

Application for Planning Permission

Town and Country Planning Act 1990 (as amended)

Publication of applications on planning authority websites

Please note that the information provided on this application form and in supporting documents may be published on the Authority's website. If you require any further clarification, please contact the Authority's planning department.

Site Location

Disclaimer: We can only make recommendations based on the answers given in the questions.

If you cannot provide a postcode, the description of site location must be completed. Please provide the most accurate site description you can, to help locate the site - for example "field to the North of the Post Office".

Number

Suffix

Property Name

Address Line 1

Address Line 2

Address Line 3

Town/city

Postcode

Description of site location must be completed if postcode is not known:

Easting (x) Northing (y)

Description

Applicant Details

Name/Company

Title

Mr

First name

Mark

Surname

Tooth

Company Name

Address

Address line 1

87 Wells Road

Address line 2

Address line 3

Gloucestershire

Town/City

Gloucester

Country

Postcode

GL4 3AN

Are you an agent acting on behalf of the applicant?

Yes

No

Contact Details

Primary number

***** REDACTED *****

Secondary number

Fax number

Email address

Agent Details

Name/Company

Title

First name

Surname

Company Name

Address

Address line 1

Address line 2

Address line 3

Town/City

Country

Postcode

Contact Details

Primary number

Secondary number

Fax number

Email address

Site Area

What is the measurement of the site area? (numeric characters only).

Unit

Description of the Proposal

Please note in regard to:

- **Fire Statements** - From 1 August 2021, planning applications for buildings of over 18 metres (or 7 stories) tall containing more than one dwelling will require a 'Fire Statement' for the application to be considered valid. There are some exemptions. [View government planning guidance on fire statements](#) or [access the fire statement template and guidance](#).
- **Permission In Principle** - If you are applying for Technical Details Consent on a site that has been granted Permission In Principle, please include the relevant details in the description below.
- **Public Service Infrastructure** - From 1 August 2021, applications for certain public service infrastructure developments will be eligible for faster determination timeframes. See help for further details or [view government planning guidance on determination periods](#).

Description

Please describe details of the proposed development or works including any change of use

Has the work or change of use already started?

- Yes
 No

Existing Use

Please describe the current use of the site

Is the site currently vacant?

- Yes
 No

Does the proposal involve any of the following? If Yes, you will need to submit an appropriate contamination assessment with your application.

Land which is known to be contaminated

- Yes
 No

Land where contamination is suspected for all or part of the site

- Yes
 No

A proposed use that would be particularly vulnerable to the presence of contamination

- Yes
 No

Materials

Does the proposed development require any materials to be used externally?

- Yes
 No

Please provide a description of existing and proposed materials and finishes to be used externally (including type, colour and name for each material)

Type:

Walls

Existing materials and finishes:

87 wells road - Red brick finish, cavity construction

Proposed materials and finishes:

Block work cavity construction with K-render smooth finish

Type:

Roof

Existing materials and finishes:

87 Wells road - Concrete interlocking tile

Proposed materials and finishes:

smooth grey tile

Type:

Windows

Existing materials and finishes:

upvc white double glazed

Proposed materials and finishes:

anthracite framed glazing throughout

Are you supplying additional information on submitted plans, drawings or a design and access statement?

- Yes
 No

If Yes, please state references for the plans, drawings and/or design and access statement

NB-87WR-MT-001a Existing Site
NB-87WR-MT-002C Proposed Plans
NB-87WR-MT-003D Proposed Site and Context
NB-87WR-MT-004B Existing and Proposed Site
Design and Access
Revised FRA.pdf
Product 4.pdf
Node Point Map (1).pdf
3_CC Guidance_Aug2021.pdf
22-OP-1226 - A1 - 002 - Drainage Construction Details
22-OP-1226 - A2 - 001 - Proposed Drainage Strategy
Simulation Calcs 1 in 100 40i

Pedestrian and Vehicle Access, Roads and Rights of Way

Is a new or altered vehicular access proposed to or from the public highway?

- Yes
 No

Is a new or altered pedestrian access proposed to or from the public highway?

- Yes
 No

Are there any new public roads to be provided within the site?

- Yes
 No

Are there any new public rights of way to be provided within or adjacent to the site?

- Yes
 No

Do the proposals require any diversions/extinguishments and/or creation of rights of way?

- Yes
 No

If you answered Yes to any of the above questions, please show details on your plans/drawings and state their reference numbers

NB-87WR-MT-004B Existing and Proposed Site

Vehicle Parking

Does the site have any existing vehicle/cycle parking spaces or will the proposed development add/remove any parking spaces?

- Yes
 No

Vehicle Type:

Cars

Existing number of spaces:

1

Total proposed (including spaces retained):

3

Difference in spaces:

2

Trees and Hedges

Are there trees or hedges on the proposed development site?

- Yes
 No

And/or: Are there trees or hedges on land adjacent to the proposed development site that could influence the development or might be important as part of the local landscape character?

- Yes
 No

If Yes to either or both of the above, you may need to provide a full tree survey, at the discretion of the local planning authority. If a tree survey is required, this and the accompanying plan should be submitted alongside the application. The local planning authority should make clear on its website what the survey should contain, in accordance with the current 'BS5837: Trees in relation to design, demolition and construction - Recommendations'.

Assessment of Flood Risk

Is the site within an area at risk of flooding? (Check the location on the Government's [Flood map for planning](#). You should also refer to national [standing advice](#) and your local planning authority requirements for information as necessary.)

- Yes
 No

Is your proposal within 20 metres of a watercourse (e.g. river, stream or beck)?

- Yes
 No

Will the proposal increase the flood risk elsewhere?

- Yes
 No

How will surface water be disposed of?

- Sustainable drainage system
 Existing water course
 Soakaway
 Main sewer
 Pond/lake

Biodiversity and Geological Conservation

Is there a reasonable likelihood of the following being affected adversely or conserved and enhanced within the application site, or on land adjacent to or near the application site?

To assist in answering this question correctly, please refer to the help text which provides guidance on determining if any important biodiversity or geological conservation features may be present or nearby; and whether they are likely to be affected by the proposals.

a) Protected and priority species

- Yes, on the development site
 Yes, on land adjacent to or near the proposed development
 No

b) Designated sites, important habitats or other biodiversity features

- Yes, on the development site
 Yes, on land adjacent to or near the proposed development
 No

c) Features of geological conservation importance

- Yes, on the development site
 Yes, on land adjacent to or near the proposed development
 No

Supporting information requirements

Where a development proposal is likely to affect features of biodiversity or geological conservation interest, you will need to submit, with the application, sufficient information and assessments to allow the local planning authority to determine the proposal.

Failure to submit all information required will result in your application being deemed invalid. It will not be considered valid until all information required by the local planning authority has been submitted.

Your local planning authority will be able to advise on the content of any assessments that may be required.

Foul Sewage

Please state how foul sewage is to be disposed of:

- Mains sewer
 Septic tank
 Package treatment plant
 Cess pit
 Other
 Unknown

Are you proposing to connect to the existing drainage system?

- Yes
 No
 Unknown

If Yes, please include the details of the existing system on the application drawings and state the plan(s)/drawing(s) references

22-OP-1226 - A2 - 001 - Proposed Drainage Strategy

Waste Storage and Collection

Do the plans incorporate areas to store and aid the collection of waste?

- Yes
 No

Have arrangements been made for the separate storage and collection of recyclable waste?

- Yes
- No

Trade Effluent

Does the proposal involve the need to dispose of trade effluents or trade waste?

- Yes
- No

Residential/Dwelling Units

Does your proposal include the gain, loss or change of use of residential units?

- Yes
- No

Please note: This question is based on the current housing categories and types specified by government.

If your application was started before 23 May 2020, the categories and types shown in this question will now have changed. We recommend that you review any information provided to ensure it is correct before the application is submitted.

Proposed

Please select the housing categories that are relevant to the proposed units

- Market Housing
- Social, Affordable or Intermediate Rent
- Affordable Home Ownership
- Starter Homes
- Self-build and Custom Build

Self-build and Custom Build

Please specify each type of housing and number of units proposed

Housing Type:

Houses

1 Bedroom:

0

2 Bedroom:

0

3 Bedroom:

0

4+ Bedroom:

1

Unknown Bedroom:

0

Total:

1

Proposed Self-build and Custom Housing Category Totals

1 Bedroom Total

0

2 Bedroom Total

0

3 Bedroom Total

0

4 Bedroom Total

1

Unknown

Bedroom Total

0

Bedroom Total

1

Existing

Please select the housing categories for any existing units on the site

- Market Housing
- Social, Affordable or Intermediate Rent
- Affordable Home Ownership
- Starter Homes
- Self-build and Custom Build

Market Housing

Please specify each existing type of housing and number of units on the site

Housing Type: Houses
1 Bedroom: 0
2 Bedroom: 0
3 Bedroom: 1
4+ Bedroom: 0
Unknown Bedroom: 0
Total: 1

Existing Market Housing Category Totals	1 Bedroom Total	2 Bedroom Total	3 Bedroom Total	4 Bedroom Total	Unknown Bedroom Total	Bedroom Total
	0	0	1	0	0	1

Totals

Total proposed residential units	1
Total existing residential units	1
Total net gain or loss of residential units	0

All Types of Development: Non-Residential Floorspace

Does your proposal involve the loss, gain or change of use of non-residential floorspace?
Note that 'non-residential' in this context covers all uses except Use Class C3 Dwellinghouses.

- Yes
- No

Employment

Are there any existing employees on the site or will the proposed development increase or decrease the number of employees?

- Yes
- No

Hours of Opening

Are Hours of Opening relevant to this proposal?

- Yes
- No

Industrial or Commercial Processes and Machinery

Does this proposal involve the carrying out of industrial or commercial activities and processes?

- Yes
- No

Is the proposal for a waste management development?

- Yes
- No

Hazardous Substances

Does the proposal involve the use or storage of Hazardous Substances?

- Yes
- No

Site Visit

Can the site be seen from a public road, public footpath, bridleway or other public land?

- Yes
- No

If the planning authority needs to make an appointment to carry out a site visit, whom should they contact?

- The agent
- The applicant
- Other person

Pre-application Advice

Has assistance or prior advice been sought from the local authority about this application?

- Yes
- No

Authority Employee/Member

With respect to the Authority, is the applicant and/or agent one of the following:

- (a) a member of staff
- (b) an elected member
- (c) related to a member of staff
- (d) related to an elected member

It is an important principle of decision-making that the process is open and transparent.

For the purposes of this question, "related to" means related, by birth or otherwise, closely enough that a fair-minded and informed observer, having considered the facts, would conclude that there was bias on the part of the decision-maker in the Local Planning Authority.

Do any of the above statements apply?

- Yes
- No

Ownership Certificates and Agricultural Land Declaration

Certificates under Article 14 - Town and Country Planning (Development Management Procedure) (England) Order 2015 (as amended)

Please answer the following questions to determine which Certificate of Ownership you need to complete: A, B, C or D.

Is the applicant the sole owner of all the land to which this application relates; and has the applicant been the sole owner for more than 21 days?

- Yes
- No

Is any of the land to which the application relates part of an Agricultural Holding?

- Yes
- No

Certificate Of Ownership - Certificate A

I certify/The applicant certifies that on the day 21 days before the date of this application nobody except myself/ the applicant was the owner* of any part of the land or building to which the application relates, and that none of the land to which the application relates is, or is part of, an agricultural holding**

* "owner" is a person with a freehold interest or leasehold interest with at least 7 years left to run.

** "agricultural holding" has the meaning given by reference to the definition of "agricultural tenant" in section 65(8) of the Act.

NOTE: You should sign Certificate B, C or D, as appropriate, if you are the sole owner of the land or building to which the application relates but the land is, or is part of, an agricultural holding.

Person Role

- The Applicant
- The Agent

Title

Miss

First Name

Briony

Surname

Church

Declaration Date

31/08/2022

Declaration made

Declaration

I / We hereby apply for Full planning permission as described in this form and accompanying plans/drawings and additional information. I / We confirm that, to the best of my/our knowledge, any facts stated are true and accurate and any opinions given are the genuine options of the persons giving them. I / We also accept that: Once submitted, this information will be transmitted to the Local Planning Authority and, once validated by them, be made available as part of a public register and on the authority's website; our system will automatically generate and send you emails in regard to the submission of this application.

I / We agree to the outlined declaration

Signed

Glenn Church

Date

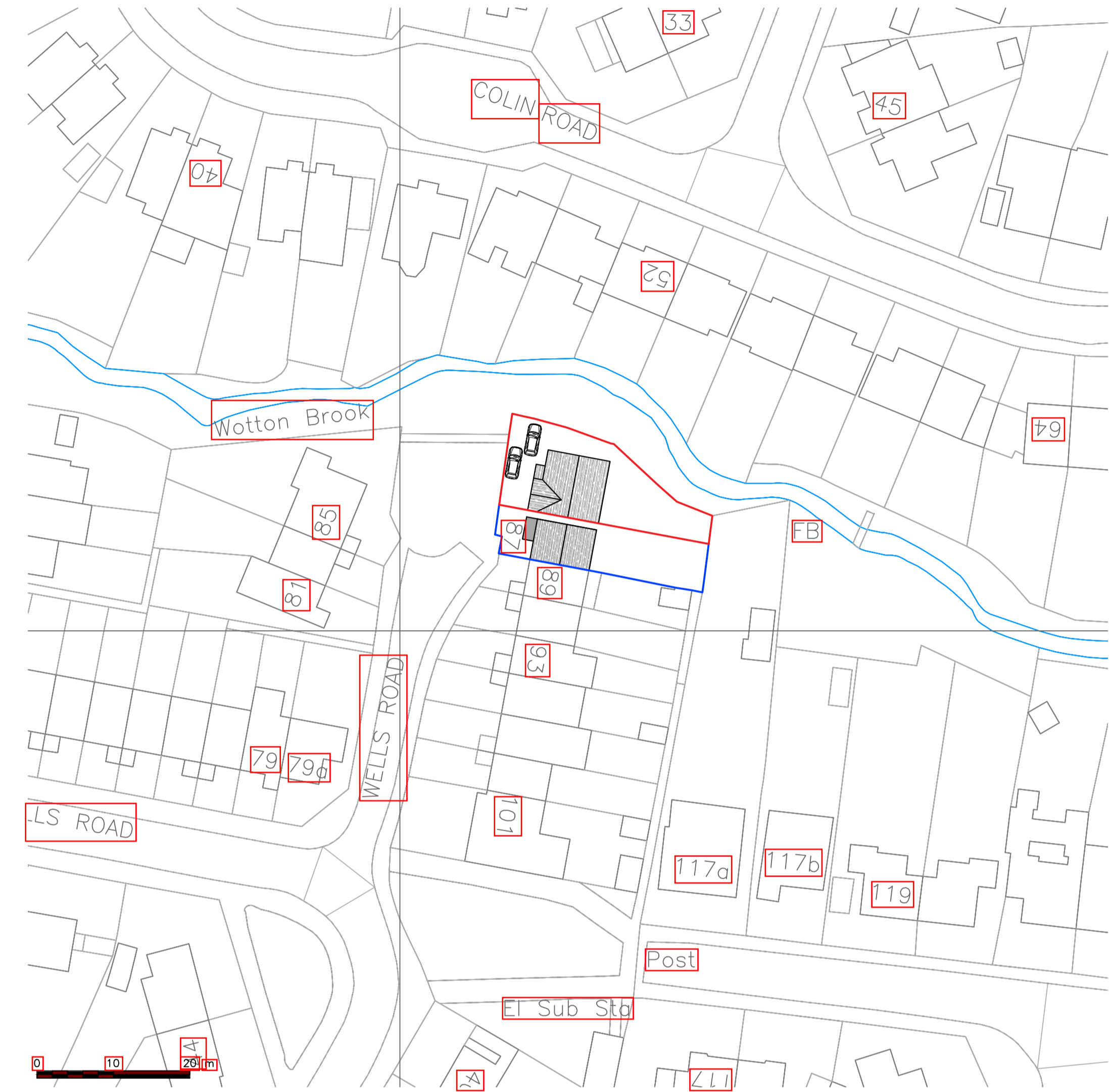
31/08/2022

FOR PLANNING ONLY

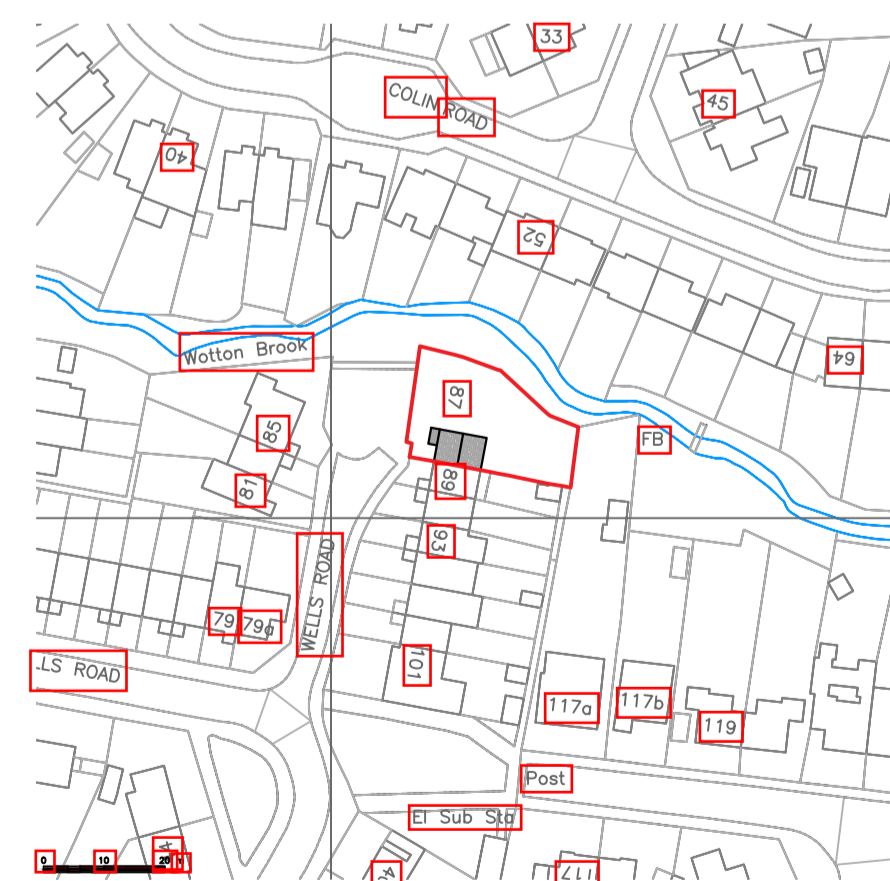
- NOTES
- 1) ALL DIMENSIONS TO BE CHECKED ONSITE PRIOR TO CONSTRUCTION (INTERNAL DIMS MAY CHANGE DEPENDING ON EXTERNAL WALL CONSTRUCTION METHOD)
 - 2) A STRUCTURAL ENGINEER MUST BE CONSULTED FOR ALL STRUCTURAL WORKS
 - 3) WORKS TO BE CARRIED OUT BY COMPETENT, QUALIFIED CONTRACTORS
 - 4) ALL WORKS TO BE CARRIED OUT UNDER A LOCAL AUTHORITY BUILDING NOTICE
ALL BUILD NOTES ARE GIVEN BASED ON STANDARD BUILDING REGULATIONS DETAILS
AND MAY VARY, CONSTRUCTION METHODS MAY VARY ACCORDING TO BUILDERS PREFERENCE AND BUILDING CONTROL OFFICER REQUIREMENTS.
THESE DRAWINGS ARE PRODUCED FOR PLANNING ONLY.



