



SIGNATURE SENIOR LIFESTYLE  
DEVELOPMENT LTD  
199-203 HENLEY ROAD  
CAVERSHAM, READING  
RG4 6LJ

FOUL AND SURFACE WATER  
DRAINAGE SCHEME REPORT

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Project No: SIG/29  
Date: March 2019  
Version: 7.0

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| <b>Revision</b> | <b>Originator</b> | <b>Comments</b>                           | <b>Date issued</b> |
|-----------------|-------------------|-------------------------------------------|--------------------|
| 1.0             | Colin Pollard     | First issue                               | 14/03/2019         |
| 2.0             | Colin Pollard     | Text and Appendix B updated               | 3/4/2019           |
| 3.0             | Colin Pollard     | Appendix B updated                        | 10/4/2019          |
| 4.0             | Alan Pipe         | Drainage layout and flow to Brook amended | 07/10/2019         |
| 5.0             | Colin Pollard     | Section 5 amended                         | 08/10/2019         |
| 6.0             | Colin Pollard     | Appendix D amended                        | 08/10/2019         |
| 7.0             | Colin Pollard     | Appendix D amended                        | 08/10/2019         |

## **1.0 INTRODUCTION**

The site is currently occupied by 3 houses, 199, 201 and 203 Henley Road and the rear gardens of 205 and 207. A new facility for Signature Senior Living is to be built. The proposed development will provide 86 care suites arranged around communal facilities, ancillary accommodation and staff facilities.

This report defines the foul and surface water drainage scheme for the site.

## **2.0 THAMES WATER ASSET SEARCH**

A copy of the Thames Water Asset Search in the vicinity of the site can be found in Appendix A. This shows the public sewers for both the foul and surface water drainage in a search area close to the site.

The Thames Water Asset Search shows that there are two foul sewers crossing the site, one across the middle of the site and one near the bottom of the site close to Berry Brook. A third foul sewer exists in Henley Road. There are no surface water sewers adjacent to the site.

## **3.0 SITE TOPOGRAPHY**

The site slopes down from the north, Henley Road, to the south boundary, Berry Brook. The level varies from 47.5m AOD at Henley Road to 36.4m AOD along Berry Brook.

## **4.0 SITE GEOLOGY**

An earlier investigation by Jomas Associates Ltd revealed the top of the site is underlain by chalk and the bottom of the site by head deposits comprising sandy clays overlying chalk. A copy of the report is being submitted with the planning application.

Considerable variation in geology across the site was recorded with the soils at the bottom of the site having low permeability. The depth of chalk varied from 0.4m in the north to in excess of 7 meters in the south. The bottom of the site is in the flood plain of the River Thames.

## **5.0 SURFACE WATER DRAINAGE**

The Asset Search revealed that there no public surface water sewers adjacent to the site.

There is only minimal existing site drainage from three houses intended for demolition. These appear to drain into the ground and Berry Brook.

A Flood Risk Assessment has been prepared by Edenvale Young Associates Ltd and a copy is enclosed in Appendix B. A drainage strategy has been developed based upon Edenvale Young's report and in anticipation that soakaways will be effective in the chalk. The suitability of

soakaways is being verified by site tests. If soakaway rates are not satisfactory then surface water will be drained into Berry Brook.

The maximum flow to the Berry Brook, assuming soakaways are ineffective, will be 50 litres per second. This is based on a rainfall rate of 0.014 litre per second per square metre, as Building Regulations Approved Document H clause H3 – 2.4, on 3410 square metres. The building is 2000m<sup>2</sup>, the adopted roadway 900m<sup>2</sup> and the paving around the building 510m<sup>2</sup>. Rainfall on the adopted site access road will be drained to a separate soakaway.

Rainfall on the soft landscaped areas and small terraces will be drained into the ground directly adjacent.

However, attenuation of the flow, with on-site storage, will be provided to and agreed with the Environment Agency.

The drainage concept is shown on drawing DR-00-01, a copy of which is in Appendix D.

## **6.0 FOUL DRAINAGE**

From the Thames Water Asset Search there are two public foul water sewers running across the site and one in Henley Road itself.

The sewer running across the middle of the site will be diverted as shown on drawings S1, S2 and S3, a copy of which is in Appendix C. Manhole 9103 will be abandoned and the pipe rerouted around the new building. Approval in principle has been received from Thames Water by letter dated 29<sup>th</sup> November 2018. A copy of the approval letter is in Appendix C.

The new development will be drained into the diverted sewer. No new connection will be made to the sewer at the bottom of the site.

It is currently envisaged that all drainage on site will be by gravity and no pump chamber will be required.

A peak discharge rate of 2.48 litres per second including the drainage from the laundry is expected from the development for the foul water. Approval from Thames Water for this discharge will be sought.

The drainage concept is shown on drawing DR-00-01, a copy of which is in Appendix D.

## **7.0 SUMMARY**

The public sewer network in the vicinity of the site is to be used to discharge the foul water flows from the site. The surface water from the buildings, paving and adopted road will be through soakaways provided the infiltration test result permits it. If the geology proves to be impermeable discharge to Berry Brook is proposed. Thames Water have not yet approved the following discharge rates.

Foul Water = 2.48L/s including discharge from the laundry

Surface Water = 0.00l/s if soakaways proven. Overflow to Brook will be a maximum of 50 l/sec which can be further restricted by Hydro-brake to an agreed level with the Environment Agency

An existing foul sewer crossing the site requires diverting. Thames Water has approved this diversion.

## **APPENDIX A**

### **THAMES WATER ASSET SEARCH**

# Residential

The Law Society's CON29DW  
Drainage & Water Enquiry



Move Reports UK Ltd  
16108 Cannock

|                         |                                               |
|-------------------------|-----------------------------------------------|
| Search address supplied | 203, Henley Road, Caversham, Reading, RG4 6LJ |
| Your reference          | 82192 - RNJ/BEA114/001                        |
| Our reference           | DWS/DWS Standard/2016_3242010                 |
| Received date           | 28 January 2016                               |
| Search date             | 29 January 2016                               |

## Important information

As of the 1 October 2013, the CON29DW has been updated with new question numbering and a helpful summary sheet showing questions and high level results. To find out more, please email [searches@thameswater.co.uk](mailto:searches@thameswater.co.uk).



Thames Water Utilities Ltd  
Property Searches, PO Box 3189, Slough SL1 4WW  
DX 151280 Slough 13



[searches@thameswater.co.uk](mailto:searches@thameswater.co.uk)  
[www.thameswater-propertysearches.co.uk](http://www.thameswater-propertysearches.co.uk)



0845 070 9148

**CON29DW**  
DRAINAGE AND WATER ENQUIRY



## CON29DW Drainage & Water Enquiry

| Question                                                                                                                                                                                                  | Summary Answer   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| <b>Maps</b>                                                                                                                                                                                               |                  |
| 1.1 Where relevant, please include a copy of an extract from the public sewer map.                                                                                                                        | Map Provided     |
| 1.2 Where relevant, please include a copy of an extract from the map of waterworks.                                                                                                                       | Map Provided     |
| <b>Drainage</b>                                                                                                                                                                                           |                  |
| 2.1 Does foul water from the property drain to a public sewer?                                                                                                                                            | Connected        |
| 2.2 Does surface water from the property drain to a public sewer?                                                                                                                                         | Connected        |
| 2.3 Is a surface water drainage charge payable?                                                                                                                                                           | Charge Payable   |
| 2.4 Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundaries of the property?                                                                            | No               |
| 2.5 Does the public sewer map indicate any public sewer within 30.48 metres (100 feet) of any buildings within the property?                                                                              | No               |
| 2.6 Are any sewers or lateral drains serving, or which are proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?                         | No               |
| 2.7 Has a sewerage undertaker approved or been consulted about any plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain?              | No               |
| 2.8 Is any building which is or forms part of the property, at risk of internal flooding due to overloaded public sewers?                                                                                 | Not At Risk      |
| 2.9 Please state the distance from the property to the nearest boundary of the nearest sewage treatment works.                                                                                            | 4.577 Kilometres |
| <b>Water</b>                                                                                                                                                                                              |                  |
| 3.1 Is the property connected to mains water supply?                                                                                                                                                      | Connected        |
| 3.2 Are there any water mains, resource mains or discharge pipes within the boundaries of the property?                                                                                                   | No               |
| 3.3 Is any water main or service pipe serving or which is proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?                          | No               |
| 3.4 Is the property at risk of receiving low water pressure or flow?                                                                                                                                      | No               |
| 3.5 Please include details of a water quality analysis made by the water undertaker for the water supply zone in respect of the most recent calendar year.                                                | Passed           |
| 3.6 Please include details of any departures authorised by the Secretary of State or National Assembly for Wales under Part 6 of the 2000 Regulations from the provisions of Part 3 of those Regulations. | Passed           |
| 3.7 Please include details of the location of any water meter serving the property.                                                                                                                       | No Meter         |
| <b>Charging</b>                                                                                                                                                                                           |                  |
| 4.1 Who are the sewerage and water undertakers for the area?                                                                                                                                              | See Details      |
| 4.2 Who bills the property for sewerage services?                                                                                                                                                         | Thames Water     |
| 4.3 Who bills the property for water services?                                                                                                                                                            | Thames Water     |
| 4.4 What is the current basis for charging for sewerage and/or water services at the property?                                                                                                            | See Details      |
| 4.5 Will the basis for charging for sewerage and water services at the property change as a consequence of a change of occupation?                                                                        | No               |

## CON29DW Drainage & Water Enquiry

**Search address supplied:** 203, Henley Road, Caversham, Reading, RG4 6LJ

Any new owner or occupier will need to contact Thames Water on 0800 316 9800 or log onto our website [www.thameswater.co.uk](http://www.thameswater.co.uk) and complete our online form to change the water and drainage services bills to their name.

The following records were searched in compiling this report: - the Map of Public Sewers, the Map of Waterworks, Water and Sewer billing records, Adoption of Public Sewer records, Building Over Public Sewer records, the Register of Properties subject to Internal Foul Flooding, the Register of Properties subject to Poor Water Pressure and the Drinking Water Register. Thames Water Utilities Ltd (TWUL), Clearwater Court, Vastern Road, Reading RG1 8DB, holds all of these.

TWUL, trading as Property Searches, are responsible in respect of the following:-

- (i) any negligent or incorrect entry in the records searched;
- (ii) any negligent or incorrect interpretation of the records searched;
- (iii) and any negligent or incorrect recording of that interpretation in the search report
- (iv) compensation payments

Please refer to the attached [Terms & Conditions](#).

### Interpretation of CON29DW Drainage and Water Search

Appendix 1 contains definitions of terms and expressions used in this report.

### Enquiries and Response

The records were searched by Renee Truter of Thames Water Utilities who has no, nor is likely to have, any personal or business relationship with any person involved in the sale of the property.

This search report was prepared by Renee Truter of Thames Water Utilities who has no, nor is likely to have, any personal or business relationship with any person involved in the sale of the property.

For your guidance:

- Thames Water Property Searches Complaints Procedure:
  - o Thames Water Property Searches offers a robust complaints procedure. Complaints can be made by telephone, in writing, by email ([searches@thameswater.co.uk](mailto:searches@thameswater.co.uk)) or through our website ([www.thameswater-propertysearches.co.uk](http://www.thameswater-propertysearches.co.uk))

As a minimum standard Thames Water Property Searches will:

- o endeavour to resolve any contact or complaint at the time of receipt. If this isn't possible, we will advise of timescales;
- o investigate and research the matter in detail to identify the issue raised (in some cases third party consultation will be required);
- o provide a response to the customer within 10 working days of receipt of the complaint;
- o provide compensation, if no response or acknowledgment that we are investigating the case is given within 10 working days of receipt of the complaint;
- o keep you informed of the progress and, depending on the scale of investigation required, update with new timescales as necessary;
- o provide an amended search, free of charge, if required;
- o provide a refund if we find your complaint to be justified; take the necessary action within our power to put things right.

If you want us to liaise with a third party on your behalf, just let us know.

If you are still not satisfied with the outcome provided we will refer the matter to a Senior Manager for resolution who will respond again within 5 working days.

If you remain dissatisfied with our final response you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). Please refer to the final page of the search for further details.

### Maps

#### 1.1 – Where relevant, please include a copy of an extract from the public sewer map.

A copy of an extract of the public sewer map is included, showing the public sewers, disposal mains and lateral drains in the vicinity of the property.

For your guidance:

- The Water Industry Act 1991 defines Public Sewers as those which Thames Water have responsibility for. Other assets and rivers, watercourses, ponds, culverts or highway drains may be shown for information purposes only.
- The company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.
- Assets other than public sewers may be shown on the copy extract, for information.

#### 1.2 – Where relevant, please include a copy of an extract from the map of waterworks.

A copy of an extract of the map of waterworks is included, showing water mains, resource mains or discharge pipes in the vicinity of the property.

For your guidance:

- The "water mains" in this context are those, which are vested in and maintainable by the water company under statute.
- Assets other than public water mains may be shown on the plan, for information only.
- Water companies are not responsible for private supply pipes connecting the property to the public water main and do not hold details of these. These may pass through land outside of the control of the seller, or may be shared with adjacent properties. The buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

### Drainage

#### 2.1 – Does foul water from the property drain to a public sewer?

Records indicate that foul water from the property drains to a public sewer.

For your guidance:

- Water companies are not responsible for any private drains that connect the property to the public sewerage system and do not hold details of these. The property owner will normally have sole responsibility for private drains serving the property. These may pass through land outside the control of the seller and the buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.
- If foul water does not drain to the public sewerage system, the property may have private facilities in the form of a cesspit, septic tank or other type of treatment plant.
- An extract from the public sewer map is enclosed. This will show known public sewers in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system.

#### 2.2 – Does surface water from the property drain to a public sewer?

Records indicate that surface water from the property drains to a public sewer.

For your guidance:

- Sewerage Undertakers are not responsible for any private drains that connect the property to the public sewerage system, and do not hold details of these.
- The property owner will normally have sole responsibility for private drains serving the property. These private drains may pass through land outside of the control of the seller and the buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.
- In some cases, 'Sewerage Undertakers' records do not distinguish between foul and surface water connections to the public sewerage system.
- At the time of privatisation in 1989, Sewerage Undertakers were sold with poorly-kept records of sewerage infrastructure. The records did not always show which properties were connected for surface water drainage purposes. Accordingly, billing records have been used to provide an answer for this element of the drainage and water search.
- Due to the potential inadequacy of 'Sewerage Undertakers' infrastructure records with respect to surface water drainage, it is the customer's responsibility to inform the Sewerage Undertaker that they do not receive the surface water drainage service. If on inspection, the buyer finds that surface water from the property does not drain to a public sewer, then the property may be eligible for a rebate of the surface water drainage charge. For further information, please contact Thames Water on Tel: 0800 316 9800, or refer to the website at [www.thameswater.co.uk](http://www.thameswater.co.uk).
- If surface water from the property does not drain to the public sewerage system, the property may have private facilities in the form of a soakaway or private connection to a watercourse.
- An extract from the public sewer map is enclosed. This will show known public sewers in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system.

### 2.3 – Is a surface water drainage charge payable?

Records confirm that a surface water drainage charge is payable for the property and the charge is £25.00 for the current financial year.

For your guidance:

- If surface water from the property drains to a public sewer, then a surface water drainage charge is payable.
- Where a surface water drainage charge is currently included in the property's water and sewerage bill but, on inspection, the buyer finds that surface water from the property does not drain to a public sewer, then the property may be eligible for a rebate of the surface water drainage charge. For further information, please contact Thames Water on Tel: 0800 316 9800 or refer to the website [www.thameswater.co.uk](http://www.thameswater.co.uk).

### 2.4 – Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundaries of the property?

The public sewer map indicates that there are no public sewers, disposal mains or lateral drains within the boundaries of the property. However, from the 1st October 2011 there may be lateral drains and/or public sewers which are not recorded on the public sewer map but which may prevent or restrict development of the property.

For your guidance:

- Thames Water has a statutory right of access to carry out work on its assets. Employees of Thames Water or its contractors may, therefore, need to enter the property to carry out work.
- The approximate boundary of the property has been determined by reference to the Ordnance Survey Record or the map supplied.
- The presence of a public sewer running within the boundary of the property may restrict further development. The company has a statutory right of access to carry out work on its assets, subject to notice. This may result in employees of the company, or its contractors, needing to enter the property to carry out work.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

### **2.5 – Does the public sewer map indicate any public sewer within 30.48 metres (100 feet) of any buildings within the property?**

The public sewer map indicates that there are no public sewers within 30.48 metres (100 feet) of any buildings within the property.

However, from the 1st October 2011 many private sewers were transferred into public ownership and may not be recorded on the public sewer map and it is our professional opinion that if the property is connected to a foul sewer it is likely that there will be a public sewer within 30.48 metres (100 feet) of any buildings within the property.

For your guidance:

- The presence of a public sewer within 30.48 metres (100 feet) of the building(s) within the property can result in the local authority requiring a property to be connected to the public sewer.
- The measurement is estimated from the Ordnance Survey record, between the building(s) within the boundary of the property and the nearest public sewer.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

### **2.6 – Are any sewers or lateral drains serving or which are proposed to serve the property the subject of an existing adoption agreement or an application for such an agreement?**

Records confirm that sewers serving the development, of which the property forms part are not the subject of an existing adoption agreement or an application for such an agreement.

For your guidance:

- This enquiry is of interest to purchasers of new homes who will want to know whether or not the property will be linked to a public sewer.
- Where the property is part of a very recent or ongoing development and the sewers are not the subject of an adoption application, buyers should consult with the developer to ascertain the extent of private drains and sewers for which they will hold maintenance and renewal liabilities.
- Final adoption is subject to the developer complying with the terms of the adoption agreement under Section 104 of the Water Industry Act 1991 and meeting the requirements of 'Sewers for Adoption' 6<sup>th</sup> Edition.

### **2.7 – Has a sewerage undertaker approved or been consulted about any plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain?**

There are no records in relation to any approval or consultation about plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain. However, the sewerage undertaker might not be aware of a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain.

For your guidance:

- From the 1st October 2011 most private sewers, disposal mains and lateral drains were transferred into public ownership and the sewerage undertaker may not have been approved or consulted about any plans to erect a building or extension on the property over or in the vicinity of these.
- Buildings or extensions erected over a sewer in contravention of building controls may have to be removed or altered.

### 2.8 – Is any building which is or forms part of the property at risk of internal flooding due to overloaded public sewers?

The property is not recorded as being at risk of internal flooding due to overloaded public sewers.

From the 1st October 2011 most private sewers, disposal mains and lateral drains were transferred into public ownership. It is therefore possible that a property may be at risk of internal flooding due to an overloaded public sewer which the sewerage undertaker is not aware of. For further information it is recommended that enquiries are made of the vendor.

For your guidance:

- A sewer is “overloaded” when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.
- “Internal flooding” from public sewers is defined as flooding, which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
- “At Risk” properties are those that the water company is required to include in the Regulatory Register that is presented annually to the Director General of Water Services. These are defined as properties that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company’s reporting procedure.
- Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk Register.
- Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company.
- Public Sewers are defined as those for which the Company holds statutory responsibility under the Water Industry Act 1991.
- It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company. This report excludes flooding from private sewers and drains and the Company makes no comment upon this matter.
- For further information please contact Thames Water on Tel: 0800 316 9800 or website [www.thameswater.co.uk](http://www.thameswater.co.uk)

**2.9 – Please state the distance from the property to the nearest boundary of the nearest sewage treatment works.**

The nearest sewage treatment works is SONNING COMMON STW which is 4.577 kilometres to the north of the property.

For your guidance:

- The nearest sewage treatment works will not always be the sewage treatment works serving the catchment within which the property is situated.
- The sewerage undertaker's records were inspected to determine the nearest sewage treatment works.
- It should be noted that there may be a private sewage treatment works closer than the one detailed above that has not been identified.
- As a responsible utility operator, Thames Water Utilities seeks to manage the impact of odour from operational sewage works on the surrounding area. This is done in accordance with the Code of Practice on Odour Nuisance from Sewage Treatment Works issued via the Department of Environment, Food and Rural Affairs (DEFRA). This Code recognises that odour from sewage treatment works can have a detrimental impact on the quality of the local environment for those living close to works. However DEFRA also recognises that sewage treatment works provide important services to communities and are essential for maintaining standards in water quality and protecting aquatic based environments. For more information visit [www.thameswater.co.uk](http://www.thameswater.co.uk)

### Water

#### 3.1 – Is the property connected to mains water supply?

Records indicate that the property is connected to mains water supply.

For your guidance:

- The Company does not keep details of private supplies. The situation should be checked with the current owner of the property.

#### 3.2 – Are there any water mains, resource mains or discharge pipes within the boundaries of the property?

The map of waterworks does not indicate any water mains, resource mains or discharge pipes within the boundaries of the property.

For your guidance:

- The boundary of the property has been determined by reference to the plan supplied. Where a plan was not supplied the Ordnance Survey Record was used.
- The presence of a public water main within the boundary of the property may restrict further development within it. Water companies have a statutory right of access to carry out work on their assets, subject to notice. This may result in employees of the company, or its contractors, needing to enter the property to carry out work.

#### 3.3 – Is any water main or service pipe serving or which is proposed to serve the property the subject of an existing adoption agreement or an application for such an agreement?

Records confirm that water mains or service pipes serving the property are not the subject of an existing adoption agreement or an application for such an agreement.

For your guidance:

- This enquiry is of interest to purchasers of new homes who will want to know whether or not the property will be linked to the mains water supply.

