



# Land between South Mansions and Gondar House

**Structures Stage 2 Report**

For

**ANX Developments**

SD Structures Project Reference

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## Contents

<b>1.0</b>	<b>Introduction.....</b>	<b>3</b>
<b>2.0</b>	<b>Existing Site Information .....</b>	<b>3</b>
<b>3.0</b>	<b>Proposed works.....</b>	<b>4</b>
<b>4.0</b>	<b>Drainage Strategy.....</b>	<b>5</b>
<b>5.0</b>	<b>Temporary works and Sequence of Construction .</b>	<b>8</b>
<b>6.0</b>	<b>Construction Implications .....</b>	<b>8</b>
<b>7.0</b>	<b>Conclusion .....</b>	<b>11</b>
	<b>APPENDIX A Outline Specification .....</b>	<b>12</b>
	<b>APPENDIX B Proposed Structural Drawings .....</b>	<b>13</b>
	<b>APPENDIX C Proposed Civil Drawings .....</b>	<b>14</b>
	<b>APPENDIX D Thames Water Asset Search .....</b>	<b>15</b>
	<b>APPENDIX E Draft Construction Programme .....</b>	<b>16</b>

## 1.0 Introduction

SD Structures have been appointed as consulting engineers by ANX Developments to provide a structural engineering report in support of a Basement Impact Assessment (BIA) prepared by Card Geotechnics Limited (CGL).

SD Structures have designed numerous basements across London from new build double storey commercial buildings, to underpinning and domestic basements under listed buildings.

The report is to look at the construction aspects and impact of the proposed substructure, in support of a planning application to the London Borough of Camden (LBC).

The proposal building is a three-storey terraces of homes with a single storey basement. The property is in the London Borough of Camden and is a previously developed land, containing concrete hardstanding and grassed areas. To the north of the site is South Mansions; to the east of the site is the rear garden of 3 Hillfield Road; to the south of the site is Gondar House; to the west of the site is the pavement to the Land between South Mansions and Gondar House.

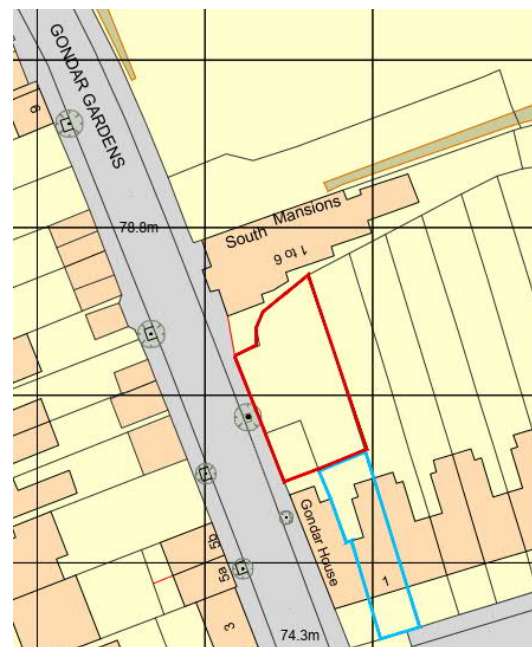


Figure 1 - Map of the project site

The red line in Figure 1 indicates the extent of the site to be developed.

The report has been prepared in line with the Camden Planning Guidance CPG4 – Basement and Lightwells and Camden Development Policies DP27 – Basement and Lightwells (July 2015). The report provides specific details of each stage of the basement impact process and information on the excavation, temporary works and construction techniques, including details of the potential impact of the subterranean development on the existing and neighbouring structures, based on the specific site characteristics, geology and hydrogeology. The report is intended to be read in conjunction with CGL Basement Impact Report Ref: CG/28978B dated May 2020.

The CGL report is arranged to suit the 5 stages required for any BIA within Camden, namely Screening, Scoping, Site investigation and study, Basement Impact Assessment and Review and Decision making. The structural engineering report refers to the 5 stages but is arranged in a sequence that best addresses the engineering matters discussed. Non-technical executive summaries on each stage are included within the CGL report.

## 2.0 Existing Site Information

### 2.1 Site History and Topography

The site is approximately 31m x 14m on plan. It is located 785m NW of West Hampstead Thameslink station. It is a previously developed land, containing concrete hardstanding and grassed areas.

The topography comprises of a slope running North to South dropping by around 1.5m from the upper north side of the proposed building to the south side of the site. The Network Rail Thameslink rail tracks are located approximately 200m to the SW of the site.

Further information on the site is found on within Chapter 03 of the CGL BIA report.

The existing site is within 2m proximity to a protected tree on the pavement. As such, the proposed works consists of 300mm diameter mini piles to account for the existing tree root protection zone. Specialist mini piled foundation techniques would be adopted to be in line with arboricultural advice.

### 2.2 Neighbouring Properties

The site is bounded by South Mansions to the north, 3 Hillfield Road to the east, Gondar House to the south, and 1 Hillfield Road to the south.

South Mansions is a three-storey Victorian block of flats with brickwork external walls. The building footprint extends to the east and does not appear to present any visible structural alterations to its layout.

3 Hillfield Road is a three-storey terraced Victorian property. The building footprint matches the approximate historic map records and does not appear to present any visible structural alterations to its layout, except the attic floor level which has been refurbished to accommodate a flat roof arrangement to the rear of the property. There is a new single storey outbuilding under construction within the garden of 3 Hillfield Road which is on the eastern site boundary of the site. There is a ground floor extension at 3 Hillfield Road currently under construction.

The Gondar House structure to the south of the site appears to have been constructed sometimes during 1910's with a slightly different layout along the rear elevation. Like 1-3 Hillfield Road, building is of similar architecture, height and structure fabric. The trial pits and further information in the CGL BIA revealed that there is no basement under the Gondar House along the party wall.

1 Hillfield Road is a three-storey terraced Victorian property. There is a live planning application to extend the building to the rear and at basement level.

## 2.3 Existing Ground Conditions

A geotechnical desk top study and site investigation was carried out by CGL and are included as part of their BIA. The CGL report should be referred to for detailed information on the ground conditions. A summary of the ground conditions outlined by CGL and associated to the rear building borehole position (WS03) is as follows:

- Made Ground (varies from 0m to 0.3m) – Firm dark brown gravelly silty clay. Gravel is subangular to angular, fine to coarse of brick and flint;
- London Clay (from 0.3m to 9.9m) – Firm brown mottled grey slightly silty clay with occasional sandy clay pockets. Sand is fine. Rare selenite crystals throughout;
- London Clay (from 9.9m to 10.0m) – Stiff grey silty clay;

Groundwater levels are discussed in section 7.6 of the CGL Basement Impact Assessment and include monitoring. The monitoring standpipes were installed to a depth of 6m and encountered water at 4.02 mbgl in the WS03 position. This is anticipated to be representative of perched water within the London Clay Formation, possibly as a result of inflow from ground level, and is not considered to be indicative of a continuous groundwater body. It is concluded that the water table is expected to be below the proposed basement formation level.

## 2.4 Existing Hydrogeology

The existing Hydrology, Flood Risk and Hydrogeological setting are discussed in detail in section 3.4 of the CGL BIA and should be referred to when considering these aspects. The current Environment Agency digital flood risk zones map reveals the area been situated in a Flood Risk Zone 1. As such, there is no FRA required for the site.

## 3.0 Proposed works

### 3.1 Proposed Development Summary

The proposal building is a three-storey terraces of homes with a single storey basement to provide floor space for duplex flats. Structural drawings are included in Appendix B.

## 3.2 Proposed Substructure

The proposed basement level is shown at a varying depth up to 4m below external ground level at the pavement. The basement consists of a basement slab and contiguous piled wall all round generally designed as a free-standing cantilever apart from where the basement is close to adjacent buildings. At the north east corner close to the outbuilding to rear of No.3 Hillfield Road, temporary and permanent propping is to be provided at the top of the contiguous piled wall. The basement slab is to be constructed as a reinforced concrete suspended slab supported on piles. The design of the piles is to be carried out by specialist geotechnical engineer based on the structural loading plans provided.

The basement waterproofing grade is to be Grade 3 generally for a habitable space to BS8102, which could be achieved using a waterproof additive in the basement concrete combined with a drained cavity system or liquid waterproofing membrane.

## 3.3 Proposed Superstructure and Stability

The structure is proposed to be of Structural Insulated Panels (SIPs) construction with timber flooring. The timber superstructure is to be built off a RC ground floor flat slab supported on the basement capping beam and internal concrete columns. Downstand concrete beam strips are proposed in areas of concentrated wall load and locations adjacent to large opening for stair voids. The basement wall is to be formed with a contiguous piled wall with a continuous capping beam.

The ground floor construction at the front half of the property, where there is no basement, is to consist of a suspended RC slab given the heave potential from the adjacent tree. The floor is to be supported on piles. The piled foundation is to be installed with specialist mini piled foundation in line with arboricultural advice and the existing tree root protection zone.

Lateral stability for the structure is provided by the SIPs panels, with the loads transferred to the diaphragm of the ground floor concrete slab and subsequently to the portal action of the central concrete columns and beams, before transferring to the ground through the pile foundation.



Figure 2 - Proposed Front Elevation



Figure 3 - Proposed Rear Elevation

## 3.4 Heave and Buoyancy

Due to the excavation and unloading of soils, the base of the excavation is likely to heave during construction and continue for a period of time after the ground has been excavated. We expect 50% of the total heave uplift forces to be released once the soil is removed. The total heave uplift pressure was confirmed by CGL to be 80kPa, thus 40kPa would be released once the excavation is completed.

The remainder 50% uplift pressure will apply vertically on to the concrete basement box. We have proposed an anti-heave Cordek layer to mitigate the uplift pressure.

### 3.5 Disproportionate Collapse

The buildings above basement level are classified as class 2A in Approved Document A of the Building Regulations. The basement is of reinforced concrete construction and inherently satisfies the tying requirements for class 2A. The timber structure comprising of loadbearing SIPS panels and timber floors is a form of platform timber frame construction that takes on a cellular plan form with all wall and floor components typically fixed to each other. The diaphragm action of the floor transfers horizontal loads to a distributed layout of load bearing walls, which in turn combines vertical support with horizontal racking resistance. Provided that all intersecting walls are fixed together and provide returns at all ends, robustness is provided by the effective anchorage of suspended floors to load bearing walls.

## 4.0 Drainage Strategy

### 4.1 Proposed Development Summary

The proposed drainage strategy is aimed at providing initial considerations with relation to the foul and surface water drainage for planning of the development and will be subject to review and amendments as the design evolves and consultation with the key statutory authorities is progressed.

### 4.2 Policy Requirements

This drainage statement sets out the principles for the proposed drainage strategy and provides outline proposals for the development, including demonstrating how SuDS techniques are proposed to be used on site. Considerations and constraints relevant to the Proposed Development have been considered with regard to the national, regional and local planning policy framework. The Proposed Development is assessed having regard to the following:

- The London Plan – Sustainable Design and Construction SPG
- Camden Planning Guidance - Water and Flooding
- Camden Planning Guidance - Basements
- National Planning Policy Framework (NPPF);
- Planning Practice Guidance (PPG);
- Emerging planning policies and guidance; and

- Relevant British Standards, Codes of Practice and Building Regulations as outlined the general drainage section.

### 4.3 London Plan

The London Plan (consolidated with alterations since 2011), March 2016, Policy 5.13 Sustainable drainage sets out the following SuDS principles.

A development should utilise sustainable urban drainage systems (SUDS) unless there are practical reasons for not doing so, and should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible in line with the following drainage hierarchy:

- store rainwater for later use;
- use infiltration techniques, such as porous surfaces in non-clay areas;
- attenuate rainwater in ponds or open water features for gradual release; attenuate rainwater by storing in tanks or sealed water features for gradual release;
- discharge rainwater direct to a watercourse
- discharge rainwater to a surface water sewer/drain;
- discharge rainwater to the combined sewer.

