitted to Anglian Water which confirmed proposed pumped conveyance was still acceptable and there was capacity within the 1200mm diameter trunk sewer to serve the proposed development (**see Appendix G**). Based on above, the Site is considered to be in **low risk** of sewer flooding.

6.4 Groundwater Flooding

Groundwater flooding is most likely to occur in the lower lying areas of the Site. This flooding occurs when water emerges through the ground due to a high-water table following prolonged periods of heavy rain.

The British Geological Survey (BGS) holds mapping of geology across the UK. The mapping indicates the vast majority of the Site to be underlain by a bedrock of Gault Formation – Mudstone with a small portion located on the southeast side of the Site to be underlain by West Melbury Marly Chalk Formation – Chalk. BGS map also shows the parts of the Site to be overlaid by superficial Head deposits – clay, silt sand and gravel, with River Terrace Deposits present east of the Site.

The Head superficial deposits are classified as Secondary (undifferentiated) aquifers and the River Terrace Deposits located to the east of the Site are classified as Secondary A aquifers. The Gault Formation bedrock present is classified as an unproductive aquifer, while the West Melbury Chalk Formation is classified as a Principal aquifer.

The hydrogeology aquifer classification suggests that the Site has Gault Formation Class 3 which comprises of rocks with essentially no groundwater.

The Greater Cambridge Integrated Water Management Study Level 1 SFRA notes that the groundwater flood risk map is based on the British Geological Survey Areas Susceptible to Groundwater Flooding. The mapping which can be found in **Appendix F** of the report, suggest that eastern portion of the Site has potential for groundwater flooding of properties situated below ground level with a very small section shown to have limited potential for groundwater flooding to occur. The current illustrative masterplan does not propose basement within the plots. Should basements be proposed in the future, appropriate waterproofing measures would be required.

Based on the above information, the Site is assessed to be in **low risk** of groundwater flooding. An increase in the likelihood of groundwater flooding as a result of the development is generally related to changes in sub-surface flow paths as a result of underground structures, such as basements or sheet piling.

6.5 Artificial Flooding i.e. Reservoirs

The EA Flood map for Reservoirs indicates that the Site sits outside of reservoir flooding for both wet day (when there is also flooding from rivers) and dry day (when river levels are normal).

The provision of the reservoir inundation map is a legal requirement under the Flood and Water Management Act (2010). The risk of reservoir flooding is extremely low with current and historic reservoir legislation ensuring reservoirs are properly maintained.

Due to the strict maintenance requirements of reservoirs, the likelihood of reservoir breach is extremely low. Therefore, the flood risk posed by a reservoir flooding to the Site is considered to be **very low**.

7. Surface Water Drainage Strategy

7.1 Existing Surface Water Drainage

The Site is currently predominantly greenfield with an approximate existing impermeable area of approximately 6.2ha. The surface water runoff is currently expected to partly infiltrate into the ground and partly overflow to Washpit Brook via overland flow following site topography.

Greenfield runoff rates have been calculated using the HR Wallingford method for the area of 36.53 hectares refer to the **Appendix I** of the report. The calculation was undertaken for various storm return periods including Qbar, 1 in 1 year, 1 in 30 year and 1 in 100-year events as shown in the Table 7 below. These values have been prorated to 1 hectare.

Table 7 Greenfield Runoff Rates

Area	Qbar (l/s)	1 in 1 year (l/s)	1 in 30 year (l/s)	1 in 100 year (l/s)
36.53 ha	72.67	63.22	258.71	305.95
1 ha	1.98	1.73	7.08	8.38

7.2 Proposed Surface Water Drainage

Surface water drainage for the Site is proposed to follow the same design intent as per the original consented scheme where the surface water runoff from individual plots and external areas are proposed to discharge into a network of SuDS features and ultimately to the undeveloped northern section of Brook Leys where the runoff is restricted to greenfield rate prior to discharge to the Washpit Brook. There are a number of competing demands for external space within the Site, including balancing drainage objectives with landscape and amenity provision. The masterplan landscaping proposals include 'shared gardens' across the Site which will function as surface water drainage conveyance routes as per the historic green finger solution. The exact forms of these shared gardens are to be determined at Reserved Matters Application stage and are expected to take form of either a network of conveyance swales or oversized pipes. For both scenarios, the surface water runoff is still proposed to be restricted at Brook Leys prior to discharge to the Washpit Brook at greenfield runoff rate with individual plots also restricted at greenfield runoff rate prior to discharging to the sitewide drainage network.

The strategy is eventually envisaged to be a combination of the two to balance the SuDS requirement and space required for landscaping/amenity areas. The surface water drainage network including attenuation volume requirements have been assessed for both options which will be developed further at detailed design stage. Additional SuDS features such as permeable paving will be considered as the strategy is developed and as part of the future plot detailed design. Consultation with the Lead Local Flood Authority (LLFA) has been undertaken to discuss the above design proposals and design parameters which was accepted in principle. **Appendix H** includes details of the correspondence with the LLFA.

Surface water runoff from external areas including highways and other paved areas outside of the Building Development Zone boundaries will discharge unrestricted into the sitewide drainage network. As part of the original application, it was determined through dialogue with the LLFA that surface water runoff from the development would be required to pass through two stages of treatment prior to discharging to the Washpit Brook. Two stages of treatment are required to ensure no pollution in terms of hydrocarbons or heavy particulates reaches the watercourse. A SuDS pollution cleansing chain uses planted swales to extract hydrocarbons from the runoff, and then the detention areas along the northern sections of Brook Leys double as settlement areas removing the heavy particulates from the runoff. Should there be no swales as part of the ultimate shared garden all runoff from vehicular hardstanding areas and highways will need to be passed through petrol interceptors prior to entering the conveyance pipework leading to Brook Leys.

The outline surface water drainage strategy can be found in **Appendix J**. The strategy provides a broad indication of the key features proposed for the Site and will be subject to further detailed design and detailed hydraulic modelling at next stage. A SuDS Proforma, outlining compliance with the Cambridgeshire County Council surface water drainage requirements, is included in **Appendix L** of the report.

7.2.1 Design Criteria

The surface water design incorporates the following design criteria:

- FEH rainfall data obtained for the Site from the UK Centre for Ecology & Hydrology's Flood Estimation Handbook Web Service. The use of FEH data is in accordance with the Cambridgeshire County Council Surface Water Planning Guidance;
- FEH rainfall data used and therefore, a return period of 2 year is used as a minimum;
- 40% climate change uplift has been applied for a 1 in 100-year and 35% for 1 in 30-year rainfall event in line with the Flood Risk Assessments: Climate Change Allowances Guidance;
- Plot and sitewide discharge rates restricted to greenfield runoff rate of 2 l/s/ha for up to 1 in 100-year + 40% CC rainfall event. Discharge rate and attenuation calculation are based on developable area only.
- Percentage impervious area (PIMP values) assigned per plot is based on qualitative assessment of the extent of soft landscape and hardstanding areas within the updated masterplan.
- An allowance for urban creep has only been considered for plots consisting of residential townhouses/terraces. In this instance, an urban creep allowance of 10% has been applied (in accordance with the Cambridgeshire County Council Surface Water Planning Guidance (refer to Table 8).

Table 8 Urban Creep Allowance

Unit Type	Urban Creep Allowance
Residential Blocks	N/A
Commercial/Academic	N/A
Sports/Recreation Facilities	N/A
Residential Townhouses/Terraces	10%

7.2.2 Attenuation Volumes

Surface water attenuation will be provided for up to 1 in 100 year + 40% climate change rainfall event over a 24-hour duration to limit the proposed surface water runoff to the 2 l/s/ha greenfield runoff rate prior to discharge to the Washpit Brook. Sitewide attenuation will be provided via network of swales or oversized pipes across the Site and detention basins along Brook Leys. On-plot attenuation is assumed to be in the form of buried tanks, the exact form of the on-plot attenuation will be developed further at detailed design stage. The detention basins will be generally dry, save during storm events. Attenuation depths within plots and along Brook Leys would be subject to the development of sitewide levels.

An outline hydraulic modelling of the surface water drainage network has been undertaken to assess the attenuation volume requirements (**Appendix K**) and Table 9 below provides a summary of the estimated attenuation volumes required within the detention basins. Additional volumes are accommodated within the sitewide drainage network in the form of swales or oversized pipes. Outline surface water drainage proposal can be found in **Appendix K**.

Table 9 Surface Water Attenuation Volumes

Outfall	Catchment Area (ha)	Discharge Rate (l/s)	Attenuation Volume for Swale Option(m ³)	Attenuation Volume for Oversized Pipes Option(m ³)
Outfall 1	7.7	15.4	2370	2150
Outfall 2	15.4	30.8	3115	2780

Individual plots are proposed to restrict the surface water runoff to 2 l/s/ha and provide on-plot attenuation prior to discharge to the sitewide drainage network. Plots northeast of the Site are proposed to discharge into the existing sitewide drainage network installed as part of the previous Phase 1 works as per the previously consented

strategy. The plots will still be restricted to the 2 l/s/ha which is a reduction from the discharge rates previously allowed for in the consented Phase 1 drainage network. Assumption on the extent of permeable and impermeable area along with urban creep has been made based on the illustrative masterplan and quick storage estimate has been used to estimate the attenuation volume requirements for each plot, summarised in Table 10 below. Upper range of the quick storage estimate has been used as a conservative approach to quantify the attenuation volume requirements and space proof the illustrative masterplan within the plot. The impermeable area is based on the extent of impermeable hardstanding area within the plot, 30% runoff contribution from the soft landscaping area. An additional 10% to account for urban creep allowance has been added to the impermeable area for plots with residential townhouses which include plots B2, C1, C2, D1, D2, E1, E2, F1, F3, G, H1, H2 and H3. This will need to be developed further at Reserved Matters Application stage following development of plot masterplan and detailed hydraulic model.