### 3.4 – Is the property at risk of receiving low water pressure or flow?

Records confirm that the property is not recorded on a register kept by the water undertaker as being at risk of receiving low water pressure or flow.

For your guidance:

- The boundary of the property has been determined by reference to the plan supplied. Where a plan was not supplied the Ordnance Survey Record was used.
- “Low water pressure” means water pressure below the regulatory reference level, which is the minimum pressure when demand on the system is not abnormal.
- Water Companies are required to include in the Regulatory Register that is presented annually to the Director General of Water Services, properties receiving pressure below the reference level, provided that allowable exclusions do not apply (i.e. events which can cause pressure to temporarily fall below the reference level)
- The reference level of service is a flow of 9 litres/minute at a pressure of 10metres / head on the customer's side of the outside stop valve (osv). The reference level of service must be applied on the customer's side of a meter or any other company fittings that are on the customer's side of the main stop tap. The reference level applies to a single property. Where more than one property is served by a common service pipe, the flow assumed in the reference level must be appropriately increased to take account of the total number of properties served. For two properties, a flow of 18 litres/minute at a pressure of 10metres/head on the customers' side of the osv is appropriate. For three or more properties the appropriate flow should be calculated from the standard loadings provided in BS6700 or the Institute of Plumbing handbook.
- **Allowable exclusions** The Company is required to include in the Regulatory Register properties receiving pressure below the reference level, provided that allowable exclusions listed below do not apply.
- **Abnormal demand:** This exclusion is intended to cover abnormal peaks in demand and not the daily, weekly or monthly peaks in demand, which are normally expected. Companies should exclude from the reported DG2 figures properties which are affected by low pressure only on those days with the highest peak demands. During the report year companies may exclude, for each property, up to five days of low pressure caused by peak demand.
- **Planned maintenance:** Companies should not report under DG2 (Low Pressure Register) low pressures caused by planned maintenance. It is not intended that companies identify the number of properties affected in each instance. However, companies must maintain sufficiently accurate records to verify that low-pressure incidents that are excluded from DG2 because of planned maintenance are actually caused by maintenance.
- **One-off incidents:** This exclusion covers a number of causes of low pressure; mains bursts; failures of company equipment (such as pressure reducing valves or booster pumps); firefighting; and action by a third party. However, if problems of this type affect a property frequently, they cannot be classed as one-off events and further investigation will be required before they can be excluded
- **Low-pressure incidents of short duration:** Properties affected by low pressures, which only occur for a short period, and for which there is evidence that incidents of a longer duration would not occur during the course of the year, may be excluded from the reported DG2 figures.
- Please contact your water company mentioned in Question 4.1 if you require further information water pressure”

**3.5 – Please include details of a water quality analysis made by the water undertaker for the water supply zone in respect of the most recent calendar year.**

The analysis confirmed that all tests met the standards prescribed by the 2000 Regulations or the 2001 Regulations.

For your guidance:

- Thames Water investigates all infringements of drinking water quality standards and takes appropriate corrective actions to resolve any problems. If there were any risk to public health from the quality of drinking water supplied, the Company would have informed customers immediately and advised not to drink the water until the issue had been resolved.
- Water companies have a duty to provide wholesome water that meets the standards of the Water Supply (Water Quality) Regulations 2000. However, the householder is responsible for any deterioration in water quality that is a result of the domestic distribution system (the supply pipe and the plumbing within the property) that results in the standards not being met.
- In England and Wales these regulations implement the requirements of the European Drinking Directive 98/83/EC. The 2000 regulations impose standards for a range of parameters, which are either health based to ensure the water is safe to drink or to ensure the water is aesthetically acceptable. They also require that drinking water should not contain any element, organism or substance (whether or not a parameter) at a concentration or value, which would be detrimental to public health.
- Water quality is normally tested at the tap used for domestic consumption, normally the kitchen. However, the householder is responsible for any of deterioration in water quality that is a result of the domestic distribution system (the supply pipe and the plumbing within the property) that results in the standards not being met.
- If there are concerns that lead pipes within the property may be causing high levels of lead in your drinking water please contact your water company mentioned in Question 4.1 for further advice.
- The Water Company undertakes a monitoring programme to establish water quality that includes random sampling from domestic properties. It will notify the consumers of any failures to meet the water quality standards that are due to the condition or maintenance of the domestic distribution system.
- The data collected by the company is subject to external review by the Drinking Water Inspectorate (DWI) and by local and health authorities. In addition to reviewing quality data the DWI also carry out audits during which any area of the company's operation can be examined. Further information may be found at [www.dwi.gov.uk](http://www.dwi.gov.uk)
- If you require further advice regarding these failures, please contact your Water Company mentioned in Question 4.1.

**3.6 – Please include details of any departures, authorised by the Secretary of State or National Assembly for Wales under Part 6 of the 2000 Regulations from the provisions of Part 3 of those Regulations.**

There are no such authorised departures for the water supply zone.

For your guidance:

- Authorised departures are not permitted if the extent of the departure from the standard is likely to constitute a potential danger to human health.
- Please contact your water company mentioned in Question 4.1 if you require further information.

### 3.7 – Please include details of the location of any water meter serving the property.

Records indicate that the property is not served by a water meter.

For your guidance:

- Where a meter does not serve the property and the customer wishes to consider this method of charging, they should contact the water undertakers mentioned in Question 4.1.

## Charging

### 4.1 – Who are the sewerage and water undertakers for the area?

Thames Water Utilities Limited, Clearwater Court, Reading, RG1 8DB is the sewerage undertaker for the area and Thames Water Utilities Limited, Clearwater Court, Reading, RG1 8DB is the water undertaker for the area.

### 4.2 – Who bills the property for sewerage services?

The property is billed for sewerage services by:

Thames Water Utilities Limited  
Clearwater Court  
Vastern Road  
Reading  
Berkshire  
RG1 8DB

Tel: 0845 9200 888  
Website: [www.thameswater.co.uk](http://www.thameswater.co.uk).

### 4.3 – Who bills the property for water services?

The property is billed for water services by:

Thames Water Utilities Limited  
Clearwater Court  
Vastern Road  
Reading  
Berkshire  
RG1 8DB

Tel: 0845 9200 888  
Website: [www.thameswater.co.uk](http://www.thameswater.co.uk).

#### **4.4 – What is the current basis for charging for sewerage and/or water services at the property?**

The charges are based on the rateable value of the property which has a rateable value of £266.00, and the charge for the current financial year of £492.84.

For your guidance:

- Water and sewerage companies' full charges are set out in their charges schemes which are available from the company free of charge upon request.
- The Water Industry Act 1991 Section 150, The Water Resale Order 2001 provides protection for people who buy their water or sewerage services from a person or company instead of directly from a water or sewerage company. Details are available from the Office of Water Services (OFWAT) website is [www.ofwat.gov.uk](http://www.ofwat.gov.uk).
- Where charges are given these are based on the data available at the time of the report.
- The Company may install a meter at the premises where a buyer makes a change of use of the property or where the buyer uses water for:
  - o Watering the garden other than by hand (this includes the use of sprinklers).
  - o Automatically replenishing a pond or swimming pool with a capacity greater than 10,000 litres.
  - o A bath with a capacity in excess of 230 litres.
  - o A reverse osmosis unit.

#### **4.5 – Will the basis for charging for sewerage and water services at the property change as a consequence of a change of occupation?**

There will be no change in the current charging arrangements as a consequence of a change of occupation.

For your guidance:

- Water and sewerage companies' full charges are set out in their charges schemes which are available from the company free of charge upon request.
- The Water Industry Act 1991 Section 150, The Water Resale Order 2001 provides protection for people who buy their water or sewerage services from a person or company instead of directly from a water or sewerage company. Details are available from the Office of Water Services (OFWAT) website is [www.ofwat.gov.uk](http://www.ofwat.gov.uk).
- It is policy to meter all new water connections. This would result in charges being levied according to the measured tariff.
- The Company may install a meter at the premises where a buyer makes a change of use of the property or where the buyer uses water for:
  - o Watering the garden other than by hand (this includes the use of sprinklers).
  - o Automatically replenishing a pond or swimming pool with a capacity greater than 10,000 litres.
  - o A bath with a capacity in excess of 230 litres.
  - o A reverse osmosis unit.

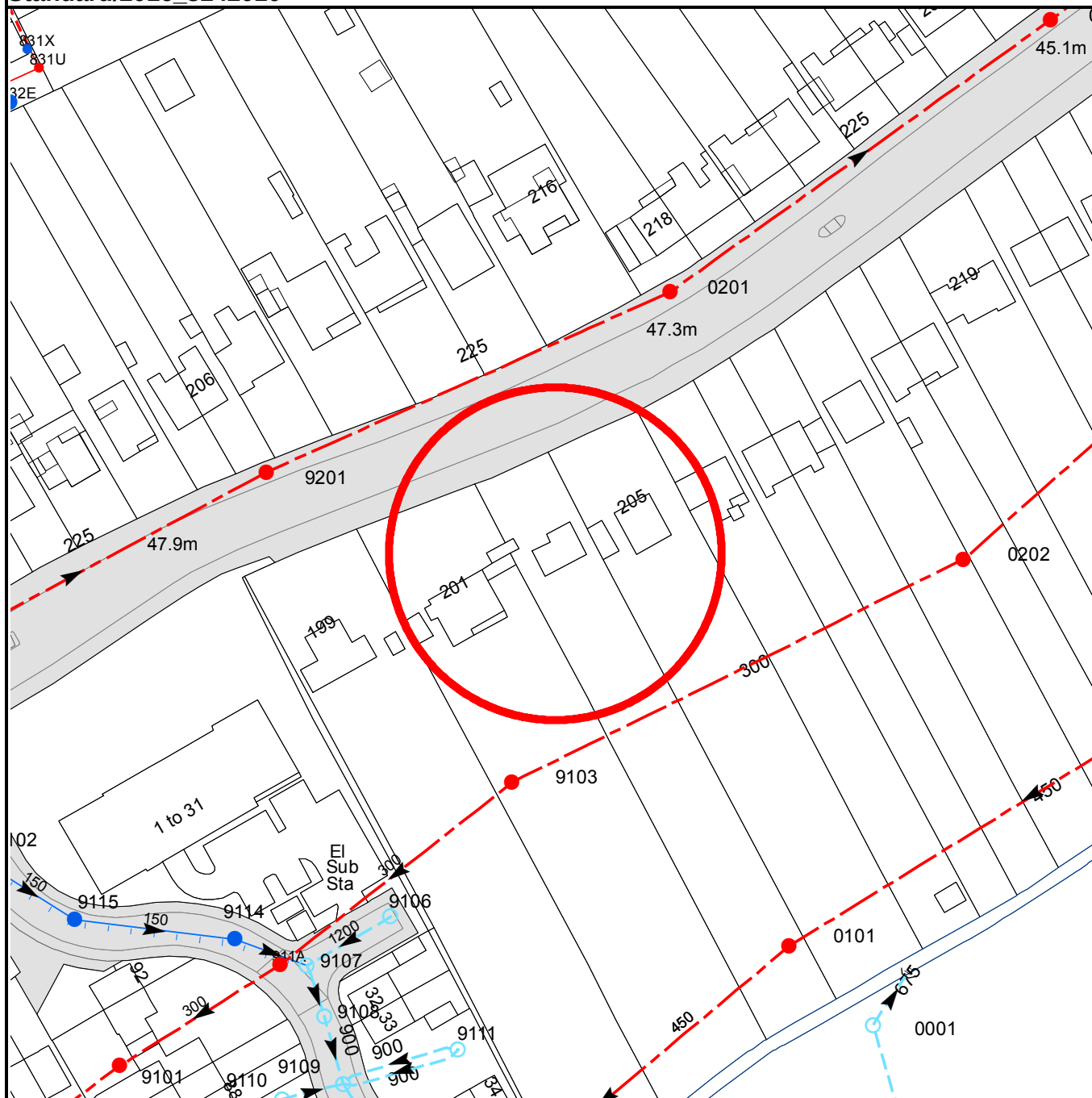
Payment for this Search

A charge will be added to your suppliers account.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information.

All prices are in accordance with the standard terms of Property Searches; discounts are available, please contact us on 0845 070 9148 to obtain further details.

# Residential CON29DW Drainage & Water Search Sewer Map-DWS/DWS Standard/2016\_3242010



The width of the displayed area is 200m

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

Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.



# Residential Drainage & Water Search Sewer Key

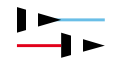
## Public Sewer Pipes (Operated & Maintained by Thames Water)

-  **Foul Sewer:** A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
-  **Surface Water Sewer:** A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers, watercourses or a treatment works.
-  **Combined Sewer:** A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
-  **Trunk Sewer:** A strategic sewer which collects either foul or surface water flow from a number of subsidiary catchments and transfers this flow to a pumping station, river outfall or treatment works.
-  **Storm Overflow Sewer:** A sewer designed to convey excess rainfall to rivers or watercourses so that the flow does not exceed the capacity of normal sewers (which could cause flooding).
-  **Biosolids:** A sewer designed to convey sludge from one treatment works to another.
-  **Vent Pipe:** A section of sewer pipe connected between the top of a sewer and vent column, used to prevent the accumulation of gas in a sewer and thus allowing the system to operate properly.
-  **Rising Main:** A pipe carrying pumped flow under pressure from a low point to a high point on the sewerage network. Line style / colour and direction of fleck indicate sewer purpose and direction of flow within the pipe.
-  **Vacuum:** A foul sewer designed to remove foul sewerage under pressure (vacuum sewers cannot accept direct new connections).
-  **Proposed Foul Sewer**
-  **Proposed Surface Water Sewer**

## Other Sewer Types (Not Operated or Maintained by Thames Water)

-  **Foul Sewer:** Any foul sewer that is not owned by Thames Water.
-  **Surface Water Sewer:** Any surface water sewer that is not owned by Thames Water.
-  **Combined Sewer:** Any combined sewer that is not owned by Thames Water.
-  **Gulley:** A sewer designed to convey surface water from large roads, motorways, etc. to watercourses or to public surface water sewers. These sewers are generally maintained by the relevant highway authority.
-  **Culverted Watercourse:** A watercourse running through a culvert or pipe which is the responsibility of the property owner or the Environment Agency.
-  **Abandoned Sewer:** A disused sewer. Usually filled with cement mixture or removed from the ground.

## Other Symbols

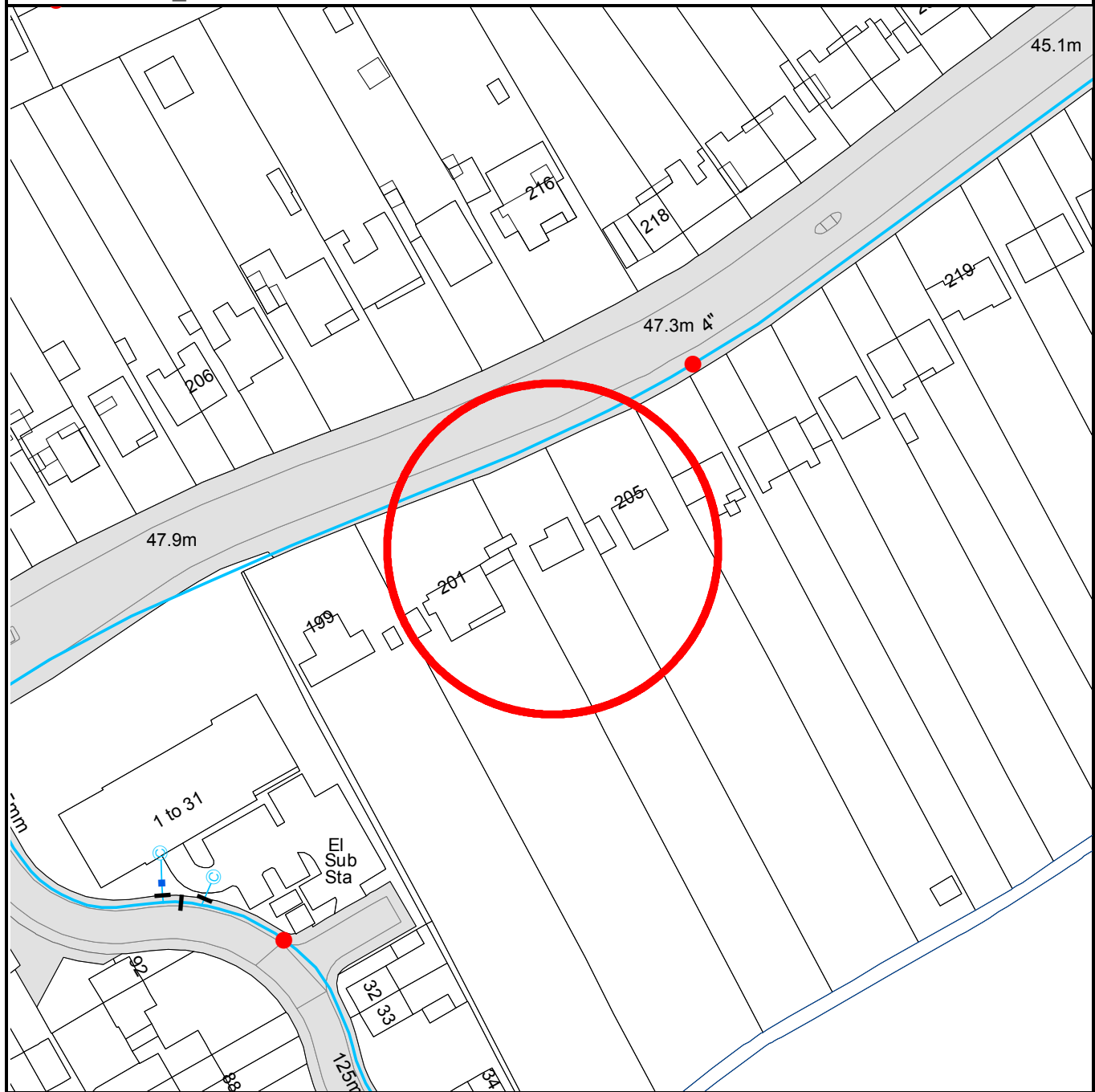
-  **Undefined Ends:** These symbols represent the point at which a pipe continues but no records of its position are currently held by Thames Water. These symbols are rare but may be found on any of the public sewer types.
-  **Public/Private Pumping Station:** Foul or Surface water pumping station.

### Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plans are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.

- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
- 5) 'na' or '0' on a manhole level indicates that data is unavailable.
- 6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Searches on 0845 070 9148.

**Residential CON29DW Drainage & Water Search Water Map-DWS/DWS  
Standard/2016\_3242010**



The width of the displayed area is 200m

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

Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.



# Residential Drainage & Water Search Water Key

## Public Water Pipes (Operated & Maintained by Thames Water)

- 4"** **Distribution Main:** The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.
- 16"** **Trunk Main:** A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.
- 3" SUPPLY** **Supply Main:** A supply main indicates that the water main is used as a supply for a single property or group of properties.
- 3" FIRE** **Fire Main:** Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.
- 3" METERED** **Metered Pipe:** A metered pipe indicates that the pipe in question supplies water for a single property or group of properties and that the quantity of water passing through the pipe is metered even though there may be no meter symbol shown.
- Transmission Tunnel:** A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.
- Proposed Main:** A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

## Depth of Water Pipes (Normal Cover)

| PIPE DIAMETER               | DEPTH BELOW GROUND |
|-----------------------------|--------------------|
| Up to 300mm (12")           | 900mm (3')         |
| 300mm - 600mm (12" - 24")   | 1100mm (3' 8")     |
| 600mm and bigger (24" plus) | 1200mm (4')        |

## Pipe fittings and controls (Operated & Maintained by Thames Water)

- Hydrant:** A point on a water main which is used by the fire services or for operational purposes by Thames Water.
- Meter:** Used to measure water flowing through a water main for domestic metering or operational purposes by Thames Water.
- General Purpose Valve:** Valves allowing control of water flow or pressure within the system.
- Air Valve:** A valve which allows the release of trapped air within a water pipe.

## Other Water Pipes (Not Operated or Maintained by Thames Water)

- Private Main:** Indicates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and ownership of the pipe.
- Other Water Company or Unknown Main:** Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.

### Note:

Most private pipe work and assets i.e. stopcocks, are not shown on our plans (in the past this information had not been recorded).