Due to the development's location, The London Plan's principles set out within its Sustainable Design and Construction SPG, section 3.4 for Flooding, are the most onerous for proposed developments within London.

This SPG provides guidance on surface water flooding, and states that in accordance with London Plan policy 5.13, developers should aim for greenfield runoff rates from their developments. It states that "typically this is between 2 and 8 litres per second per hectare". It recommends utilising the Institute of Hydrology Report 124 methodology for calculating greenfield runoff rates. It also states that "developers will be expected to clearly demonstrate how all opportunities to minimise final site runoff, as close to greenfield rate as practical, have been taken".

Section 3.4.9 depicts that "there may be situations where it is not appropriate to discharge at greenfield runoff rates", and if this is

the case, an "appropriate minimum discharge rate would be 5 litres per second per outfall".

### 4.4 National Planning Policy Framework & Planning Practice Guidance

Consideration has been given to the National Policy contained within the National Planning Policy Framework (NPPF) dated March 2012, issued by the Department for Communities and Local Government, with reference to Section 10 'Meeting the challenge of climate change, flooding and coastal change'. This has been read in conjunction with The NPPF Planning Practice Guidance (PPG) published in March 2012 and updated in April 2015 'Flood Risk and Coastal Change'.

#### 4.4 Defra National Standard for Sustainable Drainage Systems

As stated in section B7 of the Defra National Standard for Sustainable Drainage Systems, the approach for sites on previously developed land is as follows:

- Achieving as close to greenfield runoff rates as is reasonably practicable
- The flow rate discharged from the site must not exceed that prior to the proposed development for: the 1 in 1 year event; and the 1 in 100 year event.

The drainage systems must be designed so that, unless an area is designated for flood management in the Local Flood Risk Management Strategy, flooding from the drainage system does not occur:

- On any part of the site for a 1 in 30 year rainfall event; and
- During a 1 in 100 year rainfall event in any part of: a building (including a basement); or utility plant
- susceptible to water (e.g. pumping station or electricity substation); or
- On neighbouring sites during a 1 in 100 year rainfall event.

### 4.5 Climate Change

The Environment Agency's climate change guidance for flood risk assessments (February 2016) outlines the allowances for the impact of climate change on peak rainfall intensities, amongst other environmental concerns.

Applies across all of England	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper end	10%	20%	40%
Central	5%	10%	20%

Source: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

For rainfall intensity, 40% allowance for climate change should be accommodated within the design.

#### 4.6 Existing Drainage

The site is adjacent to Gondar Gardens road, within which is a 940 x 635mm (assumed culvert or brick egg shape) combined water sewer. Manhole reference 7202 is located adjacent to the site, with a cover level of 77.60m A.O.D. and an invert of 71.17m A.O.D. On visual inspection, there is an existing chamber assumed to outfall into this manhole located in the forecourt of South Mansions, immediately next to the site. This manhole has been noted on the Proposed Below Ground Drainage Layout, located in the appendix. It is current to be confirmed if the flows within this existing unknown chamber are combined, and if it is utilisable by the site.

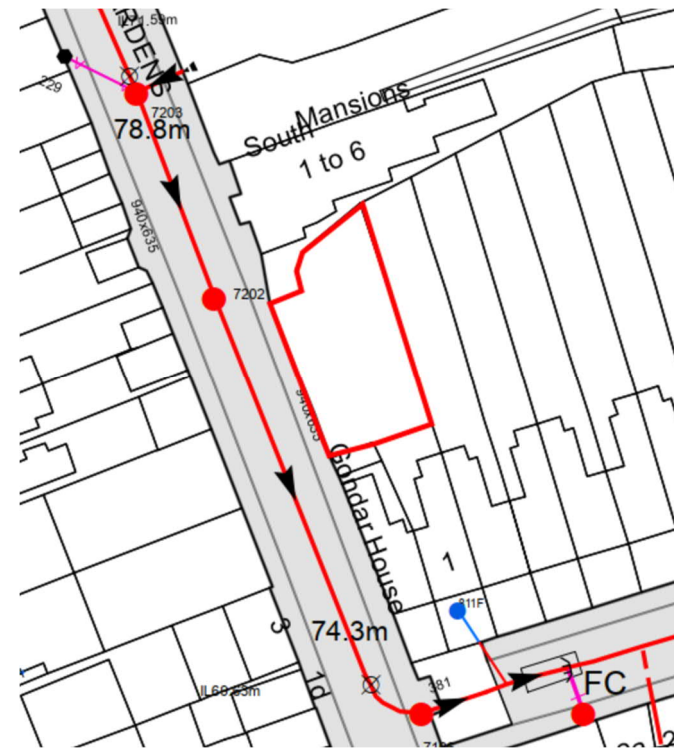


Figure 4 – Existing Thames Water Asset Plan

#### 4.7 Greenfield run-off rates

The existing site contained within the working redline area is 322.2m<sup>2</sup>, all of which is currently concrete hardstanding and grassed areas.

As per London plan, it is desirable to achieve Greenfield run-off for the area which is proposed to be developed. This has been calculated for the total proposed impermeable area (within the working red lines) as follows:

	Green field run-off rate (l/s)		
Total Area (m <sup>2</sup> )	1 in 1 year	1 in 30 year	1 in 100 year
294	0.1	0.3	0.4

Greenfield rates have been calculated from the site using MicroDrainage software's Source Control element, based on a pro-rated conversion of the IH124 calculation method.

#### 4.8 Pre-development run-off rates

In order to calculate the percentage reduction from the existing to the proposed development, the pre development run-off rate is

required. This has been calculated from the site area, as the majority of the existing site is impermeable:

	Pre-development run-off rate (l/s)		
Total Area (m <sup>2</sup> )	1 in 1 year	1 in 30 year	1 in 100 year
322.2	4.3	10.6	13.9

#### 4.9 Surface Water – Proposed Strategy

It is proposed to collect surface water flows through the use of rain water downpipes into inspection chambers, through a storage tank and flow control device before outfalling into either the existing private manhole located on the forecourt of South Mansions, or directly into the existing Thames Water Combined Sewer. The proposed surface water strategy is shown within the appendix.

The exposed courtyard area will require a packaged pump station, suitably sized to accept incoming flow, as well as provide a storage requirement sized to the peak storm event, which is TBC at this stage. The pump is also to be in accordance with the Camden Planning Guidance – Basements, section 6.13.

Both the pump and the gravity flow drainage will avoid the root protection zone of the tree adjacent to the property boundary.

Taking the values of the Greenfield and pre-development run-off rates as stated above, the discharge from the proposed development is to be limited to a practical minimum. As such, the single flow control device outfalling the surface water from the proposed development will discharge at a maximum of 5l/s to the existing public combined sewer, being the minimum practical rate that can be achieved with flow controls of a size that avoids regular blockage.

This is also supported in Section 3.4.9 of London Plan Sustainable Design and Construction SPG (as stated within the Policy Requirements section of this document) which states that that "there may be situations where it is not appropriate to discharge at greenfield runoff rates", and if this is the case, an "appropriate minimum discharge rate would be 5 litres per second per outfall".

Further design will be undertaken at later stages to show the more accurate outfalling flow rates in the lesser 1 in 1 year and 1 in 30, however taking a rate of 5l/s for the 1 in 100 year + 40% climate

change allowance, a reduction and betterment of 64% of flow rate can be expected.

#### 4.10 Attenuation

Attenuation will be provided by below ground storage tanks, large diameter pipes and manholes to control the surface water discharge from the new development areas. It has been sized to accommodate the proposed discharge rates for the 1 in 100 year rainfall event plus 40% climate change.

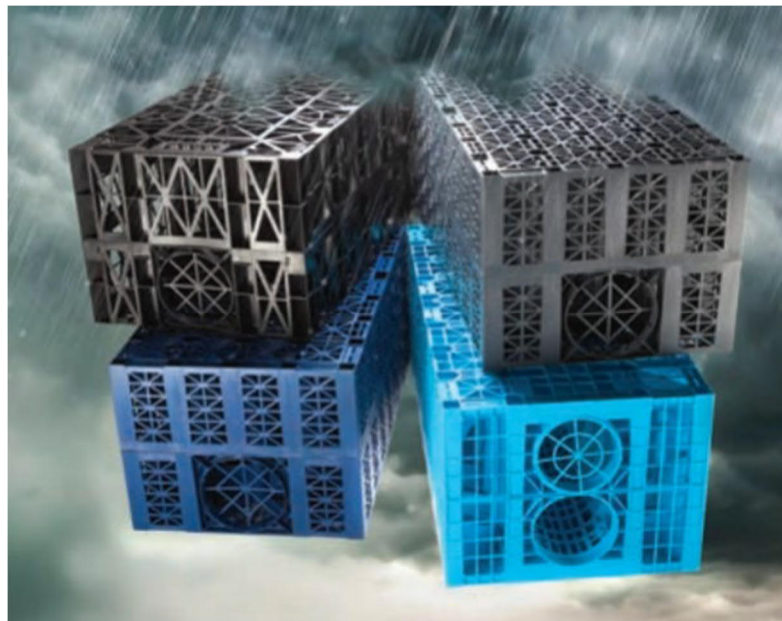


Figure 5 – Typical example of geo-cellular attenuation tank

Impermeable Area (m <sup>2</sup> )	Flow Control restriction (l/s)	Required attenuation volume
294	5	9.3

#### 4.11 Sustainable urban Drainage Systems (SuDS)

In addition to the proposed below ground attenuation as described above, it is intended that the surface water design will include the use of SuDS features to help manage the rate of run-off and improve the quality of the surface water discharge from the site; such features are outlined as follows:

- Green roofs have been considered for the development, and the proposed building will feature where possible.

- Flow Controls are present on site at the outfall; they are proposed to be Vortex Flow Control (Hydro-Brake or similar approved) type units.

#### 4.12 Foul Water

Foul drainage from the new building is proposed to discharge into the existing combined water network. The increase in flow rates have been calculated based on a proposed occupancy in line with British Water Flows and Loads 4m taking residential foul flows per capita as 150 litres per person, per day. This is then converted into l/s to give a 14 hour DWF figure. A 6DWF is then calculated to give the proposed peak flow rate. Calculations are tabulated below:

Occupancy	Daily foul flow (l)	DWF (14 hour) (l/s)	6 DWF (peak) (l/s)
36	5400	0.107	0.643

#### 4.13 General Drainage

The design of the drainage generally within the development will be in accordance with the current revisions of the relevant British Standards, Codes of Practice and Building Regulations. These include, but are not limited to the following:

- BS EN 752 - Drain and sewer systems outside buildings
- BS EN 12056 - Drain and sewer systems inside buildings
- Building Regulations – Part H: Drainage and waste disposal
- UKWIR Ltd - Civil engineering specification for the water industry
- CIRIA C753 - The SUDS manual
- WRc - Sewers for adoption 7th Edition.

#### 4.14 Operation and Maintenance

To ensure that the drainage networks continue to perform efficiently, it is essential that they are appropriately maintained. The following sections provide information on maintenance of the major features of the proposed drainage systems.

##### Hydro-Brake Vortex Flow Control

To ensure that the drainage network continues to perform efficiently, it is essential that the network and associated flow

controls are appropriately maintained. Vortex flow controls (e.g. Hydro-Brake™) or any other discharge restrictor should be regularly checked after a major storm to ensure that they are free from blockage.

##### Attenuation Tank

Regular maintenance of attenuation tanks focusses on debris and silt removal, as summarised in the table below.

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

Figure 6 – Attenuation Storage Tank Operation and Maintenance requirements (CIRIA C753: The SuDS Manual)

## 5.0 Temporary works and Sequence of Construction

Given the onerous stability and structural integrity requirements to be maintained along the neighbouring party walls, we have outlined some of the issues that affect the sequence of works on this project as follows:

- The stability of adjacent buildings
- Forming sensible access onto the site to minimise disruption to the neighbouring residents
- Providing a safe working environment

The proposed works involve the construction of a new three-storey structure with a single storey basement. It is expected that the works will be completed as a bottom up type construction.