Table 10 On-plot surface water attenuation volumes (Illustrative Masterplan)

Plot Ref.	Plot Area (ha)	Impermeable Area (ha)	Plot Discharge Rate (l/s)	Attenuation Volume (m ³)
A	5.55	2.56	11.10	2,614
B1	0.38	0.15	0.76	339
B2	3.24	1.51	6.48	1,534
B3	2.63	1.32	5.26	1,348
C1	2.62	1.32	5.24	1,339
C2	2.36	1.05	4.72	1,070
D1	3.35	2.86	6.71	2,918
D2	3.17	1.35	6.34	1,363
E1	3.20	2.75	6.40	2,808
E2	1.09	0.60	2.17	609
F1	2.77	1.46	5.54	1,491
F2	0.84	0.46	1.68	465
F3	0.74	0.35	1.47	357
G	1.65	0.91	3.31	933
H1	3.97	1.62	7.94	1,655
H2	4.46	1.53	8.91	1,567
H3	2.97	1.08	5.95	1,106
J	7.37	4.38	14.74	3,055

8. Residual Flood Risk

Table 11 Summary of Existing and Residual Flood Risk to the Site

Flood Hazard	Flood Mechanism and Possible Consequence	Existing Assessment of Risk	Mitigation Measures	Residual Risk
Fluvial / Tidal	Washpit Brook	Low to Medium	<p>Implementation of a two-stages channel as part of the flood alleviation scheme at Washpit Brook.</p> <p>Built development or land raising to be outside of the 1 in 100 year +25% modelled flood extent. Alternatively, flood compensation to be provided at Reserved Matters Application stage.</p> <p>Flood resilient and resistance measures proposed.</p>	Low
Groundwater	The impermeable nature of the underlying bedrock formation of Gault Formation limits groundwater infiltration, reducing the likelihood of groundwater flooding.	Low	N/A	Low
Surface Water (Pluvial)	Intense rainfall could lead to surface water pooling in low-lying areas due to insufficient infiltration caused by the general impermeability of the Site's area.	Low	The Site includes a surface water drainage system that will attenuate surface water runoff on plots as well as within the sitewide drainage strategy restricting the runoff rate to 2l/s/ha reducing the risk of flooding to downstream sites.	Low
Surface Water and Foul Water Sewers	Anglian Water drainage systems	Low	N/A	Low
Reservoir and Artificial Sources	Grafham Water	Very Low	N/A	Very Low

9. Conclusion

AECOM has been commissioned to prepare a site-specific FRA and a SWDS to support the OPA for the North West Cambridge Masterplan for a phased mixed-use development, including demolition of existing buildings and structures.

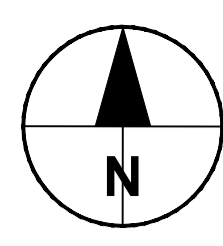
The FRA and SWDS has assessed the Site in terms of topography, geology, hydrogeology and climate change by reviewing the available information and aims to identify the potential sources of flooding and how residual flood risk will be managed without causing flood risk elsewhere.

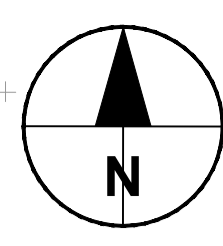
The Site is predominantly within Flood Zone 1, with the north-west corner located partly in Flood Zone 2, and a small area adjacent to the Washpit Brook within Flood Zone 3. Area within Flood Zone 3 is to remain as open space at existing levels). The proposed development within Flood Zone 1 extent is categorised as “More Vulnerable” and within Flood Zone 2 extent is categorised as “Less Vulnerable” or “Water Compatible”. All residential units will be located within Flood Zone 1. The FAS implemented as part of the Phase 1 works continue to provide reduction in flood risk to and from the Site in its entirety. Additional measures are proposed and therefore, the residual fluvial flood risk considered to be low.

Surface water runoff from individual plots and external areas will discharge into the sitewide drainage network before entering Washpit Brook at a restricted greenfield runoff rate. Runoff will be restricted and treated within plots before connecting to the wider drainage system. The surface water design has been updated to reflect the latest masterplan layout and sitewide levels. Sitewide drainage conveyance via network of swales and oversized pipes were assessed. The strategy is eventually envisaged to be a combination of the two to balance the SuDS requirement and space required for landscaping/amenity areas.

The flood risk assessment and surface water drainage proposals have been discussed with the LLFA who have accepted these proposals in principle. The drainage proposals are expected to be conditioned and further discussion with the LLFA is envisaged during Reserved Matters Application stage as the design is developed and detailed hydraulic modelling is undertaken.

Appendix A Topographical Survey





Appendix B Site Layout



Key
 — Site application boundary
 □ Excluded from application

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 No implied licence exists. This drawing should not be used to calculate areas for the purposes of valuation. Do not scale this drawing. All dimensions to be checked on the site by the contractor and such dimensions to be their responsibility. All work must comply with relevant British Standards and Building Regulations requirements. Drawing errors and omissions to be reported to the architect. To be read in conjunction with Architect's specification and other consultant information.

Status codes:
 S1 - Suitable for Coordination
 S2 - Suitable for Information
 S3 - Suitable for Review & Comment
 S4 - Suitable for Review & Authorization
 S5 - Suitable for Review & Acceptance
 A1 - Approved & Accepted as Stage complete

Rev	Description	Date
P00	Issued for planning	01.09.25

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 EC1M 5PG

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 hawkinsbrown.com

Hawkins\Brown

Project
 North West Cambridge
 Masterplan
 Eddington, North West
 Cambridge, CB3 1AF

Drawing
 Illustrative Masterplan

Scale @ A1
 1:5000

Date
 01/09/25

Drawn By
 EM

Checked By
 JM

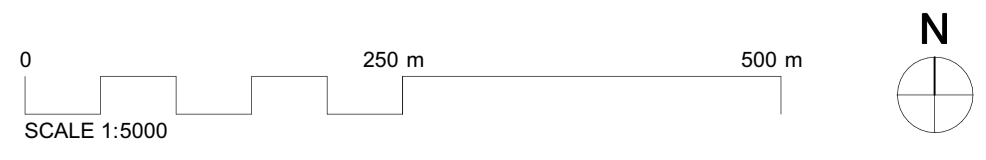
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Status
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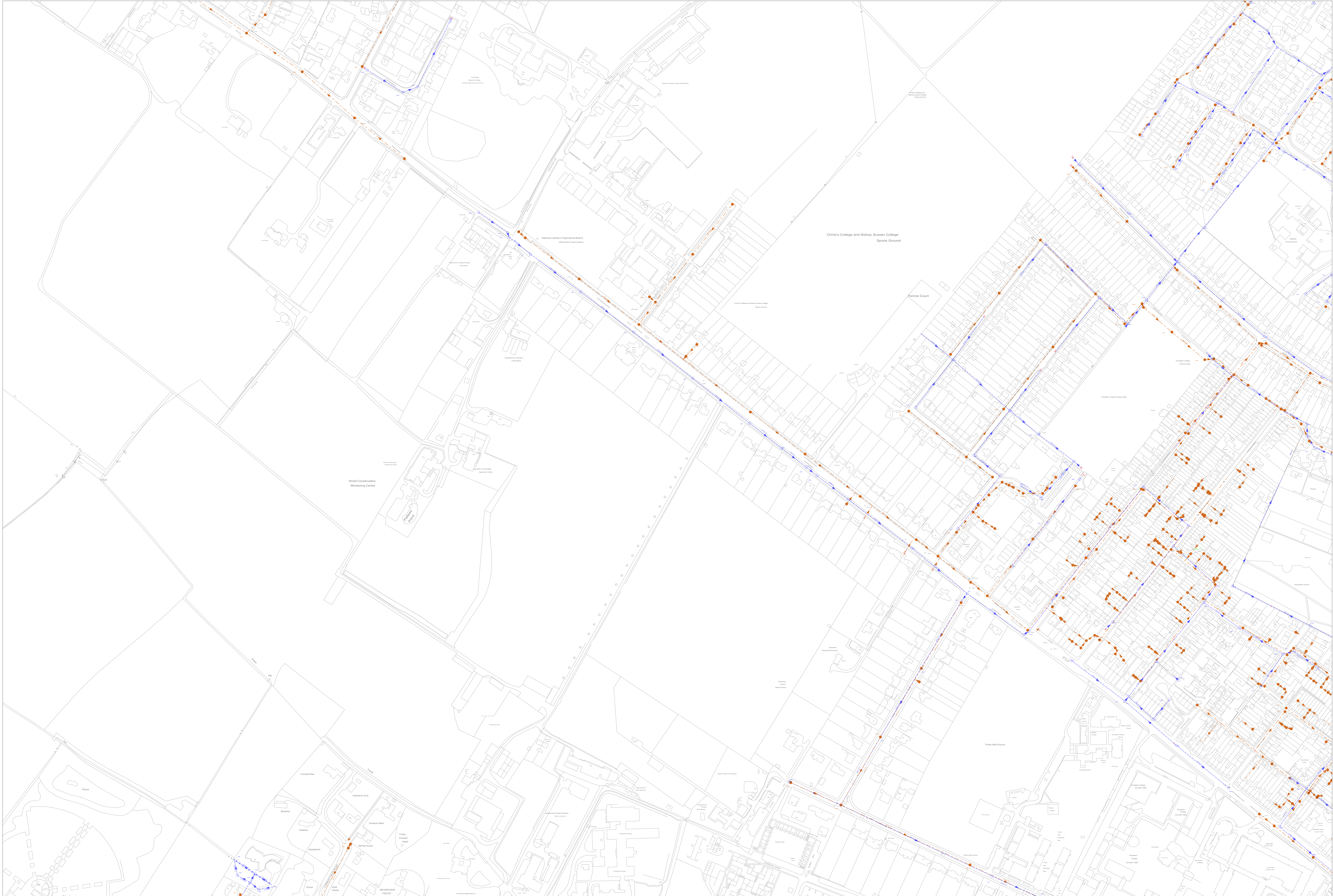
Purpose of Issue
 For information

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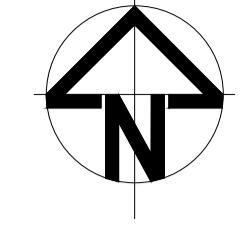
Rev
 P00



Appendix C Anglian Water Sewer Records



Appendix D Phase 1 Onsite Drainage



- GENERAL NOTES**
- DO NOT SCALE FROM DRAWING, USE FIGURED DIMENSIONS ONLY.
 - THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS & ENGINEERS DRAWINGS AND SPECIFICATIONS.
 - WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE STATUTORY REQUIREMENTS.
 - APPROPRIATE MEASURES SHOULD BE TAKEN FOR WORKING IN CLOSE PROXIMITY TO DEEP EXCAVATIONS. EVERYDAY OR LOW RISK HAZARDS THAT SHOULD BE OBVIOUS TO A COMPETENT CONTRACTOR.

