

Ref: 6618/R2

Rev A December 2024

**Land off York Close
Market Bosworth
Nuneaton**

**Flood Risk Assessment
with Outline Drainage Strategy**

August 2024



REPORT DETAILS

Site Name:

Land off York Close, Market Bosworth, Nuneaton

Report Title:

Flood Risk Assessment

Report Number:

6618/R2

Revision	Date	Status
-	August 2024	For Planning Submission
A	December 2024	DFP Rev L Incorporated & Drainage Strategy & QSE Updated

Client: Gladman Developments Ltd

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1.0 **INTRODUCTION**

- 1.1 In April 2024 Lees Roxburgh were commissioned by Gladman Developments Ltd to carry out a Flood Risk Assessment (FRA) for the proposed development of an area of land off York Close, Market Bosworth, Nuneaton.

It is proposed that the land will be developed for residential purposes.

This FRA has been prepared in support of an outline planning application for up to 100 No. dwellings.

- 1.2 The site lies within an area designated on flood mapping as Flood Risk Zone 1.

- 1.3 *The National Planning Policy Framework (NPPF)* and the accompanying *Planning Practice Guidance* set out the requirements for addressing flood risk with respect to potential development sites.

At over 1 hectare in area, the site is required to be the subject of an FRA.

- 1.4 Developers are required to provide an assessment which addresses the following;
- The potential for the proposed development to be affected by flooding either from the development proposal or external sources.
 - The potential for the proposed development to increase the flood risk elsewhere.
 - That mitigation measures introduced to deal with any risks identified can be successfully managed.
 - That the site can be developed and occupied safely.

The NPPF indicates that an assessment of flood risk should be proportionate to the risk and appropriate to the scale, nature and location of the development. This report reflects the requirements of the NPPF in this regard.

- 1.5 This report has been prepared specifically for Gladman Developments Ltd for the sole purposes of the planning application and remains subject to the requirements of all relevant planning conditions and subsequent regulatory authority approvals.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Location

- 2.1.1 The site is centred on National Grid references 440200, 302640 and is 5.61ha in area (**Appendix 1**).
- 2.1.2 The site lies on the southern outskirts of Market Bosworth and some 20km west of Leicester city centre.

2.2 Access and Surrounding Land Use

- 2.2.1 It is proposed the site will be accessed via No. 35 York Close which comprises a single detached property which is proposed to be demolished.
- 2.2.2 The two fields, one large the other small, which comprise the site are currently accessed from an unnamed lane to the south via a large field also within the overall land ownership but not proposed for development.

The smaller field fronts onto Shenton Lane to the east.

Otherwise, the north east and north boundaries are formed by residential property and gardens which comprise the limit of the settlement area.

- 2.2.3 To the east, south and west is open farmland.

Immediately to the north east and also fronting onto Shenton Lane are allotment gardens.

Immediately south east of the site there is Witherstitch Lodge Stables with associated horse menage area and grassed pasture.

- 2.2.4 Bosworth Park lies some distance to the north east with Bow Pool, a large lake, draining in a south westerly direction into a second large water body located to the south east before flowing in a southerly direction.
- 2.2.5 About 0.8km to the west is a railway line with the Ashby de la Zouch canal just beyond both running north-south.

2.3 Site Description

- 2.3.1 As noted, the site is accessed off York Close to the north via No. 35 a single detached two-storey property of brick construction with gardens to the front and to the rear extending down to the main site area. It is proposed to demolish this property.
- 2.3.2 The overall site is irregular in shape and comprises the smaller field to the south east and a much larger field occupying the north western area of the site with both fields being grassed and given over to cattle pasture.
- 2.3.3 External and internal boundaries are substantially formed by hedging, bushes and trees supplemented by post and wire fencing, all well overgrown.

To the largest field, the fencing is generally doubled up to form the boundaries with adjacent gardens, the one obvious exception being to the rear of No. 59 Stanley Road to the north boundary where there is a brick wall.

- 2.3.4 Towards the north west corner of the site, the boundary areas become increasingly overgrown. As a result, there is no visual evidence of the ditch system which is mapped (**Appendix 1B**) as forming a section of this boundary although a trickle of water was audible.

The garden to No. 31 York Close extends over the ditch and forms an inset into the site boundary.

- 2.3.5 There is a dilapidated timber shed in the north east corner of the smaller field.

Manhole covers, four pairs of which were raised, were noted in the larger field together with some evidence of vegetation consistent with waterlogged ground although noting that the site inspection took place following a lengthy, substantially dry period of weather.

Otherwise no features were noted within the two field areas.

- 2.3.6 The site appeared generally well drained.

2.4 **Topography**

- 2.4.1 The site falls from Shenton Lane predominantly north westerly and then turning west at the north west corner but with some slight fall within the smaller field area towards Shenton Lane.

Within this field, and to some extent within the larger field, mild ground undulations were noted within the overall topography.

Within the overall land falls, there is also a slight valley running close to the north boundary of the larger field and merging with the line of the ditch system.

Beyond the north west boundary, existing property is set well above, with gardens falling down to, the shared boundary.

- 2.4.2 Reference should be made to the topographical survey (**Appendix 2**) levels can be summarised as follows;

- | | | |
|---|-----------------------------------|------------|
| • | North frontage to Shenton Lane... | 120.7m AOD |
| • | South frontage to Shenton Lane... | 119.5m AOD |
| • | North corner... | 118.5m AOD |
| • | South west corner... | 120.5m AOD |
| • | North west corner... | 108.0m AOD |

2.5 Existing Drainage

- 2.5.1 As noted above, there is no visual evidence of the ditch system which forms a section of the north boundary and which is mapped as continuing west.

Whilst on site, a resident did advise that he had observed a significant flow in this system following periods of heavy rainfall.

Otherwise, a dry ditch was noted beyond the south east boundary of the larger field with no obvious outfall, with possibly a second ditch within the overgrown west boundary of the large field which extends down to the mapped ditch but, if present, very shallow and dry.

- 2.5.2 Subsequent to the site visit, some vegetation clearance and additional survey work has been undertaken and has identified a collapsed 300mm diameter culvert at the north west boundary and this is reflected on the topographical survey (**Appendix 2**).

The route of the system is not known but appears to be culverted through the adjacent garden areas.

- 2.5.3 Severn Trent sewer networks cross the site (**Appendix 3A**) comprising a foul system bisecting the site from the east and continuing beyond to the north west and foul and surface water systems running within the north boundary. The two foul systems join within the site, the surface water system discharges into the watercourse.

As noted, manhole covers provided evidence of these systems.

3.0 FLOOD RISK

3.1 Flood Mapping

3.1.1 Gov. UK Flood Map for Planning

- 3.1.1.1 Reference to the Gov. UK Flood Map (**Figure 1**) identifies that the site is located within an area of Zone 1 Flood Risk with no areas of Zone 2/3 Flood Risk identified within 1km.

Flood Risk Zone 1 comprises land assessed as having a 1 in 1000 or less annual probability of flooding.