## Appendix 1 - terms and expressions in this report

“the 1991 Act” means the Water Industry Act 1991**(1)**;

“the 2000 Regulations” means the Water Supply (Water Quality) Regulations 2000**(2)**;

“the 2001 Regulations” means the Water Supply (Water Quality) Regulations 2001**(3)**;

“adoption agreement” means an agreement made or to be made under section 51A(1) or 104(1) of the 1991 Act**(4)**;

“bond” means a surety granted by a developer who is a party to an adoption agreement;

“bond waiver” means an agreement with a developer for the provision of a form of financial security as a substitute for a bond;

“calendar year” means the twelve months ending with 31st December;

“discharge pipe” means a pipe from which discharges are made or are to be made under section 165(1) of the 1991 Act;

“disposal main” means (subject to section 219(2) of the 1991 Act) any outfall pipe or other pipe which—

(a) is a pipe for the conveyance of effluent to or from any sewage disposal works, whether of a sewerage undertaker or of any other person; and

(b) is not a public sewer;

“drain” means (subject to section 219(2) of the 1991 Act) a drain used for the drainage of one building or of any buildings or yards appurtenant to buildings within the same curtilage;

“effluent” means any liquid, including particles of matter and other substances in suspension in the liquid;

“financial year” means the twelve months ending with 31st March;

“lateral drain” means—

(a) that part of a drain which runs from the curtilage of a building (or buildings or yards within the same curtilage) to the sewer with which the drain communicates or is to communicate; or

(b) (if different and the context so requires) the part of a drain identified in a declaration of vesting made under section 102 of the 1991 Act or in an agreement made under section 104 of that Act**(5)**;

“licensed water supplier” means a company which is the holder for the time being of a water supply licence under section 17A(1) of the 1991 Act**(6)**;

“maintenance period” means the period so specified in an adoption agreement as a period of time—

(a) from the date of issue of a certificate by a sewerage undertaker to the effect that a developer has built (or substantially built) a private sewer or lateral drain to that undertaker’s satisfaction; and

(b) until the date that private sewer or lateral drain is vested in the sewerage undertaker;

“map of waterworks” means the map made available under section 198(3) of the 1991 Act**(7)** in relation to the information specified in subsection (1A);

“private sewer” means a pipe or pipes which drain foul or surface water, or both, from premises, and are not vested in a sewerage undertaker;

“public sewer” means, subject to section 106(1A) of the 1991 Act**(8)**, a sewer for the time being vested in a sewerage undertaker in its capacity as such, whether vested in that undertaker—

(a) by virtue of a scheme under Schedule 2 to the Water Act 1989**(9)**;

(b) by virtue of a scheme under Schedule 2 to the 1991 Act**(10)**;

(c) under section 179 of the 1991 Act<sup>(11)</sup>; or

(d) otherwise;

“public sewer map” means the map made available under section 199(5) of the 1991 Act<sup>(12)</sup>;

“resource main” means (subject to section 219(2) of the 1991 Act) any pipe, not being a trunk main, which is or is to be used for the purpose of—

(a) conveying water from one source of supply to another, from a source of supply to a regulating reservoir or from a regulating reservoir to a source of supply; or

(b) giving or taking a supply of water in bulk;

“sewerage services” includes the collection and disposal of foul and surface water and any other services which are required to be provided by a sewerage undertaker for the purpose of carrying out its functions;

“sewerage undertaker” means the company appointed to be the sewerage undertaker under section 6(1) of the 1991 Act for the area in which the property is or will be situated;

“surface water” includes water from roofs and other impermeable surfaces within the curtilage of the property;

“water main” means (subject to section 219(2) of the 1991 Act) any pipe, not being a pipe for the time being vested in a person other than the water undertaker, which is used or to be used by a water undertaker or licensed water supplier for the purpose of making a general supply of water available to customers or potential customers of the undertaker or supplier, as distinct from for the purpose of providing a supply to particular customers;

“water meter” means any apparatus for measuring or showing the volume of water supplied to, or of effluent discharged from any premises;

“water supplier” means the company supplying water in the water supply zone, whether a water undertaker or licensed water supplier;

“water supply zones” in relation to a calendar year means the names and areas designated by a water undertaker within its area of supply that are to be its water supply zones for that year; and

“water undertaker” means the company appointed to be the water undertaker under section 6(1) of the 1991 Act for the area in which the property is or will be situated.

In this report, references to a pipe, including references to a main, a drain or a sewer, shall include references to a tunnel or conduit which serves or is to serve as the pipe in question and to any accessories for the pipe.

(1) 1991 c. 56.

(2) S.I. 2000/3184. These Regulations apply in relation to England.

(3) S.I. 2001/3911. These Regulations apply in relation to Wales.

(4) Section 51A is inserted by section 92(2) of the Water Act 2003 (c. 37). Section 104(1) is amended by section 96(4) of that Act.

(5) To which there are various amendments made by sections 102 and 104 by section 96 of the Water Act 2003.

(6) Inserted by section 56 of and Schedule 4 to the Water Act 2003.

(7) Subsection (1A) is inserted by section 92(5) of the Water Act 2003.

(8) Section 106(1A) is inserted by section 99 of the Water Act 2003.

(9) 1989 c. 15.

(10) To which there are various amendments made by section 101(1) of and Schedule 8 to the Water Act 2003.

(11) To which there are various amendments made by section 101(1) of and Schedule 8 to the Water Act 2003.

(12) Section 199 is amended by section 97(1) and (8) of the Water Act 2003.

## **CON29DW DRAINAGE & WATER ENQUIRY (DOMESTIC).**

### **TERMS AND CONDITIONS**

**The Customer the Client and the Purchaser are asked to note these terms, which govern the basis on which this drainage and water report is supplied**

#### **Definitions**

'The Company' means Thames Water who produces the Report.

'Order' means any request completed by the Customer requesting the Report.

'Report' means the drainage and/or water report prepared by The Company in respect of the Property.

'Property' means the address or location supplied by the Customer in the Order.

'Customer' means the person, company, firm or other legal body placing the Order, either on their own behalf as Client, or, as an agent for a Client.

'Client' means the person, company or body who is the intended recipient of the Report with an actual or potential interest in the Property

"Purchaser" means the actual or potential purchaser of the Property including their mortgage lender.

#### **Agreement**

1. The Company agrees to supply the Report to the Customer and the Client subject to these terms. The scope and limitations of the Report are described in paragraph 2 of these terms. Where the Customer is acting as an agent for the Client then the Customer shall be responsible for bringing these terms to the attention of the Client and the Purchaser.

1.1 The Customer the Client and the Purchaser agree that the placing of an Order for a Report and the subsequent provision of a copy of the Report to the Purchaser indicates their acceptance of these terms.

#### **The Report**

2. Whilst The Company will use reasonable care and skill in producing the Report, it is provided to the Customer the Client and the Purchaser on the basis that they acknowledge and agree to the following:-

1.2 The information contained in the Report can change on a regular basis so The Company cannot be responsible to the Customer the Client and the Purchaser for any change in the information contained in the Report after the date on which the Report was produced and sent to the Client.

1.3 The Report does not give details about the actual state or condition of the Property nor should it be used or taken to indicate or exclude actual suitability or unsuitability of the Property for any particular purpose, or relied upon for determining saleability or value, or used as a substitute for any physical investigation or inspection. Further advice and information from appropriate experts and professionals should always be obtained.

1.4 The information contained in the Report is based upon the accuracy of the address supplied by the Customer or Client.

1.5 The Report provides information as to the location & connection of existing services and other information in relation to drainage and water enquiries and should not be relied on for any other purpose. The Report may contain opinions or general advice to the Customer the Client and the Purchaser The Company cannot ensure that any such opinion or general advice is accurate, complete or valid and accepts no liability therefore.

1.6 The position and depth of apparatus shown on any maps attached to the Report are approximate, and are furnished as a general guide only, and no warranty as to its correctness is given or implied. The exact positions and depths should be obtained by excavation trial holes and the maps must not be relied on in the event of excavation or other works made in the vicinity of The Company's apparatus.

#### **Liability**

3.1 The Company shall not be liable to the Client or the Purchaser for any failure defect or non-performance of its obligations arising from any failure of or defect in any machine, processing system or transmission link or anything beyond The Company's reasonable control or the acts or omissions of any party for whom The Company are not responsible.

3.2 Where a report is requested for an address falling within a geographical area where two different companies separately provide Water and Sewerage Services, then it shall be deemed that liability for the information given by either company will remain with that company in respect of the accuracy of the information supplied. A company supplying information which has been provided to it by another company for the purposes outlined in this agreement will therefore not be liable in any way for the accuracy of that information and will supply that information as agent for the company from which the information was obtained.

3.3 The Report is produced only for use in relation to individual domestic property transactions which require the provision of drainage and water information and cannot be used for commercial development of domestic properties or commercial properties for intended occupation by third parties. When the Report is used for land only transactions the Company's entire liability (except to the extent provided by clause 3.4) in respect of all causes of action arising by reason of or in connection with the Report (whether for breach of contract, negligence or any other tort, under statute or statutory duty or otherwise at all) shall be limited to £5,000.

3.4 The Company shall accept liability for death or personal injury arising from its negligence.

#### **Copyright and Confidentiality**

4.1 The Customer the Client and the Purchaser acknowledge that the Report is confidential and is intended for the personal use of the Client and the Purchaser. The copyright and any other intellectual property rights in the Report shall remain the property of The Company. No intellectual or other property rights are transferred or licensed to the Customer the Client or the Purchaser except to the extent expressly provided

4.2 The Customer or Client is entitled to make copies of the Report but may only copy Ordnance Survey mapping or data contained in or attached to the Report, if they have an appropriate licence from the originating source of that mapping or data

4.3 The Customer the Client and the Purchaser agree (in respect of both the original and any copies made) to respect and not to alter any trademark, copyright notice or other property marking which appears on the Report.

4.4 The maps contained in the Report are protected by Crown Copyright and must not be used for any purpose outside the context of the Report.

4.5 The enquiries in the Report are protected by copyright by the Law Society of 113 Chancery Lane, London WC2A 1PL and must not be used for any purpose outside the context of the Report.

4.6 The Customer the Client and the Purchaser agree to indemnify The Company against any losses, costs, claims and damage suffered by The Company as a result of any breach by either of them of the terms of paragraphs 4.1 to 4.4 inclusive.

#### **Payment**

5. Unless otherwise stated all prices are inclusive of VAT. The Customer shall pay for the price of the Report specified by The Company, without any set off, deduction or counterclaim. Unless the Customer or Client has an account with The Company for payment for Reports, The Company must receive payments for Reports in full before the Report is produced. For Customers or Clients with accounts, payment terms will be as agreed with The Company.

#### **General**

6.1 If any provision of these terms is or becomes invalid or unenforceable, it will be taken to be removed from the rest of these terms to the extent that it is invalid or unenforceable. No other provision of these terms shall be affected.

6.2 These terms shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts.

6.3 Nothing in these terms and conditions shall in any way restrict the Customer the Clients or the Purchasers statutory or any other rights of access to the information contained in the Report.

6.4 These terms and conditions may be enforced by the Customer the Client and the Purchaser.

These Terms & Conditions are available in larger print for those with impaired vision.

## Payment Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
4. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
5. In case of dispute TWUL's terms and conditions shall apply.
6. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
8. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800.

If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to him at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

### Ways to pay your bill

| Credit Card                                                                | BACS Payment                                                                                                                                                                                                                                                       | Telephone Banking                                                                                                           | Cheque                                                                                                                                                                                                                             |
|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Call <b>0845 070 9148</b> quoting your invoice number starting CBA or ADS. | Account number <b>90478703</b><br>Sort code <b>60-00-01</b><br>A remittance advice must be sent to:<br><b>Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.</b><br>or email <a href="mailto:ps.billing@thameswater.co.uk">ps.billing@thameswater.co.uk</a> | By calling your bank and quoting:<br>Account number <b>90478703</b><br>Sort code <b>60-00-01</b><br>and your invoice number | Made payable to ' <b>Thames Water Utilities Ltd</b> '<br>Write your Thames Water account number on the back.<br>Send to:<br><b>Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW</b><br>or by DX to <b>151280 Slough 13</b> |

Thames Water Utilities Ltd Registered in England & Wales No. 2366661 Registered Office Clearwater Court, Vastern Rd, Reading, Berks, RG1 8DB.



## **Search Code**

### **IMPORTANT CONSUMER PROTECTION INFORMATION**

This search has been produced by Thames Water Property Searches, Clearwater Court, Vastern Road, Reading RG1 8DB, which is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered search firms maintain compliance with the Code.

#### **The Search Code:**

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the United Kingdom
- sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practise and quality standards within the industry for the benefit of consumers and property professionals
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.

By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you.

#### **The Code's core principles**

Firms which subscribe to the Search Code will:

- display the Search Code logo prominently on their search reports
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## **APPENDIX B**

- **EDENVALE YOUNG FLOOD RISK ASSESSMENT REPORT  
DATED FEB 18, 2019**
- **EDENVALE YOUNG FLOOD RISK ASSESSMENT ADDENDUM  
REPORT – HENLEY ROAD FLOOD MAP UPDATE  
DATED FEB15, 2019**



## Henley Road Caversham

### Flood Risk Assessment

**Edenvale Young Associates Ltd.**

**April 8, 2019**

Revision D



Edenvale Young Associates  
30 Queen Charlotte St.  
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Signature Senior Lifestyle  
Developments Ltd

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8th April 2019

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# 1 Introduction

## 1.1 Background

Edenvale Young Associates (Ltd.) have been commissioned to prepare a Flood Risk Assessment (FRA) for a development comprising the demolition of existing structures on site and redevelopment to form a care home (Class C2), communal and ancillary facilities, associated parking and landscaping.

## 1.2 Project Scope

This FRA is a desk based study which has primarily utilised information available from the Environment Agency and the Reading Borough Council Strategic Flood Risk Assessment (SFRA) Levels 1 and 2, published in June 2017 and December 2017 respectively.

The available flood modelling has been provided by the Environment Agency and subsequently updated by Edenvale Young during a modelling study undertaken in 2017. The results of this study have been used to inform updated Flood Zones for this report.

Other sources, where used, are appropriately referenced throughout this document.

## 1.3 Site Description

### 1.3.1 Location

The location of the site is given in Figure 1.1. The development is located at 199-203 Henley Road and land to the rear of 205-207 Henley Road, Caversham RG4 6LJ, to the east of Reading town centre and approximately 2km downstream of Caversham Bridge. The Berry Brook lies to the south west of the site, and forms the primary source of fluvial flood risk at this location.



Figure 1.1: Location of the development site south of Henley Road.

### 1.3.2 Previous studies

A hydraulic modelling study was undertaken by Edenvale Young Associates in June 2017 in order to support a planning application for sixty residential properties on the current site. The scope of this study was to update the original ISIS-TUFLOW hydraulic model, which was produced by Jacobs in 2011 and used to inform the Environment Agency flood mapping. The updates resulted in a slight reduction in flood extents local to the site and planning permission for the site was obtained subsequent to the provision of an addendum to the previous FRA informed by the modelling work.

Since this study and the granting of planning permission, the site has come into new ownership and it is intended to be occupied by a new residential care home (Class C2), communal and ancillary facilities, associated parking and landscaping. The same model outputs as used in the previous assessment of this site have been used to assess the flood risk to the new property.

### 1.3.3 Proposed development

The existing site use is residential, with residential properties currently built at the northern end of the site.

The proposed development is shown in Figure 1.2.



Figure 1.2: Proposed development plan.

The remaining site is utilised as permeable grassed or vegetated garden, running from the north to the south of the site. The proposed development includes a care home (Class C2), communal and ancillary facilities, associated parking and landscaping. Additionally, the plan includes areas allocated to parking and roads connecting the development to the public access route from Henley Road.

#### **1.3.4 Topography**

Topographic survey of the site is available from previous studies. Ground levels are approximately 47.0mAOD on Henley Road, falling to approximately 36.9mAOD at the south of the site, with a total fall of 10.1m over the length of the site. Therefore, it is assumed that rainfall and runoff from the area currently drains either via infiltration or overland flow toward the Berry Brook.

#### **1.3.5 Geology**

British Geological Survey (BGS) mapping indicates that the site is underlain by geological units of the Seaford and Newhaven Chalk formation, which form part of the larger Chalk Group succession which lies beneath much of southern and eastern England.

The hydrogeological profile of this area is categorised as a highly productive aquifer, with significant yields from boreholes and good water quality. Groundwater levels within the Reading area are considered to be between 30mAOD and 40mAOD.

## 2 Background and previous studies

### 2.1 Environment Agency Flood Map

The requirement for a Flood Risk Assessment as part of a planning application depends upon the type of development, size of development and the predicted flood risk as defined by the Environment Agency's flood risk zones. In England, these zones are defined as follows:

- Zone 1 areas have a low risk with an annual probability of flooding of less than 0.1%
- Zone 2 areas have a medium risk with an annual probability of flooding between 0.1% and 1%
- Zone 3 areas have a high risk with an annual probability of flooding greater than 1%

As shown in Figure 2.1, the upper part of the site and existing residential buildings are located within Flood Zone 1. The proposed care home and associated works are primarily within the current Flood Zone 1. The southern-most part of the proposed development is shown as being within Flood Zone 2. The lower part of the existing gardens are shown within Flood Zones 2 and 3. Therefore, a FRA is required as part of the planning application as dictated by the National Planning Policy Framework (NPPF), the Environment Agency's standing advice and the relevant Strategic Flood Risk Assessment (SFRA).



Figure 2.1: Environment Agency flood mapping showing site partially within Flood Zones 1, 2 and 3.

## 2.2 SFRA - Reading Borough Council

The Reading Borough Council SFRA (June 2017) indicates that a site-specific FRA based upon readily available Environment Agency data is required for all proposed developments within Flood Zones 2 and 3. Further, the report states that it will be necessary to demonstrate that:

- The risk of flooding at the property is managed through, for example, the provision of raised floor levels, resilience options and the provision of a safe egress route or refuge space
- The risk of alternative sources of flooding, including e.g. groundwater and/or defence failure, is considered
- Where possible, the proposed (re)development has contributed to a reduction in flood risk within the area and does not increase flood risk elsewhere
- The impacts of climate change and subsequent increase in flow and rainfall is considered over the lifetime of the development

## 2.3 National Planning Policy Framework

### 2.3.1 Introduction

The NPPF sets out a number of tests or criteria which must be passed in order for development to take place in areas at risk of flooding. The criteria for development are determined by the EA flood zone in which the site is located.

### 2.3.2 The Sequential Test

The NPPF Sequential Test is used to, where possible, steer development to sites at the lowest risk of flooding. As the updated

| 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.

Figure 2.2: Flood Risk Vulnerability Classification reproduced from the NPPF.

modelling produced by Edenvale Young has shown a slight reduction to the flood extent local to the site, all buildings are located within Flood Zone 1. Therefore, the Sequential Test is not required to be passed. Further details on the results of the modelling are available in Section 3.3.

### 2.3.3 The Exception Test

The proposed development corresponds to permanent residential housing within a care home, which is categorised as being a "More Vulnerable" development according to NPPF Technical Guidance. Figure 2.2 indicates the compatibility of development types within particular Flood Zones. Development on the northern part of the site, within Flood Zones 1 and 2, is considered appropriate for "More Vulnerable" development. However, any residential development on the lower part of the site would be within Flood Zone 3, therefore the development must pass the Exception Test.

For the Exception Test to be passed, NPPF states that:

- It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a SFRA where one has been prepared; and
- A site specific FRA must demonstrate that the development will be safe for its lifetime taking into account the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall

The information contained within the SFRA is concordant with requirements set out by the [NPPF](#), [NPPG](#), and [Environment Agency](#). Therefore, the above four documents have been used to guide the content of this FRA which is intended to confirm whether

the planned development, with mitigation measures if necessary, are acceptable to the EA and local planning authority in terms of flood risk.

## 3 Existing Flood Risk

### 3.1 Historic flooding

The nearest flow gauges to the site are on the Thames at Kingston 30km downstream of Reading, with records from 1883 to 2012, and Days Weir, some 30km upstream, with records from 1939 to 2012. The records at both gauges are considered by the Environment Agency to be of good quality and are therefore suitable for flow estimation using standard hydrological methods.

Figure 3.2 shows the largest floods during the period of record at the nearest gauging stations.

| Kingston |            | Day's Weir |            |
|----------|------------|------------|------------|
| Date     | Flow (cms) | Date       | Flow (cms) |
| 18/11/94 | 806        | 17/03/47   | 349.2      |
| 20/03/47 | 714.2      | 09/02/40   | 260.1      |
| 17/09/68 | 600.1      | 29/01/39   | 255.3      |
| 05/01/15 | 585.1      | 24/01/59   | 248.5      |
| 23/11/74 | 559        | 04/01/03   | 237.5      |

Figure 3.1: Largest flow events at two EA gauging stations during the period of record.

The map shown in Figure 3.2 shows that flooding occurred on the site in 1947.



Figure 3.2: Historical flood extent map showing the approximate outlines of the 1947, 2003 and 2014 flood events.

Other major flood events such as those in 2003 and 2014, did not impact the site despite flooding being experienced in other parts of Reading and Caversham.

From the available information, it appears that the 1947 flood event may have been the only event to have flooded the lower lying area of the site although the accuracy of the EA historical flood outlines are not always consistent or reliable.

Analysis of the available LiDAR data in this area shows that the 1947 flood level does not appear consistent with the topography, as the outline follows a line with a ground level that varies from 39.78m OD to 38.03m OD. Additionally, in most areas around Caversham the EA Flood Zone 2 (area susceptible to a 1 in 1000 year flood) outline either exceeds or is equal to the 1947 flood outline, but at the site the 1947 outline exceeds the Flood Zone 2 outline, which is inconsistent with the local area as shown in Figure 3.3.



Figure 3.3: Comparison of the EA Flood Zone 2 and the 1947 flood outline.

As a result of this analysis, it is considered that the 1947 flood outline may be unreliable in this area and should therefore not be used to inform flood risk to the site.

### 3.2 Fluvial flooding

The primary source of flooding to the site is from the River Thames and its tributary the Berry Brook, which flows from west to east to the south of the site. Mapping indicates that there are no other watercourses in the vicinity of the site that pose a potential risk of fluvial flooding.

The EA flood maps, Figure 2.1, show that approximately half of the site lies within Flood Zone 2, with a smaller proportion at the south of the site in Flood Zone 3.

### 3.3 Hydraulic model results

Edenvale Young Associates updated existing hydraulic modelling produced originally by Jacobs as part of a study carried out in 2017 to inform a different planning application for the current site. This modelling was approved by the Environment Agency, along with updated flood zones, and planning permission for a residential development on this site was granted.