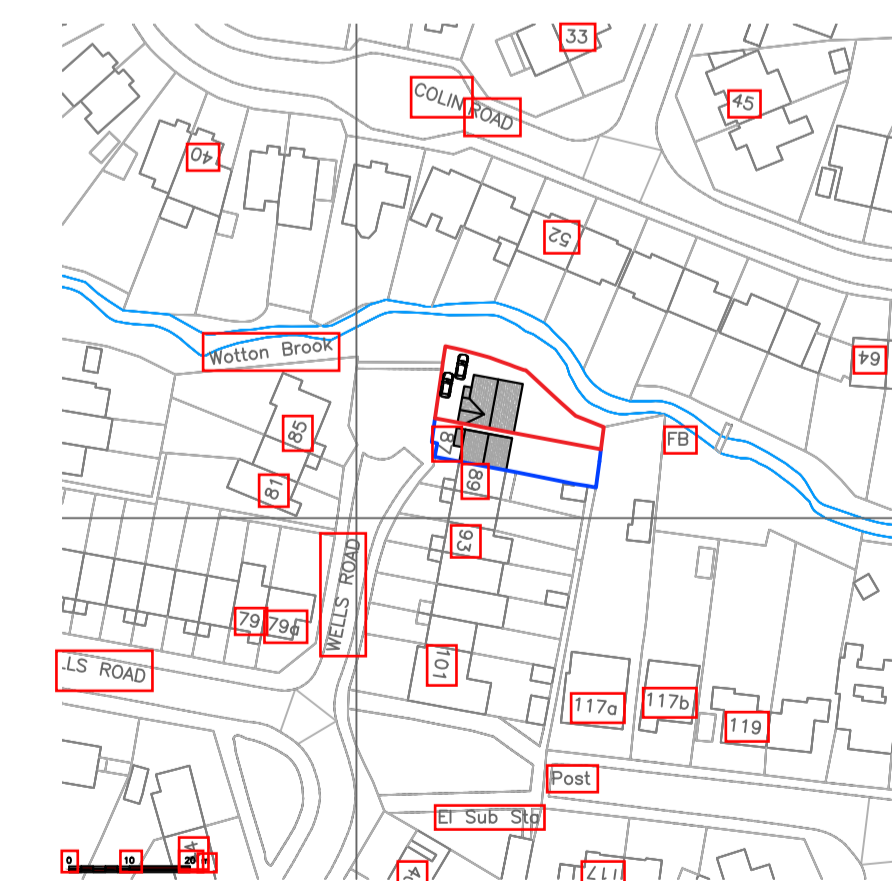
EXISTING BLOCK PLAN - 1:500



PROPOSED BLOCK PLAN - 1:500



EXISTING SITE PLAN - 1:1250



PROPOSED SITE PLAN - 1:1250



CLIENT/PROJECT:
 MARK TOOTH
 PROPOSED DEVELOPMENT TO LAND ADJACENT TO
 87 WELLS ROAD, GLOUCESTER, GL4 3AN

TITLE:
 AS EXISTING & PROPOSED SITE PLANS & ELEVATIONS

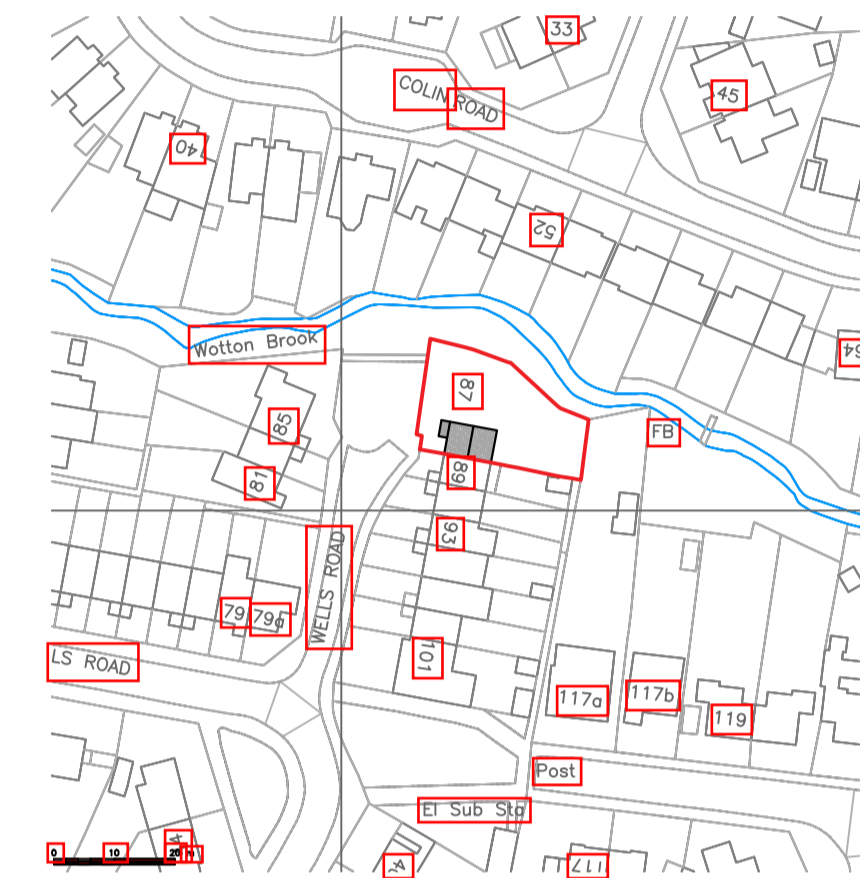
SCALE:
 1:500 & 1:1250 @ A1

DATE:
 APRIL 2022

NB-87WR-MT-004B



EXISTING BLOCK PLAN - 1:500



EXISTING SITE PLAN - 1:1250



NOTES
 1) ALL DIMENSIONS TO BE CHECKED ONSITE PRIOR TO CONSTRUCTION (INTERNAL DIMS MAY CHANGE DEPENDING ON EXTERNAL WALL CONSTRUCTION METHOD)
 2) A STRUCTURAL ENGINEER MUST BE CONSULTED FOR ALL STRUCTURAL WORKS
 3) WORKS TO BE CARRIED OUT BY COMPETENT, QUALIFIED CONTRACTORS
 4) ALL WORKS TO BE CARRIED OUT UNDER A LOCAL AUTHORITY BUILDING NOTICE
 ALL BUILD NOTES ARE GIVEN BASED ON STANDARD BUILDING REGULATIONS DETAILS
 AND MAY VARY. CONSTRUCTION METHODS MAY VARY ACCORDING TO BUILDERS PREFERENCE AND BUILDING CONTROL OFFICER REQUIREMENTS.
 THESE DRAWINGS ARE PRODUCED FOR PLANNING ONLY.

CLIENT/PROJECT:
 MARK TOOTH
 PROPOSED DEVELOPMENT TO LAND ADJACENT TO
 87 WELLS ROAD, GLOUCESTER, GL4 3AN

TITLE:
 EXISTING SITE PLANS

SCALE:
 1:1250 & 1:500 @ A1

DATE:
 APRIL 2022

Flood Risk and Coastal Change

Climate Change allowances for planning (SHWG area)

August 2021

The National Planning Practice Guidance refers to Environment Agency guidance on considering climate change in planning decisions which is available online: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

This has been updated and replaces the March 2016 guidance.

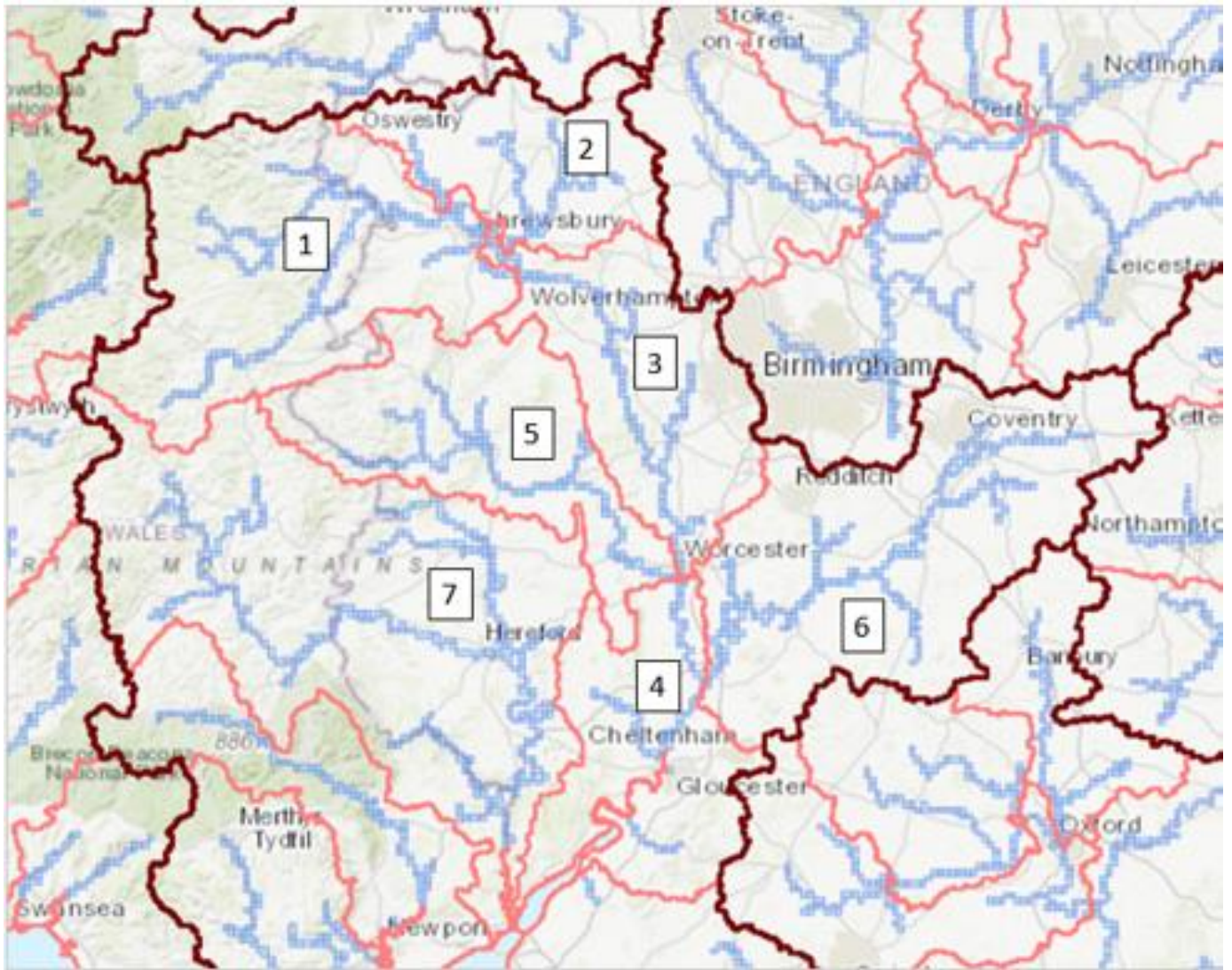
It should be used to help planners, developers and advisors implement the National Planning Policy Framework (NPPF)'s policies and practice guidance on flood risk. It will help inform Flood Risk Assessments (FRA's) for planning applications, local plans, neighbourhood plans and other projects.

Fluvial flooding – peak river flows

NPPG advises that an allowance should be added to 'peak river flows' to account for 'climate change' which should be specific to a 'management catchment' and development type (vulnerability). To work out which management catchment allowances to use, you need to: access the climate change allowances for [peak river flow map](#)

In Shropshire, Herefordshire, Worcestershire and Gloucestershire area, we would refer you to the map extract on page 2 below. This outlines the '**peak river flows**' within the specific 'Management catchments' for the Severn River Basin District, and specifies the range of percentage allowances to reflect individual development's vulnerability and lifetime. The following allowances should be used:

Development Vulnerability	Allowance (lifetime)
Essential Infrastructure	Higher Central - 2080's
Highly Vulnerable and More Vulnerable (residential)	Central - 2080's
Less Vulnerable and Water Compatible	Central - 2050's



1. Severn Uplands Peak River Flows	2020's	2050's	2080's	5. Teme Peak River Flows	2020's	2050's	2080's
Higher Central	17%	24%	43%	Higher Central	21%	33%	60%
Central	13%	18%	33%	Central	16%	24%	45%
2. Severn Middle Shrops Peak River Flows	2020's	2050's	2080's	6. Avon Peak River Flows	2020's	2050's	2080's
Higher Central	20%	25%	44%	Higher Central	12%	14%	32%
Central	15%	18%	33%	Central	7%	8%	21%
3. Severn Middle Worcs River Flows	2020's	2050's	2080's	7. Wye Peak River Flows	2020's	2050's	2080's
Higher Central	16%	21%	40%	Higher Central	19%	27%	49%
Central	12%	15%	30%	Central	14%	20%	37%
4. Severn Vale Peak River Flows	2020's	2050's	2080's				
Higher Central	20%	28%	53%				
Central	14%	19%	37%				

Extract: Management Catchments within the Severn River Basin District – refer to interactive [peak river flow map](#) for more detail. The Environment Agency also provide these allowances in the [peak river flow climate change allowances by management catchment table](#) – you have to know your management catchment to get the information you need. (Allowances reflect the latest projections in UKCP18 and subsequent research that models how the latest rainfall projections are likely to affect peak river flows).

Sea Level rise allowances

Table 3 of the guidance (extract below) indicates that net sea level risk is as follows (updated from the 2013 version).

Area of England	Allowance	2000 to 2035 (mm)	2036 to 2065 (mm)	2066 to 2095 (mm)	2096 to 2125 (mm)	Cumulative rise 2000 to 2125 (metres)
South West	Higher central	5.8 (203)	8.8 (264)	11.7 (351)	13.1 (393)	1.21
South West	Upper end	7 (245)	11.4 (342)	16 (480)	18.4 (552)	1.62

Note - For sites utilising the Severn tidal model the above allowances should be considered and applied. As of August 2020, specific updated flood level data is now available for the 2096 to 2125 epoch based upon the Environment Agency's Tidal Severn model within the West Midlands area and will be provided where relevant as part of our Request For Information service; contact Enquiries_Westmids@environment-agency.gov.uk

Flood Risk Assessment considerations:

The design flood (1% flood level fluvial, or 0.5% tidal, plus climate change allowance) should be used to inform the sequential test, including appropriate location of built development; consideration of flood risk impacts, mitigation/enhancement and ensure 'safe' development.

Vulnerability classification

- Development classed as 'Essential Infrastructure' (as defined within Table 2 - Flood Risk Vulnerability Classification, Paragraph: 066 Reference ID: 7-066-20140306 of the NPPG) should be designed to the 'higher central' climate change allowance (2080).
- For highly vulnerable or more vulnerable development e.g. housing, the FRA should use the 'central' climate change allowance (2080), as a minimum, to inform built in resilience.
- For water compatible or less vulnerable development e.g. commercial, the FRA should use the 'central' climate change allowance (2050), as a minimum, to inform built in resilience.

Assessing off-site impacts and calculating floodplain storage compensation

The appropriate allowance to assess off-site impacts and calculate floodplain storage compensation depends on land uses in affected areas. Use the central 2080 allowance for most cases (including where more vulnerable or highly vulnerable is affected) but apply the higher central allowance when the affected area contains essential infrastructure.

Modelling approach

- **Major Development:**

For 'major' development (as defined within The Town and Country Planning Development Management Procedure (England) Order 2015)*, see definition note below, we would expect a detailed FRA to provide an appropriate assessment (hydraulic model) of the 1% with relevant climate change ranges.

There are two options:

Scenario 1 - Produce a model and incorporate relevant climate change allowances within your Management catchment area location.

Scenario 2 - Re-run an existing model and incorporate relevant climate change allowances as specified in the Management catchment area data.

• **Non Major Development:**

For 'non major' development, we would advise that a model is produced or existing model is re-run, similar to the above approach (Scenario 1 and 2). This would give a greater degree of certainty on the design flood extent to inform a safe development.

However, for 'non major' development only, in the absence of modelled climate change information it may be reasonable to utilise an alternative approach. To assist applicants and Local Planning Authorities we have provided some 'nominal' climate change allowances within the 'Table of nominal allowances' below. These should be considered as appropriate within any FRA. There are three additional options:

Scenario 3 - Where previous modelled data (for a variety of return periods) is available, you could interpolate your own climate change figure (see note iv below).

Scenario 4 - Where the 1% level is available from an existing model add on the relevant 'nominal climate change allowance' provided in the 'Table of nominal allowances' below.

Scenario 5 - Establish the 1% level, for example using topographical levels (including LiDAR) and assessment of watercourse flow and nature and then add on the relevant 'nominal climate change allowances' provided in the 'Table of nominal allowances' below.

– *Note: For definitions of 'major' development see 'Interpretation 2.—(1)', on page 5, at: www.legislation.gov.uk/ukxi/2015/595/pdfs/ukxi_20150595_en.pdf

Table of Nominal Allowances

Watercourse	Central allowance (2050) Water compatible and Less Vulnerable.	Central allowance (2080) More Vulnerable
Upper Severn	600mm	850mm
River Wye		
River Teme		
River Avon	200mm	400mm
Lower Severn	400mm	600mm
Tributaries and 'ordinary watercourses'	200mm	300mm

Notes to above:-

(i) Watercourse definition:

The "Upper Severn"/"Lower Severn" boundary is taken as Bevere Weir, North of Worcester, (national grid reference SO8376859428). These do not directly relate to management catchments.

Use of the Avon nominal is only valid upstream of the M5 crossing and downstream of that point the Lower Severn nominals should be used.

An 'Ordinary Watercourse' is a watercourse that does not form part of a main river. Main Rivers are indicated on our Flood Map. You can also check the classification of the watercourse with the LLFA, some of which have produced Drainage and Flooding Interactive Maps.

(ii) Where a site is near the confluence of two, or more, watercourses, the FRA should use the larger river climate change allowances.

(iii) We may hold more precise information for some of the "tributaries". We would recommend that you seek this information from us via a 'pre-planning enquiry/data request', to the email address below.

(iv) We would also recommend that you contact us for our modelled '20%' allowances and associated flow data. This is available for some rivers. This data may help inform a more detailed climate change analysis (where necessary), including any interpolation of levels or flow to create a 'stage discharge rating' in order to estimate the required percentage; or be of assistance to inform 'less vulnerable' or 'water compatible' development proposals.

IMPORTANT NOTE

Please note the nominal climate change allowances are provided as a pragmatic approach, for consideration, in the absence of a modelled flood level and the applicant undertaking a detailed model of the watercourse. Use of nominal climate change allowances are not provided/ recommended as a preference to detailed modelling and historical data.

The Local Planning Authority may hold data within their Strategic Flood Risk Assessment (SFRA), or any future updates, which may help inform the above.

FREEBOARD NOTE

It is advised that Finished Floor Levels should be set no lower than '600mm' above the 1% river flood level plus climate change. Flood proofing techniques might be considered where floor levels cannot be raised (where appropriate). This 600mm freeboard takes into account any uncertainties in modelling/flood levels and wave action (or storm surge effects).

Surface Water

Table 2 of the guidance also indicates the relevant increases that surface water FRA should consider for an increase in peak rainfall intensity.

The following table is for 'peak rainfall intensity' allowance in small and urban catchments. Please note that **surface water (peak rainfall intensity) climate change allowances should be discussed with the Lead Local Flood Authority (LLFA).**

Peak Rainfall Intensity - Applies across all of England	Total potential change anticipated for 2010-2039	Total potential change anticipated for 2040-2069	Total potential change anticipated for 2070-2115
Upper end	10%	20%	40%
Central	5%	10%	20%

Note to above:-

For river catchments around or over 5 square kilometres, the peak river flow allowances are appropriate.

Produced by: WestMidsPlanning@environment-agency.gov.uk

West Midlands Area -

Shropshire, Herefordshire, Worcestershire and Gloucestershire Sustainable Places Team.

customer service line

incident hotline

floodline

www.environment-agency.gov.uk

Homeplan Drafting Services

Planning and Architectural Services

28 Jasmine Close, Abbeydale, Gloucester GL4 5FJ

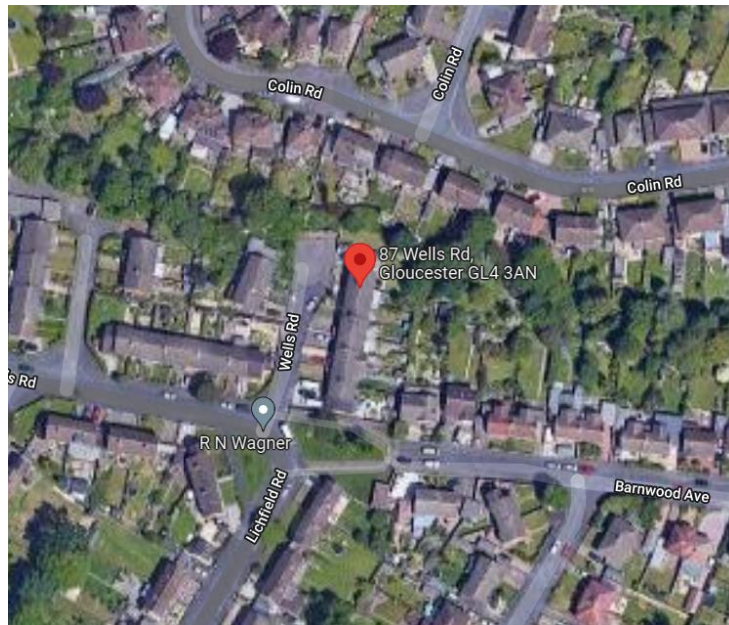
www.homeplanservices.co.uk

PROPOSED ERECTION OF 4 BED DWELLING TO LAND AT 87 Wells Road, GLOUCESTER, GL4 3AN

DESIGN & ACCESS STATEMENT

SITE LOCATION

87 Wells Road is situated in a small cul-de-sac from the main portion of Wells Road. The area is predominately residential made up of a varying style of 2, 3 & 4 bed dwellings.



EXISTING DWELLING

The site is approximately 247.6sqm (red line boundary to proposed site)

The site is currently occupied by a single 3 bed semi-detached property.

The site does not fall within any protected area however, the site does border a flood zone due to its locality to Wotton Brook. Flood risk investigation and report attached to this application.

PROPOSED WORKS & IMPACT ON ITS SURROUNDINGS:

(Please read in conjunction with drawings provided)

The Proposal/Justification:

We are proposing the erection of a 4-bed detached dwelling. The proposed dwelling locality will continue the existing building line of the street scene. Continuing the build line will reduce the impact of the proposal on the surrounding dwellings. We believe the properties setting and design will have no detrimental impact to the surrounding neighbourhood.

The proposal will be finished with a cream/off white smooth k-render, existing properties within the area are a mix of both red brick and render finishes. We hope the proposals materiality will compliment the existing properties within the area as well as introducing an element of contemporary design.

Access/Parking:

This application has provisions for two new parking off road parking spaces. Accessed via the existing off-road entrance to No.87.

Product 4 (Detailed Flood Risk Data) for 87 Wells Road, Gloucester, GL4 3AN

Reference number: 231227

Date of issue: 15 September 2021

Model Information

The following information and attached maps contain a summary of the modelled information relevant to the area of interest. The information provided is based on the best available data as of the date of issue.

Model Name	Release Date
Wotton Brook	2007

Flood Map for Planning (Rivers and Sea)

The Flood Map for Planning (Rivers and Sea) indicates the area at risk of flooding, **assuming no flood defences exist**, for a flood event with a 0.5% chance of occurring in any year for flooding from the sea, or a 1% chance of occurring in any year for fluvial (river) flooding (Flood Zone 3). It also shows the extent of the Extreme Flood Outlines (Flood Zone 2) which represents the extent of a flood event with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater. The Flood Zones refer to the land at risk of flooding and **do not** refer to individual properties. It is possible for properties to be built at a level above the floodplain but still fall within the risk area.

This Flood Map only indicates the extent and likelihood of flooding from rivers or the sea. It should also be remembered that flooding may occur from other sources such as surface water, sewers, road drainage, etc.

To find out which flood zone a location is in please use: <https://flood-map-for-planning.service.gov.uk/>

Definition of flood zones

- **Zone 1** - The area is within the lowest probability of flooding from rivers and the sea, where the chance of flooding in any one year is less than 0.1% (i.e. a 1000 to 1 chance).