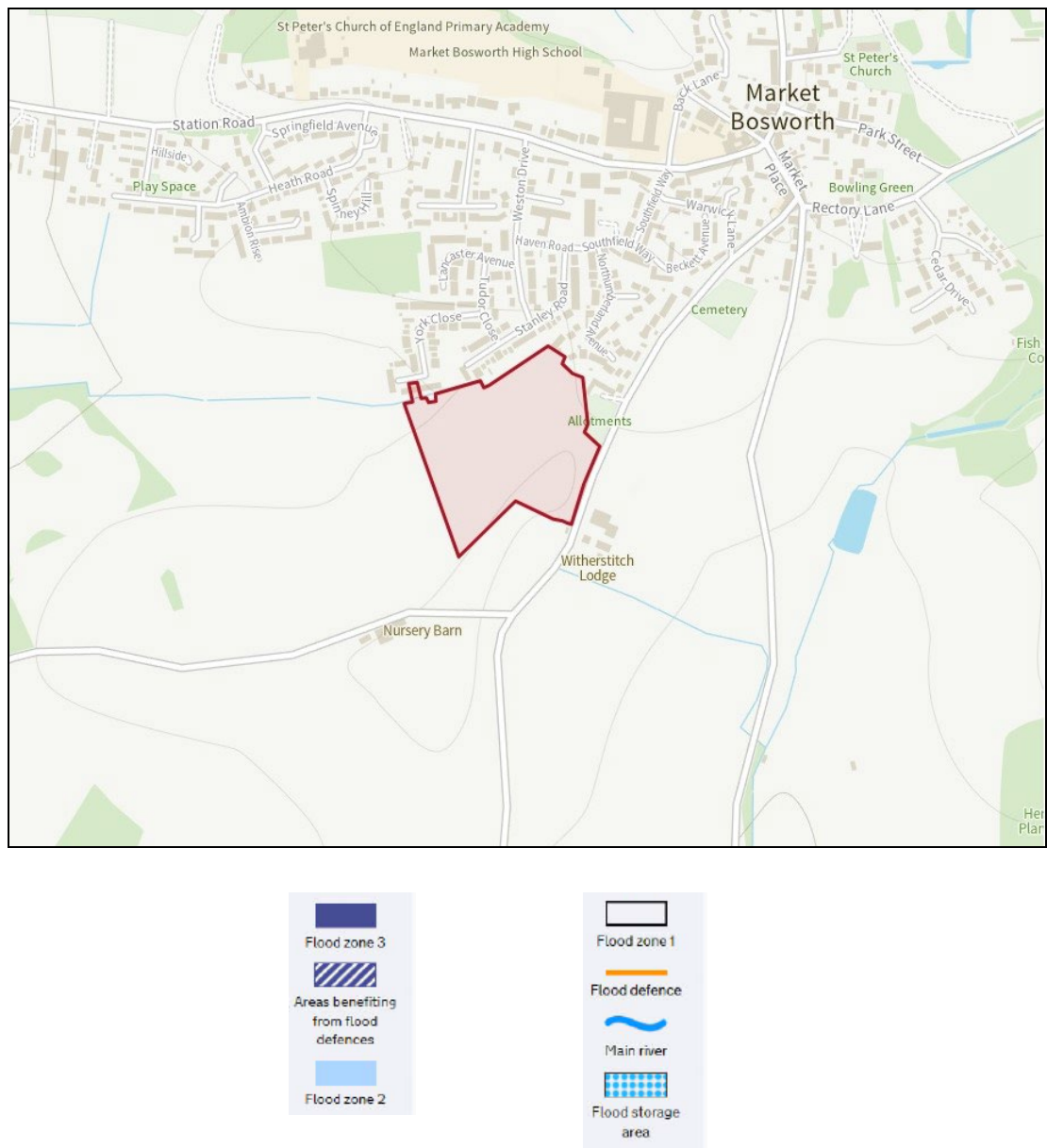


Figure 1: Gov. UK Flood Map for Planning

3.1.2 Gov. UK Surface Water Flood Risk

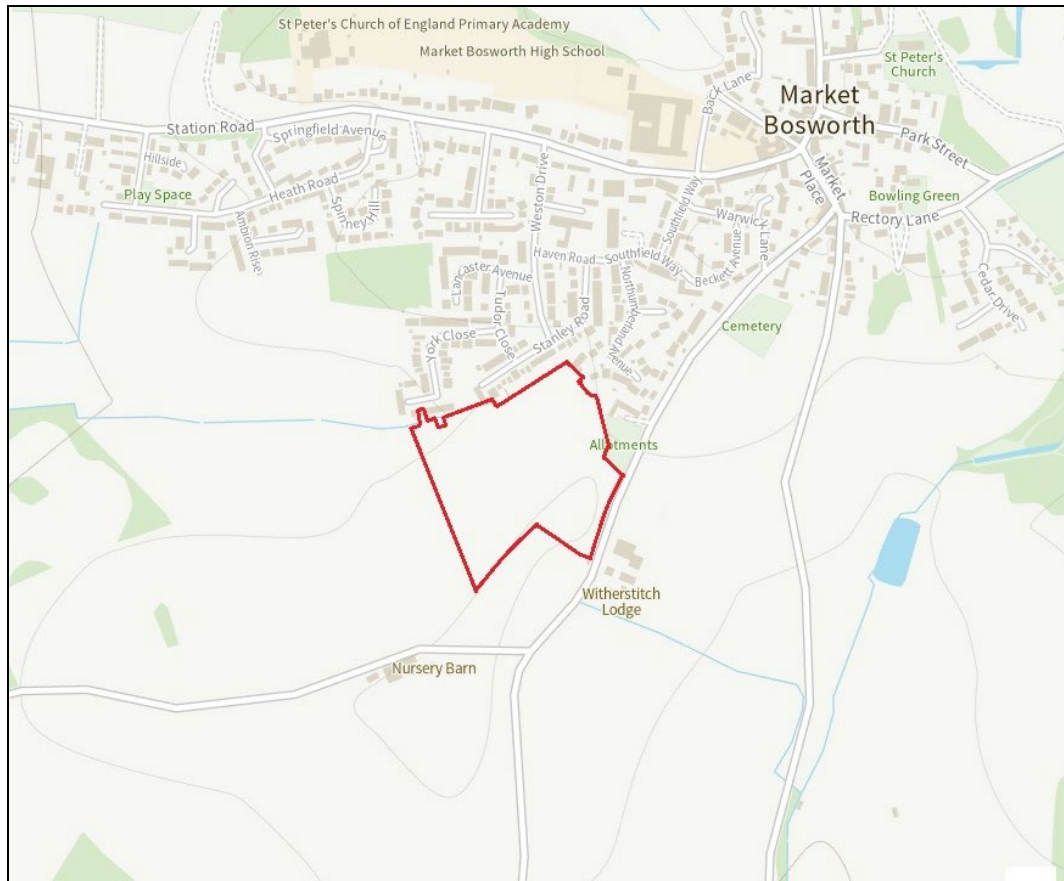
- 3.1.2.1 Reference to the Gov. UK Surface Water Flood Risk Map (**Figure 2**) identifies a ribbon of risk within the northern area of the site following the slight valley, merging with an incoming risk from Stanley Road to the north and widening out within the low area alongside the north west boundary.



Figure 2: Gov. UK Flood Risk from Surface Water

3.1.3 Gov. UK Extent of Flooding from Reservoirs

- 3.1.3.1 Reference to the Gov. UK Extent of Flooding from Reservoirs Map (**Figure 3**) identifies that the site is not at risk of flooding from reservoirs.



Maximum extent of flooding

Figure 3: Gov. UK Extent of Flooding from Reservoirs

3.1.4 Groundwater Flood Risk

- 3.1.4.1 Reference to the GeoSmart GWS Map (**Figure 4**) identifies the site as being at negligible risk.

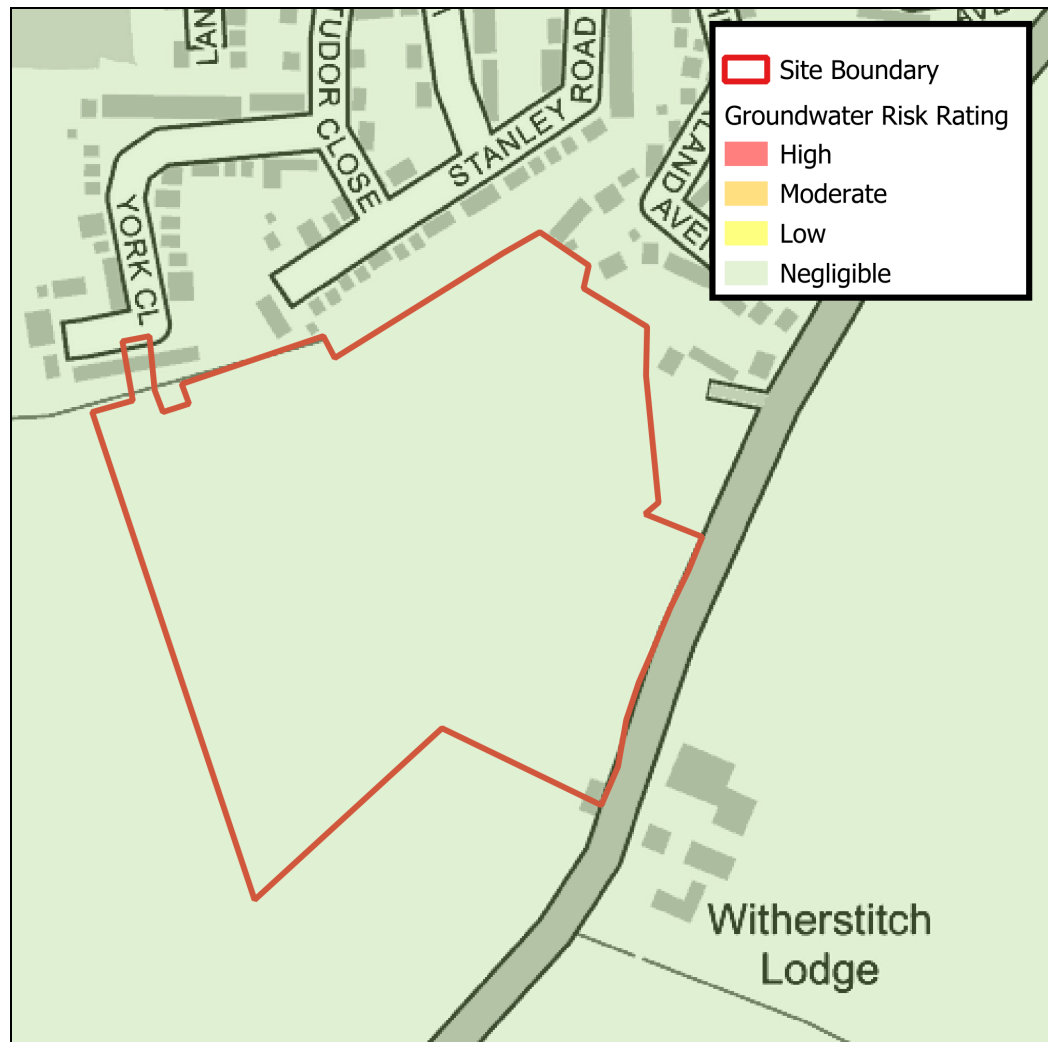


Figure 4: GeoSmart GW5 Map (GeoSmart 2024)

3.2 Land Use Vulnerability Classification and Sequential and Exception Tests

- 3.2.1 As set out in the NPPF, the Sequential Test is a risk based approach which should be applied at all stages of the planning process in order to steer new development to areas at risk from the lowest probability of flooding (i.e. from Flood Zones 2 and 3 to Flood Zone 1).
- 3.2.2 The NPPF Planning Practice Guidance incorporates a list of appropriate land uses in each flood zone dependent on the vulnerability of the proposed development to flooding. Table 2 of the guidance classifies residential development as 'More Vulnerable'.