The updated model includes a higher resolution model domain in the Caversham area, as well as the most up to date LiDAR data and detailed topographic survey of the development site.

Additionally, this study included running the model for updated EA climate change guidance, which dictates that a peak river flow allowance of 35 and 70% should be applied to the 1 in 100 year fluvial event for a "More Vulnerable" development in Flood Zones 2 and 3.

The predicted flood outline and maximum depths from relevant modelled events is shown in Figure 3.4.



Figure 3.4: Maximum outline and water level for all modelled flood events.

In the 1 in 100 year return period design flood event, water is not predicted to inundate the site. In the 70% climate change scenario, flooding is predicted to reach the southern-most part of the site. For any of the modelled return periods, including the largest 70% climate change scenario, water is not predicted to reach the proposed care home or any of the associated roads or landscaped gardens.

There is some discrepancy between the results obtained via the updated modelling and the available Environment Agency flood mapping which is likely to be due to the use of more detailed and up to date local survey and LiDAR data used to inform the updated model. The updated model is therefore considered fit for the purpose of informing development in this area. It is considered that the proposed care home building lies within Environment Agency Flood Zone 1, and is not shown to be inundated during any modelled return period, including those return periods with an allowance for the effects of climate change.

A full modelling report is available in Appendix A.

### 3.4 Surface water (pluvial) flooding

Surface water flooding occurs when excess water runs off across the surface of the land due to an inability to permeate into the underlying ground. Additionally, surface water flooding may occur if the capacity of the drainage system is exceeded. Such flooding is generally the result of short duration but high intensity storms.

Available surface water flood risk mapping for the site is shown in Figure 3.5.



Figure 3.5: EA Flood Mapping showing the risk of surface water flooding at the site.

Both Henley Road and the site appear to be at very low risk of surface water flooding with the exception of small, isolated areas that are considered to have a low risk of surface water flooding. Furthermore, no mention is made of surface water flooding having occurred previously in this region within the Reading Borough Council SFRA.

It is considered that if the recommendations made within this FRA are adhered to, such as raised ground floor levels and the incorporation of Sustainable Urban Drainage Systems (SUDS), that the risk of surface water flooding will be further lowered.

### 3.5 Sewer flooding

Sewer flooding may occur if the capacity of a sewage network is exceeded during periods of higher flows or rainfall. Large flows are likely to occur during prolonged periods of rainfall in the autumn and winter months, however during summer when flows are reduced, blockage can occur.

The SFRA does not contain any recorded instances of sewer flooding near to the site. Sewer flooding is difficult to predict as it is based upon numerous factors, however the proposed raised ground levels will provide additional protection against sewer flooding. There is a sewer that runs across the southern end of the site, therefore this should be considered during the planning of drainage for the site.

### 3.6 Groundwater flooding

Following widespread flooding during winter 2000/2001, a study was commissioned investigating the occurrence of groundwater flooding throughout England. Areas most susceptible to groundwater flooding are primarily in low-lying areas above chalk aquifers, particularly in the south-east of England.

Long periods of sustained high rainfall may cause the water table to rise above normal levels. The risk posed by groundwater

flooding is highly variable and dependent upon local conditions, and therefore it is not possible to accurately predict the risk. The SFRA shows there are no records of this area having been affected in the past.

As the Berry Brook is in close proximity to the site, flooding from rising groundwater is unlikely as any water which reaches the surface will flow to the south and drain to the watercourse. Additionally, as the ground floor of the residential properties will be raised above ground level it is unlikely that groundwater flooding would inundate the buildings.

### **3.7 Infrastructure or defence failure**

There are no existing flood defences to protect the site from flooding, and the SFRA indicates there are no flood alleviation works planned in proximity to the site.

The Environment Agency flood risk from reservoir mapping does not predict any risk posed by reservoir failure at the site. Infrastructure or defence failure therefore does not pose a significant risk in this area, and has not been considered further within this FRA.

### **3.8 Tidal flooding**

The site is located inland at an elevation of approximately 36mAOD, therefore tidal flooding is not considered a risk at this site and is not considered further within this FRA.

# 4 Discussion

## 4.1 Flood Resilience

### 4.1.1 Finished floor levels

The SFRA indicates that the ground floor level of a residential building should be a minimum of 300mm above the modelled 1 in 100 annual probability plus appropriate allowance for climate change fluvial flood level. For this FRA, the lower and upper end climate change allowances are considered to be 35 and 70% respectively.

Model results for the 1 in 100 year plus 70% climate change allowance event show a maximum flood level of 36.80mAOD at the southern end of the site. For the highest standard of protection, it is therefore recommended that a finished floor level of 37.1 mAOD is adopted. As the ground levels at the southern edge of the property are at a minimum surveyed level of 36.92mAOD, raising the floor levels in this way will increase the resilience of the property for the future.

### 4.1.2 Flood resilience measures

As the higher end climate change level should be adopted as the finished floor level, it should not be necessary to include resilience measures as the properties will be above the predicted levels of flooding in all cases.

### 4.1.3 Volume of Displacement

The provided development plan will involve the construction of new buildings within an area that does not flood. Therefore, as it is proposed that no buildings are constructed within Flood Zone 3 there will be no loss of flood plain storage and subsequently no displaced water and no change in flooding potential for adjacent sites. It is considered there is no requirement for compensatory storage.

### 4.1.4 Egress route

In the event of a flood, it is predicted that egress from the building should not be impacted by floodwaters. Residents can leave the building into the proposed car park area, and then follow the access road to Henley Road. Further, obstruction to vehicular access or emergency services to the property in the event of a flood should not occur.

#### **4.1.5 Flood Response Plan**

As the proposed development does not include any buildings within Flood Zone 3, a Flood Response Plan is not required.

#### **4.1.6 Flood Defence Consent**

Thames Water by-laws require a flood defence consent for works within 8m of a river bank. However, as the new buildings will be at least 8m from the top of the river bank this will not be required.

### **4.2 The Exception Test**

The Exception Test is only required for more vulnerable uses in Zone 3, and as all buildings are located within Flood Zone 1, therefore this test is not required.

# 5 Conclusions and Recommendations

## 5.1 Conclusions

- The proposed development involves the construction of a care home (Class C2), communal and ancillary facilities, associated parking and landscaping on a site located in Caversham, to the east of Reading. The site drains to the Berry Brook which lies to the south of the site. This brook also forms the primary source of fluvial flood risk to the site.
- The site is partially within Environment Agency Flood Zones 2 and 3, therefore a site specific Flood Risk Assessment is required as part of any planning application. The requirements set out by the NPPF, NPPG, EA Guidelines and the local SFRA are considered in this FRA.
- Other sources of flood risk, including surface water, groundwater, tides and defence failure have been evaluated. However, the main source of flood risk is from the Berry Brook, a tributary of the River Thames. The largest flood in recent times which may have affected part of the site was in 1947. Other significant flood events in 1968, 2003, 2014, which resulted in flooding to parts of Caversham and Reading, did not impact the site.
- The updated model local to the proposed development site shows a slight reduction in flood extents when compared to the original, Environment Agency supplied model. This is likely to be due to the higher grid resolution and incorporation of detailed topographic survey data in this location. In addition, the model was re-run with updated EA climate change allowances. The relevant allowances are a 1 in 100 year event plus 35 and 70% allowance for rising rain and flow levels associated with climate change.
- The proposed development is free from flooding in all modelled return periods, including in the 1 in 100 year event, 1 in 100 year return period flood event plus 35% climate change allowance and the 1 in 1000 year return period flood event.
- As specified in the Reading Borough Council SFRA, finished floor levels should be 300mm above the maximum water level for the 1 in 100 year plus climate change allowance event. This gives a level of 37.1mAOD for the upper allowance.

- A safe egress route is available from the properties. The route will be to the north and onto Henley Road, which remains dry even during extreme flood events.
- As the updated modelling shows that the planned properties are located in Flood Zone 1, and thus at the lowest possible risk of flooding, there is consequently no need for the Sequential Test to be passed.
- Planning permission has been granted for the development of residential properties on the site after the updated modelling study undertaken by Edenvale Young Associates in 2017 and subsequent to the submission of an adequate Flood Risk Assessment. The site is now to be re-developed as mentioned within this report. As the flood risk to the site has previously been considered to be minimal, it is considered that the flood risk now posed to the new development is similarly negligible.

## 5.2 Recommendations

It is recommended that:

- Sustainable Drainage Systems should be developed and incorporated into the final site design. The site is underlain by permeable chalk, and may therefore be suitable for the incorporation of, for example, permeable paved areas, soakaways and infiltration trenches.
- Finished floor levels should be at minimum, 37.1mAOD for the upper climate change allowance. If finished floor levels are set at this higher level, resilience options do not need to be incorporated as the risk of flooding is low.
- Residents are made aware of the flood risk posed to the site. Residents should be informed of the safe egress route and flood warning systems that they can access. This includes signing up to the Environment Agency flood [warning system](#), which provides warnings via phone, email or text message.
- The Environment Agency historical flood extent maps for 1947 are reconsidered to ensure they are as accurate as possible representation of the likely flood extent in this event.

## **Appendices**

# A Hydraulic modelling report

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The consultant will follow accepted procedure in providing the services but given the residual risk associated with any prediction and the variability which can be experienced in flood conditions, the consultant takes no liability for and gives no warranty against actual flooding of any property (client's or third party) or the consequences of flooding in relation to the performance of the service.

# **FRA Addendum Report**

## **Henley Road Flood Map Update**

Edenvale Young Associates

30, Queen Charlotte Street,  
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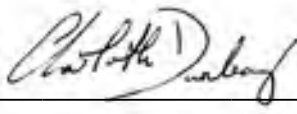
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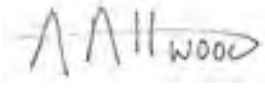


## Quality Assurance

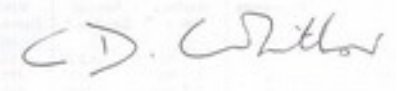
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# 1 Introduction

A previous modelling study had been undertaken in 2017 by Edenvale Young Associates to update the existing Jacobs 2011 model and assess flood risk to a site located at 199-203 Henley Road and land to the rear of 205-207 Henley Road, Caversham RG4 6LJ. The results of the updated model were approved by the Environment Agency and planning permission for residential development on this site was obtained.

The site was subsequently sold and is now to be redeveloped. This includes The demolition of existing structures and redevelopment to form a care home (Class C2), communal and ancillary facilities, associated parking and landscaping. As the updated model results have been approved by the EA, these results are going to be used to assess flood risk to the new development within an FRA report.

A specific FRA has been written for this new development using the results of the hydraulic modelling from the approved 2017 study. This document forms an appendix to the flood risk assessment (FRA), named “EVY0764\_Henley\_Road\_Caversham\_FRA\_RevD”. The location of the residential care home is shown in Figure 1.1.

## 1.1 Previous study

The original modelling work undertaken to inform the published EA flood map was carried out by Jacobs for the Environment Agency (EA) in 2011.

The model shows how the River Thames flows generally west to east through Reading where it has a confluence with the River Kennet. Close to Shiplake the river has a further confluence with the River Loddon. Further downstream the river flows from north to south through Maidenhead. The Thames is joined by the River Wye to the north of Maidenhead, the Cut to the south of Maidenhead, before flowing on eastward towards Windsor and then London.

The River Thames is gauged upstream of Reading at Days Weir, in Reading itself at Reading Bridge and downstream at Maidenhead and Windsor. The major tributaries are also gauged; the Kennet at Theale, the Loddon at Twyford, the Wye at Hedsor and the Cut at Binfield.

As part of the 2017 modelling study, Edenvale Young have procured and reviewed the previous Jacobs (2011) flood model, made improvements local to the site and include d the latest climate change guidance. This model has been used to enable more accurate flood mapping at the site. It should be noted that these modelling updates were approved by the Environment Agency (see Appendix A of this document).

Using the updated model, more accurate peak flood levels adjacent to the site have been produced, which would therefore enable more

accurate flood zone extents to be calculated. The new model has then been used to run the amended climate change scenarios as required to supplement the FRA report. This report documents the changes made to the original Jacobs 2011 model.

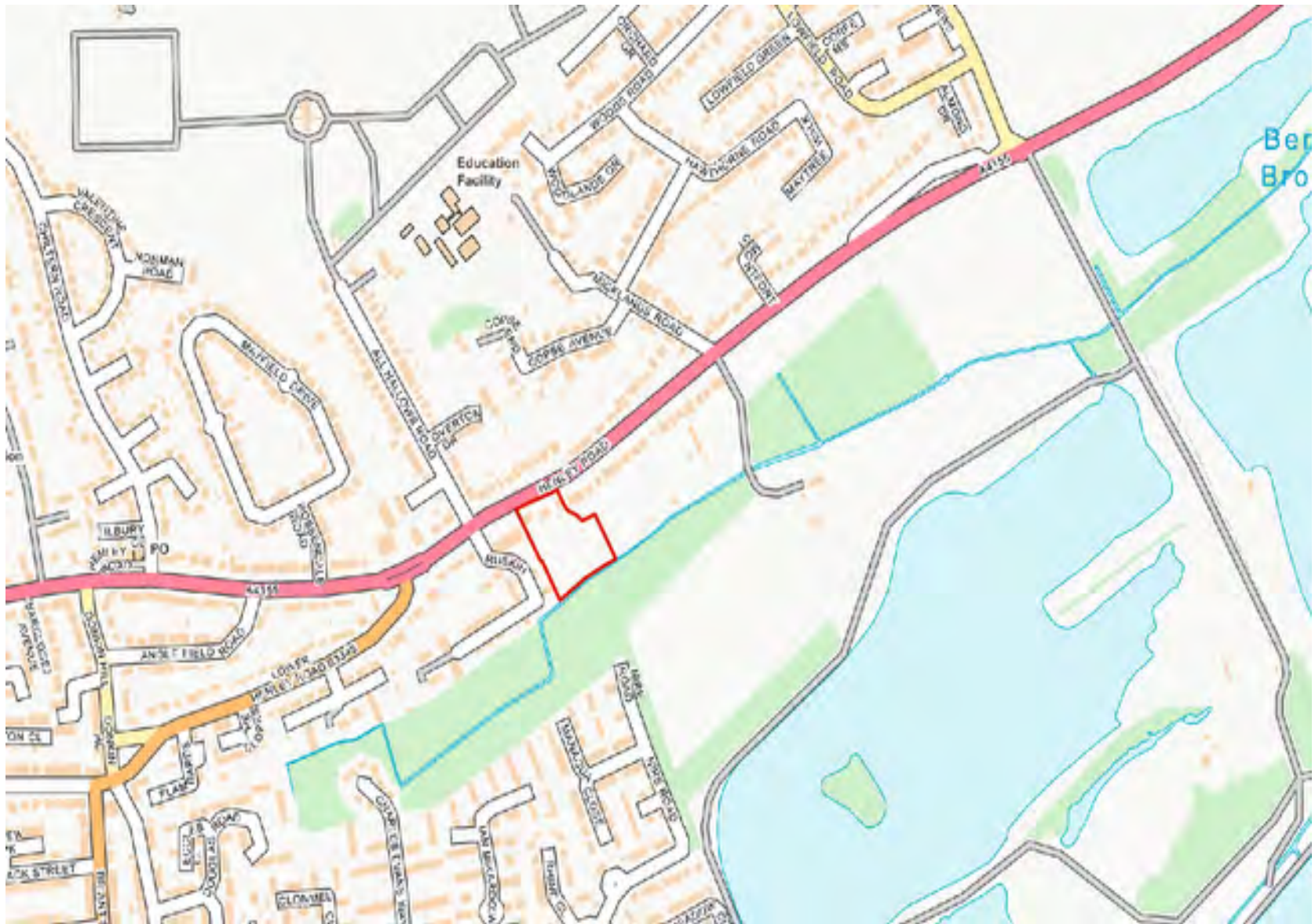


Figure 1.1: Site location

## 2 Preliminary Study

Initial modelling showed that using the latest version of TUFLOW 2017-09-AC-iDP-w64 and Flood Modeller Pro 4.3.0.290 double precision, did not allow the high return period events to be simulated successfully using the model as supplied. Consequently a series of improvements were suggested and summarised below:

- Modelling improvements to the existing ISIS data file to reflect current best practice.
- Reduction of the model grid size in the domain of interest to determine more accurate flood levels and extents on the site.
- Reduction of the time-step to aid model stability.
- Updating of the terrain data with the latest 1m resolution LiDAR data.
- Inclusion of the latest topographic survey of the site.

## 3 Hydrology

### 3.1 Hydrology Updates

The same hydrological inflows have been used as in the original model.

Only the inflow factors specified in the new climate change guidance were updated to the values of 35% and 70% as appropriate to the Reading area.

## 4 Model Scenarios

### 4.1.1 Model Run Parameters

The parameters implemented in the supplied ISIS model were updated so the new parameters keep in line with current best practice:

- Dflood=5
- Maxitr=6
- Minitr=2

As can be clearly seen below the ISIS model is stable even for large events such as the 100 years plus 70% climate change.

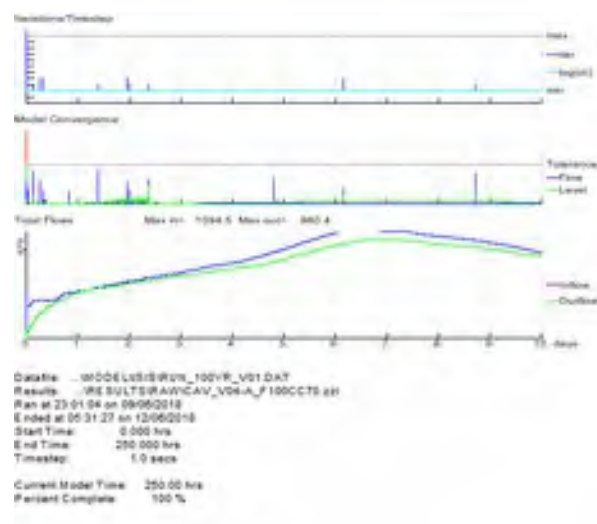


Figure 4.1: ISIS Convergence Bitmap

#### 4.1.2 *Grid size*

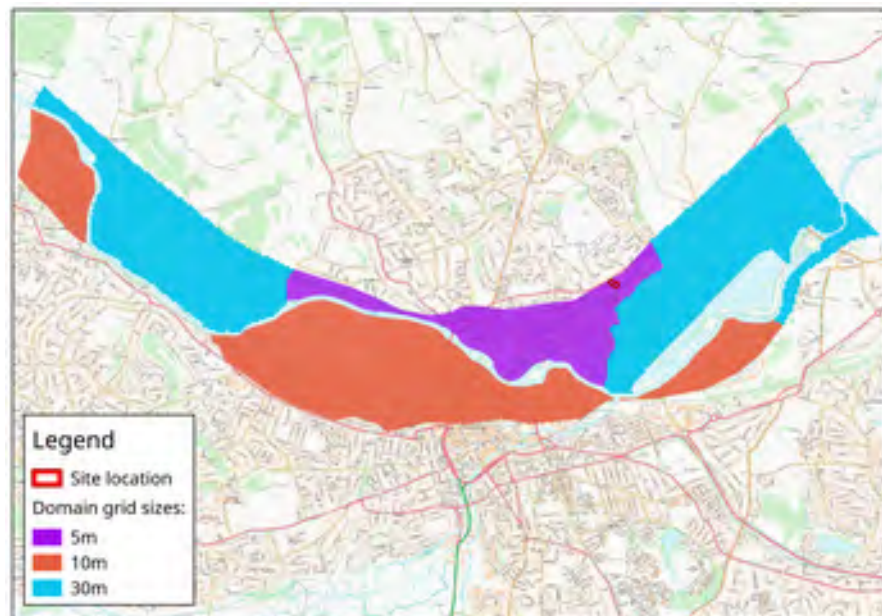
The supplied model was large, complex and contained two different TUFLOW domains.

The larger domain was kept at a 30m grid size, as no additional accuracy was required in this area.

The smallest domain in the supplied model was set at 10m grid size and included the Reading area, where the proposed development site in Caversham site is located.

To improve model accuracy local to the development site, this domain was further split and a new even smaller 5m grid size domain replaced the old 10m domain to the north of the River Thames local to the site.

Figure 4.2 below shows the final TUFLOW domains and the location of the site within these.



*Figure 4.2: TUFLOW Model domains*

#### 4.1.3 *Time-step*

The ISIS 1D time-step was reduced to 1 second following the reduction in grid size. The 2D time-step is 2 seconds in order to match the minimum grid size of 5m.

#### 4.1.4 *Boundary Conditions*

The previous ISIS model schematisation was causing problems with the high flows produced at the high return periods associated with the climate change events.

Several approaches were suggested, however in order to minimise changes to the existing model, the boundary was kept in place and a spill with the same shape as the previous river section was introduced upstream of the boundary. This modification has no effect on the results but allows the model to run stably at high return periods.

#### **4.1.5**      *Terrain Data*

The model makes use of 1m LiDAR data for the majority of the DTM. This is the latest available LiDAR made available from the Environment Agency Open data store.

#### **4.1.6**      *Terrain Modification*

In the updated model, topographic survey data of the site was included, that modifies the values of the corresponding LiDAR data and represents ground levels local to the site more accurately. This topographic survey data was processed and refined for use in the model.

#### **4.1.7**      *Model Roughness*

The roughness values in the 1D FMP and 2D TUFLOW model have been carried over from the original Jacobs model.

#### **4.1.8**      *Improvements*

The model has been reviewed and some issues amended. Gully lines were snapped to avoid creation of “friction barriers”. The original model contained all gullies and culverts separated by a short distance. This issue was corrected and now all the culverts and gullies pass flow with no restriction.