Email: [REDACTED]

Website: www.gov.uk/government/organisations/environment-agency

- **Zone 2** - The area which falls between the extent of a flood with an annual probability of 0.1% (i.e. a 1000 to 1 chance) fluvial and tidal, or greatest recorded historic flood, whichever is greater, and the extent of a flood with an annual probability of 1% (i.e. a 100 to 1 chance) fluvial / 0.5% (i.e. a 200 to 1 chance) tidal. (Land shown in light blue on the Flood Map).
- **Zone 3** - The chance of flooding in any one year is greater than or equal to 1% (i.e. a 100 to 1 chance) for river flooding and greater than or equal to 0.5% (i.e. a 200 to 1 chance) for coastal and tidal flooding.

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

Areas Benefitting From Defences

Where possible we show the areas that benefit from the flood defences, in the event of flooding:

- from rivers with a 1% (1 in 100) chance in any given year, or;
- from the sea with a 0.5% (1 in 200) chance in any given year.

If the defences were not there, these areas would flood. Please note that we do not show all areas that benefit from flood defences.

The associated Dataset is available here: <https://data.gov.uk/dataset/flood-map-for-planning-rivers-and-sea-areas-benefiting-from-defences>

Node Data/ Modelled Levels

The attached map will show a selection of 1D & 2D model node points near to your site. The fluvial levels for these node points are shown below.

Fluvial Flood Levels (m AOD)

The modelled levels are given in m AOD (N), m AOD indicates metres Above Ordnance Datum (Newlyn).

The information is taken from the model referenced above and does not include the updated climate change figures.

Node Label	Easting	Northing	Annual Exceedance Probability - Maximum Water Levels (m AOD)									
			50% (1 in 2)	20% (1 in 5)	10% (1 in 10)	4% (1 in 25)	2% (1 in 50)	1.33% (1 in 75)	1% (1 in 100)	1% (1 in 100) inc. 20% increase in inflows	0.5% (1 in 200)	0.1% (1 in 1000)
WB_5425U	385922	217905	24.03	24.11	24.17	24.25	24.32	24.35	24.43	24.62	24.61	24.91
WB_5388.4	385918	217943	22.29	22.52	22.74	23.04	23.36	23.48	23.53	23.70	23.70	24.14
WB_5338	385875	217948	22.15	22.42	22.67	23.01	23.35	23.47	23.52	23.67	23.67	24.03
WB_5257	385811	217960	22.00	22.31	22.59	22.97	23.32	23.44	23.51	23.66	23.66	24.01
WB_5257d	385798	217970	21.88	22.11	22.33	22.55	22.69	22.76	22.82	22.96	22.95	23.37
WB_5174	385746	218000	21.76	21.98	22.22	22.44	22.58	22.65	22.69	22.83	22.82	23.17
WB_5107	385681	218000	21.57	21.80	22.09	22.33	22.45	22.52	22.56	22.68	22.67	22.94
WB_5040	385628	218034	21.36	21.64	21.99	22.25	22.38	22.44	22.49	22.60	22.60	22.88
I_WB_4980	385568	218033	21.18	21.50	21.93	22.19	22.32	22.38	22.41	22.51	22.51	22.61
I_WB_4875	385472	218051	20.88	21.31	21.89	22.17	22.31	22.36	22.40	22.50	22.49	22.58
WB_4786	385397	218071	20.67	21.13	21.80	22.10	22.26	22.32	22.35	22.47	22.45	22.57
WB_4741	385360	218108	20.58	21.01	21.63	21.68	21.76	21.78	21.79	21.89	21.85	22.01
2D 01	385613	218020	-	-	-	-	-	22.43	22.48	22.58	22.59	22.84

Email: [REDACTED]

Website: www.gov.uk/government/organisations/environment-agency

Modelled Flood Extents

Available modelled flood outlines produced as part of the detailed modelling have been provided to you in GIS format, these show modelled flood extents. Climate change will increase flood risk due to overtopping of defences.

<https://ea.sharefile.com/d-sd2b41f46f20426eb>

Climate Change

The '[Flood Risk Assessments: Climate Change Allowances](#)' are published on gov.uk. This is in replacement of previous climate change allowances for planning applications. The data provided in this product does not include the new allowances. You will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding. The climate change factors are now more complex and a single uplift percentage across England cannot be justified.

The Environment Agency will incorporate the new allowances into future modelling studies. For now it remains the applicant's responsibility to demonstrate through their proposal and flood risk assessments that new developments will be safe in flood risk terms for its lifetime.

Recorded Flood Outlines

Following an examination of our records of historical flooding we do hold records of flooding for this area, please find tabulated information below for these recorded flood events.

Flood Event Date	Source of Flooding	Cause of Flooding
July 2007	Wotton Brook	Channel capacity exceeded (no raised defences)

The corresponding recorded flood outline/s can be accessed here:

<https://data.gov.uk/dataset/recorded-flood-outlines1>

Please note; the records of flooding from between October 2019 and March 2020 and beyond are still being reviewed, the outcomes of which have not yet been published or reflected within this request for information.

The Recorded Flood Outlines take into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding. It includes flood extents that may have been affected by overtopping, breaches or blockages. Any flood extents shown do not necessarily indicate that properties were flooded internally. It is also possible that the pattern of flooding in this area has changed and that this area would now flood or not flood under different circumstances.

Please note that our records are not comprehensive and that the map is an indicative outline of areas which have previously flooded, not all properties within this area will have flooded. It is possible that other flooding may have occurred that we do not have records for.

You may also wish to contact your Local Authority or Internal Drainage Board (where relevant), to see if they have other relevant local flood information.

Flood Defences

Flood defences do not completely remove the chance of flooding. They can be overtopped by water levels which exceed the capacity of the defences.

If flood defences are located in your area, you can access this data here:

<https://data.gov.uk/dataset/spatial-flood-defences-including-standardised-attributes>

Planning developments

If you have requested this information to help inform a development proposal, then you should note the information on GOV.UK on the use of Environment Agency Information for Flood Risk Assessments. You can also request pre application advice:

<https://www.gov.uk/planning-applications-assessing-flood-risk>

<https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion>

Supporting Information

River modelling: technical standards and assessment guidance

The link below contains standards for the flood risk management industry on how to build and review hydraulic models and provide evidence for flood risk management decisions.

<https://www.gov.uk/government/publications/river-modelling-technical-standards-and-assessment>

Surface Water

Managing the risk of flooding from surface water is the responsibility of Lead Local Flood Authorities. The 'risk of flooding from surface water' map has been produced by the Environment Agency on behalf of government, using information and input from Lead Local Flood Authorities.

You may wish to contact your Local Authority who may be able to provide further detailed information on surface water.

It is not possible to say for certain what the flood risk is but we use the best information available to provide an indication so that people can make informed choices about living with or managing the risks. The information we supply does not provide an indicator of flood risk at an individual site level. Further information can be found on the Agency's website:

<https://flood-warning-information.service.gov.uk/long-term-flood-risk>

Flood Risk from Reservoirs

The Flood Risk from Reservoirs map can be found on the Long Term Flood Risk Information website:

<https://flood-warning-information.service.gov.uk/long-term-flood-risk/map?map=Reservoirs>

Flood Alert & Flood Warning Area

We issue flood alert/warnings to specific areas when flooding is expected. If you receive a flood warning you should take immediate action.

You can check whether you are in a Flood Alert/Warning Area and register online using the links below:

<https://www.gov.uk/check-flood-risk>

<https://www.gov.uk/sign-up-for-flood-warnings>

If you would prefer to register by telephone, or if you need help during the registration process, please call Floodline on 0345 988 1188.

The associated dataset for flood warning areas is available here:

<https://data.gov.uk/dataset/flood-warning-areas3>

The associated dataset for flood alert areas is available here: <https://data.gov.uk/dataset/flood-alert-areas2>

Flood Risk Activity Permits

We now consider applications for works, which may be Flood Risk Activities, under Environmental Permitting Regulations. This replaces the process of applying for a Flood Defence Consent. You may need an environmental Permit for flood risk activities if you want to do work:

- in, under, over or near a main river (including where the river is in a culvert)
- on or near a flood defence on a main river
- in the flood plain of a main river
- on or near a sea defence

Email: [REDACTED]

Website: www.gov.uk/government/organisations/environment-agency

Please go to this website to find out more about how to apply:

<https://www.gov.uk/guidance/flood-risk-activities-environmental-permits>.

Please be aware that Bespoke and Standard Rules permits can take up to 2 months to determine and will incur a charge.

Further details about the Environment Agency information supplied can be found on the GOV.UK website:

<https://www.gov.uk/browse/environment-countryside/flooding-extreme-weather>

Reference: GCFRC21/262/RevB
Flood Risk Assessment to support
planning application
87 Wells Road
Gloucester
GL4 3AN



Flood Risk
Consultancy

www.qcfloodrisk.co.uk

Contents:

Cover Page	Page 1
Contents	Page 2
1.0 Scope of Report	Page 3
2.0 Site Location	Page 3
3.0 Description of Proposal	Page 3
4.0 Flood Risk Setting	Page 3
5.0 Sequential and Exception Tests	Page 5
6.0 Site-Specific Flood Risk	Page 6
6.1 Fluvial	
6.2 Pluvial	
6.3 Coastal	
6.4 Reservoirs	
6.5 Sewers	
7.0 Climate Change and Design Flood Level (DFL)	Page 8
8.0 Flood Risk Mitigation and Resilience	Page 9
9.0 Flood Storage Compensation	Page 10
10.0 Flood Emergency Plan	Page 10
11.0 Surface Water Management	Page 12
12.0 Summary	Page 12
Appendices:	
Appendix 1: Site Location Plan	Page 13
Appendix 2: Environment Agency Flood Map for Planning	Page 14
Appendix 3: Environment Agency Warning Codes	Page 15
Appendix 4: Flood Evacuation Route	Page 16
Tables:	
Table 1: Flood Risk Vulnerability Classification	Page 5
Table 2: Ground Level Data	Page 6
Table 3: Flood Depths	Page 9
Table 4: Danger to people for different combinations of depth and velocity	Page 11

1.0 Scope of Report:

- 1.1 The following report is being written in support of the development proposal at 87 Wells Road which would result in the erecting of a two-storey detached dwelling. In line with local and national planning policy, it is deemed appropriate that a Flood Risk Assessment (FRA) be undertaken to evaluate the flood risk associated with the proposed development. This FRA has been carried out in line with the National Planning Policy Framework (NPPF) and Planning Practice Guidance (PPG).

2.0 Site Location:

- 2.1 The site address is: 87 Wells Road, Gloucester, GL4 3AN and the location is NGR SO 85617 18017. Please see Appendix 1 for map diagram showing what we understand is the red line boundary of the development.
- 2.2 At this location and due to the nature of the proposal, the Local Planning Authority (LPA) is Gloucester City Council. With this in mind, the following report pays consideration to the relevant policies including 'Policy E6: Flooding, sustainable drainage, and wastewater' in the emerging Gloucester City Plan.
- 2.3 Access and egress for the developed site would be located at Wells Road.

3.0 Description of Proposal:

- 3.1 The development proposal includes a single two-storey detached dwelling and the demolition of an existing side garage and outbuilding.

4.0 Flood Risk Setting:

- 4.1 As shown in Appendix 2, the proposed development site location is in Flood Zone 2 (Medium Risk) and partially in Flood Zone 3 (High Risk) according to the Environment Agency (EA) Flood Maps for Planning and as defined by Table 1 in the Flood and Coastal Change section of the Planning Practice Guidance (PPG). The proposal would have a use class of C3 as defined by Town and Country Planning (Use Classes) Order 1987 and the new development it would be classed as More Vulnerable in accordance with Table 2 in the Flood and Coastal Change Section of the PPG.
- 4.2 Local Planning policies state that:

“Development shall be safe from flooding and shall not lead to an increase in flood risk elsewhere. In accordance with the National Planning Policy Framework, flood risk betterment shall be sought through the development process.

Planning permission will not be granted for any development in the functional flood plain (Flood Zone 3b) except for development with 'water compatible' and 'essential infrastructure' flood risk vulnerability development classifications.

The sequential test (flood risk) and exception test will be evaluated in line with government planning guidance.

All development will be expected to incorporate Sustainable Drainage Systems (SuDS) to reduce surface water discharge rates and address water quality, unless it can be shown, to the satisfaction of the City Council, that this is not feasible.

The most up to date Environment Agency and Local Lead Flood Authority climate change guidance shall be used in the evaluation of fluvial flood risk and for the design of drainage / SuDS.

Development proposals shall facilitate watercourse restoration, exploiting opportunities to open culverts, naturalise river channels, and protect and improve the floodplain, buffer strips and adjacent terrestrial habitats and water quality, as well as the heritage value. Development proposals to impound and narrow waterways will be refused.

An 8 metre riparian buffer strip, measured from the top of bank to each side of the watercourse or the outside edge of any culverted watercourses where is necessary for the culvert to remain in situ, shall be kept free of development. As well as for flood risk reasons, this is to facilitate maintenance access and to act as a green corridor for ecological benefit.

Applicants shall demonstrate that all surface water discharge points have been selected in accordance with the principles laid out in within the SuDS/drainage hierarchy. That is, where possible, connections to the public sewerage systems, and in particular the combined sewer network, are to be avoided. Wherever possible, foul drainage from development shall connect to the mains public sewer.

Where necessary, financial contributions towards flood risk management infrastructure will be sought through the development process.”

5.0 Sequential and Exception Tests:

- 5.1 National Planning policy dictates that a LPA takes a sequential approach to development planning and control in order to steer new development to the areas with the lowest risk of flooding. Gloucester City is significantly impacted by fluvial flood risk, with a set of mitigation measures this proposal will provide valuable windfall development in a sustainable way. The position of the proposed dwelling within the red line boundary is in an area at which the flood risk is predominantly medium.
- 5.2 Once Gloucester City Council are satisfied that the proposal passes the Sequential Test, the potential requirement to pass the Exception Test is considered. Due to the fact that the development is partially in Flood Zone 3 and the vulnerability class, this development is required to pass the Exception Test in line with Table 3 in the Flood and Coastal Change Section of the PPG (below).

Table 1: Flood Risk Vulnerability Classification Table

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.

- 5.3 This report will outline a range of mitigation measures to ensure that the development is safe to users for its lifetime, does not cause any increased flood risk to third parties and (where possible) provides betterment.

6.0 Site-Specific Flood Risk:

6.1 Fluvial:

- 6.1.1 According to the flood level data provided by the EA (submitted alongside this report), the main source of flood risk for this site is the Wotton Brook and the 1:100 or 1% AEP (Annual Exceedance Probability) level is 22.48m AOD. The Ground Level at the location is 22.358m AOD at its lowest point giving flood depths of 122mm at this location.
- 6.1.2 Table 1 (below) shows the ground levels on-site using the EA's LIDAR data (all data gathered using the EA composite 2m spatial resolution LIDAR data). Figures 1 and 2 show where these points are on the site and these points plotted on the EA LIDAR map layer to extract the ground level data, respectively.
- 6.1.3 The LIDAR analysis shows the depth of flooding at each point plotted in Figures 1 and 2 in a design flood event.

Table 2 – Ground Level Data

Description	Grid Reference	X	Y	Ground Levels
Point A	SO 85614 18020	385614	218020	22.5m AOD
Point B	SO 85619 18019	385619	218019	22.488m AOD
Point C	SO 85622 18018	385622	218018	24.62m AOD
Point D	SO 85627 18018	385627	218018	24.06m AOD
Point E	SO 85615 18024	385615	218024	22.374m AOD
Point F	SO 85619 18023	385619	218023	22.358m AOD
Point G	SO 85623 18022	385623	218022	22.388m AOD
Point H	SO 85627 18021	385627	218021	22.583m AOD

Figure 1

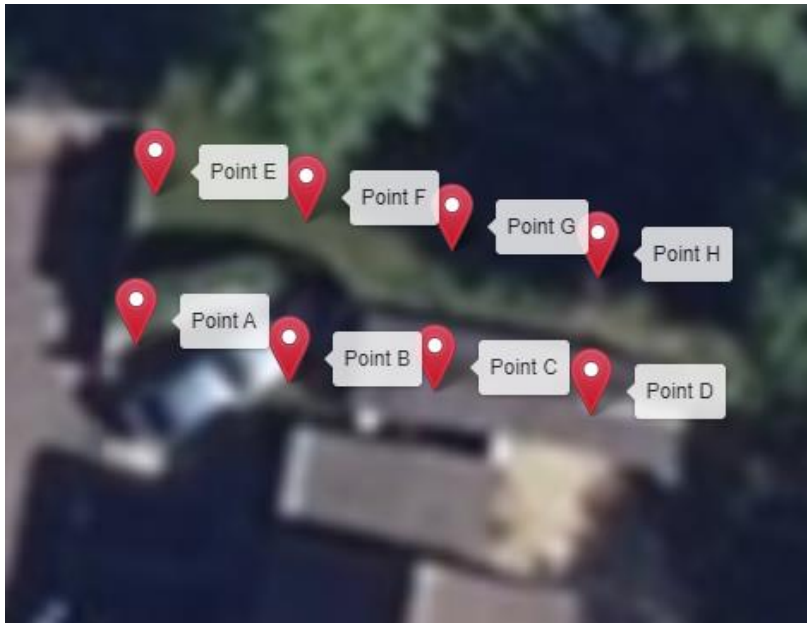
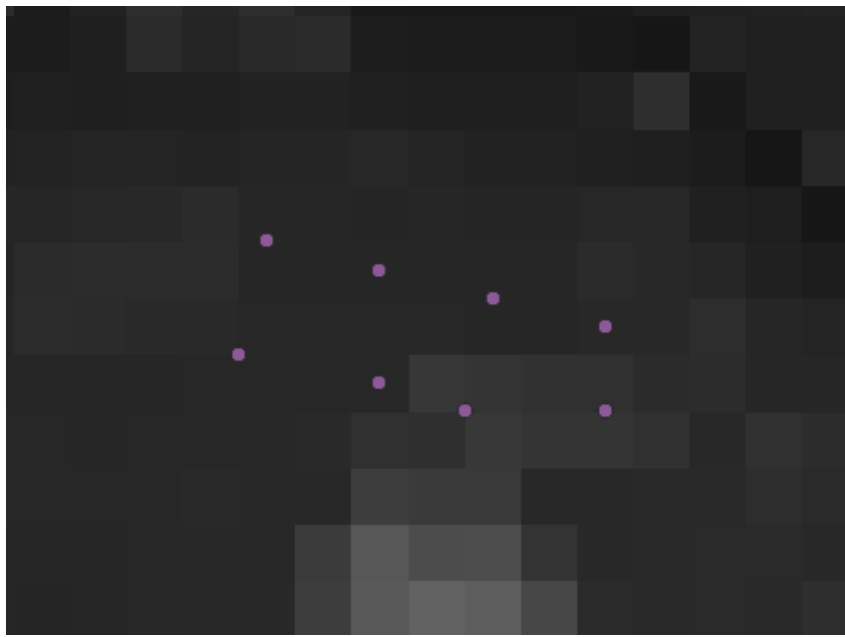


Figure 2



6.2 **Pluvial:**

6.2.1 The site is at high risk of surface water flood according to the Environment Agency. However when interrogated against their own map (see picture below) the site on which the proposed development would be is not in the area of high risk and appears to be in an area of low risk. A separate detailed

drainage strategy will support the proposal to address surface water treatment.

Risk of surface water flooding:

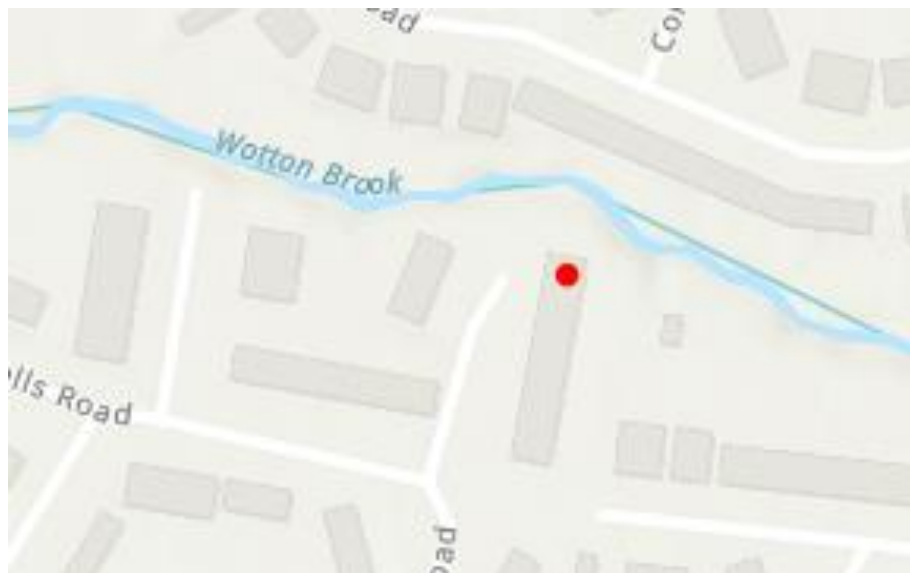


6.3 **Coastal:**

6.3.1 The site is at low risk from coastal flooding.

6.4 **Reservoirs:**

6.4.1 The site is at low risk of flooding from reservoirs according to the Environment Agency's 'Risk Of Flooding From Reservoirs Maximum Flood Speed' (see below).



7.0 Climate Change and Design Flood Level (DFL)

7.1 The consideration of flood risk associated on this site should take into account the current guidance for the anticipated effect of climate change on flood levels in this area. For a development of this size, a

proportionate approach would be to use the nominal allowances given by the “Climate Change allowances for planning (SHWG area)” (August 2021) document (Submitted alongside this report). This site is located within the Severn River Basin District, the Wotten Brook is a tributary of the Severn and as such the nominal allowance to be added is 300mm. This value represents the higher central allowance category taken to the 2080’s. Using this value satisfies one of the principles of the Exception Test that a planning proposal design should be safe for users over the lifetime of the development.