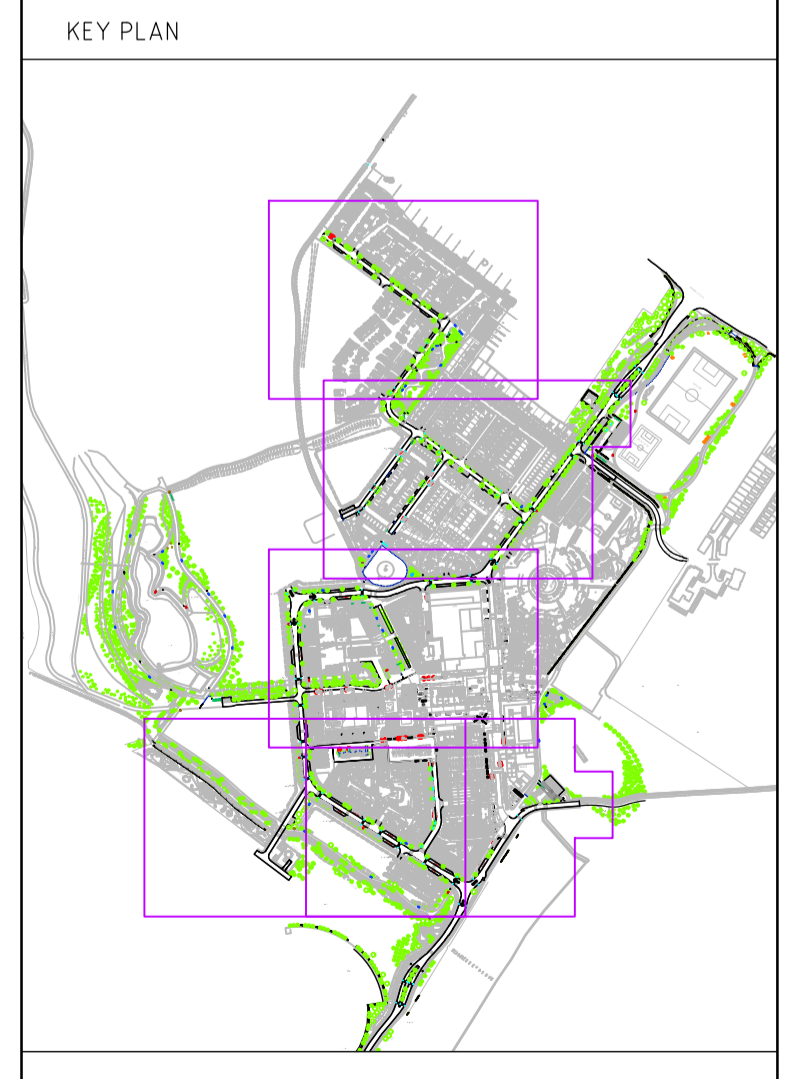
- DRAINAGE NOTES**
- ALL WORKS TO COMPLY WITH SEWERS FOR ADOPTION 7th EDITION AND ANGLIAN WATER'S REQUIREMENTS.
 - ALL MANHOLE COVERS WITHIN TRAFFICKED AREAS TO BE CLASS D400
 - ALL PIPE BEDDING TYPE 'S'
 - ALL MANHOLES WILL BE CONSTRUCTED TO CONFORM TO THE SFA7 DOCUMENT PART B3 AND FIGURE B1
 - AN APPROPRIATE ROOT BARRIER IS TO BE INSTALLED WHERE REQUIRED TO PROTECT THE DRAINAGE SYSTEM. SEE TYPICAL SECTIONS.
 - ALL TREE CANOPIES TO CONFORM TO THE REQUIREMENTS WITHIN SFA7 DOCUMENT PART B3.1.13
 - REFER TO FOUL WATER DRAINAGE SCHEDULE NWC1-HYD-SW-050-XX-SCH-CE-0002-P26 FOR DETAILS OF PIPES AND CHAMBERS.

- KEY**
- FOUL SEWER ADOPTABLE NETWORK
 - FOUL WATER ADOPTABLE MANHOLE
 - FOUL SEWER NETWORK NOT ADOPTABLE UNDER THIS CONTRACT. FOR DETAILS REFER TO TABLE BELOW.

A THESE MANHOLES & SPURS ARE CURRENTLY NOT PART OF THE SECTION 104 WORKS
 FW_MH76 & Spur 28.000
 FW_MH79 & Spur 30.000
 FW_MH83 & Spur 32.000

B SPURS AND MANHOLES TO FORM PART OF LOT CONTRACTORS 104 APPLICATION
 Spur Pipe935 Spur Pipe938
 Spur Pipe942 Spur FW_10.000
 Spur Pipe940 Spur FW_36.000
 Spur Pipe936 Spur FW_26.00
 Spur FW_4.000 FW_MH73
 Spur FW_5.000 FW_MH92

- HAZARD WARNING**
- THE EXACT POSITION OF BURIED SERVICES SHALL BE CONFIRMED ON SITE PRIOR TO THE USE OF ANY MECHANICAL PLANT.
 - FOR MORE DETAILED INFORMATION PLEASE REFER TO THE DESIGNER'S H&S HAZARD RECORD
 - SHOULD ANY ADDITIONAL HAZARDS BE IDENTIFIED THE CONTRACTOR SHOULD NOTIFY ALL THE RELEVANT PROJECT TEAM MEMBERS.



AS BUILT INFORMATION SHOWN ON THIS LAYOUT IS AS PROVIDED BY SKANSKA VIA ACONEX

ALL CONCRETE TO BE SULPHATE RESISTANT.
 TO ACEC CLASS D54-AC4 WITHIN GAULT CLAY
 TO ACEC CLASS D52-AC2 WITHIN GRAVEL AREAS
 TO ACEC CLASS D51-AC1 IN MADE GROUND

FOR CONTINUATION SEE SHT 2
 MATCH LINE

Z02	AS BUILT - KEY REVISED	12-09-18
Z01	AS BUILT ISSUE	03-07-17
C05	SITE LAYOUT UPDATED	26-09-16
C04	DRAINAGE ANNOTATION REVISED AND NOTES ADDED	22-04-16
C03	ADDED SHEET 5 TO SHOW NEW EXTENT OF FOUL NETWORK	10-12-15
C02	CONSTRUCTION ISSUE	01-12-15
Issue	Description	Date

Client	UNIVERSITY OF CAMBRIDGE NORTH WEST CAMBRIDGE DEVELOPMENT
Scale	1:500
Original Size	A1
Height Datum	DATUM
Grid	GRID
File name	NWC1-HYD-SW-050-XX-DRG-CE-0048-0052-Z02-SECTION 104 FOUL_WATER_DRAINAGE_LAYOUT.dwg

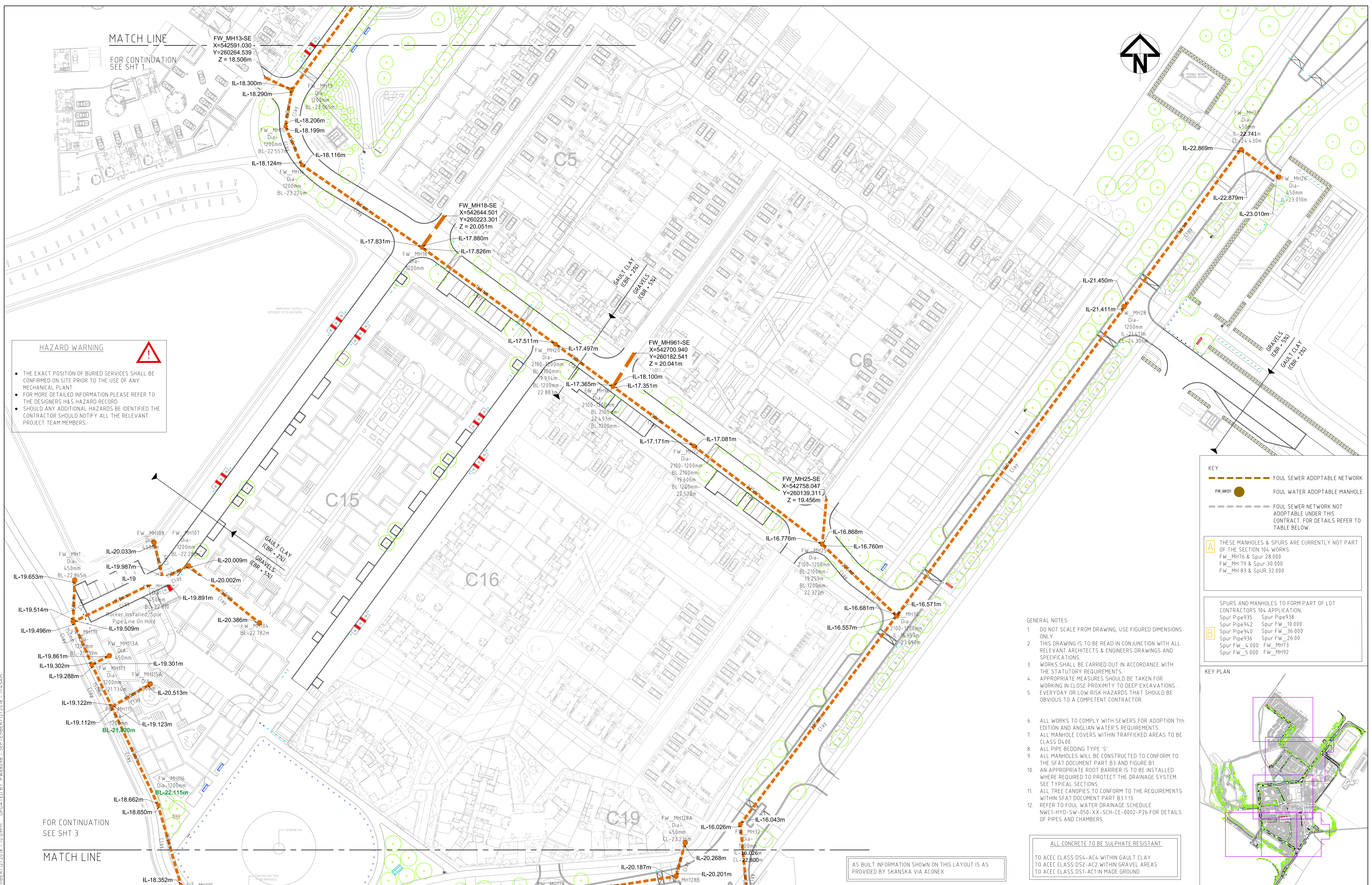
Current Issue Signatures	Author: M.GRIFFITHS, Checker: P.JOHNSON, Approver: S.A.DAVIES
Status	AS BUILT
Project	NORTH WEST CAMBRIDGE
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Title	FOUL WATER DRAINAGE SECTION 104 AGREEMENT (SHEET 1 OF 5)
Project No.	UA006967
Drawing Number	NWC1-HYD-SW-050-XX-DRG-CE-0048
Issue	Z02

