A Report for

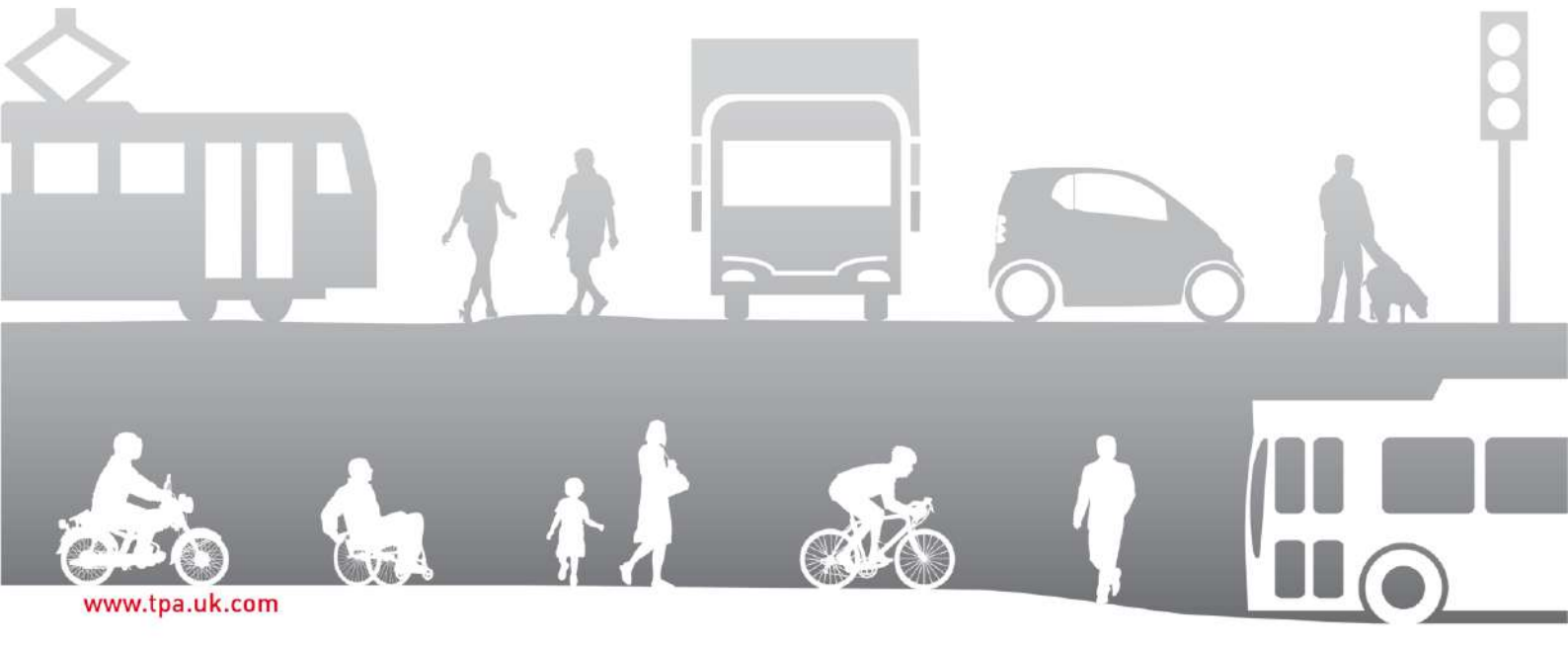
TAYLOR WIMPEY STRATEGIC LAND

In respect of

Land North of Cambridge Road (A1307), Linton

Flood Risk Assessment & Drainage Strategy Report

February 2020



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CONTENTS PAGE

LIST OF FIGURES

LIST OF APPENDICES

EXECUTIVE SUMMARY

Transport Planning Associates has been commissioned by Taylor Wimpey Strategic Land in collaboration with the landowner to support the promotion of 'Land North of Cambridge Road (A1307), Linton' to be referred to hereafter as 'the Site'.

The Site is identified as being within Flood Zones 1, 2 and 3, where there is less than 0.1%, between 0.1% and 1% and more than 1% annual probability of river or sea flooding respectively.

The Site superficial deposits are classified as part of Alluvium – Clay, Silt, Sand and Gravel and the River Terrace Deposits, 1 to 2 – Sand and Gravel. The bedrock deposits is underlain with the New Pit Chalk Formation – Chalk.

The nearest Main River to the Site is the River Granta, which is located to the north of the Site. There are also a number of minor drains within the Site and its immediate vicinity which currently discharge into the existing River Granta.

According to Anglian Water asset map, there is no surface water public sewer within the Site's vicinity. However, there is a foul water public sewer running to the west of the proposed development and to the north of the River Granta.

Following the hierarchy of the surface water disposal, stated within The Building Regulations approved documents Part H, there are three options for the management of surface water drainage at the Site:

- An adequate soakaway/infiltration system;
- Discharge into the nearest watercourse; or
- Discharge into the existing public sewer.

The underlying soil type is considered to be compatible for using infiltration techniques as a way to manage the surface water drainage runoff. However, specific on-site infiltration testing will be required in order to confirm whether the existing Site ground conditions are compatible for the storage of groundwater.

Should the on-site infiltration testing demonstrates that the storage of groundwater is not a viable method for the management of the surface water drainage runoff, attenuation and discharge within the nearest watercourse will be proposed as part of the overall surface water drainage strategy.

A pre-planning enquiry has been submitted to Anglian Water in order to receive further information with regards to how to deal with foul water drainage flows. As part of the Pre-Planning Enquiry, a confirmation of the current capacity within the existing foul water public sewer network and a proposed connection point will be provided.

The drainage strategy has been developed with reference to the relevant national and local guidance documents, including making adequate allowances for climate change (40%) and urban creep (10%), which is known as the loss of permeable surfaces within urban areas creating increased runoff which contributes to flooding and other problems.

It is considered that this assessment represents a comprehensive and robust analysis of the flood impact of the development upon other adjacent properties and of existing flood mechanisms on the development itself.

It demonstrates that the proposed development is sustainable in terms of flood risk and the management of foul and surface water drainage.

1 INTRODUCTION

1.1 Transport Planning Associates (TPA) has been instructed by Taylor Wimpey Strategic Land in collaboration with the landowner to support the promotion of Land North of Cambridge Road (A1307), Linton ('the Site'), for future residential development of circa 85 dwellings and assess its suitability in flood risk and drainage related terms.

1.2 The Site is an amended version of a previously submitted larger site which extended to land south of the A1307, and was originally submitted as part of the Greater Cambridge Local Plan: Call for sites 2019 consultation.

1.3 These submissions form part of a series of representations in response to the new Greater Cambridge Local Plan Issues and Options 2020 consultation which is seeking potential sites to be put forward and allocated for future development, in order to inform the upcoming Greater Cambridge Joint Local Plan.

1.4 As part of this call for sites, each site or location will be assessed on its suitability, availability and achievability for future development, with local planning constraints also considered.

1.5 In response to this criteria, key flood risk and drainage related matters will be addressed in relation to the Site. This will include the identification of achievable and appropriate methods for the delivery of the Site in terms of flood risk, foul and surface water drainage.

1.6 This report has been prepared to support the potential development of this Site and demonstrate that a development at this location is acceptable and also appropriate measures can be adopted to manage flood risk and drainage.

Flood Risk Assessment

1.7 The Flood Risk Assessment ('FRA') is a desktop study to ascertain potential flood risks to the development Site by gathering information from:

- The British Geological Survey ('BGS') 'Superficial' and 'Bedrock' maps;
- The Environment Agency ('EA') 'Flood Maps';
- The South Cambridgeshire District Council Strategic Flood Risk Assessment dated September 2010 ('SCDC SFRA'), and;
- Cambridgeshire Flood and Water Supplementary Planning Document.

Foul and Surface Water Management Strategy

1.8 The management of foul and surface water will be undertaken in accordance with the Sewers for Adoption ('SfA') (A Design and Construction Guide for Developers) to ensure that an appropriate system is developed for dealing with both foul and surface water generated by the Site.

1.9 The management of the surface water will acknowledge any sources of flooding discovered in the FRA, provide guidance to the developer on how to manage surface water runoff and provide evidence that the developed Site's surface water runoff will be managed, using the appropriate system to at least mimic the current flows.

2 EXISTING SITE

Site Location

2.1 The Site is located in Linton, Cambridgeshire. It is currently Greenfield and it is bounded to the west by a residential area, to the south by Cambridge Road (A1307), to the east by Mill Lane and to the north by the River Granta.

2.2 The nearest post code is CB21 4NL and the approximate grid reference for the centroid of the Site is X_556287, Y_246503.

2.3 A copy of the Site Location Plan is included in **Appendix A**.

Site Description

2.4 The total Site area is approximately 6.32 ha and it is currently Greenfield.

2.5 A topographical survey carried out by Survey Solutions shows that the Site falls naturally from south to north of the Site, with levels ranging from approximately 42.50 m AOD to the south and 38.00 m AOD to the north of the Site.

2.6 A copy of the topographical survey and the existing ground levels model have been included within **Appendix B**.

2.7 The nearest Main River to the Site is the River Granta, which is located to the north of the Site.

2.8 There are also a number of minor drains within the Site and its immediate vicinity which currently discharge into the existing River Granta.

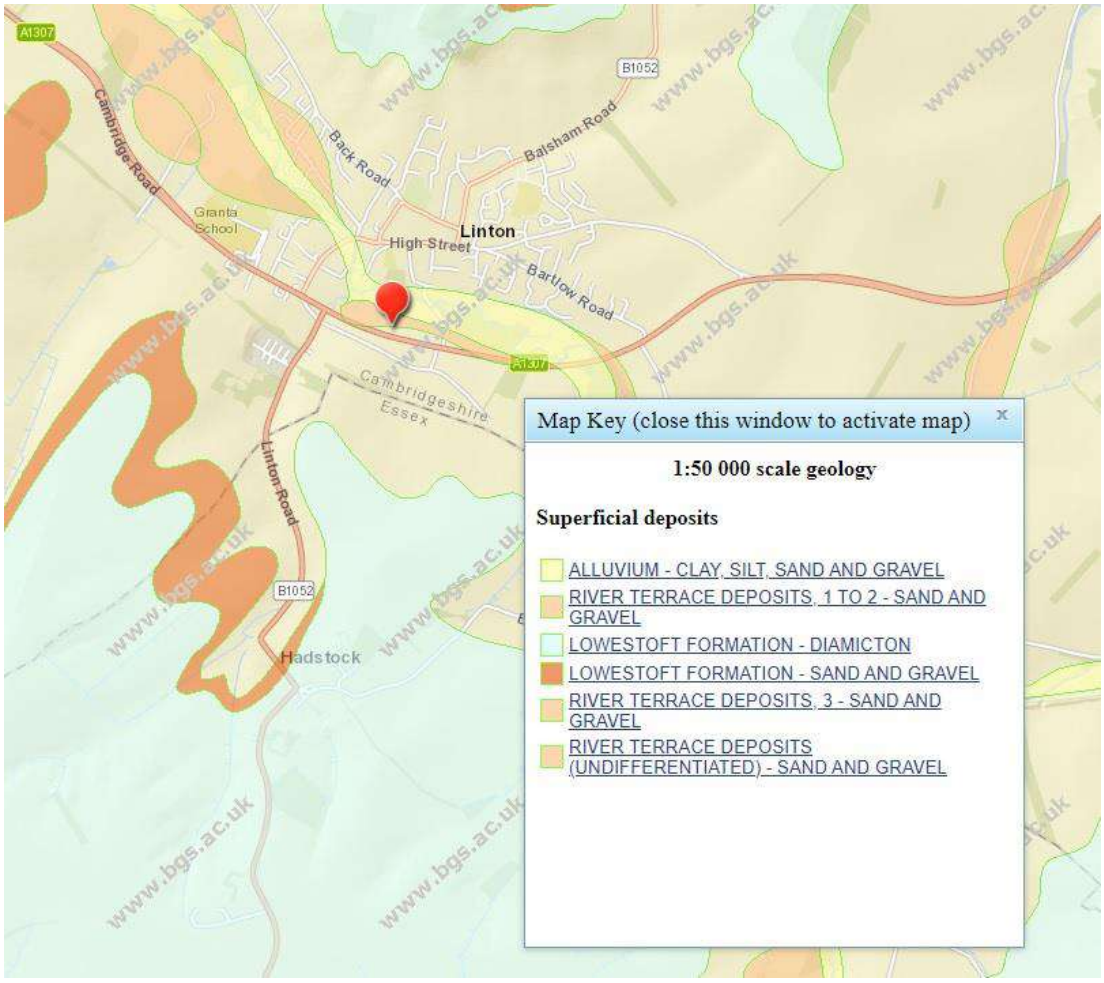
Site Geology

2.9 The BGS maps have been studied to identify the Site's geological properties. The following figures demonstrate the information extracted from BGS maps with the indicative Site location highlighted in red.