- 7.2 Flood depths are deduced using the Product 4 Data and Node Point Map for this site, acquired from the Environment Agency (submitted alongside this report). The node point used in this instance is 2D 01 which is the 2D Model Node Point for this site.
- 7.3 By adding the nominal climate change allowance of 300mm to the 1:100 (1% AEP) flood level of 22.48m AOD, the DFL is given as 22.78m AOD. This DFL informs what level of flooding the development proposal should be made resilient to.
- 7.4 Using **DFL = 22.78** gives the following flood depth at the points illustrated in Figure 1:

Table 3 – Flood depths

Description	Grid Reference	X	Y	Ground Levels	Flood depth
Point A	SO 85614 18020	385614	218020	22.5m AOD	0.28m
Point B	SO 85619 18019	385619	218019	22.488m AOD	0.292m
Point C	SO 85622 18018	385622	218018	24.62m AOD	0m
Point D	SO 85627 18018	385627	218018	24.06m AOD	0m
Point E	SO 85615 18024	385615	218024	22.374m AOD	0.406m
Point F	SO 85619 18023	385619	218023	22.358m AOD	0.422m
Point G	SO 85623 18022	385623	218022	22.388m AOD	0.392m
Point H	SO 85627 18021	385627	218021	22.583m AOD	0.197m

8.0 Flood Risk Mitigation and Resilience:

- 8.1 CIRIA Guidance (CIRIA C624 Development and Flood Risk – Guidance for the Construction Industry 2004) advises that 600mm freeboard should be included in any flood risk mitigation measures.
- 8.2 Based on the DFL of 22.78m AOD it is recommended that the development should incorporate mitigation measures to 23.38m AOD.
- 8.3 With regards to FFL’s, if it is not possible to incorporate 600mm freeboard, a minimum of 300mm freeboard should be used instead. Giving minimum FFL’s of 23.08m AOD.
- 8.4 The exterior walls should be made of non-permeable materials to the 23.38m AOD level and any exterior doors should be flood proof doors

to ensure the property does not become inundated in the event of a flood.

- 8.5 The mains power sockets should be fitted above the 23.38m AOD level to protect future users should the property become flooded.

9.0 Flood Storage Compensation:

- 9.1 The existing building comprises of a house and garage with a footprint of 63.38m² and an outbuilding with a footprint of 31.5m². The proposed development would result in the removal of the outbuilding and garage, the erection of a new dwelling with a footprint of 74.9m² and the retention of the existing house with a footprint of 46.7m². Therefore the net increase in the footprint of development can be expressed as such:

$$(74.9 + 46.7) - (63.38 + 31.5) = \mathbf{26.72m^2}$$

- 9.2 Based on the figures shown in chapter 6.1.1, there DFL gives a flood depth of 122mm on site, given an additional 300mm for climate change the flood depth is 422mm or 0.422m. Therefore the amount of flood storage compensation necessary is:

$$26.72m^2 \times 0.422m = \mathbf{11.3m^3}$$

- 9.3 This will be achieved by removing earth from the rear garden of the proposed development, the rear garden has an area in excess of 70m². A layer of earth will be removed evenly over the area of the garden, keeping the existing contours to offer like-for-like compensation as required. It is recommended that **12m³** of earth is removed in total to offer the betterment as prescribed by the Exception Test.

10.0 Flood Emergency Plan

- 10.1 Access and egress for the site is gained at the front door of the proposed dwelling, illustrated in submitted plans (ref: NB-87WR-MT-003C). At this point the flood depth is expected to be 0.406m. The likely velocity at this point would be 2m/s (according to DEFRA document: 'Assessing and Valuing the Risk to Life from Flooding for Use in Appraisal of Risk Management Measures May 2008') is that flood risk at the point of access and egress for the property would present a 'danger for most' scenario according to Table 4 below.

Table 4: Danger to people for different combinations of depth and velocity – Taken from Table 13.1 of the Defra, Flood Risk Assessment Guidance for New Development, FD2320/TR2 Report

Table 13.1 Danger to people for different combinations of depth and velocity

Velocity (m/s)	Depth of flooding (m)											
	0.05	0.10	0.20	0.30	0.40	0.50	0.60	0.80	1.00	1.50	2.00	2.50
0.00												
0.10												
0.25												
0.50												
1.00												
1.50												
2.00												
2.50												
3.00												
3.50												
4.00												
4.50												
5.00												

Key:

- Danger for some
- Danger for most
- Danger for all

- 10.2 The EA operate a flood forecasting and warning service in areas at risk of flooding from rivers or the sea, which relies on direct measurements of rainfall, river levels, tide levels, in-house predictive models, rainfall radar data and information from the Met Office. This service operates 24 hours a day, 365 days a year.
- 10.3 The EA have a Flood Alert system available at this location and it is recommended this is signed up to by the user/owner of the property. The flood alert service offers the users of a dwelling less time to react to flooding than the flood warning service.
- 10.4 Flood warnings may be available for this property in the future. If flooding is forecast, warnings are issued using a set of easily recognisable codes. A description of the codes is shown in Appendix 3.
- 10.5 Floodline Warnings is a free service operated by the EA that provides flood warnings direct to you by phone, email or text message. Sign up for Flood Warnings by calling Floodline on 0345 988 1188 or online by following this link: <https://www.gov.uk/sign-up-for-flood-warnings>.
- 10.6 In the case of an emergency, the evacuation route is shown in Appendix 4.
- 10.7 Should flooding occur and the chance to evacuate is lost, the proposed development incorporates an area of safe refuge from flooding, (e.g. a location above flooding for all people on site, including those with restricted mobility), in the case of a no warning flooding event. This area is located on the first floor of the proposed dwelling. Also, should the mitigation measures recommended by this report be incorporated, the ground floor of the proposed development should not become inundated with water in a 1 in 100 flood event.

11.0 Surface Water Management

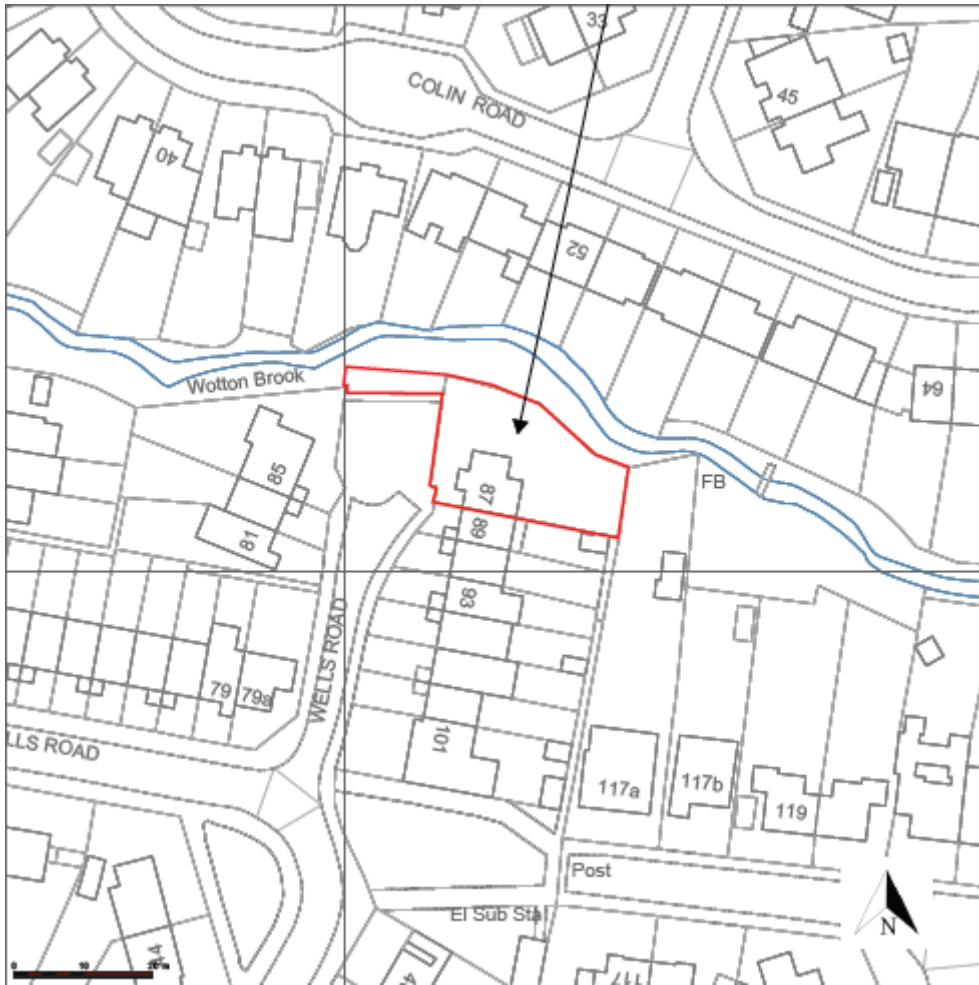
- 11.1 The development proposes to discharge to the Wotton Brook in order to manage surface water runoff, incorporating some attenuation.
- 11.2 The net increase of the proposed development compared to the existing site is 18.41m². This is a comparatively small amount to be mitigated against, although it is acknowledged that Gloucester City Council Policy will also require a 40% betterment be offered for the existing footprint.
- 11.3 The application will be supported by a detailed surface water management plan separately.

12.0 Summary

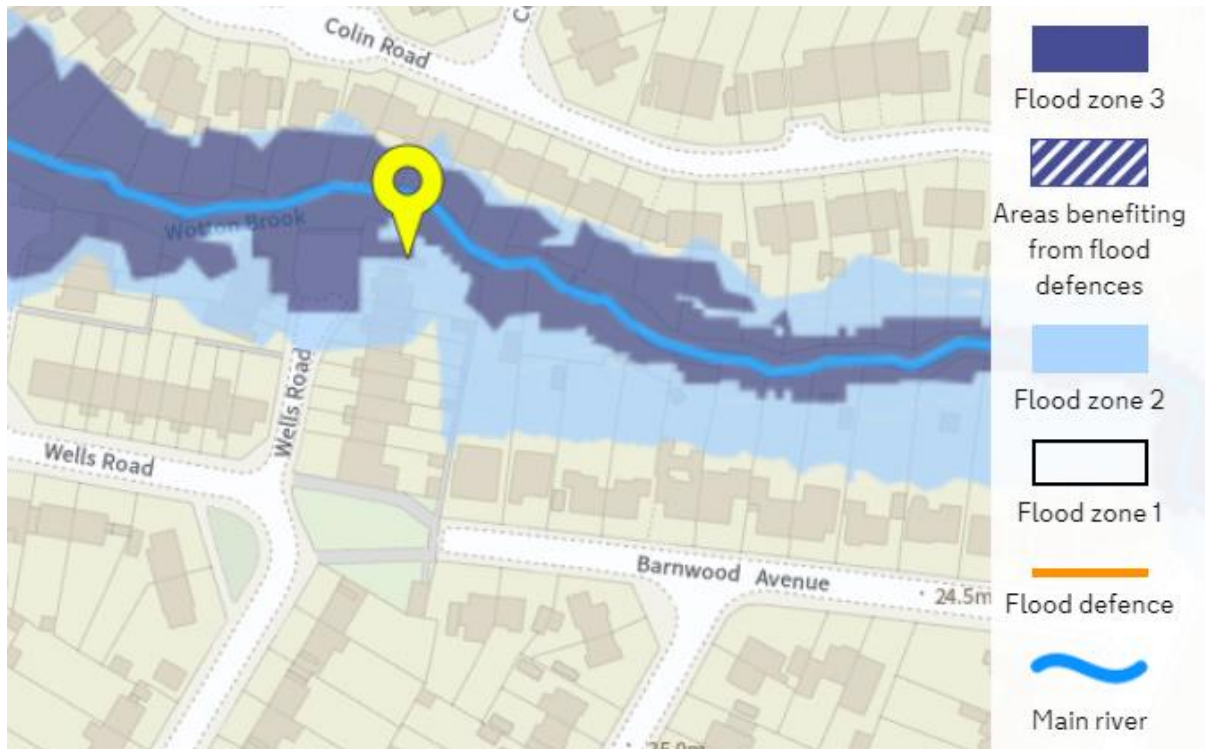
- 12.1 The proposed development would be impacted by flooding but by incorporating the mitigation measures and flood storage compensation outlined in this report, the proposal can meet all three principles of the Exception Test.
- 12.2 Finished floor levels of the ground floor should be no lower than 23.08m AOD. To achieve this, the ground floor level at the left hand side as you look at the front elevation of the proposed development should be at least 720mm above ground level.
- 12.3 Resilience measures including flood proof doors, non-permeable materials and raised electrical installation should be incorporated to a minimum level of 23.38m AOD.

Appendices

Appendix 1 – Red Line Boundary for Proposal Site



Appendix 2 – Flood Maps for Planning



Appendix 3: Environment Agency Warning Codes

Flood Alert



Key Message: Flooding is possible. Be prepared

Timing: 2 hours to 2 days in advance of flooding

Actions: Be prepared for flooding
Prepare a flood kit of essential items
Monitor local water levels and flood forecasts

Flood Alerts are to warn people of the possibility of flooding and encourage them to be alert, stay vigilant and to make early preparations for flooding.

Flood Warning



Key Message: Flooding is expected. Immediate Action Required

Timing: Half an hour to 1 day in advance of flooding

Actions: Act now to protect your property
Block doors with flood boards or sandbags and cover airbricks and other ventilation holes
Move family, pets and valuables to a safe place
Turn off gas, electricity and water supplies if safe to do so
Keep a flood kit ready
Move cars, pets, food, valuables and important documents to safety

Flood Warnings are to warn people flooding is expected and encourage them to take immediate action to protect themselves and their property.

Severe Flood

Warning



Key Message: Severe flooding. Danger to life

Timing: When flooding poses a significant threat to life and different actions are required

Actions: Stay in a safe place with a means of escape
Be ready should you need to evacuate from your home
Co-operate with the emergency services
Call 999 if you are in immediate danger

Severe Flood Warnings are to warn people of a significant risk to life or significant disruption to communities caused by widespread or prolonged flooding, and encourage them to take immediate action to protect themselves and follow the advice of the emergency services.

Warnings no

longer in force

(no icon)

Key Message: No further flooding is currently expected for your area

Timing: When river or sea conditions begin to return to normal

Actions: Be Careful. Flood water may still be around for several days and could be contaminated
If you've been flooded, ring your insurance company as soon as possible

Warnings are removed to inform people that the threat has now passed.

Appendix 4 – Evacuation Route (in red)



Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	0.500
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
6	0.008	5.00	99.850	450	-231050.953	108794.191	0.600
1	0.003	5.00	99.850	450	-231049.583	108802.170	0.737
5	0.003	5.00	99.850	450	-231040.387	108792.182	0.600
2	0.000		99.850	1200	-231038.645	108800.356	0.924
3	0.000		98.900	600	-231035.956	108804.630	0.311
4	0.000		98.700	600	-231035.226	108805.660	0.133

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	6	1	8.096	0.600	99.250	99.113	0.137	59.1	100	5.13	50.0
1.001	1	2	11.087	0.600	99.113	98.926	0.187	59.3	100	5.32	50.0
2.000	5	2	8.358	0.600	99.250	98.926	0.324	25.8	100	5.09	50.0
1.002	2	3	5.050	0.600	98.926	98.589	0.337	15.0	100	5.36	50.0
1.003	3	4	1.262	0.600	98.589	98.567	0.022	57.4	100	5.38	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.004	7.9	1.1	0.500	0.637	0.008	0.0	25	0.707
1.001	1.002	7.9	1.5	0.637	0.824	0.011	0.0	29	0.767
2.000	1.526	12.0	0.4	0.500	0.824	0.003	0.0	13	0.707
1.002	2.005	15.7	1.9	0.824	0.211	0.014	0.0	24	1.365
1.003	1.019	8.0	1.9	0.211	0.033	0.014	0.0	33	0.835

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	8.096	59.1	100	Circular_Default Sewer Type	99.850	99.250	0.500	99.850	99.113	0.637
1.001	11.087	59.3	100	Circular_Default Sewer Type	99.850	99.113	0.637	99.850	98.926	0.824
2.000	8.358	25.8	100	Circular_Default Sewer Type	99.850	99.250	0.500	99.850	98.926	0.824
1.002	5.050	15.0	100	Circular_Default Sewer Type	99.850	98.926	0.824	98.900	98.589	0.211




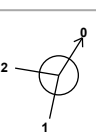


Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	6	450	Manhole	Private	1	450	Manhole	Private
1.001	1	450	Manhole	Private	2	1200	Manhole	Private
2.000	5	450	Manhole	Private	2	1200	Manhole	Private
1.002	2	1200	Manhole	Private	3	600	Manhole	Private

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.003	1.262	57.4	100	Circular_Default Sewer Type	98.900	98.589	0.211	98.700	98.567	0.033

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.003	3	600	Manhole	Private	4	600	Manhole	Private

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
6	-231050.953	108794.191	99.850	0.600	450				
						0	1.000	99.250	100
1	-231049.583	108802.170	99.850	0.737	450				
						0	1.001	99.113	100
5	-231040.387	108792.182	99.850	0.600	450				
						0	2.000	99.250	100
2	-231038.645	108800.356	99.850	0.924	1200				
						1	2.000	98.926	100
						2	1.001	98.926	100
						0	1.002	98.926	100
3	-231035.956	108804.630	98.900	0.311	600				
						1	1.002	98.589	100
						0	1.003	98.589	100
4	-231035.226	108805.660	98.700	0.133	600				
						1	1.003	98.567	100

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	✓
M5-60 (mm)	20.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

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

Node 2 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	98.926	Product Number	CTL-SHE-0069-2000-0900-2000
Design Depth (m)	0.900	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +40% CC 15 minute summer	488.233	138.153	100 year +40% CC 360 minute summer	56.677	14.585
100 year +40% CC 15 minute winter	342.620	138.153	100 year +40% CC 360 minute winter	36.841	14.585
100 year +40% CC 30 minute summer	320.551	90.705	100 year +40% CC 480 minute summer	43.979	11.622
100 year +40% CC 30 minute winter	224.948	90.705	100 year +40% CC 480 minute winter	29.219	11.622
100 year +40% CC 60 minute summer	214.603	56.713	100 year +40% CC 600 minute summer	35.604	9.738
100 year +40% CC 60 minute winter	142.577	56.713	100 year +40% CC 600 minute winter	24.327	9.738
100 year +40% CC 120 minute summer	129.587	34.246	100 year +40% CC 720 minute summer	31.433	8.424
100 year +40% CC 120 minute winter	86.094	34.246	100 year +40% CC 720 minute winter	21.125	8.424
100 year +40% CC 180 minute summer	97.729	25.149	100 year +40% CC 960 minute summer	25.432	6.697
100 year +40% CC 180 minute winter	63.526	25.149	100 year +40% CC 960 minute winter	16.847	6.697
100 year +40% CC 240 minute summer	75.977	20.078	100 year +40% CC 1440 minute summer	18.055	4.839
100 year +40% CC 240 minute winter	50.477	20.078	100 year +40% CC 1440 minute winter	12.134	4.839

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 96.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
30 minute winter	6	25	99.740	0.490	3.9	0.2086	0.0000	FLOOD RISK
30 minute winter	1	26	99.736	0.623	4.4	0.1495	0.0000	FLOOD RISK
30 minute winter	5	26	99.727	0.477	1.5	0.1236	0.0000	FLOOD RISK
30 minute winter	2	26	99.727	0.801	3.9	0.9060	0.0000	FLOOD RISK
120 minute summer	3	62	98.629	0.040	2.0	0.0112	0.0000	OK
120 minute summer	4	62	98.601	0.034	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
30 minute winter	6	1.000	1	3.2	0.760	0.407	0.0633	
30 minute winter	1	1.001	2	3.2	0.564	0.401	0.0867	
30 minute winter	5	2.000	2	1.2	0.534	0.098	0.0654	
30 minute winter	2	Hydro-Brake®	3	2.0				
120 minute summer	3	1.003	4	2.0	0.764	0.250	0.0033	7.2

Results for 100 year +40% CC 15 minute summer. 255 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute summer	6	15	99.610	0.360	4.8	0.1534	0.0000	FLOOD RISK
15 minute summer	1	15	99.607	0.494	5.6	0.1186	0.0000	FLOOD RISK
15 minute summer	5	15	99.600	0.350	1.8	0.0906	0.0000	FLOOD RISK
15 minute summer	2	15	99.599	0.673	5.0	0.7616	0.0000	FLOOD RISK
15 minute summer	3	33	98.629	0.040	2.0	0.0112	0.0000	OK
15 minute summer	4	33	98.601	0.034	2.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute summer	6	1.000	1	3.9	0.831	0.492	0.0633	
15 minute summer	1	1.001	2	3.7	0.616	0.470	0.0867	
15 minute summer	5	2.000	2	1.6	0.436	0.137	0.0654	
15 minute summer	2	Hydro-Brake®	3	2.0				
15 minute summer	3	1.003	4	2.0	0.764	0.250	0.0033	3.6

Results for 100 year +40% CC 15 minute winter. 255 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	6	15	99.706	0.456	5.0	0.1941	0.0000	FLOOD RISK
15 minute winter	1	16	99.701	0.588	5.3	0.1412	0.0000	FLOOD RISK
15 minute winter	5	16	99.695	0.445	2.0	0.1152	0.0000	FLOOD RISK
15 minute winter	2	16	99.694	0.768	4.5	0.8691	0.0000	FLOOD RISK
15 minute winter	3	36	98.629	0.040	2.0	0.0112	0.0000	OK
15 minute winter	4	36	98.601	0.034	2.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
15 minute winter	6	1.000	1	3.8	0.805	0.488	0.0633	
15 minute winter	1	1.001	2	3.5	0.671	0.446	0.0867	
15 minute winter	5	2.000	2	1.4	0.545	0.119	0.0654	
15 minute winter	2	Hydro-Brake®	3	2.0				
15 minute winter	3	1.003	4	2.0	0.764	0.250	0.0033	4.1