Reference is made to the table below, reproduced from Table 3 of the guidance, which sets out the Flood Risk Vulnerability Classification.

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	x	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	x	x	x	✓*

Key:

✓ Development is appropriate

x Development should not be permitted.

- 3.2.3 The site is located within a Zone 1 area of flood risk and the development is classified as 'More Vulnerable'. On this basis development is appropriate and the Sequential and Exception Tests will not apply.

3.3 Sources of Flood Risk

3.3.1 **Water Bodies, Watercourse Systems, Surface Water Flooding and Groundwater**

- 3.3.1.1 There are no significant water bodies in the area which are considered as presenting a source of risk to the development.

- 3.3.1.2 At the north west boundary there is a watercourse system (becomes Bosworth Brook) which runs due west and appears to pass under the Ashby de la Zouch Canal from where it is conjectured it turns southerly and outfalls into the main watercourse system about 3km to the south west. This system is designated none main river.

To the south east beyond Shenton Lane a second watercourse network extends from the ponds within Bosworth Park in a southerly direction picking up the network which forms the field boundary to the south and continues along Sutton Lane.

Additional networks, some isolated, are recorded to the east, north and west all draining away from the site.

The risk from the system which runs close to or along the north boundary needs to be considered.

- 3.3.1.3 Surface water flood mapping has identified an area of surface water flows within the site some of which will be generated from the site itself with mapped incoming flows from Stanley Road to the north.

This risk needs to be considered.

- 3.3.1.4 The risk from groundwater is considered negligible.

3.3.2 Existing Sewers and Drainage

- 3.3.2.1 Copies of Severn Trent Water public sewer records have been obtained and identify the presence of adopted drainage infrastructure in the area of and within the site. These records have been incorporated **Appendix 3A**.

- 3.3.2.2 Reference to the records identifies the following;

- Foul and surface water systems within Market Bosworth.
- Sewer networks serving Market Bosworth cross the site comprising a foul system bisecting the site from the east and continuing north west and foul and surface water systems running within the north boundary. The two foul systems join within the site, the surface water system discharges into the watercourse.

- 3.3.2.3 Whilst the foul system does not present a source of risk to the development, the surface water system needs to be considered.

3.3.3 Land Drainage

- 3.3.3.1 The site appeared well drained and with the ditch available for connection no land drainage or groundwater issues are anticipated which cannot readily be dealt with during the design and construction process.

3.3.4 Comment

- 3.3.4.1 On the basis of the assessment of the potential sources of flood risk described above, it is concluded that the risks associated with the following need to be addressed by this FRA;

- Watercourse and surface water flooding
- Existing surface water sewer
- Development drainage proposals

4.0 SURFACE WATER RUNOFF

4.1 Requirements for Surface Water Drainage of the Site

- 4.1.1 The NPPF recommends that surface water generated by the development site should, as far as is practicable, be managed in a sustainable manner to mimic the surface water flows arising from the site prior to the proposed development.
- 4.1.2 Proposals should ensure that peak flow rates of surface water leaving the developed site are no greater than those prior to development, reducing surface water run off where possible.

4.2 Site Area

- 4.2.1 The site occupies an area of 5.61 ha of which 2.925 ha is proposed for development.

4.3 Existing Site Run Off

- 4.3.1 The existing site is greenfield.
- 4.3.2 Existing greenfield run off rates have been calculated using HR Wallingford for the developable area (**Appendix 4**) and these are as follows;

- $Q_{bar...}$ 11.0 litres/sec
- $Q_{1...}$ 9.0 litres/sec
- $Q_{30...}$ 22.0 litres/sec
- $Q_{100...}$ 28.26 litres/sec

4.4 Surface Water Run Off from the Developed Site

- 4.4.1 The development plan is incorporated in **Appendix 5**.
- 4.4.2 Uncontrolled flows from the development will exceed existing run off rates. It is considered that development run off rates limited at maximum to the existing run off rates identified in 4.3 would be appropriate.

5.0 DRAINAGE HIERARCHY

5.1 National Planning Practice Guidance

5.1.1 National Planning Practice Guidance states the aim that surface water run off should be discharged as high up the drainage hierarchy as reasonably practicable;

- Into the ground (infiltration)
- To a surface water body or watercourse
- To a surface water sewer, highway drain or other drainage system
- To a combined sewer

The following measures have therefore been considered and identified.

5.2 Potential for Ground Infiltration Based Drainage

5.2.1 A Phase 1 Geoenvironmental Assessment has been undertaken by Lees Roxburgh (Ref. 6618/R1) and has identified that the site is immediately underlain by sand and gravel with a ribbon of clay, silt, sand and gravel encroaching into the north west area of the site along the line of the ditch network.

Underlying these deposits is mudstone of the Gunthorpe Member.

5.2.2 On this basis it is considered that infiltration based drainage may be feasible and will be investigated at a more detailed stage.

Meanwhile, for the purposes of the outline application, a positive surface water outfall from the development is proposed.

5.3 Surface Water Outfalls

5.3.1 On this basis connection is proposed to the watercourse system at the north west boundary.

6.0 MITIGATION MEASURES

6.1 Watercourse and Surface Water Flooding

6.1.1 The risk from the watercourse needs to be considered in conjunction with that from surface water flooding.

6.1.2 Whilst it is considered that the introduction of development drainage proposals will inherently mitigate the risk of surface water flows generated from within the site itself there will remain a risk associated with potential flows entering the site from the north.

It is proposed that these flows together with flows within the watercourse will be assessed at a more detailed stage.

6.1.3 Meanwhile, the following mitigation measures are proposed;

- Set ground levels to pick up and direct residual and remaining surface water flows along the north boundary and below the proposed access road.

It is intended that the managed flow path will follow the line of the diverted surface water sewer proposed under section 6.3.

- Size proposed culvert capacity at the access road to accommodate the assessed watercourse and surface water flows.
- Set development levels a minimum of 300mm above existing ground levels at the north boundary although in this regard it is anticipated that the overall development platform design and the introduction of attenuation basins (again discussed under Section 6.3) will inherently provide additional mitigation.

6.1.4 It is reiterated that development drainage proposals discussed under Section 6.3 will inherently reduce uncontrolled surface water runoff from within the site into the watercourse network and hence will deliver betterment.

6.2 Existing Surface Water Sewer

6.2.1 It is proposed to divert the existing surface water sewer along the north boundary and this is discussed under Section 6.3.

6.2.2 As a result any overtopping of the existing sewer will follow the surface water flood path and through the access road culvert as described under Section 6.1 thus mitigating any risk to the development.

6.3 Development Surface Water Drainage

6.3.1 Drainage Strategy

6.3.1.1 It is proposed to restrict overall flows from the development into the watercourse network to the Q_{bar} rate of 11 litres/sec established under Section 4.3.2.

6.3.1.2 The length of access road from York Close and the main development area will be drained to attenuation features located along the north boundary and within the

western area of the site. These will be linked, with that to the west incorporating the ultimate outfall from the development into the watercourse.

It is proposed to restrict flows to the overall entitlement of 11 litres/sec.

- 6.3.1.3 Highways, houses and associated hard surfaces will be served by a piped surface water system designed to adoptable standards to ensure, at minimum, no flooding up to the 1 in 30 year event and will discharge into the basins.

Overall flows up to the 1 in 100 year event plus allowance for 40% climate change will be contained on site within the basins and pipe systems.

The basins have been sized accordingly, on a preliminary basis and all remaining subject to detailed design. The impermeable areas reflected in the calculations for each parcel are based on 50% impermeability plus 10% allowance for urban creep i.e., 55% (**Appendix 5A**).

Otherwise the introduction of source control measures would need to be assessed for deliverability at a more detailed stage and could include:

- Swales
- Filter strips
- Permeable paving
- Rain gardens
- Rills
- Water butts

- 6.3.1.4 As noted it is intended to divert the existing surface water sewer along the north boundary and this will be done via a Section 98 agreement with Severn Trent Water. No connection is proposed into this system other than possibly at a point very close to the existing outfall, all subject to the design of the access road and associated drainage arrangements.

6.3.2 **Future Maintenance**

- 6.3.2.1 It is proposed that the main piped systems and the basins and outfalls will be adopted by Severn Trent Water under the Sewerage Sector Guidance.
- 6.3.2.2 Provision will be made within the site for maintenance access to the watercourse at the north west corner and also along the north boundary albeit its location is not known, with the management company appointed for the development to take on the riparian responsibility for future maintenance.

6.3.3 **Water Quality**

- 6.3.3.1 Whilst ground conditions remain to be proven as suitable for the incorporation of infiltration based drainage techniques, the risk to water quality from housing developments is categorised as low to very low.

The incorporation of trapped gullies to roads and the provision of the basins will nonetheless provide two levels of treatment.

- 6.3.3.2 At detailed design stage a surface water quality treatment assessment will be undertaken in accordance with the simple index approach set out in the Ciria SuDS Manual.

6.3.4 **Drainage Strategy**

- 6.3.4.1 The drainage strategy for the development has been prepared accordingly and is incorporated in **Appendix 5B**.

6.4 **Exceedance Flows**

- 6.4.1 More generally, floor levels will be set a minimum of 0.15m above external ground level and will encourage any flows generated by an exceedance event (i.e. greater than the 1 in 100 year plus climate change design event) to pass safely through the development.
- 6.4.2 Flow routes will of course follow the topography and have been indicated in **Appendix 5B**.