Hyder Consulting

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CAD FILE: V:\E-OurDrawings\CAD\050 Series\NWC1-HYD-SW-050-XX-DRG-CE-0048-0052-Z02-Section 104 Foul Water Drainage Layout.dwg
 PRINTED BY: PW68098 - SEPTEMBER/17/2018 - 10:05PM - UPDATED BY: PW68098 - SEPTEMBER/12/2018 - 11:45AM



Issue	Description	Date
Z01	AS BUILT	12-09-18
C07	AS BUILTS UPDATED AS OF INFORMATION RECEIVED ON 2017-05-31	03-07-17
C06	SITE LAYOUT UPDATED	26-09-16
C05	DRAINAGE ANNOTATION, RIDGEWAY MANHOLES COVER LEVELS REVISED AND NOTES ADDED	22-04-16

Client	UNIVERSITY OF CAMBRIDGE
Client	NORTH WEST CAMBRIDGE DEVELOPMENT
Client	SKANSKA

Scale	1:500
Original Size	A1
Height Datum	DATUM
Grid	GRID
Filename	NWC1-HYD-SW-050-XX-DRG-CE-0048-0052-Z02-Section 104 Foul Water Drainage Layout.dwg

Current Issue Signatures	Status	AS BUILT
Author: M.GRIFFITHS	Project	NORTH WEST CAMBRIDGE
Checker: P.JOHNSON	Project No.	UA006967
Approver: S.DAVIES	Issue	Z01
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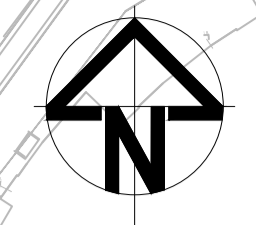
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Project No.	UA006967
Drawing Number	NWC1-HYD-SW-050-XX-DRG-CE-0049

Hyder Consulting	Hyder Consulting (UK) Limited Manning House 22 Carlisle Place London SW1P 1JA Tel: +44(0) 203 014 9000
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Project No.	UA006967
Drawing Number	NWC1-HYD-SW-050-XX-DRG-CE-0049
Issue	Z01

CAD FILE: V:\E-OurDrawings\CAD\050 Series\NWC1-HYD-SW-050-XX-DRG-CE-0048-0052-Z02-Section 104 Foul Water Drainage Layout.dwg
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MATCH LINE

FOR CONTINUATION SEE SHT 2

MATCH LINE

FOR CONTINUATION SEE SHT 4

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 - APPROPRIATE MEASURES SHOULD BE TAKEN FOR WORKING IN CLOSE PROXIMITY TO DEEP EXCAVATIONS. EVERYDAY OR LOW RISK HAZARDS THAT SHOULD BE OBVIOUS TO A COMPETENT CONTRACTOR.

- DRAINAGE NOTES:
- ALL WORKS TO COMPLY WITH SEWERS FOR ADOPTION 7TH EDITION AND ANGLIAN WATER'S REQUIREMENTS.
 - ALL MANHOLE COVERS WITHIN TRAFFICKED AREAS TO BE CLASS D400.
 - ALL PIPE BEDDING TYPE 'S'.
 - ALL MANHOLES WILL BE CONSTRUCTED TO CONFORM TO THE SFAT7 DOCUMENT PART B3 AND FIGURE B1.
 - AN APPROPRIATE ROOT BARRIER IS TO BE INSTALLED WHERE REQUIRED TO PROTECT THE DRAINAGE SYSTEM. SEE TYPICAL SECTIONS.
 - ALL TREE CANOPIES TO CONFORM TO THE REQUIREMENTS WITHIN SFAT7 DOCUMENT PART B3.1.3.
 - REFER TO FOUL WATER DRAINAGE SCHEDULE NWC1-HYD-SW-050-XX-SCH-CE-0002-P26 FOR DETAILS OF PIPES AND CHAMBERS.

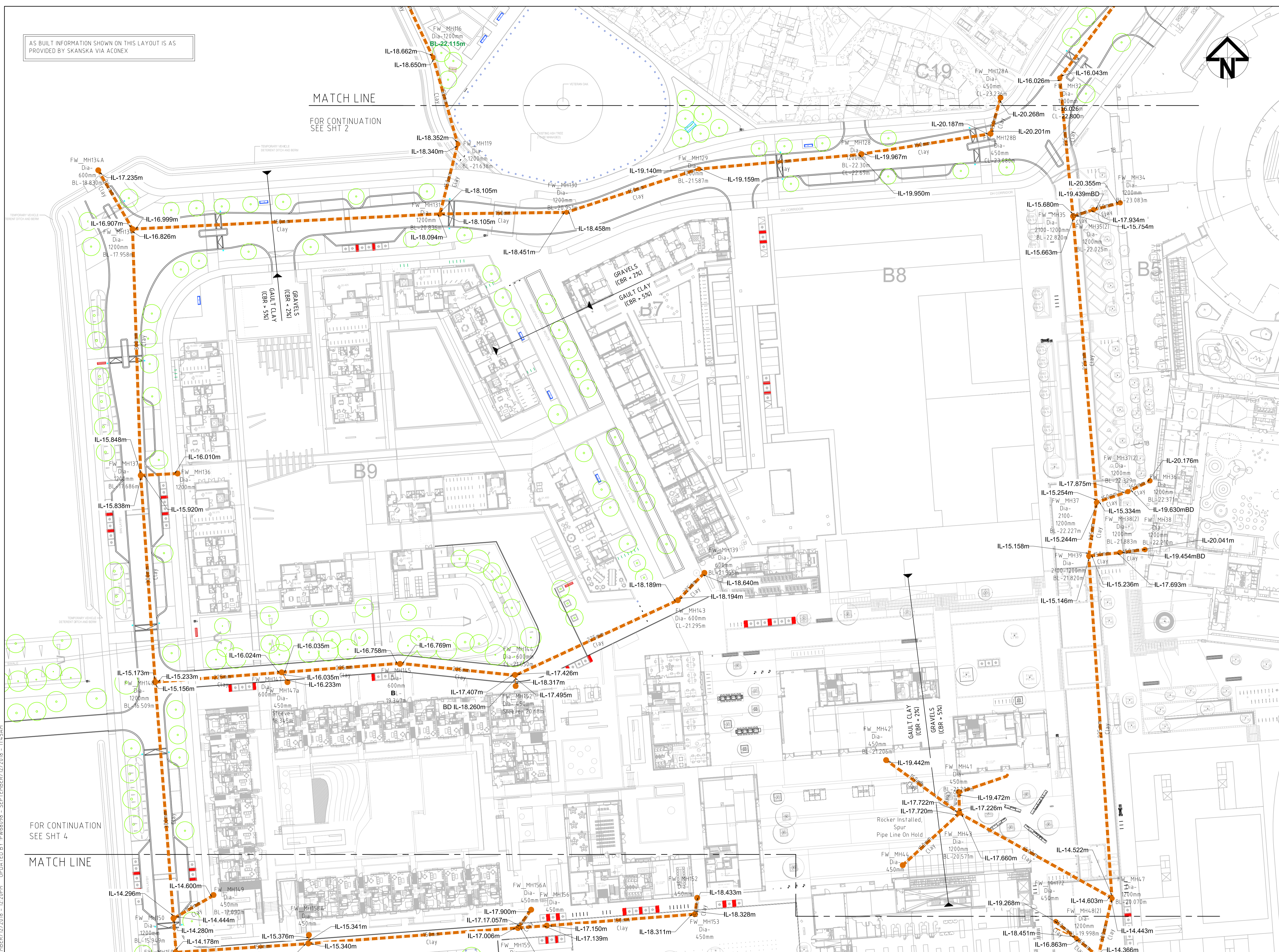
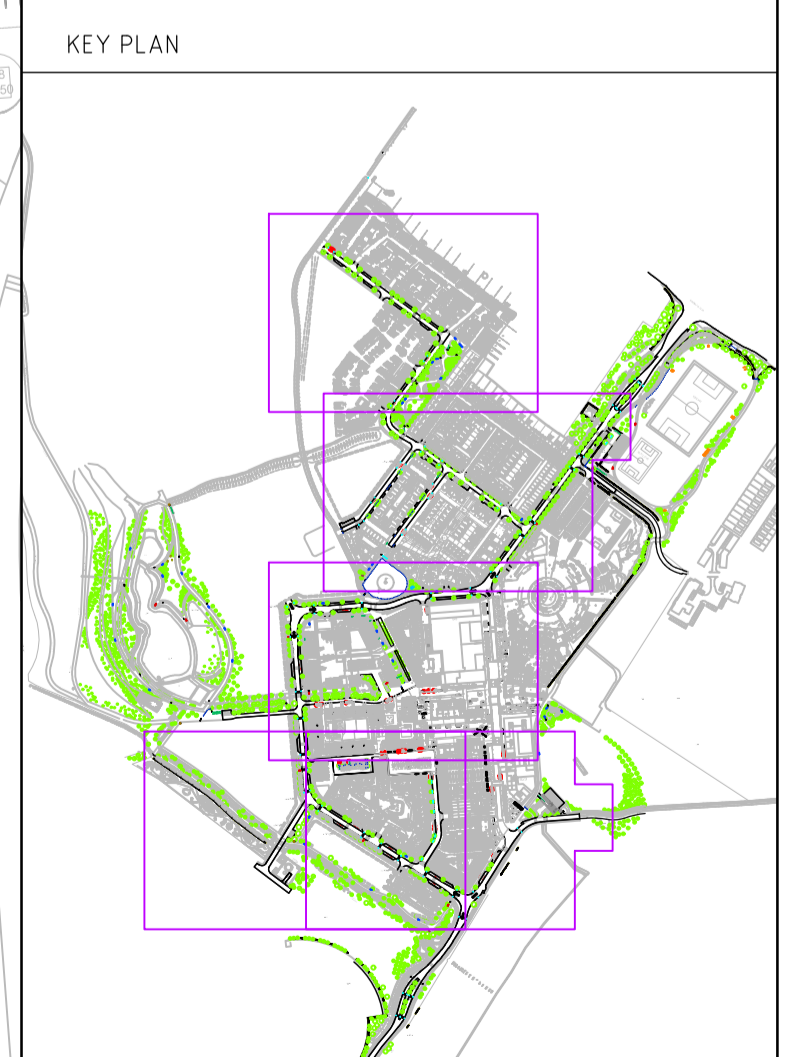
- KEY
- FOUL SEWER ADOPTABLE NETWORK
 - FOUL WATER ADOPTABLE MANHOLE
 - FOUL SEWER NETWORK NOT ADOPTABLE UNDER THIS CONTRACT. FOR DETAILS REFER TO TABLE BELOW.