Results for 100 year +40% CC 30 minute summer. 270 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
30 minute summer	6	24	99.647	0.397	4.3	0.1689	0.0000	FLOOD RISK
30 minute summer	1	24	99.644	0.531	5.2	0.1274	0.0000	FLOOD RISK
30 minute summer	5	24	99.637	0.387	1.7	0.1001	0.0000	FLOOD RISK
30 minute summer	2	24	99.636	0.710	4.4	0.8031	0.0000	FLOOD RISK
30 minute summer	3	46	98.629	0.040	2.0	0.0112	0.0000	OK
30 minute summer	4	46	98.601	0.034	2.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
30 minute summer	6	1.000	1	3.7	0.761	0.464	0.0633	
30 minute summer	1	1.001	2	3.3	0.553	0.423	0.0867	
30 minute summer	5	2.000	2	1.4	0.505	0.120	0.0654	
30 minute summer	2	Hydro-Brake®	3	2.0				
30 minute summer	3	1.003	4	2.0	0.764	0.250	0.0033	4.8

Results for 100 year +40% CC 30 minute winter. 270 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
30 minute winter	6	25	99.740	0.490	3.9	0.2086	0.0000	FLOOD RISK
30 minute winter	1	26	99.736	0.623	4.4	0.1495	0.0000	FLOOD RISK
30 minute winter	5	26	99.727	0.477	1.5	0.1236	0.0000	FLOOD RISK
30 minute winter	2	26	99.727	0.801	3.9	0.9060	0.0000	FLOOD RISK
30 minute winter	3	50	98.629	0.040	2.0	0.0112	0.0000	OK
30 minute winter	4	50	98.601	0.034	2.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
30 minute winter	6	1.000	1	3.2	0.760	0.407	0.0633	
30 minute winter	1	1.001	2	3.2	0.564	0.401	0.0867	
30 minute winter	5	2.000	2	1.2	0.534	0.098	0.0654	
30 minute winter	2	Hydro-Brake®	3	2.0				
30 minute winter	3	1.003	4	2.0	0.764	0.250	0.0033	5.4

Results for 100 year +40% CC 60 minute summer. 300 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
60 minute summer	6	41	99.580	0.330	3.2	0.1406	0.0000	FLOOD RISK
60 minute summer	1	41	99.577	0.464	4.0	0.1114	0.0000	FLOOD RISK
60 minute summer	5	41	99.571	0.321	1.2	0.0831	0.0000	FLOOD RISK
60 minute summer	2	41	99.570	0.644	3.6	0.7289	0.0000	FLOOD RISK
60 minute summer	3	65	98.629	0.040	2.0	0.0112	0.0000	OK
60 minute summer	4	65	98.601	0.034	2.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
60 minute summer	6	1.000	1	2.9	0.741	0.372	0.0633	
60 minute summer	1	1.001	2	2.8	0.584	0.356	0.0867	
60 minute summer	5	2.000	2	1.1	0.429	0.090	0.0654	
60 minute summer	2	Hydro-Brake®	3	2.0				
60 minute summer	3	1.003	4	2.0	0.764	0.250	0.0033	5.9

Results for 100 year +40% CC 60 minute winter. 300 minute analysis at 1 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
60 minute winter	6	44	99.637	0.387	2.6	0.1650	0.0000	FLOOD RISK
60 minute winter	1	44	99.634	0.521	3.2	0.1251	0.0000	FLOOD RISK
60 minute winter	5	44	99.627	0.377	1.0	0.0976	0.0000	FLOOD RISK
60 minute winter	2	44	99.627	0.701	3.1	0.7923	0.0000	FLOOD RISK
60 minute winter	3	70	98.629	0.040	2.0	0.0112	0.0000	OK
60 minute winter	4	70	98.601	0.034	2.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
60 minute winter	6	1.000	1	2.3	0.716	0.289	0.0633	
60 minute winter	1	1.001	2	2.4	0.580	0.308	0.0867	
60 minute winter	5	2.000	2	0.9	0.376	0.073	0.0654	
60 minute winter	2	Hydro-Brake®	3	2.0				
60 minute winter	3	1.003	4	2.0	0.764	0.250	0.0033	6.7

Results for 100 year +40% CC 120 minute summer. 360 minute analysis at 2 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
120 minute summer	6	72	99.388	0.138	2.1	0.0590	0.0000	SURCHARGED
120 minute summer	1	74	99.385	0.272	2.9	0.0652	0.0000	SURCHARGED
120 minute summer	5	74	99.376	0.126	0.8	0.0327	0.0000	SURCHARGED
120 minute summer	2	74	99.376	0.450	2.9	0.5087	0.0000	SURCHARGED
120 minute summer	3	62	98.629	0.040	2.0	0.0112	0.0000	OK
120 minute summer	4	62	98.601	0.034	2.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
120 minute summer	6	1.000	1	2.1	0.695	0.264	0.0633	
120 minute summer	1	1.001	2	2.1	0.551	0.271	0.0867	
120 minute summer	5	2.000	2	0.8	0.289	0.066	0.0654	
120 minute summer	2	Hydro-Brake®	3	2.0				
120 minute summer	3	1.003	4	2.0	0.764	0.250	0.0033	7.2

Results for 100 year +40% CC 120 minute winter. 360 minute analysis at 2 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
120 minute winter	6	76	99.330	0.080	1.6	0.0342	0.0000	OK
120 minute winter	1	76	99.328	0.215	2.2	0.0515	0.0000	SURCHARGED
120 minute winter	5	76	99.319	0.069	0.6	0.0179	0.0000	OK
120 minute winter	2	76	99.319	0.393	2.5	0.4441	0.0000	SURCHARGED
120 minute winter	3	62	98.629	0.040	2.0	0.0112	0.0000	OK
120 minute winter	4	62	98.601	0.034	2.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
120 minute winter	6	1.000	1	1.6	0.674	0.203	0.0590	
120 minute winter	1	1.001	2	1.9	0.502	0.241	0.0867	
120 minute winter	5	2.000	2	0.6	0.196	0.050	0.0568	
120 minute winter	2	Hydro-Brake®	3	2.0				
120 minute winter	3	1.003	4	2.0	0.764	0.250	0.0033	8.0

Results for 100 year +40% CC 180 minute summer. 420 minute analysis at 4 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
180 minute summer	6	92	99.280	0.030	1.5	0.0127	0.0000	OK
180 minute summer	1	104	99.260	0.147	2.1	0.0352	0.0000	SURCHARGED
180 minute summer	5	96	99.265	0.015	0.6	0.0040	0.0000	OK
180 minute summer	2	104	99.250	0.324	2.5	0.3666	0.0000	SURCHARGED
180 minute summer	3	96	98.629	0.040	2.0	0.0112	0.0000	OK
180 minute summer	4	96	98.601	0.034	2.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
180 minute summer	6	1.000	1	1.5	0.672	0.190	0.0388	
180 minute summer	1	1.001	2	1.9	0.426	0.239	0.0867	
180 minute summer	5	2.000	2	0.6	0.276	0.050	0.0358	
180 minute summer	2	Hydro-Brake®	3	2.0				
180 minute summer	3	1.003	4	2.0	0.764	0.250	0.0033	8.4

Results for 100 year +40% CC 180 minute winter. 420 minute analysis at 4 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
180 minute winter	6	96	99.277	0.027	1.2	0.0113	0.0000	OK
180 minute winter	1	96	99.144	0.031	1.6	0.0074	0.0000	OK
180 minute winter	5	88	99.263	0.013	0.4	0.0033	0.0000	OK
180 minute winter	2	104	99.081	0.155	2.0	0.1750	0.0000	SURCHARGED
180 minute winter	3	104	98.627	0.038	1.9	0.0109	0.0000	OK
180 minute winter	4	104	98.600	0.033	1.9	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
180 minute winter	6	1.000	1	1.2	0.651	0.152	0.0149	
180 minute winter	1	1.001	2	1.6	0.328	0.203	0.0546	
180 minute winter	5	2.000	2	0.4	0.184	0.033	0.0351	
180 minute winter	2	Hydro-Brake®	3	1.9				
180 minute winter	3	1.003	4	1.9	0.754	0.237	0.0032	8.9

Results for 100 year +40% CC 240 minute summer. 480 minute analysis at 4 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
240 minute summer	6	124	99.278	0.028	1.3	0.0118	0.0000	OK
240 minute summer	1	124	99.145	0.032	1.8	0.0078	0.0000	OK
240 minute summer	5	124	99.264	0.014	0.5	0.0036	0.0000	OK
240 minute summer	2	128	99.115	0.189	2.3	0.2137	0.0000	SURCHARGED
240 minute summer	3	132	98.628	0.039	2.0	0.0111	0.0000	OK
240 minute summer	4	132	98.601	0.034	2.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
240 minute summer	6	1.000	1	1.3	0.657	0.164	0.0160	
240 minute summer	1	1.001	2	1.8	0.460	0.226	0.0555	
240 minute summer	5	2.000	2	0.5	0.135	0.041	0.0354	
240 minute summer	2	Hydro-Brake®	3	2.0				
240 minute summer	3	1.003	4	2.0	0.760	0.245	0.0033	8.2

Results for 100 year +40% CC 240 minute winter. 480 minute analysis at 4 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
240 minute winter	6	132	99.273	0.023	0.9	0.0097	0.0000	OK
240 minute winter	1	124	99.140	0.027	1.3	0.0066	0.0000	OK
240 minute winter	5	124	99.262	0.012	0.4	0.0032	0.0000	OK
240 minute winter	2	128	99.014	0.088	1.7	0.0999	0.0000	OK
240 minute winter	3	128	98.624	0.035	1.6	0.0099	0.0000	OK
240 minute winter	4	128	98.597	0.030	1.6	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
240 minute winter	6	1.000	1	0.9	0.601	0.114	0.0125	
240 minute winter	1	1.001	2	1.3	0.355	0.164	0.0499	
240 minute winter	5	2.000	2	0.4	0.136	0.033	0.0327	
240 minute winter	2	Hydro-Brake®	3	1.6				
240 minute winter	3	1.003	4	1.6	0.724	0.201	0.0028	9.7

Results for 100 year +40% CC 360 minute summer. 600 minute analysis at 8 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
360 minute summer	6	184	99.273	0.023	0.9	0.0097	0.0000	OK
360 minute summer	1	184	99.140	0.027	1.3	0.0066	0.0000	OK
360 minute summer	5	184	99.263	0.013	0.4	0.0032	0.0000	OK
360 minute summer	2	184	99.014	0.088	1.7	0.0998	0.0000	OK
360 minute summer	3	184	98.624	0.035	1.6	0.0099	0.0000	OK
360 minute summer	4	184	98.597	0.030	1.6	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
360 minute summer	6	1.000	1	0.9	0.584	0.114	0.0125	
360 minute summer	1	1.001	2	1.3	0.294	0.164	0.0502	
360 minute summer	5	2.000	2	0.4	0.127	0.033	0.0329	
360 minute summer	2	Hydro-Brake®	3	1.6				
360 minute summer	3	1.003	4	1.6	0.723	0.200	0.0028	8.6

Results for 100 year +40% CC 360 minute winter. 600 minute analysis at 8 minute timestep. Mass balance: 99.35%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
360 minute winter	6	184	99.270	0.020	0.7	0.0086	0.0000	OK
360 minute winter	1	184	99.137	0.024	1.0	0.0058	0.0000	OK
360 minute winter	5	184	99.261	0.011	0.3	0.0028	0.0000	OK
360 minute winter	2	184	98.993	0.067	1.3	0.0757	0.0000	OK
360 minute winter	3	184	98.619	0.030	1.2	0.0085	0.0000	OK
360 minute winter	4	184	98.594	0.027	1.2	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
360 minute winter	6	1.000	1	0.7	0.545	0.089	0.0104	
360 minute winter	1	1.001	2	1.0	0.422	0.127	0.0389	
360 minute winter	5	2.000	2	0.3	0.127	0.025	0.0252	
360 minute winter	2	Hydro-Brake®	3	1.2				
360 minute winter	3	1.003	4	1.2	0.677	0.154	0.0023	9.9

Results for 100 year +40% CC 480 minute summer. 720 minute analysis at 8 minute timestep. Mass balance: 99.63%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
480 minute summer	6	248	99.270	0.020	0.7	0.0086	0.0000	OK
480 minute summer	1	248	99.137	0.024	1.0	0.0058	0.0000	OK
480 minute summer	5	248	99.261	0.011	0.3	0.0028	0.0000	OK
480 minute summer	2	248	98.993	0.067	1.3	0.0757	0.0000	OK
480 minute summer	3	248	98.619	0.030	1.2	0.0085	0.0000	OK
480 minute summer	4	248	98.594	0.027	1.2	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
480 minute summer	6	1.000	1	0.7	0.545	0.089	0.0104	
480 minute summer	1	1.001	2	1.0	0.292	0.127	0.0389	
480 minute summer	5	2.000	2	0.3	0.127	0.025	0.0252	
480 minute summer	2	Hydro-Brake®	3	1.2				
480 minute summer	3	1.003	4	1.2	0.677	0.154	0.0023	9.3

Results for 100 year +40% CC 480 minute winter. 720 minute analysis at 8 minute timestep. Mass balance: 98.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
480 minute winter	6	256	99.267	0.017	0.5	0.0072	0.0000	OK
480 minute winter	1	256	99.133	0.020	0.7	0.0048	0.0000	OK
480 minute winter	5	280	99.259	0.009	0.2	0.0024	0.0000	OK
480 minute winter	2	256	98.976	0.050	0.9	0.0564	0.0000	OK
480 minute winter	3	280	98.614	0.025	0.9	0.0070	0.0000	OK
480 minute winter	4	280	98.589	0.022	0.9	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
480 minute winter	6	1.000	1	0.5	0.496	0.063	0.0081	
480 minute winter	1	1.001	2	0.7	0.422	0.087	0.0278	
480 minute winter	5	2.000	2	0.2	0.127	0.017	0.0178	
480 minute winter	2	Hydro-Brake®	3	0.9				
480 minute winter	3	1.003	4	0.9	0.618	0.108	0.0018	9.9

Results for 100 year +40% CC 600 minute summer. 840 minute analysis at 15 minute timestep. Mass balance: 99.20%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
600 minute summer	6	300	99.269	0.019	0.6	0.0079	0.0000	OK
600 minute summer	1	300	99.134	0.021	0.8	0.0051	0.0000	OK
600 minute summer	5	300	99.259	0.009	0.2	0.0024	0.0000	OK
600 minute summer	2	330	98.980	0.054	1.0	0.0611	0.0000	OK
600 minute summer	3	330	98.615	0.026	1.0	0.0074	0.0000	OK
600 minute summer	4	330	98.590	0.023	1.0	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
600 minute summer	6	1.000	1	0.6	0.534	0.075	0.0090	
600 minute summer	1	1.001	2	0.8	0.292	0.100	0.0306	
600 minute summer	5	2.000	2	0.2	0.122	0.017	0.0195	
600 minute summer	2	Hydro-Brake®	3	1.0				
600 minute summer	3	1.003	4	1.0	0.635	0.120	0.0019	9.6

Results for 100 year +40% CC 600 minute winter. 840 minute analysis at 15 minute timestep. Mass balance: 99.38%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
600 minute winter	6	300	99.267	0.017	0.5	0.0072	0.0000	OK
600 minute winter	1	300	99.133	0.020	0.7	0.0048	0.0000	OK
600 minute winter	5	300	99.259	0.009	0.2	0.0024	0.0000	OK
600 minute winter	2	300	98.976	0.050	0.9	0.0564	0.0000	OK
600 minute winter	3	300	98.614	0.025	0.9	0.0070	0.0000	OK
600 minute winter	4	300	98.589	0.022	0.9	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
600 minute winter	6	1.000	1	0.5	0.496	0.063	0.0081	
600 minute winter	1	1.001	2	0.7	0.281	0.087	0.0278	
600 minute winter	5	2.000	2	0.2	0.111	0.017	0.0178	
600 minute winter	2	Hydro-Brake®	3	0.9				
600 minute winter	3	1.003	4	0.9	0.616	0.107	0.0018	10.9

Results for 100 year +40% CC 720 minute summer. 960 minute analysis at 15 minute timestep. Mass balance: 99.30%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
720 minute summer	6	360	99.267	0.017	0.5	0.0072	0.0000	OK
720 minute summer	1	360	99.133	0.020	0.7	0.0048	0.0000	OK
720 minute summer	5	360	99.259	0.009	0.2	0.0024	0.0000	OK
720 minute summer	2	360	98.976	0.050	0.9	0.0564	0.0000	OK
720 minute summer	3	360	98.614	0.025	0.9	0.0070	0.0000	OK
720 minute summer	4	360	98.589	0.022	0.9	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
720 minute summer	6	1.000	1	0.5	0.496	0.063	0.0081	
720 minute summer	1	1.001	2	0.7	0.281	0.087	0.0278	
720 minute summer	5	2.000	2	0.2	0.111	0.017	0.0178	
720 minute summer	2	Hydro-Brake®	3	0.9				
720 minute summer	3	1.003	4	0.9	0.616	0.107	0.0018	9.7

Results for 100 year +40% CC 720 minute winter. 960 minute analysis at 15 minute timestep. Mass balance: 98.64%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
720 minute winter	6	345	99.265	0.015	0.4	0.0065	0.0000	OK
720 minute winter	1	345	99.130	0.017	0.5	0.0041	0.0000	OK
720 minute winter	5	240	99.257	0.007	0.1	0.0017	0.0000	OK
720 minute winter	2	345	98.965	0.039	0.6	0.0437	0.0000	OK
720 minute winter	3	345	98.609	0.020	0.6	0.0056	0.0000	OK
720 minute winter	4	345	98.585	0.018	0.6	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
720 minute winter	6	1.000	1	0.4	0.486	0.050	0.0066	
720 minute winter	1	1.001	2	0.5	0.276	0.062	0.0203	
720 minute winter	5	2.000	2	0.1	0.122	0.008	0.0126	
720 minute winter	2	Hydro-Brake®	3	0.6				
720 minute winter	3	1.003	4	0.6	0.554	0.071	0.0013	10.7

Results for 100 year +40% CC 960 minute summer. 1200 minute analysis at 15 minute timestep. Mass balance: 99.49%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
960 minute summer	6	480	99.265	0.015	0.4	0.0065	0.0000	OK
960 minute summer	1	495	99.132	0.019	0.6	0.0045	0.0000	OK
960 minute summer	5	495	99.259	0.009	0.2	0.0023	0.0000	OK
960 minute summer	2	495	98.972	0.046	0.8	0.0523	0.0000	OK
960 minute summer	3	495	98.612	0.023	0.8	0.0065	0.0000	OK
960 minute summer	4	495	98.588	0.021	0.8	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
960 minute summer	6	1.000	1	0.4	0.485	0.051	0.0071	
960 minute summer	1	1.001	2	0.6	0.276	0.076	0.0252	
960 minute summer	5	2.000	2	0.2	0.122	0.016	0.0162	
960 minute summer	2	Hydro-Brake®	3	0.8				
960 minute summer	3	1.003	4	0.8	0.598	0.095	0.0016	9.1

Results for 100 year +40% CC 960 minute winter. 1200 minute analysis at 15 minute timestep. Mass balance: 98.29%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
960 minute winter	6	510	99.263	0.013	0.3	0.0057	0.0000	OK
960 minute winter	1	510	99.128	0.015	0.4	0.0036	0.0000	OK
960 minute winter	5	330	99.257	0.007	0.1	0.0017	0.0000	OK
960 minute winter	2	510	98.961	0.035	0.5	0.0392	0.0000	OK
960 minute winter	3	510	98.607	0.018	0.5	0.0051	0.0000	OK
960 minute winter	4	510	98.584	0.017	0.5	0.0000	0.0000	OK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
960 minute winter	6	1.000	1	0.3	0.435	0.038	0.0055	
960 minute winter	1	1.001	2	0.4	0.257	0.050	0.0175	
960 minute winter	5	2.000	2	0.1	0.122	0.008	0.0110	
960 minute winter	2	Hydro-Brake®	3	0.5				
960 minute winter	3	1.003	4	0.5	0.528	0.059	0.0011	12.0

Results for 100 year +40% CC 1440 minute summer. 1680 minute analysis at 30 minute timestep. Mass balance: 98.36%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
1440 minute summer	6	720	99.263	0.013	0.3	0.0057	0.0000	OK
1440 minute summer	1	720	99.128	0.015	0.4	0.0036	0.0000	OK
1440 minute summer	5	630	99.257	0.007	0.1	0.0017	0.0000	OK
1440 minute summer	2	720	98.961	0.035	0.5	0.0392	0.0000	OK
1440 minute summer	3	720	98.607	0.018	0.5	0.0051	0.0000	OK
1440 minute summer	4	720	98.584	0.017	0.5	0.0000	0.0000	OK