6.5 **Land Drainage Consents**

- 6.5.1 Formal land drainage consents will be required for the road culverting and the surface water outfalls.
- 6.5.2 In this regard attention is drawn to Leicestershire County Council Guidance Notes for Ordinary Watercourse Land Drainage Consent Applications.

7.0 **FOUL DRAINAGE**

- 7.1 Two foul sewer systems enter the site from the east and north east before combining and continuing in a north westerly direction. It is intended to either maintain these systems along their existing routes or divert within the development layout under a Section 98 agreement with Severn Trent.
- 7.2 Severn Trent Water have advised as to a point of connection of foul flows to MH0701 within the north west area of the site. However, subject to detailed design and further consultations with Severn Trent Water it is anticipated that these systems will be available within the development for connection of discrete parcels.
- 7.3 The foul system will be designed to adoptable standards and submitted for adoption under the Sewerage Sector Guidance by Severn Trent Water in conjunction with the surface water scheme.
- 7.4 The outline foul drainage strategy for the development has been prepared accordingly and is incorporated in **Appendix 5B**.

8.0 **CONCLUSIONS**

- 8.1 The proposal is for residential development which is classified as more vulnerable. More vulnerable uses are considered acceptable in terms of flood risk in Flood Zone 1 (low risk). Given that the proposed residential uses are solely located in Flood Zone 1, the Sequential Test is not required.

Potential sources of flooding from water bodies and groundwater have been considered and found to be negligible with risks from surface water runoff to be managed at a site level by the appropriate setting of development levels.

- 8.2 At the north west boundary there is a none main river system which runs due west with a surface water sewer crossing the site and outfalling into this system. Surface water flood mapping has identified an area of risk from within the site and with incoming flows from the north.

The introduction of development drainage proposals will inherently mitigate the risk of surface water flows generated from within the site itself.

The following mitigation measures are proposed;

- Set ground levels to pick up and direct surface water flows along the line of the surface water sewer to be diverted to the north boundary with the culvert capacity at the access road to be sized to accommodate the watercourse and surface water flows.
- Set development levels a minimum of 300mm above existing ground levels at the north boundary although the overall development platform design and the introduction of attenuation basins will inherently provide additional mitigation.

Any overtopping of the existing sewer will follow the surface water flood path and through the access road culvert.

- 8.3 Geoenvironmental Assessment work has identified that the site is immediately underlain by sand and gravel with a ribbon of clay, silt, sand and gravel encroaching into the north west area of the site along the line of the ditch network. Infiltration based drainage may be feasible and will be investigated at a more detailed stage.

For the purposes of the outline application, a positive surface water outfall from the development is proposed with connection proposed to the watercourse system at the north west boundary.

- 8.4 It is proposed to restrict overall flows from the development into the watercourse network to Q_{bar} rate of 11 litres/sec.

Highways, houses and associated hard surfaces will be served by a piped surface water system designed to adoptable standards and will discharge into the basins with the exception of the access road. Overall flows up to the 1 in 100 year event plus allowance for 40% climate change will be contained on site within the basins and pipe systems.

Otherwise the introduction of source control measures would need to be assessed for deliverability at a more detailed stage and could include swales, filter strips, permeable paving, rain gardens, rills and water butts

The existing surface water sewer along the north boundary will be diverted via a Section 98 agreement with Severn Trent Water.

- 8.5 It is proposed that the main piped systems and the basins and outfalls will be adopted by Severn Trent Water under the Sewerage Sector Guidance.

Provision will be made within the site for maintenance access to the watercourse at the north west corner and also along the north boundary albeit its location is not known, with the management company appointed for the development to take on the riparian responsibility for future maintenance.

- 8.6 Whilst ground conditions remain to be proven as suitable for the incorporation of infiltration based drainage techniques, the risk to water quality from housing developments is categorised as low to very low.

The incorporation of trapped gullies to roads and the provision of the basins will nonetheless provide two levels of treatment. At detailed design stage a surface water quality treatment assessment will be undertaken in accordance with the simple index approach set out in the Ciria SuDS Manual.

- 8.7 Levels will be set and land drainage introduced to ensure residual surface water run off will be conveyed safely through the development.

More generally, floor levels will be set a minimum of 0.15m above external ground level and will encourage any flows generated by an exceedance event to pass safely through the development.

- 8.8 Formal land drainage consents will be required for the road culverting and the surface water outfalls.

- 8.9 It is intended to either maintain or divert the existing foul network within the development layout also under a Section 98 agreement with Severn Trent.

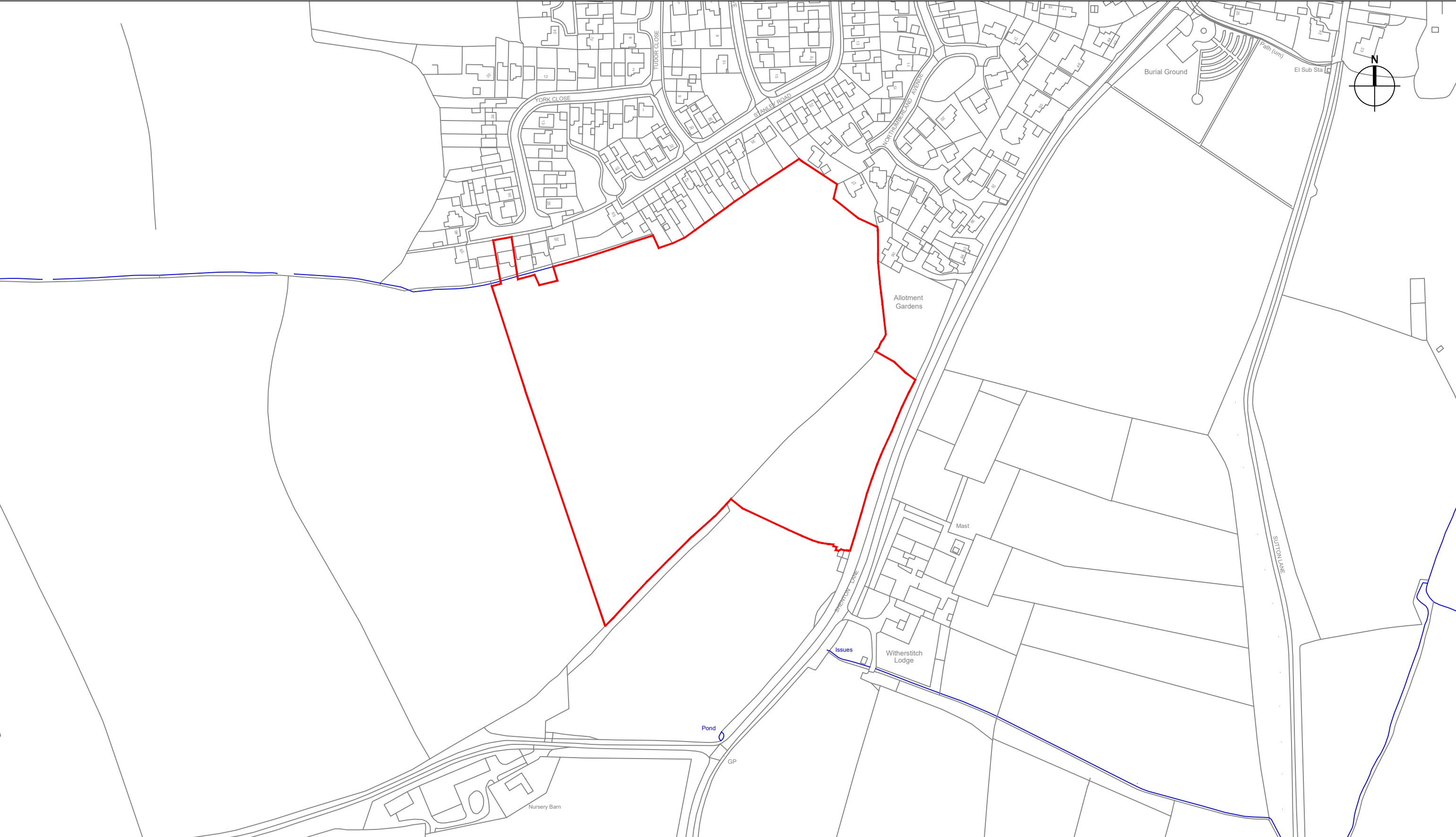
Severn Trent Water have advised as to a point of connection of foul flows within the north west area of the site although it is anticipated that these systems will be available within the development for connection of discrete parcels.

The foul system will be designed to adoptable standards and submitted for adoption under the Sewerage Sector Guidance by Severn Trent Water in conjunction with the surface water scheme.

- 8.10 It is therefore concluded that the development can be delivered in accordance with the NPPF so as not to be at risk of flooding from external sources or from within the development, and so as not to increase flood risk to the surrounding area and development is therefore appropriate.