SD Structures will advise on the selection of an appropriate contractor who will need the relevant experience and expertise for this type of project. Thereafter, SD Structures will have an on-going role during the works on site to review that the works are being carried out in accordance with our design and specification.

The Contractor is entirely responsible for maintaining the stability of all existing buildings and structures, within and adjacent to the works, and of all the works from the date for possession of the site until practical completion of the works.

A full set of temporary works drawings and calculations will be provided by the contractor and will be reviewed by SD Structures prior to works starting on site.

A suggested safe sequence of works would be:

### Stage 1: Site Set-Up

- Erect hoarding to fully enclose the site along the boundary of the site to provide protection to general public.
- Create and manage site entrance in line with CTMP.

### Stage 2: Enabling Works

- Remove the existing drainage where necessary;

- Remove rubble and waste materials via tipper lorries loaded within the site. Removal of waste to adhere with the CDM regulations and requirements;
- Site waste to be removed and recycled where applicable.

Stage 3: Install RC contiguous piled wall and capping beam around perimeter of proposed basement.

- Before starting the work, the Contractor is to locate any services that could be damaged by the excavation works.
- Trench protection and propping installed to ensure safe excavation. Contractor to design propping and submit for SD Structure approval.

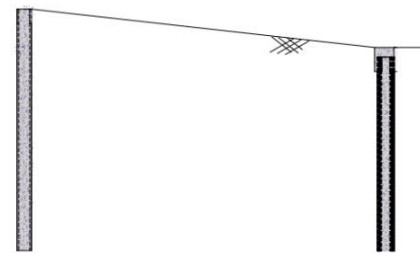


Figure 7 - Installation of RC contiguous Piled Wall

The contiguous piled wall is to be designed to cantilever. Temporary props are provided to limit lateral deflection adjacent to the existing building. The temporary props are subsequently removed when the permanent props are installed. Positions of permanent horizontal props to the capping beam are shown on Figure 8.

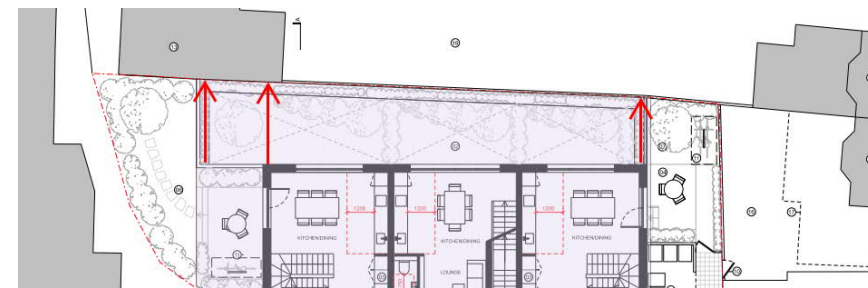


Figure 8 - Position of Permanent Horizontal Props to Capping Beam

Stage 4: Install piled foundation at the front of the building.

- Install piles with specialist mini piles foundation technique in root protection zone in accordance to recommendation from arboriculturist

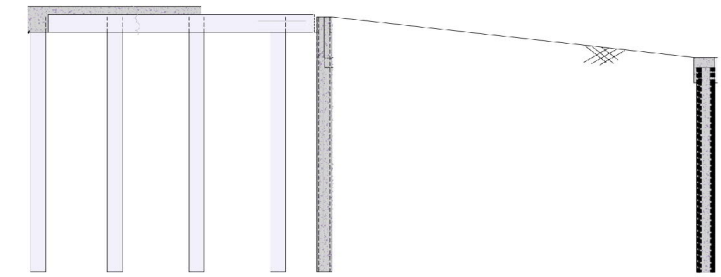


Figure 9 - Installation of Piled Foundation at Front

Stage 5: Excavate basement to required depth and temporary propping to be used to support ground where required.

- Excavate and remove earth to basement formation level, ensuring that any additional temporary props are fully installed as the basement excavation commences.
- The principles for the removal of spoil are set out in the draft Construction Management Plan that accompanies this application

Stage 6: Install basement structure of piled foundations and suspended RC slab with anti-heave clay protection.

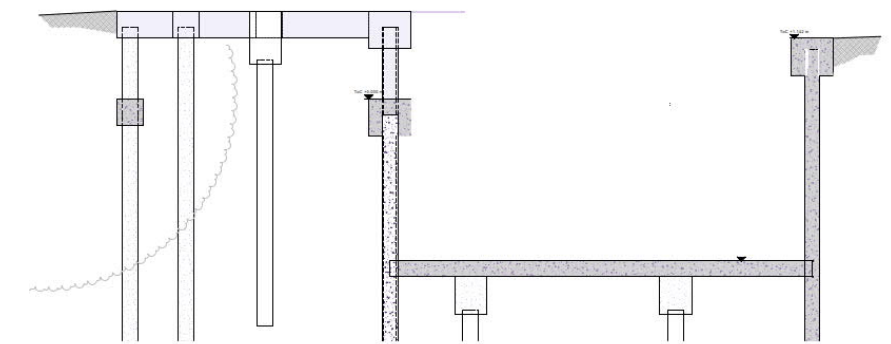


Figure 10 - Installation of Basement Structure (Piled Foundations)

Stage 7: Construct pile caps and RC ground beams

Stage 8: Construction superstructure platform timber frame

## 6.0 Construction Implications

A ground movement analysis (GMA) has been completed by the specialist ground investigation consultant and is included within the CGL BIA report. The report is based on loading information and design drawings provided by SD Structures and provides a damage category assessment based on the guidance in CIRIA Special



Publication 200 and CIRIA 760 and in accordance with the Burland and Wroth scale.

The GMA assessment has identified the following construction processes which are likely to generate movement along the neighbouring properties:

- Heave: Excavation of the basement gives rise to undrained elastic heave, resulting in upwards movement of the bearing strata underlying London Clay in the short term.

CGL's Conceptual Site Model has been designed to cover the different loading and unloading areas in order to establish the most 'worst case' conditions. CGL has identified 2 no. critical areas noted as Section 1 and 1a (South Mansions), Section 2 (Outbuilding to 3 Hillfield Road), Section 3 (Proposed extension to 3 Hillfield Road), and Section 4 (1 Hillfield Road).

The construction of piled foundation with suspended basement slab has been considered in the assessment. The results of the assessment are also applicable for the construction of a concrete raft supporting internal columns.

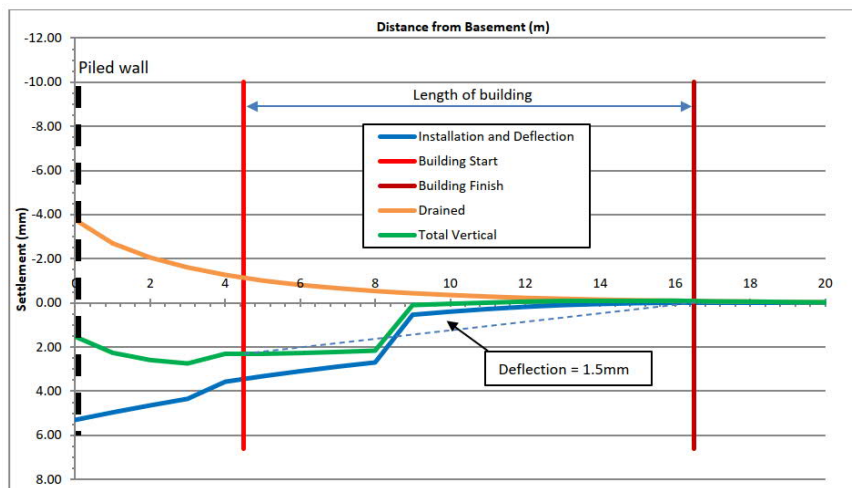


Figure 11 - Plot of Settlement for Critical Section 1  
Maximum Deflection = 1.5mm

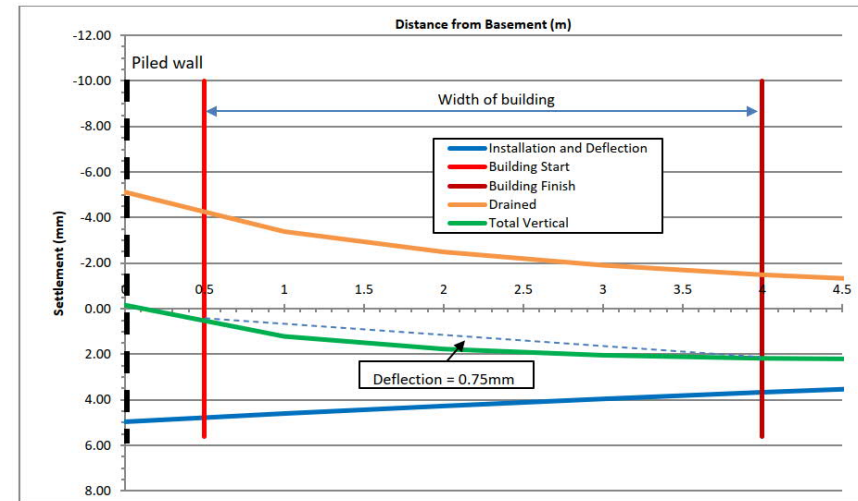


Figure 12 - Plot of Settlement for Critical Section 2  
Maximum Deflection = 0.75mm

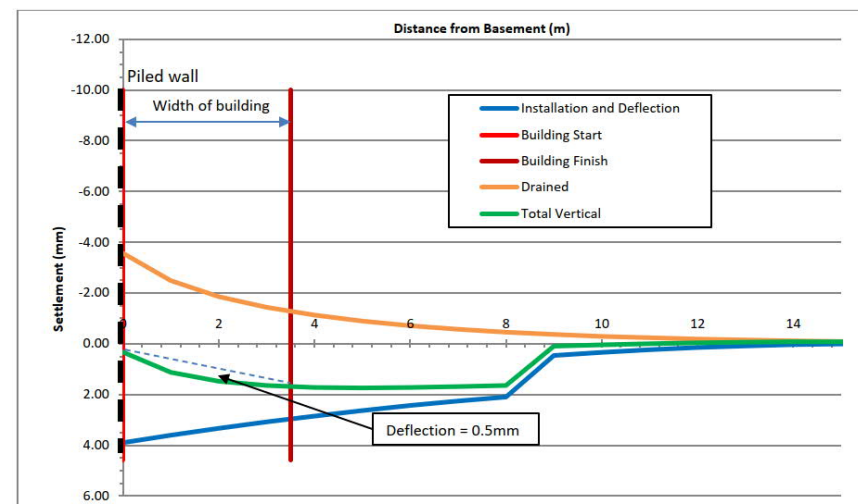


Figure 13 - Plot of Settlement for Critical Section 3  
Maximum Deflection = 0.5mm

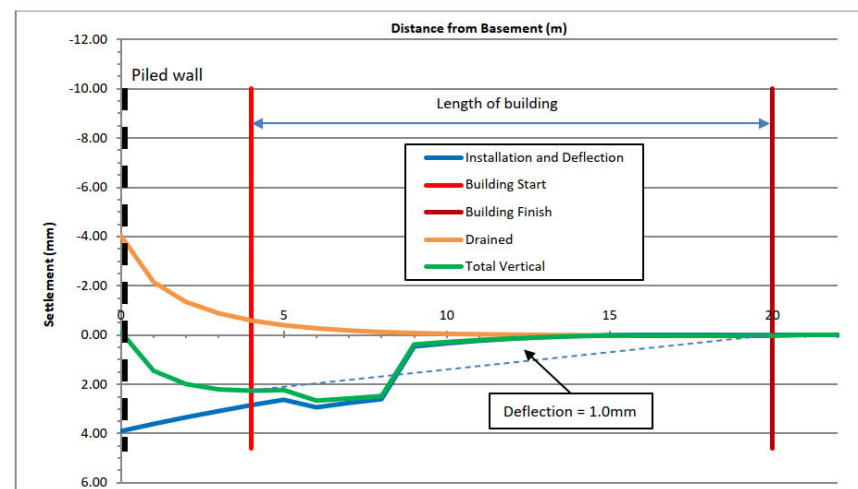


Figure 14 - Plot of Settlement for Critical Section 4  
Maximum Deflection = 1.0mm

The Ground movement assessment report should be referred to for full details of the damage category assessment. In summary, the report concludes that the predicted level Burland category for the critical areas is at worst Category 1 ('very slight') based on anticipated actual realised damage.