Another feature of the original model that has been amended was the existence of 1d networks in the 2D domain. This may not be an issue if they are coded out but the supplied model included a “double counting” of the flood path; one in the 1D with the network and another one in the 2D domain with the LiDAR.

## 5 Results

### 5.1 Flood maps

The flood events modelled were the 1 in 100 year, 1 in 100 year plus 35% climate change allowance, 1 in 100 year plus 70% climate change allowance and the 1 in 1000 year event return periods.

Figure 5.1 to Figure 5.4 show the maximum inundation extent results on a large scale. Figure 5.5 to Figure 5.8 show the maximum inundation extent results on a site-specific scale.

Figure 5.9 shows a maximum flood extent map, showing results for all the four modelled scenarios. It also gives the maximum modelled flood levels for each event:

|                                                 |           |
|-------------------------------------------------|-----------|
| 1 in 100 year                                   | 36.32mAOD |
| 1 in 100 year plus 35% climate change allowance | 36.64mAOD |
| 1 in 100 year plus 70% climate change allowance | 36.80mAOD |
| 1 in 1000 year event return periods.            | 36.76mAOD |

The development is free from flooding in the 1 in 100 year event, 1 in 100 year return period flood event plus 35% climate change allowance, 1 in 100 year return period flood event plus 70% climate change allowance and the 1 in 1000 year return period flood event.

The final two figures, Figure 5.10 and Figure 5.11 show a comparison between the flood zone extents for the Environment Agency supplied model and the updated, more detailed model developed for this study.

It can be seen that there is a slight reduction in flood zone extents produced from the updated model, which is likely to be associated with use of a smaller grid size and more accurate site survey data.

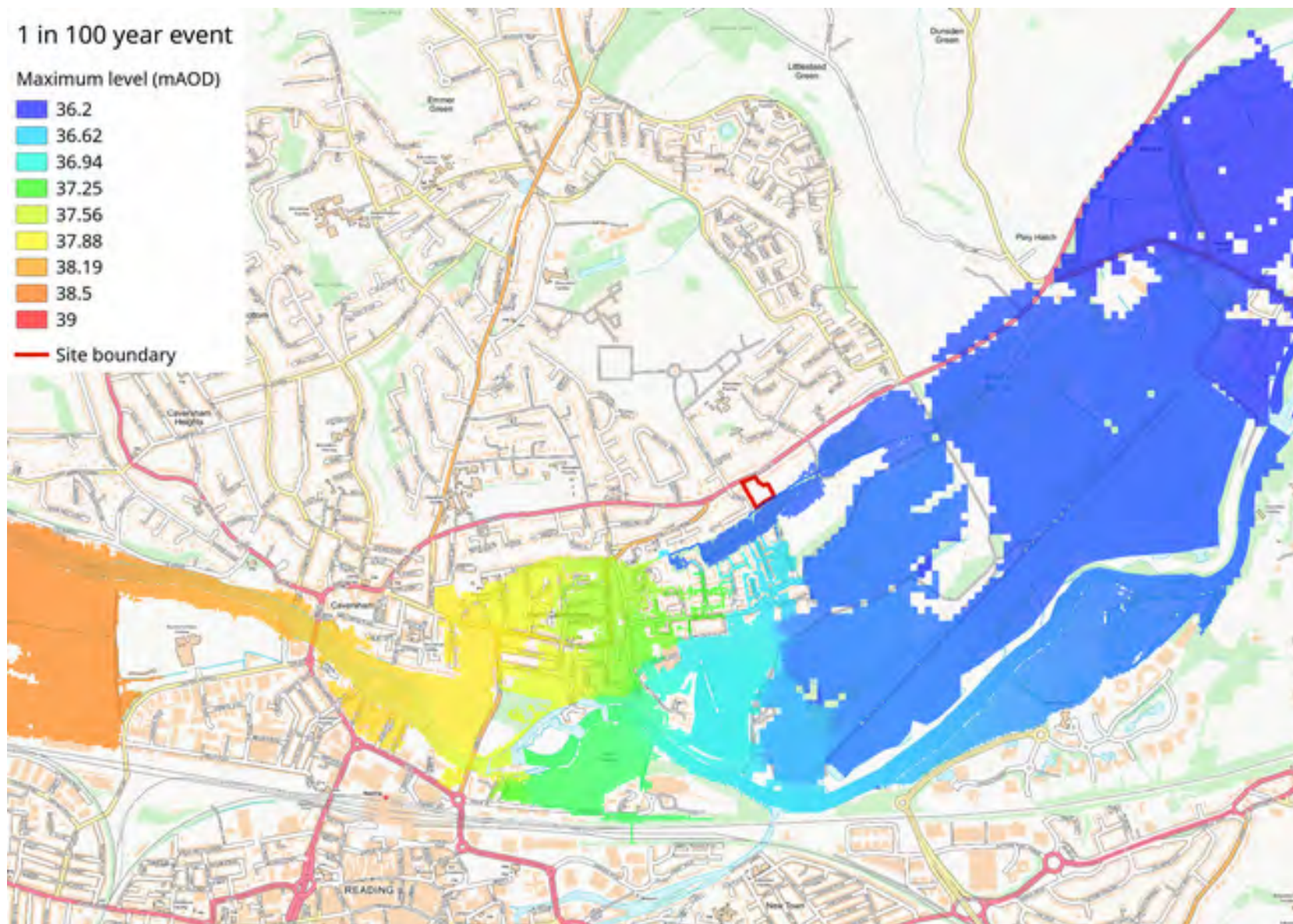


Figure 5.1: 1 in 100 year event return period flood extent

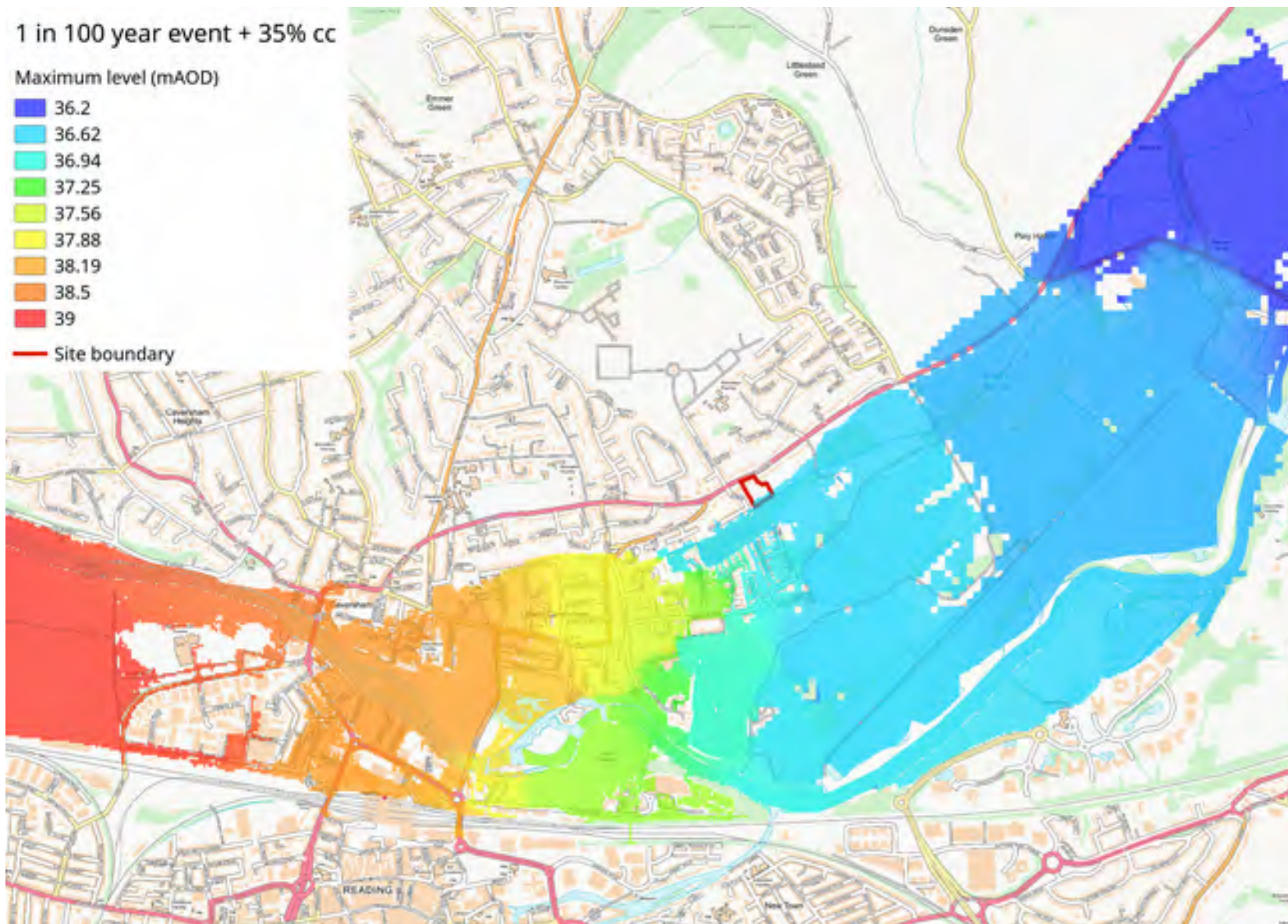


Figure 5.2: 1 in 100 year event return period flood extent plus 35% climate change

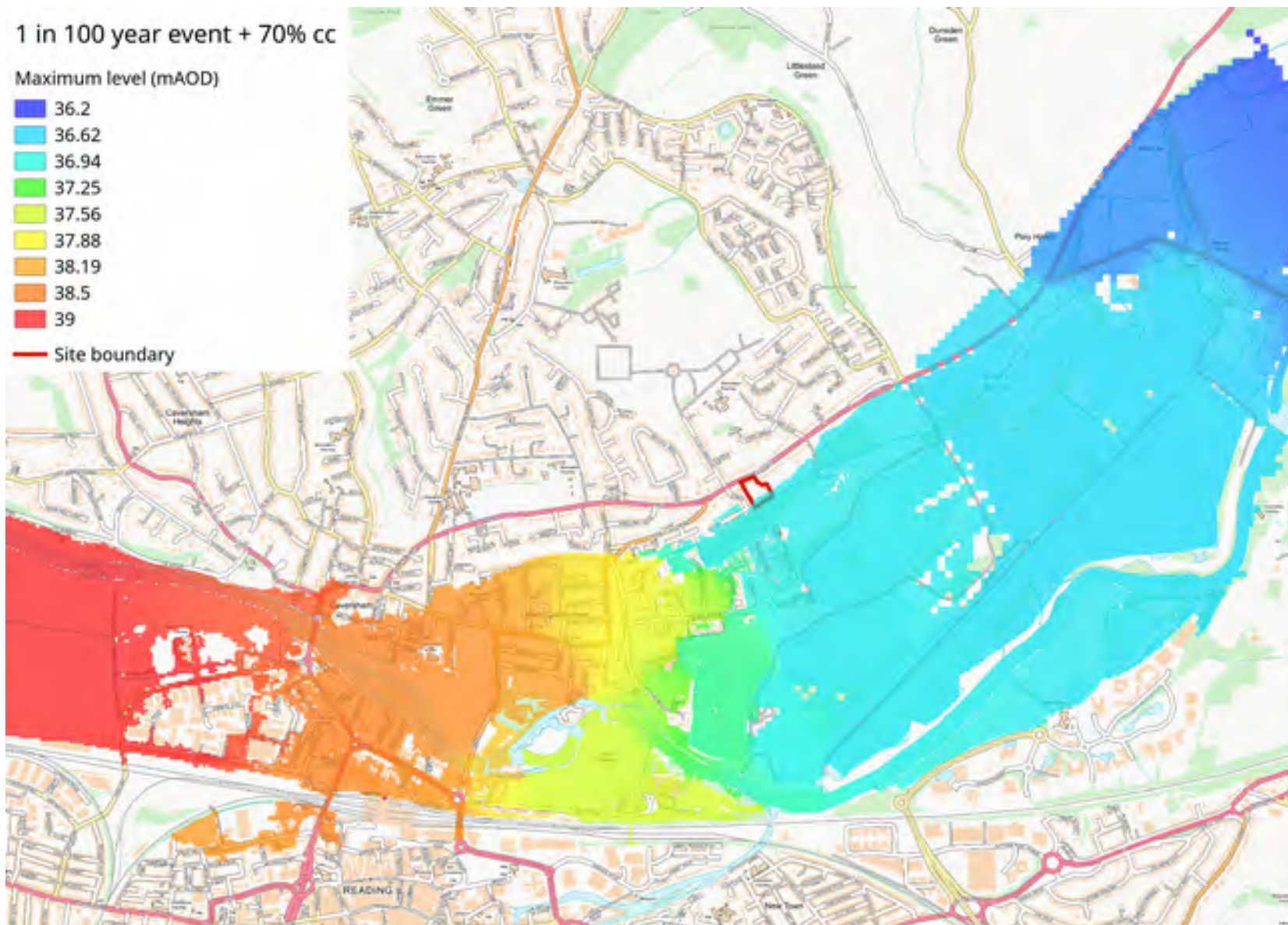


Figure 5.3: 1 in 100 year event return period flood extent plus 70% climate change

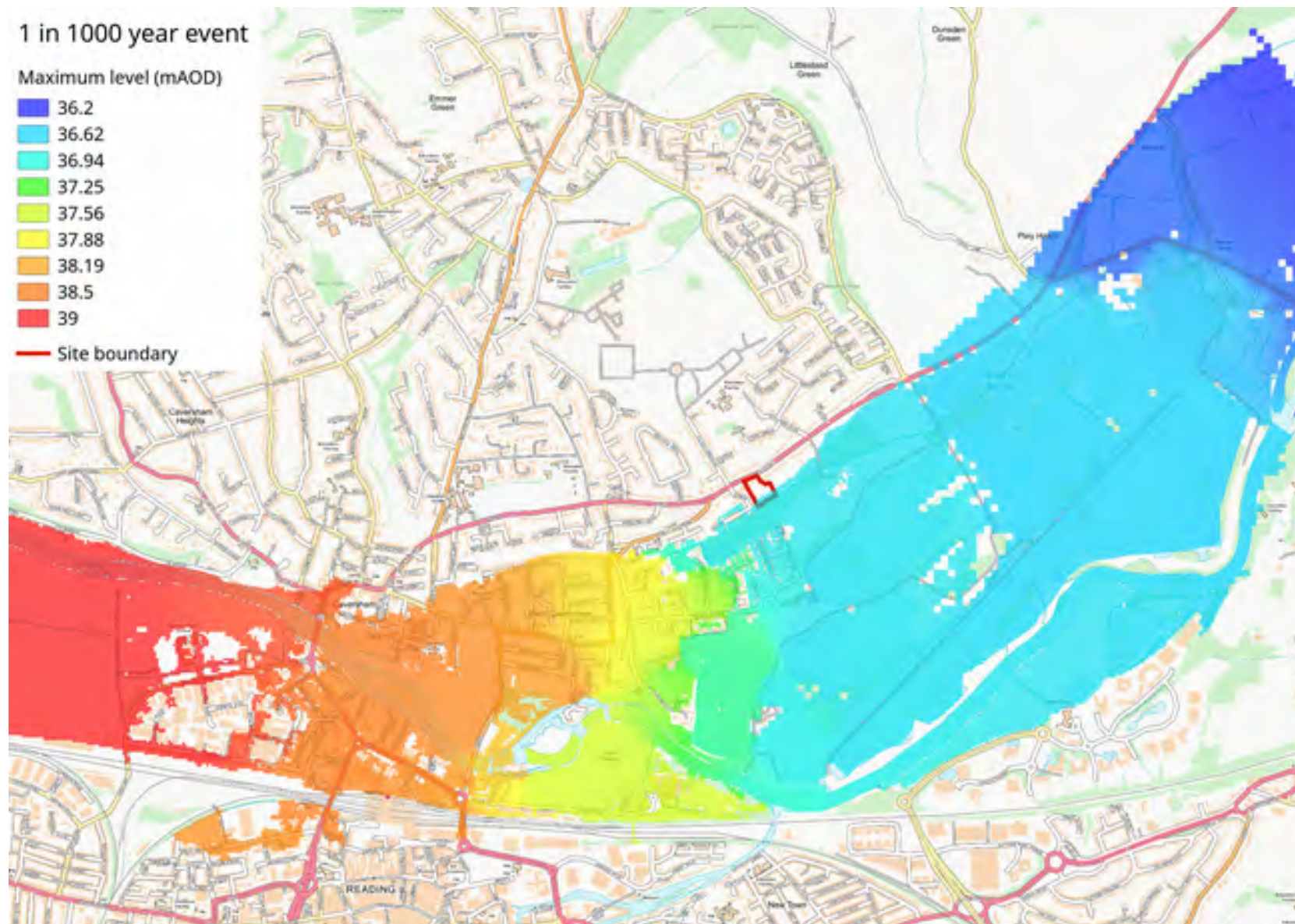


Figure 5.4: 1 in 1000 year event return period flood extent



*Figure 5.5: Site Level Detailed flood extent for 1 in 100 year return period flood*



Figure 5.6: Site Level Detailed flood extent for 1 in 100 year return period flood event plus 35% climate change allowance

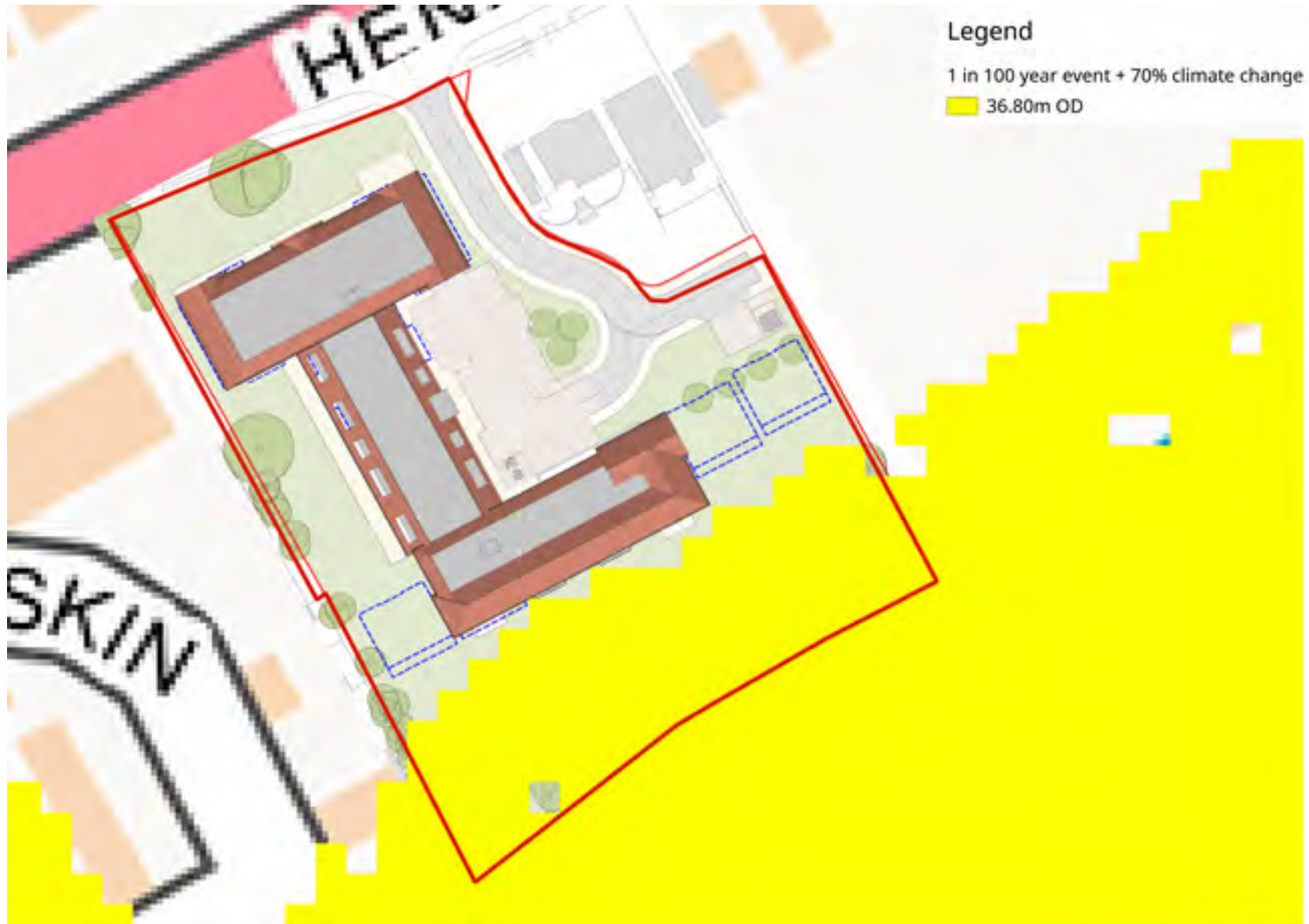


Figure 5.7: Site Level Detailed flood extent for 1 in 100 year return period flood event plus 70% climate change allowance



Figure 5.8: Site Level Detailed flood extent for 1 in 1000 year return period flood event