Geology

2.10 Figure 2.1 below shows the Site's superficial deposit geological information:

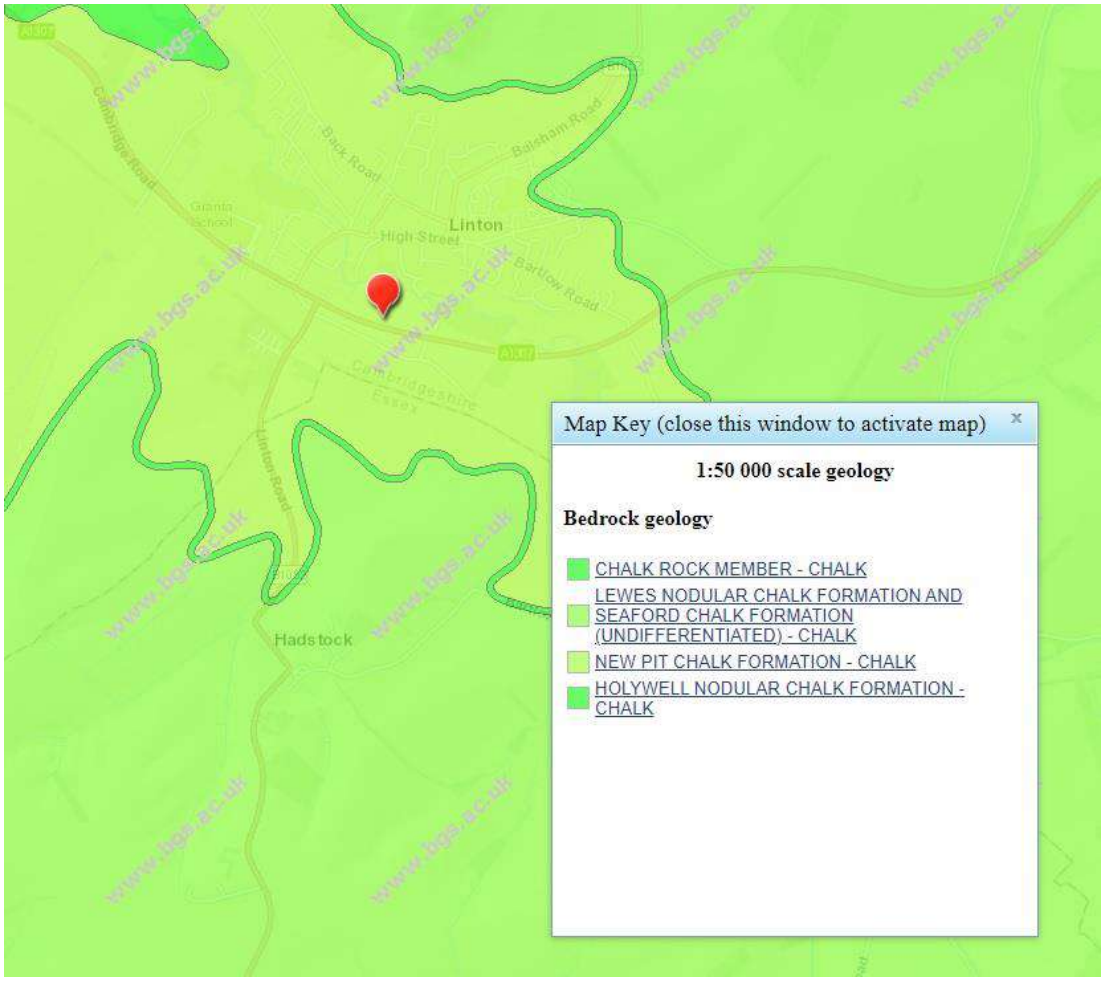
Figure 2.1 British Geological Surveys – Superficial Geology Map



2.11 Figure 2.1 shows that the Site's superficial deposits are classified as part of the Alluvium – Clay, Silt, Sand and Gravel and the River Terrace Deposits, 1 to 2 – Sand and Gravel.

2.12 Both superficial deposits, the Alluvium and the River Terrace Deposits were formed up to 2 million years ago in the Quaternary Period where the local environment was previously dominated by rivers. These sedimentary deposits are fluvial in origin. They are detrital, ranging from coarse to fine-grained and form beds and lenses of deposits reflecting the channels, floodplains and levees of a river or estuary (if in a coastal setting).

Figure 2.2 British Geological Surveys – Bedrock Geology Map



2.13 Figure 2.2 identifies that the Site is underlain by the New Pit Chalk Formation – Chalk. This soil type is considered to be a sedimentary bedrock formed approximately 90 to 94 million years ago in the Cretaceous Period where the local environment was previously dominated by warm chalk seas.

2.14 These sedimentary rocks are shallow-marine in origin. They are biogenic and detrital, generally comprising carbonate material forming distinctive beds of chalk.

Hydrogeology

2.15 The Magic Map Application, shows the Site to be entirely underlain by a Principal bedrock Aquifer which according to the BGS records, comprises the New Pit Chalk Formation – Chalk.

2.16 Such aquifers comprise layers of rock or drift deposits that have a high intergranular and/r fracture permeability, which usually provide a high level of water storage. As such, they may support water supply and river baseflow on a strategic scale.

2.17 The Site is designated as being in an area of medium-high groundwater vulnerability. Also, the SCDC SFRA Groundwater Source Protection Zones Map shows that the eastern area of the Site lies within Zone 2 'Outer Protection Zone' and the western area of the Site is within Zone 3 'Total Catchment'.

2.18 The Zone 2 'Outer Protection Zone' is defined by a 400 day travel time from a point below the water table. The previous methodology gave an option to define SPZ2 as the minimum recharge area required to support 25 per cent of the protected yield. This option is no longer available in defining new SPZs and instead this zone has a minimum radius of 250 or 500 metres around the source, depending on the size of the abstraction.

2.19 The Zone 3 'Total Catchment' is defined as the area around a source within which all groundwater recharge is presumed to be discharged at the source. In confined aquifers, the source catchment may be displaced some distance from the source. For heavily exploited aquifers, the final Source Catchment Protection Zone can be defined as the whole aquifer recharge area where the ratio of groundwater abstraction to aquifer recharge (average recharge multiplied by outcrop area) is >0.75. There is still the need to define individual source protection areas to assist operators in catchment management.

Hydrology

2.20 The nearest surface water feature is an existing off-site pond located to the west of the Site.

2.21 There are also a numbers of existing drains located within the Site and its surroundings and also there is a Main River, the River Granta, located alongside the northern boundary of the Site.

On-Site Soakaway Testing

2.22 According to the SDCD SFRA, the Site lies within an area designated as having a high potential for infiltration. However, specific on-site infiltration testing will be required in order to confirm whether the existing Site ground conditions are compatible for the storage of groundwater.

2.23 As part of the soakaway testing works, groundwater levels will be monitored within all trial pits, so there will be recorded evidence of the existing groundwater table levels.

2.24 It is recommended that this on-site intrusive works are undertaken prior to the submission of the planning application in order to provide the required evidences that infiltration is or is not a feasible option for the management of the proposed surface water drainage runoff.

3 FLOOD RISK

3.1 The EA Flood Maps for planning and the SCDC SFRA have been consulted to identify the flood zone for the Site, as well as potential sources of flooding facing the development. These potential sources of flooding may be categorised as follows:

- Flood risk from Rivers of the Sea;
- Flood risk from Surface Water;
- Flood risk from Reservoirs;
- Overland Flooding;
- Groundwater Flooding, and;
- Historic Flooding.

3.2 Each of the above sources of flooding with regards to their effect and proposed method of mitigation on the development is addressed below.

3.3 A copy of the Flood Mapping obtained from the EA web and the SCDC SFRA which identify the potential flooding issues in the area for each flood source is included in **Appendix C**.

Flood Risk from Rivers and the Sea

3.4 According to the EA Flood mapping, the Site lies within Flood Zones 1, 2 and 3:

- Flood Zone 1 extent is shown within the southern extent of the Site, where there is less than 0.1% of annual probability of river or sea flooding. Therefore, the probability of flooding by this means is considered to be negligible within this area.
- Flood Zone 2 is identified predominantly within the northern and western area of the Site, but also there is an area to the southern area where there is between 0.1% and 1% of annual probability of river or sea flooding. Therefore, the probability of flooding by this means is considered to be medium in this area.
- Flood Zone 3 is mainly highlighted within the northern area of the Site, where there is more than 1% of annual probability of river or sea flooding. Therefore, the probability of flooding by this means is considered to be high.

3.5 In principle, it seems that development proposal seeks for the construction for circa 85 residential dwellings. The approximate area within Flood Zone 1 is 3.90 ha and the standard development density in the UK is between 30-40 dwellings per hectare.

3.6 Based on the above parameters, the level of development identified can be accommodated within Flood Zone 1 and 2, where a residential use is always permitted according to the National Planning Policy Framework ('NPPF'), as the development density circa 85 residential dwellings and 3.90 ha is approximate 22 dwellings per hectare.

3.7 However, given that the northern Site area is affected by Flood Zone 3, it will be required to undertake a detailed hydraulic modelling, so the exact area affected by Flood Zone 3 and the predicted flooded volume can be accurately measured.

Flood Risk from Surface Water

3.8 Surface water flooding is caused when the volume of rainwater falling does not drain through the existing drainage systems or soak into the ground, but lies on or flows over the ground instead. This type of flooding is usually short lived and associated with heavy downpours of rain, thunder storms etc.

3.9 According to the EA Flood mapping, the southern area of the Site is identified as being at very low risk of surface water flooding, which means that each year this area has a chance of flooding of less than 0.1%.

3.10 However, the northern area of the Site is highlighted as being at low, medium and high risk of surface water flooding, which means that each year this area has a chance of flooding of between 0.1% and 1%, 1% and 3.3% and more than 3.3% respectively.

3.11 The ongoing risk of surface water flooding can be mitigated by using conveyance features, which will collect and convey this runoff to the final point of the discharge within the proposed SuDS features, where this extra volume will be accommodated.

Flood Risk from Reservoirs

3.12 The EA Flood mapping confirms that the Site is not at risk of flooding from reservoirs and therefore the probability of flooding by this source is considered to be negligible.

Overland Flooding

3.13 As previously mentioned, the Site is bounded to the west by a residential area, to the south by Cambridge Road (A1307), to the east by Mill Lane and to the north by the River Granta.

3.14 The Site falls naturally from south to north of the Site, with levels ranging from approximately 42.50 m AOD to the south and 38.00 m AOD to the north of the Site.

3.15 Overland flows from the proposed development are expected to be minimal as the land is currently Greenfield and these flows will drain away from the proposed development to the lowest point of the Site.

3.16 Therefore, it is proposed that overland flows run from south to north prior to being infiltrated within the ground or reaching the lowest point of the Site towards to the existing River Granta located to the northern area of the Site.

Groundwater Flooding

3.17 Groundwater flooding is defined here as the emergence of groundwater at the ground surface away from perennial river channels or the rising of groundwater into man-made ground, under conditions where the normal ranges of groundwater level and groundwater flow are exceeded.

3.18 Groundwater flooding is highly variable and dependant on localised ground conditions.

3.19 In accordance with the SCDC SFRA Groundwater Source Protection Zones Map, the eastern area of the Site lies within Zone 2 'Outer Protection Zone' and the western area of the Site is within Zone 3 'Total Catchment'.

3.20 Furthermore, the SDDC SFRA shows that the Site is designated as being in an area of medium-high groundwater vulnerability. However, there are no records of any historic flooding from groundwater within the Linton area.

3.21 As mentioned above on this report, groundwater levels will be monitored once the on-site soakaway testing is undertaken, which will confirm where the groundwater table level is and whether the Site is or is not at risk of groundwater flooding.

3.22 Therefore, at this stage, the risk of groundwater flooding within the Site is considered to be medium.

Historic Flooding

3.23 The SCDC SFRA identifies a number of recorded historic flood events, which are summarised within Table 4A &B included in **Appendix C**.

Residual Risk and Designing for Exceedance

3.24 It is recommended that the final layout uses the proposed road infrastructure to provide drainage exceedance (overland flood flow) routes through the development and towards to the River Granta for events more than the capacity of the drainage system.