### 6.1 Party Wall Matters

The proposed development falls within the scope of the Party Walls Act 1996. Procedures under the act will be dealt with in full by the Employer's Party Wall Surveyor as the project progresses. As part of the next stage, the Party Wall Surveyor will prepare and serve necessary notices under the provisions of the Act and agree Party Wall awards. The Contractor will be required to provide the Party Wall Surveyor with appropriate drawings, method statements and other relevant information covering the works that are notable under the Act. The resolution of matters under the Act and provisions of the Party Wall Awards will protect the interests of the owners.

The proposed works will be developed so as not to inhibit any works on the adjoining properties. This will be verified by the surveyors as part of the process under the Act.

### 6.2 Managing the Impacts on Construction

The proposed works will be developed so as not to inhibit any works on the adjoining properties. This will be verified by the surveyors as part of the process under the Act. Measures will be implemented to ensure that the potential impact of the works on residents and neighbours will be kept to a minimum. This includes those outlined within the Construction Management Plan.

The Contractor shall undertake the works in such a way as to minimise noise, dust and vibration when working close to adjoining buildings in order to protect the amenities of the nearby occupiers.

### 6.3 Ground movement and monitoring

The method of working should be carried out to ensure minimal vibration and movement during construction to avoid damage to the surrounding buildings.

CGL have undertaken a detailed ground movement assessment for the proposed basement. The analysis was undertaken presuming

the basement was constructed with a formation level both below and above the water table. The report concluded that the predicted damage to the neighbouring properties would generally be Damage Category 1 ('very slight').

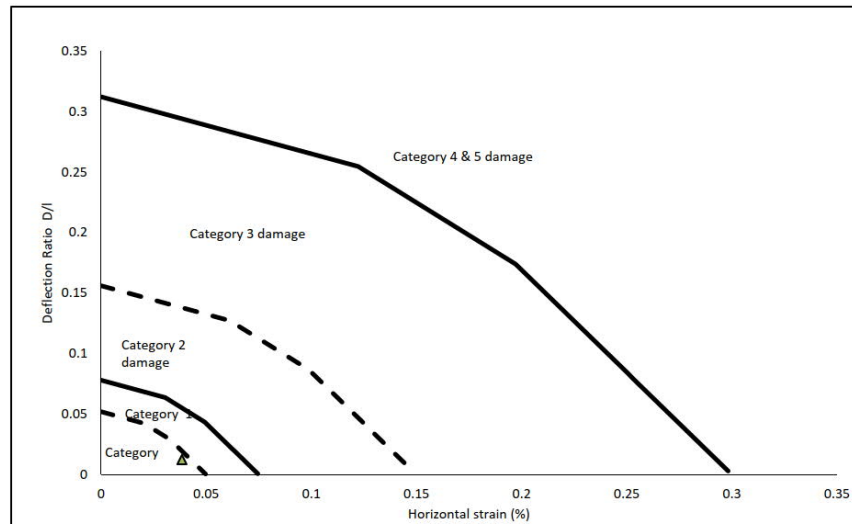


Figure 15 - Building Damage Plot for Critical Section 1

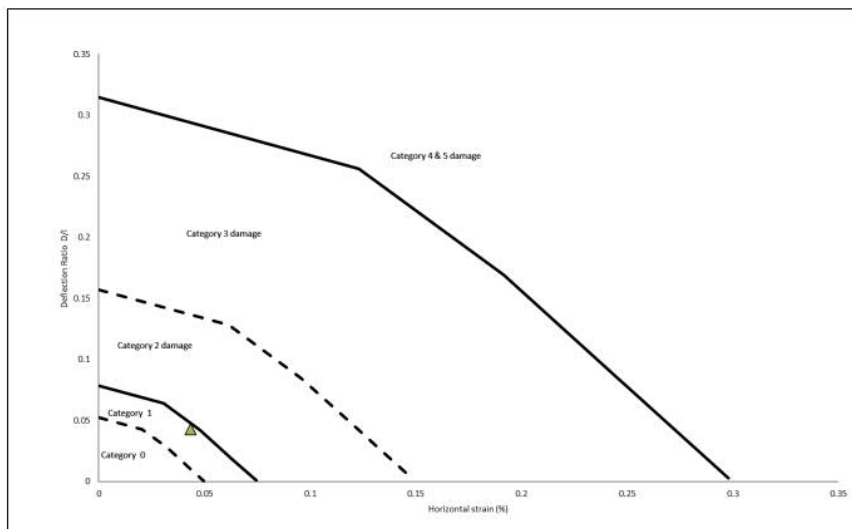


Figure 16 - Building Damage Plot for Critical Section 2

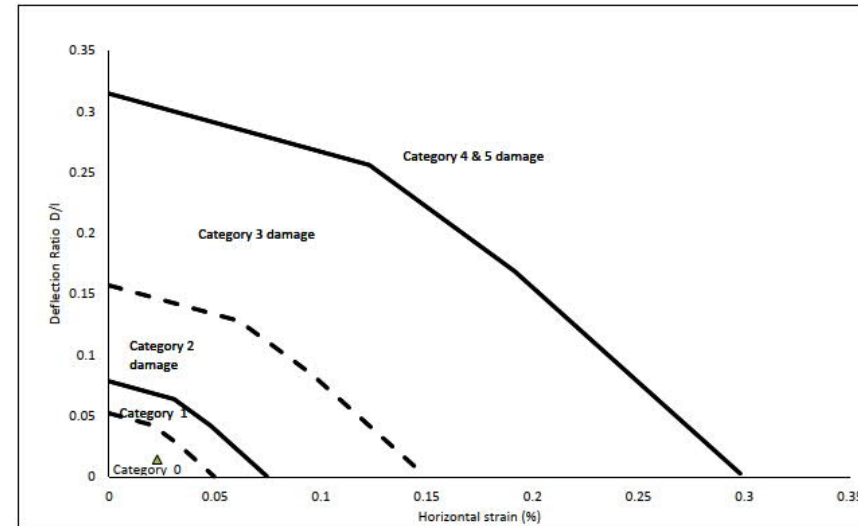


Figure 17 - Building Damage Plot for Critical Section 3

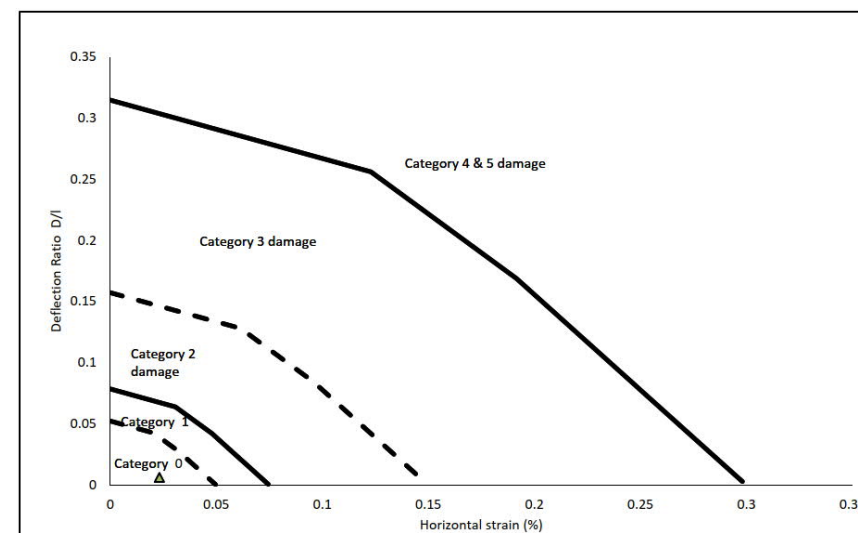


Figure 18 - Building Damage Plot for Critical Section 4

A regime of monitoring will need to be in place to enable the excavation to be fully controlled and ensure that movements do not exceed pre-agreed limits. Prior to the commencement of any construction work, a survey monitoring system will be established with the main and the specialist contractor. The monitoring will be carried out by a third-party surveyor and will consist of the following:

A condition survey of the nearest neighbouring buildings at Gondar House, South Mansions, and 1-3 Hillfield Road.

Regular monitoring of vertical and horizontal movements at three points along each party wall using a precision level to an accuracy

of +/-1mm. Levels are to be plotted graphically. The frequency may need to be increased when excavating very close to adjacent structures. Cracks greater than 1mm will have tell-tales attached and be monitored on a regular basis.

A traffic light warning system will be used to alert site personnel of any movement. We propose the following trigger levels:

Vertical Movement

- Green – 2mm or below. Continue monitoring at agreed intervals
- Amber 3mm - increase frequency of monitoring
- Red 5mm - cease works, review processes, take action.

Horizontal Movement

- Green – 3mm or below. Continue monitoring at agreed intervals
- Amber 4mm - increase frequency of monitoring
- Red 7mm - cease works, review processes, take action.

## 7.0 Conclusion

The proposed development comprises a reinforced concrete basement box to form a single storey basement and a three-storey, development.

The site is within proximity to neighbouring buildings and this report, combined with the CGL Basement Impact Assessment, shows how the proposed development can be safely undertaken. Given that the works are completed in accordance with our design and specification, the impact on the structural stability of the neighbouring buildings will be minimal and movements on surrounding buildings resulting from the development are expected to fall within the tolerances outlined within CIRIA Special Publication 200 and CIRIA 760 guidance and in accordance with the Burland and Wroth scale.

From a Civil and drainage perspective, this report demonstrates that the proposed development in the land between South Mansions and Gondar House are viable from a drainage perspective and in line with various planning policies.

Proposed surface water flows from the plot will be drained mostly via gravity, apart from those discharging into the basement courtyard area, which will be picked up via gullies, and pumped into the gravity system. These flows are proposed to exit the proposed development either by use of the existing manhole within South Mansions (with flow type, CL, IL and viability TBC), or into a new proposed manhole built to adoptable standards within the road, subject to Thames Water approval.

Proposed foul water flows will be dealt with via gravity, discharging via a combined water manhole as the last chamber on site before discharging as above, into the existing Thames Water combined sewer within the road.

A detailed maintenance strategy will be required in further stages to ensure the drainage system continues to perform adequately for the lifetime of the proposed development.