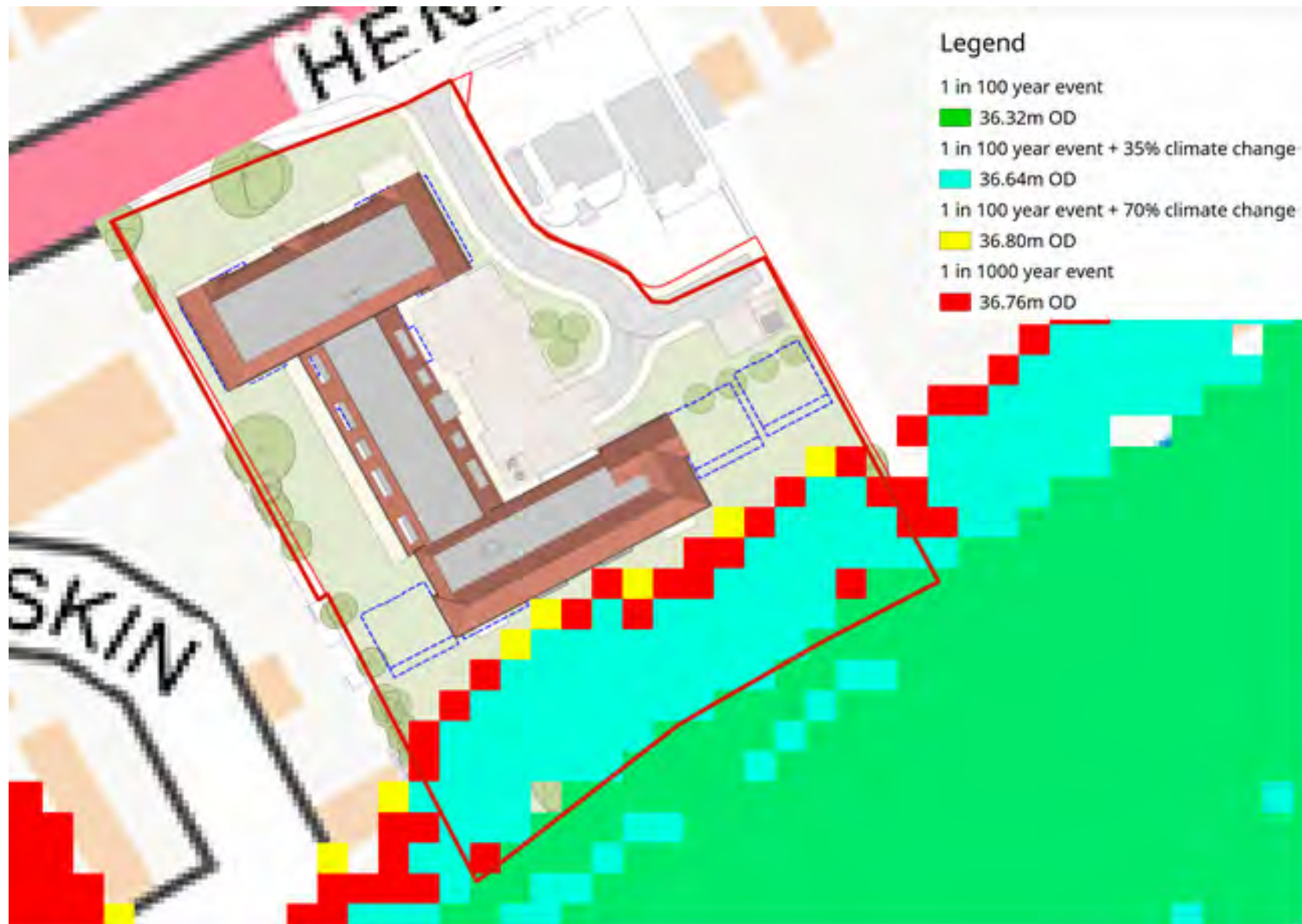


Figure 5.9: Maximum modelled flood levels for all modelled events



Figure 5.10: Comparison of updated and existing model flood zone 3 extents



Figure 5.11: Comparison of updated and existing model flood zone 2 extents

## 6 Conclusions

- A previous modelling study had been undertaken in 2017 by Edenvale Young Associates to update the existing Jacobs 2011 model and assess flood risk to the site. The results of the updated model were approved by the Environment Agency and planning permission for residential development on this site was obtained.
- The site was subsequently sold and is now to be developed as a care home (Class C2), communal and ancillary facilities, associated parking and landscaping. As the updated model results have been approved by the EA, these results are going to be used to assess flood risk to the new development within an FRA report.
- The updated model includes a higher resolution model domain in the Caversham area as well as the most up to date LiDAR data and detailed topographic survey of the proposed development site. Improvements were introduced to the model as supplied so that it would run successfully for the required high return period flood events using up to date versions of the FMP and TUFLOW software.
- The original hydrology has been used to minimise differences between the updated model and that supplied by the Environment Agency.
- The updated model was run successfully for the 1 in 100 year flood event, 1 in 100 year return period flood event plus allowances of 35% and 70% for climate change together with the 1 in 1000 year return period flood event.
- The updated model local to the proposed development site shows a slight reduction in flood extents when compared to the original, Environment Agency supplied model. This is likely to be due to the higher grid resolution and incorporation of detailed topographic survey data in this location.
- The development is free from flooding in all modelled return periods, including the 1 in 100 year event, 1 in 100 year return period flood event plus 35% climate change allowance, 1 in 100 year return period flood event plus 70% climate change allowance and the 1 in 1000 year return period flood event.
- The National Planning Policy Framework (NPPF) Sequential Test is used to, where possible, steer development toward sites at the lowest risk of flooding. Given that the development is located in Flood Zone 1 and thus at the lowest possible risk of

flooding, there is consequently no need for the Sequential Test to be passed.

## **7 Recommendations**

The Environment Agency should use the updated modelling to provide minor revisions to the existing flood map local to the Caversham area.

For flood resilience purposes it is recommended that finished floor level for all developments is 37.1mAOD. This is 300mm above the 1 in 100 year + 70% climate change event flood level of 36.80mAOD.

## Appendix A

Environment Agency agreement that the Edenvale Young model updates have successfully applied climate change.

---

**From:** Planning\_THM <Planning\_THM@environment-agency.gov.uk>  
**Sent:** 18 October 2017 15:11  
**To:** Bedford, Susanna  
**Cc:** 'ksconsultancy@btinternet.com'  
**Subject:** 170959  
**Attachments:** 170959.pdf

**This is an EXTERNAL EMAIL. STOP. THINK before you CLICK links or OPEN attachments.**

Dear Susanna  
I attach our response.

Kind Regards

Cathy Harrison  
Planning Advisor  
Sustainable Places  
Internal: 59601  
External: 0203 025 9601  
Email: [planning\\_THM@environment-agency.gov.uk](mailto:planning_THM@environment-agency.gov.uk)

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Ms Susanna Bedford  
Reading Borough Council  
Development Control  
PO Box 17  
Reading  
Berkshire  
RG1 7TD

**Our ref:** WA/2017/124117/03-L01  
**Your ref:** 170959  
**Date:** 18 October 2017

Dear Ms Bedford

**Demolition of nos. 199-203 Henley Road and erection of 60 dwellings at 199-203 Henley Road and to the rear of 205-207 Henley Road with associated access from Henley Road and landscaping at 199 Henley Road, Caversham, Reading, RG4 6LJ.**

We have reviewed the submitted hydraulic flood model and we agree that this has appropriately analysed climate change. The model has demonstrated that the 35% climate change level does not reach the proposed built development.

**Environment Agency position**

We have **no** objections to the proposed development providing the following conditions are applied to any planning permission granted.

**Condition 1**

The proposed development will only meet the requirements of the National Planning Policy Framework if the following measures as detailed in the Flood Risk Assessment, the FRA Addendum Report and the Proposed Site Section drawing submitted with this application are implemented and secured by way of a planning condition on any planning permission.

1. Finished flood levels are set no lower than 37.12 metres above Ordnance Datum.

The mitigation measures shall be fully implemented prior to occupation and subsequently in accordance with the timing / phasing arrangements embodied within the scheme, or within any other period as may subsequently be agreed, in writing, by the local planning authority.

**Reason 1**

To reduce the risk of flooding to the proposed development and future occupants.

Cont/d..

**Condition 2**

Any walls or fencing constructed within or around the site within the 1% annual probability (1 in 100) flood extent with a 35% allowance for climate change shall be designed to be permeable to flood water.

**Reason 2**

Walls and fences can have a significant impact on the flow and storage of flood water, especially if they are constructed across a flood flow route. This can lead to higher levels of flood water on the upstream side of the fence or wall which will potentially increase the flood risk to nearby areas. This condition is necessary to prevent obstruction to the flow and storage of flood water, with a consequent increased risk of flooding.

**Advice to applicant**

We recommend the use of post and rail fencing, hit and miss fencing (vertical slats fixed alternately on each side of horizontal posts) or hedging. If a solid wall is proposed there must be openings below the 1% annual probability (1 in 100) flood level with an appropriate allowance for climate change to allow the movement of flood water. The openings should be at least 1 metre wide by the depth of flooding and there should be one opening in every 5-metre length of wall.

**Ground Raising**

There should be no ground raising within the 1% annual probability (1 in 100) flood extent with a 35% allowance for climate change. This is to prevent a loss of flood plain storage and an obstruction to flood flows.

**Environmental permitting regulations (EPR)**

This development may require an Environmental Permit from the Environment Agency under the terms of the Environmental Permitting (England and Wales) (Amendment) (No. 2) Regulations 2016 for any proposed works or structures, in, under, over or within 8 metres of the top of the bank of designated 'main rivers'. This was formerly called a Flood Defence Consent. Some activities are also now excluded or exempt. An environmental permit is in addition to and a separate process from obtaining planning permission. Further details and guidance are available on the GOV.UK website: <https://www.gov.uk/guidance/flood-risk-activities-environmental-permits>.

Please provide a copy of the decision notice for our records. This would be greatly appreciated.

If you have any queries regarding this letter please do not hesitate to contact me.

Yours sincerely

**Mrs Cathy Harrison**  
**Planning Advisor**

Direct dial 0203 025 9601

Direct e-mail [planning\\_THM@environment-agency.gov.uk](mailto:planning_THM@environment-agency.gov.uk)

cc Kevin Scott Consultancy



**APPENDIX C**

**SEWER DIVERSION DOCUMENTS**

CLARK SMITH PARTNERSHIP DRAWINGS S1, S2 & S3

AND

THAMES WATER APPROVAL LETTERS DATED  
29<sup>th</sup> NOVEMBER 2018



**Hiten Gorsia**

Clark Smith Partnership  
65 Whitechapel Road  
London  
E1 1DU

|          |                                      |
|----------|--------------------------------------|
| Your ref |                                      |
| Our ref  | DS6052298                            |
| Name     | Natalya Collins                      |
| Phone    | 0203 577 8292                        |
| Email    | developer.services@thameswater.co.uk |

29 November 2018

Dear Mr Gorsia

**Sewer Diversion under Section 104/116 of the Water Industry Act 1991**

**Site Address: 199-203 HENLEY ROAD CAVERSHAM READING RG4 6LJ**

Thank you for your diversion application for the above site. Due to the non-strategic nature of the sewer you would like to divert, we would process your original S185 Sewer Diversion application under a Section 104/116 diversion agreement. This will allow your own suitably qualified contractor (so long as they have operatives qualified for working in confined spaces) to undertake the diversion works, which will be inspected by Thames Water and subject to a legal agreement. Diversion of a sewer under Section 104/116 requires Thames Water to agree to adopt the new sewer in advance of construction (S104), and divest/abandon as a public sewer the old section (S116).

Following the technical review of your design we are pleased to confirm that your proposals as shown on drawing number SIG29-S1 Rev P6, SIG29-S3 Rev P2 and SIG29-S2 Rev P5 are acceptable to us in principle, subject to completion of a suitable Section 104/116 Agreement. Our acceptance is also subject to certain conditions and statements which are listed below.

1. All plans should include the following statement: 'All adoptable drainage works to be constructed as detailed in Sewers for Adoption, 7<sup>th</sup> edition' or as stipulated in Thames Water's Addendum.
2. Please ensure the provision of rocker pipes.
3. No private drainage shown coloured on the proposed Agreement plan.
4. All sewers proposed for adoption are to be constructed with a minimum 3.0m easement either side of the sewer where it is located outside public open space.
5. Where 3.0m easement cannot be provided adjacent to proposed building footprints, a Build Over application must be submitted.
6. Pressure testing programme. Sewers for adoption 7<sup>th</sup> Edition E7.3.3 sets out the requirement for an air-test once backfilling is complete. In the case of sewers constructed using plastic pipework of less than 400mm diameter, TWUL requires that under clause E1.3, the post-backfilling test shall be carried out at the end of the maintenance period to confirm that any high pressure jetting carried out

Thames Water  
Developer Services  
3<sup>rd</sup> Floor West  
Clearwater Court  
Vestern Road  
Reading  
RG1 8DB

T 0800 009 3921  
I [www.thameswater.co.uk](http://www.thameswater.co.uk)

Thames Water Utilities Ltd  
Registered in England and Wales  
No. 2366661, Registered office



under clause E7.1.1 has not damaged the pipework. For complex developments, TWUL may require the developer to provide an air testing programme showing how the air testing of plastic pipework will be carried out.

NOTE: For the avoidance of doubt, for new clay and concrete sewers, no air test is required at the end of the maintenance period as their resistance to high pressure jetting is much greater. See WRC Jetting Guidance for further information.

7. Trees and shrubs of a large size or heavy canopy, or with a moderate or high water demand must not be planted within any sewer easement.

The above acceptance is for the onsite adoptable gravity network only and is not to be used for the discharge of any drainage related planning condition covering the offsite drainage strategy and any related reinforcement works detailed in the Sewer Impact Study.

These works may be undertaken by a competent contractor of your choice so long as they have operatives qualified to work in confined spaces.

Thames Water  
Developer Services  
3<sup>rd</sup> Floor West  
Clearwater Court  
Vastern Road  
Reading  
RG1 8DB

T 0800 009 3921  
I [www.thameswater.co.uk](http://www.thameswater.co.uk)

Thames Water Utilities Ltd  
Registered in England and Wales  
No. 2366661, Registered office



## NEXT STEPS

### 1. LEGAL AGREEMENT

Please find attached a legal draft copy S104/116 agreement and legal pro forma document. Note; the S104 Agreement is only a 'draft copy', not to be send to solicitors. On completion of the attached legal pro forma, our solicitors will be instructed to prepare the S104 agreement specific to this site. **It is imperative that the legal pro forma is fully completed, (missing information will lead to delays and costs between our respective solicitors).**

In light of this, we require the following information:

- A completed copy of the enclosed Legal pro forma document completing all sections marked Developer/Agent.
- Payment for our inspection fees to the value of **£1,300**, representing 2.5% of the scheme estimate after deduction of initial £500 application fee. Please note that in addition our solicitors will also request a fee in the region of £600 to draft the legal agreement (please pay that money to our solicitors on their request and inform your solicitor). Please note that the £1,000 fee already paid for the S185 Sewer Diversion application will be covering the £500 S116 Divesting fee and the remaining £500 will be used against the required S104 inspection fees.

Thames Water requires a cash deposit in lieu of the normal bond or surety. The deposit must be paid before any sewer diversion works begin on site and should be equal in value to the full estimate of the proposed diversion works. In this case Thames Water estimates the value of the work to be **£72,000**.

This deposit is fully refundable (in stages) once the diversion has been completed, inspected to our satisfaction, and the developer has fulfilled his obligations as set out in the standard clauses of the aforementioned Agreement. (see pages 158-159 of Sewers for Adoption 6<sup>th</sup> edition).

Please note that no works can begin until the Section 104/116 Agreement has been signed and the cash deposit paid.

### 2. SITE INSPECTIONS

#### Gravity Sewer

Please provide 3 copies of the adoptable drainage layout plan, manhole schedule and longitudinal sections, this will be submitted to our Field Engineer to complete the inspections. They will contact you to arrange this. Please fill Site Inspections Contact Details form and send back.

Thames Water  
Developer Services  
3<sup>rd</sup> Floor West  
Clearwater Court  
Vestern Road  
Reading  
RG1 8DB

T 0800 009 3921  
I [www.thameswater.co.uk](http://www.thameswater.co.uk)

Thames Water Utilities Ltd  
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### **3. PROVISIONAL CERTIFICATE AND REFUND OF 80% DEPOSIT**

In order to issue the Provisional Certificate of Substantial Completion and refund 80% deposit we will need the following items in place:

- 1) Signed Agreement
- 2) Satisfactory inspection and CCTV Survey of the adoptable sewers
- 3) As Built drawings

### **4. FINAL CERTIFICATE AND REFUND OF REMAINING 20% DEPOSIT**

Following the 12 months Maintenance Period we will carry out a final inspection before issuing the Final Certificate and 20% refund. Please contact the Field Engineer to arrange the final inspection quoting the Service Order provided.

The reference number for your application is DS6052298 ; please quote this in any future communications.

If you have any questions please give the Helpdesk a call on 0800 009 3921. We are open 8am-5pm, Monday to Friday, or you can email us at [developer.services@thameswater.co.uk](mailto:developer.services@thameswater.co.uk).

We look forward to hearing from you.  
Yours sincerely

A handwritten signature in black ink, appearing to read 'Natalya', written over a light grey rectangular background.

Natalya Collins  
Development Engineer - Wastewater

Thames Water  
Developer Services  
3<sup>rd</sup> Floor West  
Clearwater Court  
Vastern Road  
Reading  
RG1 8DB

T 0800 009 3921  
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Thames Water Utilities Ltd  
Registered in England and Wales  
No. 2366661, Registered office

**LEGAL INSTRUCTION PRO FORMA - TO BE COMPLETED BEFORE THAMES'  
SOLICITORS WILL PROGRESS SECTION 104 AGREEMENT**

**THAMES WATER - LEGAL INSTRUCTION PRO FORMA**

**PLEASE NOTE:**

- This document is to be completed prior to Thames Waters' solicitors progressing the section 104/116 Agreement.
- Please complete and return this document via return email as a PDF attachment to [developer.services@thameswater.co.uk](mailto:developer.services@thameswater.co.uk) providing the reference number starting with 'DS' followed by 7 No. digits.

**- PLEASE TAKE TIME TO ENSURE ALL REQUIRED FIELDS ARE FULLY COMPLETED, FAILURE TO DO SO WILL RESULT IN DELAYS / INCREASED COSTS INCURRED WITH SOLICITORS FOR BOTH PARTIES.**

**\* Mandatory Fields** - All boxes marked in yellow are Mandatory fields that must be completed

|                                 |                                                                                                       |                                                                |
|---------------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| <b>*1. Developer/<br/>Agent</b> | Name and location of Development                                                                      | Name:<br><br>Address:                                          |
| 2. TWE                          | Thames Water Reference Number                                                                         | DS6052298                                                      |
| <b>*3. Developer/<br/>Agent</b> | Developer's solicitor's details                                                                       | Name:.....<br><br>Address:<br>.....<br>.....<br>.....<br>..... |
| <b>*4. Developer/<br/>Agent</b> | Developer's details<br><br>(Note: please enter details of all developers, if there are more than one) | Name:.....<br><br>Address:<br>.....<br>.....<br>.....<br>..... |

**LEGAL INSTRUCTION PRO FORMA - TO BE COMPLETED BEFORE THAMES'  
SOLICITORS WILL PROGRESS SECTION 104 AGREEMENT**

|                          |                                                                                                                                                                                                                          |                                                                |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| *5. Developer/<br>Agent  | Owner's details if different to Developer<br><br>(Note: please enter details of all Owners, if there are more than one)                                                                                                  | Name:.....<br><br>Address:<br>.....<br>.....<br>.....<br>..... |
| *6. Developer/<br>Agent  | Adjoining Owners who need to be a party to the Agreement<br><br>(Note please enter details of all Adjoining Owners, if there are more than one)                                                                          | Name:.....<br><br>Address:<br>.....<br>.....<br>.....<br>..... |
| 8. TWE                   | Cash deposit in lieu of the normal bond or surety                                                                                                                                                                        | £ <b>72,000</b>                                                |
| 9. TWE                   | Inspection Fees                                                                                                                                                                                                          | £ <b>1,300</b>                                                 |
| *10. Developer/<br>Agent | Period of Construction and date it starts from<br><br>(Note : The planned completion date for the S.104 Agreement must NOT be more than 3 months from the date you provide us with the completed Instruction Pro Forma). | Period of construction: .....<br><br>Start date: .....         |
| *11. Developer/<br>Agent | Layout Plan(s)                                                                                                                                                                                                           | Drawing Number(s).....                                         |
| *12. Developer/<br>Agent | Is a Deed of Easement required?<br><br>Will the party to the Deed of Easement be the Owner or the Adjoining Owner?                                                                                                       |                                                                |
| *14. Developer/<br>Agent | Is there a Pumping Station? (Whether or not transfer is to happen at a later date)                                                                                                                                       |                                                                |
| 15. TWE                  | Does this instruction include the <u>transfer</u> of a Pumping Station?                                                                                                                                                  | <b>No</b>                                                      |
| *16. Developer/<br>Agent | Are there any above ground surface water Balancing Facilities?                                                                                                                                                           |                                                                |



## CONTACT DETAILS FOR INSPECTIONS FORM

Please fill and return

Thames Water application reference: DS6052298

|                                       |  |
|---------------------------------------|--|
| <b>FULL NAME<br/>AND<br/>COMPANY:</b> |  |
| <b>PHONE:</b>                         |  |
| <b>EMAIL:</b>                         |  |