THESE MANHOLES & SPURS ARE CURRENTLY NOT PART OF THE SECTION 104 WORKS:
 FW_MH76 & Spur 28.000
 FW_MH79 & Spur 30.000
 FW_MH83 & Spur 32.000

SPURS AND MANHOLES TO FORM PART OF LOT CONTRACTOR'S 104 APPLICATION:
 Spur Pipe935 Spur Pipe938
 Spur Pipe942 Spur FW_10.000
 Spur Pipe940 Spur FW_36.000
 Spur Pipe936 Spur FW_26.000
 Spur FW_4.000 FW_MH73
 Spur FW_5.000 FW_MH92

ALL CONCRETE TO BE SULPHATE RESISTANT:
 TO ACEC CLASS D54-AC4 WITHIN GAULT CLAY
 TO ACEC CLASS D52-AC2 WITHIN GRAVEL AREAS
 TO ACEC CLASS D51-AC1 IN MADE GROUND

- HAZARD WARNING
- THE EXACT POSITION OF BURIED SERVICES SHALL BE CONFIRMED ON SITE PRIOR TO THE USE OF ANY MECHANICAL PLANT.
 - FOR MORE DETAILED INFORMATION PLEASE REFER TO THE DESIGNERS H&S HAZARD RECORD.
 - SHOULD ANY ADDITIONAL HAZARDS BE IDENTIFIED THE CONTRACTOR SHOULD NOTIFY ALL THE RELEVANT PROJECT TEAM MEMBERS.



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 PRINTED BY: PW68098 - SEPTEMBER/17/2018 - 12:20PM - UPDATED BY: PW68098 - SEPTEMBER/12/2018 - 11:45AM

Issue	Description	Date
Z02	AS BUILT - KEY REVISED	12-09-18
Z01	AS BUILT ISSUE	03-07-17
C05	DRAINAGE LAYOUT AMENDED & SITE LAYOUT UPDATED	26-09-16
C04	DRAINAGE ANNOTATION, RIDGEWAY MANHOLES COVER LEVELS REVISED AND NOTES ADDED	22-04-16
C03	ADDED SHEET 5 TO SHOW NEW EXTENT OF FOUL NETWORK	10-12-15

ALL CONCRETE TO BE SULPHATE RESISTANT:
 TO ACEC CLASS D54-AC4 WITHIN GAULT CLAY
 TO ACEC CLASS D52-AC2 WITHIN GRAVEL AREAS
 TO ACEC CLASS D51-AC1 IN MADE GROUND

Client

UNIVERSITY OF CAMBRIDGE

NORTH WEST CAMBRIDGE DEVELOPMENT

SKANSKA

Scales	1:500
Original Size	A1
Height Datum	DATUM
Grid	GRID
Filename	NWC1-HYD-SW-050-XX-DRG-CE-0048-0052-Z02-Section 104 Foul Water Drainage Layout.dwg

Current Issue Signatures

Author: M.GRIFFITHS

Checker: P.JOHNSON

Approver: S.DAVIES

Status: AS BUILT ISSUE

Project: NORTH WEST CAMBRIDGE

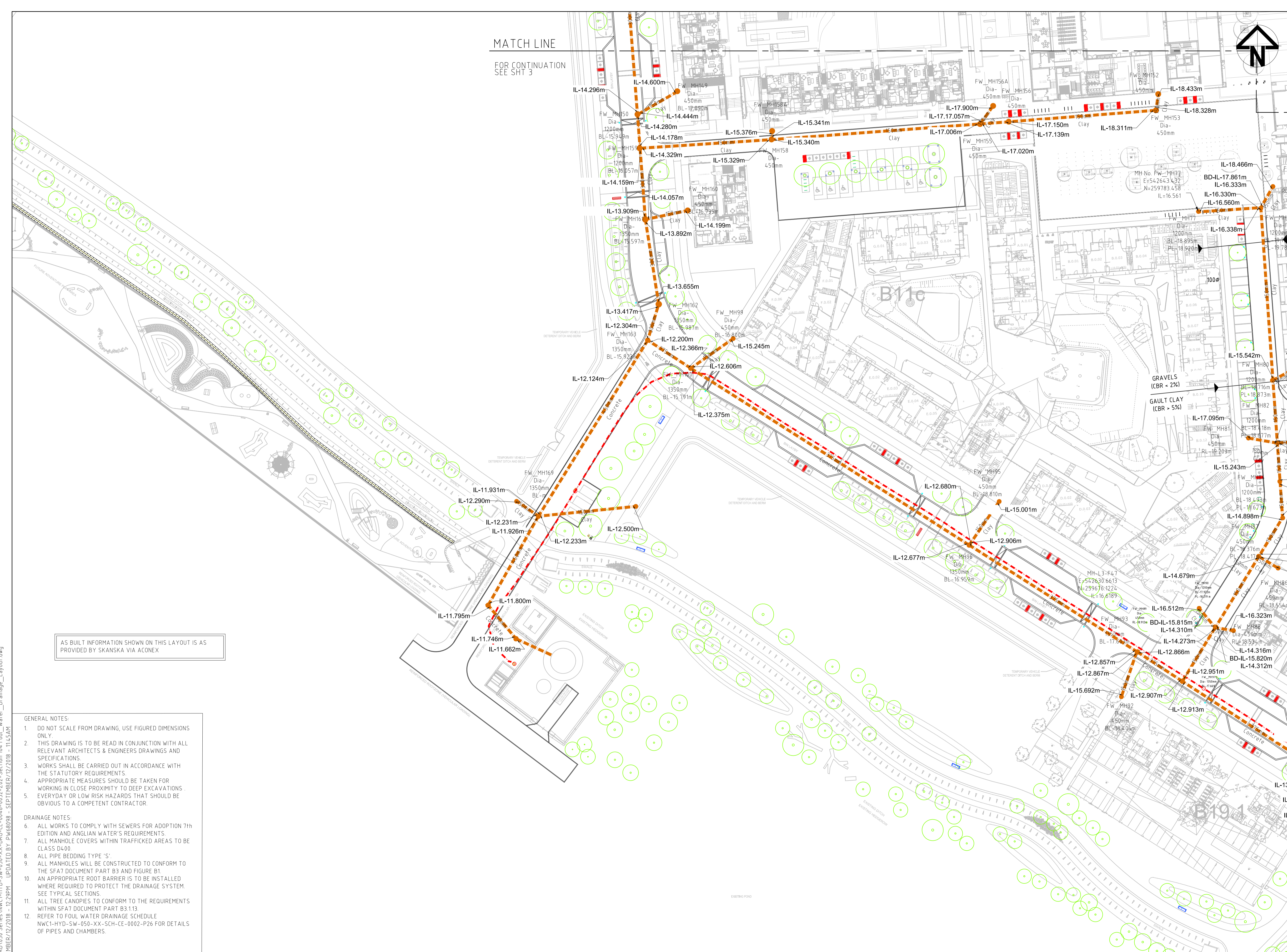
Title: FOUL WATER DRAINAGE SECTION 104 AGREEMENT (SHEET 3 OF 5)

Project No: UA006967

Hyder Consulting (UK) Limited
 Manning House
 22 Carlisle Place
 London SW1P 1JA
 Tel: +44(0) 203 014 9000

Drawing Number: NWC1-HYD-SW-050-XX-DRG-CE-0050

Issue: Z02



ALL CONCRETE TO BE SULPHATE RESISTANT:
 TO ACEC CLASS DS4-AC4 WITHIN GAULT CLAY
 TO ACEC CLASS DS2-AC2 WITHIN GRAVEL AREAS
 TO ACEC CLASS DS1-AC1 IN MADE GROUND

KEY
 - - - - - FOUL SEWER ADOPTABLE NETWORK
 ● FOUL WATER ADOPTABLE MANHOLE
 - - - - - FOUL SEWER NETWORK NOT ADOPTABLE UNDER THIS CONTRACT. FOR DETAILS REFER TO TABLE BELOW.
 - - - - - RISING MAIN