# APPENDIX A

## Outline Specification

### A.1 Codes of Practice

#### A.1.1 Eurocodes

Loading BS EN 1990 NA (Basis of Structural Design)  
BS EN 1991-1-1 NA (Dead & Imposed Loads)  
BS EN 1991-1-4 NA (Wind Actions)  
BS EN 1992-1-1 NA (Concrete)  
BS EN 1995-1-1 NA (Timber)  
BS EN 1997-1 NA (Foundation)

#### A.1.2 Building Regulations 2000:

Approved Document A – Structure (2004 edition)  
Approved Document H – Drainage & Waste Disposal (2002 edition)

### A.2 Design Loadings:

#### A.2.1 Imposed Loadings (new build areas): kN/m<sup>2</sup>

- a. Residential 1.5+0.5
- b. Roof, no access / including snow 0.75

#### A.2.3 Deflection:

Imposed load deflections will be limited to:

Concrete

Internal floors - Span / 250

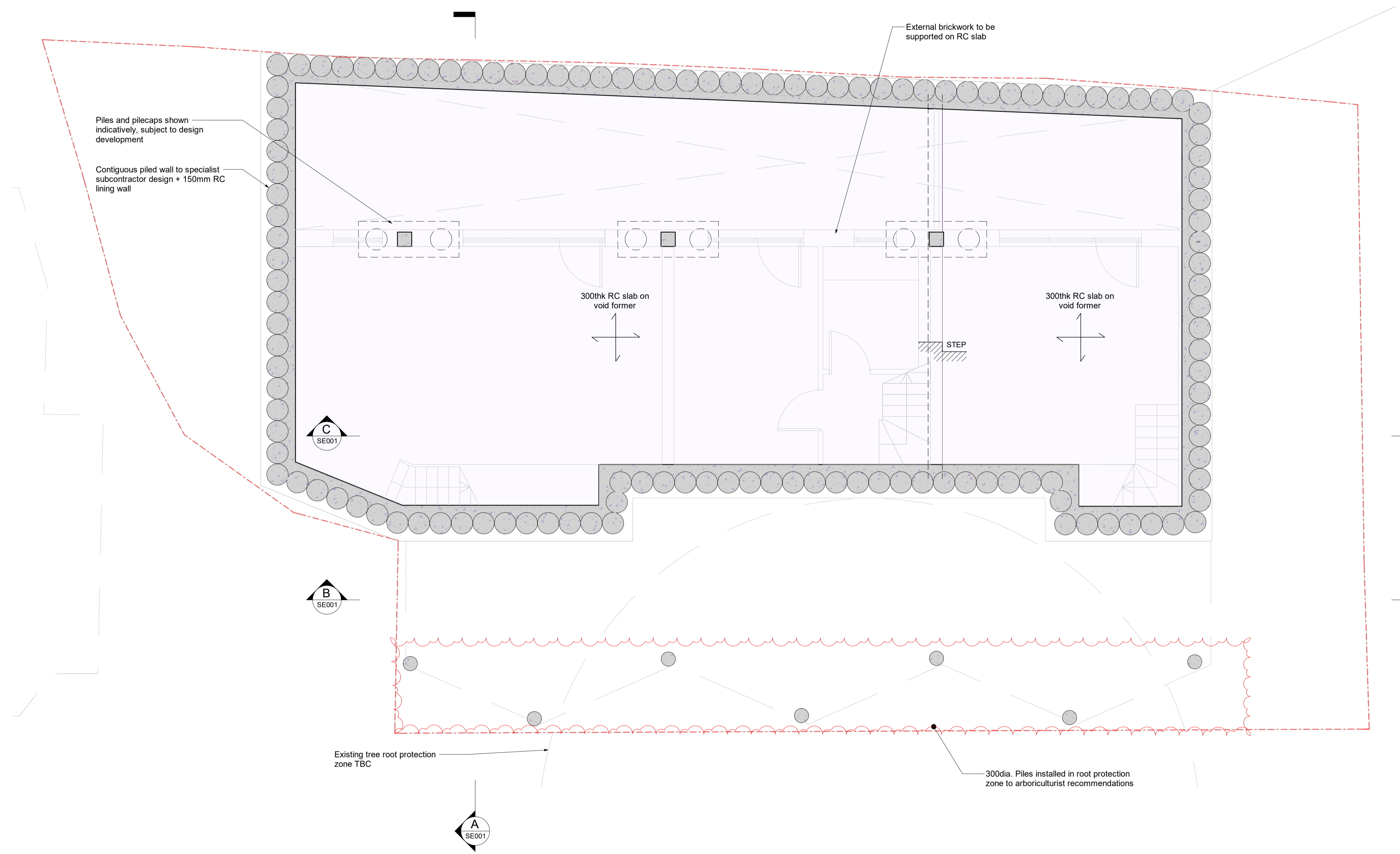
Load bearing wall support structure - Span / 500

#### A.2.4 Wind Loading to BS EN 1991-1-4 NA

# APPENDIX B

## Proposed Structural Drawings

KEY LEGEND	
	Retained existing structure - Masonry & Concrete
	Existing Timber stud wall
	New brickwork
	New blockwork
	New RC concrete structure
	100x50 C24 studs Headers and Sole plate. Stud @ 400/c U.N.O.
	Ground level
	New floor span
	Existing floor span
	Moment Connection Frame
	Double joist / Triple joist
	Double stud
	Column Below
	Assumed boundary line
	Crank Point Location
	Lateral Restraint Straps
	Step on slab
	Lintel above opening (Refer to schedule for size)



**BASEMENT FLOOR PLAN**  
Scale 1 : 50

- Notes:
1. These drawings are not to be used for setting out purposes. Refer to the latest Architects information and site measure as required.
  2. Contact SD Structures in the event of any discrepancies between findings on site and these drawings.
  3. Drawing is to be read in conjunction with the SD Structures Engineer's Specification and General Notes.
  4. 3D views are indicative only and any conflicting 2D information should take precedence. If in doubt contact SD Structures prior to starting work

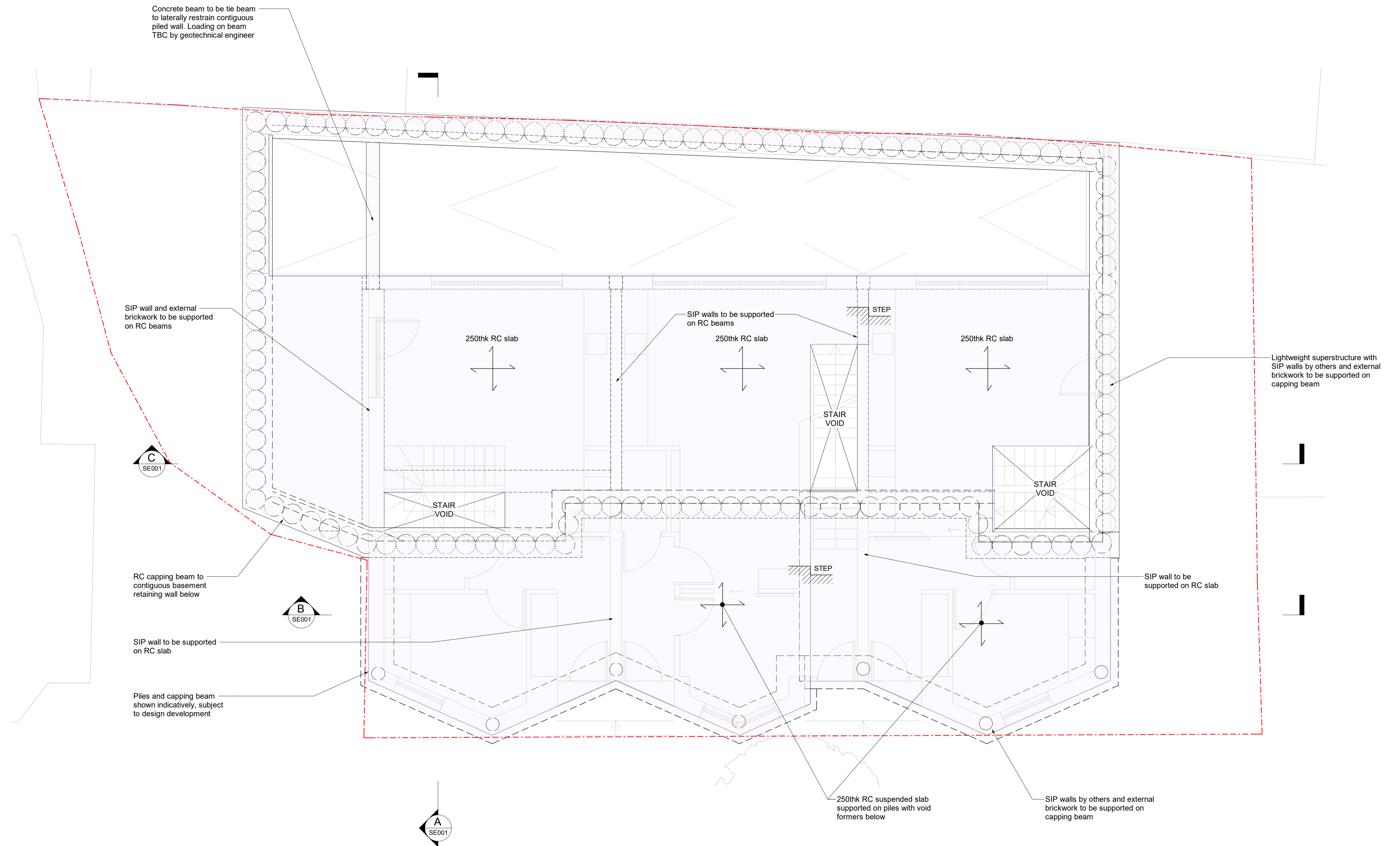


**PRELIMINARY**  
Gondar Gardens  
SDS795  
Basement Plan

Eng: JN  
Drawn: EP

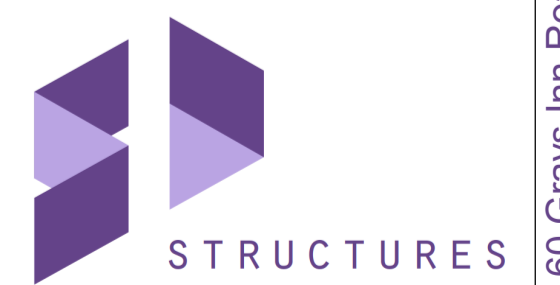
P0	Preliminary	14/05/2021	EP	JN	As indicated	SDS795 - PL001	Rev: P0
Rev	Amendment	Date	Drawn	Eng	Scale: @A1		

KEY LEGEND	
	Retained existing structure - Masonry & Concrete
	Existing Timber stud wall
	New brickwork
	New blockwork
	New RC concrete structure
	100x50 C24 studs Headers and Sole plate. Stud @ 400c/c U.N.O.
	Ground level
	New floor span
	Existing floor span
	Moment Connection Frame
	Double joist / Triple joist
	Double stud
	Column Below
	Assumed boundary line
	Crank Point Location
	Lateral Restraint Straps
	Step on slab
	Lintel above opening (Refer to schedule for size)



**GROUND FLOOR PLAN**  
Scale 1 : 50

- Notes:
1. These drawings are not to be used for setting out purposes. Refer to the latest Architects information and site measure as required.
  2. Contact SD Structures in the event of any discrepancies between findings on site and these drawings.
  3. Drawing is to be read in conjunction with the SD Structures Engineer's Specification and General Notes.
  4. 3D views are indicative only and any conflicting 2D information should take precedence. If in doubt contact SD Structures prior to starting work