3.25 If the capacity of the attenuated storage is exceeded, ground levels should be profiled to direct overland flows towards to the existing River Granta located to the northern area of the Site.

3.26 In order to mitigate the impact from Flood Zone 3, it will be proposed that a SuDS feature located alongside the southern extent of the River Granta will be provided in order to accommodate the predicted flooded volume resulting from extreme rainfall events obtained from the detailed hydraulic modelling. We can also provide an embankment between the northern area of the development and the southern side of this proposed SuDS feature as a flood defence to the future development.

Policy Guidance

3.27 The NPPF looks further into more community driven priorities. Its main driver is sustainability making developments concentrate on how the proposals impact upon the community in which it resides. It incorporates a number of key objectives including providing quality homes, improving quality of life and meeting the challenge of climate change, flooding and coastal change.

3.28 Where the NPPF relates to Flooding and Flood Risk it states:

> ***"155. Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.***
>
> ***156. Strategic policies should be informed by a strategic flood risk assessment, and should manage flood risk from all sources. They should consider cumulative impacts in, or affecting, local areas susceptible to flooding, and take account of advice from the Environment Agency and other relevant flood risk management authorities, such as lead local flood authorities and internal drainage boards.***
>
> ***157. All plans should apply a sequential, risk-based approach to the location of development – taking into account the current and future impacts of climate change so as to avoid, where possible, flood risk to people and property. They should do this, and manage any residual risk, by:***
>
> - ***applying the sequential test and then, if necessary, the exception test as set out below;***
> - ***safeguarding land from development that is required, or likely to be required, for current or future flood management;***
> - ***using opportunities provided by new development to reduce the causes and impacts of flooding (where appropriate through the use of natural flood management techniques); and***
> - ***where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to relocate development, including housing, to more sustainable locations.***
>
> ***158. The aim of the sequential test is to steer new development to areas with the lowest risk of flooding. Development should not be allocated or permitted if there are reasonably available s appropriate for the proposed development in areas with a lower risk of flooding. The strategic flood risk assessment will provide the basis for applying this test. The sequential approach should be used in areas known to be at risk now or in the future from any form of flooding.***
>
> ***159. If it is not possible for development to be located in zones with a lower risk of flooding (taking into account wider sustainable development objectives), the exception test may have to be applied. The need for the exception test will depend on the potential vulnerability of the Site and of the development***

proposed, in line with the Flood Risk Vulnerability Classification set out in national planning guidance.

160. The application of the exception test should be informed by a strategic or specific flood risk assessment, depending on whether it is being applied during plan production or at the application stage. For the exception test to be passed it should be demonstrated that:

- ***the development would provide wider sustainability benefits to the community that outweigh the flood risk; and***
- ***the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.***

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

3.29 The Site is located within Flood Zones 1, 2 and 3. However, development proposal seeks for the construction of 85 residential dwellings which can be accommodated within the area highlighted as being located within Flood Zones 1 and 2. Flood Zones 1 and 2 comply with the Sequential Test and are therefore suitable for a Residential use. The proposed development meets the requirements of Sections 155 to 160 of the NPPF.

3.30 Based upon Tables 1-3 of the NPPF 'Technical Guidance' the Site is identified within the EA Flood Maps as being within Flood Zones 1, 2 and 3 (Table 1), the proposed residential land use is categorised as being 'More Vulnerable' from effects of flooding (Table 2). Table 3 indicates that a 'More Vulnerable' categorised Site, such as proposed for the Site, is an appropriate land use for a Flood Zones 1 and 2, and an Exception Test is not required.

4 DEVELOPMENT PROPOSALS

4.1 This representation is made in the context of promoting this Site for residential development of circa 85 dwellings, open space, landscaping and new vehicular access points from Cambridge Road.

4.2 The Site being promoted is a refined version of that which was previously submitted by Taylor Wimpey to the Greater Cambridge 2019 SHELAA Call for Sites consultation. The Site extent has been reduced from the previous larger 'Land at Mill Lane and Long Lane, Linton, CB21 4NL' and now simply comprises Land North of Cambridge Road (A1307), Linton. This smaller area is confined to land directly abutting the existing settlement boundary for Linton and now benefits from masterplanning and technical work to assess its suitability for residential development.

5 PROPOSED SURFACE WATER DRAINAGE STRATEGY

5.1 In order to demonstrate that all forms of flooding have been considered as required by the NPPF a drainage strategy has been developed. The aim of including this strategy as part of the flood risk assessment is so that it can easily be seen that the proposed development will not adversely affect the surface water regime in the area and that overall the current situation will be improved.

Existing Surface Water Drainage

5.2 According to the SCDC SFRA SuDS Infiltration Feasibility Plan, the Site lies within an area designated as having a high potential for infiltration, which allows for the basic assumption that the current runoff infiltrates within the ground.

5.3 The nearest Main River to the Site is the River Granta, which is located to the north of the Site.

5.4 There are also a number of minor drains within the Site and its immediate vicinity which currently discharge into the existing River Granta.

5.5 There are no foul, surface or combined sewers located within the Site. However, there is a foul water public sewer located mainly to the west and north of the proposed development.

5.6 As the Site is currently Greenfield, all flows from the Site would drain naturally to the lowest point of the Site prior to being infiltrated within the ground or reaching the lowest point of the Site towards to the existing River Granta.

5.7 The Greenfield runoff rate for the 1in1 year return period has been calculated as 12.6 l/s, for the Greenfield Site, as shown in **Appendix D**.

Proposed Surface Water Drainage Strategy

5.8 Findings from research have demonstrated that:

- The Site is located within Flood Zones 1, 2 and 3. However, it will be proposed that the residential development circa 85 dwellings will be located within the area identified as being at Flood Zone 1;
- The Site is underlain by bedrock which has potential for using infiltration techniques for the management of the surface water runoff;
- There are a number of drains within the Site and its surroundings and the River Granta is located alongside the northern Site boundary, and;
- There is no surface water public sewer within the immediate vicinity of the Site.

5.9 It is proposed that a Surface Water Management Plan ('SWMP') will use SuDS for the 1in100 years plus 40% climate change, in a manner which mimics the surface water flow rate and volume from the Site whilst providing water cleansing, through the provision of appropriate management trains.

5.10 The hierarchy of the surface water disposal, stated within the Building Regulation approved document Part H, is as follows:

- An adequate soakaway/infiltration system;
- Discharge into the nearest watercourse; and,
- Discharge into the existing public sewer.

5.11 The evidences collected from the BGS bedrock geology map and the SCDC SFRA allow for the basic assumption that the Site may have a high potential for using infiltration as part of the overall surface water drainage strategy.

5.12 However, in order to demonstrate and provide further evidences to the Local Lead Flood Authority ('LLFA') that infiltration is a viable method for the management of the surface water disposal, specific on-site infiltration testing will be required across the Site.

Surface Water Drainage Strategy – Option A – Infiltration

5.13 Should on-site infiltration testing results demonstrate that the rates achieved are within the range for using infiltration as part of the overall surface water drainage strategy, the SWMP recommends the following approach:

- Domestic drainage from roofs shall discharge into water butts located at the ends of rainwater downpipes. The water butts will have a high level overflow to take excess flows into the infiltration drainage solution associated with the property.
- The excess flows from roofs will be catered for by a private soakaway at the rear garden of each plot. The soakaway must be located at least 5 metres away from any building.
- Permeable paving granular filtration structures within private drives will accommodate runoff from driveways.
- The rest of the impermeable area (adoptable road and footpath) will be accommodated within infiltration trenches located alongside the adoptable highways area.
- Water cleansing will be provided within the SuDS features (soakaways, permeable paving and infiltration trenches) in order to remove pollutants before infiltrate the water within the ground.

5.14 It should be noted that the proposed surface water drainage strategy and calculated volumes are indicative only, as these will depend on the eventual impermeable area of the development and detailed drainage design and calculations will be completed at the planning stage.

5.15 In order to provide an initial idea of the storage estimate required for the proposed development, an indicative infiltration rate of $3x10^{-6}$ m/s has been utilised. This value has been obtained from the CIRIA C753 Manual.

5.16 Based on the above indicative infiltration rate and assuming that 50% of the total approximate Flood Zone 1 area will be considered as impermeable, the preliminary storage requirements are within the range of 877 – 1,788 m^3.

Surface Water Drainage Strategy – Option B – Attenuation & Discharge into Watercourse

5.17 Only if on-site infiltration testing demonstrates that the use of groundwater storage is not feasible, an alternative option based on attenuation within the Site and discharge into the River Granta at the Q1in1 year Greenfield runoff rate will be proposed.

5.18 In order to achieve this option, the SWMP suggests the following approach:

- Domestic drainage from roofs shall discharge into water butts (scope for rainwater recycling) located at the ends of rainwater downpipes, with a high level overflow to take the excess flows into the Site's surface water piped network drainage system.
- The runoff from driveways and adoptable road areas will be captured via gullies and conveyed through a surface water piped network system. This piped network will be also taking the excess flows from the roofs located to the south of the scheme prior being discharged into an attenuation basin located within the public open space at the western area of the Site.
- It is proposed that the surface water piped network system discharges into a proposed swale, which will be designed for conveyancing and treatment purposes, prior discharging the runoff into the attenuation basin.
- The attenuation basin has been designed to accommodate the full 1in100 years plus 40% climate change at a controlled rate of 12.6 l/s prior to being discharged into the existing River Granta located to the north of the Site.

5.19 Given that there is no a detailed Site layout for the proposed development, the storage estimate requirements for the proposed Site is based on an impermeable area of 50% of the total developable Site area and the Q1in1 year Greenfield runoff rate.

5.20 Based on the above parameters, the storage estimate requirements for the proposed Site is within the range of 1,064 – 1,389 m^3.

5.21 A copy of these preliminary storage requirements calculations and a indicative flood risk and surface water opportunities and constraints plan have been included within **Appendix E**.

Treatment Processes within SuDS

5.22 There are a range of water quality treatment processes that can be exploited within the design of a sustainable drainage system.

5.23 Treatment effectiveness is strongly linked to the hydraulic control of runoff, in particular:

- Velocity control: sediment depositions, filtration and other removal processes occurring at low flow velocities during regular rainfall events.
- Retention time: the removal of contaminants through settling, adsorption and other removal processes occurring over the period of time that the runoff is in contact with SuDS treatment media or held within a permanent water storage volume.

5.24 In order to provide water quality treatment for the proposed drainage system design, self-cleansing will be provided by designing the velocity higher than 1.0 m/s within the pipes as well as SuDS, which will be incorporated to the drainage layout to assure the water will be treated prior infiltrating within the ground or discharging within the existing River Granta.

Operation and Maintenance

5.25 The drainage network should be designed in accordance with adoptable standards to allow for potential adoption by Anglian Water and/or the LLFA.

5.26 If the drainage is not adopted, the requirements for ongoing maintenance of the drainage network should form part of the Operation and Maintenance manual for the Site and should be undertaken by the Site management. Any specialist or proprietary products that are specified at detailed design should have a manufacturer specific maintenance regime which should be included within the document.

5.27 If a manual is not yet available, it should be developed at the detailed design stage. Examples of details to consider include:

- All drainage features should be in open areas which are readily accessible.
- Pipes, manholes and silt traps should be inspected and de-silted at least once a year, where necessary.
- The surface water attenuation areas will be predominantly dry and the base should be seeded with a wildflower grass seed mix that can tolerate wet ground conditions.
- Flow controls should be inspected every 6 months, litter/debris and silt build up should be removed as necessary.

5.28 Infiltration systems will require regular maintenance to ensure continuing operation to design performance standards, and all designers should provide detailed specifications and frequencies for the required maintenance activities along with likely machinery requirements and typical annual costs – within the Maintenance Plan.

5.29 The following figures provide guidance on the type of operational and maintenance requirements that may be appropriate for soakaways, infiltration trenches, permeable paving, swales and attenuation basins respectively. The list of actions is not exhaustive and some actions may not always be required.

5.30 Property owners will be individually responsible for their own private soakaways. Figure 5.3 extracted from CIRIA C753 manual provides guidance on the type of operational and maintenance requirements that may be appropriate for soakaways and infiltration trenches:

Figure 5.3 Operation and Maintenance Requirements for Soakaways and Infiltration Trenches

TABLE 13.1 Operation and maintenance requirements for soakaways

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect for sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	Annually
	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages	Annually (or as required)
Occasional maintenance	Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	As required, based on inspections
Remedial actions	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs	As required
	Replacement of clogged geotextile (will require reconstruction of soakaway)	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually
	Check soakaway to ensure emptying is occurring	Annually

Permeable Paving

5.31 Regular inspection and maintenance is important for the effective operation of pervious pavements. Maintenance responsibility for a pervious pavement and its surrounding area should be placed with an appropriate responsible organisation. Before handing over the pavement to the client, it should be inspected for clogging, litter, weeds and water ponding, and all failures should be rectified. After handover, the pavement should be inspected regularly, preferably during and after heavy rainfall to check effective operation and to identify any areas of ponding.