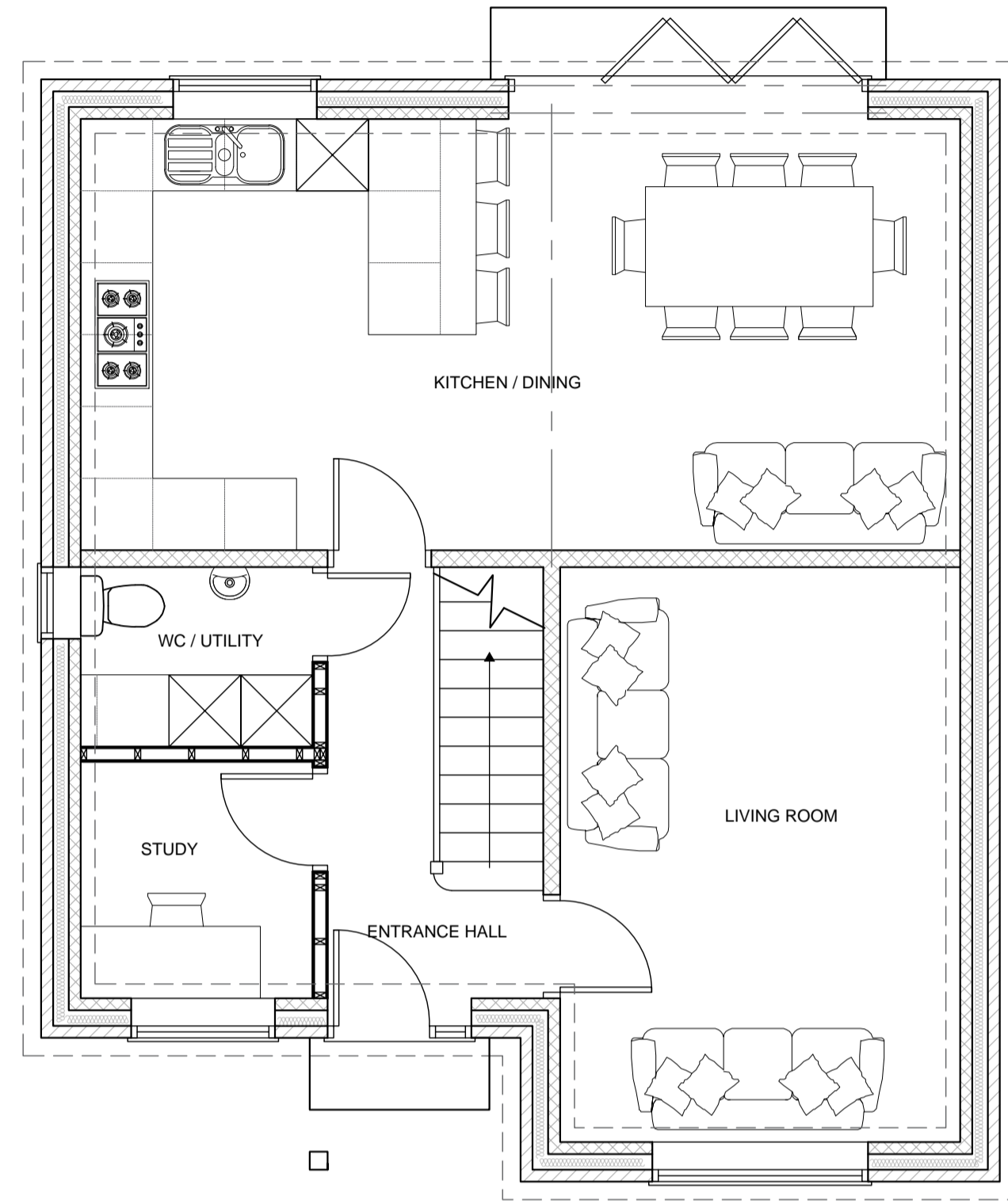
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
1440 minute summer	6	1.000	1	0.3	0.434	0.038	0.0055	
1440 minute summer	1	1.001	2	0.4	0.257	0.050	0.0175	
1440 minute summer	5	2.000	2	0.1	0.120	0.008	0.0110	
1440 minute summer	2	Hydro-Brake®	3	0.5				
1440 minute summer	3	1.003	4	0.5	0.528	0.059	0.0011	9.2

Results for 100 year +40% CC 1440 minute winter. 1680 minute analysis at 30 minute timestep. Mass balance: 96.66%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
1440 minute winter	6	600	99.261	0.011	0.2	0.0047	0.0000	OK
1440 minute winter	1	600	99.126	0.013	0.3	0.0032	0.0000	OK
1440 minute winter	5	570	99.257	0.007	0.1	0.0017	0.0000	OK
1440 minute winter	2	600	98.957	0.031	0.4	0.0347	0.0000	OK
1440 minute winter	3	600	98.605	0.016	0.4	0.0045	0.0000	OK
1440 minute winter	4	600	98.582	0.015	0.4	0.0000	0.0000	OK

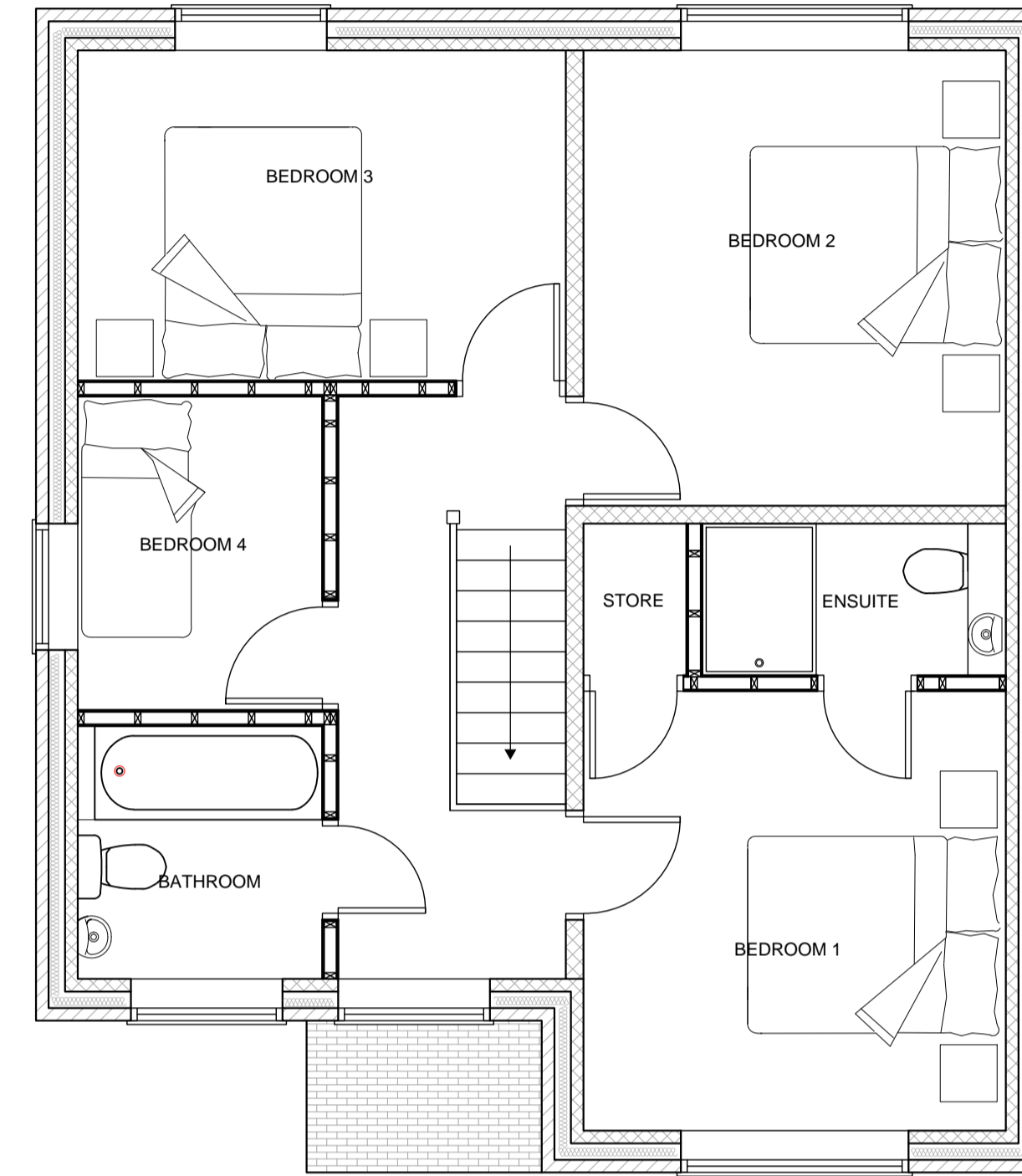
Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)	Discharge Vol (m ³)
1440 minute winter	6	1.000	1	0.2	0.366	0.025	0.0043	
1440 minute winter	1	1.001	2	0.3	0.230	0.037	0.0146	
1440 minute winter	5	2.000	2	0.1	0.120	0.008	0.0094	
1440 minute winter	2	Hydro-Brake®	3	0.4				
1440 minute winter	3	1.003	4	0.4	0.498	0.048	0.0010	11.5

FOR PLANNING ONLY



PROPOSED GROUND FLOOR PLAN - 1:50

0 1 2 3 4 5
THIS BAR SHOULD SCALE 5M @ 1:50

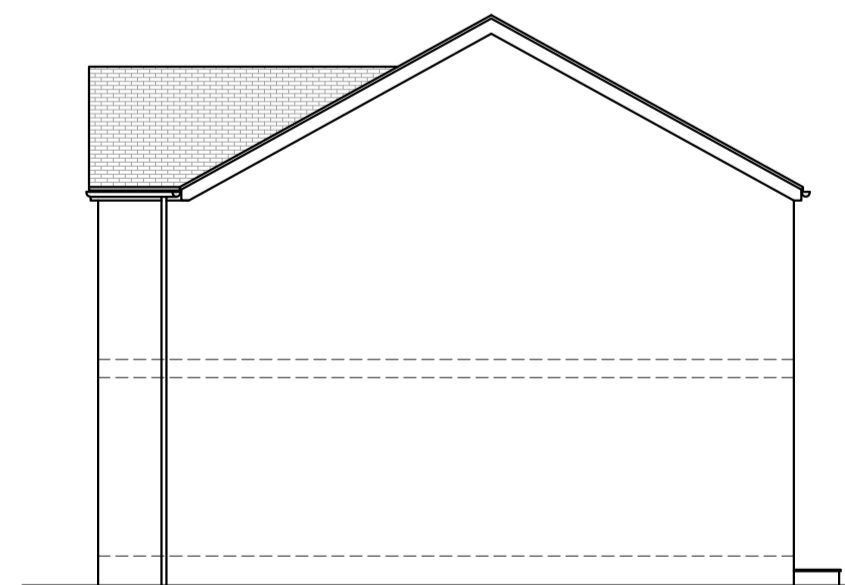


PROPOSED FIRST FLOOR PLAN - 1:50



PROPOSED FRONT ELEVATION - 1:100

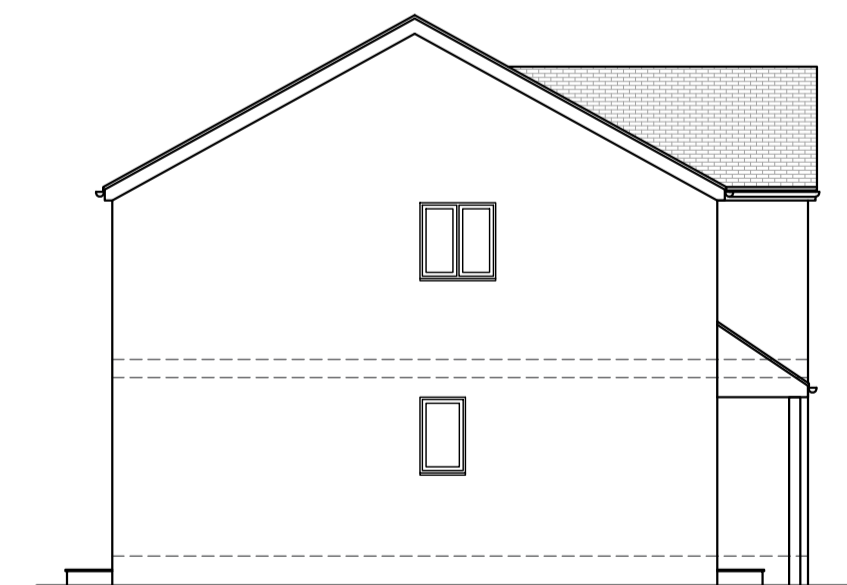
0 1 2 3 4 5
THIS BAR SHOULD SCALE 5M @ 1:100



SIDE ELEVATION - 1:100



REAR ELEVATION - 1:100



END ELEVATION - 1:100

- NOTES**
- 1) ALL DIMENSIONS TO BE CHECKED ONSITE PRIOR TO CONSTRUCTION (INTERNAL DIMS MAY CHANGE DEPENDING ON EXTERNAL WALL CONSTRUCTION METHOD)
 - 2) A STRUCTURAL ENGINEER MUST BE CONSULTED FOR ALL STRUCTURAL WORKS
 - 3) WORKS TO BE CARRIED OUT BY COMPETENT, QUALIFIED CONTRACTORS
 - 4) ALL WORKS TO BE CARRIED OUT UNDER A LOCAL AUTHORITY BUILDING NOTICE ALL BUILD NOTES ARE GIVEN BASED ON STANDARD BUILDING REGULATIONS DETAILS AND MAY VARY, CONSTRUCTION METHODS MAY VARY ACCORDING TO BUILDERS PREFERENCE AND BUILDING CONTROL OFFICER REQUIREMENTS. THESE DRAWINGS ARE PRODUCED FOR PLANNING ONLY.



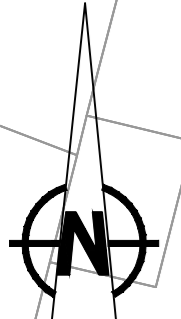
CLIENT/PROJECT:
MARK TOOTH
PROPOSED DEVELOPMENT TO LAND ADJACENT TO
87 WELLS ROAD, GLOUCESTER, GL4 3AN

TITLE:
PROPOSED PLANS & ELEVATIONS

SCALE:
1:100 & 1:50 @ A1

DATE:
APRIL 2022

NB-87WR-MT-002C



Wotton Brook

WELLS ROAD

52

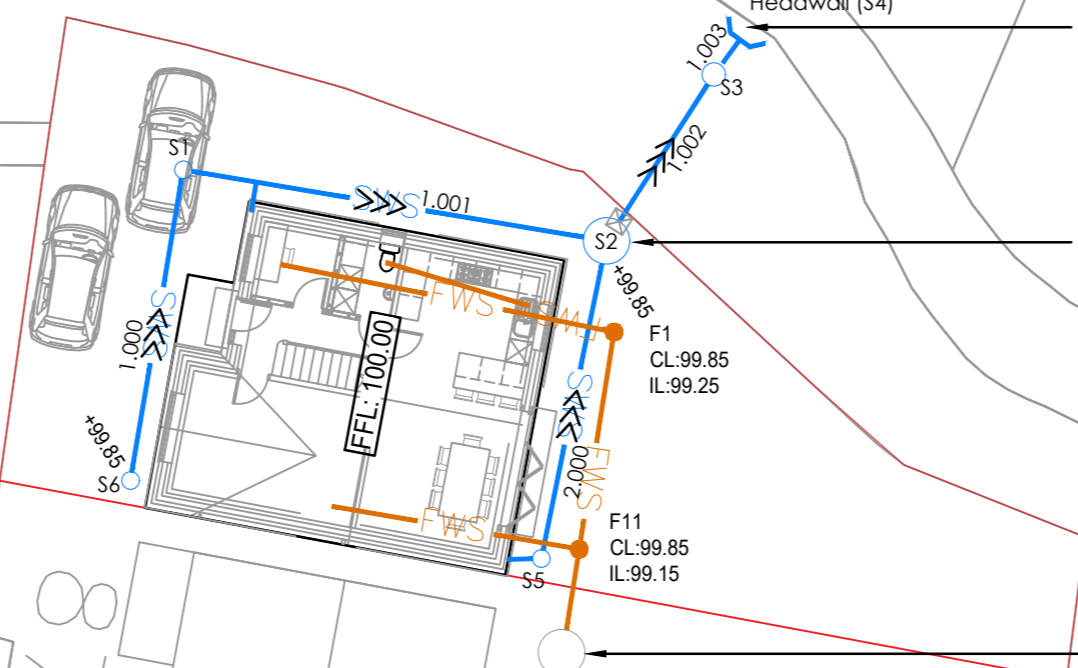
85

81

88

93

79 79a



Proposed new headwall to be constructed on existing watercourse (Wotton Brook). Connection subject to DIRECT S106 approval by local water authority.

Invert level and location to be confirmed on site prior to ANY construction

1200mm Ø Hydro-Brake manhole with maximum permitted discharge of 2/s from 0.9m head. See simulation calculations for clarity.

System designed not to flood in 1in100 year storm event plus 40% for climate change.

Proposed new connection to be constructed on existing Public Surface Water sewer. Connection subject to INDIRECT S106 approval by local water authority.

CL:99.80
IL:99.10

Invert level and location assumed and to be confirmed on site prior to ANY construction

KEY:

	450mm (DIA MH)	SWS	SEE SIMULATION CALCULATIONS FOR MANHOLE AND PIPE SIZES
	RODDING EYE	SWS	
	1200mm (DIA MH)	SWS	
	1200mm (DIA MH)	FWS	PRIVATE FOUL SEWER. PIPE TO BE 100mm IN DIAMETER AND MANHOLE TO BE POLYTHENE 450mm IN DIAMETER UP TO 1m DEPTH AND 1200mm DIAMETER CONCRETE RINGS GRATER THAN 1m DEPTH OR WITHIN ROAD
	450mm (DIA MH)	FWS	

Notes:

1. THE COPYRIGHT OF THIS DRAWING IS VESTED IN DEMUS DESIGN LTD AND IT MAY NOT BE REPRODUCED IN WHOLE OR PART OR USED FOR THE MANUFACTURE OF ANY ARTICLE WITHOUT THE EXPRESS PERMISSION OF THE COPYRIGHT HOLDERS.
2. WORK TO FIGURED DIMENSIONS ONLY.
3. THIS DRAWING SHOULD ONLY BE USED FOR PLANNING ONLY
4. ALL DIMENSIONS IN METERS UNLESS STATED OTHERWISE.
4. ALL PRIVATE DRAINAGE WORKS ARE TO COMPLY WITH THE REQUIREMENTS OF BS 752 BUILDING DRAINAGE AND BUILDING REGULATIONS 2000 APPROVED DOCUMENT H 2002 EDITION. ALL ADOPTABLE DRAINAGE TO COMPLY WITH THE REQUIREMENTS OF SEVERN TRENT WATER AND SEWERS FOR ADOPTION (6th EDITION), INCLUDING THE RELEVANT PROVISIONS OF THE COMBINED ADDENDUM.
5. ALL MATERIALS, UNLESS SPECIFIED OTHERWISE, SHALL COMPLY WITH THE RELEVANT BRITISH STANDARD. SOURCES OF MATERIALS ARE TO BE AGREED WITH THE EMPLOYER'S REPRESENTATIVE/ENGINEER IN ADVANCE OF THE WORKS.
6. ANY DISCREPANCIES IN THE DETAILS SHOWN TO BE REPORTED TO THE EMPLOYER'S REPRESENTATIVE/ENGINEER PRIOR TO CONSTRUCTION.
7. LOCATION AND LEVELS OF EXISTING DRAINAGE RUNS ARE BASED UPON SEWER RECORD PLANS AND MUST BE CHECKED ON SITE PRIOR TO THE COMMENCEMENT OF ANY DRAINAGE WORKS.
8. ALL EXISTING SERVICES TO BE LOCATED PRIOR TO THE COMMENCEMENT OF ANY DRAINAGE WORKS WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORKS.
9. ALL ADOPTABLE DRAINAGE AND FITTINGS TO BE FLEXIBLY JOINTED CLAYWARE TO BS EN295 OR CONCRETE TO BS5911 PART 100, FLEXIBLY JOINTED UPVC PIPES AND FITTINGS TO WIS No 4-13-05 MAY BE USED FOR PRIVATE BUILDING DRAINAGE SYSTEMS ONLY.
10. TYPICAL PIPE BEDDING TO DRAINAGE WHERE DEPTH TO SOFFIT IS GREATER THAN 600mm IN LANDSCAPED AREAS AND GREATER THAN 1200mm IN ADOPTABLE HIGHWAYS AND 900mm IN OTHER TRAFFICKED AREAS IS TO BE CLASS 5 (I.E. 10-14mm GRADED IMPORTED GRANULAR BED AND SURROUND FOR PIPES UP TO 525 Dia AND 20 - 40mm GRADED IMPORTED GRANULAR BED AND SURROUND FOR PIPES GREATER THAN 525 Dia)
11. BACKFILL TO DRAINAGE TRENCHES UNDER CARRIAGEWAYS TO BE TYPE 1 SUB-BASE MATERIAL, ELSEWHERE BACKFILL TO BE FREE DRAINING READILY COMPATIBLE MATERIAL FREE FROM RUBBISH AND ORGANIC MATTER, FROZEN SOIL CLAY LUMPS AND LARGE STONES, TO BE COMPACTED IN LAYERS NOT EXCEEDING 150mm THICK.
12. CONCRETE MIXES INDICATED ON THIS DRAWING ARE DESIGNATED MIXES CONFORMING TO BS 8500-1, 2002.
13. A FLEXIBLE JOINT SHALL BE PROVIDED AS CLOSE AS IS FEASIBLE TO OUTSIDE FACE OF ANY STRUCTURE INTO WHICH A PIPE IS BUILT, COMPATIBLE WITH THE SATISFACTORY COMPLETION AND SUBSEQUENT MOVEMENT OF THE JOINT, THE LENGTH OF THE NEXT PIPE (ROCKER PIPE) AWAY FROM THE STRUCTURE SHALL BE AS SHOWN IN THE TABLE BELOW.
NOMINAL DIAMETER - 150mm-600mm = EFFECTIVE LENGTH 600mm
14. RWP & SVP LOCATIONS TO BE CONFIRMED ONSITE PRIOR TO ANY CONSTRUCTION
15. SITE TO BE REVIEWED FOLLOWING RECEIPT OF TOPOGRAPHICAL SURVEY AND/OR EXTERNAL LEVELS DRAWING

REV:	DESCRIPTION:	BY:	DATE:
------	--------------	-----	-------

STATUS: **PLANNING ISSUE**



Tel:01902 475653
17 Goldthorn Avenue, Penn, Wolverhampton, WV4 5AA
www.onn-point.co.uk

CLIENT:

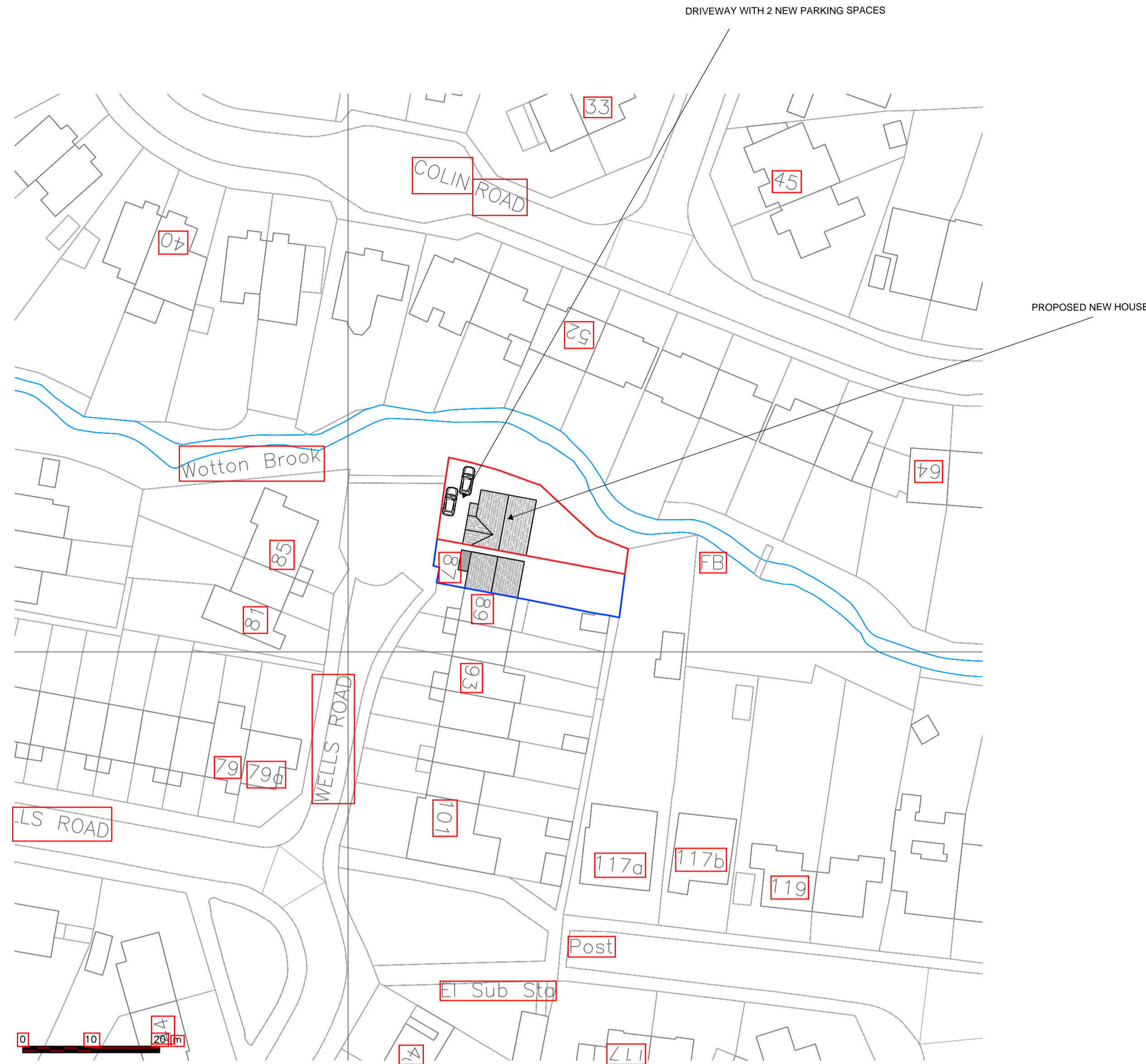
SITE: **LAND ADJ TO 78 WELLS ROAD
ABBEYDALE, GLOUCESTER**

TITLE: **PROPOSED DRAINAGE
STRATEGY**

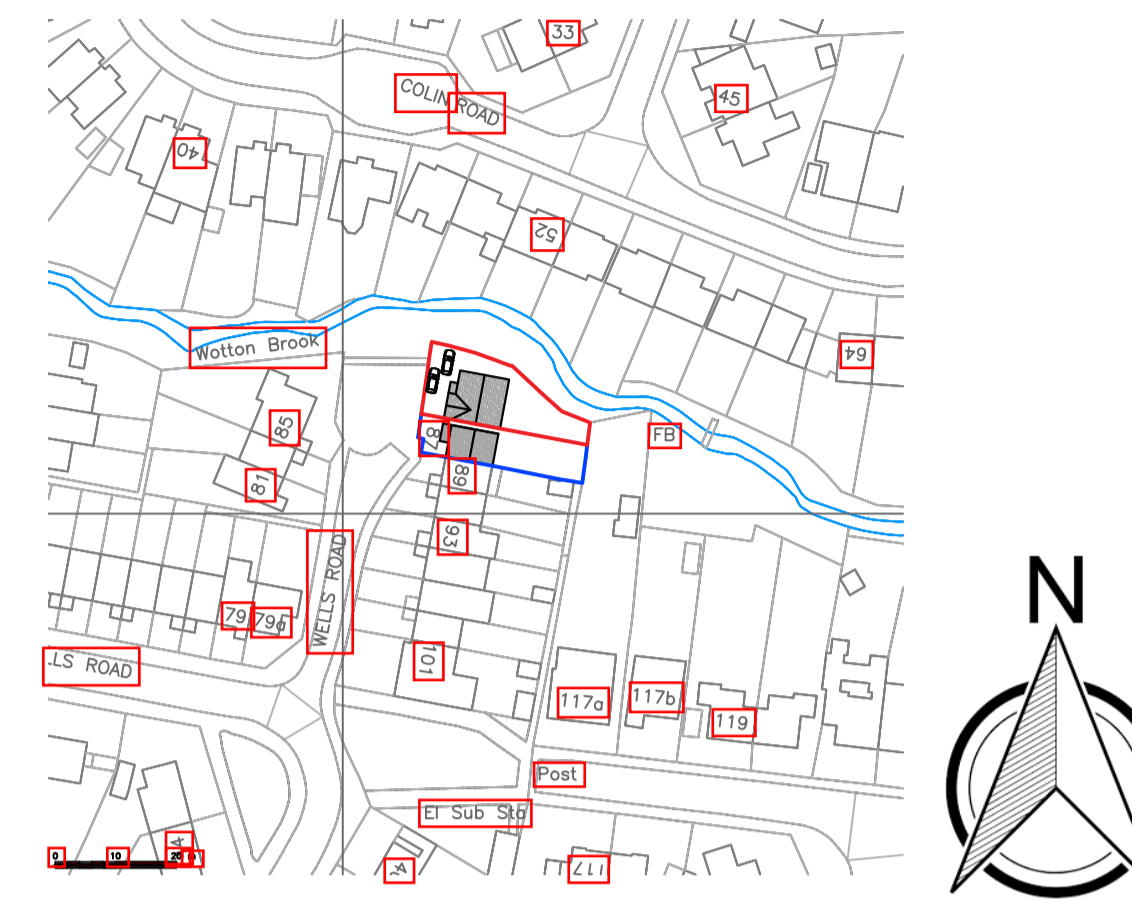
SCALE AT A2: 1:200	DATE: 19.08.22	DRAWN: RJS	CHECKED:
PROJECT NO: 22-OP-1226	DRAWING NO: A2/001	REVISION:	-

FOR PLANNING ONLY

- NOTES
- 1) ALL DIMENSIONS TO BE CHECKED ONSITE PRIOR TO CONSTRUCTION (INTERNAL DIMS MAY CHANGE DEPENDING ON EXTERNAL WALL CONSTRUCTION METHOD)
 - 2) A STRUCTURAL ENGINEER MUST BE CONSULTED FOR ALL STRUCTURAL WORKS
 - 3) WORKS TO BE CARRIED OUT BY COMPETENT, QUALIFIED CONTRACTORS
 - 4) ALL WORKS TO BE CARRIED OUT UNDER A LOCAL AUTHORITY BUILDING NOTICE. ALL BUILD NOTES ARE GIVEN BASED ON STANDARD BUILDING REGULATIONS DETAILS AND MAY VARY. CONSTRUCTION METHODS MAY VARY ACCORDING TO BUILDERS PREFERENCE AND BUILDING CONTROL OFFICER REQUIREMENTS. THESE DRAWINGS ARE PRODUCED FOR PLANNING ONLY.



PROPOSED BLOCK PLAN - 1:500



PROPOSED SITE PLAN - 1:1250



PROPOSED FRONT ELEVATION - 1:100 (IN CONTEXT)

THIS BAR SHOULD SCALE 5M @ 1:100



PROPOSED REAR ELEVATION - 1:100 (IN CONTEXT)

CLIENT/PROJECT:

MARK TOOTH
PROPOSED DEVELOPMENT TO LAND ADJACENT TO
87 WELLS ROAD, GLOUCESTER, GL4 3AN

TITLE:

PROPOSED SITE PLANS & ELEVATIONS

SCALE:

1:100, 1:500 & 1:1250 @ A1

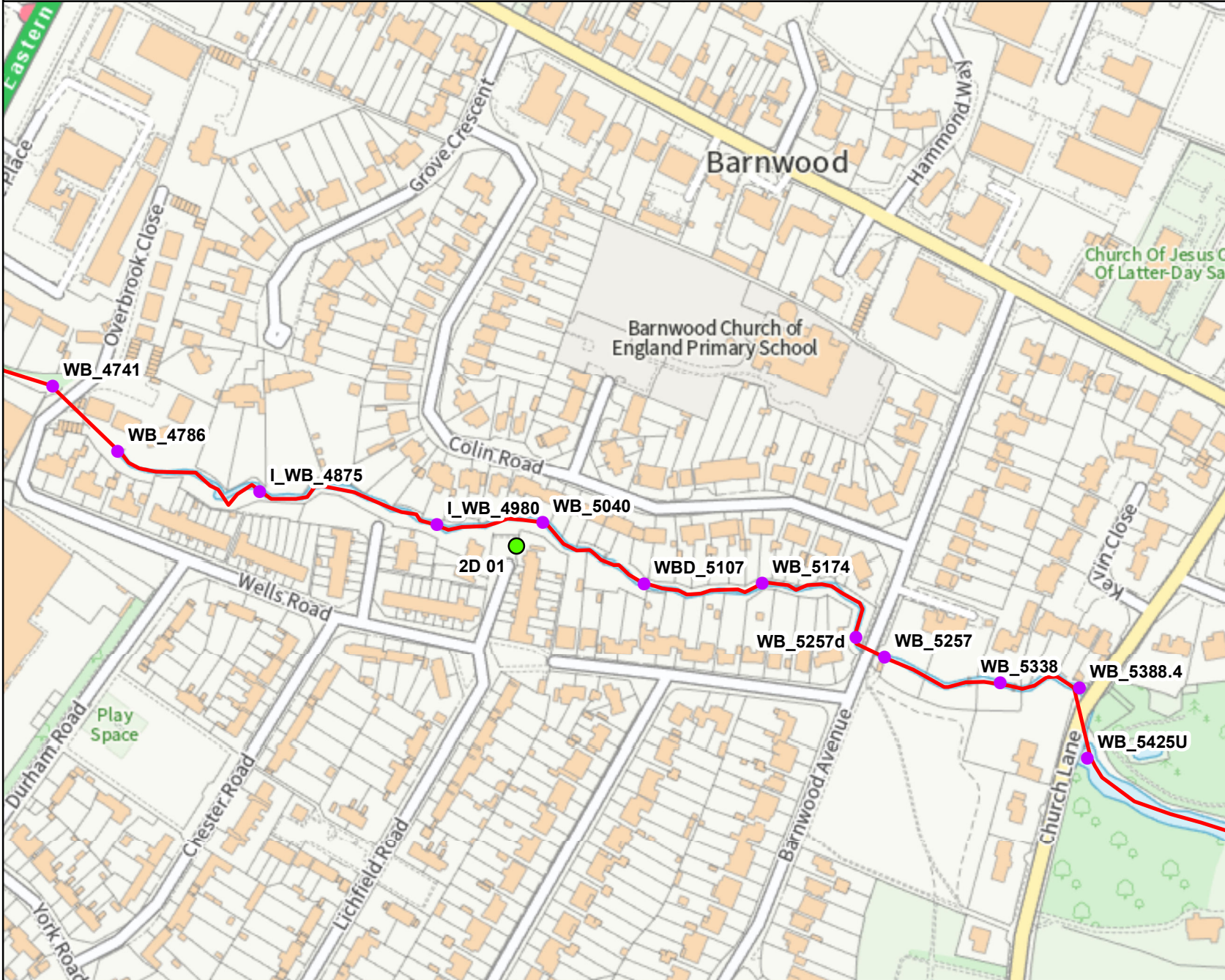
DATE:

APRIL 2022

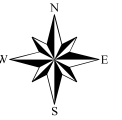


NB-87WR-MT-003D

Wotton Brook Model Node Location Map including GL4 3AN - created 13/09/2021 [231227]



Scale 1: 3000



Legend

- Main River
- Wotton Brook Model Node Point
- 2D Model Node Point



Created by Partnerships and Strategic Overview Team, West Midlands

1. THE COPYRIGHT OF THIS DRAWING IS VESTED IN ONN POINT ENGINEERING AND IT MAY NOT BE REPRODUCED IN WHOLE OR PART OR USED FOR THE MANUFACTURE OF ANY ARTICLE WITHOUT THE EXPRESS PERMISSION OF THE COPYRIGHT HOLDERS.

2. WORK TO FIGURED DIMENSIONS ONLY.

3. ALL DIMENSIONS IN METRES UNLESS STATED OTHERWISE.

4. ALL PRIVATE DRAINAGE WORKS ARE TO COMPLY WITH THE REQUIREMENTS OF BS 752 BUILDING DRAINAGE AND BUILDING REGULATIONS 2010 APPROVED DOCUMENT H 2002 EDITION. ALL ADAPTABLE DRAINAGE TO COMPLY WITH THE REQUIREMENTS OF SEVERN TRENT WATER AND SEWERS FOR ADOPTION (7th EDITION), INCLUDING THE RELEVANT PROVISIONS OF THE COMBINED ADDENDUM.

5. ALL MATERIALS, UNLESS SPECIFIED OTHERWISE, SHALL COMPLY WITH THE RELEVANT BRITISH STANDARD. SOURCES OF MATERIALS ARE TO BE AGREED WITH THE EMPLOYER'S REPRESENTATIVE/ENGINEER IN ADVANCE OF THE WORKS.

6. ANY DISCREPANCIES IN THE DETAILS SHOWN TO BE REPORTED TO THE EMPLOYER'S REPRESENTATIVE/ENGINEER PRIOR TO CONSTRUCTION.

7. ALL EXISTING SERVICES TO BE LOCATED PRIOR TO THE COMMENCEMENT OF ANY DRAINAGE WORKS WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORKS.

8. TYPICAL PIPE BEDDING TO DRAINAGE WHERE DEPTH TO SOFFIT IS GREATER THAN 400mm IN LANDSCAPED AREAS AND GREATER THAN 1200mm IN ADOPTABLE HIGHWAYS AND 900mm IN OTHER TRAFFICKED AREAS IS TO BE CLASS 5 (I.E. 10-14mm GRADED IMPORTED GRANULAR BED AND SURROUND FOR PIPES UP TO 525 Dia AND 20 - 40mm GRADED IMPORTED GRANULAR BED AND SURROUND FOR PIPES GREATER THAN 525 Dia)

9. BACKFILL TO DRAINAGE TRENCHES UNDER CARRIAGEWAYS TO BE TYPE 1 SUB-BASE MATERIAL. ELSEWHERE BACKFILL TO BE FREE DRAINING READILY COMPATIBLE MATERIAL FREE FROM RUBBISH AND ORGANIC MATTER. FROZEN SOIL, CLAY LUMPS AND LARGE STONES, TO BE COMPACTED IN LAYERS NOT EXCEEDING 150mm THICK.

10. A FLEXIBLE JOINT SHALL BE PROVIDED AS CLOSE AS IS FEASIBLE TO OUTSIDE FACE OF ANY STRUCTURE INTO WHICH A PIPE IS BUILT. COMPATIBLE WITH THE SATISFACTORY COMPLETION AND SUBSEQUENT MOVEMENT OF THE JOINT. THE LENGTH OF THE NEXT PIPE (ROCKER PIPE) AWAY FROM THE STRUCTURE SHALL BE AS SHOWN IN THE TABLE BELOW.

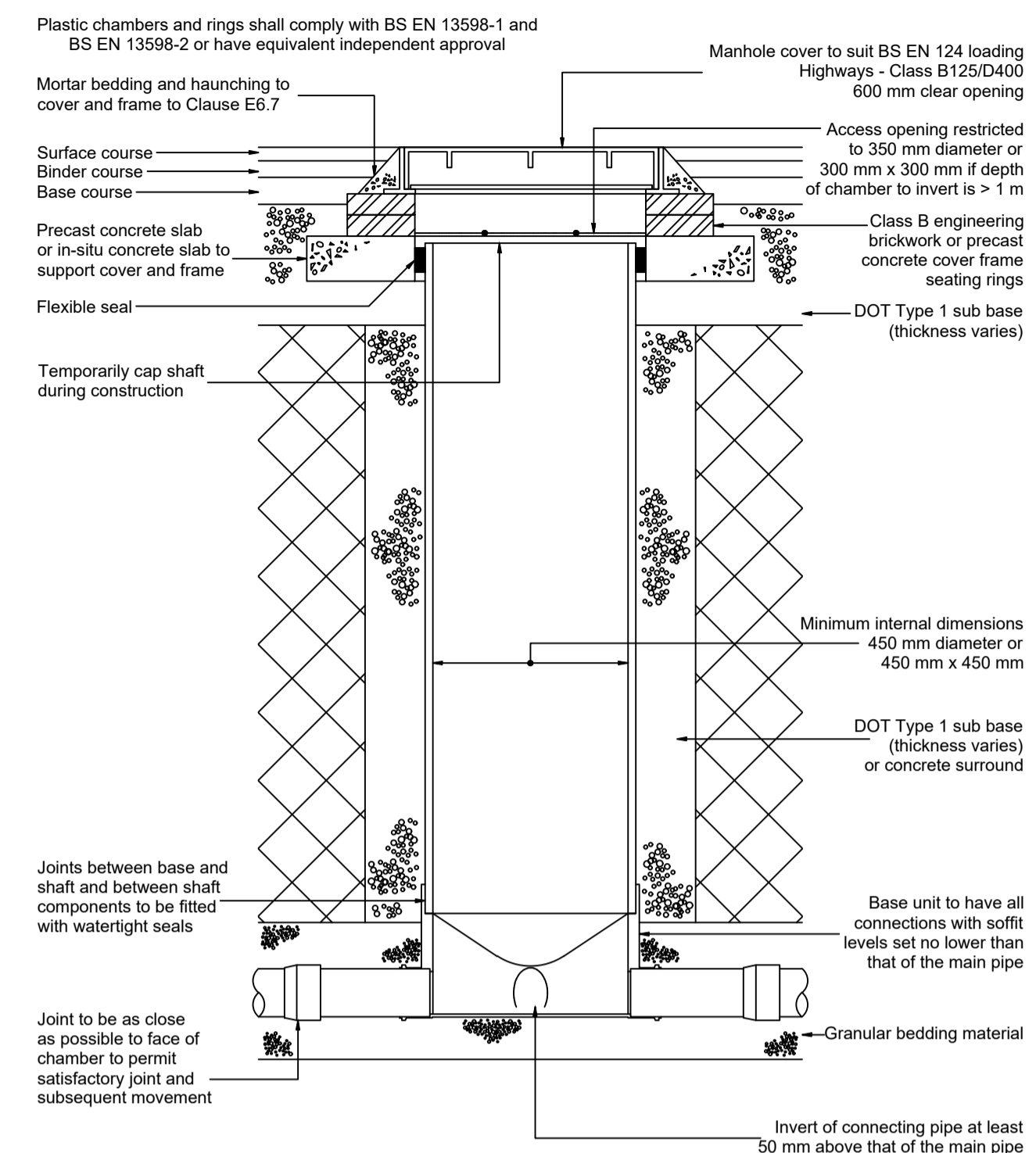
NOMINAL DIAMETER (mm)	EFFECTIVE LENGTH (m)
150-600	0.6
675-750	1.0
825 AND OVER	1.25

11. WHERE COVER TO PIPE WORK IS LESS THAN 600mm IN PRIVATE AREAS CONCRETE BED AND SURROUND IS TO BE USED.

12. PRECAST CONCRETE MANHOLE RINGS MUST NOT BE CUT UNDER ANY CIRCUMSTANCES

13. IN AREAS OF LESS THAN 1.2m COVER, PIPEWORK IS TO HAVE CONCRETE BED AND SURROUND

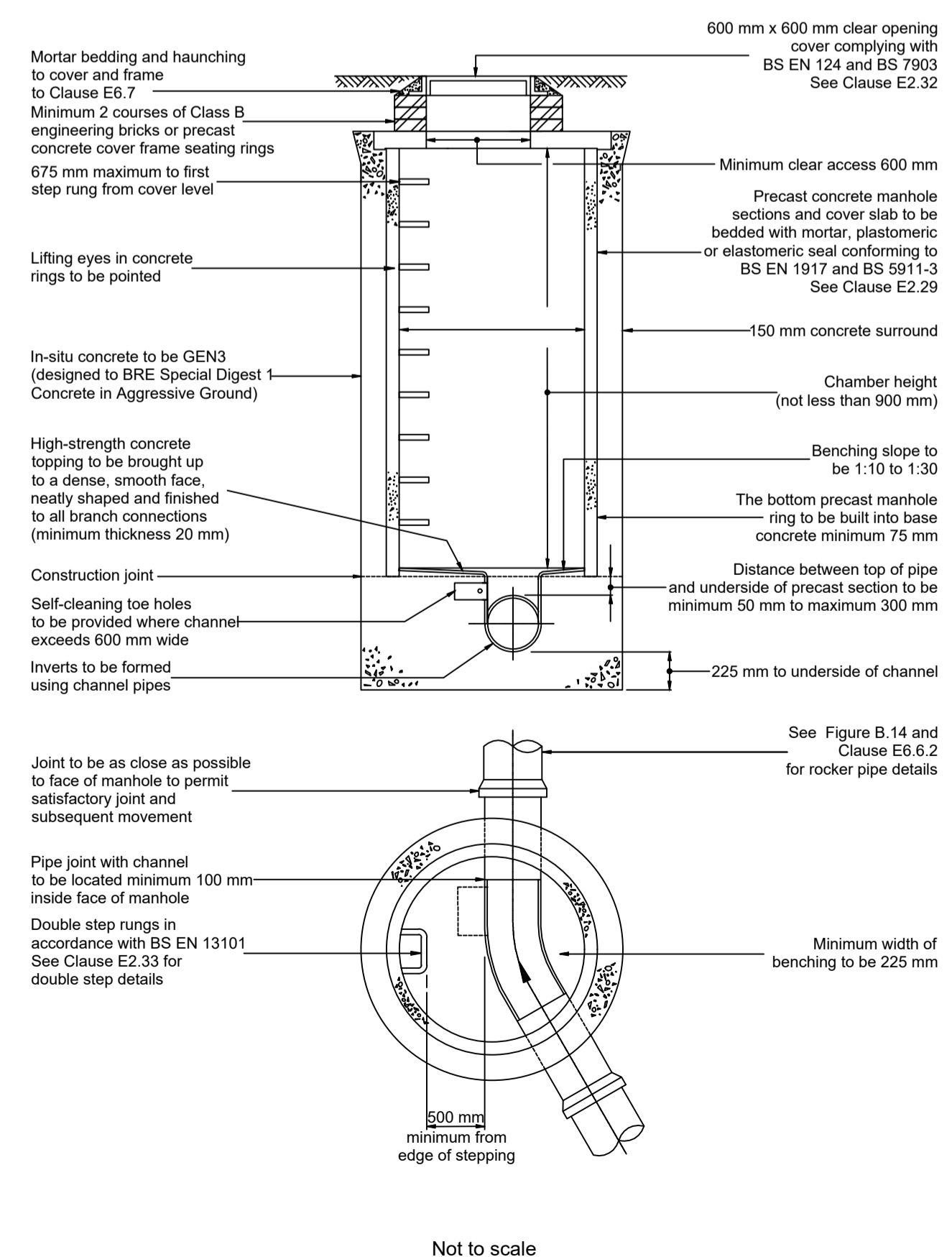
FIGURE B.16
TYPICAL INSPECTION CHAMBER DETAIL - TYPE 3 (Flexible material detail)
Maximum depth from cover level to soffit of pipe in areas subject to vehicle loading 3 m, non-entry