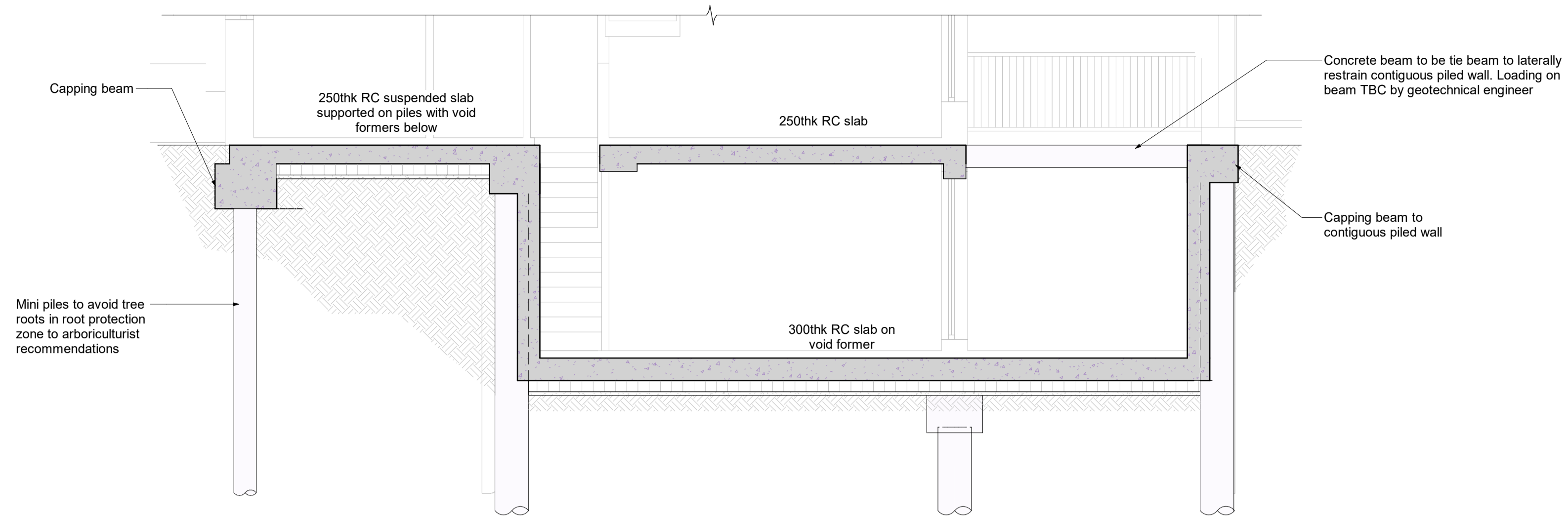


**PRELIMINARY**

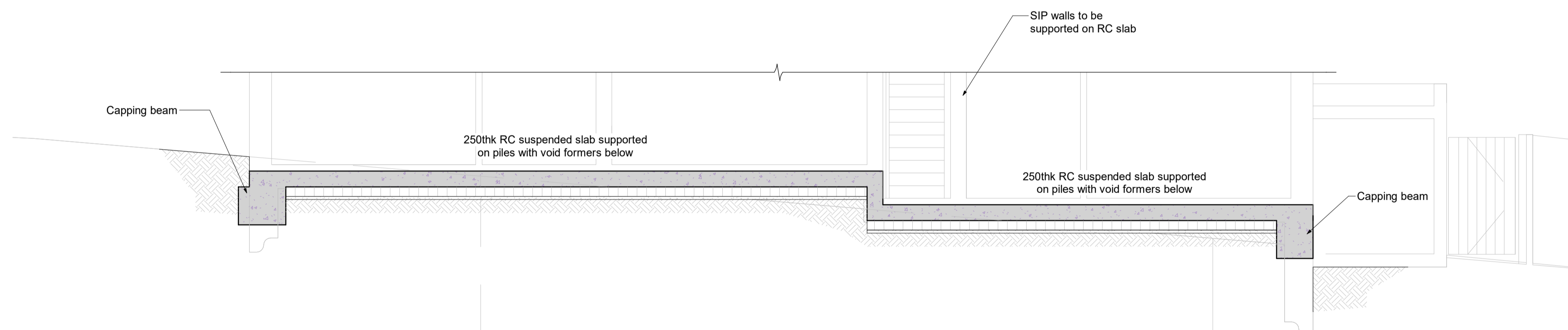
Gondar Gardens  
SDS795  
Ground Floor Plan

Eng: JN  
Drawn: EP

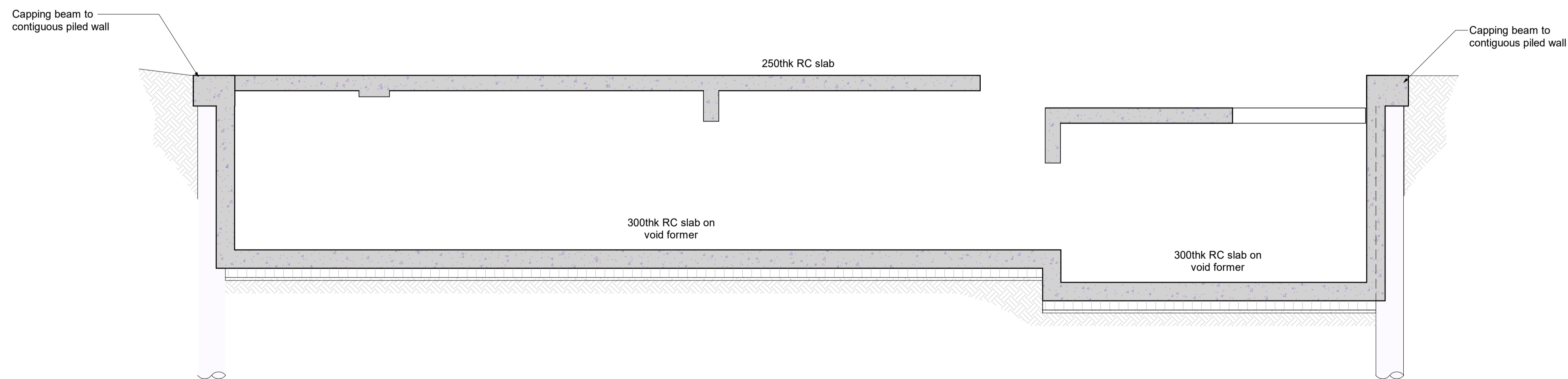
P0	Preliminary	14/05/2021	EP	JN	Scale: As indicated @A1	SDS795 - PL002	Rev: P0
Rev	Amendment	Date	Drawn	Eng			



**SECTION A - A**  
Scale 1 : 50



**SECTION B - B**  
Scale 1 : 50



**SECTION C - C**  
Scale 1 : 50

- Notes:**
1. These drawings are not to be used for setting out purposes. Refer to the latest Architects information and site measure as required.
  2. Contact SD Structures in the event of any discrepancies between findings on site and these drawings.
  3. Drawing is to be read in conjunction with the SD Structures Engineer's Specification and General Notes.
  4. 3D views are indicative only and any conflicting 2D information should take precedence. If in doubt contact SD Structures prior to starting work



**PRELIMINARY**

Gondar Gardens  
 SDS795  
 Sections

Eng: JN  
 Drawn: EP

P0	Preliminary	14/05/2021	EP	JN	Scale: 1 : 50 @A1	SDS795 - SE001	Rev: P0
Rev	Amendment	Date	Drawn	Eng			



# APPENDIX C

## Proposed Civil Drawings

**General Drainage Notes:**

- All private drainage works shall be in accordance with 'The Building Regulations Approved Document H and BS EN 752:2017'.
- The Contractor's attention is drawn to diagrams 7 and 8 of 'The Building Regulations Approved Document H' showing details of drains laid below and near to buildings. Where ground beams are used, their level shall be set to avoid clashing with drain connections.
- Access fittings, inspection chambers and manholes shall be constructed to the dimensions shown in tables 11 and 12 of 'The Building Regulations Approved Document H' and from the materials listed in table 14. Access points, inspection chambers and manholes shall be constructed from products designed / rated for the location in which they are to be used. They shall be installed in accordance with the manufacturers' / suppliers' recommendations.
- Prior to commencement of the works all drainage outfall points, whether existing sewer, drain or watercourse, shall be verified on site by the contractor. If the outfall point is found to be higher or significantly lower than shown on the drawings then the Engineer shall be notified immediately (significant redesign of drainage and levels may be necessary).
- Prior to commencement of construction on-site the contractor shall install all off-site drainage connections, or satisfy themselves that there are no obstructions or other reasons why the drainage connections cannot be made.
- Prior to commencement of works the contractor is to arrange tracing of the existing drainage to ensure that no 'live' connections remain. Any such 'live' connections must be reported to the Engineer, prior to diversion into the new drains, which may be subject to a Section 185 (WIA) to be approved by the Local Water Authority.
- Prior to the commencement of any works all existing drainage must be surveyed to determine: network connectivity, pipe sizes / gradients, invert levels, manhole details etc. Survey details must be reported to the Engineer prior to commencing construction.
- Existing drainage encountered within 3m of the proposed building footprint shall be identified to the Engineer.
- The contractor shall make allowance for dealing with any live flows in existing drains or sewers.
- All existing chambers, gullies, channels, pipes and other drainage apparatus shall be protected from damage during the works. The contractor shall take all necessary measures to ensure that no material enters the drains (other than that which they are designed to carry).
- All pre-cast and in-situ concrete and mortars used in the construction of drains and sewers shall be made from suitably durable material.
- All cover levels are approximate. Exact levels of new covers and frames to be determined on site to match level and profile of finished surface.
- Unless noted otherwise all pipework shall be:
  - 100mmØ (diameter) laid to a fall of 1 in 80 or steeper for Surface Water
  - 1 in 40 or steeper for Foul Water
  - Foul drains with one or more W.C. connected may be laid at 1 in 80 or steeper.
  - Road gully connections shall be 150mm dia dia 1 in 150 or steeper.
- Exact location of gullies to be determined on site to suit low points. The contractor shall ensure that all finished surfaces are laid to falls that are sufficient for surface water to drain without ponding.
- Rainwater downpipes that do not connect directly to an access point, shall be fitted with a rodding access at low level.
- Testing of the Surface Water system shall be undertaken in accordance with the guidance in BS EN:1610.
- All sanitary pipework shall be constructed and installed in accordance with BS EN:12056-2. System III (single discharge stack system with full bore branch discharge pipes), shall be used unless otherwise specified by Architect or M&E engineer.
- For the exact location of soil pipes, substacks, W.C.'s, RWP's and other drainage connections refer to the Architectural building plans or M&E Engineer drawings.
- All external building drainage shall be constructed and installed in accordance with BS EN:752 and BS EN:1610.
- All air admittance valves (AAVs) shall be installed in accordance with BS EN:12380.
- Testing of the completed wastewater system shall be carried out in accordance with BS EN:1610 for drainage under and around buildings.
- All floor gullies and drains are to be roddable. All traps to sanitary appliances must be removable.
- All drainage proposals subject to Client, Local Authority and Undertaker approval.
- The surface water and foul drainage strategy (including discharge rates and size of attenuation) is subject to formal technical approval from the relevant authority (e.g. LFA or EA).
- Excavations shall be kept free of standing water. The contractor shall ensure the stability of excavations is maintained at all times. Temporary works design to be undertaken by others.
- All covers, gratings and frames to chambers, gullies, channels etc. shall be of the correct type and load class to suit their location / finish in accordance with BS EN 124 regulations as follows:
  - Private drives
  - Load class C250 (C) Lightly trafficked roads
  - Load class D400 (D) Main roads
  - Load class E600 (E) Docks forklift truck pavements
  - Load class F900 (F) Aircraft pavements
- Refer to site investigation report for existing ground conditions and any special requirements for buried concrete (special requirements for buried concrete shall include all pre-cast and in-situ concrete and mortars). Where appropriate refer to contamination reports for details of chemicals affecting choice of materials and other additional requirements.
- SVPs to be fitted with above ground rodding access.
- The head of each proposed foul drain is to be vented in accordance with M&E requirements.
- All catchpits and silt traps to be regularly cleaned and maintained following installation to allow the Surface Water system to operate at its full capacity. Silt build up can lead to insufficient capacity and can result in surface ponding.
- In areas of block or flag paving, manhole covers (to private drainage) shall be recessed type to receive finishes. Requirement to be determined by Landscape designer and Architect. Resulting cover weight shall be considered in conjunction with the need for possible mechanical assistance.
- All internal manhole covers shall be double sealed, recessed, lockable tray type with stainless steel edging unless specified otherwise by the architect.
- Private drainage with less than 900mm cover in areas accessible to vehicles shall be provided with class 2 concrete surround as per detail drawings.
- Attenuation tanks are designed by specialist proprietary manufacturers and shall be installed strictly in accordance with the manufacturers' recommendations. Proprietary manufacturers and products shall be subject to review by the Engineer.