A THESE MANHOLES & SPURS ARE CURRENTLY NOT PART OF THE SECTION 104 WORKS.
 FW_MH76 & Spur 28 000
 FW_MH 79 & Spur 30 000
 FW_MH 83 & SpUR 32 000

B SPURS AND MANHOLES TO FORM PART OF LOT CONTRACTORS 104 APPLICATION.
 Spur Pipe935 Spur Pipe938
 Spur Pipe942 Spur FW_10,000
 Spur Pipe940 Spur FW_36,000
 Spur Pipe936 Spur FW_26,000
 Spur FW_4,000 FW_MH73
 Spur FW_5,000 FW_MH92

HAZARD WARNING

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 - EVERYDAY OR LOW RISK HAZARDS THAT SHOULD BE OBVIOUS TO A COMPETENT CONTRACTOR.
- DRAINAGE NOTES:
- ALL WORKS TO COMPLY WITH SEWERS FOR ADOPTION 7th EDITION AND ANGLIAN WATER'S REQUIREMENTS.
 - ALL MANHOLE COVERS WITHIN TRAFFICKED AREAS TO BE CLASS D4-D0.
 - ALL PIPE BEDDING TYPE 'S'.
 - ALL MANHOLES WILL BE CONSTRUCTED TO CONFORM TO THE SFA7 DOCUMENT PART B3 AND FIGURE B1.
 - AN APPROPRIATE ROOT BARRIER IS TO BE INSTALLED WHERE REQUIRED TO PROTECT THE DRAINAGE SYSTEM. SEE TYPICAL SECTIONS.
 - ALL TREE CANOPIES TO CONFORM TO THE REQUIREMENTS WITHIN SFA7 DOCUMENT PART B3.1.13.
 - REFER TO FOUL WATER DRAINAGE SCHEDULE NW1-HYD-SW-050-XX-SCH-CE-0002-P26 FOR DETAILS OF PIPES AND CHAMBERS.

Z02	AS BUILT - KEY REVISED	12-09-18
Z01	AS BUILT ISSUE	03-07-17
C05	SITE LAYOUT UPDATED	26-09-16
C04	DRAINAGE ANNOTATION REVISED AND NOTES ADDED	22-04-16
C03	ADDED SHEET 5 TO SHOW NEW EXTENT OF FOUL NETWORK	10-12-15
Issue	Description	Date

Client	UNIVERSITY OF CAMBRIDGE
	SKANSKA
	NORTH WEST CAMBRIDGE DEVELOPMENT

Scales	1:500
Original Size	A1
Height Datum	DATUM
Grid	GRID
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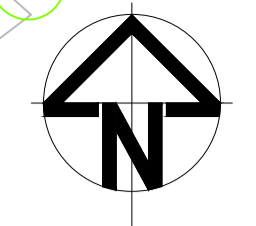
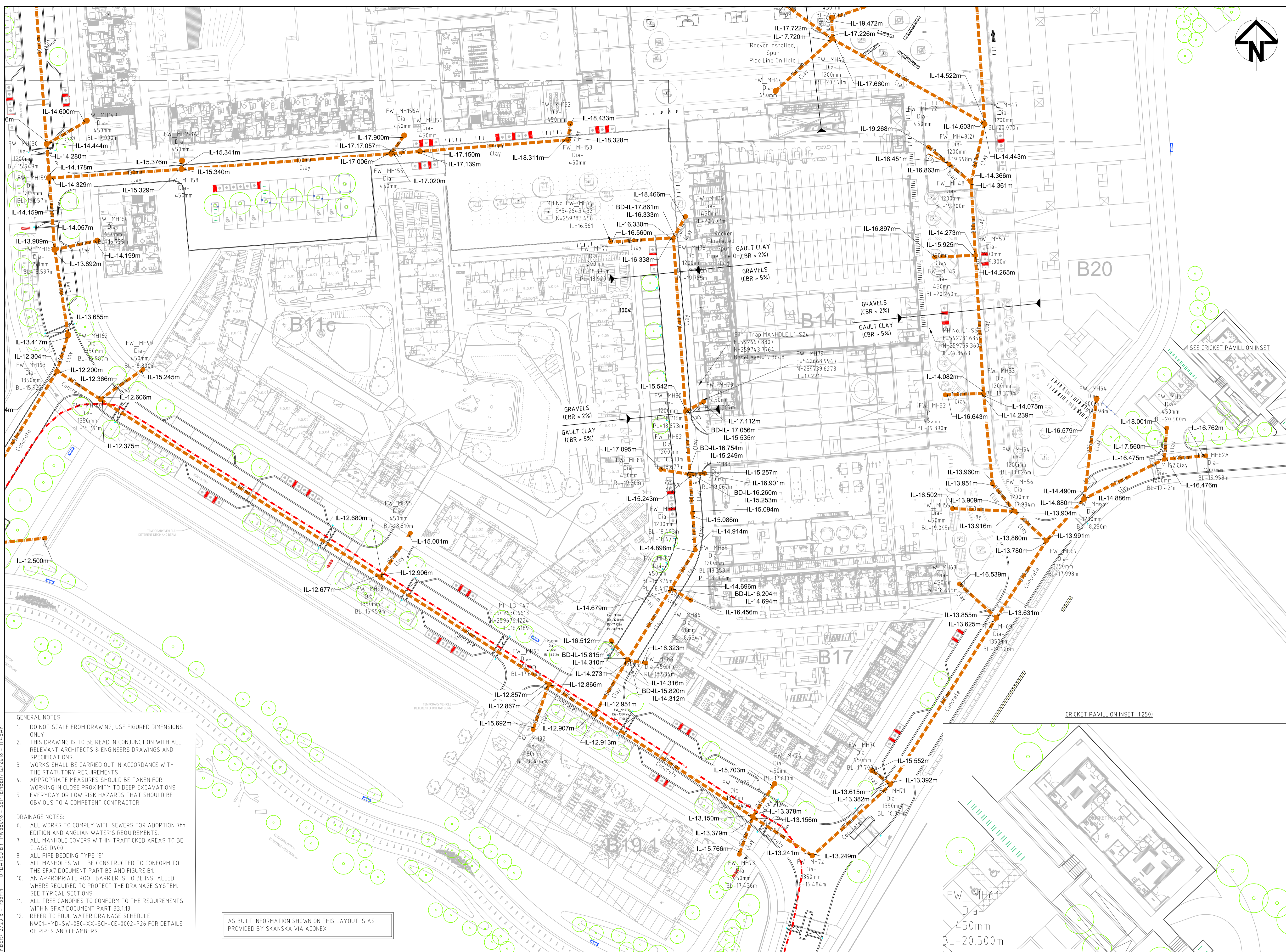
Current Issue Signatures	Status
Author M.GRIFFITHS	AS BUILT
Checker P. JOHNSON	Project
Approver S.A. DAVIES	
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Title	FOUL WATER DRAINAGE SECTION 104 AGREEMENT (SHEET 4 OF 5)
Project No.	UA006967
Drawing Number	NW1-HYD-SW-050-XX-DRG-CE-0051

Client	Hyder Consulting
Address	Hyder Consulting (UK) Limited Manning House 22 Carlisle Place London SW1P 1JA Tel: +44(0) 203 014 9000

Issue	Z02
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 PRINTED BY: PW68098 - SEPTEMBER/17/2018 - 12:29PM - UPDATED BY: PW68098 - SEPTEMBER/12/2018 - 11:55AM



ALL CONCRETE TO BE SULPHATE RESISTANT:
 TO ACEC CLASS DS4-AC4 WITHIN GAULT CLAY
 TO ACEC CLASS DS2-AC2 WITHIN GRAVEL AREAS
 TO ACEC CLASS DS1-AC1 IN MADE GROUND

- KEY
- FOUL SEWER ADAPTABLE NETWORK
 - FOUL WATER ADAPTABLE MANHOLE
 - FOUL SEWER NETWORK NOT ADAPTABLE UNDER THIS CONTRACT FOR DETAILS REFER TO TABLE BELOW.
 - RISING MAIN

A THESE MANHOLES & SPURS ARE CURRENTLY NOT PART OF THE SECTION 104 WORKS.
 Fw_MH76 & Spur 28.000
 Fw_MH79 & Spur 30.000
 Fw_MH83 & Spur 32.000

B SPURS AND MANHOLES TO FORM PART OF LOT CONTRACTORS 104 APPLICATION.
 Spur Pipe935 Spur Pipe938
 Spur Pipe942 Spur Fw_10.000
 Spur Pipe940 Spur Fw_36.000
 Spur Pipe936 Spur Fw_26.000
 Spur Fw_4.000 Fw_MH73
 Spur Fw_5.000 Fw_MH92

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 7. ALL MANHOLE COVERS WITHIN TRAFFICKED AREAS TO BE CLASS D4.00.
 8. ALL PIPE BEDDING TYPE 'S'.
 9. ALL MANHOLES WILL BE CONSTRUCTED TO CONFORM TO THE SFA7 DOCUMENT PART B3 AND FIGURE B1.
 10. AN APPROPRIATE ROOT BARRIER IS TO BE INSTALLED WHERE REQUIRED TO PROTECT THE DRAINAGE SYSTEM. SEE TYPICAL SECTIONS.
 11. ALL TREE CANOPIES TO CONFORM TO THE REQUIREMENTS WITHIN SFA7 DOCUMENT PART B3.113.
 12. REFER TO FOUL WATER DRAINAGE SCHEDULE NWC1-HYD-SW-050-XX-SCH-CE-0002-P26 FOR DETAILS OF PIPES AND CHAMBERS.