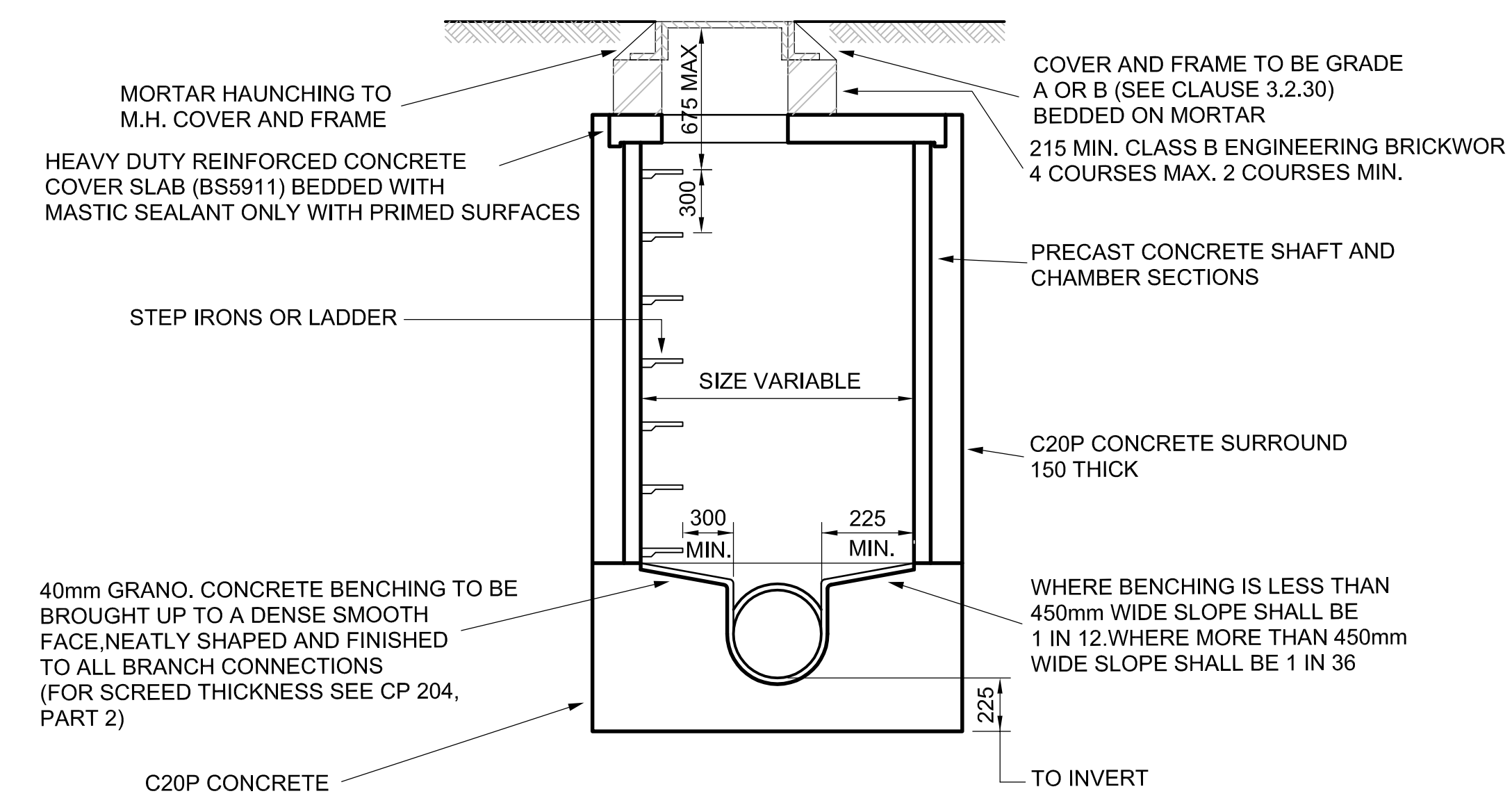
Thames Water  
Developer Services  
3<sup>rd</sup> Floor West  
Clearwater Court  
Vastern Road  
Reading  
RG1 8DB

T 0800 009 3921  
I [www.thameswater.co.uk](http://www.thameswater.co.uk)

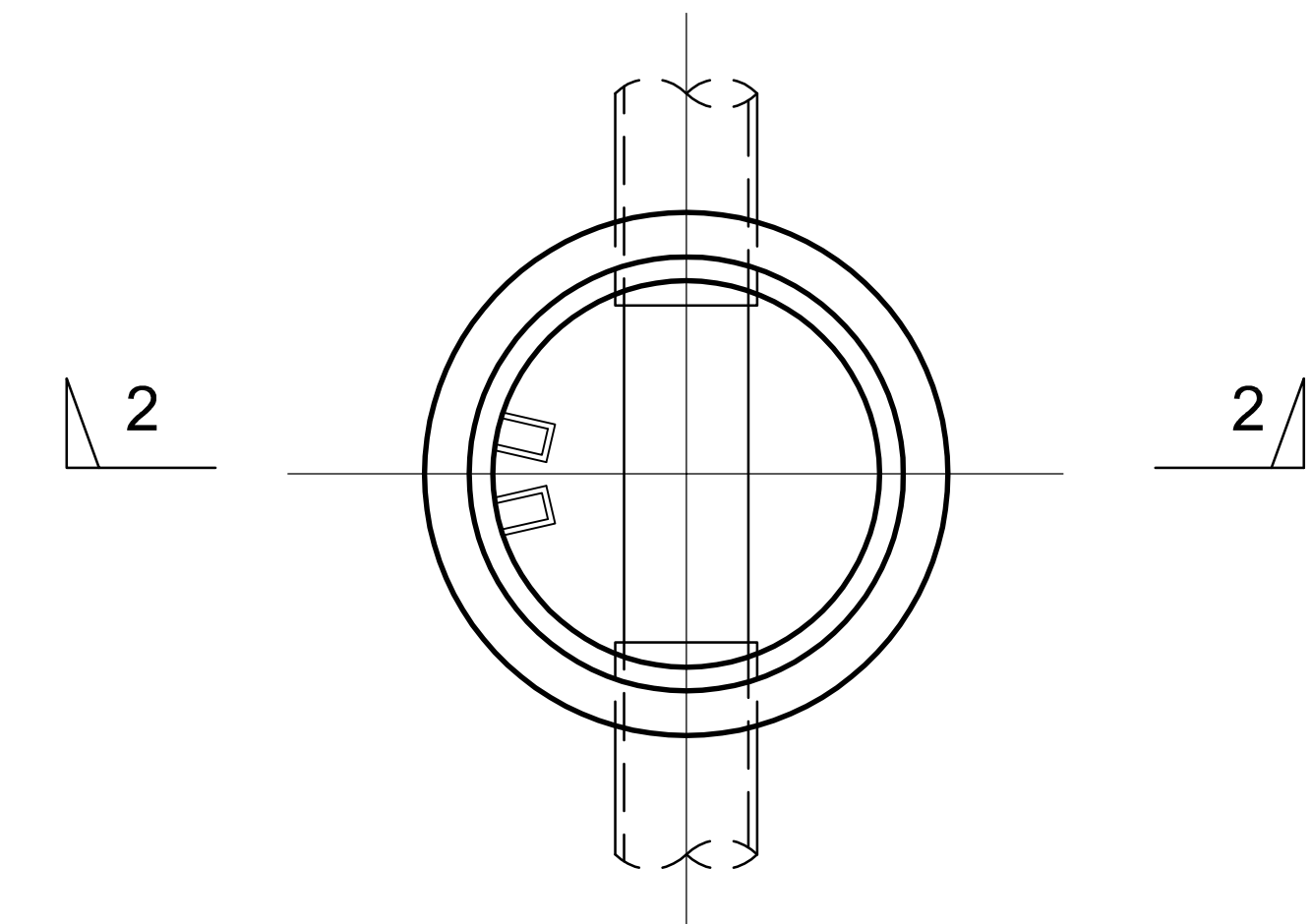
Thames Water Utilities Ltd  
Registered in England and Wales  
No. 2366661, Registered office



- ## NOTES
1. FOR LONGITUDINAL SECTIONS REFER TO DRG.No. SIG29-S2.
  2. ALL ADAPTABLE DRAINAGE WORKS TO BE CONSTRUCTED AS DETAILED IN SEWERS FOR ADOPTION, 7th EDITION OR AS STIPULATED IN THAMES WATER'S ADDENDUM.
  3. TREES WITH MODERATE TO HIGH WATER DEMAND AND LARGE SHRUBS TO BE LOCATED OUTSIDE SEWER EASEMENT ZONE, WHERE TREES ARE WITHIN EASEMENT ZONE PROVIDE TREE ROOT PROTECTION TO SEWER.
  4. FINAL MANHOLE LOCATIONS SUBJECT TO DESIGN AND DEVELOPMENT.
  5. INVERT LEVELS OF EXISTING MANHOLES MH9103 & MH2022 DERIVED FROM EMAIL OF 20.06.2018 FROM TMW. INVERT LEVELS OF DOWNSTREAM MANHOLE ON RUSKIN ROAD DERIVED USING CCTV SURVEY AND AN ASSUMED COVER LEVEL OF 38.90m AOD.
  6. MANHOLES TO BE LOCATED 1.0m AWAY FROM KERB/ FOOTPATH AND ONTO ROAD.
  7. ALL EXISTING ABANDONED SEWERS TO BE GRUBBED OUT

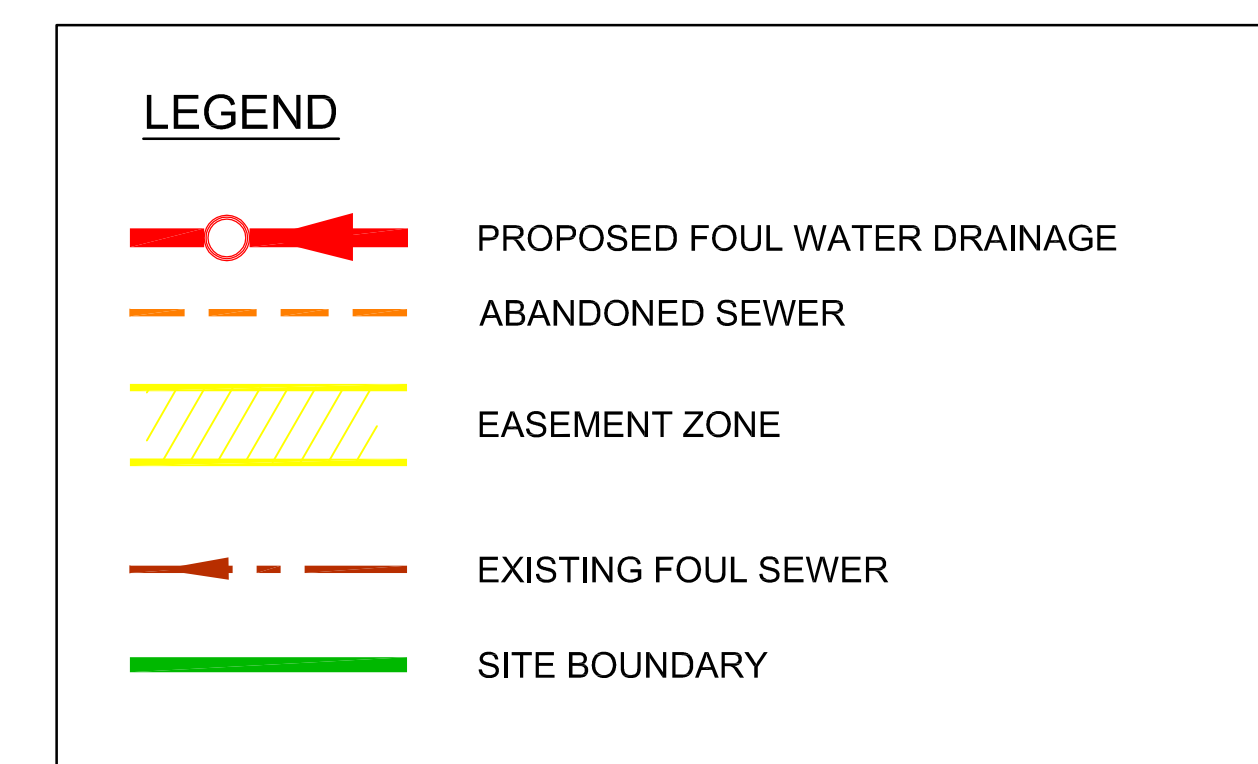


SECTION 2 - 2



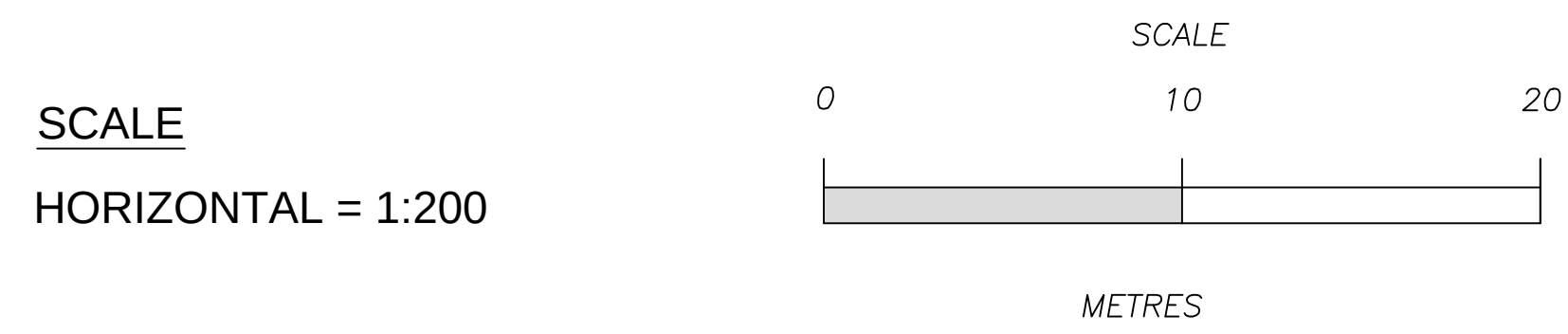
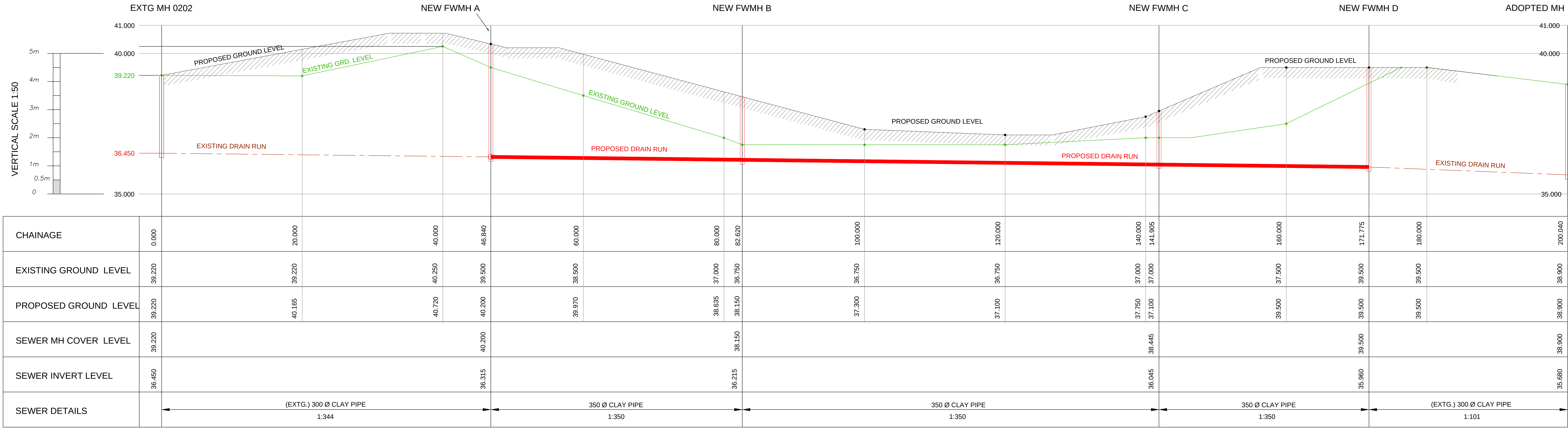
### TYPICAL CONCRETE MANHOLE DETAIL

SCALE 1:25

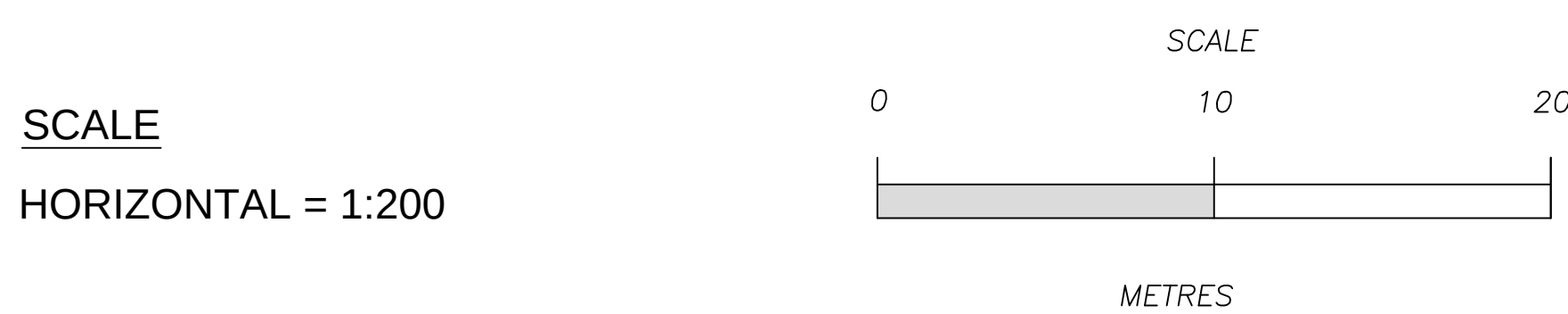
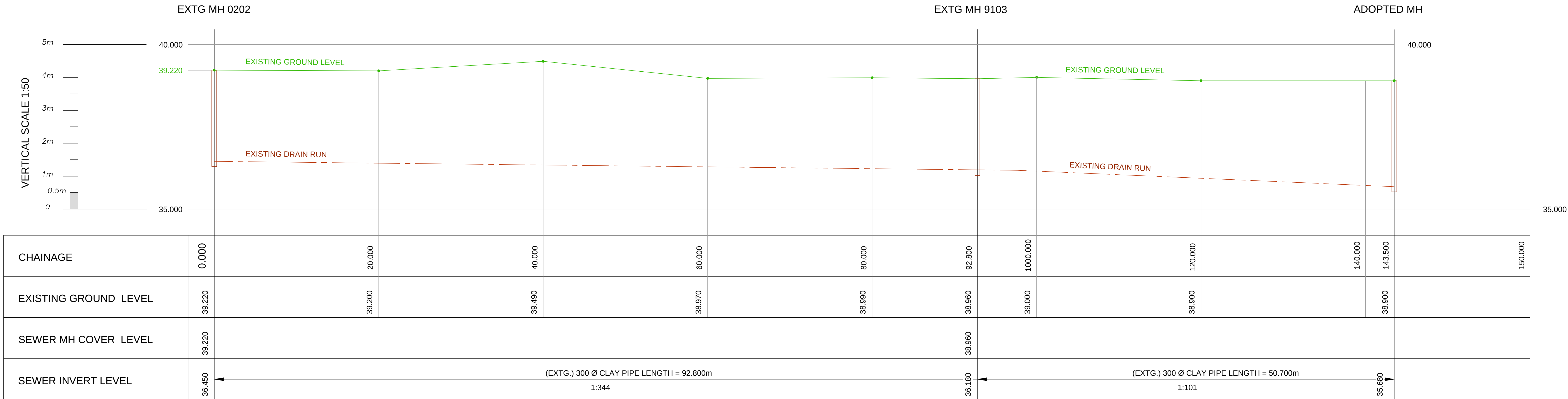


| FOUL WATER MANHOLE SCHEDULE |                     |                      |               |            |            |      |               |
|-----------------------------|---------------------|----------------------|---------------|------------|------------|------|---------------|
| MH. REF.                    | COVER LEVEL<br>(m ) | INVERT LEVEL<br>(m ) | DEPTH<br>(m ) | COVER TYPE | MANHOLE    |      | NOTES         |
|                             |                     |                      |               |            | TYPE       | SIZE |               |
| MH 0202 (extg.)             | 39.220              | 36.450               | 2.770         | ---        | ---        | ---  | ---           |
| FWMH A                      | 40.200              | 36.315               | 3.885         | D400       | TYPE 2 PCC | 1200 | 750 SQ. COVER |
| FWMH B                      | 38.150              | 36.215               | 1.935         | D400       | TYPE 3 PCC | 1200 | 600 SQ. COVER |
| FWMH C                      | 38.445              | 36.045               | 2.400         | C250       | TYPE 3 PCC | 1200 | 600 SQ. COVER |
| FWMH D                      | 39.500              | 35.960               | 3.540         | C250       | TYPE 2 PCC | 1200 | 750 SQ. COVER |
| EXTG. MH<br>(Ruskin)        | 38.900              | 35.680               | 3.220         | ---        | ---        | ---  | ---           |
| FWMH E                      | 42.800              | 39.130               | 3.670         | D400       | TYPE 2 PCC | 1200 | 750 SQ. COVER |

|                                                                                                                                                                                                                                 |                                                                |                   |           |       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-------------------|-----------|-------|
| P6                                                                                                                                                                                                                              | ENTRANCE ROAD ALIGNMENT REVISED                                | 19.11.16          | MB        | HG    |
| P5                                                                                                                                                                                                                              | PRELIMINARY FOR COMMENT                                        | 17.10.16          | LCS       | HG    |
| P4                                                                                                                                                                                                                              | SEWER DRAIN RUN & MH TABLE REVISED                             | 05.10.16          | LCS       | HG    |
| P3                                                                                                                                                                                                                              | SITE PLAN AND NOTES UPDATED                                    | 17.09.16          | LCS       | HG    |
| P2                                                                                                                                                                                                                              | NOTES AND MH SCHEDULE AMENDED AS PER THAMES WATER REQUIREMENTS | 12.09.16          | LCS       | HG    |
| P1                                                                                                                                                                                                                              | ISSUED FOR APPROVAL                                            | 11.08.16          | LCS       | HG    |
| Rev                                                                                                                                                                                                                             | Description                                                    | Date              | By        | CHK'd |
| Status                                                                                                                                                                                                                          |                                                                |                   |           |       |
| <h2>PRELIMINARY</h2>                                                                                                                                                                                                            |                                                                |                   |           |       |
| Client                                                                                                                                                                                                                          |                                                                |                   |           |       |
|                                                                                                                                            |                                                                |                   |           |       |
| Project                                                                                                                                                                                                                         |                                                                |                   |           |       |
| <b>199 - 203 HENLEY ROAD<br/>CAVERSHAM, READING<br/>RG4 6LJ</b>                                                                                                                                                                 |                                                                |                   |           |       |
| Title                                                                                                                                                                                                                           |                                                                |                   |           |       |
| <b>S104/116 DRAINAGE<br/>PLAN</b>                                                                                                                                                                                               |                                                                |                   |           |       |
| <b>CLARK SMITH PARTNERSHIP</b><br>CONSULTING CIVIL & STRUCTURAL ENGINEERS<br>WHITECHAPEL TECHNOLOGY CENTRE<br>65 WHITECHAPEL ROAD, LONDON E1 1DU<br>TEL: 020 7247 7315    FAX: 020 7247 7476<br>E-MAIL: ENGINEERS@CSPLONDON.COM |                                                                |                   |           |       |
|                                                                                                                                            |                                                                |                   |           |       |
| Scale @ A0<br>1:200 U.N.O.                                                                                                                                                                                                      | Drawn<br>LCS                                                   | Date<br>SEPT. '18 | Checked   |       |
| Job Number                                                                                                                                                                                                                      | Dirg Number                                                    |                   | Revision  |       |
| <b>SIG29</b>                                                                                                                                                                                                                    | <b>S1</b>                                                      |                   | <b>P6</b> |       |