**Material Specification:**

- Unless noted otherwise pipe work can be constructed from any of the following, bedded and backfilled as per the manufacturers' recommendations and the below listed publications:
 

**Rigid Pipes:**

  - 1.1. Vitrified clay to BS 65 & BS EN 295
  - 1.2. Concrete to BS 5911
  - 1.3. Grey iron to BS 437
  - 1.4. Ductile iron BS EN 598

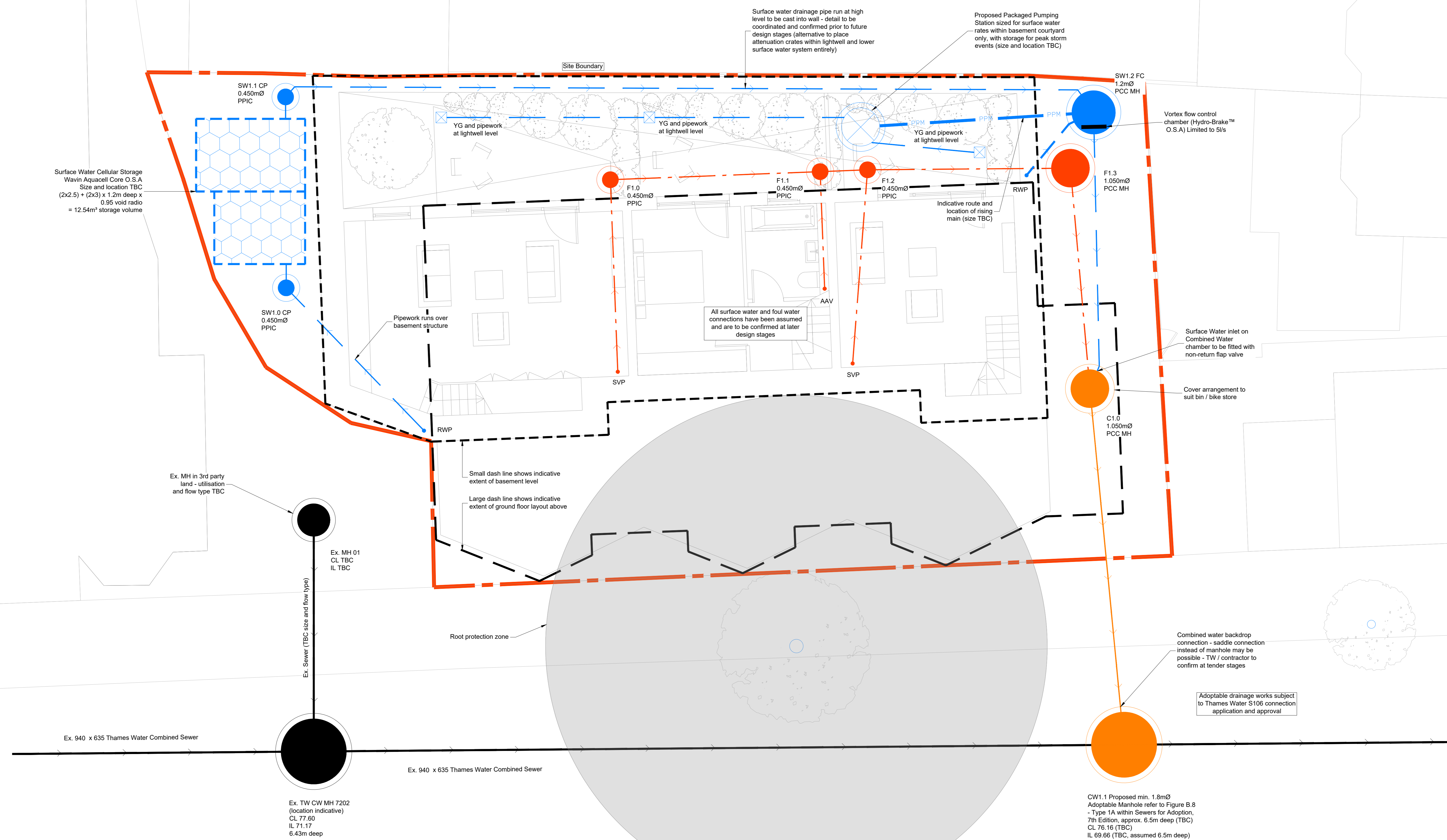
**Flexible Pipes:**

  - 1.5. UPVC to BS EN 1401
  - 1.6. PP to BS EN 1852
  - 1.7. Structure walled plastic pipes to BS EN 13476

Note: not all of these materials will be suitable for conveying trade effluent.
- Unless noted otherwise, all internal gullies and channel / slot drainage to be stainless steel, to Architect's specification.
- Gratings to gullies and channel drains to be in accordance with Landscape designers' specification.
- Where high temperature or chemical content waste is anticipated, pipe and jointing specification will be upgraded accordingly.

**Adoptable Drainage Notes:**

- All proposed adoptable sewers, and all works to existing public sewers shall be strictly in accordance with the 'Water Authorities Association specification 'Sewers for Adoption' 6th or 7th edition and to the requirements and satisfaction of the Local Water Authority, via section 104 / 106 (WIA) approval.
- The cost of any CCTV survey undertaken at the instruction of the Water Authority shall be borne by the contractor.
- The contractor is responsible for liaising with the Adopting Water Engineer for inspection and approval of the works at agreed stages of construction.



Below Ground Drainage Key	
<b>General Notation</b>	
100mmØ ID (pipe diameter) at 1/80 (approximate gradient)	Pipework other than that covered by the general drainage notes will be identified as adjacent
	BD - Backdrop connection
	U.L. - Upper Invert Level
<b>Existing Drainage</b>	
	Existing Drainage - Combined Water
	Existing Drainage - Foul Water
	Existing Drainage - Surface Water
	Existing Drainage - to be abandoned
	Existing Drainage - Manholes Sizes as shown on plan / schedules Information as per services survey
	Existing Drainage - Pump and Rising Main Sizes shown inductively Information as per services survey
<b>Combined Water</b>	
	Proposed Drainage - Combined Water drain
	Proposed Drainage - Combined Water Manholes Sizes are per plan and schedules PPIC - Polypropylene Inspection Chamber PCC - Pre-Cast Concrete
<b>Foul Water</b>	
	Proposed Drainage - Foul Water drain
	Proposed Drainage - Foul Water Manholes Sizes are per plan and schedules PPIC - Polypropylene Inspection Chamber PCC - Pre-Cast Concrete
	Proposed Drainage - Foul Water Pumping Chamber and Rising Main Sizes shown inductively Refer to pump manufacturers' specification
	Floor Socket F.S. - Floor Socket FA - From Above (refer to Architectural / M&E plans for internal gullies / shower drains)
	FG - Floor Gully (trapped and roddable)
<b>Surface Water</b>	
	Proposed Drainage - Surface Water drain
	Proposed Drainage - Surface Water land drain Perforated pipe laid within sub-base material
	Proposed Drainage - Surface Water channel drain (ACO or similar approved)
	Proposed Drainage - Surface Water Manholes Sizes are per plan and schedules PPIC - Polypropylene Inspection Chamber PCC - Pre-Cast Concrete FC - Flow Control chamber (Hydro-Brake™ by Hydro International or similar approved) CP - Catch Pit chamber
	Proposed Drainage - Surface Water Pumping Chamber and Rising Main Sizes shown inductively Refer to pump manufacturers' specification
	Proposed Drainage - Cellular storage structure or soakaway

- General Notes:**
- Do not scale from this drawing manually or electronically. Written permission must be obtained from SD Structures prior to scaling.
  - Contact SD Structures in the event of any discrepancies between findings on site and these drawings.
  - This drawing is to be read in conjunction with all relevant Architect's, Engineer's and Specialist's drawings and specifications.
  - 3D views are indicative only and any conflicting 2D information should take precedence. If in doubt contact SD Structures prior to starting work.
  - All work is to be carried out in accordance with the relevant British Standards, European norms, codes of practice and building practice.
  - The Contractor shall obtain licences from the Highway Authority prior to carrying out any workings within the existing Public Highway.

**Construction (Design and Management) Regulations - 2015 Designers Risk Information:**

In accordance with the construction (design and management) regulations the hazards and risks associated with constructing maintaining and cleaning the structure have been assessed.

The design solution has mitigated these where possible, however, residual/ unusual hazards or risks identified have been recorded in the designers risk information specific to the project.

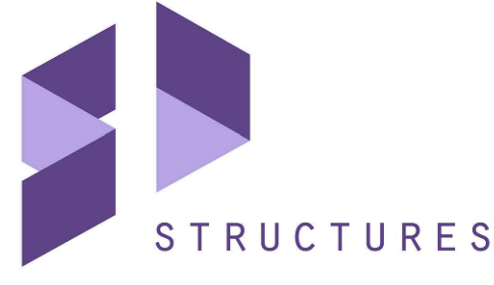
Assumptions made about the method of construction, maintenance and demolition have been stated where these form an integral part of managing the risks and hazards, however, this does not restrict the contractor to these methods alone.

It is understood that a competent contractor will carry out construction, maintenance and demolition work in accordance with recognised good industry practice.

- Asbestos:** the contractor should ensure that an appropriate asbestos survey is undertaken prior to any demolition and any remedial actions completed.
- Buried services:** the contractor should refer to all current services information collated by the principal designer and is advised to undertake his own on-site searches/surveys to check locations of these and for any further services. All services identified should be recorded and marked out on site.
- Ground contamination:** high standards of personal hygiene are to be maintained and all workers should be vigilant and use appropriate ppe.
- Drilling rig stability:** the piling contractor should construct a working platform designed to safely accommodate the loads generated by the proposed plant and machinery.
- Excavation in made ground:** the safe batter angles noted in the geotechnical report should not be exceeded. Temporary supports should be provided for any other excavation within made ground where man entry is required or where the avoidance of collapse is important. Plant should be kept away from edges of all excavations.

The above notes refer specifically to the information shown on this drawing as designers. Please refer to the designers risk information for further clarification and those relevant to other disciplines.

- Scheme Notes:**
- Internal and external drop point locations TBC.
  - Internal RWP's to be avoided where possible to mitigate surface water flooding in proposed development & basement structure.
  - All internal chambers to be bolt down, double sealed, recess-type to accept architectural floor finishes and to mitigate overlapping during surcharge.
  - All attenuation and storage structures in abeyance pending information regarding existing structures.
  - Proposed Packaged Pumping station within courtyard to be adequately designed and sized for peak flow rate of basement courtyard area. Pump and associated works by others, constructed to specialists' recommendations.



**INFORMATION**

Land between South Mansions and Gondar House  
Eng: CC  
Drawn: CC

**Below Ground Drainage Layout**

P2 / Updated as per new layouts	24/05/2021	CC	CC
P1 / Amended RPZ note as per client comments	13/05/2020	CC	CC
PO / Preliminary Issue for BIA Report / Information	07/05/2020	CC	CC
Rev / Amendment	Date / Drawn / Eng	Scale: 1:50 @ A0	SDS795 - C - PL100

# APPENDIX D

## Thames Water Asset Search

# Asset location search



## Property Searches

Express Solutions Group  
152 Commercial Road  
STAINES-UPON-THAMES  
TW18 2QW

**Search address supplied** 1  
Hillfield Road  
London  
NW6 1QD

**Your reference** NW6 1QD

**Our reference** ALS/ALS Standard/2019\_4000542

**Search date** 10 May 2019

### Keeping you up-to-date

#### Notification of Price Changes

From 1 September 2018 Thames Water Property Searches will be increasing the price of its Asset Location Search in line with RPI at 3.23%.

For further details on the price increase please visit our website: [www.thameswater-propertysearches.co.uk](http://www.thameswater-propertysearches.co.uk)  
Please note that any orders received with a higher payment prior to the 1 September 2018 will be non-refundable.



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



**Search address supplied:** 1, Hillfield Road, London, NW6 1QD

Dear Sir / Madam

**An Asset Location Search is recommended when undertaking a site development.** It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This search provides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

## Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0845 070 9148, or use the address below:

Thames Water Utilities Ltd  
Property Searches  
PO Box 3189  
Slough  
SL1 4WW

Email: [searches@thameswater.co.uk](mailto:searches@thameswater.co.uk)

Web: [www.thameswater-propertysearches.co.uk](http://www.thameswater-propertysearches.co.uk)

## Waste Water Services

**Please provide a copy extract from the public sewer map.**

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- 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.