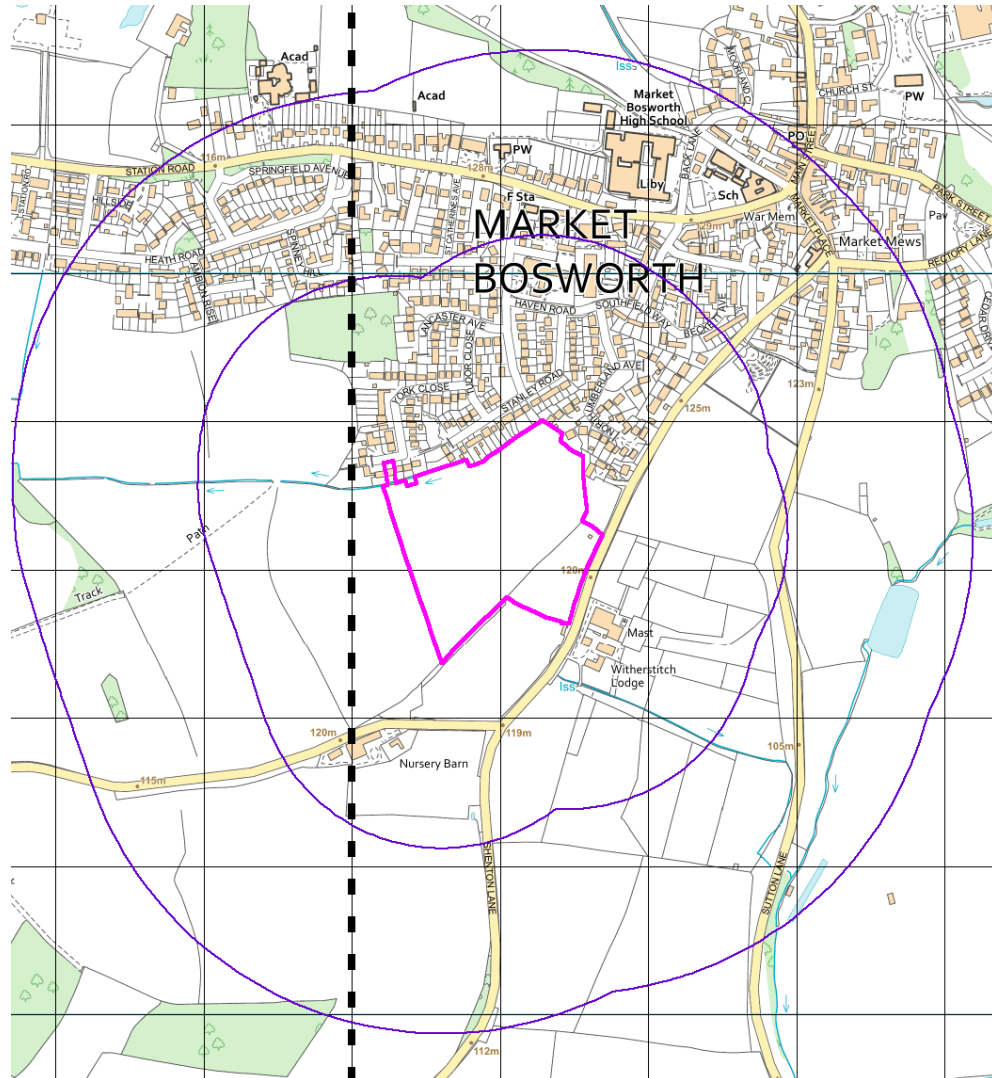
Appendix 1: Site Details

Appendix 1A: Location Plan



 GLADMAN Gladman House, Alexandria Way Congleton Business Park Congleton, Cheshire CW12 1LB Tel: 01260 288800 Fax: 01260 288801 www.gladman.co.uk				Project				Drawn by	Issue date	
				Shenton Lane, Market Bosworth				SB	21.05.2020	
								Title checked by	Title checked date	
								SB	21.05.2020	
								Highways checked by	Highways checked date	
Information				Status	Title				CHECKED BY	CHECKED_DATE
									Topo checked by	Topo checked date
									CHECKED BY	CHECKED_DATE
									Scale(s)	
									1:2500 @ A3	
									Drawing No	
									2020-030/001A	

Appendix 1B: Watercourse Systems



WATERCOURSE SYSTEMS

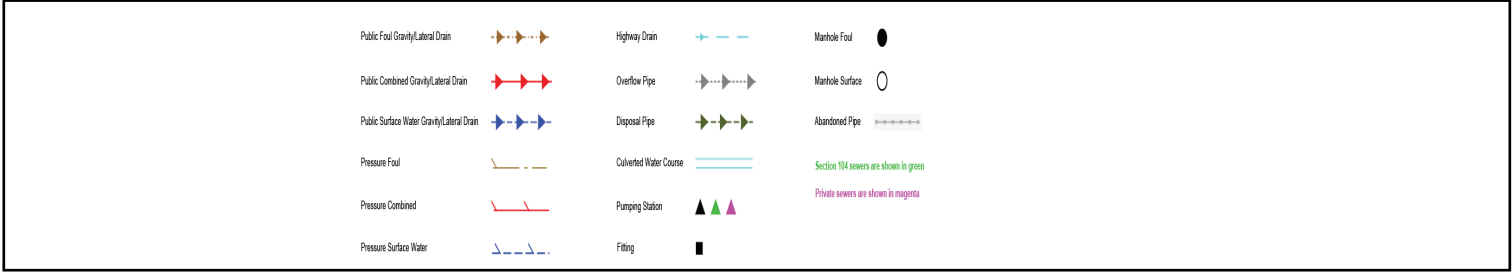
LAND OFF YORK CLOSE, MARKET BOSWORTH, NUNEATON

Appendix 2: Topographical Survey

2020-030_Topo_01_2D Rev G

Appendix 3: Severn Trent Water Public Sewer Records

Appendix 3A: Public Sewer Records



GENERAL CONDITIONS AND PRECAUTIONS TO BE TAKEN WHEN CARRYING OUT WORK ADJACENT TO SEVERN TRENT WATER'S APPARATUS

Please ensure that a copy of these conditions is passed to your representative and/or your contractor on site. If any damage is caused to Severn Trent Water Limited (STW) apparatus (defined below), the person, contractor or subcontractor responsible must inform STW immediately on: **0800 753 4444 (24 hours)**

- a) These general conditions and precautions apply to the public sewerage, water distribution and cables in ducts including (but not limited to) sewers which are the subject of an Agreement under Section 104 of the Water Industry Act 1991(a legal agreement between a developer and STW, where a developer agrees to build sewers to an agreed standard, which STW will then adopt), mains installed in accordance with an agreement for the self-construction of water mains entered into with STW and the assets described at condition b) of these general conditions and precautions. Such apparatus is referred to as "STW Apparatus" in these general conditions and precautions.
- b) Please be aware that due to The Private Sewers Transfer Regulations June 2011, the number of public sewers has increased, but many of these are not shown on the public sewer record. However, some idea of their positions may be obtained from the position of inspection covers and their existence must be anticipated.
- c) On request, STW will issue a copy of the plan showing the approximate locations of STW Apparatus although in certain instances a charge will be made. The position of private drains, private sewers and water service pipes to properties are not normally shown but their presence must be anticipated. This plan and the information supplied with it is furnished as a general guide only and STW does not guarantee its accuracy.
- d) STW does not update these plans on a regular basis. Therefore the position and depth of STW Apparatus may change and this plan is issued subject to any such change. Before any works are carried out, you should confirm whether any changes to the plan have been made since it was issued.
- e) The plan must not be relied upon in the event of excavations or other works in the vicinity of STW Apparatus. It is your responsibility to ascertain the precise location of any STW Apparatus prior to undertaking any development or other works (including but not limited to excavations).
- f) No person or company shall be relieved from liability for loss and/or damage caused to STW Apparatus by reason of the actual position and/or depths of STW Apparatus being different from those shown on the plan.

In order to achieve safe working conditions adjacent to any STW Apparatus the following should be observed:

1. All STW Apparatus should be located by hand digging prior to the use of mechanical excavators.
2. All information set out in any plans received from us, or given by our staff at the site of the works, about the position and depth of the mains, is approximate. Every possible precaution should be taken to avoid damage to STW Apparatus. You or your contractor must ensure the safety of STW Apparatus and will be responsible for the cost of repairing any loss and/or damage caused (including without limitation replacement parts).
3. Water mains are normally laid at a depth of 900mm. No records are kept of customer service pipes which are normally laid at a depth of 750mm; but some idea of their positions may be obtained from the position of stop tap covers and their existence must be anticipated.
4. During construction work, where heavy plant will cross the line of STW Apparatus, specific crossing points must be agreed with STW and suitably reinforced where required. These crossing points should be clearly marked and crossing of the line of STW Apparatus at other locations must be prevented.
5. Where it is proposed to carry out piling or boring within 20 metres of any STW Apparatus, STW should be consulted to enable any affected STW Apparatus to be surveyed prior to the works commencing.
6. Where excavation of trenches adjacent to any STW Apparatus affects its support, the STW Apparatus must be supported to the satisfaction of STW. Water mains and some sewers are pressurised and can fail if excavation removes support to thrust blocks to bends and other fittings.
7. Where a trench is excavated crossing or parallel to the line of any STW Apparatus, the backfill should be adequately compacted to prevent any settlement which could subsequently cause damage to the STW Apparatus. In special cases, it may be necessary to provide permanent support to STW Apparatus which has been exposed over a length of the excavation before backfilling and reinstatement is carried out. There should be no concrete backfill in contact with the STW Apparatus.
8. No other apparatus should be laid along the line of STW Apparatus irrespective of clearance. Above ground apparatus must not be located within a minimum of 3 metres either side of the centre line of STW Apparatus for smaller sized pipes and 6 metres either side for larger sized pipes without prior approval. No manhole or chamber shall be built over or around any STW Apparatus.
9. A minimum radial clearance of 300 millimetres should be allowed between any plant or equipment being installed and existing STW Apparatus. We reserve the right to increase this distance where strategic assets are affected.
10. Where any STW Apparatus coated with a special wrapping is damaged, even to a minor extent, STW must be notified and the trench left open until the damage has been inspected and the necessary repairs have been carried out. In the case of any material damage to any STW Apparatus causing leakage, weakening of the mechanical strength of the pipe or corrosion-protection damage, the necessary remedial work will be recharged to you.
11. It may be necessary to adjust the finished level of any surface boxes which may fall within your proposed construction. Please ensure that these are not damaged, buried or otherwise rendered inaccessible as a result of the works and that all stop taps, valves, hydrants, etc. remain accessible and operable. Minor reduction in existing levels may result in conflict with STW Apparatus such as valve spindles or tops of hydrants housed under the surface boxes. Checks should be made during site investigations to ascertain the level of such STW Apparatus in order to determine any necessary alterations in advance of the works.
12. With regard to any proposed resurfacing works, you are required to contact STW on the number given above to arrange a site inspection to establish the condition of any STW Apparatus in the nature of surface boxes or manhole covers and frames affected by the works. STW will then advise on any measures to be taken, in the event of this a proportionate charge will be made.
13. You are advised that STW will not agree to either the erection of posts, directly over or within 1.0 metre of valves and hydrants,
14. No explosives are to be used in the vicinity of any STW Apparatus without prior consultation with STW.