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Issue	Description	Date
Z01	AS BUILT	12-09-18
C05	AS BUILTS UPDATED FROM INFORMATION RECEIVED ON 2017-05-31	03-07-17
C04	CRICKET PAVILLION INSET ADDED - CP_FW07 IL AMENDED	29-03-17
C03	DRAINAGE LAYOUT AMENDED & SITE LAYOUT UPDATED	26-09-16
C02	DRAINAGE ANNOTATION REVISED AND NOTES ADDED	22-04-16

Client	UNIVERSITY OF CAMBRIDGE
Client	NORTH WEST CAMBRIDGE DEVELOPMENT

Scales	1:500
Original Size	A1
Height Datum	DATUM
Grid	GRID
Filename	NWC1-HYD-SW-050-XX-DRG-CE-0048-0052-Z02-Section 104 Foul_Water_Drainage_Layout.dwg

Current Issue Signatures	Status
Author M.GRIFFITHS	AS BUILT
Checker P.JOHNSON	Project
Approver S.A.DAVIES	

Title	AS BUILT
Title	FOUL WATER DRAINAGE SECTION 104 AGREEMENT (SHEET 5 OF 5)
Project No.	UA006967

Project No.	UA006967
Drawing Number	NWC1-HYD-SW-050-XX-DRG-CE-0052
Issue	Z01

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 22 Carisle Place
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 Tel: +44(0) 203 014 9000

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 PRINTED BY: PW68098 - SEPTEMBER/17/2018 - 15:35PM - UPDATED BY: PW68098 - SEPTEMBER/17/2018 - 15:35PM





Appendix E Flood Alleviation Scheme



GIRTON CP

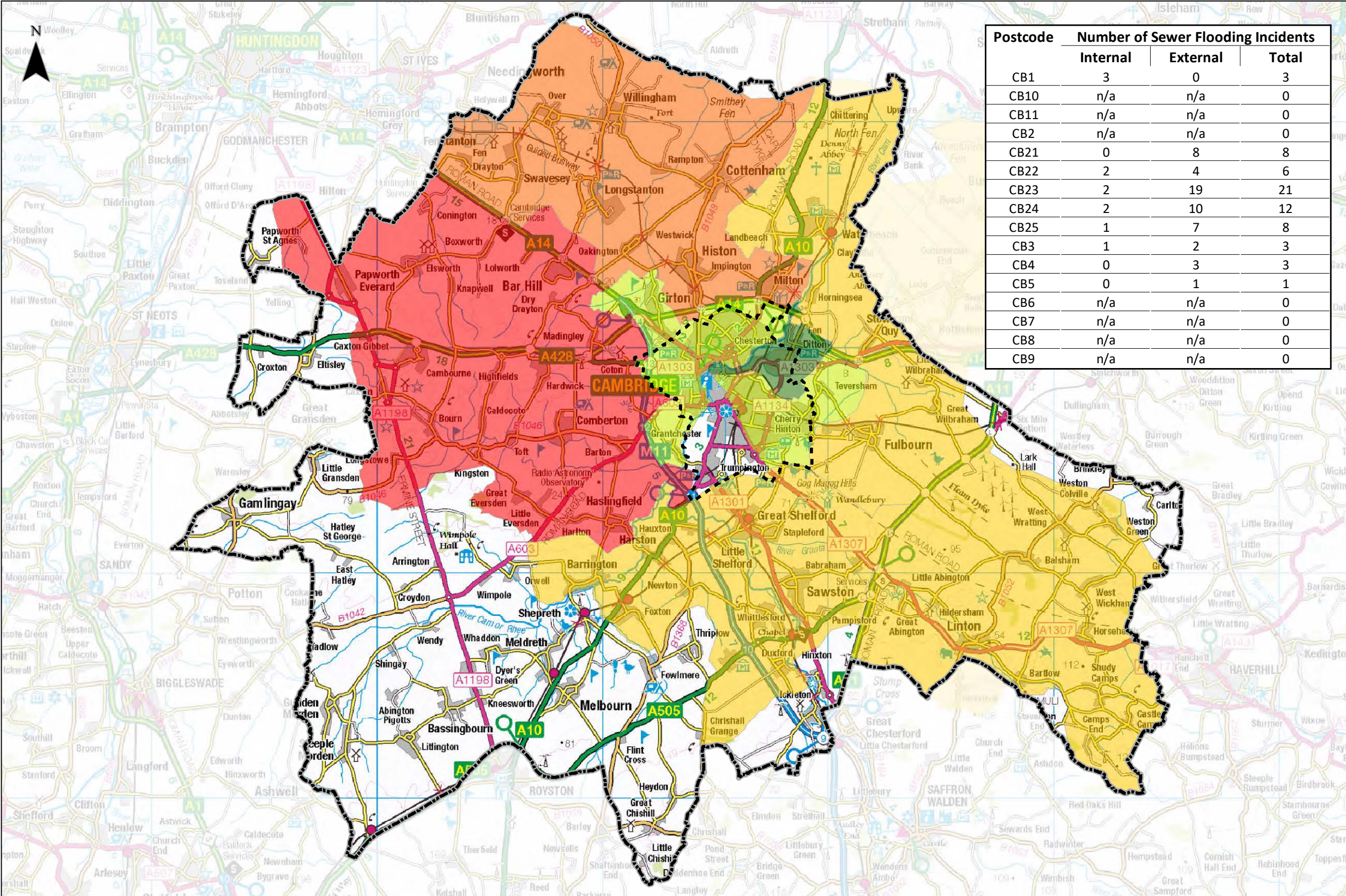
The flood extents are only displayed up to the downstream boundary of the site.
The Original baseline does not show the extents on the western side of the M11

Legend

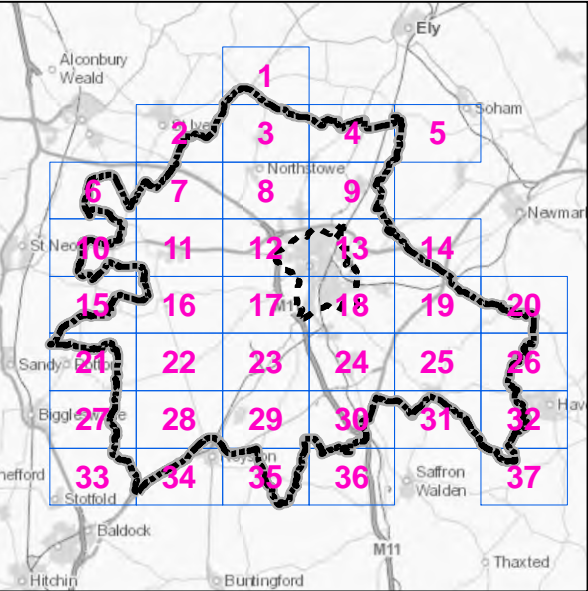
-  Main River
-  Ordinary Watercourses
-  1%AEP + 20 CC Flood Extent for the Original 'With Design' Scenario
-  1%AEP + 25 CC Flood Extent for the Updated 'With Design' Scenario



Appendix F SFRA Maps



Postcode	Number of Sewer Flooding Incidents		
	Internal	External	Total
CB1	3	0	3
CB10	n/a	n/a	0
CB11	n/a	n/a	0
CB2	n/a	n/a	0
CB21	0	8	8
CB22	2	4	6
CB23	2	19	21
CB24	2	10	12
CB25	1	7	8
CB3	1	2	3
CB4	0	3	3
CB5	0	1	1
CB6	n/a	n/a	0
CB7	n/a	n/a	0
CB8	n/a	n/a	0
CB9	n/a	n/a	0



Legend

Study Area

- Cambridge City Boundary
- South Cambridgeshire Boundary

Total Number of Incidents

- 0
- 1
- 2 - 5
- 6 - 10
- 11 - 15
- > 15

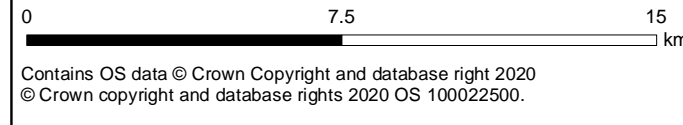
Notes

The Historic Sewer Flooding map uses the DG5 register provided by the sewerage company, Anglian Water, which is a record of all reported sewer flooding incidents.