5.32 Figure 5.4 provides guidance for permeable paving on the type of operational and maintenance requirements that may be appropriate:

Figure 5.4 Operation and Maintenance Requirements for Permeable Paving

Operation and maintenance requirements for pervious pavements		
Maintenance schedule	**Required action**	**Typical frequency**
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm 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	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	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 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Swales

5.33 Figure 5.5 shows the guidance for swales on the type of operational and maintenance requirements that may be appropriate.

5.34 Maintenance plan and schedules should be developed during the design phase. Specific maintenance needs of the swales should be monitored, and maintenance schedules adjusted to suit requirements:

Figure 5.5 Operation and Maintenance Requirements for Swales

TABLE 17.1 Operation and maintenance requirements for swales

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly, or as required
	Cut grass – to retain grass height within specified design range	Monthly (during growing season), or as required
	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 infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly, or when required
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
Occasional maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required or if bare soil is exposed over 10% or more of the swale treatment area
Remedial actions	Repair erosion or other damage by re-turfing or reseeding	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

Attenuation Basins

5.36 Figure 5.6 below provides guidance for attenuation basins on the type of operational and maintenance requirements that may be appropriate. The list of actions is not exhaustive and some actions may not always be required.

Figure 5.6 Operation and Maintenance Requirements for Attenuation Basins

TABLE 22.1 Operation and maintenance requirements for detention basins

Maintenance schedule	Required action	Typical frequency
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 (spring – before nesting season, and 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 (as set out in Chapter 23)
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	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required

5.37 Maintenance plans and schedules should be developed during the design phase. Specific maintenance needs of the system should be monitored, and maintenance schedules adjusted to suit requirements.

6 PROPOSED FOUL WATER DRAINAGE STRATEGY

Existing Foul Water Drainage

6.1 A Pre-Planning Enquiry ('PPE') has been submitted to Anglian Water, where it has been confirmed that there is a foul water public sewer within the immediate vicinity of the Site, located to the west and north of the proposed development.

6.2 A copy of the PPE has been included within **Appendix F**.

Proposed Foul Water Drainage

6.3 Development proposals will comprise the construction of circa 85 residential dwellings.

6.4 The proposed foul flows calculations are based on 4,000 litres per dwelling per day, which is then divided by 86,400 (24 hours x 60 minutes x 60 seconds) to give a foul rate in litres per second. Based upon Sewers for Adoption, the foul flows for the residential dwellings have been calculated as 3.91 l/s.

6.5 The foul water drainage from the proposed development is in the catchment of Linton Water Recycling Centre, which currently has capacity to treat the flows from the proposed development site. Anglian Water cannot reserve capacity and the available capacity at the water recycling centre can be reduced at any time due to growth, environmental and regulation driven changes.

6.6 As the Site naturally falls from south to north, it is proposed that foul flows from the development will be conveyed via a new S104 foul sewerage system to the lowest point of the Site, where the flows will be discharged by gravity into the nearest foul water sewer point of connection located to the west of the Site at manhole 0501.

6.7 Anglian Water has assessed the impact of gravity flows from the planned development to the public foul sewerage network and confirmed that this connection is acceptable as the foul sewerage system, at present, has available capacity for the proposed Site.

6.8 The nearest practicable connection is to the 150mm diameter sewer at manhole 0501 at National Grid Reference ('NGR') TL 56030 46562. The cover levels is 39.28 m and the invert level is 37.52 m.

6.9 If for any reason a connection by gravity cannot be made into manhole 0501, there would be an alternative for making a connection into manhole 0601 with cover level 38.63 m and invert level 36.30 m. This change of point of connection must be agreed with Anglian Water.

Maintenance and Adoption

6.10 For a foul connection into the AWS public sewerage system, the developer will be required to make a formal application under Section 106 prior to commencement of works to agree the approved method and location of connection.

6.11 Sewers intended for future adoption by Anglian Water under Section 104 must be constructed in accordance with 'Sewers for Adoption'. At the detailed design stage it should be confirmed with AWS which version of Sewers for Adoption should be used.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 TPA has been commissioned by Taylor Wimpey Strategic Land to prepare a Flood Risk Assessment and Drainage Strategy report to support the promotion of prospective residential development circa 85 dwellings at 'Land North of Cambridge Road (A1307), Linton'.

7.2 The Site is located within Flood Zones 1, 2 and 3, therefore it is recommended that a detailed hydraulic flood modelling is undertaken to identify accurately the extent of Flood Zone 3 prior to the submission of a planning application. However, this report identifies that the development can be delivered by providing the mitigation measures proposed within this assessment.

7.3 Other origins of flooding have also been assessed and it has been found that even though there are some flood risks (surface water mainly), these can be mitigated by providing the right mitigation measures.

7.4 The total Site area is approximately 6.32 ha and it is currently Greenfield, where the Q1in1 year Greenfield runoff rate is 12.6 l/s.

7.5 According to the SCDC SFRA the Site lies within an area designated as having high potential for infiltration. Consequently, it is highly recommended that specific on-site infiltration testing is undertaken prior to the submission of a planning application.

7.6 Should these intrusive works demonstrate that the Site has no capacity for the storage of groundwater, the presence of existing drains and the River Granta allows the proposed development to discharge the attenuated flows into this Main River at the Q1in1 Greenfield runoff discharge rate.

7.7 The proposed on site drainage surface water drainage system will be suitable to attenuate flows up to and including the 1in100 year plus 40% climate change rainfall event.

7.8 Proprietary treatment systems will be used in order to provide water cleansing so that remove the pollutants before infiltrating within the ground.

7.9 The foul discharge rate from the residential area of the development has been calculated as 3.91 l/s. It is proposed that the proposed foul flows from the development will be conveyed via a new S104 foul sewerage system to the lowest point of the Site prior to making a connection by gravity into the 150mm diameter sewer at manhole 0501 at NGR TL 56030 46562.

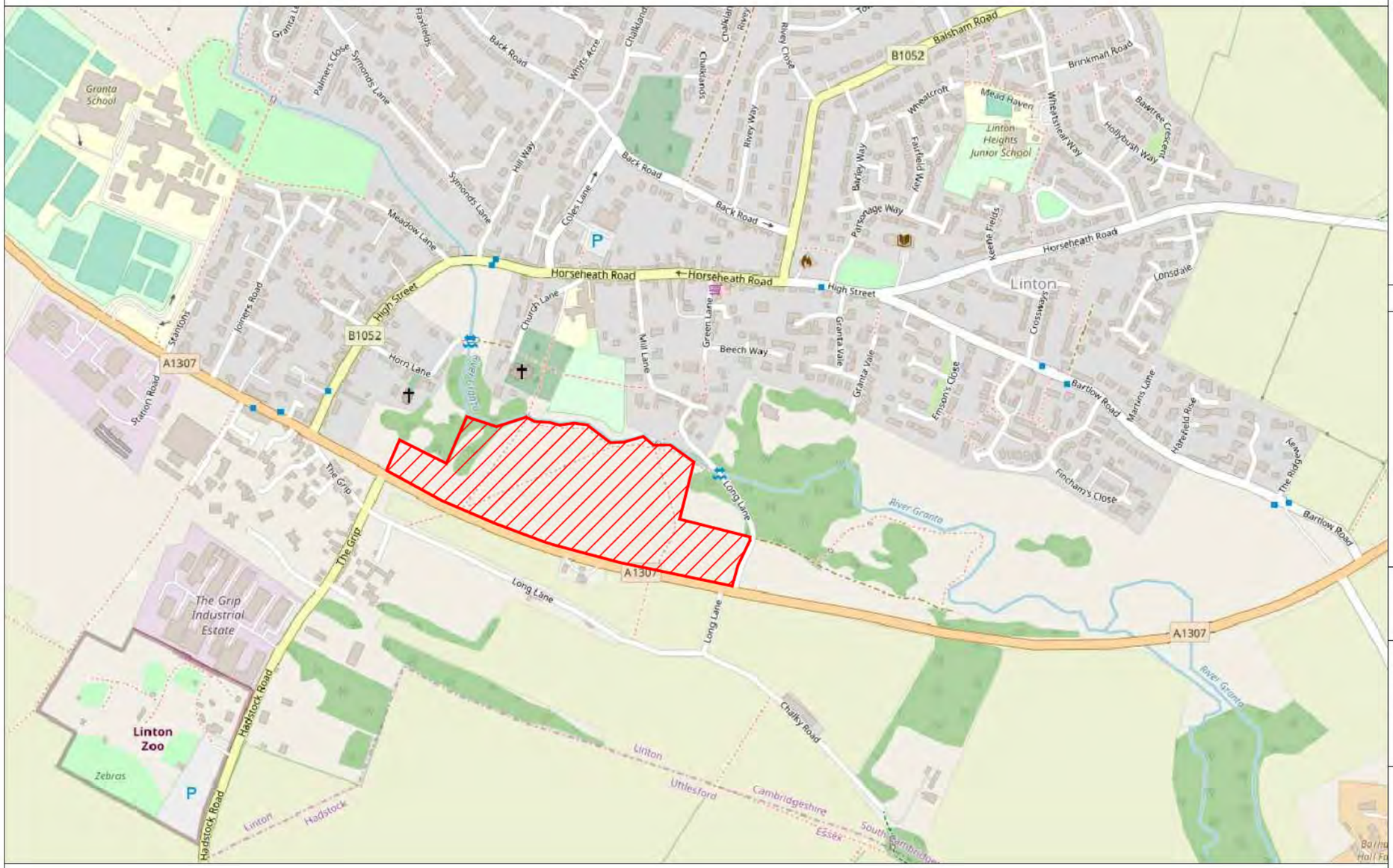
7.10 This report demonstrates that a development at this location is sustainable for a residential use in terms of flood risk and the management of foul and surface water drainage.

APPENDIX A

A3
ORIGINAL
PLOT SIZE

NOTES:
1. Based on OpenStreetMap.

KEY
- Indicative Site Boundary.



Rev	Date	Details	Drawn by	Checked by	Approved by
-	-	-	-	-	-

[redacted]

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Transport Planning Associates