TREE PLANTING RESTRICTIONS

There are many problems with the location of trees adjacent to sewers, water mains and other STW Apparatus and these can lead to the loss of trees and hence amenity to the area which many people may have become used to. It is best if the problem is not created in the first place. Set out below are the recommendations for tree planting in close proximity to public sewers, water mains and other STW Apparatus.

15. Please ensure that, in relation to STW Apparatus, the mature root systems and canopies of any tree planted do not and will not encroach within the recommended distances specified in the notes below.
16. Both Poplar and Willow trees have extensive root systems and should not be planted within 12 metres of a sewer, water main or other STW Apparatus.
17. The following trees and those of similar size, be they deciduous or evergreen, should not be planted within 6 metres of a sewer, water main or other STW Apparatus. E.g. Ash, Beech, Birch, most Conifers, Elm, Horse Chestnut, Lime, Oak, Sycamore, Apple and Pear. Asset Protection Statements Updated May 2014
18. STW personnel require a clear path to conduct surveys etc. No shrubs or bushes should be planted within 2 metre of the centre line of a sewer, water main or other STW Apparatus.
19. In certain circumstances, both STW and landowners may wish to plant shrubs/bushes in close proximity to a sewer, water main of other STW Apparatus for screening purposes. The following are shallow rooting and are suitable for this purpose: Blackthorn, Broom, Cotoneaster, Elder, Hazel, Laurel, Privet, Quickthorn, Snowberry, and most ornamental flowering shrubs.

Appendix 3B: Response of 21st May 2024

WONDERFUL ON TAP



Severn Trent Water Ltd

Oxley Moor Rd
Wolverhampton
WV9 5HN

www.stwater.co.uk

Network.Solutions@severntrent.co.uk

Contact: Michael Taylor

Your ref:

Our ref: 1116873

John Lees
Lees Roxburgh Ltd
The Genesis Centre
Science Park South
Birchwood
Warrington
WA3 7BH

21st May 2024

Dear John

Proposed Redevelopment at: I/o Shenton Ln Market Bosworth

I refer to your 'Development Enquiry Request' 125 Housing Property in respect of the above site. Please find enclosed the sewer records that are included in the fee together with the Supplementary Guidance Notes which refer to surface water disposal from development sites.

Public Sewers in Site – Required Protection

Due to a change in legislation on 1 October 2011, there may be former private sewers on the site which have transferred to the responsibility of Severn Trent Water Ltd, which are not shown on the statutory sewer records, but are located in your client's land. These sewers would also have protective strips that we will not allow to be built over. If such sewers are identified to be present on the site, please contact us for further guidance. Our sewer records indicate that crossing the development site are a 225mm foul sewer crossing from east to west, there are also a 225mm foul and 300mm surface water sewers running parallel from north east to east. All public sewers carry the following protection zones.

100mm to 225mm 6m -3m either side
300mm to 999mm 10m -5m either side
1000mm and above 15m-7.5m either side.

We do not permit any development within the protection zones, the site layout must be designed that the sewers run within public open space or highway/footway, and the sewers should not run within private gardens especially rear gardens.

If the site cannot be planned this way then you may wish to consider a S185 sewer diversion application to divert the public sewers.

WONDERFUL ON TAP

SEVERN

TRENT

Foul Water Drainage

The nearest foul water sewers capable of receiving flows are crossing the development site a connection to m/h 0701(to avoid surcharge in m/h 0602). The sewers should be able to accept gravity connection @ 1.95l/s 2xdwf from your proposed site into these sewers. Please be advised that a new / indirect connection to this sewer would be allowed subject to a formal S.106 sewer connection approval (see later).

Surface Water Drainage

Under the terms of Section H of the Building Regulations 2010, the disposal of surface water by means of soak ways should be considered as the primary method.

If following testing, it is demonstrated that soakaways would not be possible on the site; satisfactory evidence will need to be submitted from the SI consultant (extract or a supplementary letter).

If soak way is proven not possible then a connection to the local watercourses/ditches within the proposed site should be investigated flows at 5l/s greenfield rates.If a direct connection to the watercourse is not possible then a connection to 300mm surface water sewer m/h 0603 @5l/s would be acceptable.

This would satisfy SGN1 (enclosed), in accordance with Leicestershire Council SUDS Policy as the Lead Local Flood Authority (LLFA) for the area and statutory consultee in the planning process. Please see the guidance notes attached for further information.

New Connections

For any new connections (including the re-use of existing connections) to the public sewerage system, the developer will need to submit Section 106 application forms. Our New Connections department are responsible for handling all such enquiries and applications. To contact them for an application form and associated guidance notes please call 0800 7076600 or download from www.stwater.co.uk.

Please quote 1116873 in any future correspondence (including e-mails) with STW Limited. Please note that 'Development Enquiry' responses are only valid for 6 months from the date of this letter.

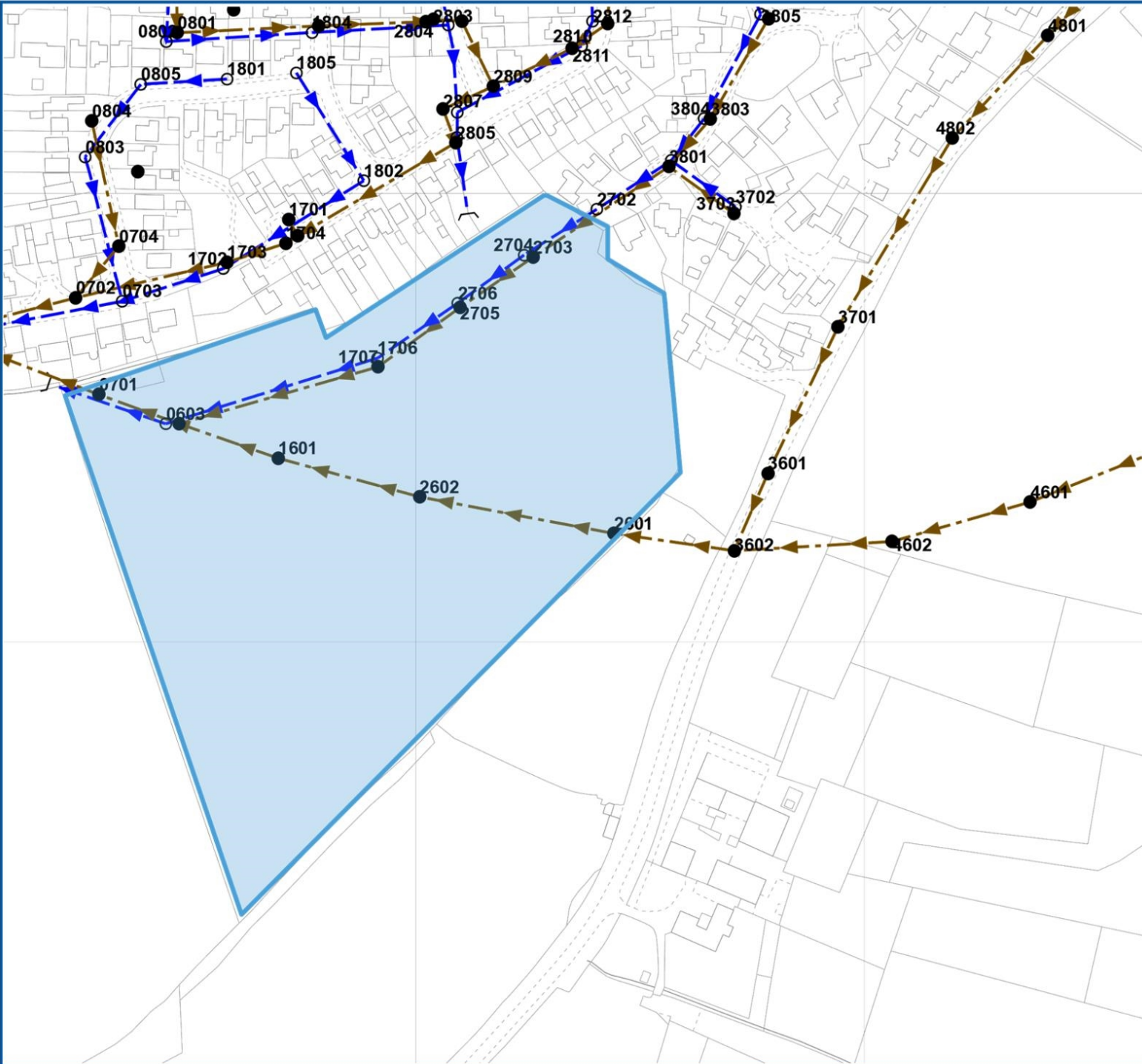
WONDERFUL ON TAP



Yours sincerely

A handwritten signature in black ink, appearing to be "MT" with a stylized flourish.