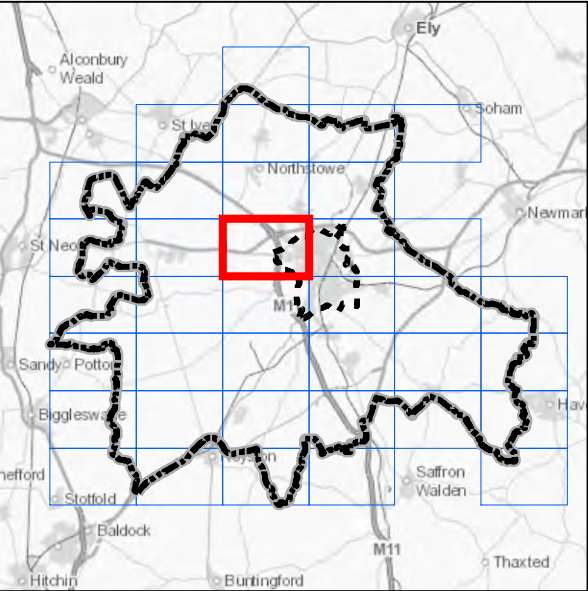
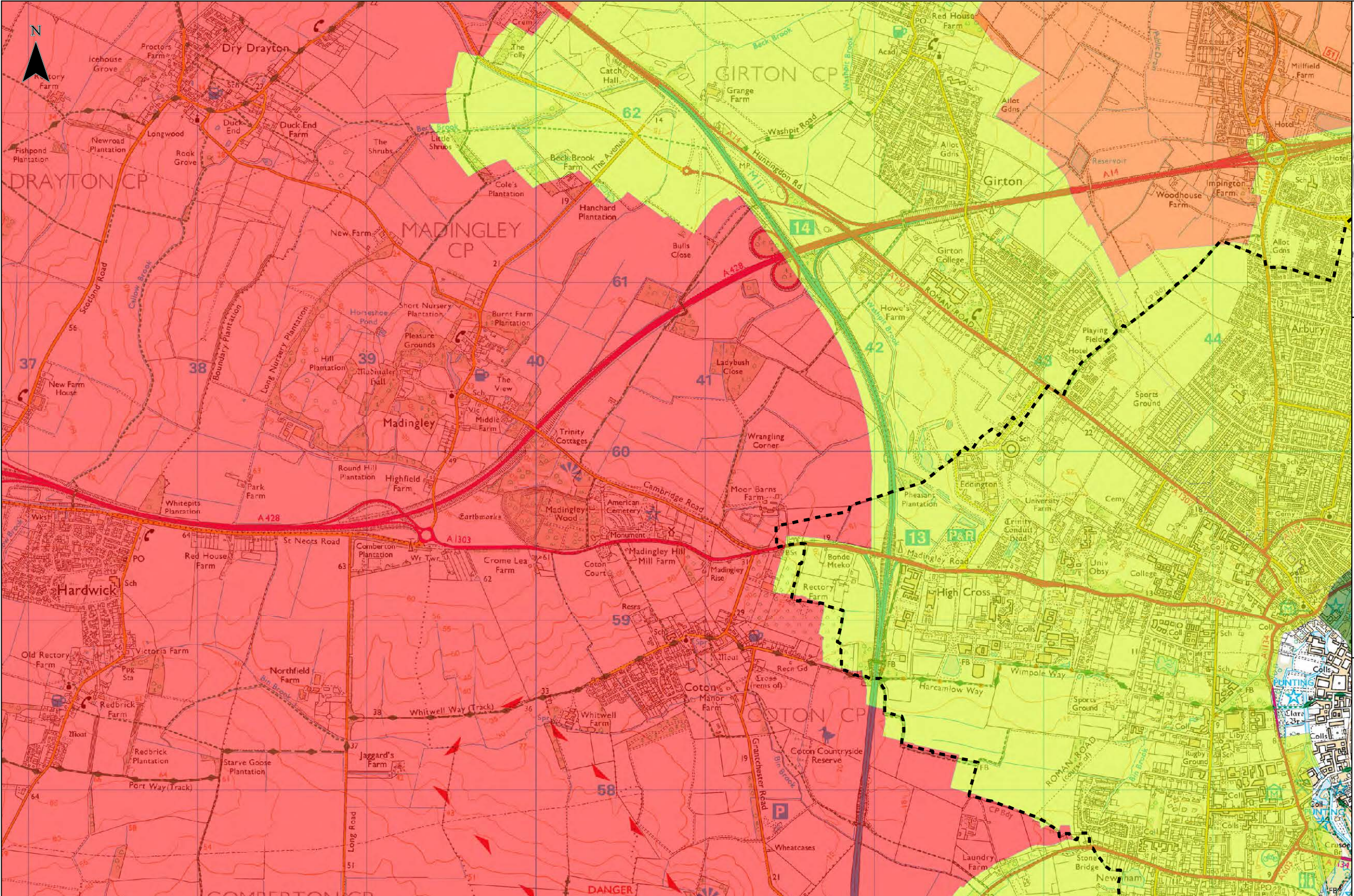
The incidents are recorded on a postcode basis, therefore each coloured area represents the total number of reported incidents, both internal and external, within that postcode. The greatest number of incidents reported was 21 in the CB23 area.



Greater Cambridge Integrated Water Management Study
 Historic Sewer Flooding



Sheet Number: Master	1:180,000 @ A3	Date: 26/07/2021
	Drawn: MD	Checked: PJ
	Figure: 48444/4005/GIS029	Rev A



Legend

Study Area

- Cambridge City Boundary
- South Cambridgeshire Boundary

Total Number of Incidents

- 0
- 1
- 2 - 5
- 6 - 10
- 11 - 15
- > 15

Notes

The Historic Sewer Flooding map uses the DG5 register provided by the sewerage company, Anglian Water, which is a record of all reported sewer flooding incidents.

The incidents are recorded on a postcode basis, therefore each coloured area represents the total number of reported incidents, both internal and external, within that postcode. The greatest number of incidents reported was 21 in the CB23 area.



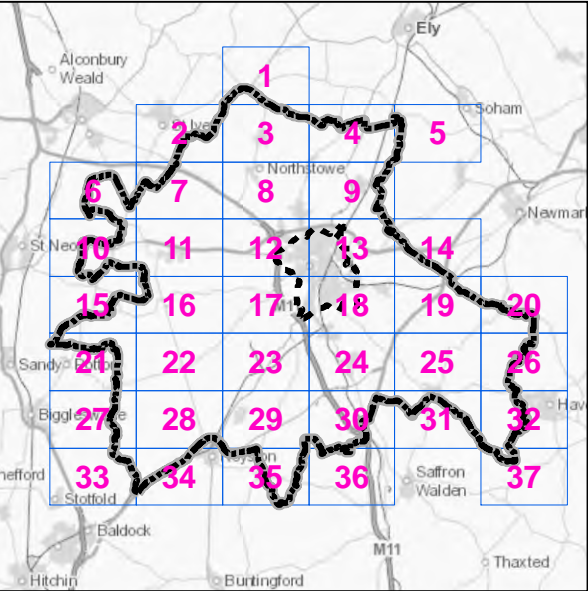
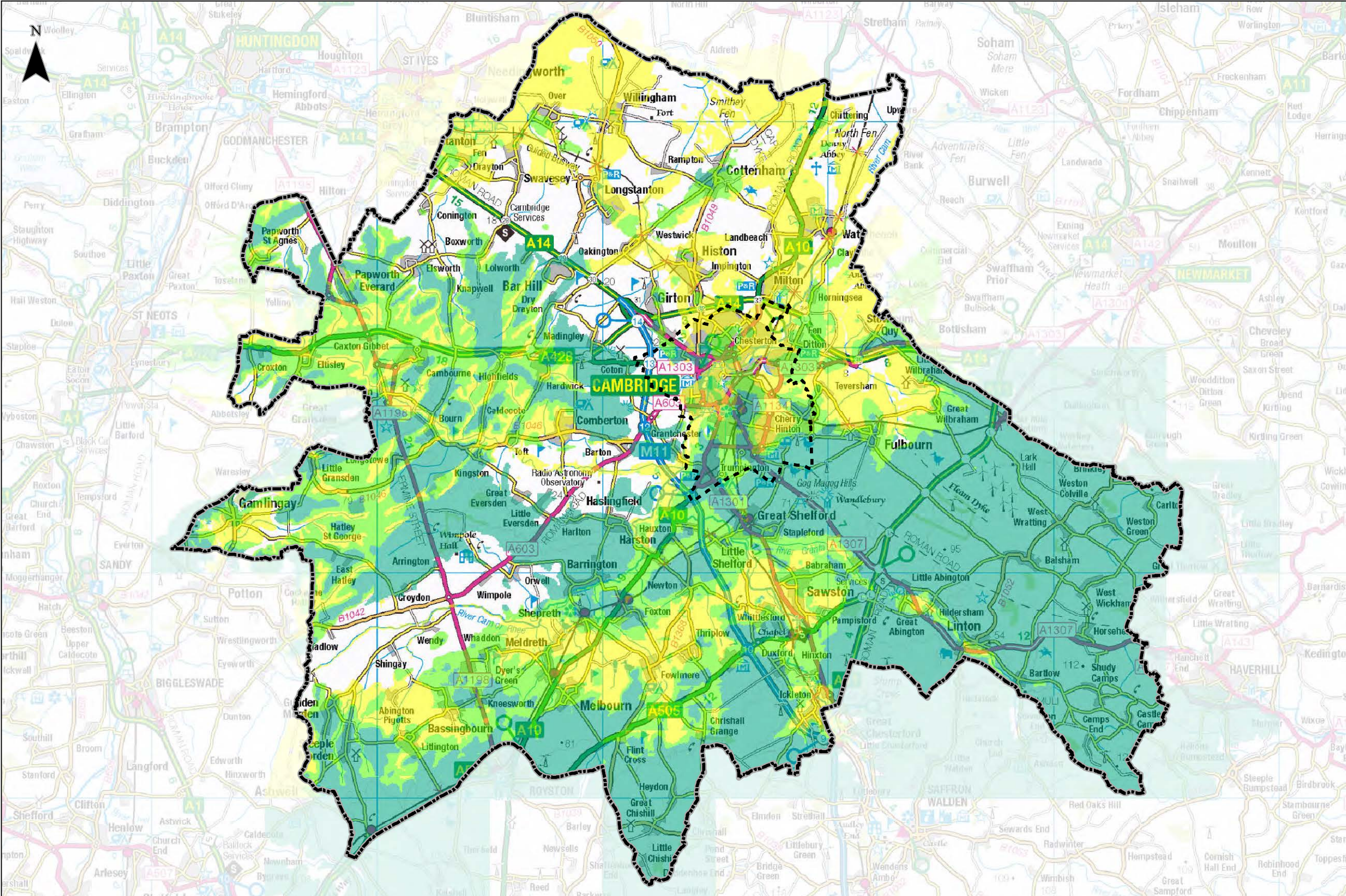
Greater Cambridge Integrated Water Management Study
Historic Sewer Flooding

0 1 2 km

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Sheet Number:
12 of 37

1:23,980 @ A3 Date: 26/07/2021
 Drawn: MD Checked: PJ
 Figure: 48444/4005/GIS029 Rev A



Legend

Study Area

- Cambridge City Boundary
- South Cambridgeshire Boundary

Groundwater Flooding Potential

- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

Notes

The Susceptibility to Groundwater Flooding dataset indicates areas where geological conditions could enable groundwater flooding to occur, whether that be close to the ground surface or at the surface. It has been produced by the British Geological Survey (BGS) and classifies the potential of groundwater flooding, based on geological and hydrogeological information, into three classes:

- 'Limited potential for groundwater flooding to occur';
- 'Potential for groundwater flooding of property situated below ground level';
- 'Potential for groundwater flooding to occur at surface'.

Areas not classified as any of these are not considered to be prone to groundwater flooding.

It should be noted that the data indicates susceptibility to groundwater flooding and not illustrate hazard or risk; therefore should not be used on its own to inform planning decisions at any scale.



Greater Cambridge Integrated Water Management Study
 Susceptibility to Groundwater Flooding

0 7.5 15 km

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Figure: 48444/4005/GIS024 Rev A