CLIENT:
TAYLOR WIMPEY UK Ltd

PROJECT:
LAND AT LINTON, CAMBRIDGESHIRE

TITLE:
INDICATIVE SITE LOCATION PLAN

STATUS:
FOR INFORMATION

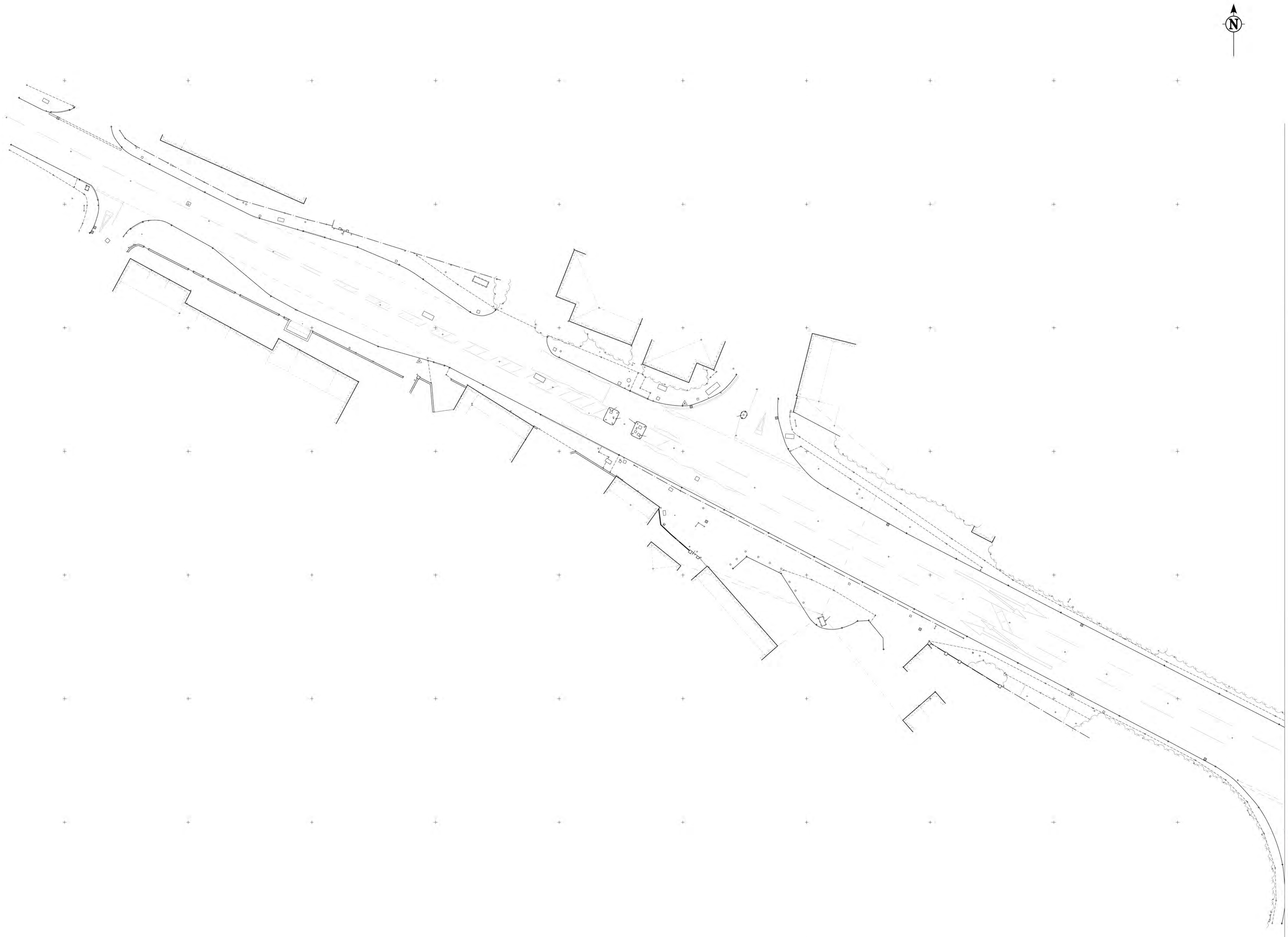
SCALE:	DATE:	DRAWN:	CHECKED:	APPROVED:
NTS	12.02.20	NR	TH	JH

JOB NO:	DRAWING NO:	REVISION:
1902-05	SL01	-

W E S

INDICATIVE

APPENDIX B



S

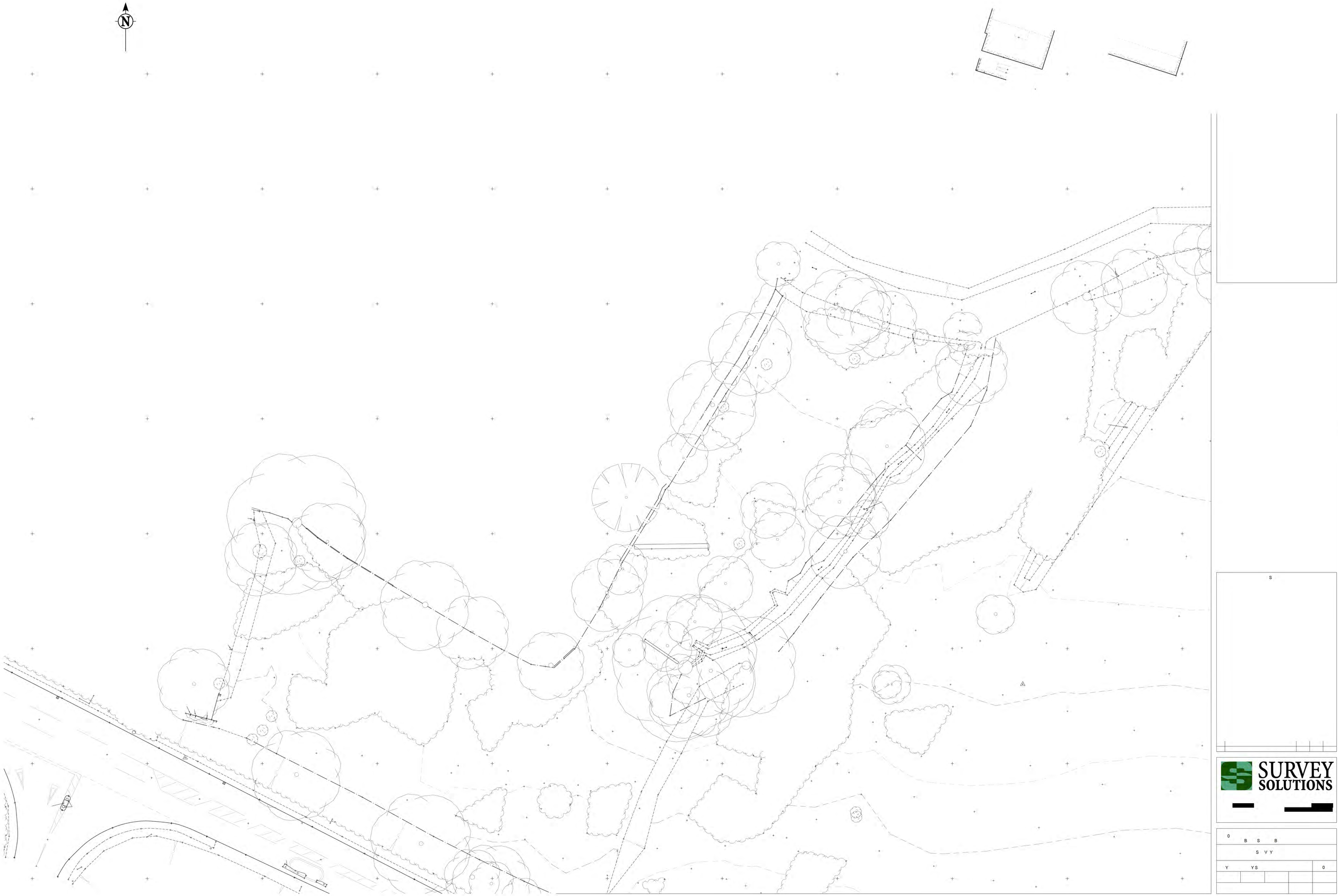
SURVEY SOLUTIONS

0

B S B

S V Y

Y YS 0



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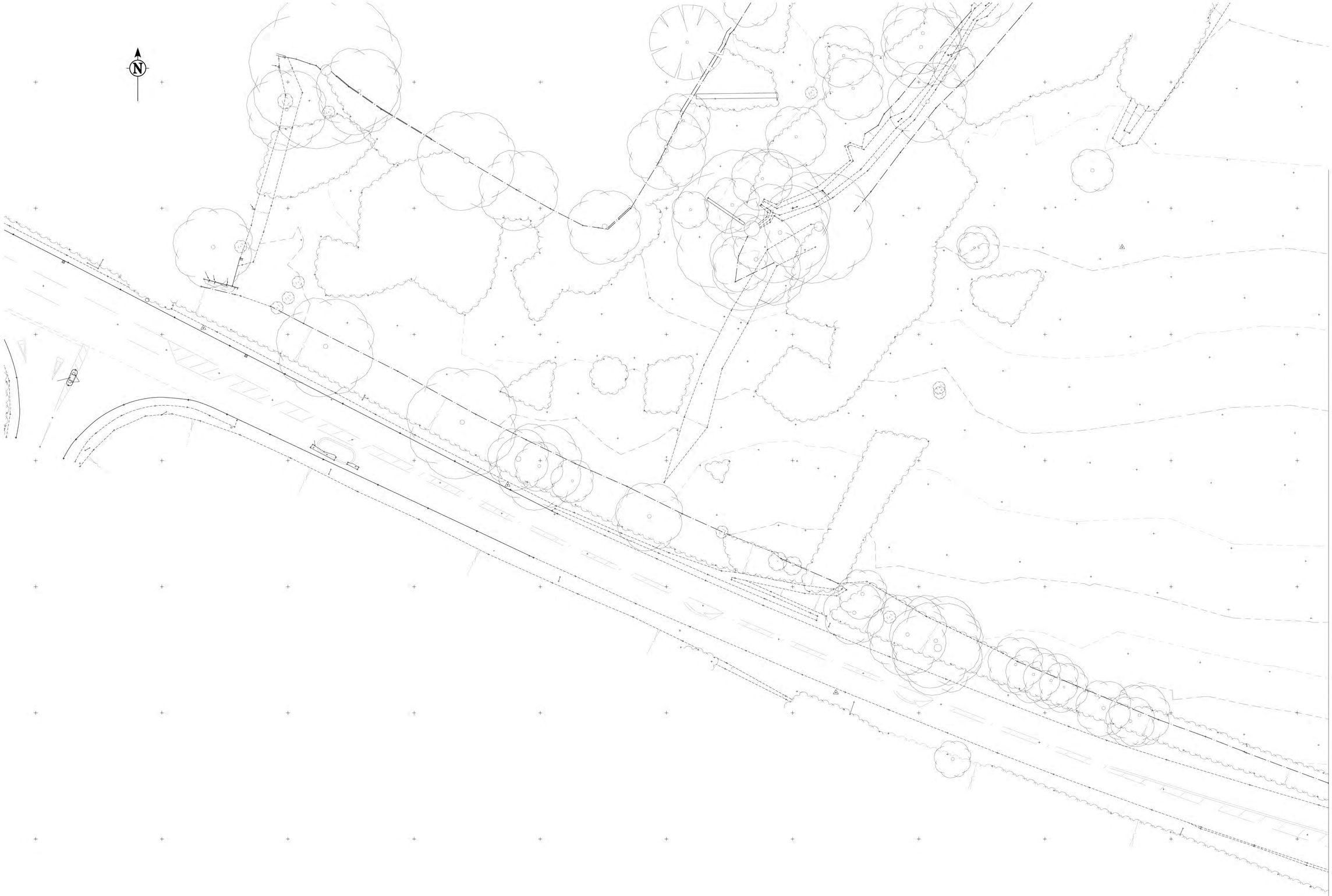
Y YS 0



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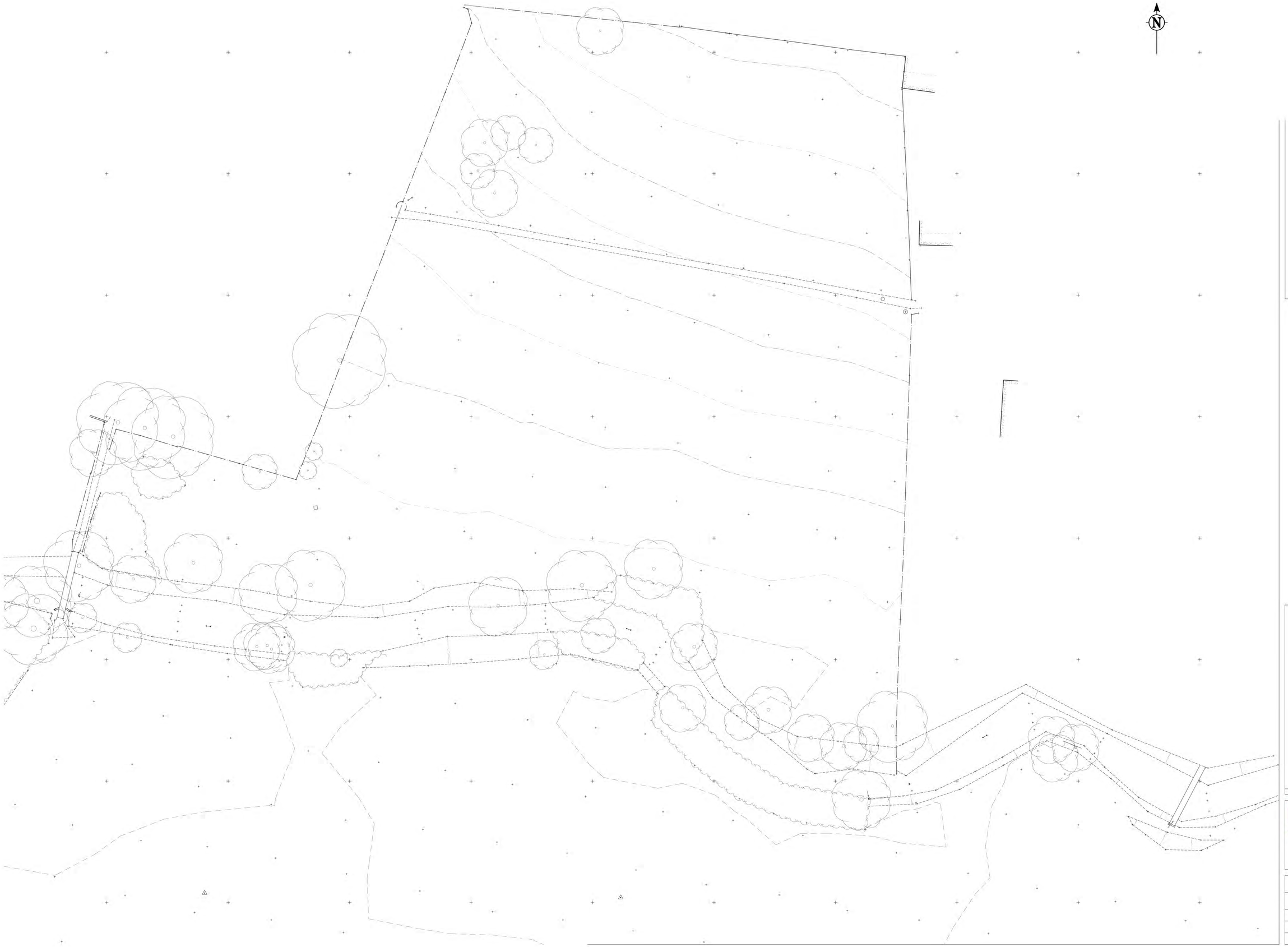