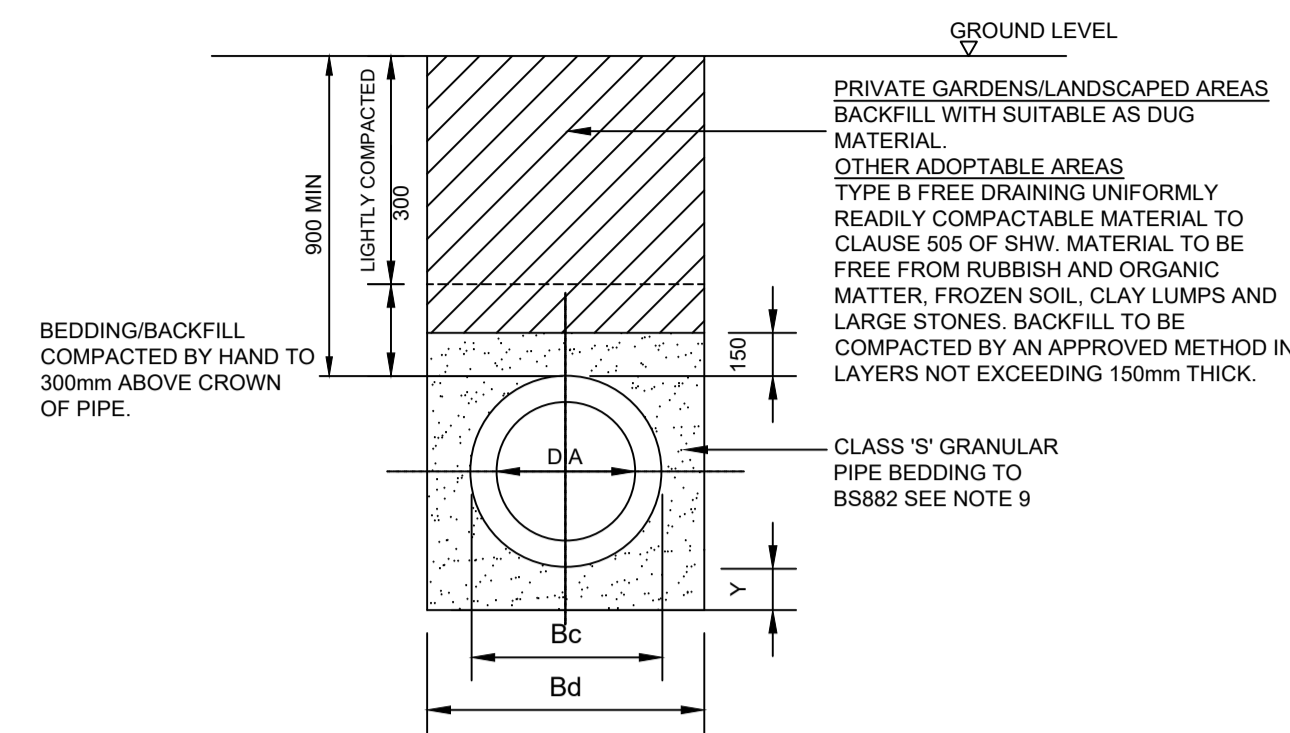
Note: Where the access chamber is in the highway the Highway Authority can have specific requirements

Not to scale

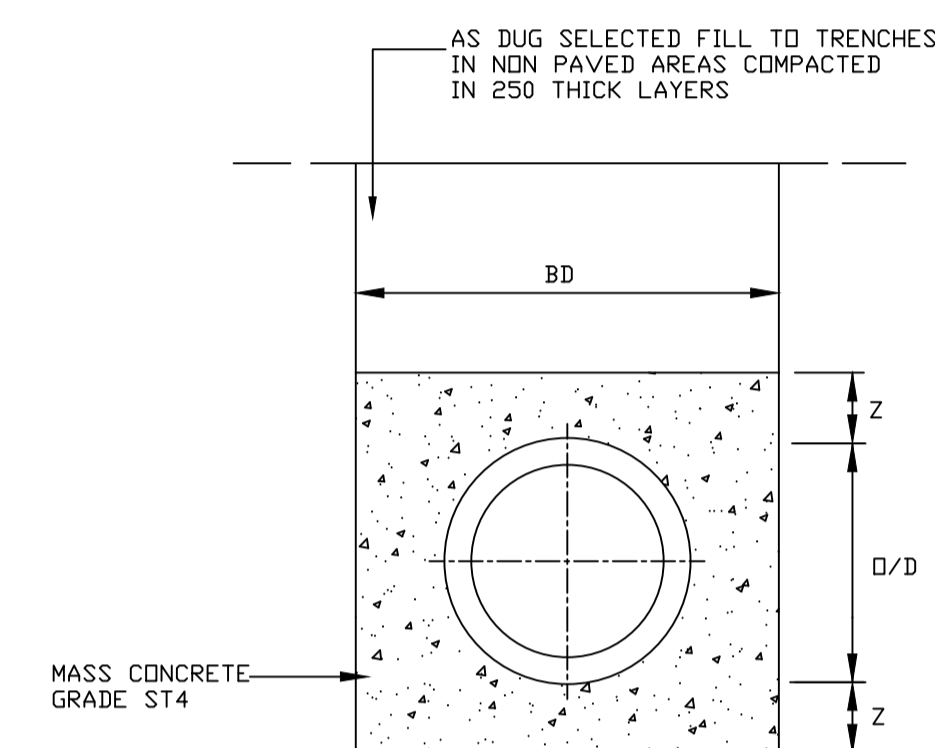
FIGURE B.2.5
TYPICAL MANHOLE DETAIL - TYPE B
Maximum depth from cover level to soffit of pipe 3.0 m



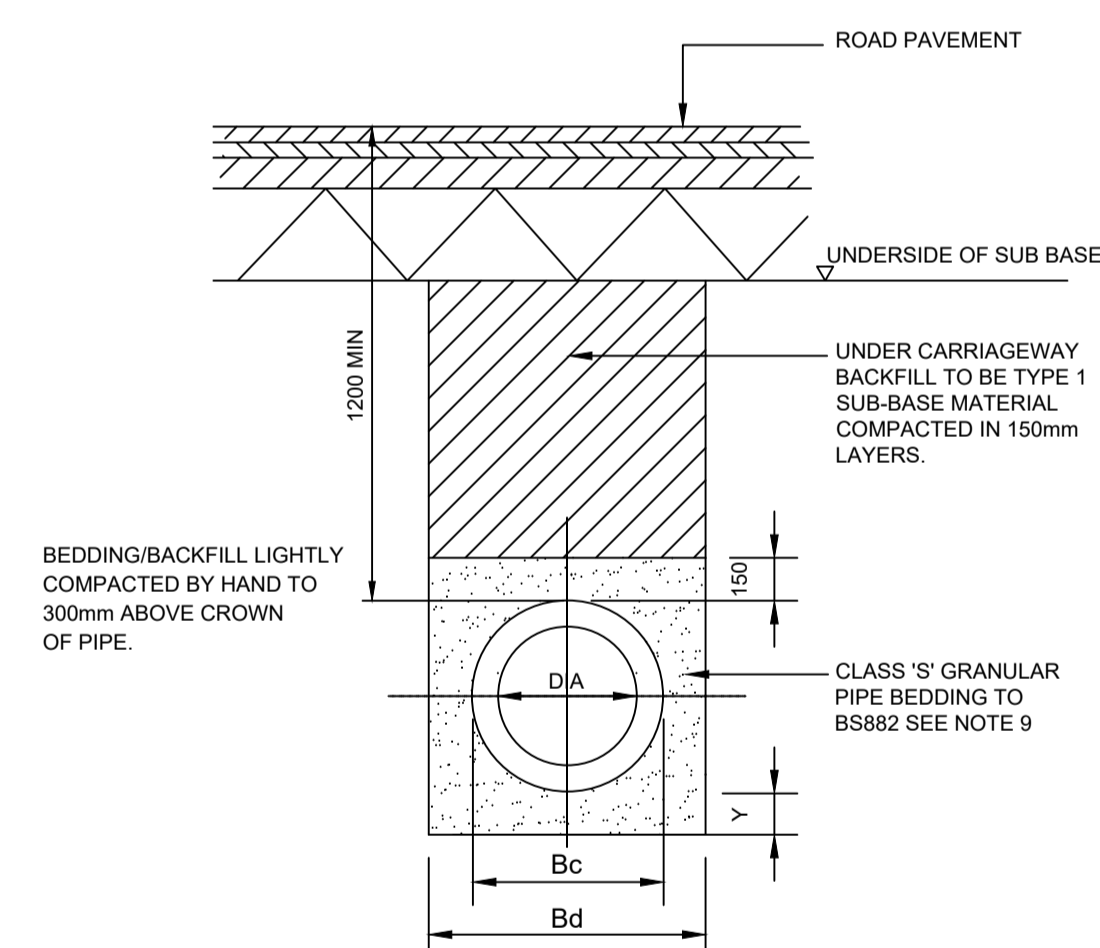
Not to scale



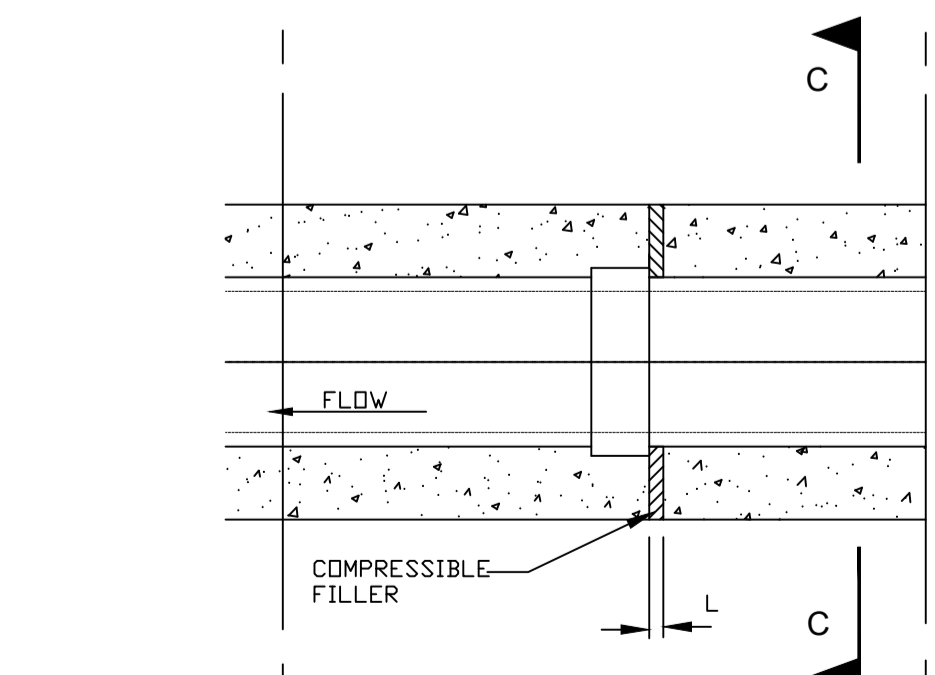
TYPICAL CROSS SECTION THROUGH DRAINAGE TRENCH IN OTHER AREAS
SCALE 1:20



TYPE Z SECTION C - C
SCALE 1:25



TYPICAL CROSS SECTION THROUGH DRAINAGE TRENCH UNDER CARRIAGEWAY/ADOPTABLE AREAS
SCALE 1:20



TYPE Z - FLEXIBLE JOINT DETAIL
CONCRETE BED AND SURROUND
N.T.S

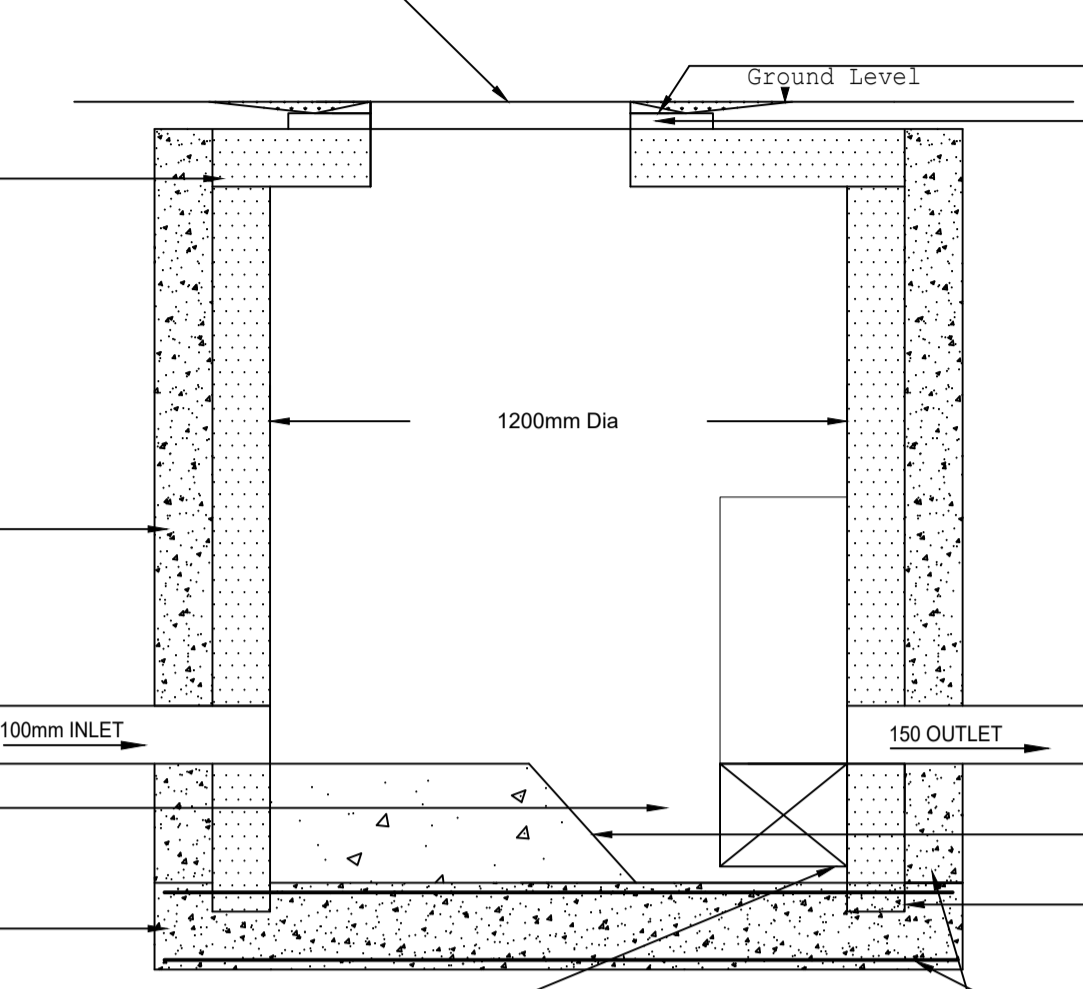
CLASS D400 DUCTILE IRON MANHOLE COVER AND FRAME TO BS EN124 : 1994 WITH CLEAR OPENING COVER AND FRAME TO BE BEDDED ON MORTAR. SUITABLY SIZED TO REMOVE HYDRO-BRAKE

OPENING COVER SLAB BEDDED ON PC CHAMBER SECTION WITH MORTAR, PROPRIETARY BITUMEN OR RESIN MASTIC SEALANT

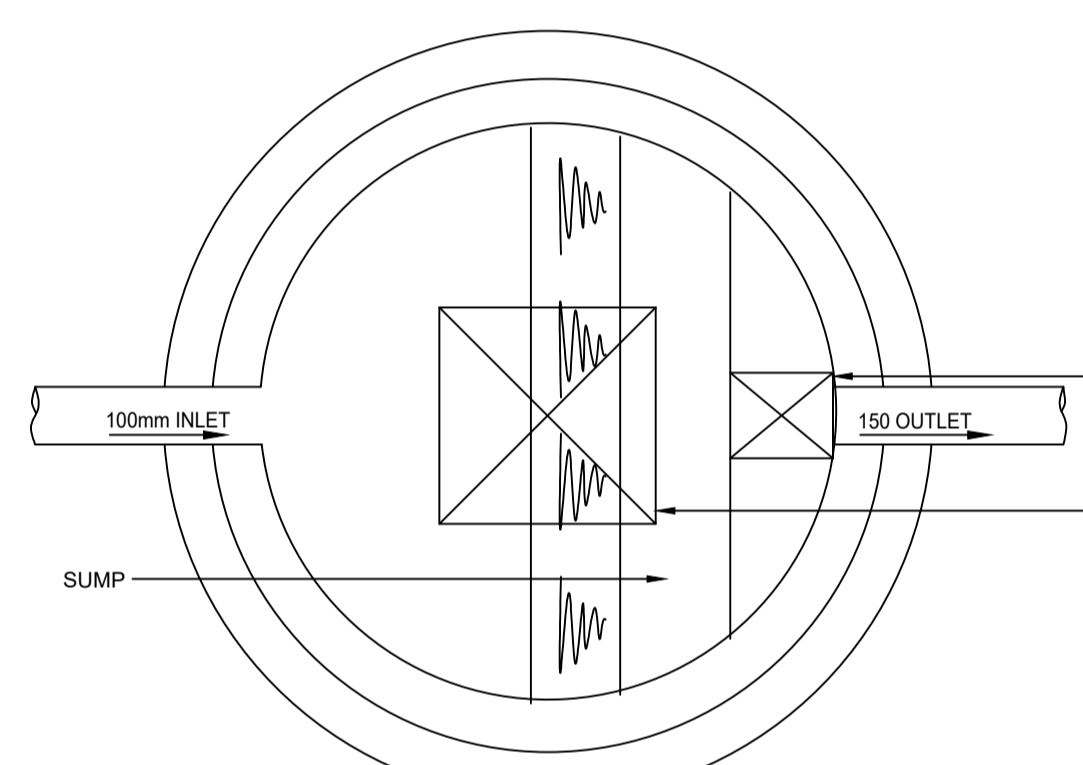
150 IN SITU CONCRETE SURROUND MIX GEN 3 WITH SULPHATE RESISTANT CEMENT.

225 IN SITU CONCRETE SURROUND MIX GEN 3 WITH SULPHATE RESISTANT CEMENT.

HYDRO-BRAKE FLOW CONTROL UNIT. MAXIMUM PERMITTED DISCHARGE 2 L/S FROM 0.9m HEAD. FIXED TO MANHOLE WALL. SIZE TO BE CHECKED PRIOR TO ORDERING TO CONFIRM SPACE OF CHOSEN HYDRO-BRAKE FITS.



SECTION A-A
SCALE 1:20



HYDRO-BRAKE FLOW CONTROL UNIT MAXIMUM PERMITTED DISCHARGE 3 L/S FROM 0.9m HEAD. FIXED TO THE MANHOLE WALL.

CLASS D400 DUCTILE IRON MANHOLE COVER AND FRAME TO BS EN124 : 1994 WITH 600x600 CLEAR OPENING COVER AND FRAME TO BE BEDDED ON MORTAR.

PIPE DIA/TYPE	TRENCH WIDTH		APPROX. EXT PIPE DIA	BEDDING THICKNESS
	Bd	Y		
150	600	190	100	100
225	700	280	100	100
300	850	380	100	100
450	1150	575	100	100
525	1200	670	125	125
600	1350	770	130	130
900	1900	1100	185	185

TABLE APPLIES FOR TRENCHES UNDER CARRIAGEWAY AND IN LANDSCAPED AREAS

REV: DESCRIPTION: BY: DATE:
STATUS: **PLANNING ISSUE**



Tel:01902 475653
17 Goldthorn Avenue, Penn
Wolverhampton, WV4 5AA
www.onn-point.co.uk

CLIENT:

SITE: **LAND ADJ 78 WELLS ROAD ABBEYDALE, GLOUCESTER**

TITLE: **DRAINAGE CONSTRUCTION DETAILS - PRIVATE**

SCALE: AT A1: 1:200 DATE: 19.08.22 DRAWN: RJS CHECKED:
PROJECT NO: 22-OP-1226 DRAWING NO: A1/002 REVISION: