GeoSmart Information

Environmental Thinking

SuDSmart Pro

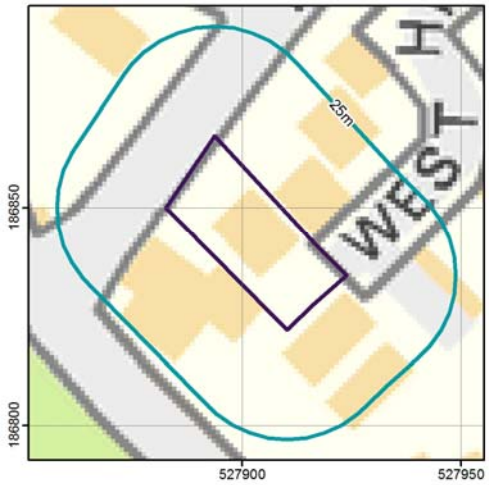
Report reference:	Report status:	Date issued:
66298R1	Final	July 2017

Site address:

26 West Hill Park, London, N6 6ND

Overview:

A combination of SuDS features comprising a rainwater harvesting butt and a green roof, will reduce surface water run-off and provide a maximum allowance for climate change. The SuDS drainage system will be designed to attenuate a minimum of 5 m³.



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1. Executive summary

This report assesses the feasibility of a range of SuDS options in support of the Site development process and provides a recommended strategy.

SuDS suitability

Risk	Issue	Result
SuDS suitability	What is the infiltration potential at the Site?	Moderate
	What is the potential to discharge to surface water features?	Low
	What is the potential to discharge to sewers?	High
Flooding	What is the overall flood risk at the Site?	Negligible
Pollution	Is the groundwater a protected resource?	No
	Is the surface water feature a protected resource?	No

SuDS runoff and volume summary

Potential increase in runoff due to the development*[1] Minimum attenuation assuming some off-site discharge.	Total runoff including climate change (+40%)*[1] Maximum attenuation assuming no off-site discharge	Change in impermeable area on a previously developed site As a % of total area
↑ +10 m^3	+77 m^3	↑ + 14%

*[1] for the 6 hour, 1 in 100 year event excluding mitigation

It is recommended that the residential extension which is located on a previously developed site, should incorporate SuDS features (Section 2) comprising of a rainwater harvesting butt and green roof to intercept and attenuate surface water runoff; prior to discharging to the public sewer via the existing connection. Based on Site Investigation data (Chelmer ref: BIA/8417, May 2017) the sandy silty clay recorded over two separate borehole records is unlikely to support focused infiltration to ground. A minimum attenuation of 5 m^3 with a controlled discharge rate of 1 l/s is the storage and rate required to achieve as close to 50% attenuation of the site's (prior to re-development) surface water runoff (during the 6 hour 1 in 100 year storm event) at peak times. This would also provide as close to three times the greenfield run off rate as is feasibly practical, in line with the minimum requirements stated within London Borough of Camden Planning Guidance (CPG 3: Sustainability) (July, 2015).

Next steps

A Thames Water pre-development enquiry is recommended to obtain approval in principle to discharge from the Site via the existing connection and to determine allowable discharge rates.

Additional considerations:

The final design capacity for a SuDS depends on the Site constraints and the following assessments are required:

Site topography and drainage routes, calculation of runoff rates and volumes and assessment of SuDS options and drainage strategy.

Environmental and ecological considerations:

The Site is not located within a Special Protected Area (SPA) or a Site of Special Scientific Interest (SSSI).

CDM considerations:

If your development is defined as 'Construction Work' under CDM 2015, you or the organisation that is having the work carried out will be defined as 'the Client' and have specific duties under the Regulations. A full list of CDM considerations and our Terms and Conditions can be found on our website, the links can be found in section at the back of this report.

2. Potential SuDS scheme options layout

The SuDS scheme layout is indicated below with further supporting information provided in subsequent sections to provide a minimum attenuation of 5m³ (storage required for controlled discharge to the minimum discharge rate of 1 l/s per outfall for developments which require discharge into a surface water course/sewer, in line with the London Borough of Camden Planning Guidance (CPG 3: Sustainability))

Key:

- Site Boundary
- Green roof
- Rainwater tank
- Permeable Paving
- Swale
- Hydro-brake & non-return flap valve
- Aco Drain
- Proposed Development
- Natural Flow Direction
- Exceedance Flow Direction
- Basement extent

The underlying substrate of the green roof should be agreed at the detailed design stage; however it is recommended that discussions are held with a specialist green roof design company to ensure the most cost effective use of materials. This will depend on the required thickness to attenuate surface water runoff and the weight requirements of the roof.

A small orifice control will be required to reduce the outflow from into the surface water sewer to an acceptable rate during exceedance events.

Orifices are a circular or rectangular opening of a shape and size (small diameter holes) which allows a controlled rate of outflow when submerged.

The flow rate depends on the height of the water above the opening (hydraulic head) and the size and edge treatment of the orifice.

Permeable paving, rainwater harvesting tanks and green roofs are proposed in order to improve the water quality and act as a form of treatment. Both would act to catch and store the first 5 mm of rainfall.

Gradients of connecting pipework on the green roof should fall towards the assumed rainwater downpipes to ensure drainage is achieved by gravity and self-cleansing velocity is achieved.

Primary Site drainage:

Green Roof

A green roof covering 104m² (proposed cover area) green roof mix example depth of 0.3m and Geocomposite example depth of 0.005m depth would attenuate for 5 m³.

Rainwater Harvesting

Rainwater harvesting tanks are recommended for the Site. Due to the relatively small amounts of attenuation provided by rainwater harvesting tanks in this instance and the requirement to retain water for non-potable uses such as toilet flushing or garden maintenance, the volume of run-off which could be attenuated by rainwater harvesting has not been considered within the report but should be used on the Site within the garden area to provide water quality benefits.

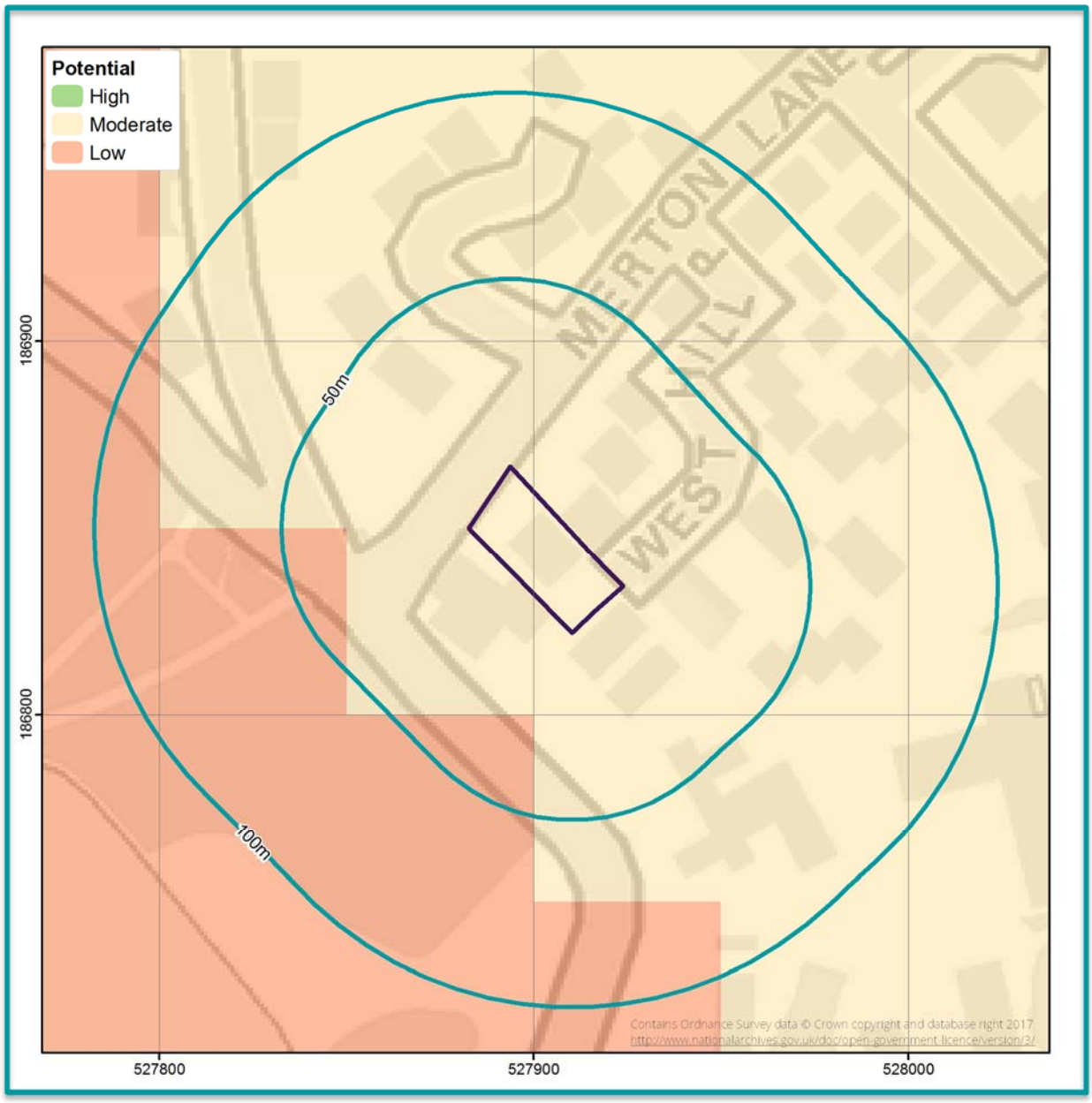
Permeable paving

A 18m² area which consists of permeable paving with a 0.3 m depth and 95% void space geo-cellular storage system, would result in 5m³ attenuation.

3. Site location

Report prepared on:
2017-07-03
Site area:
864 m^2
Current use:
Residential Development
Proposed use:
Side extension, rear basement extension and front basement extension
Report author:
Sam Cogan
Report Checker
Mike Piotrowski
Report reviewer(s):
Alan White/Paul Ellis

4. SuDS infiltration suitability (SD50) map

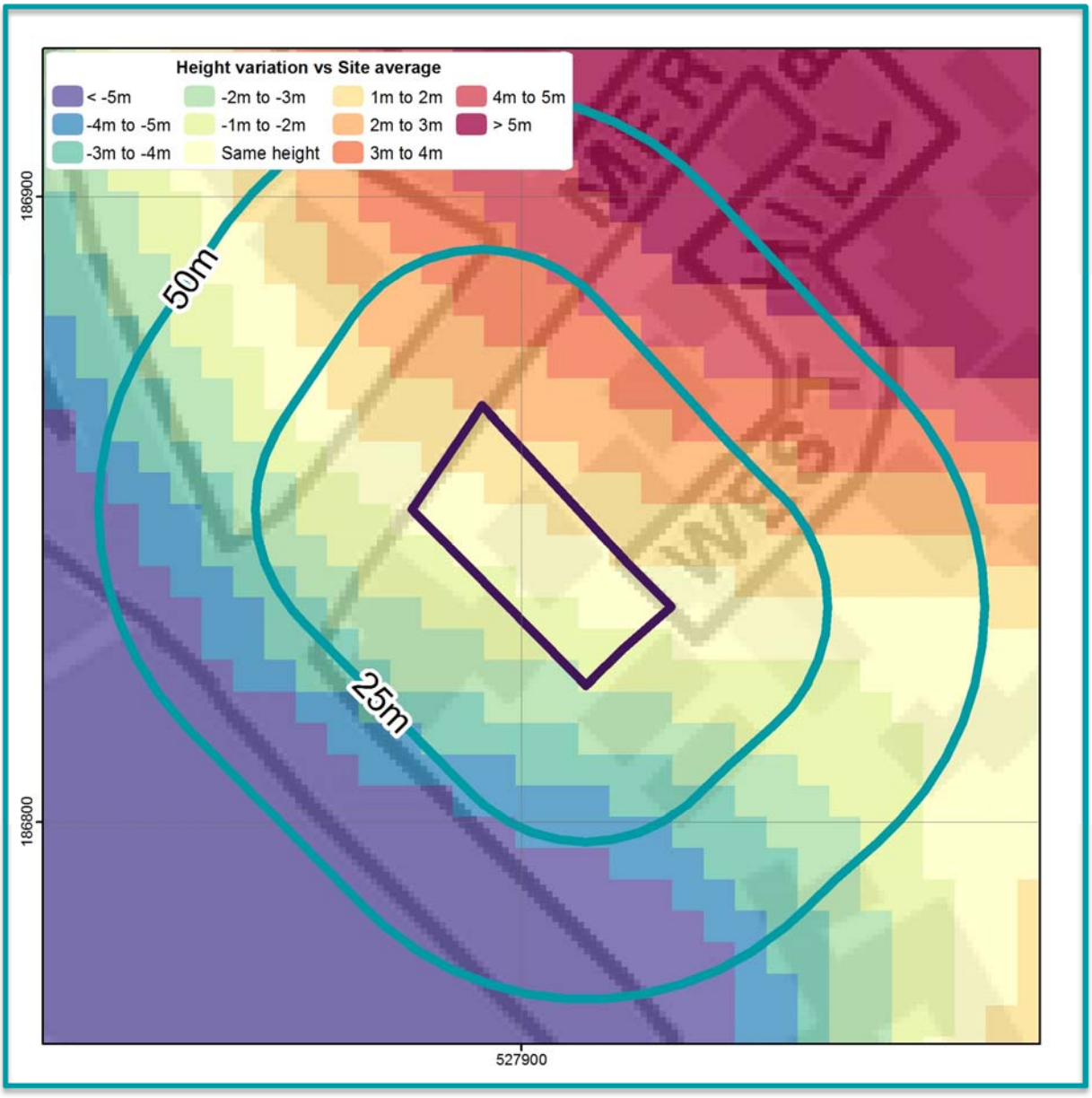


The GeoSmart SuDS Infiltration Suitability (SD50) Map screens the potential for infiltration drainage at the Site and indicates where further assessment is recommended.

There is a moderate potential for infiltration SuDS in parts of the Site as there may be constraints on the use of infiltration SuDS as a result of the varying permeability of the underlying Claygate Member Bedrock. The feasibility of infiltration SuDS is fully discussed in Section 12.

The map combines information on the thickness and permeability of the underlying material and the depth to the high groundwater table. It supports conceptual Site drainage design and the planning of further Site investigation.

5. Site topography



GeoSmart have undertaken an assessment of the topography at the Site and within its vicinity, using LiDAR elevation data from the Environment Agency. The mapping shows a comparison between average ground levels on the Site with ground levels in the surrounding area.

Assessment has been undertaken using GIS/OS mapping data as well as interrogation of LiDAR DTM5 elevation data, to identify localized depressions. The mapping confirms ground levels fall to the south west. Drainage networks may be able utilise the existing gradient on the Site to discharge locations such as sewers.

Further analysis could be undertaken by visiting the Site or by collecting additional topographic survey to provide further confirmation of ground levels.

6. Source protection zone map

GeoSmart have undertaken an assessment of the Environment Agency groundwater Source Protection Zones (SPZ) within the vicinity of the Site.

The site is not within an SPZ, therefore if the bedrock is suitable infiltration to the ground is likely to be acceptable providing suitable mitigation measures are in place if required to prevent an impact on water quality from the proposed or historical land use and contaminated land.

If further analysis is required, this would involve a review of Site specific contaminated land data. If hazards are identified, it is recommended that the Local Authority and the Environment Agency are contacted to confirm the susceptibility of any SPZ's within the wider area.

7. Surface water features map

GeoSmart have undertaken an assessment of the location of surface water features within the vicinity of the Site. The Site is over 100m from a surface water body. Discharge to surface water is unlikely to be appropriate.

The site is also not located within 250m of a SSSI.

Further analysis could be undertaken by visiting the Site or by contacting the Local Council and the Environment Agency to confirm the presence, location and condition of these watercourses.

8. Sewer features map

GeoSmart have undertaken an assessment of the location of sewer features within the vicinity of the Site. According to an STL sewer search there is a public combined sewer located within 50m of the Site, according to mapping included within section 8 and Appendix C. Plans provided also shows that the Site is already served by surface water manhole covers located towards the front of the property.

Further analysis of the connections and condition of the public surface water and foul drainage systems should be undertaken by carrying out a CCTV survey, or by contacting the drainage provider or the Local Council to confirm the presence, location and condition of these sewers. Consultation with the drainage provider should be undertaken to ensure permission to connect and to determine that sufficient capacity is available to accept the proposed discharge.

9. Risk of flooding from rivers and sea map

GeoSmart have undertaken an assessment of the risk of flooding from the rivers and the sea within the vicinity of the Site.

According to the Environment Agency's mapping, the site has a very low risk of fluvial or coastal flooding.

Where there is a moderate or high risk, further analysis could be undertaken by visiting the Site or by contacting the Local council and the Environment Agency to confirm the risk and the associated flood depths.

10. Risk of flooding from surface water map

GeoSmart have undertaken an assessment of the risk of flooding from pluvial sources within the vicinity of the Site. The mapping shown above confirms pluvial flood depths in a 1 in 100 year storm event.

According to the Environment Agency's Risk of Flooding from pluvial sources, the Site is at 'Very Low' Risk of pluvial flooding. According to the SFRA, the Site is located within a Critical Drainage Area (CDA) (Group3_001). It is not however located within a Local Flood Risk Zone (LFRZ) (URS Ltd, 2014).

Further analysis could be undertaken by visiting the Site or by contacting the Local Council and the Environment Agency; to confirm the pluvial flood risk and flood depths and velocities where applicable.

11. Groundwater flood risk (GW5) map

According to GeoSmart's Groundwater Flood Risk (GW5) map, the site has a negligible risk of groundwater flooding during the 1 in 100 year event. Therefore SuDS design is unlikely to be affected at the Site by flooding through the underlying geology.

Confirmation of sufficient depth to the high water table in areas at moderate risk would be appropriate. A review of ground stability and minimum soakaway separation from adjacent buildings could also be assessed through further Site Investigation.

12. Site conditions

Site information

The purpose of this report is to assess the potential for disposing of surface water through a sustainable drainage system (SuDS) for the site of 26 West Hill Park, London, N6 6ND (the Site). The Site is located in the Highgate area of Camden in a setting of residential land use. The land slopes to the south west from 91.75 to maOD (above Ordnance Datum) to 87.81 maOD according to a site specific topographic survey, undertaken by CD Surveys Ltd in October 2016. Site plans and drawings are provided in Appendix A.

Development

The Site is currently used within a residential capacity as a 3 storey development with a lower ground floor. At present there is a single building with a garage and landscaped areas. The proposed development to the site intends to develop a side extension, rear basement extension and front basement extension to the existing building. The rear basement extension will extend underneath the existing garden area. As the development is intended for the extension of a basement with no change to the existing building footprint (the side extension is for a first floor overhang over existing impermeable cover) or the garage development, there developments have been excluded from consideration within the report calculations.

Geology, permeability and thickness

A number of different formations underlie the site and each formation may have a range of permeability.

Geology present on site		Potentially permeable?
Superficial geology	None recorded at the Site	N/A
Bedrock geology	Claygate Member (Clay, Silt And Sand)	Unknown

British Geological Survey (BGS) records confirming the permeability of the underlying material at the site were not available.

Based on Site Investigation data undertaken for the property in relation to a Basement Impact Assessment (BIA) (Chelmer Site investigations, February 2017), the underlying material comprises made ground (to a depth of 0.9m) which

transitions into a firm orange brown sandy silty clay layer which continues to a depth of > 10m. The sandy silty clay recorded over two separate borehole records is likely to have low permeability and would not be supportive of focused infiltration to ground.

Confirmation of the infiltration capacity is recommended where focused infiltration features are suitable for the Site and the soil infiltration coefficient must be sufficient to accommodate the constraints on the dimensions of the soakaway and its emptying time.

Depth to groundwater

Boreholes undertaken within the Site Investigation recorded groundwater seepage in one borehole at a depth of 6.8 mbgl (below ground level) and a groundwater strike was recorded in the other borehole at a depth of 7.0m bgl.

The base of an attenuation or infiltration system should be at least 1m above the expected seasonal high water table. Passage through unsaturated soil is important for improving the quality of infiltrating water before it reaches the water table. Infiltration and attenuation systems should be designed to operate in periods of extreme groundwater levels.

Guidance

'It is essential that the consideration of sustainable drainage takes place at the land acquisition due diligence stage'

LASOO (2015), Practice Guidance, Local Authority SuDS Officer Organisation.

Ground conditions

A Site specific review of underlying ground stability undertaken for the BIA states that slope instability could be a potential problem as there is a moderate hazard for shrink-swell clays at the Site (Chelmer Site investigations, February 2017).

In this instance the infiltration potential is low therefore infiltration SuDS are unlikely to be installed and have a detrimental impact on the underlying ground stability.

Water quality

The site does not lie within a source protection zone. In this case an assessment of the quality of infiltrating runoff and the possibilities for pre-treatment is not required.

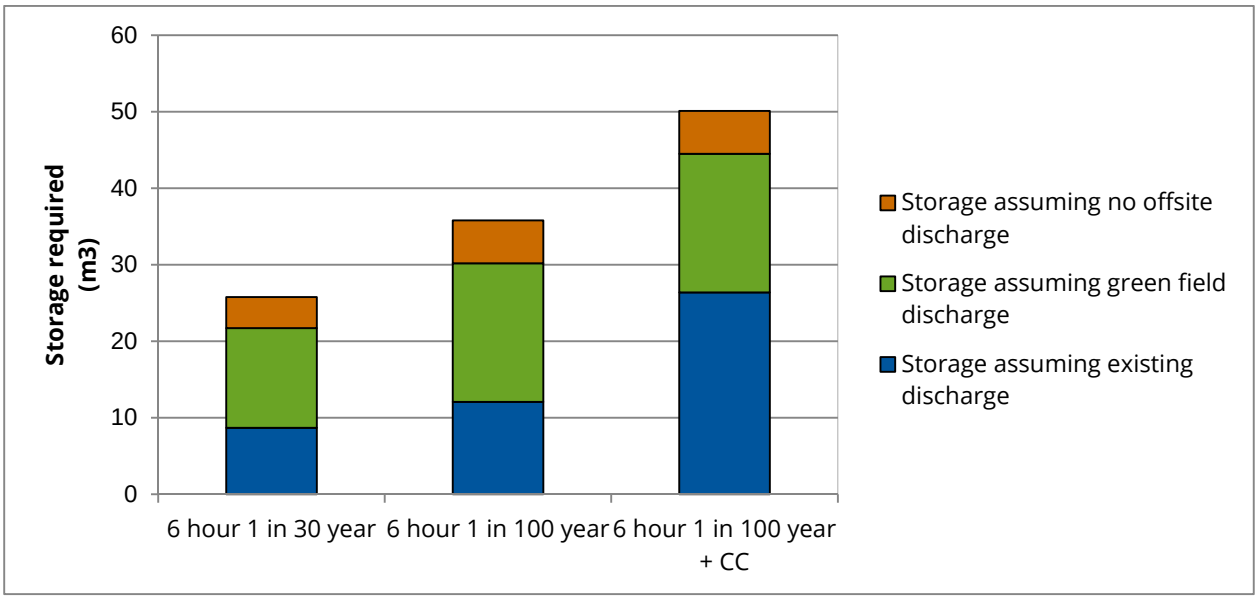
Consultation with the Local Authority and examination of historical land uses would enable early indication of the likelihood of contamination.

The influence of surface runoff on water quality will depend on whether there is a source of contamination on Site and the sensitivity of the receiving environment, either groundwater or surface water. The intervening pathway from source to receptor including mitigation and natural attenuation will determine the final impact.

The impact of contaminants on the groundwater are reduced by travel and natural attenuation through the unsaturated soil zone. A greater depth of unsaturated zone and the presence of significant clay and organic material will provide greater protection for the underlying groundwater. Rapid flow through fractures will provide less protection than intergranular flow around soil and rock particles.

13. Storage, volume and peak flow rate

Suggested minimum and aspirational storage requirements for an infiltration SuDS scheme for the development footprint are set out below with more detail provided in subsequent sections. Storage volumes may be reduced (but not below the minimum level) if the design incorporates off-site discharge.



Attenuation scenario	Attenuation requirement (m^3)	Explanation
Attenuation with controlled discharge to 1 l/s (Camden Planning Guidance)	5	Storage required to achieve as close to 50% attenuation of the Site's (prior to re-development) surface water runoff rate (during the 6 hour 1 in 100 year storm event) at peak times and as close and to as close to three times the greenfield run off rate as is feasibly practical in line with the minimum requirements stated within London Borough of Camden Planning Guidance (CPG 3: Sustainability) (July, 2015) (See Appendix B).
Aspirational	64	Storage required assuming no off site drainage for the 6 hour 1 in 100 year event, including the maximum effects of climate change. *Note: discharge off site will reduce this, and the increase as a result of climate change is less for buildings with a limited design life.*

London Drainage Policy

London Plan - Policy 5.13 Sustainable drainage (March, 2016)

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:

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

London Plan - Sustainable design and Construction SPG: Section 3.4.9 (April, 2014)

Most developments have been able to achieve at least 50% attenuation of the site's (prior to re-development) surface water runoff at peak times. This is the minimum expectation from development proposals.

On previously developed sites, runoff rates should not be more than three times the calculated greenfield rate. The only exceptions to this, where greater discharge rates may be acceptable, are where a pumped discharge would be required to meet the standards or where surface water drainage is to tidal waters and therefore would be able to discharge at unrestricted rates provided unacceptable scour would not result.

Discharge to surface water course/sewer

There may be situations where it is not appropriate to discharge at greenfield runoff rates. These include, for example, sites where the calculated greenfield runoff rate is extremely low and the final outfall of a piped system required to achieve this would be prone to blockage.

London Borough of Camden Planning Guidance (CPG 3: Sustainability) (July, 2015)

Within Camden, SuDS systems must be designed in accordance with London Plan policy 5.13. This requires that developments should utilise 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.

Camden Development Policy 23 (Water) requires developments to reduce pressure on combined sewer network and the risk of flooding by limiting the rate of run-off through sustainable urban drainage systems.

Camden Planning Guidance 3 (CPG3) requires developments to achieve a greenfield run off rate once SuDS have been installed. Where it can be demonstrated that this is not feasible, a minimum 50% reduction in run off rate across the development is required.

Critical Storm Duration and volume requirements

According to calculations of runoff from the Site, the 1 in 100 year run-off rate is c. 0.03 l/s. Existing run-off rates, for a 6 hour, 1 in 100 year event is 1.1 l/s.

Restricting run-off rates to 50% of existing would result in a run-off rate of 0.55 l/s and restricting flow rates to three times the greenfield runoff rate would result in a run-off rate of 0.09 l/s, neither of which are feasibly practical. Flow control products available on the market can control flow rates to a minimum of 1 l/s, the discharge rate recommended within this report.

Appendix B presents storage volumes for the 1 in 100 year plus climate change (40%) used to assess the impact of the proposed development and calculate the required storage volumes for the critical storm duration for attenuation features, limited to a maximum discharge rate of 1 l/s. According to calculations, the 0.75 hour storm is the critical storm duration when applying a discharge rate of 1 l/s and would require an attenuation volume of $5m^3$.

Surface water runoff

An increase in impermeable area on site will result in greater rainfall runoff. Reduction in runoff will help mitigate flood risk both on and off site. Further information on the surface water runoff calculations is provided in Section 16 'Background Information'.

Guidance

The Non-Statutory Technical Guidance for SuDS (Defra, March 2015) states:

"Where reasonably practicable, for Greenfield development, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event should never exceed the Greenfield runoff volume for the same event. Where reasonably practicable, for developments which have been previously developed, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must be constrained to a value as close as is reasonably practicable to the Greenfield runoff volume for the same event, but should never exceed the runoff volume from the development site prior to redevelopment for that event."

Table 1: Change in impermeable area associated with the development

The rear basement extension (104 m^2) will extend underneath the existing garden area and, for the basis of these calculations, has been classed as 'impermeable'.

Total site area	840 m^2
Area that remains unchanged and is excluded from the development footprint drainage and runoff calculations	718 m^2

Proposed Impermeable area (and as a percentage of the total area of the proposed development footprint of 122 m^2)	
Pre-development	Post-development
470 m^2 (56%)	540 m^2 (64%)
Impermeable Land use: 195 m^2 paved walkway 60 m^2 parking area 215 m^2 house and garage Permeable Land use: 370 m^2 landscaped areas	New impermeable land use: 104 m^2 basement extension 213 m^2 paved walkway 60 m^2 parking area 215 m^2 house and garage New permeable land use: 248 m^2 of landscaped areas

For the purposes of these calculations, only the basement extension area (104 m^2) and the difference between the existing and proposed paving areas (18 m^2) have been used to calculate the runoff volumes and rates.

Guidance

"The drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur on any part of the site for a 1 in 30 year rainfall event' and 'flooding does not occur during a 1 in 100 year rainfall event in any part of: a building (including a basement); or in any utility plant susceptible to water (e.g. pumping station or electricity substation) within the development"

(Defra, March 2015, non-statutory guidance).

Peak discharge rates

The table below presents peak discharge rates for a range of storm events used to assess the impact of the proposed development and select the maximum permitted discharge rate. Further information on the calculation and control of peak discharge rates is provided in Section 16 'Background Information'.

Table 2: Peak discharge rates associated with the development

Rainfall event	Greenfield runoff rates	Existing runoff rates[1] (l/s)	Potential runoff rates without attenuation	Potential minus existing (l/s)
QBAR	0.00	N/A	N/A	N/A
6 hour 1 in 1 year	0.00	0.0	0.2	0.1
6 hour 1 in 10 year	0.00	0.0	0.3	0.2
6 hour 1 in 30 year	0.00	0.0	0.4	0.3
6 hour 1 in 100 year	0.01	0.0	0.5	0.5
6 hour 1 in 100 year + 20% CC	N/A	N/A	0.6	0.6
6 hour 1 in 100 year + 40% CC	N/A	N/A	0.7	0.7

[1] Assumes 100% runoff from impermeable surfaces. Assumes Greenfield runoff from permeable surfaces calculated using the IoH124 method.

Relevant local and regional plan policy should be consulted to determine restrictions on runoff from previously developed sites. In some cases green field rates may be requested. In practice according to the CIRIA SuDS Manual (C753), it is difficult to restrict discharge rates at any one control point to less than 5 l/s, although modern flow control systems can restrict rates to as low as 1 l/s.

Total discharge volumes

The table below presents discharge volumes for a range of storm events used to assess the impact of the proposed development and calculate the required storage volumes. Further information on the calculation of total discharge volumes is provided in Section 17 'Methodology and Limitations'.

Table 3: Total discharge volumes associated with the development

Rainfall event	Greenfield runoff volume (m^3)	Existing runoff volume[2] (m^3)	Potential runoff volume without attenuation (m^3)	Potential minus existing (m^3)
QBAR	0.4	N/A	N/A	N/A
6 hour 1 in 1 year	0.3	0.3	3.3	3.0
6 hour 1 in 10 year	0.6	0.6	5.7	5.1
6 hour 1 in 30 year	0.8	0.8	7.8	7.1
6 hour 1 in 100 year	1.1	1.1	10.9	9.8
6 hour 1 in 100 year + 20% CC	N/A	N/A	13.0	12.0
6 hour 1 in 100 year + 40% CC	N/A	N/A	15.2	14.2

[2] Assumes 100% runoff from impermeable surfaces. Assumes Greenfield runoff from permeable surfaces calculated using the IoH124 method.

Climate change

Projections of future climate change, in the UK, indicate more frequent, short-duration, high-intensity rainfall and more frequent periods of long duration rainfall. Guidance included within the National Planning Policy Framework (NPPF) recommends that the effects of climate change are incorporated into Flood Risk Assessments (NPPF technical guidance note, DCLG, 2012).

Updated guidance (March 2016) on climate change recommends that both the 20% Central Allowance and 40% Upper End allowances should be added to the peak rainfall intensity for residential or commercial development, to understand the range of impacts. Where feasible, a precautionary approach should be taken particularly in areas at risk of flooding.

Table 4: Peak rainfall intensity allowance in small and urban catchments (use 1961 to 1990 baseline)

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%

14. Runoff destination

Options for the destination for the runoff generated on-site have been assessed in line with the prioritisation set out in the Building Regulations Part H document (HM Government, 2010) and Defra's Draft National Standards for SuDS (2011). Flow attenuation using infiltration SuDS (discharge to ground) is generally the preferred option. If discharge to ground is not available, runoff discharge to surface water is the other preferred method. Only if these two options are impractical should discharge to the sewer network be considered.

Discharge to ground

As discussed in Section 3 the Site has a moderate potential for infiltration, although based on site specific borehole information, sandy silty clay bedrock was recorded over two separate borehole records which is likely to have low permeability, and is unlikely to be supportive of infiltration to ground.

Discharge to surface watercourse

There are no watercourses or surface water features within 100 m of the Site. Therefore it would be extremely difficult to obtain third party agreements to connect into the nearest surface water feature. The Site would be unsuitable for discharge to surface water features.

Discharge to sewer

Discharge to sewer is likely to be the optimum sustainable drainage option for the new development area. According to the STL Regulated Drainage and Water search (Appendix C) there is a public combined sewer located within 50m of the Site and the existing Site already drains to the public sewer. Plans provided confirm the Site is already served by surface water manhole covers located towards the front of the property.

A flow control device will be required to limit peak discharge rates to the maximum selected rate as indicated in Section 13, along with the appropriate attenuation storage volume described in section 2 and 16 of this report.

15. Water quality

A key requirement of any SuDS system is that it protects the receiving water body from the risk of pollution. This can be effectively managed by an appropriate "train" or sequence of SuDS components that are connected in series. The frequent and short duration rainfall events are those that are most loaded with potential contaminants (silts, fines, heavy metals and various organic and inorganic contaminants). Therefore, the first 5-10 mm of rainfall (first flush) should be adequately treated with SuDS.

The minimum number of treatment stages will depend on the sensitivity of the receiving water body and the potential hazard associated with the proposed development SuDS Manual (CIRIA, 2015). The proposed development is a combination of low (roof water) to medium hazard (runoff from car parking and road). The site does not lie within a source protection zone and therefore additional treatment stages are not required.

Table 5: Level of hazard

Hazard	Source of hazard
Very Low	Residential roof drainage
Low	Residential, amenity uses including low usage car parking spaces and roads, other roof drainage.
Medium	Commercial, industrial uses including car parking spaces and roads (excluding low usage roads, trunk roads and motorways).
High	Areas used for handling and storage of chemicals and fuels, handling of storage and waste (incl. scrap-yards).

The recommended minimum number treatment stages suggested for the different runoff waters identified for the proposed development is highlighted in Table 6.

Table 6: Minimum number of treatment stages for runoff

		Sensitivity of the receiving water body		
		Low	Medium	High
Hazard	Low	1	1	1
	Med	2	2	2
	High	3	3	3

16. Sustainable drainage systems

It is recommended the drainage system has the capacity to accommodate the 1 in 100 year event before flooding occurs. Drainage from areas outside the development footprint will continue to use the existing drainage arrangements.

Attenuation SuDS are recommended in this instance, subject to appropriate agreements from Thames Water.

The recommended drainage strategy has been summarised within the schematic included in Section 2 of this report and would provide a minimum surface water storage of $5m^3$. This is the storage required for the minimum discharge rate of 1 l/s per outfall for developments which require discharge into a surface water course/sewer.

The minimum discharge rate of 1 l/s is required to achieve as close to 50% attenuation of the site's (prior to re-development) surface water runoff (during the 6 hour 1 in 100 year storm event) rate at peak times, and as close and to as close to three times the greenfield run off rate as is feasibly practical in line with the minimum requirements stated within London Borough of Camden Planning Guidance (CPG 3: Sustainability) (July, 2015)

1. 104 m^2 of green roof is already proposed for the roof space of the development. Green roofs usually comprise an ABG green roof mix and a geo-composite layer. The first 5mm of storage would be provided within green roofs and high-porosity substrate below the growing medium to attenuate surface water and throttle flows at a downpipe entrance. A green roof covering $104m^2$ (proposed cover area) with a green roof mix example depth of 0.3m and Geocomposite example depth of 0.005m depth would attenuate for $5m^3$. An overflow from the proposed green roof should also connect to rainwater pipes to prevent pooling on the development roof.

2. To comply with London Plan policy, rainwater harvesting tanks should be established for the proposed development. The tank is likely to be used throughout the year however due to the flood risks which could be associated, overflow from the tanks should be discharged into the geo-cellular storage crate system underneath the permeable paving.

   The run-off from the proposed development roof should be led into a rainwater harvesting butt/tank via rainwater downpipes. The nature and use of the tank should be confirmed (for water use either within the proposed developments or within an amenity scope – i.e. for watering garden areas). An overflow system will still be required for implementation on the Site due to exceedance events (where the pumps fail or there is a blockage within the system / or the number of residents and subsequent water usage is reduced).

   Due to the potential flood risk associated with rainwater harvesting butts/tanks, volume of run-off which could be attenuated by Rainwater Harvesting has not been considered within the calculations for attenuation within the proposed drainage strategy.

Initial recommendation:

Source Control attenuation SuDS (rainwater harvesting butt, green roofs and permeable paving) with controlled discharge to sewer via the existing connection.

Interception via green/brown roofs would enable the storage of run-off and infiltrate collected water gradually into the underlying substrate; this provides various levels of storage depending on the surface area of the feature and the thickness / type of the substrate being use. The different types of green roof include the following:

- Extensive roofs, have low substrate depths (and therefore low loadings on the building structure), simple planting and low maintenance requirements; these tend not to be accessible.

- Intensive roofs (or roof gardens) have deeper substrates (and therefore higher loadings on the building structure) that can support a wide variety of accessible planting but which tend to require more intensive maintenance.

Green roofs can also provide improvements to water quality as they intercept water at the source, and the layering of the substrate can incorporate filtration measures to remove pollutants from the system. Green Roofs are roofs which incorporate planting, often sedum or wildflower and meadow planting, grasses and mosses. In fact, some can even be planted with trees and shrubs. Brown roofs are similar to green roofs, the main difference is that whilst green roofs are often installed partly for the aesthetic value, brown roofs tend to be installed for environmental reasons, mainly, to encourage plants and wildlife.

In addition, although green roofs absorb most of the rainfall that they receive during frequent events, there will always be a need to discharge excess water to the building's drainage system and these areas should be positively drained. The hydraulic performance of green roofs once saturated tends to be fairly similar to standard roofs. Therefore, the hydraulic design of green roof drainage should follow the advice in BS EN 12056-3:2000. Useful information is also provided in BS 6229:2003. Detailed guidelines for the planning, execution and upkeep of green roof sites are contained within GRO (2014).

It is recommended that attenuation should be provided in the form of a high porosity substrate underlying the growing medium, which would provide sufficient storage (depending on loading requirements of a fully saturated substrate). It is likely that the high porosity medium would only have to be relatively thin in order to achieve the attenuation requirements. Surface water would then be throttled to a suitable rate at a downpipe entrance before discharging to the combined sewer system, via an existing connection.

Rainwater Harvesting/Water Butts is primarily used to collect rainwater from impermeable areas and roofs for the use within development buildings and other miscellaneous usage. Due to the relatively small amounts of attenuation provided by rainwater harvesting tanks in this instance and the requirement to retain water for non-potable uses such as toilet flushing or garden maintenance, the volume of run-off which could be attenuated by rainwater harvesting has not been considered within the report. Cost in regards to rainwater harvesting is mainly due to the provision of a storage tank, pumps and pipework which is required for the system to be fully operational. As there is an issue with the storage

capability of Rainwater Harvesting tanks, this method should only be used as an additional SuDS "source control" feature with a fixed attenuation volume and a controlled outlet to discharge into the proposed infiltration feature. In terms of attenuation storage within this SuDS scheme, volume of run-off which could be attenuated by Rainwater Harvesting has not been considered within the Preliminary SuDS schematic.

Permeable paving within the garden patio and walkway areas, underlain by a geo-cellular crate storage system would ensure a suitable amount of surface water attenuation could be provided. All SuDS systems should be lined due to the presence of a basement development on the Site.

Plastic geo-cellular systems beneath permeable paving increases the void space and therefore storage but does not allow filtration unless they are combined with aggregate material and/or permeable geotextiles.

Exceedance Flow Route:

During an exceedance event through blockage or where a storm event was greater in size than the designed SuDS system, the Site would not be able to discharge into a nearby surface water channel, therefore an exceedance route into the nearest public drainage network would be required. The SuDS system recommended for the Site should provide enough storage that this method would only be utilized during a worst case scenario.

Orifice:

A small orifice control will be required to reduce the outflow from the attenuation features into the surface water sewer to an acceptable rate, one which cannot be achieved via hydro brake measure due to the potential blockage risks associated with hydro brakes if set below 2 l/s. Orifices are a circular or rectangular opening of a shape and size (small diameter holes) which allows a controlled rate of outflow when submerged. The flow rate depends on the height of the water above the opening (hydraulic head) and the size and edge treatment of the orifice. Perforated pipes can become affected by Silt or fine particles and require regular maintenance. For shallow systems, where there is a limited depth of water storage, simple orifice controls are often the most suitable form of control. The final allowable discharge rate would need to be determined with Thames Water.

Secondary recommendation:

Permeable paving underlain by geo-cellular storage with controlled discharge to sewer via the existing connection.

Attenuation of surface water runoff could also be provided within permeable paving underlain by geo-cellular storage crates (underlying permeable sub-base with a high void ratio) to provide a form of source control for surface run-off.

Permeable paving could be established on the new paved walkways proposed for the Site. A 18 m^2 area (the difference between the existing paved walkway area of 195 m^2 and the proposed walkaway area of 213 m^2) which consists of permeable paving with a 0.3 m depth and 95% void space via geo-cellular storage would result in 5 m^3 attenuation. Paving should be lined due to the presence of the basement and lower ground floor levels

SuDS maintenance

Regular maintenance is essential to ensure effective operation of the SuDS features over the intended lifespan of the proposed development. The SuDS Manual (C753) (CIRIA, 2015) provides a maintenance schedule for SuDS with details of the necessary required actions as shown in the Table oveleaf.

Asset type	Maintenance schedule (and frequency)
Green Roof	Regular inspection: • Inspect all components (soil substrate, vegetation, drainage, irrigation systems, membranes and roof structure, waterproofing, structural stability (annually and after severe storms) • Inspect soil substrate for evidence of erosion channels (annually and after severe storms). • Inspect drain inlets for unrestricted run-off (annually and after severe storms). • Inspect underside of roof for leakage (annually and after severe storms). Regular maintenance: • Remove litter and debris from inlet drains (six monthly, annually or as required). • Cleaning of clippings (six monthly or as required). • Trimming of grasses and removal of nuisance weeds and invasive vegetation (six monthly or as required). • Replace dead plants (annually or as required). Monitoring: • Stabilise any erosion channels with extra soil substrate (as required). • Identify sources of erosion and control (as required). • Investigate and repair drain inlet if inlet has settled, cracked or moved (as required).
Rainwater Harvesting	Regular maintenance: • Inspection of tank for debris and sediment build up (annually and following poor performance). • Inspection of inlets, outlets, overflow areas, pumps and filters (annually and following poor performance). • Cleaning of tank, inlets, outlets, gutters, roof drain filters and withdrawal devices (annually or as required). Remedial actions: • Repair or overflow erosion damage or damage to tank and associated components (as required)
Permeable pavements	Regular maintenance: • Brushing and vacuuming (three times per year). • Trimming any roots and surrounding grass and weeds that may be causing blockages (annually or as required). Monitoring: • Initial inspection (monthly). • Inspect for poor performance and inspection chambers (annually).

Client checklist

A drainage strategy has been recommended as suitable on the basis of the information provided. Prior to installation of the site drainage system it is recommended that the client carries out the following checks to confirm the development proposals. Geosmart would be able to support with any updates required to the drainage scheme, please contact us and we would be happy to provide you with a proposal to undertake the work.

Conditions in Draft National Standards (Defra, 2011), limitations to infiltration SuDS	Do these conditions arise at the site?
Is the surface runoff greater than the rate at which water can infiltrate into the ground?	
Is there an unacceptable risk of ground instability?	
Is there an unacceptable risk of mobilising contaminants?	
Is there an unacceptable risk of pollution to groundwater?	
Is there an unacceptable risk of groundwater flooding?	
Is the infiltration system going to create a high risk of groundwater leakage to the combined sewer?	

SuDS design considerations

Confirm that potential flooding on site in excess of the design storm event and exceedance flow routes have been considered.	
Review options for the control of discharge rates (e.g. hydrobrake).	
Confirm the owners/adopters of the drainage system. Consider management options for multiple owners	
Is there an unacceptable risk of pollution to groundwater?	
Review access and way leave requirements.	
Review maintenance requirements.	

Health and safety considerations for SuDS

GeoSmart Pro reports may include outline strategies or designs to support with development plans. Any drawings or advice provided do not comprise any form of detailed design. Implementation of any conceptual scheme options may constitute 'Construction Work' as defined by CDM Regulations (2015).

The CDM Regulations place specific Health and Safety duties on those commissioning, planning and undertaking construction works. If you are uncertain what this means you should seek the advice of your architect, builder or other competent professional.

GeoSmart does not provide health and safety advisory services but we are required to advise you of your general responsibilities under CDM (visit http://geosmartinfo.co.uk/knowledge-hub/cdm-2015/ for more information).

Please remember that detailed design work should be undertaken by a competent professional who might be your engineer, architect, builder or another competent party.

17. Methodology and limitations of study

This report assesses the feasibility of infiltration SuDS and alternative drainage strategies in support of the Site development process. From April 6th 2015 SuDS are regulated by Local Planning Authorities and will be required under law for major developments in all cases unless demonstrated to be inappropriate. What is considered appropriate in terms of costs and benefits by the Planning Authority will vary depending on local planning policy, and Site setting. The Lead Local Flood Authority will require information as a statutory consultee on major planning applications with surface water drainage implications. The National Planning Policy Framework requires that new developments in areas at risk of flooding should give priority to the use of SuDS and demonstrate that the proposed development does not increase flood risk downstream to third parties.

How was the suitability of SuDS estimated for the Site?

There are a range of SuDS options available to provide effective surface water management that intercept and store excess runoff. When considering these options, the destination of the runoff should be assessed using the order of preference outlined in the Building Regulations Part H document (HM Government, 2010) and Defra's Draft National Standards for SuDS (2011):

1. Discharge to the ground;
2. Discharge to a surface water body;
3. Discharge to a surface water sewer;
4. Discharge to a local highway drain; and
5. Discharge to a combined sewer.

Data sets relating to each of the potential discharge options have been analysed to assess the feasibility of each option according to the hierarchy set out above. Hydrogeological characteristics for the Site are assessed in conjunction with the occurrence of SPZ's to assess infiltration suitability. The Site has been screened to determine whether flood risk from groundwater, surface water, fluvial or coastal sources may constrain SuDS. The distance to surface water bodies and sewers has been reviewed gauge whether these provide alternative options.

GeoSmart SuDS Infiltration Suitability Map (SD50)

The GeoSmart SuDS Infiltration Suitability Map (SD50) screens the suitability for infiltration drainage in different parts of the Site and indicates where further assessment is recommended. In producing the SuDS Infiltration Suitability Map (SD50), GeoSmart used data from the British Geological Survey on groundwater levels, geology and permeability to

screen for areas where infiltration SuDS may be suitable. The map classifies areas into 3 categories of High, Medium and Low suitability for infiltration SuDS. This can then be used in conjunction with additional data on Site constraints to give recommendations for SuDS design and further investigation.

The primary constraint on infiltration potential is the minimum permeability of the underlying material and in some cases the range in permeability may be considerable, ranging down to low. The map classifies these areas as moderate infiltration suitability requiring further investigation. In cases where the thickness of the receiving permeable horizon is less than 1.5 meters then additional Site investigation is recommended. If the Site is at risk of groundwater flooding for up to the 1% annual occurrence the map classifies these areas as moderate infiltration suitability requiring further investigation.

The GeoSmart SuDS Infiltration Suitability Map (SD50) is a national screening tool for infiltration SuDS techniques but a Site specific assessment should be used before final detailed design is undertaken. Further information on the GeoSmart SuDS Infiltration Suitability Map (SD50) is available at geosmartinfo.co.uk

How is the suitability to discharge to sewers and watercourses calculated?

The suitability to discharge to discharge to sewers and watercourses has been calculated using the distance from the Site to both. For example, where the Site is within 50m of a surface water body. Discharge to surface water is potentially appropriate subject to land access arrangements and a feasibility assessment. Where the Site is within 50m of a sewer, discharge to sewer is potentially appropriate subject to land access arrangements and a feasibility assessment. The utility company should be contacted to agree connection feasibility and sewer capacity.

Further information relating to sewers available in the area can be found in Appendix A in Section 12 of this report.

What is a Source Protection Zone?

The Environment Agency have defined Source Protection Zones (SPZs) for 2000 groundwater sources such as wells, boreholes and springs used for public drinking water supply. These zones show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk. The maps show three main zones (inner, outer and total catchment) and a fourth zone of special interest, which is occasionally applied. The zones are used to set up pollution prevention measures in areas which are at a higher risk. The shape and size of a zone depends on the condition of the ground, how the groundwater is removed, and other environmental factors. Inner zone

(Zone 1) is defined as the 50 day travel time from any point below the water table to the source (minimum radius of 50 metres). Outer zone (Zone 2) is defined by a 400 day travel time. Total catchment (Zone 3) is defined as the area around a source within which all groundwater recharge is presumed to be discharged at the source.

How was surface water runoff estimated from the site?

In accordance with The SuDS Manual (C753) (CIRIA, 2015), the Greenfield runoff from the Site has been calculated using the IoH124 method and is assumed representative of the runoff generated on the undeveloped surfaces that are affected by the proposed development. The method used for calculating the runoff complies with the NPPF (DGLC, 2014). For the impermeable surfaces, it has been assumed that 100% runoff will occur (calculations provided in Appendix B). Rainfall data is derived from the Flood Estimation Handbook (FEH) CD-ROM, developed by NERC (2009) and updated with the FEH 2013 dataset, obtained from the online FEH service. Only areas affected by the proposed development are considered in the flow and volume calculations. Permeable areas that remain unchanged are not included in the calculations as it is assumed these will not be actively drained and attenuated.

What is the peak discharge rate?

An estimation of peak runoff flow rate and volume is required to calculate infiltration, storage and discharge requirements. The peak discharge rate is the maximum flow rate at which surface water runoff leaves the site during a particular storm event, without considering the impact of any mitigation such as storage, infiltration or flow control. Proposed discharge rates (with mitigation) should be no greater than existing rates for all corresponding storm events. If all drainage is to infiltration there will be no discharge off site. Discharging all flow from site at the existing 1 in 100 event would increase flood risk during smaller events. Flow restriction is generally required to limit the final discharge from site during all events as a basic minimum to the green field QBAR rate. A more complex flow restriction which varies the final discharge rate from the site depending on the storm event will reduce the volume of storage required on site. Drainage to infiltration SuDS is subtracted from the total discharge off site to achieve a beneficial net affect.

What is the total discharge volume?

The total discharge volume is calculated on the basis of the surface water runoff that has the potential to leave the site as a result of the assumed 6 hour duration design storm event. The runoff is related to the underlying soil conditions, impermeable cover, rainfall intensity and duration of the storm event. The total volume generated by the current site is compared to the potential total volume from the developed site (not taking into consideration any mitigation). The difference provides the minimum total volume that will

need to be stored and infiltrated on site or released at a controlled rate. Guidance indicates that the total discharge volume should never exceed the runoff volume from the development site prior to redevelopment for that event and should be as close as is reasonably practicable to the Greenfield runoff volume.

18. Background SuDS information

SuDS control surface water runoff close to where it falls. SuDS are designed to replicate, as closely as possible, the natural drainage from the Site before development to ensure that the flood risk downstream does not increase as a result of the Site being developed, and that the Site will have satisfactory drainage under current and likely future climatic conditions. SuDS provide opportunities to reduce the causes and impacts of flooding; remove pollutants from urban runoff at source; and combine water management with green space with benefits for amenity, recreation and wildlife. Government planning policy and planning decisions now include a presumption in favour of SuDS being used for all development Sites, unless they can be shown to be inappropriate.

For general information on SuDS see our web site: http://geosmartinfo.co.uk/

Infiltration SuDS

Government policy for England is to introduce sustainable drainage systems (SuDS) via conditions in planning approvals. Guidance indicates that capturing rainfall runoff on site and infiltrating it into the ground (infiltration SuDS) is the preferred method for managing surface water without increasing flood risk downstream.

The greatest benefit to general flood risk is if all runoff is infiltrated on site, however, this may not be feasible due to physical and economic constraints in which case infiltration may be considered as a part of an integrated drainage solution. The final design capacity for an infiltration SuDS system depends on the site constraints and the requirements of the individual Planning Authority and the Lead Local Flood Authority.

The capacity of the ground to receive infiltration depends on the nature, thickness and permeability of the underlying material and the depth to the high groundwater table. The final proportion of the site drained by infiltration will depend on topography, outfall levels and a suitable drainage gradient. It is important to note that, even if the whole site cannot be drained by infiltration, the use of partial infiltration is encouraged, with the remainder of runoff discharged via other SuDS systems.

Types of infiltration SuDS

Infiltration components include infiltration trenches, soakaways, swales and infiltration basins without outlets, rain gardens and permeable pavements. These are used to capture surface water runoff and allow it to infiltrate (soak) and filter through to the subsoil layer, before returning it to the water table below.

An infiltration trench is usually filled with permeable granular material and is designed to promote infiltration of surface water to the ground. An infiltration basin is a dry basin or depression designed to promote infiltration of surface water runoff into the ground. Soakaways are the most common type of infiltration device in the UK where drainage is often connected to over-sized square or rectangular, rubble-filled voids sited beneath lawns. According to the guidance in Building Research Establishment (BRE) Digest 365 (2007) a soakaway must be able to discharge 50% of the runoff generated during a 1 in 10 year storm event within 24 hours in readiness for subsequent storm flow. This is the basic threshold criteria for a soakaway design and the internal surface area of the proposed soakaway design options should be calculated on this basis by taking into account the soil infiltration rate for the Site.

Developers need to ensure their design takes account of the construction, operation and maintenance requirements of both surface and subsurface components, allowing for any machinery access required.

SuDS maintenance and adoption

Regular maintenance is essential to ensure effective operation of the soakaway(s) over the intended lifespan of the proposed development. A maintenance schedule for SuDS is required. Sewerage undertakers or Local Authorities may adopt SuDS and will require maintenance issues to be dealt with in accordance with their Management Plan. If the SuDS will not be adopted other provision is required with associated financial implications. Maintenance is a long-term obligation requiring the upkeep of all elements of the SuDS, including mechanical components (e.g. pumps), as well as inspections, regular maintenance and repair.

Additional background SuDS information can be found on our website:
http://geosmartinfo.co.uk/

19. References and glossary

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Glossary[3]

Attenuation	Reduction of peak flow and increased duration of a flow event.
Combined sewer	A sewer designed to carry foul sewage and surface water in the same pipe.
Detention basin	A vegetated depression, normally is dry except after storm events, constructed to store water temporarily to attenuate flows. May allow infiltration of water to the ground.
Evapotranspiration	The process by which the Earth's surface or soil loses moisture by evaporation of water and by uptake and then transpiration from plants.
FEH	Flood Estimation Handbook, produced by Centre for Ecology and Hydrology, Wallingford (formerly the Institute of Hydrology).
Filter drain or trench	A linear drain consisting of a trench filled with a permeable material, often with a perforated pipe in the base of the trench to assist drainage, to store and conduct water, but may also be designed to permit infiltration.
First flush	The initial runoff from a site or catchment following the start of a rainfall event. As runoff travels over a catchment it will collect or dissolve pollutants, and the "first flush" portion of the flow may be the most contaminated as a result. This is especially the case for intense storms and in small or more uniform catchments. In larger or more complex catchments pollution.
Flood plain	Land adjacent to a watercourse that would be subject to repeated flooding under natural conditions (see Environment Agency's Policy and practice for the protection of flood plains for a fuller definition).
Greenfield runoff	This is the surface water runoff regime from a site before development, or the existing site conditions for brownfield redevelopment sites.
Impermeable surface	An artificial non-porous surface that generates a surface water runoff after rainfall.
Permeability	A measure of the ease with which a fluid can flow through a porous medium. It depends on the physical properties of the medium, for example grain size, porosity and pore shape.
Runoff	Water flow over the ground surface to the drainage system. This occurs if the ground is impermeable, is saturated or if rainfall is particularly intense.
Sewerage undertaker	This is a collective term relating to the statutory undertaking of water companies that are responsible for sewerage and sewage disposal including surface water from roofs and yards of premises.
Soakaway	A subsurface structure into which surface water is conveyed to allow infiltration into the ground.
Treatment	Improving the quality of water by physical, chemical and/or biological means.

[3] The terms included in this glossary have been taken from CIRIA (2015) guidance.

20. Further information

Disclaimer

This report has been prepared by GeoSmart in its professional capacity as soil and groundwater specialists, with reasonable skill, care and diligence within the agreed scope and terms of contract and taking account of the manpower and resources devoted to it by agreement with its client, and is provided by GeoSmart solely for the internal use of its client.

The advice and opinions in this report should be read and relied on only in the context of the report as a whole, taking account of the terms of reference agreed with the client. The findings are based on the information made available to GeoSmart at the date of the report (and will have been assumed to be correct) and on current UK standards, codes, technology and practices as at that time. They do not purport to include any manner of legal advice or opinion. New information or changes in conditions and regulatory requirements may occur in future, which will change the conclusions presented here.

This report is confidential to the client. The client may submit the report to regulatory bodies, where appropriate. Should the client wish to release this report to any other third party for that party's reliance, GeoSmart may, by prior written agreement, agree to such release, provided that it is acknowledged that GeoSmart accepts no responsibility of any nature to any third party to whom this report or any part thereof is made known. GeoSmart accepts no responsibility for any loss or damage incurred as a result, and the third party does not acquire any rights whatsoever, contractual or otherwise, against GeoSmart except as expressly agreed with GeoSmart in writing.

Further information

Information on confidence levels and ways to improve this report can be provided for any location on written request to info@geosmart.co.uk or via our website. Updates to our model are ongoing and additional information is being collated from several sources to improve the database and allow increased confidence in the findings. Further information on groundwater levels and flooding are being incorporated in the model to enable improved accuracy to be achieved in future versions of the map. Please contact us if you would like to join our User Group and help with feedback on infiltration SuDS and mapping suggestion.

Important consumer protection information

This search has been produced by GeoSmart Information Limited, New Zealand House, 160-162 Abbey Foregate, Shrewsbury, SY2 6FD.

Tel: 01743 276150
Email: info@geosmartinfo.co.uk

GeoSmart Information Ltd 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 practice 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 he finds that you have suffered actual loss 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
Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk.

Please ask your search provider if you would like a copy of the search code

Complaints procedure

GeoSmart Information Limited is registered with the Property Codes Compliance Board as a subscriber to the Search Code. A key commitment under the Code is that firms will handle any complaints both speedily and fairly.

If you want to make a complaint, we will:

- Acknowledge it within 5 working days of receipt.
- Normally deal with it fully and provide a final response, in writing, within 20 working days of receipt.
- Keep you informed by letter, telephone or e-mail, as you prefer, if we need more time.
- Provide a final response, in writing, at the latest within 40 working days of receipt.
- Liaise, at your request, with anyone acting formally on your behalf.

If you are not satisfied with our final response, or if we exceed the response timescales, you may refer the complaint to The Property Ombudsman scheme (TPOs): Tel: 01722 333306, E-mail: admin@tpos.co.uk. We will co-operate fully with the Ombudsman during an investigation and comply with his final decision.

Complaints should be sent to:

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Operations Manager
GeoSmart Information Limited
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160 Abbey Foregate
Shrewsbury
SY2 6FD
Tel: 01743 276150
jemmaprydderch@geosmartinfo.co.uk

21. Terms and conditions, CDM regulations and data limitations

Terms and conditions can be found on our website: http://geosmartinfo.co.uk/terms-conditions/

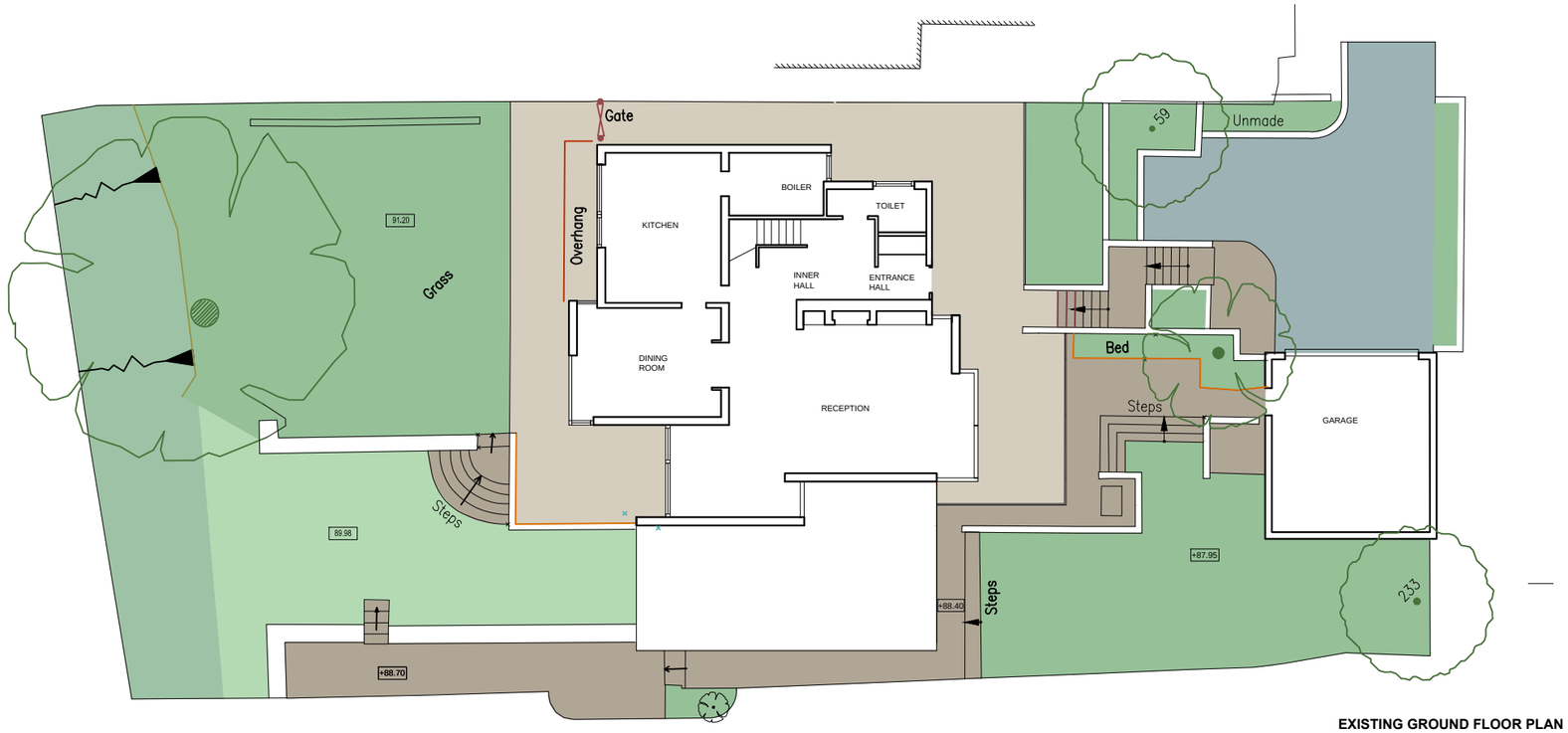
CDM regulations can be found on our website: http://geosmartinfo.co.uk/knowledge-hub/cdm-2015/

Data use and limitations can be found on our website: http://geosmartinfo.co.uk/data-limitations/

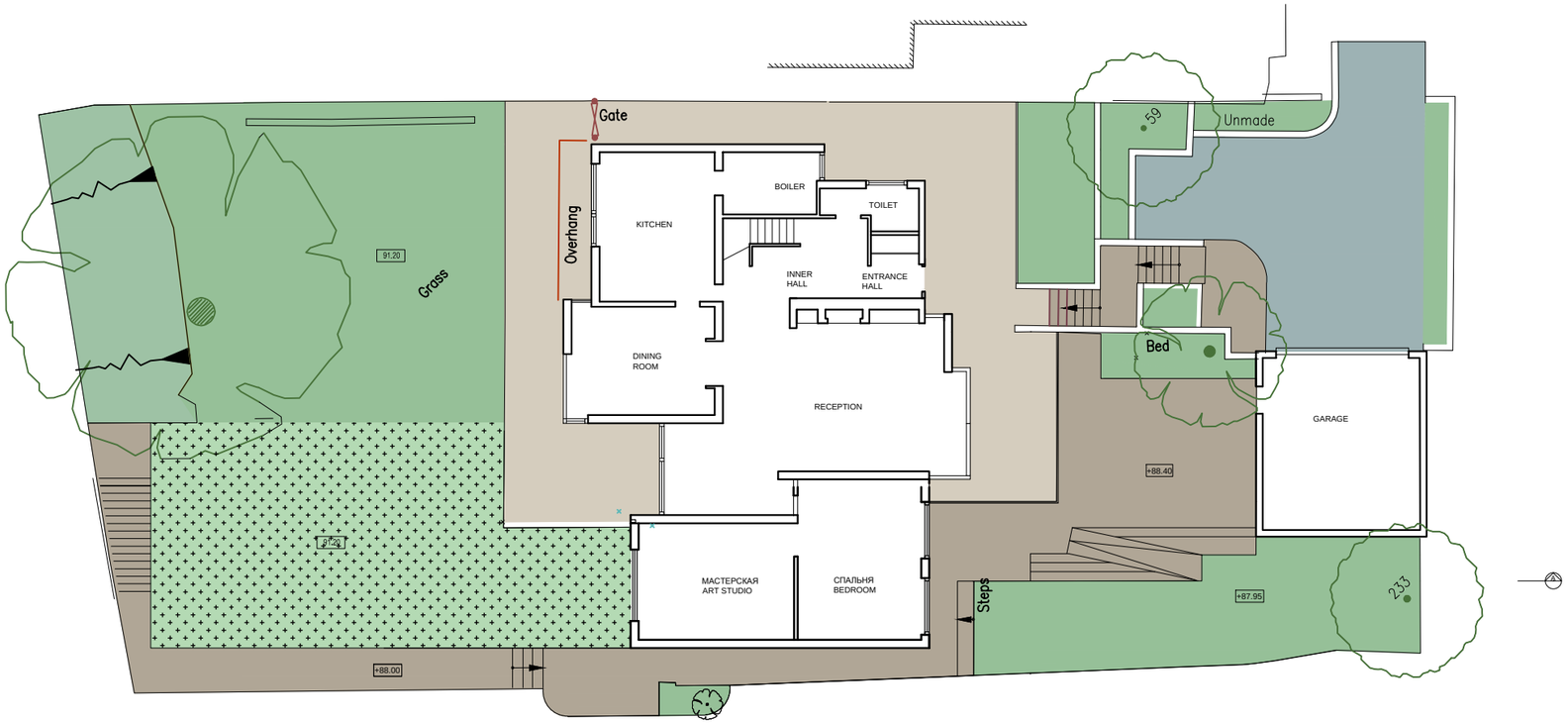
22. Appendices

Appendix A

Existing and proposed Site plans (layout and topography)



EXISTING GROUND FLOOR PLAN



PROPOSED GROUND FLOOR PLAN

0 2 4 6 8 10 20m

M 1:200

Rev. No.	Date	Revision Notes	By

PAVEMENT TILES

PAVING SLABS

GRASS

GREEN ROOF

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www.ldc-group.co.uk

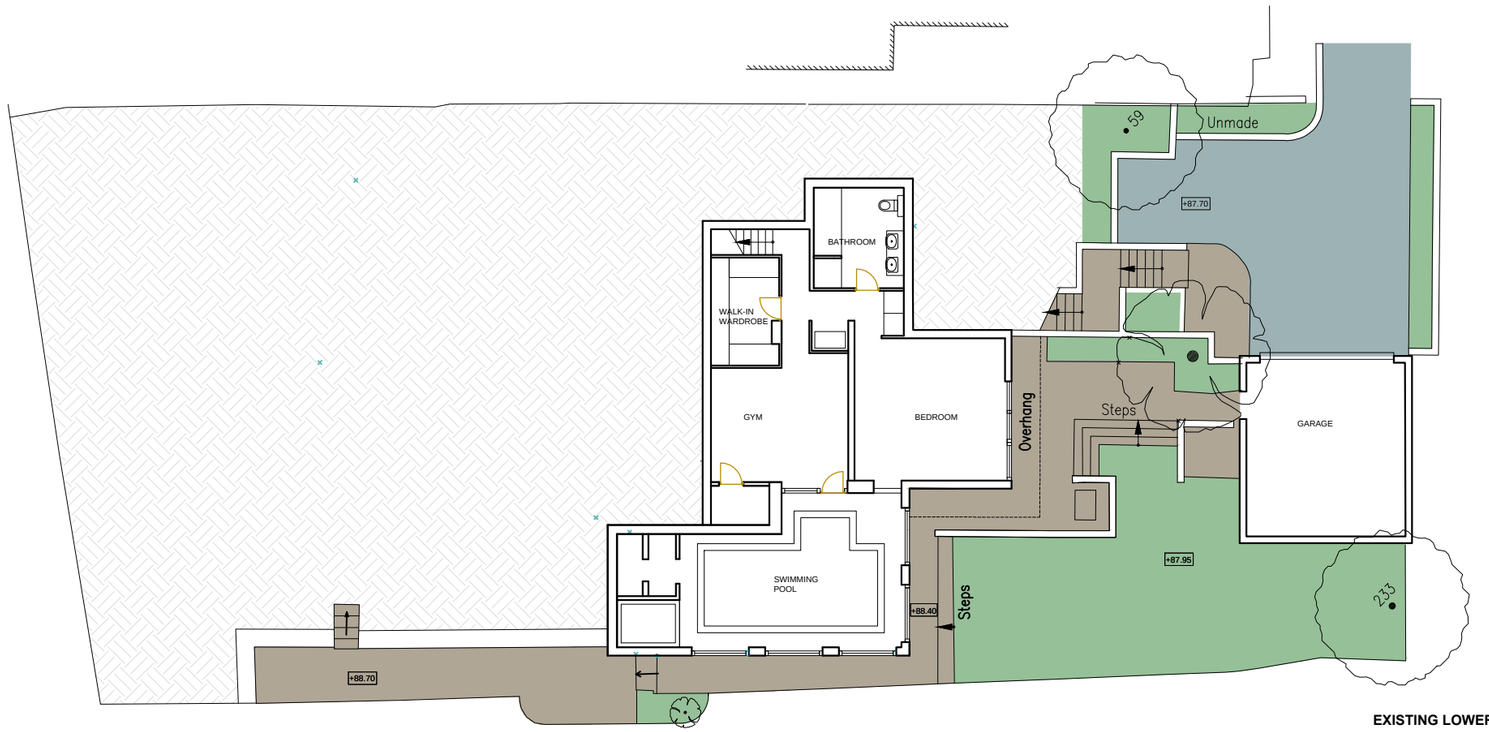
London Development & Construction

Project : **26 West hill park, London,**

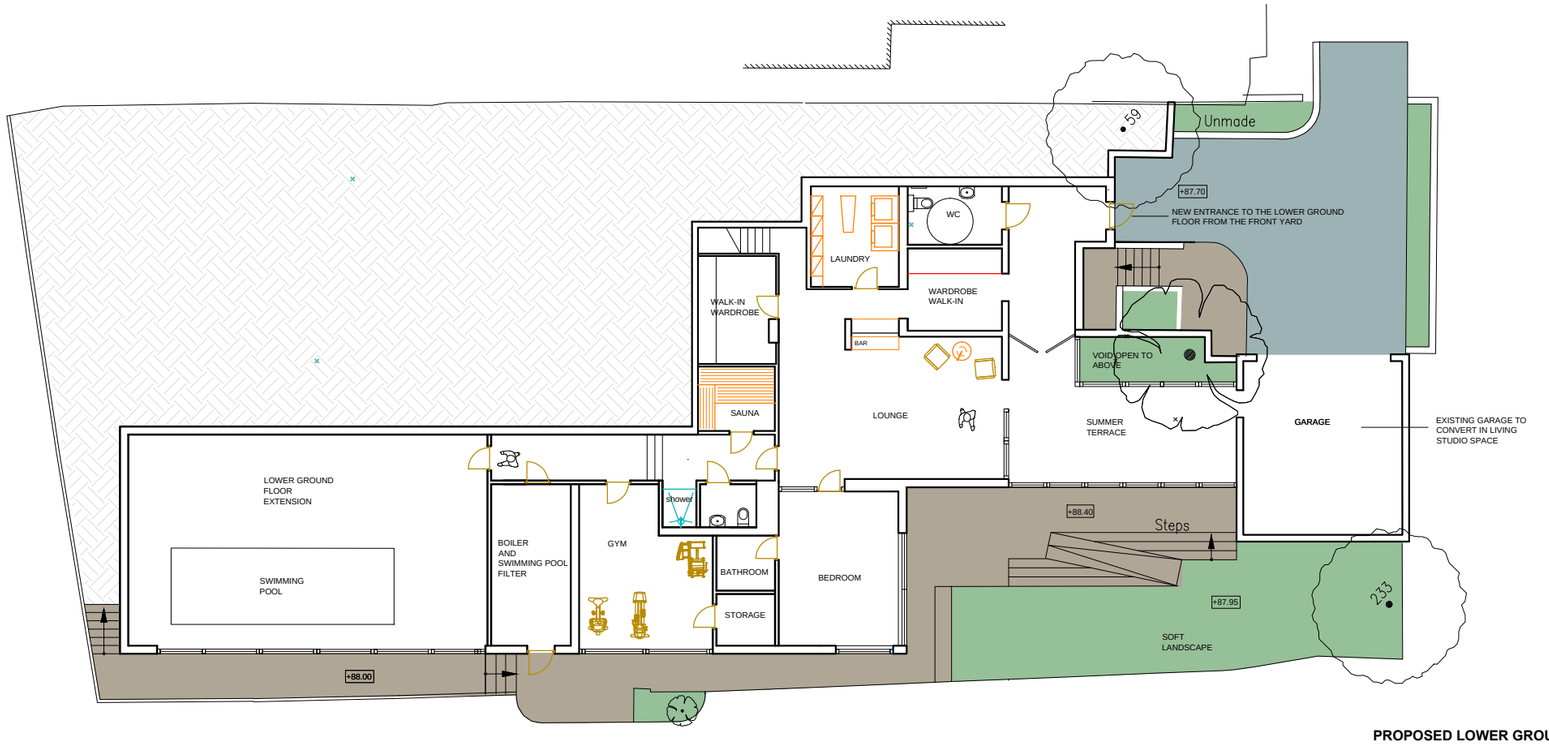
Drawing : **EXISTING AND PROPOSED LANDSCAPE PLAN (GROUND FLOOR)**

Date : **03.04.2017** Scale : **1.200 @ A3**

Drawn :	Drg. No.	Status of Drawing
Checked :	**04**	**NOT FOR CONSTRUCTION**



EXISTING LOWER GROUND FLOOR PLAN



PROPOSED LOWER GROUND FLOOR PLAN

0 2 4 6 8 10 20m

M 1:200

Rev. No.	Date	Revision Notes	By

PAVEMENT TILES

PAVING SLABS

GRASS

+44 (0) 203 581 9800
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info@LDC-group.co.uk
www.ldc-group.co.uk

London Development & Construction

Project : **26 West hill park, London,**

Drawing : **EXISTING AND PROPOSED LANDSCAPE PLAN (LOWER GR FLOOR)**

Date : **03.04.2017** Scale : **1.200 @ A3**

Drawn :	Drg. No.	Status of Drawing
Checked :	**04**	**NOT FOR CONSTRUCTION**

527880E 527900E 527920E

186880N 186860N 186840N 186820N

Notes:

Whilst every effort has been made to correctly identify species of trees on the site, we advise that an arborologist be consulted before any final decisions are made.

All information contained in this drawing (including digital data) should be checked and verified prior to any fabrication or construction.

Grid coordinates are based on an OS GNSS system.

INDICATIVE

Tree Schedule

Pt No	Spread	Bole	Height	Species
59	5.0	0.15	6.0	YEW
131	5.0	0.35	6.0	CHERRY
233	5.0	0.20	6.0	CYPRESS
284	1.0	0.75	1.0	SAPLING
355	13.0	0.90	15.0	OAK

Coordinate Table

Stn	Easting	Northing	Level
1	527908.461	186840.549	91.315
2	527916.867	186830.460	88.588
3	527905.921	186834.440	88.557
4	527898.156	186833.606	88.441
5	527889.600	186841.582	88.729
6	527893.296	186856.860	91.286
7	527902.906	186854.729	91.284
8	527910.689	186846.307	91.268
6A	527888.210	186861.425	90.989

Rev. Suffix	Date	Initial	Revision Details

Surveyor	MB	Verified By	MB	CAD Operator	TJH	Approved By	ARL	Date	12.10.16

Levelling GNSS Datum OSGB36

To an OS GNSS Datum

Client

Luxury Development Construction

Location

26 Westhill Park
Highgate

Drawing Title

Topographical Survey

Job No. 1609006	Old Job No.
Drawing Number LDC/1609006	Revision Suffix
Scale 1:200m (A2)	Date October 2016

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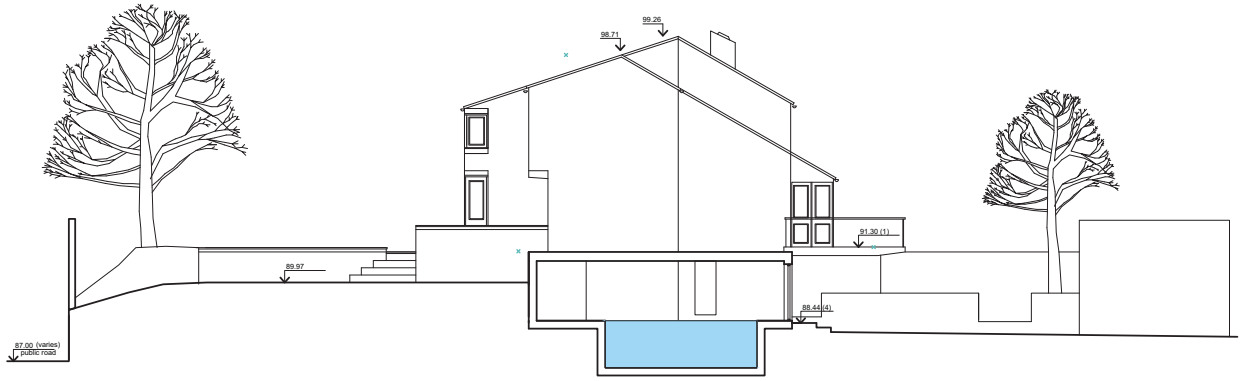
LAND, BUILDING & SITE ENGINEERING
PENTIRE - STABLE 1
FORDBRIDGE ROAD,
SUNBURY-ON-THAMES
MIDDLESEX, TW16 6AX
Tel (01932) 761196
Fax (01932) 786419
Email: mail@cdsurveys.com
Visit us at: www.cdsurveys.com

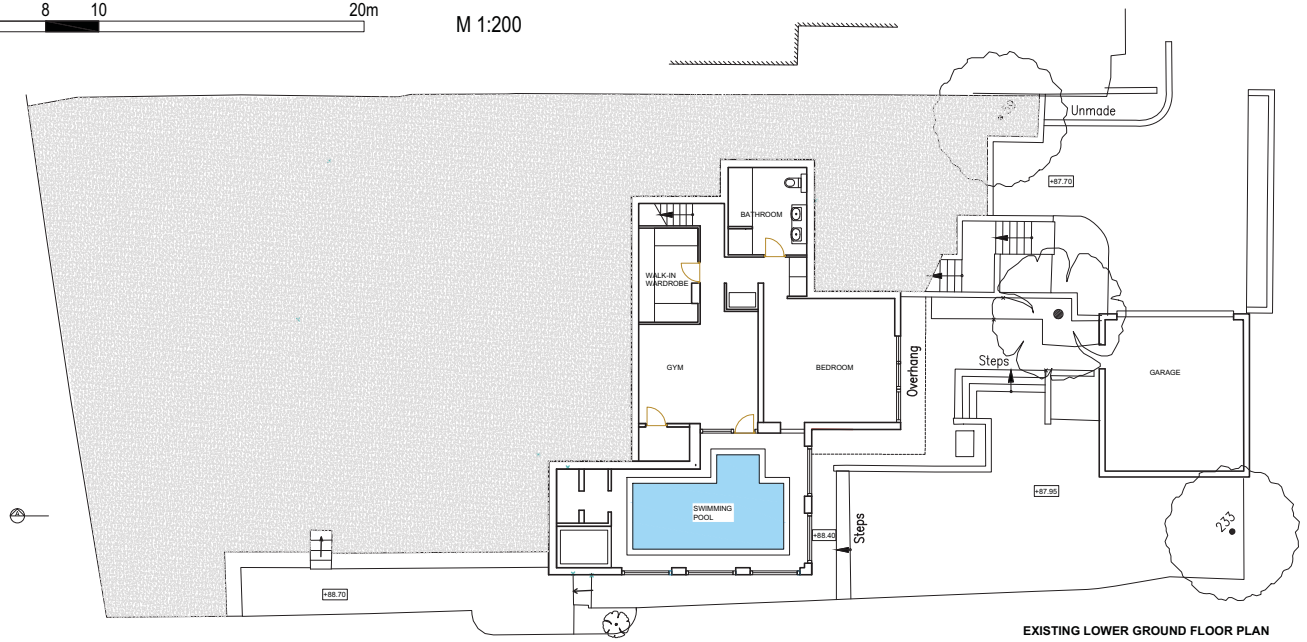
EXISTING SIDE FACADE



EXISTING SECTION A-A

0 2 4 6 8 10 20m

M 1:200



EXISTING LOWER GROUND FLOOR PLAN

Rev. No.	Date	Revision Notes	By

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London Development & Construction

Project : **26 West hill park, London,**

Drawing : **EXISTING LOWER GROUND FLOOR PLAN**

Date : **03.04.2017** Scale : 1:200 @ A3

Drawn :	Drg. No.	Status of Drawing
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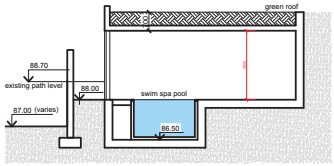
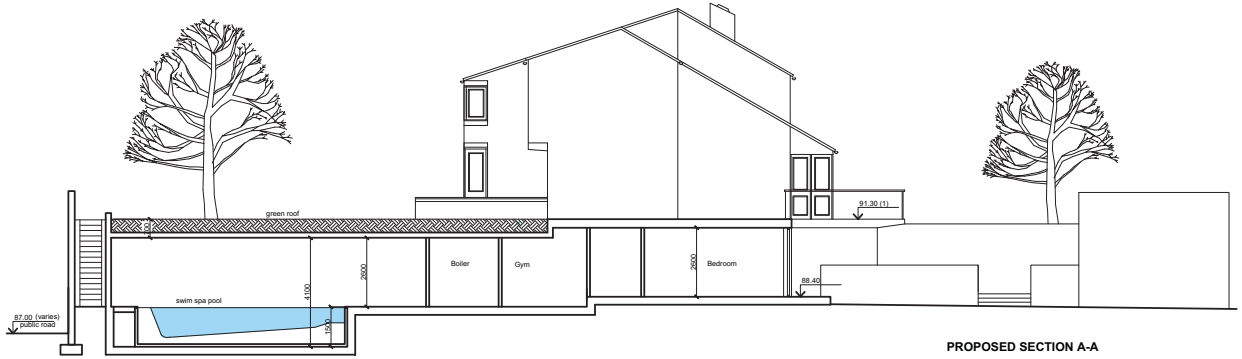
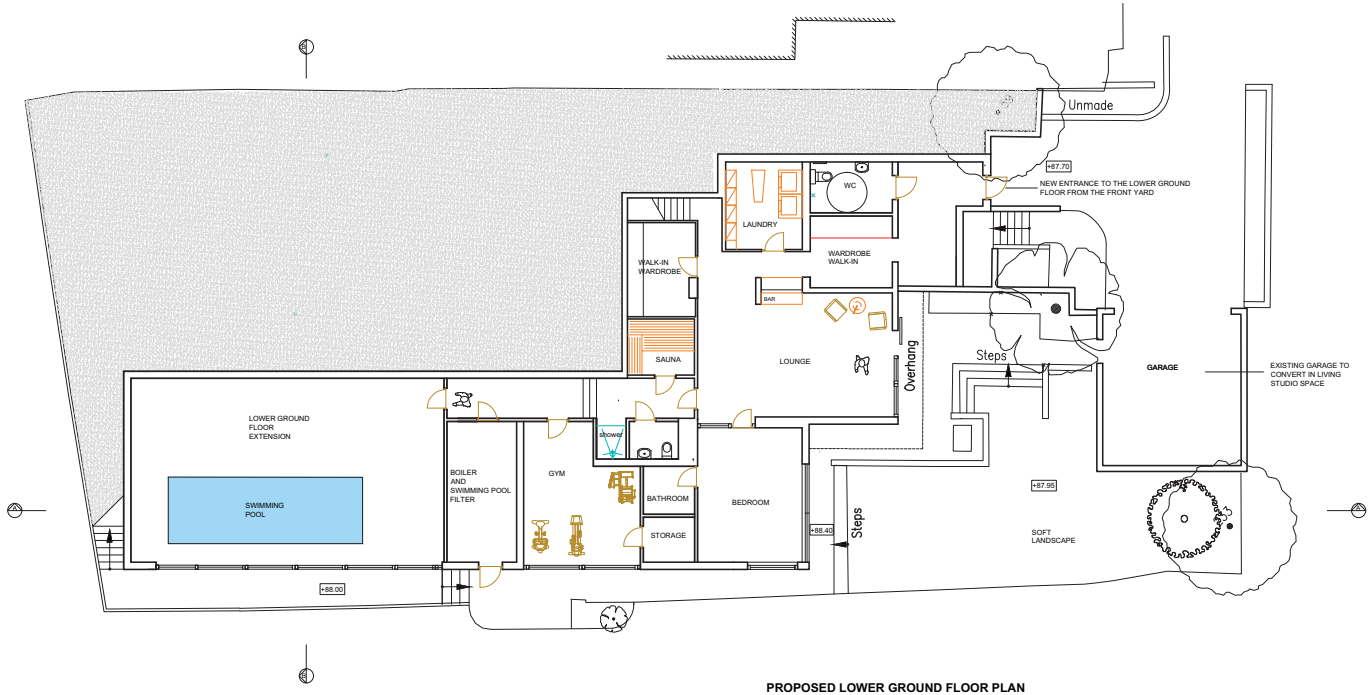


PROPOSED SECTION B-B



PROPOSED SECTION A-A



PROPOSED LOWER GROUND FLOOR PLAN

0 2 4 6 8 10 20m

M 1:200

Rev. No.	Date	Revision Notes	By

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www.ldc-group.co.uk

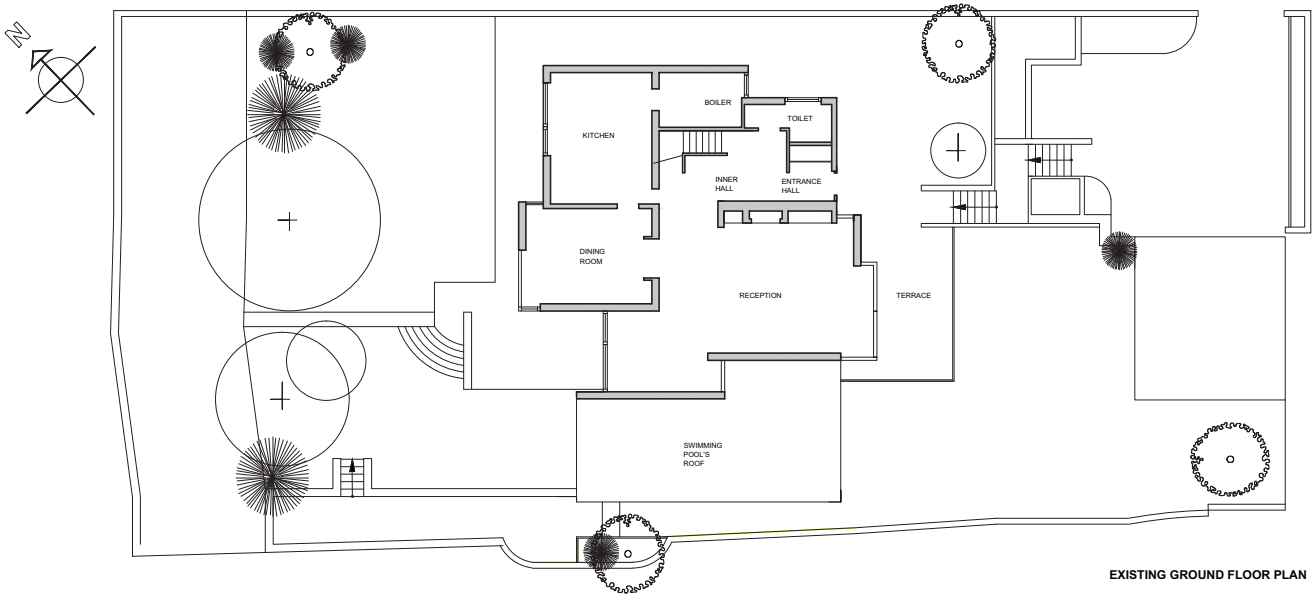
London Development & Construction

Project : **26 West hill park, London,**

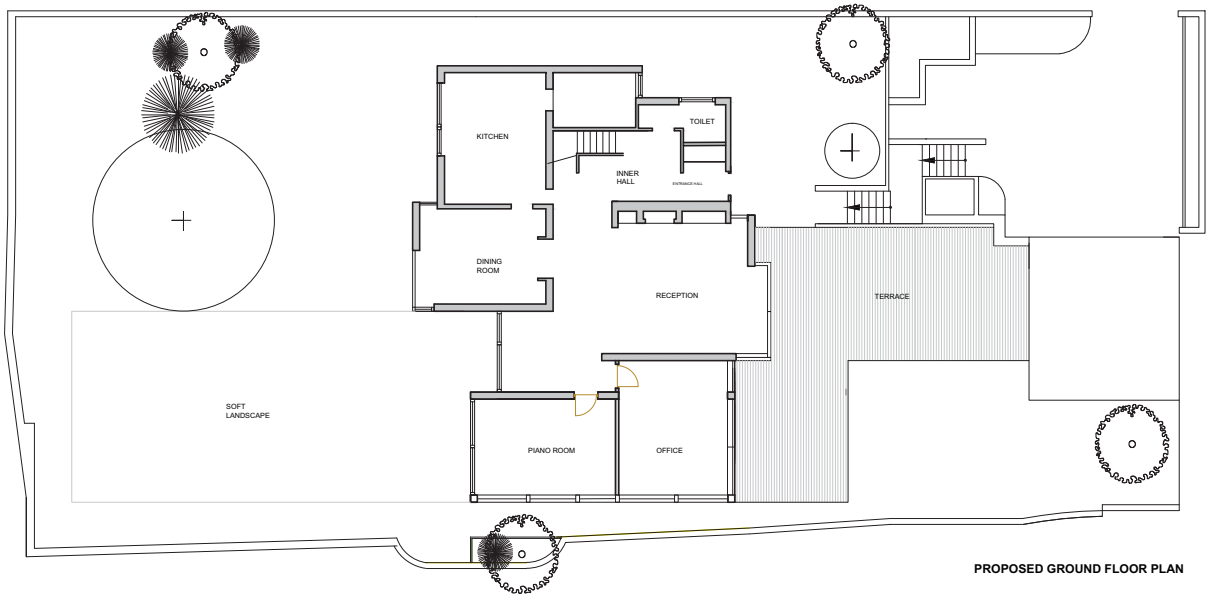
Drawing : **PROPOSED SECTIONS A-A AND B-B**
LOWER GROUND FLOOR PLAN

Date : **03.04.2017** Scale : 1:200 @ A3

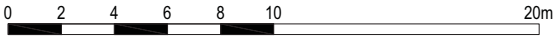
Drawn :	Drg. No.	Status of Drawing
Checked :	02	NOT FOR CONSTRUCTION



EXISTING GROUND FLOOR PLAN



PROPOSED GROUND FLOOR PLAN



M 1:200

Rev. No.	Date	Revision Notes	By

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www.ldc-group.co.uk

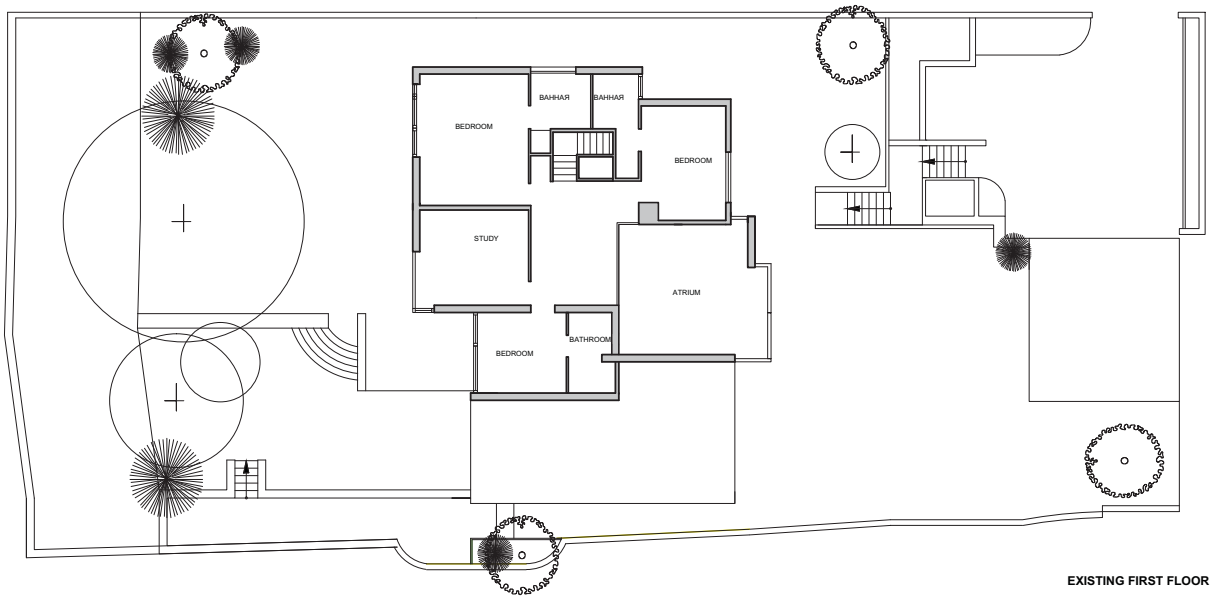
London Development & Construction

Project : **26 West hill park, London,**

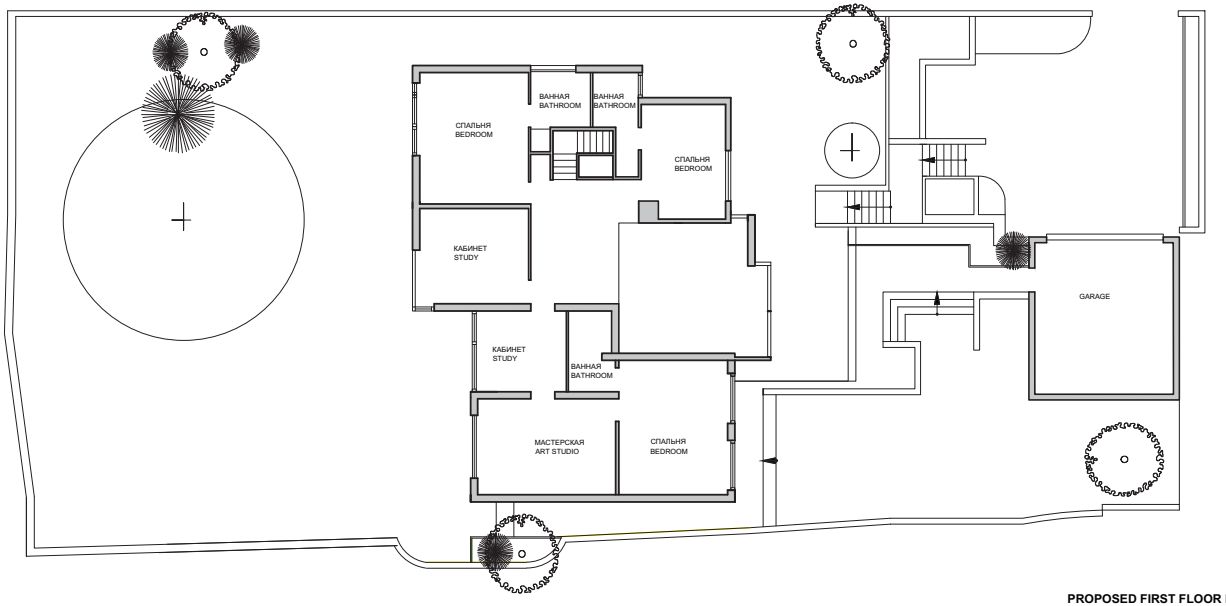
Drawing : **EXISTING AND PROPOSED GROUND FLOOR PLAN**

Date : **03.04.2017** Scale : 1:200 @ A3

Drawn :	Drg. No.	Status of Drawing
Checked :	03	NOT FOR CONSTRUCTION



EXISTING FIRST FLOOR PLAN



PROPOSED FIRST FLOOR PLAN

0 2 4 6 8 10 20m

M 1:200

Rev. No.	Date	Revision Notes	By

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www.ldc-group.co.uk

London Development & Construction

Project : **26 West hill park, London,**

Drawing : **EXISTING AND PROPOSED FIRST FLOOR PLAN**

Date : **03.04.2017** Scale : 1:200 @ A3

Drawn :	Drg. No.	Status of Drawing
Checked :	**04**	**NOT FOR CONSTRUCTION**

EXISTING FRONT FACADE

PROPOSED FRONT FACADE OPTION 1

PROPOSED FRONT FACADE OPTION 2

PROPOSED FRONT FACADE OPTION 3

EXISTING GARDEN FACADE

PROPOSED GARDEN FACADE

Rev. No.	Date	Revision Notes	By

+44 (0) 203 581 9800
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info@LDC-group.co.uk
www.ldc-group.co.uk

London Development & Construction

Project : **26 West hill park, London,**

Drawing : **EXISTING AND PROPOSED FACADES**

Date : **03.04.2017** Scale : 1:200 @ A3

Drawn :	Drg. No.	Status of Drawing
Checked :	**05**	**NOT FOR CONSTRUCTION**

EXISTING SIDE FACADE

PROPOSED SIDE FACADE OPTION 3

PROPOSED SIDE FACADE OPTION 1

Rev. No.	Date	Revision Notes	By

+44 (0) 203 581 9800
15 Stratton Street, London , W1J 8LQ
info@LDC-group.co.uk
www.ldc-group.co.uk

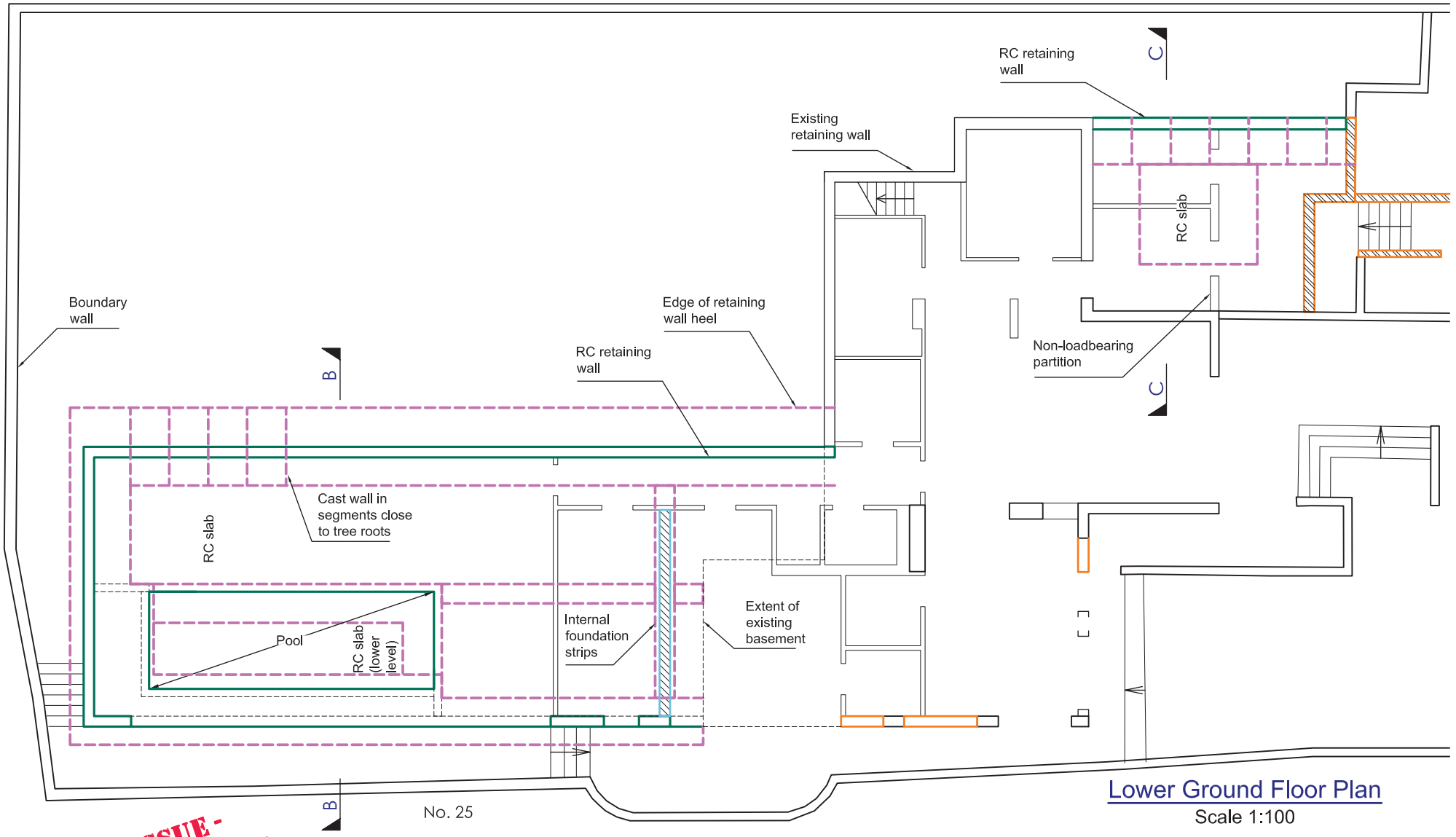
London Development & Construction

Project : **26 West hill park, London,**

Drawing : **EXISTING AND PROPOSED SIDE FACADE**

Date : **03.04.2017** Scale : 1:200 @ A3

Drawn :	Drg. No.	Status of Drawing
Checked :	**07**	**NOT FOR CONSTRUCTION**



Lower Ground Floor Plan

Scale 1:100

- PLANNING ISSUE -
NOT FOR CONSTRUCTION

Rev	Date	Amendments
-	21.04.2017	First issue for comment

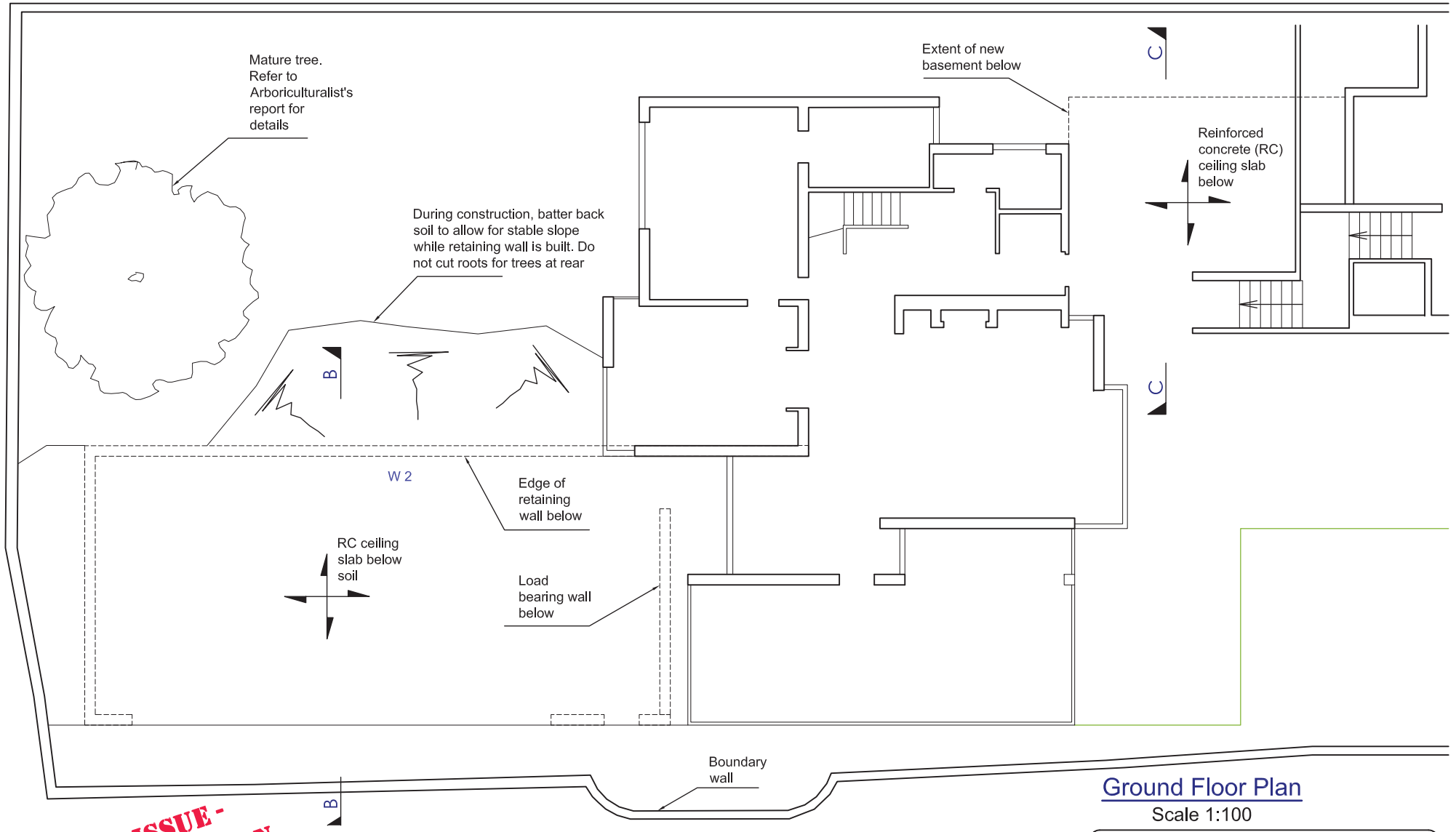
Job No. 161206	Drawn GW / Chk'd -	Scale As shown @ A3
Dwg No. SL-10	Rev. -	Date April 2017

Croft Structural Engineers
Clockshop Mews,
r/o 60 Saxon Rd,
London, SE25 5EH.
020 8684 4744
www.croftse.co.uk

Client: Nadia Gobova

Project: 26 West Hill Park

Title : Structural Scheme Design - Lower Ground Floor Plan



Ground Floor Plan

Scale 1:100

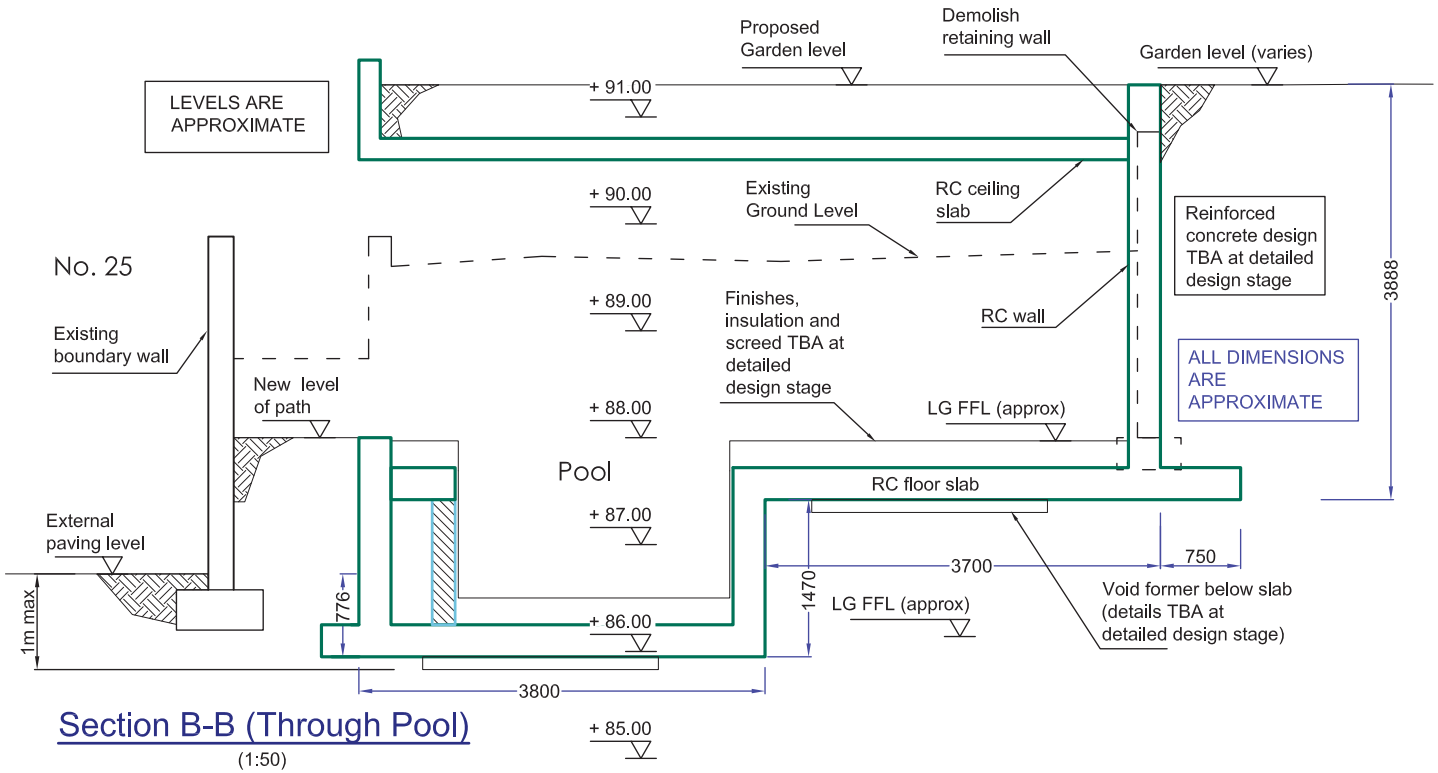
- PLANNING ISSUE -
NOT FOR CONSTRUCTION

Rev	Date	Amendments
-	21.04.2017	First issue for comment

Job No. 161206	Drawn GW	Scale As shown @ A3
	Chk'd -	
Dwg No. SL-20	Rev. -	Date April 2017

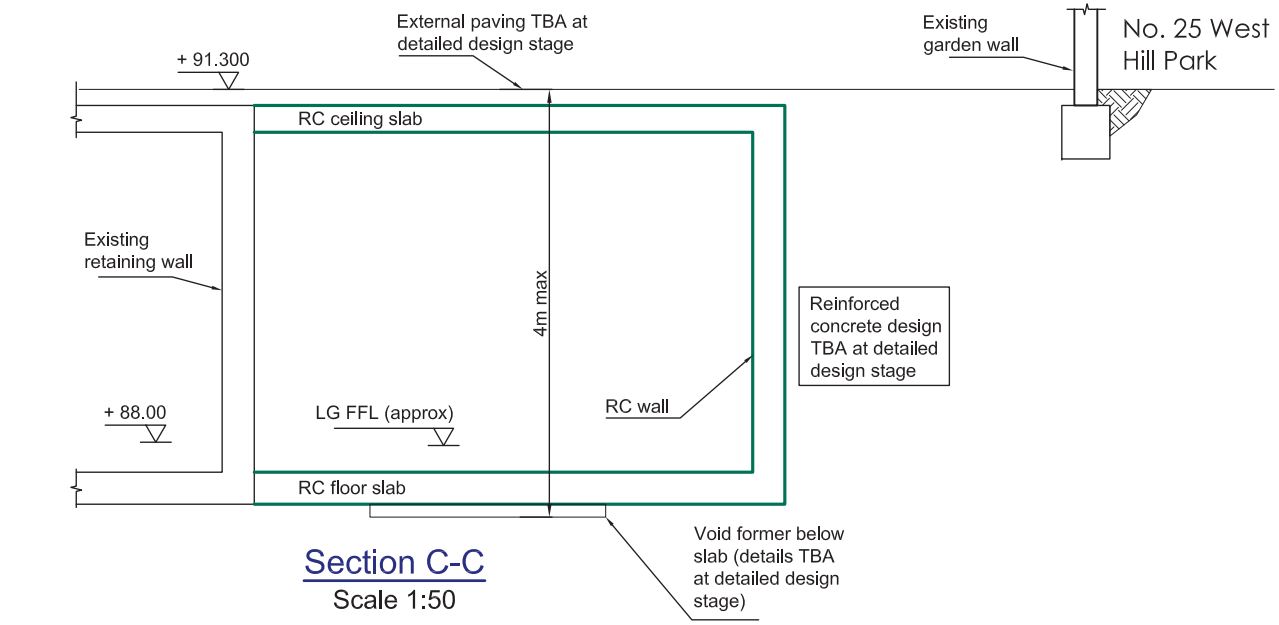
Croft Structural Engineers
Clockshop Mews,
r/o 60 Saxon Rd,
London, SE25 5EH.
020 8684 4744
www.croftse.co.uk