S

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S

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SOLUTIONS

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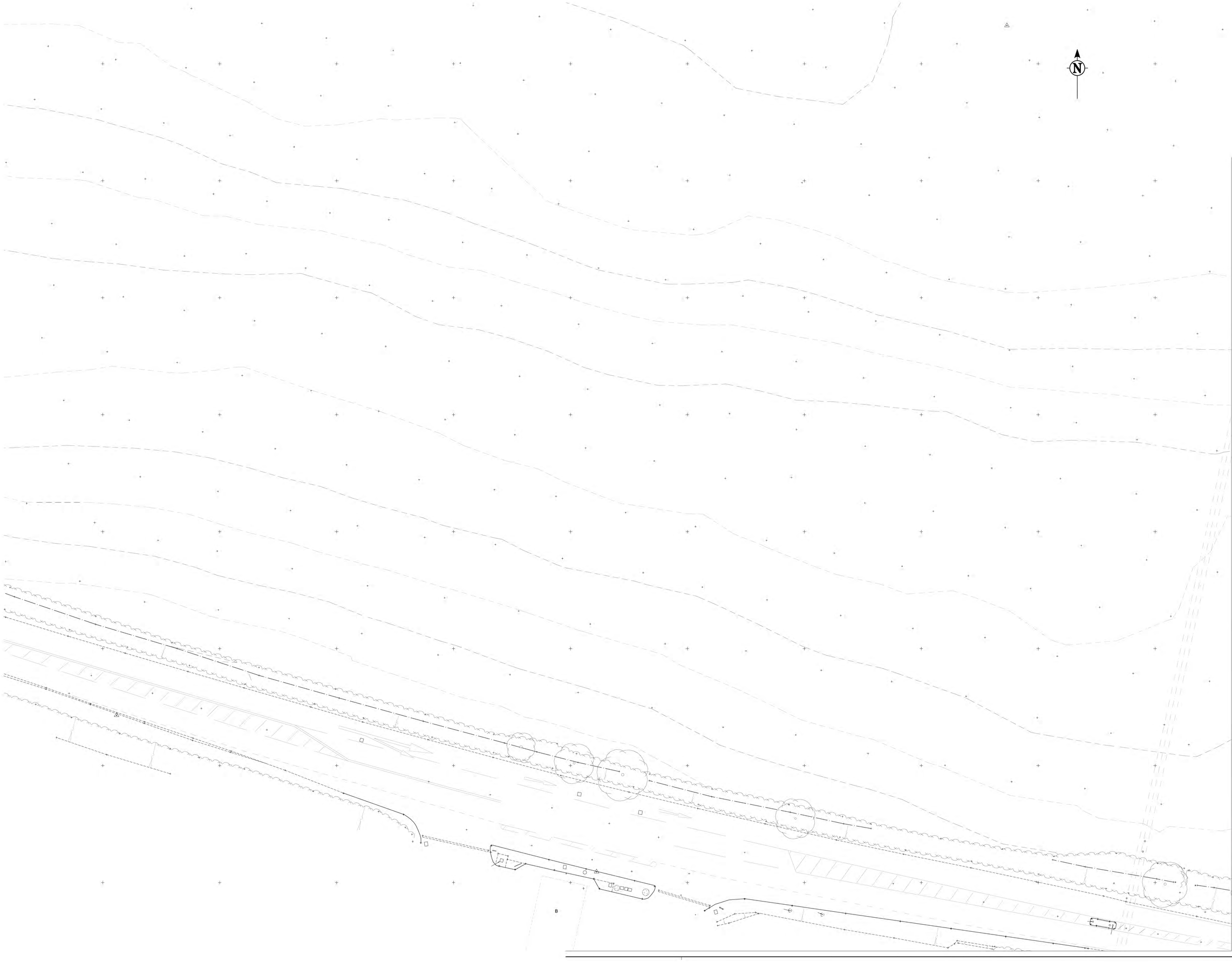
Y YS 0



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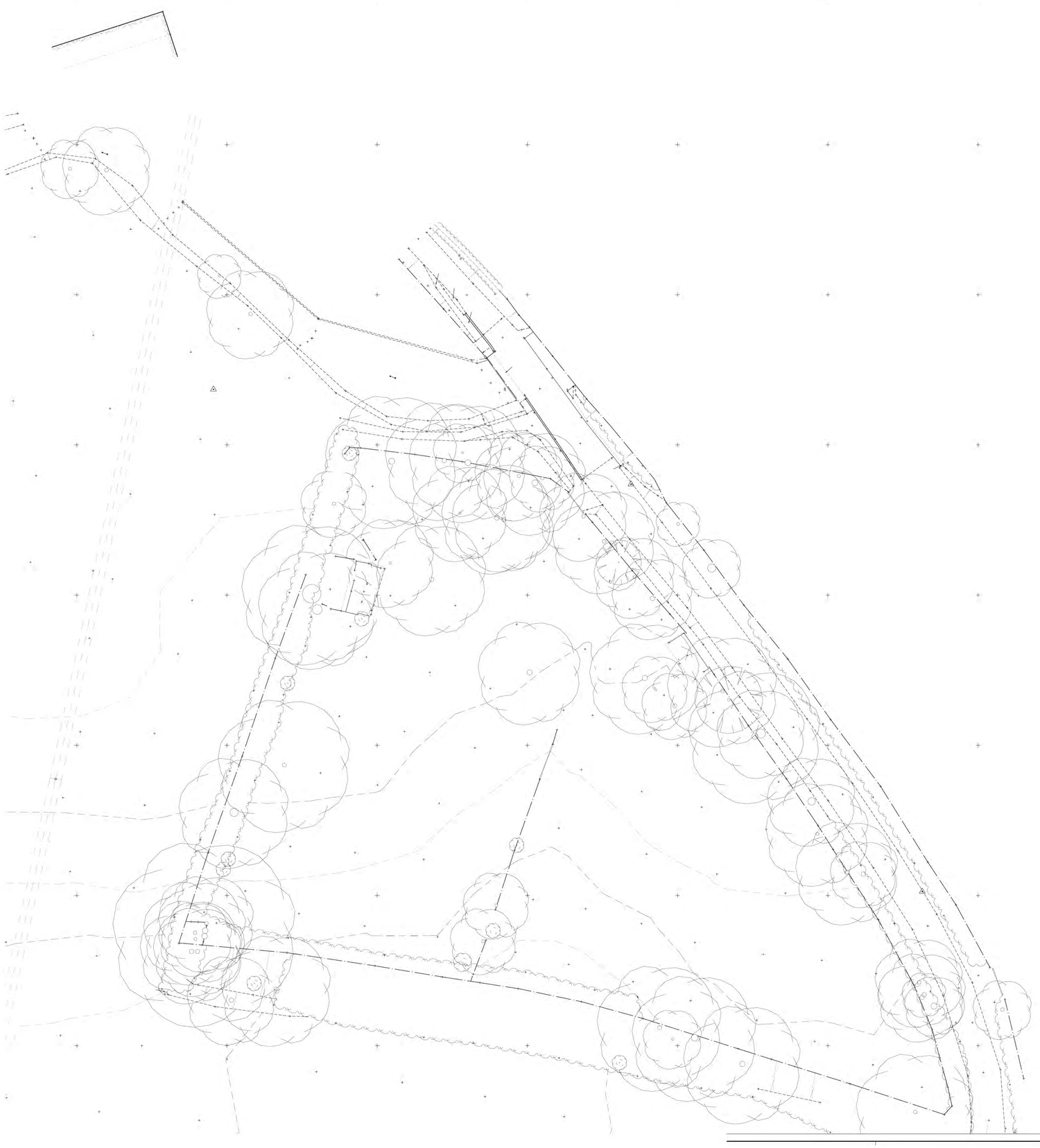

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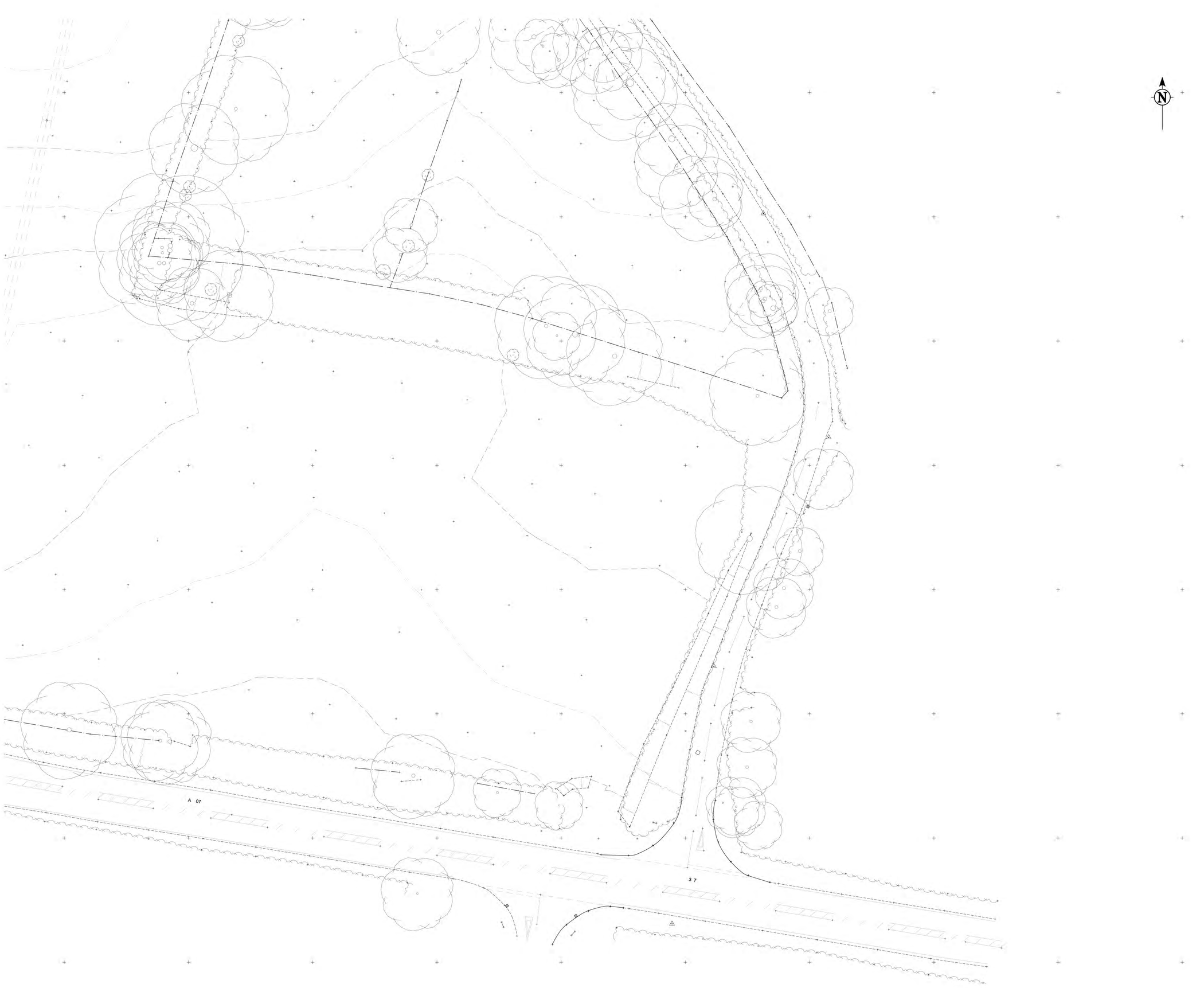