Michael Taylor
Network Solutions



Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SK40020702	110.5599	106.4	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK40022801	121.8399	118.46	117.83	F	VC	C	225	<UNK>	52.56	31/12/1899 00:00:00
SK40021703	113.44	110.35	109.26	F	VC	C	225	<UNK>	64.3	31/12/1899 00:00:00
SK40020804	115.1399	112.83	110.31	F	VC	C	150	<UNK>	22.81	31/12/1899 00:00:00
SK40023801	121.04	118.45	115.77	F	VC	C	225	<UNK>	26.7	31/12/1899 00:00:00
SK40022811	121.0299	117.53	116.67	F	VC	C	225	<UNK>	45.77	31/12/1899 00:00:00
SK40021704	114.1399	111.68	111.37	F	VC	C	225	<UNK>	86.87	31/12/1899 00:00:00
SK40021803	121.6999	118.97	118.62	F	VC	C	225	<UNK>	140.11	31/12/1899 00:00:00
SK40021601	114.9599	112.44	111.63	F	VC	C	225	<UNK>	57.74	31/12/1899 00:00:00
SK40021801	118.6999	116.1	113.95	S	VC	C	150	<UNK>	18.16	31/12/1899 00:00:00
SK40022601	120.4499	115.94	115.72	F	VC	C	225	<UNK>	402.09	31/12/1899 00:00:00
SK40022802	121.83	118.93	116.72	S	VC	C	300	<UNK>	13.61	31/12/1899 00:00:00
SK40023602	<UNK>	<UNK>	115.95	F	<UNK>	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK40021701	114.61	113.7	<UNK>	F	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK40022810	121.0599	118.5	116.8	S	VC	C	300	<UNK>	36.85	31/12/1899 00:00:00
SK40022804	121.8499	118.61	118.6	F	VC	C	225	<UNK>	316	31/12/1899 00:00:00
SK40022809	119.05	116.65	116.34	F	VC	C	225	<UNK>	76.68	31/12/1899 00:00:00
SK40024801	126.51	124.52	122.71	F	VC	C	<UNK>	<UNK>	34.39	31/12/1899 00:00:00
SK40022813	121.8399	117.94	117.54	F	VC	C	225	<UNK>	46.5	31/12/1899 00:00:00
SK40023703	122.5899	120.56	118.52	F	VC	C	150	<UNK>	17.16	31/12/1899 00:00:00
SK40022808	118.11	116.76	116.23	S	CO	C	450	<UNK>	20.75	31/12/1899 00:00:00
SK40024802	125.02	122.68	121.05	F	VC	C	<UNK>	<UNK>	60.61	31/12/1899 00:00:00
SK40021802	116.41	114.68	110.89	S	VC	C	150	<UNK>	19.41	31/12/1899 00:00:00
SK40023802	121.08	118.81	117.41	S	CO	C	300	<UNK>	28.54	31/12/1899 00:00:00
SK40023702	122.73	121.06	119.02	S	VC	C	150	<UNK>	17.16	31/12/1899 00:00:00
SK40020602	113.4599	111.59	108.99	F	VC	C	225	<UNK>	14.57	31/12/1899 00:00:00
SK40022705	115	112.48	111.35	F	VC	C	225	<UNK>	39.3	31/12/1899 00:00:00
SK40021702	113.3799	110.8	109.12	S	VC	C	225	<UNK>	28.99	31/12/1899 00:00:00
SK40020603	113.355	109.98	108.88	S	CO	C	300	<UNK>	47.35	31/12/1899 00:00:00

LEGEND

Operational Site

Waste Water Pump

Transfered Asset

S24

S104

S102

Null Private

Null

None

Highway Drain

Adopted Sewer

Storage

DS

Disposal Site

Off-Line Waste Water Storage

On-Line Waste Water Storage

Wet Well

Waste Water Process Structure

119

111

117

111

Manhole

Twin Manhole

Foul Manhole

Surface Water Manhole

Combined Manhole

Dual Manhole

Unsurveyed Foul Manhole

Unsurveyed Surface Water Manhole

Unsurveyed Combined Manhole

Unsurveyed Unknown Manhole

Gravity Sewer Pipe

Foul Gravity Sewer

Combined Gravity Sewer

Surface Water Gravity Sewer

S104 Surface Water Gravity Sewer

S104 Combined Gravity Sewer

S104 Foul Gravity Sewer

Private Surface Water Gravity Sewer

Private Combined Gravity Sewer

Surface Water Unserved Pipe

Combined Unserved Pipe

Foul Unserved Pipe

Transfered Surface Water Sewer

Transfered Combined Sewer

Transfered Foul Sewer

Disposal Pipe

Overflow Pipe

Culverted Water Course

Waste Internal Site Pipe

Sewer Service Connection

Gravity Sewer Others

Pressure Sewer Pipe

Surface Water Pressure Sewer

Combined Pressure Sewer

Foul Pressure Sewer

S104 Surface Water Pressure Sewer

S104 Combined Pressure Sewer

S104 Foul Pressure Sewer

Private Surface Water Pressure Sewer

Private Combined Pressure Sewer

Foul Vacuum Sewer

Combined Vacuum Sewer

S104 Surface Water Vacuum Sewer

S104 Combined Vacuum Sewer

S104 Foul Vacuum Sewer

Private Surface Water Vacuum Sewer

Private Combined Vacuum Sewer

Private Foul Vacuum Sewer

Surface Water Siphon

Transfered Surface Water Lateral Da

Transfered Combined Lateral Drain

Transfered Foul Lateral Drain

Ancillary

Balancing Lagoon

Grease Trap

Interceptor

Screen

Chamber

Flushing Chamber

Scalaway

Overflow

Fitting

Blind Shaft

Facility Connector

Head Node

Lamphole

Sewerage Air Valve

Sewerage Chemical Injection Point

Sewerage Hatch Box

Sewerage Pressure Washout

Vent Column

Waste Water Outfall

Control Valve

Hydrocable

Penstock

Sewerage Isolation Valve

Sewerage Non Return Valve

Print200mLine

MATERIALS

-
- AC - ASBESTOS CEME
- BR - BRICK
- CC - CONCRETE BOX CULVERT
- CI - CAST IRON
- CO - CONCRETE
- CSB - CONCRETE SEGMENTS (BOLTED)
- CSU - CONCRETE SEGMENTS (UNBOLTED)
- DI - DUCTILE IRON
- GRP - GLASS REINFORCED PLASTIC
- MAC - MASONRY IN REGULAR COURSES
- MAR - MASONRY RANDOMLY COURSED
- PE - POLYETHYLENE
- PF - PITCH
- PP - POLYPROPYLENE
- PSC - PLASTIC STEEL COMPOSITE
- PVC - POLYVINYL CHLORIDE
- RPM - REINFORCED PLASTIC MATRIX
- SI - SPUN (GREY) IRON
- ST - STEEL
- U - UNKNOWN
- VC - VITRIFIED CLAY
- XXX - OTHER

CATEGORIES

- W - WEIR
- C - CASCADE
- DB - DAMBOARD
- SE - SIDE ENTRY
- FV - FLAP VALVE
- BD - BACK DROP
- S - SIPHON
- D - HIGHWAY DRAIN
- S104 - SECTION 104

SHAPE

- C - CIRCULAR
- E - EGG SHAPED
- O - OTHER
- R - RECTANGLE
- S - SQUARE
- T - TRAPEZOIDAL
- U - UNKNOWN

PURPOSE

- C - COMBINED
- E - FINAL EFFLUENT
- F - FOUL
- L - SLUDGE
- S - SURFACE WATER



Severn Trent Water Limited
Asset Data Management
PO Box 5344
Coventry
CV3 9FT
Telephone: 0345 601 6616

SEWER RECORD (Tabular)

O/S Map Scale: 1:2,500

This map is centred upon:

Date of Issue: 21-05-24

X: 440270.39

Y: 302647.76

Disclaimer Statement

- 1 Do not scale off this Map.
- 2 This plan and any information supplied with it is furnished as a general guide, is only valid at the date of issue and no warranty as to its correctness is given or implied. In particular this plan and any information shown on it must not be relied upon in the event of any development or works (including but not limited to excavations) in the vicinity of SEVERN TRENT WATER assets or for the purposes of determining the suitability of a point of connection to the sewerage or distribution systems.
- 3 On 1 October 2011 most private sewers and private lateral drains in Severn Trent Water's sewerage area, which were connected to a public sewer as at 1 July 2011, transferred to the ownership of Severn Trent Water and became public sewers and public lateral drains. A further transfer takes place on 1 October 2012. Private pumping stations, which form part of these sewers or lateral drains, will transfer to ownership of Severn Trent Water on or before 1 October 2016. Severn Trent Water does not possess complete records of these assets. These assets may not be displayed on the map.
- 4 Reproduction by permission of Ordnance Survey on behalf of HMSO. Crown Copyright and database right 2004. All rights reserved.
- 5 Ordnance Survey licence number: 100031673
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Appendix 4: Existing Run Off Rates

HR Wallingford

Calculated by: Lees Roxburgh

Site name: 6618 York Close

Site location: Market Bosworth

Site Details

Latitude: 52.62044° N

Longitude: 1.40913° W

Reference: 2577152430

Date: Aug 23 2024 08:52

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

Runoff estimation approach

FEH Statistical

Site characteristics

Total site area (ha): 2.925

Methodology

Q_{MED} estimation method: Calculate from BFI and SAAR

BFI and SPR method: Specify BFI manually

HOST class: N/A

BFI / BFIHOST: 0.353

Q_{MED} (l/s):

Q_{BAR} / Q_{MED} factor: 1.12

Hydrological characteristics

	Default	Edited
SAAR (mm):	639	639
Hydrological region:	4	4
Growth curve factor 1 year:	0.83	0.83
Growth curve factor 30 years:	2	2
Growth curve factor 100 years:	2.57	2.57
Growth curve factor 200 years:	3.04	3.04

Notes

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

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

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

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

(3) Is SPR/SPRHOST ≤ 0.3?