## Clean Water Services

**Please provide a copy extract from the public water main map.**

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies.

For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.

# Asset location search



## Property Searches

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- 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.

### **Payment for this Search**

A charge will be added to your suppliers account.

## Further contacts:

### Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)  
Thames Water  
Clearwater Court  
Vastern Road  
Reading  
RG1 8DB

Tel: 0800 009 3921  
Email: [developer.services@thameswater.co.uk](mailto:developer.services@thameswater.co.uk)

### Clean Water queries

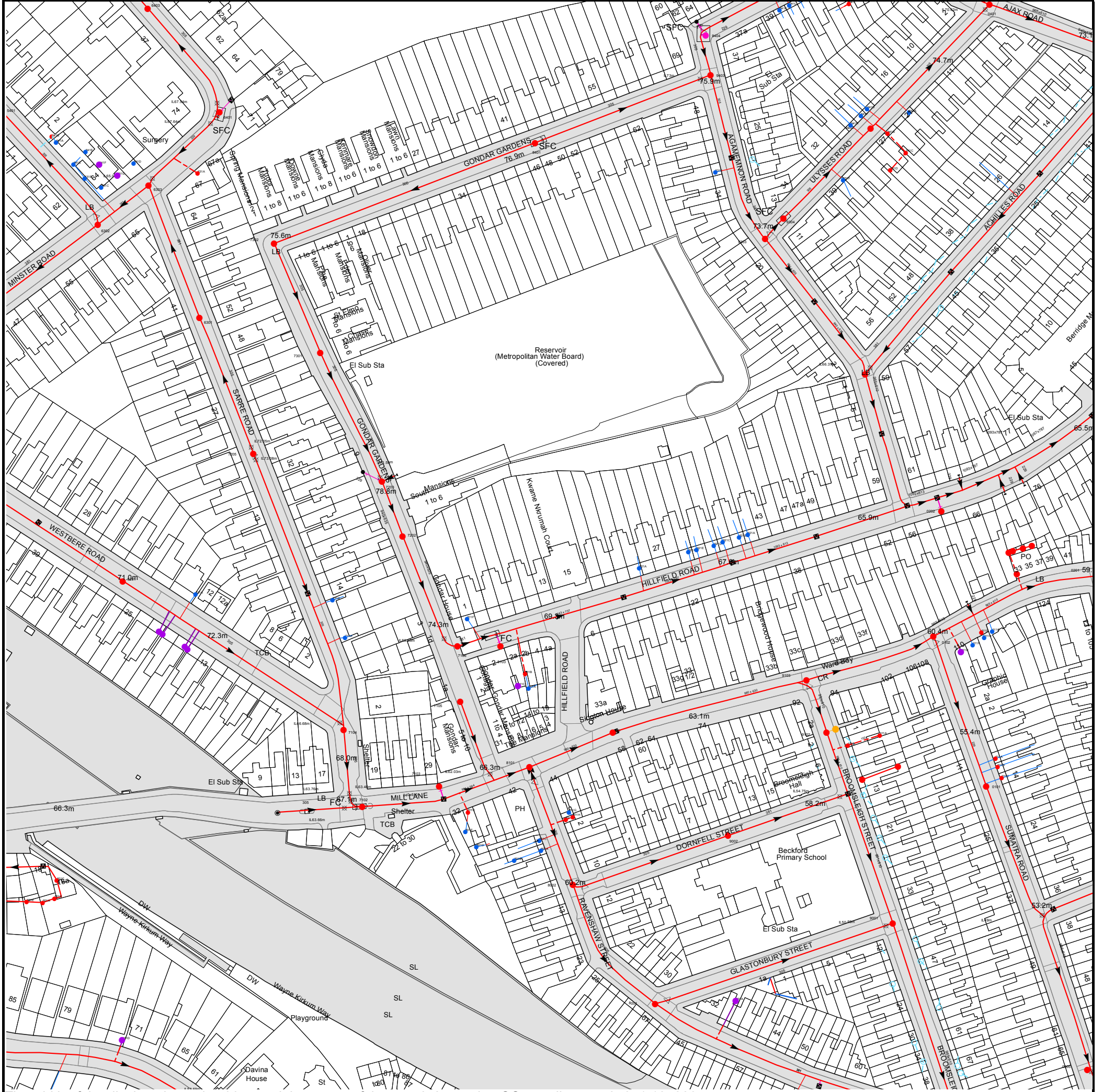
Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)  
Thames Water  
Clearwater Court  
Vastern Road  
Reading  
RG1 8DB

Tel: 0800 009 3921  
Email: [developer.services@thameswater.co.uk](mailto:developer.services@thameswater.co.uk)



Asset Location Search Sewer Map - ALS/ALS Standard/2019\_4000542



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 524841,185228

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.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
09EJ	n/a	n/a
0905	51.11	n/a
09EI	n/a	n/a
09DJ	n/a	n/a
09DI	n/a	n/a
00FE	n/a	n/a
90DH	n/a	n/a
00EG	n/a	n/a
00EF	n/a	n/a
9001	54.03	50.39
90EE	n/a	n/a
0221	n/a	n/a
0220	n/a	n/a
0201	59.7	56.44
941K	n/a	n/a
941L	n/a	n/a
941M	n/a	n/a
931F	n/a	n/a
941I	n/a	n/a
941H	n/a	n/a
941F	n/a	n/a
941D	n/a	n/a
9402	74.12	71.16
941B	n/a	n/a
931D	n/a	n/a
041C	n/a	n/a
041A	n/a	n/a
0401	74.47	70.49
821A	n/a	n/a
7301	77.48	71.97
6301	72.39	68.35
7302	75.75	72.44
9303	73.81	70.61
631A	n/a	n/a
931E	n/a	n/a
94AJ	n/a	n/a
8401	76.93	74.08
6401	71.08	n/a
9403	75.81	72.98
9404	76.01	73.48
641B	n/a	n/a
641A	n/a	n/a
641C	n/a	n/a
631B	n/a	n/a
641E	n/a	n/a
6302	68.1	63.97
641F	n/a	n/a
631C	n/a	n/a
631D	n/a	n/a
641D	n/a	n/a
6403	67.85	65.04
6303	69.34	64.79
8101	65.68	61.03
811D	n/a	n/a
7104	69.15	66.06
7105	69.98	68.54
811A	n/a	n/a
811C	n/a	n/a
811B	n/a	n/a
6104	n/a	n/a
6103	n/a	n/a
7106	n/a	69.13
8103	n/a	n/a
711A	n/a	n/a
6102	n/a	n/a
6101	n/a	n/a
811F	n/a	n/a
721A	n/a	n/a
621A	n/a	n/a
6201	71.02	67.6
921F	n/a	n/a
921E	n/a	n/a
921D	n/a	n/a
921C	n/a	n/a
921B	n/a	n/a
7202	77.6	71.17
921A	n/a	n/a
7203	78.65	71.54
7205	75.72	n/a
9304	73.83	71.7
9103	61.76	57.04
9102	60.11	56.57
911B	n/a	n/a
91DB	n/a	n/a
91BJ	n/a	n/a
91DH	n/a	n/a
9301	69.05	66.01
91EC	n/a	n/a
90ED	n/a	n/a
911A	n/a	n/a
91BH	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
0102	60.54	56.75
03HJ	n/a	n/a
0202	n/a	n/a
011D	n/a	n/a
011F	n/a	n/a
011E	n/a	n/a
011H	n/a	n/a
0101	56.28	52.57
011G	n/a	n/a
011A	n/a	n/a
011B	n/a	n/a
011C	n/a	n/a
0223	n/a	n/a
0222	n/a	n/a
0224	n/a	n/a
601D	n/a	n/a
601A	n/a	n/a
601E	n/a	n/a
601B	n/a	n/a
601C	n/a	n/a
7102	66.77	63.12
7103	n/a	n/a
801E	n/a	n/a
811E	n/a	n/a
801D	n/a	n/a
801B	n/a	n/a
801C	n/a	n/a
801A	n/a	n/a
811I	n/a	n/a
811G	n/a	n/a
8002	60.96	57.63
811H	n/a	n/a
8001	56.08	52.79
9002	59.05	56.17
901A	n/a	n/a

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.



# ALS Sewer Map Key

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

- Foul:** A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
- Surface Water:** A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
- Combined:** A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
- Trunk Surface Water
- Trunk Foul
- Storm Relief
- Trunk Combined
- Vent Pipe
- Bio-solids (Sludge)
- Proposed Thames Surface Water Sewer
- Proposed Thames Water Foul Sewer
- Gallery
- Foul Rising Main
- Surface Water Rising Main
- Combined Rising Main
- Sludge Rising Main
- Proposed Thames Water Rising Main
- Vacuum

## Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

- Air Valve
- Dam Chase
- Fitting
- Meter
- Vent Column

## Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

- Control Valve
- Drop Pipe
- Ancillary
- Weir

## End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol, Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

- Outfall
- Undefined End
- Inlet

## Other Symbols

Symbols used on maps which do not fall under other general categories

- Public/Private Pumping Station
- Change of characteristic indicator (C.O.C.I.)
- Invert Level
- Summit

### Areas

Lines denoting areas of underground surveys, etc.

- Agreement
- Operational Site
- Chamber
- Tunnel
- Conduit Bridge

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

- Foul Sewer
- Surface Water Sewer
- Combined Sewer
- Gully
- Culverted Watercourse
- Proposed
- Abandoned Sewer

### 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 Insight on 0845 070 9148.









# ALS Water Map Key

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


- 
**Distribution Main:** The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.
- 
**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.
- 
**Supply Main:** A supply main indicates that the water main is used as a supply for a single property or group of properties.
- 
**Fire Main:** Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.
- 
**Metered Pipe:** A metered main indicates that the pipe in question supplies water for a single property or group of properties and that 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.

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')

## Valves

-  General Purpose Valve
-  Air Valve
-  Pressure Control Valve
-  Customer Valve

## Hydrants








-  Single Hydrant

## Meters










-  Meter

## End Items

Symbol indicating what happens at the end of a water main.

-  Blank Flange
-  Capped End
-  Emptying Pit
-  Undefined End
-  Manifold
-  Customer Supply
-  Fire Supply



## Operational Sites

-  Booster Station
-  Other
-  Other (Proposed)
-  Pumping Station
-  Service Reservoir
-  Shaft Inspection
-  Treatment Works
-  Unknown
-  Water Tower

## Other Symbols

-  Data Logger

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

-  **Other Water Company 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.
-  **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 owner of the pipe.

## Terms and Conditions

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

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

## Terms and Conditions

### Search Code



#### IMPORTANT CONSUMER PROTECTION INFORMATION

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#### 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
- act with integrity and carry out work with due skill, care and diligence
- at all times maintain adequate and appropriate insurance to protect consumers
- conduct business in an honest, fair and professional manner
- handle complaints speedily and fairly
- ensure that products and services comply with industry registration rules and standards and relevant laws
- monitor their compliance with the Code

#### Complaints

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award compensation of up to £5,000 to you if the Ombudsman finds that you have suffered actual loss and/or aggravation, distress or inconvenience as a result of your search provider failing to keep to the code.

**Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.**

#### TPOs Contact Details

The Property Ombudsman scheme  
Milford House  
43-55 Milford Street  
Salisbury  
Wiltshire SP1 2BP  
Tel: 01722 333306  
Fax: 01722 332296  
Web site: [www.tpos.co.uk](http://www.tpos.co.uk)  
Email: [admin@tpos.co.uk](mailto:admin@tpos.co.uk)

You can get more information about the PCCB from [www.propertycodes.org.uk](http://www.propertycodes.org.uk)

**PLEASE ASK YOUR SEARCH PROVIDER IF YOU WOULD LIKE A COPY OF THE SEARCH CODE**



# APPENDIX E

## Draft Construction Programme