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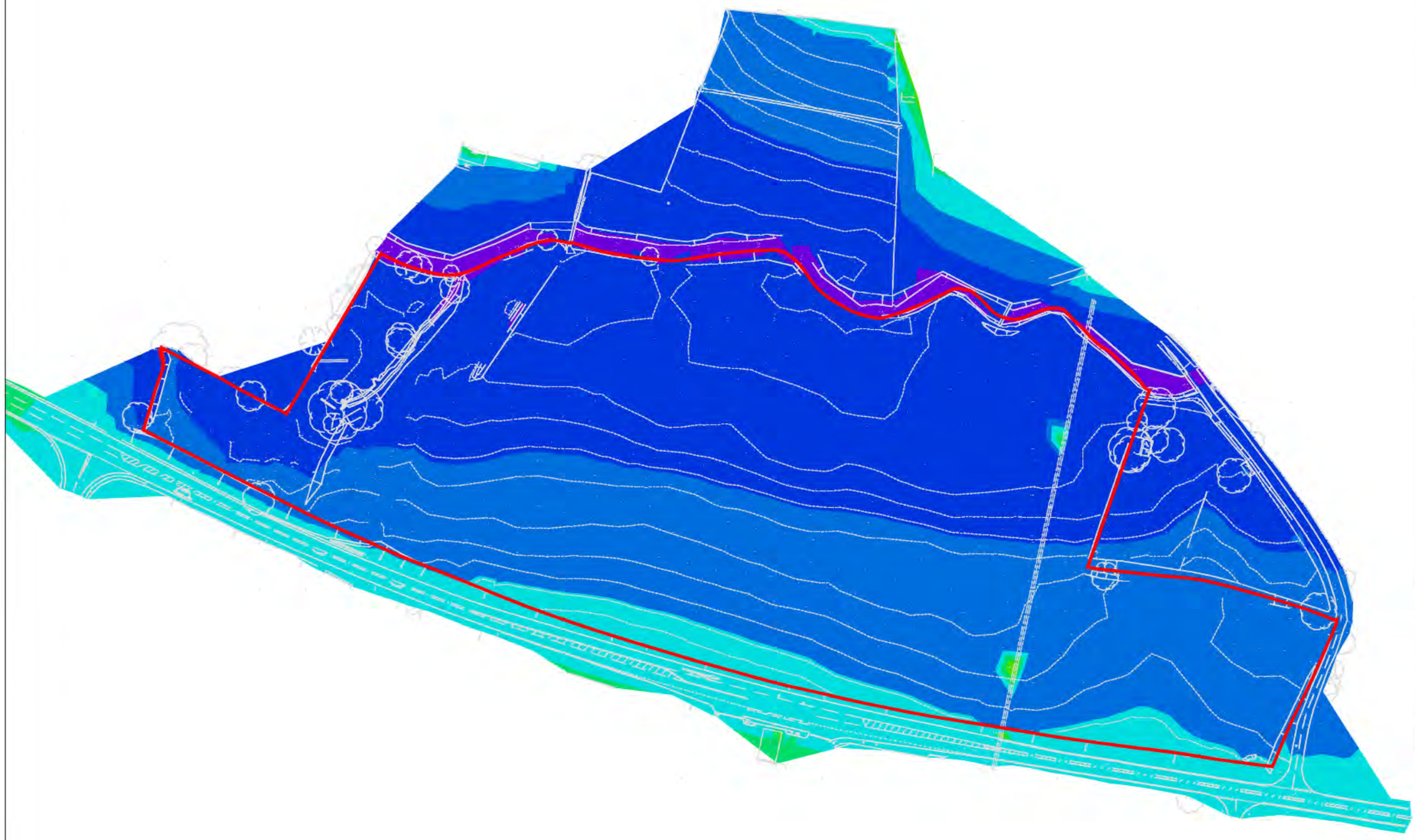
SURVEY SOLUTIONS

0 B S B

S V Y

Y Y S 0

A3
ORIGINAL
PLOT SIZE



NOTES:
1. Based on "SURVEY SOLUTIONS" Drawing No. 25955se-01-08.

KEY

- Indicative Site Boundary.

Height Bands
- 55.7m - 58m
- 53.4m - 55.7m
- 51.1m - 53.4m
- 48.8m - 51.1m
- 46.5m - 48.8m
- 44.2m - 46.5m
- 41.9m - 44.2m
- 39.6m - 41.9m
- 37.3m - 39.6m
- 35m - 37.3m

Rev	Date	Details	Drawn by	Checked by	Approved by
-	-	-	-	-	-

[redacted]

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Transport Planning Associates

CLIENT:
TAYLOR WIMPEY UK Ltd

PROJECT:
LAND AT LINTON,
CAMBRIDGESHIRE

TITLE:
EXISTING GROUND
LEVELS MODEL
LAYOUT

STATUS:
FOR INFORMATION

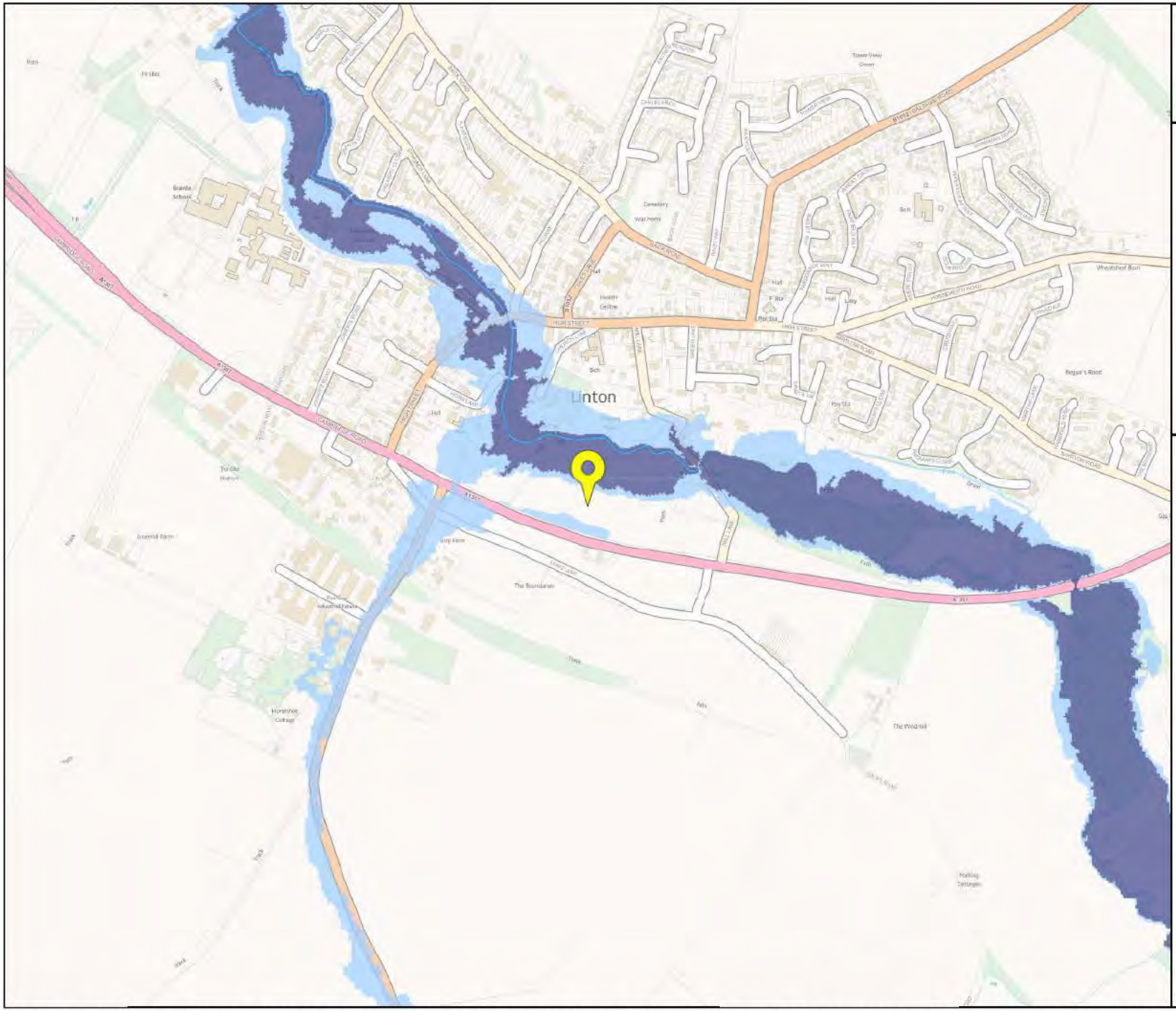
SCALE:	DATE:	DRAWN:	CHECKED:	APPROVED:
1:2,000	11.02.20	NR	TH	JH

JOB NO:	DRAWING NO:	REVISION:
1902-05	SK101	-

W E S

INDICATIVE

APPENDIX C



Environment Agency

Flood map for planning

Your reference
Linton

Location (easting/northing)
556255/246481

Scale
1:10000

Created
11 Feb 2020 11:37

- Selected point
- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Flood storage area

0 100 200 300m

A3
ORIGINAL
PLOT SIZE

Extent of flooding from surface water

High Medium Low Very low Location you selected

INDICATIVE

NOTES:
1. Based on Environment Agency data.

Rev	Date	Details	Drawn by	Checked by	Approved by
-	-	-	-	-	-

[redacted]

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CLIENT:
TAYLOR WIMPEY UK Ltd

PROJECT:
LAND AT LINTON, CAMBRIDGESHIRE

TITLE:
ENVIRONMENT AGENCY FLOOD RISK FROM SURFACE WATER MAP

STATUS:
FOR INFORMATION

SCALE:	DATE:	DRAWN:	CHECKED:	APPROVED:
NTS	12.02.20	NR	TH	JH

JOB NO:	DRAWING NO:	REVISION:
1902-05	FM01	-

A3
ORIGINAL
PLOT SIZE

Extent of flooding from rerservoirs

Maximum extent of flooding Location you selected

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NOTES:
1. Based on Environment Agency data.

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-	-	-	-	-	-

[redacted]

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CLIENT:
TAYLOR WIMPEY UK Ltd