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

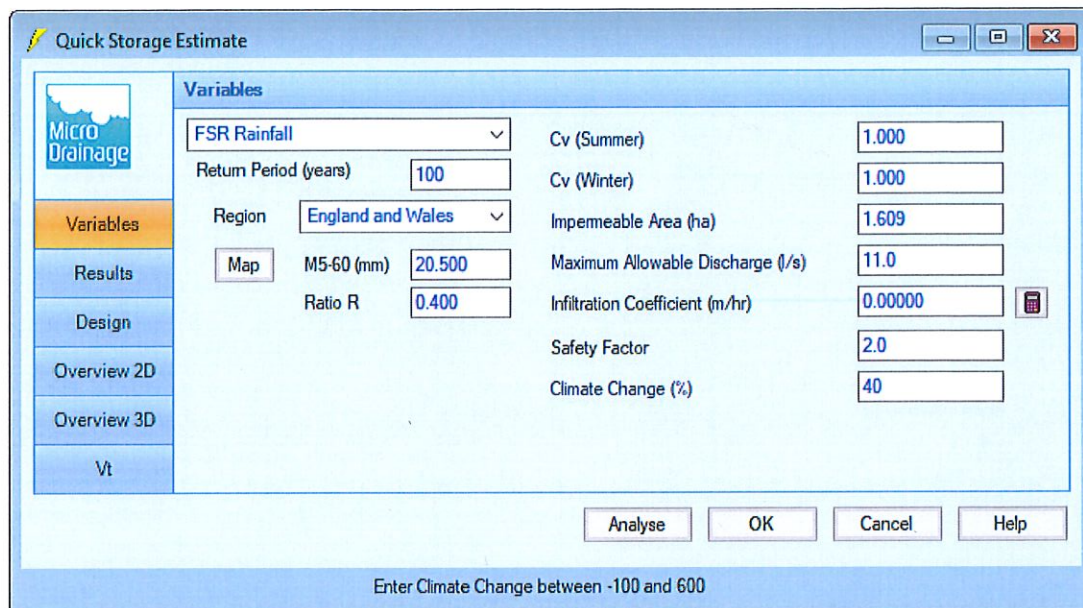
Greenfield runoff rates

	Default	Edited
Q _{BAR} (l/s):		11
1 in 1 year (l/s):		9.13
1 in 30 years (l/s):		21.99
1 in 100 year (l/s):		28.26
1 in 200 years (l/s):		33.43

Appendix 5: Flood Risk and Outline Drainage Strategy

Appendix 5A: Quick Storage Estimate

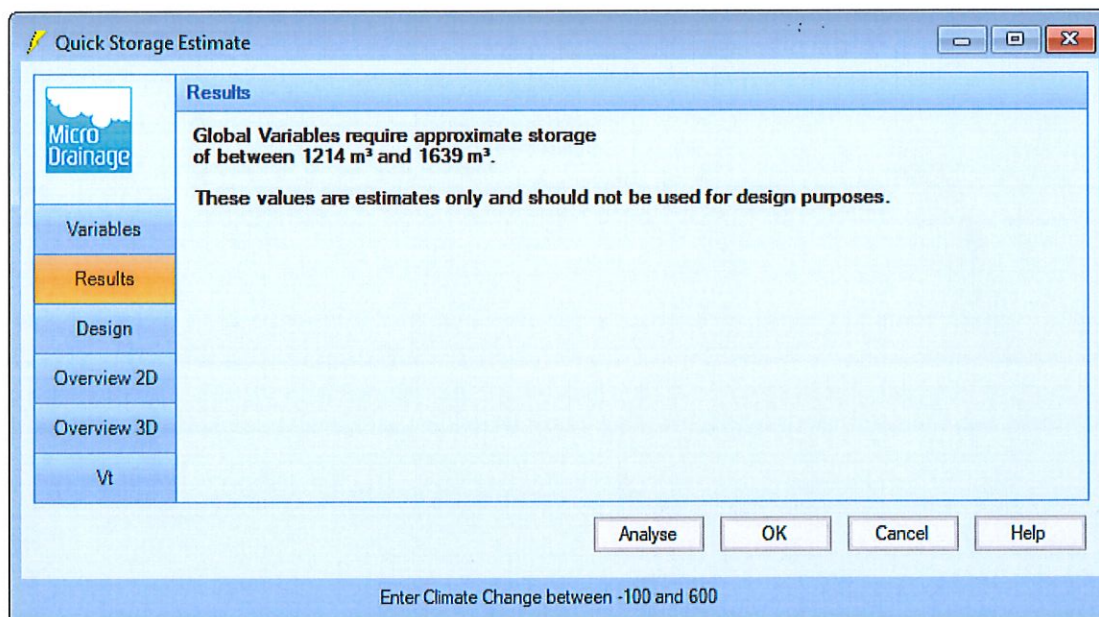
6618 Land off York Close, Market Bosworth



The screenshot shows the 'Variables' tab of the 'Quick Storage Estimate' window. The left sidebar contains a vertical menu with 'Variables' selected, and other options: Results, Design, Overview 2D, Overview 3D, and Vt. The main area is titled 'Variables' and contains several input fields. On the left, there is a 'Map' button and a dropdown menu for 'Region' set to 'England and Wales'. Below this are two input fields: 'M5-60 (mm)' with the value '20.500' and 'Ratio R' with the value '0.400'. To the right of these are two columns of input fields. The first column contains 'Cv (Summer)' (1.000), 'Cv (Winter)' (1.000), 'Impervious Area (ha)' (1.609), 'Maximum Allowable Discharge (l/s)' (11.0), 'Infiltration Coefficient (m/hr)' (0.00000), 'Safety Factor' (2.0), and 'Climate Change (%)' (40). The second column contains a small calculator icon. At the bottom of the window are four buttons: 'Analyse', 'OK', 'Cancel', and 'Help'. A status bar at the very bottom reads 'Enter Climate Change between -100 and 600'.

Variable	Value
FSR Rainfall	[Dropdown]
Return Period (years)	100
Region	England and Wales
M5-60 (mm)	20.500
Ratio R	0.400
Cv (Summer)	1.000
Cv (Winter)	1.000
Impervious Area (ha)	1.609
Maximum Allowable Discharge (l/s)	11.0
Infiltration Coefficient (m/hr)	0.00000
Safety Factor	2.0
Climate Change (%)	40

Enter Climate Change between -100 and 600



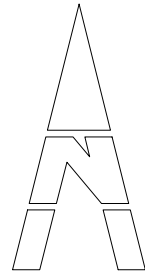
The screenshot shows the 'Results' tab of the 'Quick Storage Estimate' window. The left sidebar is the same as the previous screen, but 'Results' is now selected. The main area is titled 'Results' and contains the following text: 'Global Variables require approximate storage of between 1214 m³ and 1639 m³.' and 'These values are estimates only and should not be used for design purposes.' At the bottom of the window are four buttons: 'Analyse', 'OK', 'Cancel', and 'Help'. A status bar at the very bottom reads 'Enter Climate Change between -100 and 600'.

Global Variables require approximate storage of between 1214 m³ and 1639 m³.

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

Enter Climate Change between -100 and 600

Appendix 5B: Lees Roxburgh Drg. No. 6618/01-03 Rev A



Notes

- Existing
- Watercourse
- Open
 - Culverted
- Foul Sewer
- To be maintained or diverted within layout
- Surface Water Sewer
- To be diverted along north boundary

Sewer Easements to be incorporated as necessary

Greenfield Run Off Rates
Based on Area = 2.925 ha
Q_{bar} 11 l/s
Q₃₀ 22 l/s
Q₁₀₀ 28.26 l/s

- Proposed
- Foul Network
 - Surface Water Network
 - Surface Water Attenuation Basins

Attenuation and pipes to be designed to accomodate all storm events up to and including 1 in 100 year + 40% allowance for climate change.

Connections to be made to watercourse as follows

Surface Water Flow Management

Indicative Routing

Exceedance Flows

Indicative Routing

A Updated to DFP Rev L. Access road drainage connected into basin CB 17.12.24

Rev	Revision	By	Date
-----	----------	----	------



Land Off York Close
Market Bosworth

Flood Risk And
Outline Drainage Strategy

LeesRoxburgh
Consulting Engineers

The Genesis Centre
Science Park South
Birchwood
Warrington
WA3 7BH

01925 812898
office@leesroxburgh.co.uk
www.leesroxburgh.co.uk

Job No.	Drawing No.	Revision.
6618	01-03	A
Scale 1:1000@A2		Date August 2024
Drawn By	Designed By	Checked By
RD	CB	JEL