LONGITUDINAL SECTION THROUGH PROPOSED FOUL DRAIN RUN

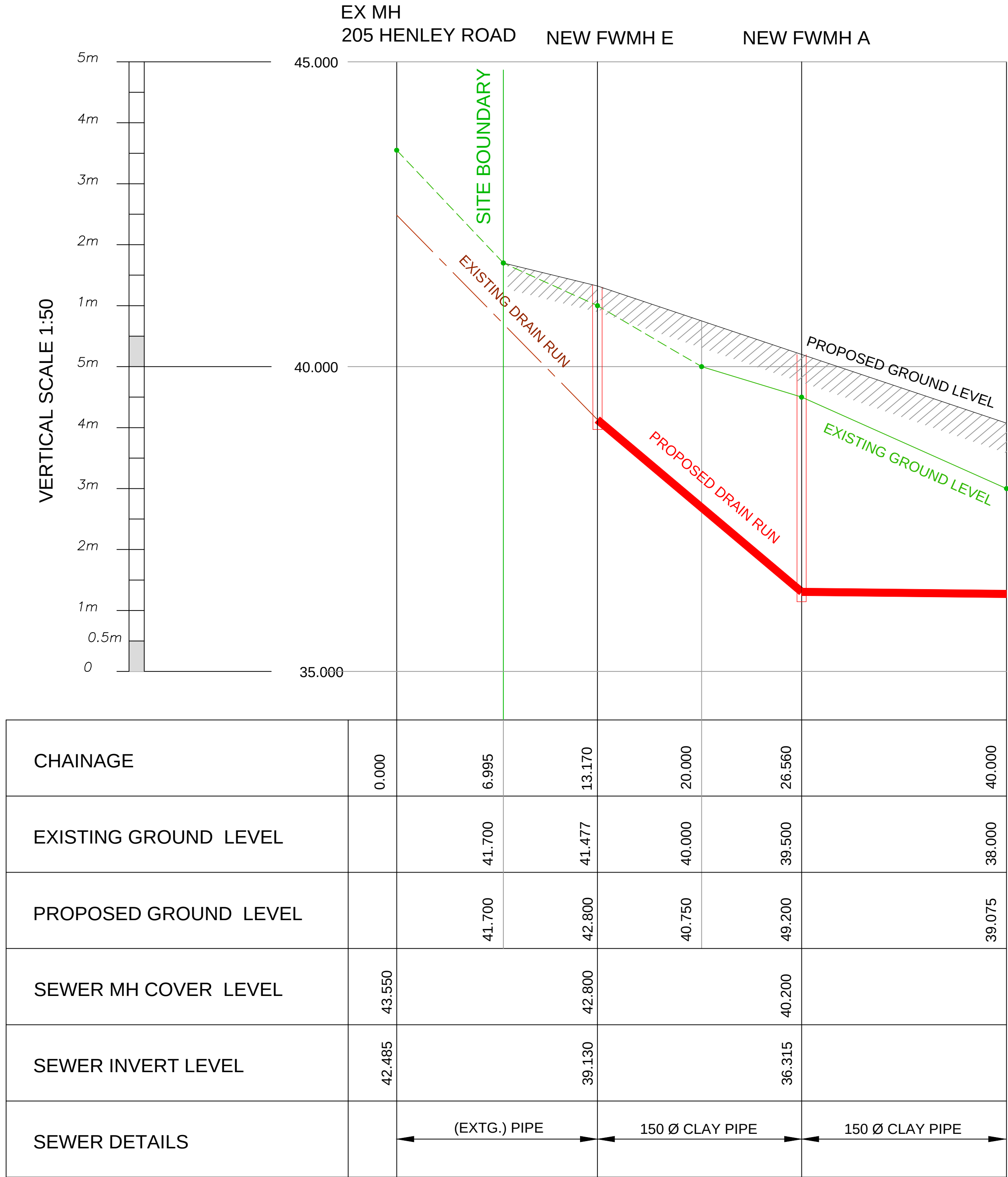


LONGITUDINAL SECTION THROUGH EXISTING FOUL DRAIN RUN

NOTES

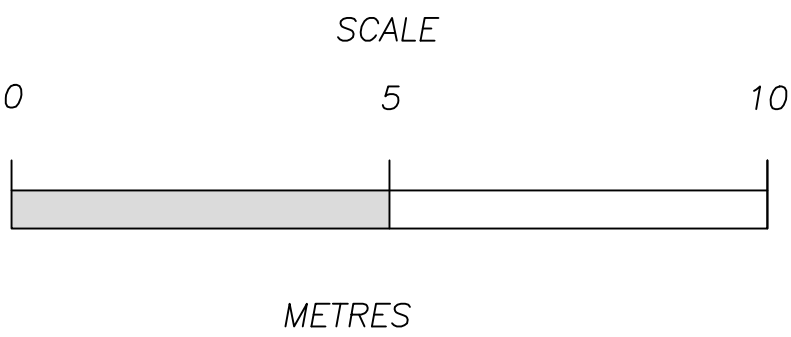
- FOR PLANS REFER TO DRG. No. SIG29-S1
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|                                                                                                                                                                                                                      |                                 |          |         |       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------|---------|-------|
|                                                                                                                                                                                                                      |                                 |          |         |       |
| P5                                                                                                                                                                                                                   | ISSUED FOR COMMENT              | 29.11.18 | MB      | HG    |
| P4                                                                                                                                                                                                                   | PROPOSED GROUND PROFILE AMENDED | 05.10.18 | LCS     | HG    |
| P3                                                                                                                                                                                                                   | SECTIONS AND NOTES UPDATED      | 17.09.18 | LCS     | HG    |
| P2                                                                                                                                                                                                                   | NOTES AMENDED                   | 12.09.18 | LCS     | HG    |
| P1                                                                                                                                                                                                                   | ISSUED FOR APPROVAL             | 11.09.18 | LCS     | HG    |
| Rev                                                                                                                                                                                                                  | Description                     | Date     | By      | CHK'd |
| Status                                                                                                                                                                                                               |                                 |          |         |       |
| PRELIMINARY                                                                                                                                                                                                          |                                 |          |         |       |
| Client                                                                                                                                                                                                               |                                 |          |         |       |
| Signature                                                                                                                                                                                                            |                                 |          |         |       |
| Project                                                                                                                                                                                                              |                                 |          |         |       |
| 199-203 HENLEY ROAD<br>CAVERSHAM, READING<br>RG4 6LJ                                                                                                                                                                 |                                 |          |         |       |
| Title                                                                                                                                                                                                                |                                 |          |         |       |
| S104/116<br>DRAINAGE LAYOUT<br>LONGITUDINAL SECTIONS                                                                                                                                                                 |                                 |          |         |       |
| CLARK SMITH PARTNERSHIP<br>CONSULTING CIVIL & STRUCTURAL ENGINEERS<br>WHITECHAPEL TECHNOLOGY CENTRE<br>65 WHITECHAPEL ROAD, LONDON E1 1DU<br>TEL: 020 7247 7315 FAX: 020 7247 7476<br>E-MAIL: ENGINEER@CSPLONDON.COM |                                 |          |         |       |
| Scale @ AD                                                                                                                                                                                                           | Drawn                           | Date     | Checked |       |
| AS NOTED                                                                                                                                                                                                             | LCS                             | SEPT. 18 |         |       |
| Job Number                                                                                                                                                                                                           | Dwg Number                      | Revision |         |       |
| SIG29                                                                                                                                                                                                                | S2                              | P5       |         |       |



SCALE

HORIZONTAL = 1:100



LONGITUDINAL SECTION THROUGH PROPOSED FOUL DRAIN RUN

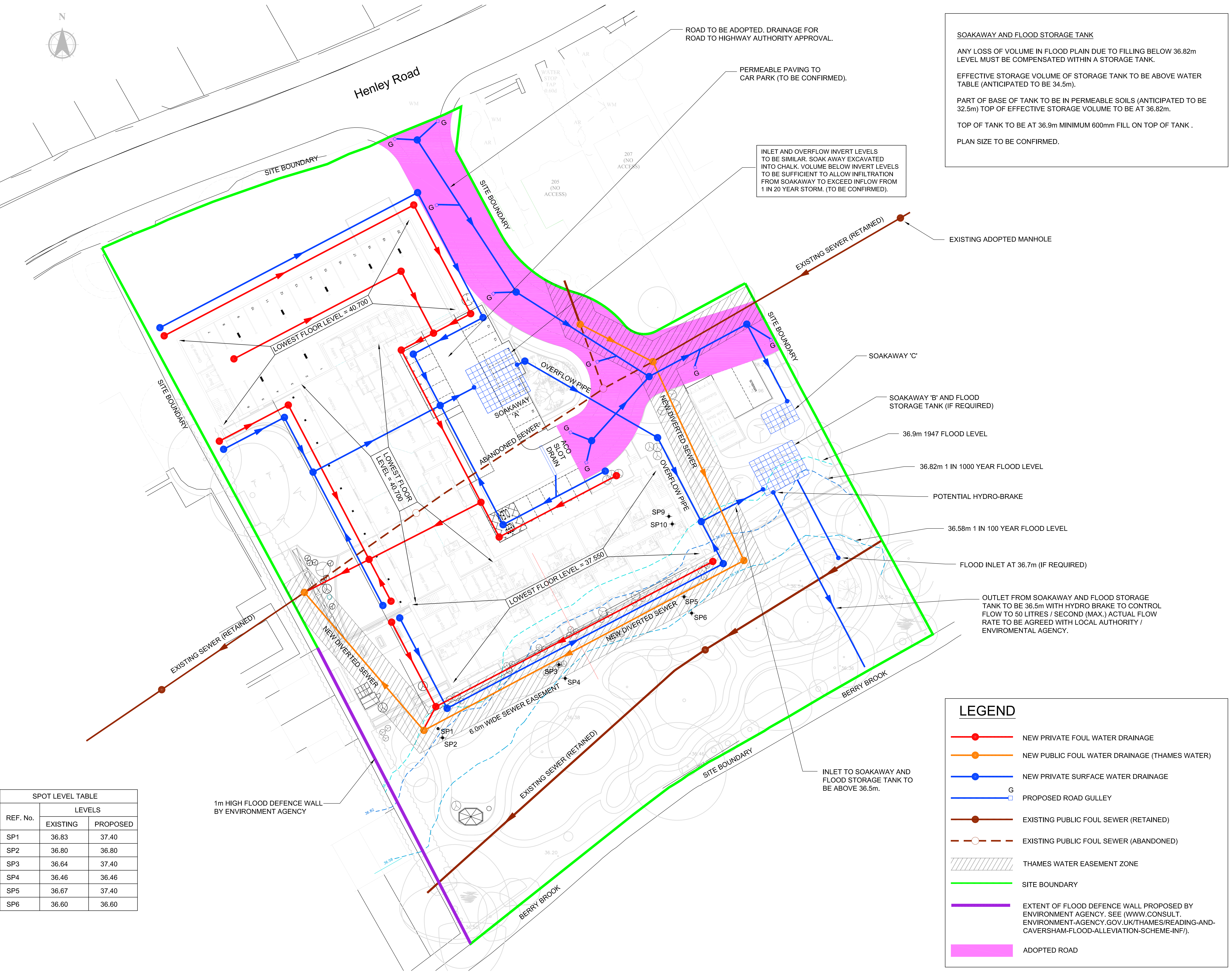
NOTES

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|                                                                                                                                                                                                                      |                     |          |                                                                                       |      |  |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------|---------------------------------------------------------------------------------------|------|--|--|--|
|                                                                                                                                                                                                                      |                     |          |                                                                                       |      |  |  |  |
| P2                                                                                                                                                                                                                   | ISSUED FOR COMMENT  | 19.11.18 | MB                                                                                    | HG   |  |  |  |
| P1                                                                                                                                                                                                                   | ISSUED FOR APPROVAL | 05.10.18 | LCS                                                                                   | HG   |  |  |  |
| Rev                                                                                                                                                                                                                  | Description         | Date     | By                                                                                    | Chkd |  |  |  |
| Status                                                                                                                                                                                                               |                     |          |                                                                                       |      |  |  |  |
| PRELIMINARY                                                                                                                                                                                                          |                     |          |                                                                                       |      |  |  |  |
| Client                                                                                                                                                                                                               |                     |          |                                                                                       |      |  |  |  |
|                                                                                                                                 |                     |          |                                                                                       |      |  |  |  |
| Project                                                                                                                                                                                                              |                     |          |                                                                                       |      |  |  |  |
| 199-203 HENLEY ROAD<br>CAVERSHAM, READING<br>RG4 6LJ                                                                                                                                                                 |                     |          |                                                                                       |      |  |  |  |
| Title                                                                                                                                                                                                                |                     |          |                                                                                       |      |  |  |  |
| ---/---<br>DRAINAGE LAYOUT<br>LONGITUDINAL SECTIONS                                                                                                                                                                  |                     |          |                                                                                       |      |  |  |  |
| CLARK SMITH PARTNERSHIP<br>CONSULTING CIVIL & STRUCTURAL ENGINEERS<br>WHITECHAPEL TECHNOLOGY CENTRE<br>65 WHITECHAPEL ROAD, LONDON E1 1DU<br>TEL: 020 7247 7315 FAX: 020 7247 7476<br>E-MAIL: ENGINEER@CSPLONDON.COM |                     |          |                                                                                       |      |  |  |  |
| Scale @ A0                                                                                                                                                                                                           | Drawn               | Date     | Checked                                                                               |      |  |  |  |
| AS NOTED                                                                                                                                                                                                             | LCS                 | SEPT. 18 |  |      |  |  |  |
| Job Number                                                                                                                                                                                                           | Org Number          | Revision |                                                                                       |      |  |  |  |
| SIG29                                                                                                                                                                                                                | S3                  | P2       |                                                                                       |      |  |  |  |

## **APPENDIX D**

### **FOUL AND SURFACE WATER DRAINAGE CONCEPT**



| SPOT LEVEL TABLE |          |          |
|------------------|----------|----------|
| REF. No.         | LEVELS   |          |
|                  | EXISTING | PROPOSED |
| SP1              | 36.83    | 37.40    |
| SP2              | 36.80    | 36.80    |
| SP3              | 36.64    | 37.40    |
| SP4              | 36.46    | 36.46    |
| SP5              | 36.67    | 37.40    |
| SP6              | 36.60    | 36.60    |

**SOAKAWAY AND FLOOD STORAGE TANK**

ANY LOSS OF VOLUME IN FLOOD PLAIN DUE TO FILLING BELOW 36.82m LEVEL MUST BE COMPENSATED WITHIN A STORAGE TANK.

EFFECTIVE STORAGE VOLUME OF STORAGE TANK TO BE ABOVE WATER TABLE (ANTICIPATED TO BE 34.5m).

PART OF BASE OF TANK TO BE IN PERMEABLE SOILS (ANTICIPATED TO BE 32.5m) TOP OF EFFECTIVE STORAGE VOLUME TO BE AT 36.82m.

TOP OF TANK TO BE AT 36.9m MINIMUM 600mm FILL ON TOP OF TANK .

PLAN SIZE TO BE CONFIRMED.

- NOTES**
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  - TREES WITH MODERATE TO HIGH WATER DEMAND AND LARGE SHRUBS TO BE LOCATED OUTSIDE SEWER EASEMENT ZONE.
  - FINAL MANHOLE LOCATIONS SUBJECT TO DESIGN AND DEVELOPMENT.

**LEGEND**

- NEW PRIVATE FOUL WATER DRAINAGE
- NEW PUBLIC FOUL WATER DRAINAGE (THAMES WATER)
- NEW PRIVATE SURFACE WATER DRAINAGE
- PROPOSED ROAD GULLEY
- EXISTING PUBLIC FOUL SEWER (RETAINED)
- EXISTING PUBLIC FOUL SEWER (ABANDONED)
- THAMES WATER EASEMENT ZONE
- SITE BOUNDARY
- EXTENT OF FLOOD DEFENCE WALL PROPOSED BY ENVIRONMENT AGENCY. SEE (WWW.CONSLT. ENVIRONMENT-AGENCY.GOV.UK/THAMES/READING-AND-CAVERSHAM-FLOOD-ALLEVATION-SCHEME-INF/).
- ADOPTED ROAD

|                                                                                                                                                                                                                      |                                     |           |         |       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-----------|---------|-------|
| P9                                                                                                                                                                                                                   | SOAKAWAY 'C' MOVED                  | 08.10.19  | RM      | AP    |
| P8                                                                                                                                                                                                                   | OVERFLOW PIPE DELETED               | 08.10.19  | RM      | AP    |
| P7                                                                                                                                                                                                                   | UPDATED TO AMEND FLOW RATE TO BROOK | 07.10.19  | RM      | AP    |
| P6                                                                                                                                                                                                                   | UPDATED TO SUIT ADOPTED ROAD        | 03.10.19  | RM      | GP    |
| P5                                                                                                                                                                                                                   | NEW LAYOUT INSERTED                 | 17.04.19  | RM      | GP    |
| P4                                                                                                                                                                                                                   | UPDATED                             | 14.03.19  | RM      | HG    |
| P3                                                                                                                                                                                                                   | UPDATED                             | 14.03.19  | RM      | HG    |
| P2                                                                                                                                                                                                                   | ISSUED PRELIMINARY FOR COMMENT      | 01.10.18  | LCS     | HG    |
| P1                                                                                                                                                                                                                   | ISSUED PRELIMINARY FOR COMMENT      | 19.08.18  | LCS     | HG    |
| Rev Description                                                                                                                                                                                                      |                                     | Date      | By      | CHK'd |
| Status                                                                                                                                                                                                               |                                     |           |         |       |
| <b>PRELIMINARY</b>                                                                                                                                                                                                   |                                     |           |         |       |
| Client                                                                                                                                                                                                               |                                     |           |         |       |
|                                                                                                                                                                                                                      |                                     |           |         |       |
| Project                                                                                                                                                                                                              |                                     |           |         |       |
| 199 - 203 HENLEY ROAD<br>CAVERSHAM, READING<br>RG4 6LJ                                                                                                                                                               |                                     |           |         |       |
| Title                                                                                                                                                                                                                |                                     |           |         |       |
| DRAINAGE LAYOUT                                                                                                                                                                                                      |                                     |           |         |       |
| CLARK SMITH PARTNERSHIP<br>CONSULTING CIVIL & STRUCTURAL ENGINEERS<br>WHITECHAPEL TECHNOLOGY CENTRE<br>65 WHITECHAPEL ROAD, LONDON E1 1DU<br>TEL: 020 7247 7315 FAX: 020 7247 7476<br>E-MAIL: ENGINEER@CSPLONDON.COM |                                     |           |         |       |
| Scale @ AD                                                                                                                                                                                                           | Drawn                               | Date      | Checked |       |
| 1:200 U.N.D.                                                                                                                                                                                                         | LCS                                 | SEPT. '18 |         |       |
| Job Number                                                                                                                                                                                                           | Dwg Number                          | Revision  |         |       |
| SIG29                                                                                                                                                                                                                | DR-00-01                            | P9        |         |       |