PROJECT:
LAND AT LINTON,
CAMBRIDGESHIRE

TITLE:
ENVIRONMENT AGENCY
FLOOD RISK FROM
RESERVOIRS MAP

STATUS:
FOR INFORMATION

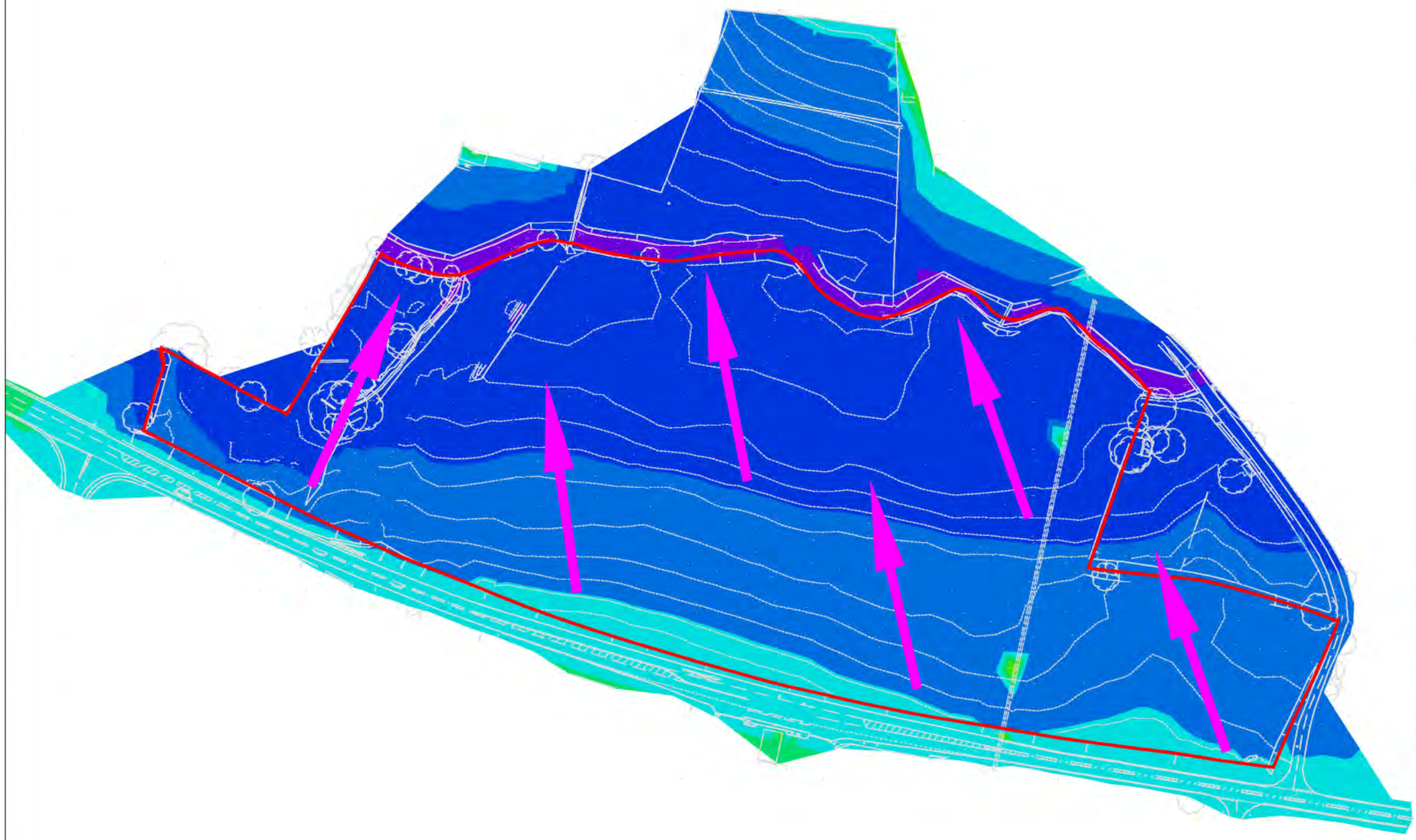
SCALE:	DATE:	DRAWN:	CHECKED:	APPROVED:
NTS	12.02.20	NR	TH	JH

JOB NO:	DRAWING NO:	REVISION:
1902-05	FM02	-

W E S

INDICATIVE

A3
ORIGINAL
PLOT SIZE



NOTES:
1. Based on "SURVEY SOLUTIONS" Drawing No. 25955se-01-08.

KEY

- Indicative Site Boundary.

Height Bands
- 55.7m - 58m
- 53.4m - 55.7m
- 51.1m - 53.4m
- 48.8m - 51.1m
- 46.5m - 48.8m
- 44.2m - 46.5m
- 41.9m - 44.2m
- 39.6m - 41.9m
- 37.3m - 39.6m
- 35m - 37.3m

- Indicative Exceedance Route.

Rev	Date	Details	Drawn by	Checked by	Approved by
-	-	-	-	-	-

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CLIENT:
TAYLOR WIMPEY UK Ltd

PROJECT:
LAND AT LINTON,
CAMBRIDGESHIRE

TITLE:
INDICATIVE OVERLAND
FLOODING ROUTE

STATUS:
FOR INFORMATION

SCALE:	DATE:	DRAWN:	CHECKED:	APPROVED:
1:2,000	12.02.20	NR	TH	JH

JOB NO:	DRAWING NO:	REVISION:
1902-05	FM03	-

W E S

INDICATIVE

Date Modified: 22/09/2010

Drawn By: ukdl001

KEY

South Cambridgeshire DC & Cambridge City Council Boundaries

Key Communities

OVER
WILLINGHAM
FEN DRAYTON
LONGSTANTON
COTTENHAM
WATERBEACH
OAKINGTON
BAR HILL
IMPINGTON
HISTON
MILTON
PAPWORTH EVERARD
GIRTON
MADINGLEY
CAMBOURNE
HARDWICK
CAMBRIDGE
FULBOURN
TRUMPINGTON
GAMLINGAY
GREAT SHELFORD
LITTLE SHELFORD
WEST WRATTING
HARSTON
ARRINGTON
BARRINGTON
SAWSTON
ABINGTON
WHITTLESFORD
GREAT ABINGTON
SHEPRETH
LINTON
DUXFORD
MELBOURN
GREAT CHISHILL

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0 2 4 6 8 Kilometres

SCALE: 1:175,000

WSP

TITLE:

SOUTH CAMBRIDGESHIRE DC AND CAMBRIDGE CITY COUNCIL LEVEL 1 SFRA

FIGURE No:

ASSESSMENT AREA
1402 - A - 1

File: Q:\WSP_UK\WSP_D\Hertford\Cambridge SFRA\Cambridgeshire SFRA 2\DRAWINGS\A1 Assessment Area.mxd

Date Modified: 29/09/2010

Drawn By: ukdld001

KEY

South Cambridgeshire DC & Cambridge City Council Boundaries

EA Main River

Ordinary Watercourses

Old West Internal Drainage Board

Swaffam Internal Drainage Board

Waterbeach Level Internal Drainage Board

Beds and Ivel Internal Drainage Board

Swavesey Internal Drainage Board

Willingham and Over Internal Drainage Board

SCDC IDB areas

- Bedfordshire & River Ivel IDB
- Old West IDB
- Swaffam IDB
- Swavesey IDB
- Waterbeach IDB
- Willingham & Over IDB

WATERBEACH
IMPINGTON
HISTON
MILTON
CAMBRIDGE
Cam
Quy Brook
Cherry Hinton Brook
Hobson's Brook
TRUMPINGTON
FULBOURN
GREAT SHELFORD
LITTLE SHELFORD
Granta
SAWSTON
WHITTLESFORD
ABINGTON
GREAT ABINGTON
LINTON
DUXFORD
WEST WRATTING
SAFFRON WALDEN

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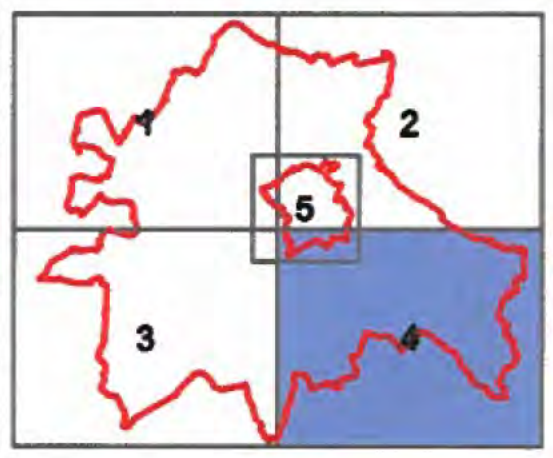


WSP

TITLE:

SOUTH CAMBRIDGESHIRE DC AND CAMBRIDGE CITY COUNCIL LEVEL 1 SFRA

FIGURE No:

EXISTING WATERCOURSES
1402 - B - 1.4

File: Q:\WSP_UK\WSP_D\Hertford\Cambridge SFRA\Cambridgeshire SFRA 2\DRAWINGS\B1.4 Watercourses.mxd

Date Modified: 22/09/2010

Drawn By: ukdid001

KEY

South Cambridgeshire DC & Cambridge City Council Boundaries

Reservoir Locations

RESERVOIR SCHEDULE

Ref	Reservoir Name
1	Babraham
2	Fen Drayton Lakes
3	Home Farm (Longstanton)
4	Park Lake - Gamlingay (ID388)
5	Pitt Dene
6	Wimpole Hall Estate

NOTES

1. This plan shows the locations of large raised reservoirs, as defined in the Reservoirs Act 1975.

2. Information and location of the reservoirs has been provided by the Environment Agency.

OVER
WILLINGHAM
FEN DRAYTON
LONGSTANTON
COTTENHAM
WATERBEACH
OAKINGTON
BAR HILL
IMPINGTON
HISTON
MILTON
PAPWORTH EVERARD
MADINGLEY
GIRTON
CAMBOURNE
HARDWICK
CAMBRIDGE
FULBOURN
TRUMPINGTON
GAMLINGAY
GREAT SHELFORD
WEST WRATTING
LITTLE SHELFORD
HARSTON
ARRINGTON
BARRINGTON
SAWSTON
ABINGTON
WHITTLESFORD
GREAT ABINGTON
SHEPRETH
LINTON
DUXFORD
MELBOURN
GREAT CHISHILL
STEVENAGE

0 2 4 6 8 Kilometres

SCALE: 1:175,000

WSP

TITLE:

SOUTH CAMBRIDGESHIRE DC AND CAMBRIDGE CITY COUNCIL LEVEL 1 SFRA

FIGURE No:

RESERVOIR LOCATIONS
1402 - B - 2

File: Q:\WSP_UK\WSP_D\Hertford\Cambridge SFRA\Cambridgeshire SFRA 2\DRAWINGS\B2 Reservoir Locations.mxd

Date Modified: 22/09/2010

Drawn By: ukdld001

KEY

South Cambridgeshire DC & Cambridge City Council Boundaries

Sewage Treatment Works (STW)

NOTES

1. Location of Sewage Treatment Works, as received from Anglian Water, 21 May 2010.

SEWAGE TREATMENT WORKS SCHEDULE

Ref	STW Name
1	Arrington STW
2	Balsham STW
3	Bassingbourn STW
4	Bourn STW
5	Cambridge STW
6	Camps STW
7	Coton STW
8	Duxford STW
9	Foxton STW (Cambs)
10	Gamlingay STW
11	Guilden Morden STW
12	Haslingfield STW
13	Hatley St George STW
14	Linton STW
15	Litlington STW
16	Melbourn STW
17	Over STW
18	Papworth Everard STW
19	Royston STW
20	Sawston STW
21	Tadlow STW
22	Teversham STW
23	Uttons Drove STW
24	Waterbeach STW
25	West Wickham STW

OVER
WILLINGHAM
FEN DRAYTON
LONGSTANTON
COTTENHAM
WATERBEACH
BAR HILL
OAKINGTON
PAPWORTH EVERARD
IMPINGTON
HISTON
MILTON
MADINGLEY
GIRTON
CAMBOURNE
HARDWICK
CAMBRIDGE
FULBOURN
TRUMPINGTON
GAMLINGAY
GREAT SHELFORD
LITTLE SHELFORD
WEST WRATTING
HARSTON
ARRINGTON
BARRINGTON
SAWSTON
SHEPRETH
WHITTLESFORD
GREAT ABINGTON
ABINGTON
LINTON
DUXFORD
MELBOURN
GREAT CHISHILL

0 2 4 6 8 Kilometres

SCALE: 1:175,000

WSP

TITLE:

SOUTH CAMBRIDGESHIRE DC AND CAMBRIDGE CITY COUNCIL LEVEL 1 SFRA

FIGURE No:

SEWAGE TREATMENT WORKS LOCATIONS 1402 - B - 5

File: Q:\WSP_UK\WSP_D\Hertford\Cambridge SFRA\Cambridgeshire SFRA 2\DRAWINGS\B5 STW Locations.mxd

Date Modified: 22/09/2010

Drawn By: ukdld001

KEY

South Cambridgeshire DC & Cambridge City Council Boundaries

Historical Flooding Events

- Fluvial
- Ground Water
- Fluvial
- Sewer
- Oct 2001 Flooded Locations
- Oct 2001 Survey

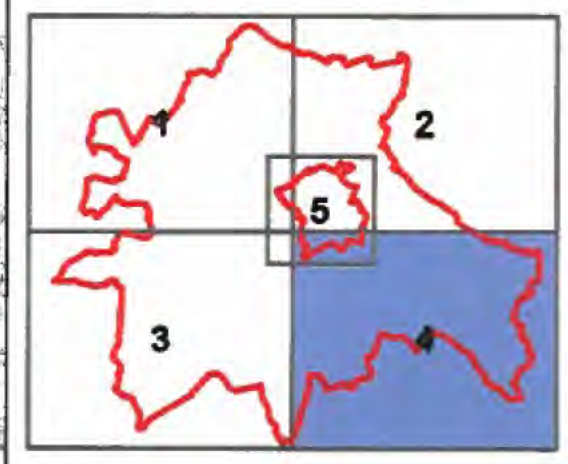
Historical Flood Outlines

- March 1947
- September 1968
- May 1978
- May 1981
- October 1993
- Easter 1998
- October 2001

WATERBEACH
IMPINGTON
HISTON
MILTON
CAMBRIDGE
FULBOURN
TRUMPINGTON
GREAT SHELFORD
LITTLE SHELFORD
SAWSTON
WHITTLESFORD
DUXFORD
ABINGTON
GREAT ABINGTON
LINTON
WEST WRATTING
SAFFRON WALDEN

0 1 2 3 4 Kilometres

SCALE: 1:90,000



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TITLE:

SOUTH CAMBRIDGESHIRE DC AND CAMBRIDGE CITY COUNCIL LEVEL 1 SFRA

FIGURE No:

HISTORICAL DATA
1402 - B - 3.4

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