Client:	Nadia Gobova
Project:	26 West Hill Park
Title :	Structural Scheme Design - Ground Floor Plan



Section B-B (Through Pool)

(1:50)



Section C-C

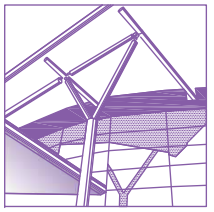
Scale 1:50

- PLANNING ISSUE - NOT FOR CONSTRUCTION

Rev	Date	Amendments
-	21.04.2017	First issue for comment

Job No. 161206	Drawn GW / Chk'd -	Scale As shown @ A3
Dwg No. SD-11	Rev. -	Date April 2017

Croft Structural Engineers
Clockshop Mews,
r/o 60 Saxon Rd,
London, SE25 5EH.
020 8684 4744
www.croftse.co.uk

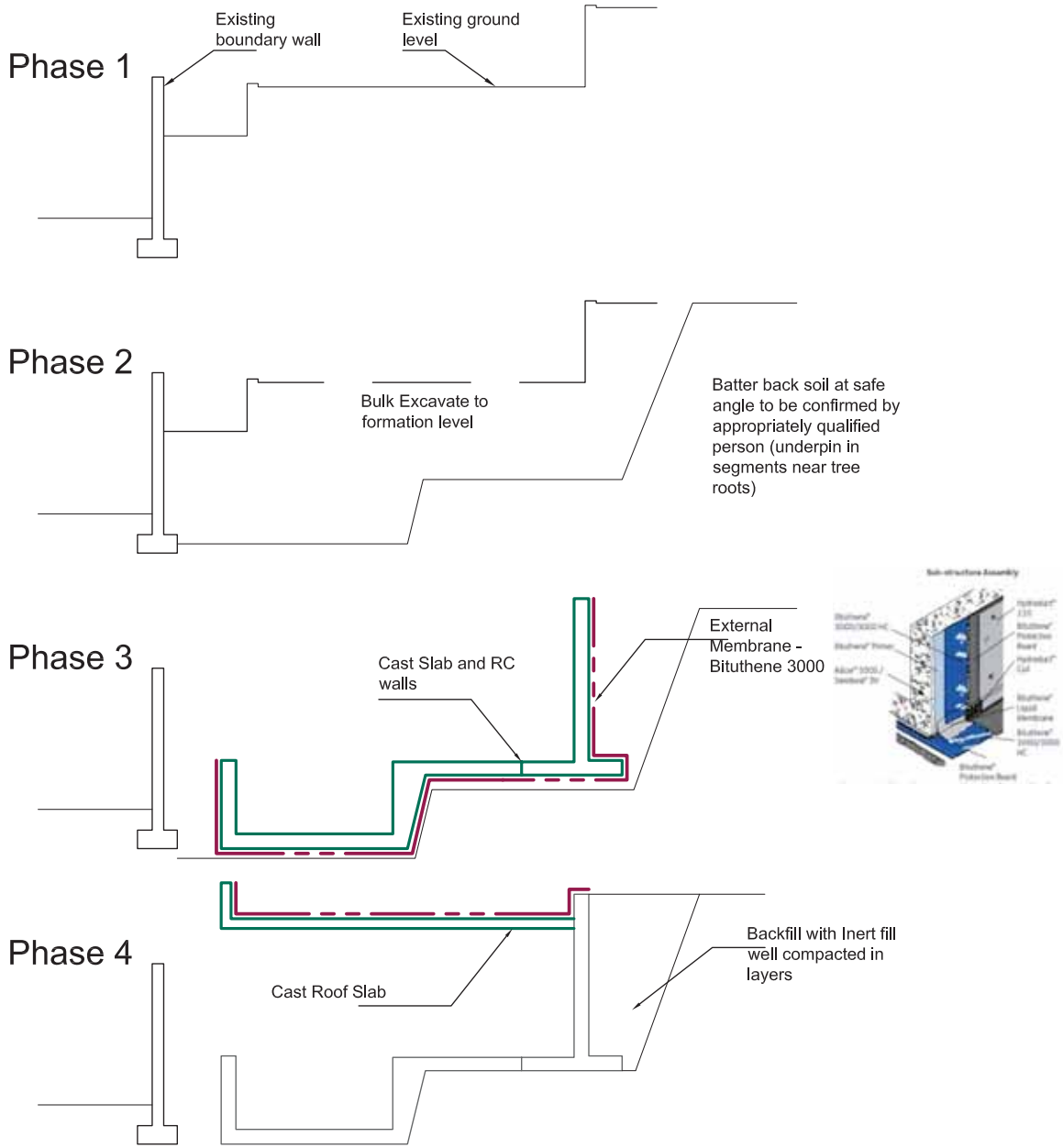


Client: Nadia Gobova

Project: 26 West Hill Park

Title : Structural Scheme Design - Sections

USE IN CONJUNCTION WITH BASEMENT CONSTRUCTION METHOD STATEMENT



Typical section showing construction sequence

(1:100)

- PLANNING ISSUE -
NOT FOR CONSTRUCTION

Rev	Date	Amendments
-	21.04.2017	First issue for comment

Job No. 161206	Drawn GW	Scale As shown @ A3
Dwg No. TW-10	Chk'd -	Date April 2017
	Rev. -	

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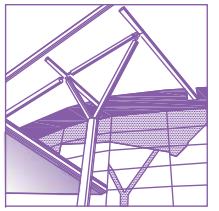
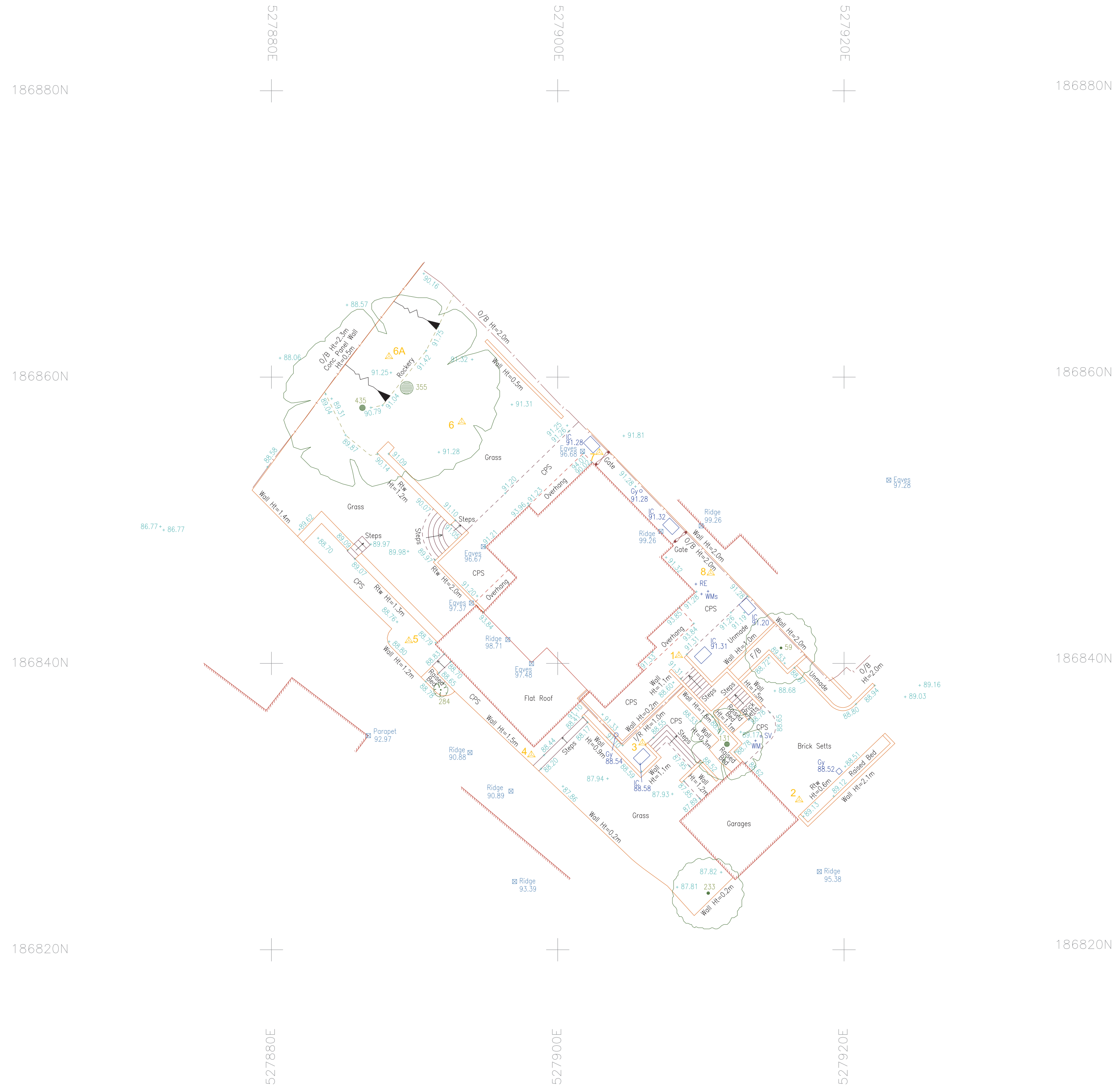


Client: Nadia Gobova

Project: 26 West Hill Park

Title : Temporary Works Scheme Design



Notes:

Whilst every effort has been made to correctly identify species of trees on the site, we advise that an arborologist be consulted before any final decisions are made.

All information contained in this drawing (including digital data) should be checked and verified prior to any fabrication or construction.

Grid coordinates are based on an OS GNSS system.

Tree Schedule

Pt No	Spread	Bole	Height	Species
59	5.0	0.15	6.0	YEW
131	5.0	0.35	6.0	CHERRY
233	5.0	0.20	6.0	CYPRESS
284	1.0	0.75	1.0	SAPLING
355	13.0	0.90	15.0	OAK
435	11.0	0.40	15.0	SILVER BIRCH

Coordinate Table

Stn	Easting	Northing	Level
1	527908.461	186840.549	91.315
2	527916.867	186830.460	88.588
3	527905.921	186834.440	88.557
4	527898.156	186833.606	88.441
5	527889.600	186841.582	88.729
6	527893.296	186856.860	91.286
7	527902.906	186854.729	91.284
8	527910.689	186846.307	91.268
6A	527888.210	186861.425	90.989

Rev. Suffix	Date	Initial	Revision Details

Surveyor	MB	Verified By	MB	CAD Operator	TJH	Approved By	ARL	Date	12.10.16

Levelling GNSS Datum OSGB36

To an OS GNSS Datum

Client

Luxury Development Construction

Location

26 Westhill Park
Highgate

Drawing Title

Topographical Survey

Job No. 1609006 | Old Job No.

Drawing Number LDC/1609006 | Revision Suffix

Scale 1:200m (A2) | Date October 2016

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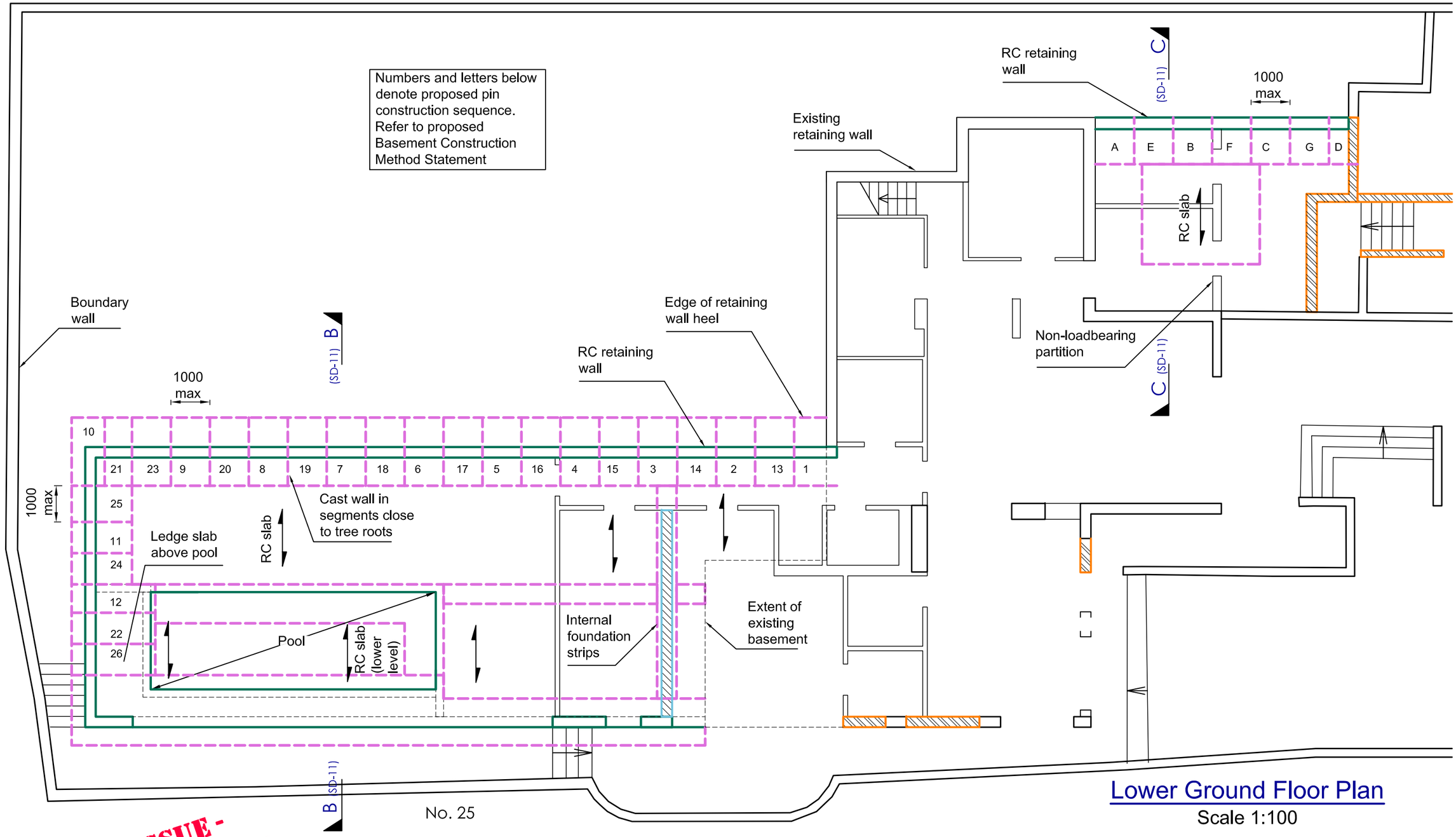
SUNBURY-ON-THAMES
MIDDLESEX, TW16 6AX
Tel (01932) 761196
Fax (01932) 786419
Email: mail@cdsurveys.com
Visit us at: www.cdsurveys.com

Numbers and letters below denote proposed pin construction sequence. Refer to proposed Basement Construction Method Statement



Lower Ground Floor Plan

Scale 1:100

- PLANNING ISSUE -
NOT FOR CONSTRUCTION

Rev	Date	Amendments
1	05.06.2017	Pin numbers/letters added
-	21.04.2017	First issue for comment

Job No. 161206	Drawn GW	Scale As shown @ A3
Dwg No. SL-10	Chk'd - / Rev. 1	Date April 2017

Croft Structural Engineers
Clockshop Mews,
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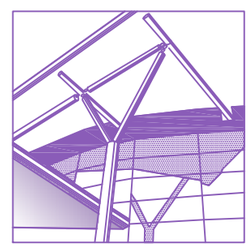
020 8684 4744
www.croftse.co.uk

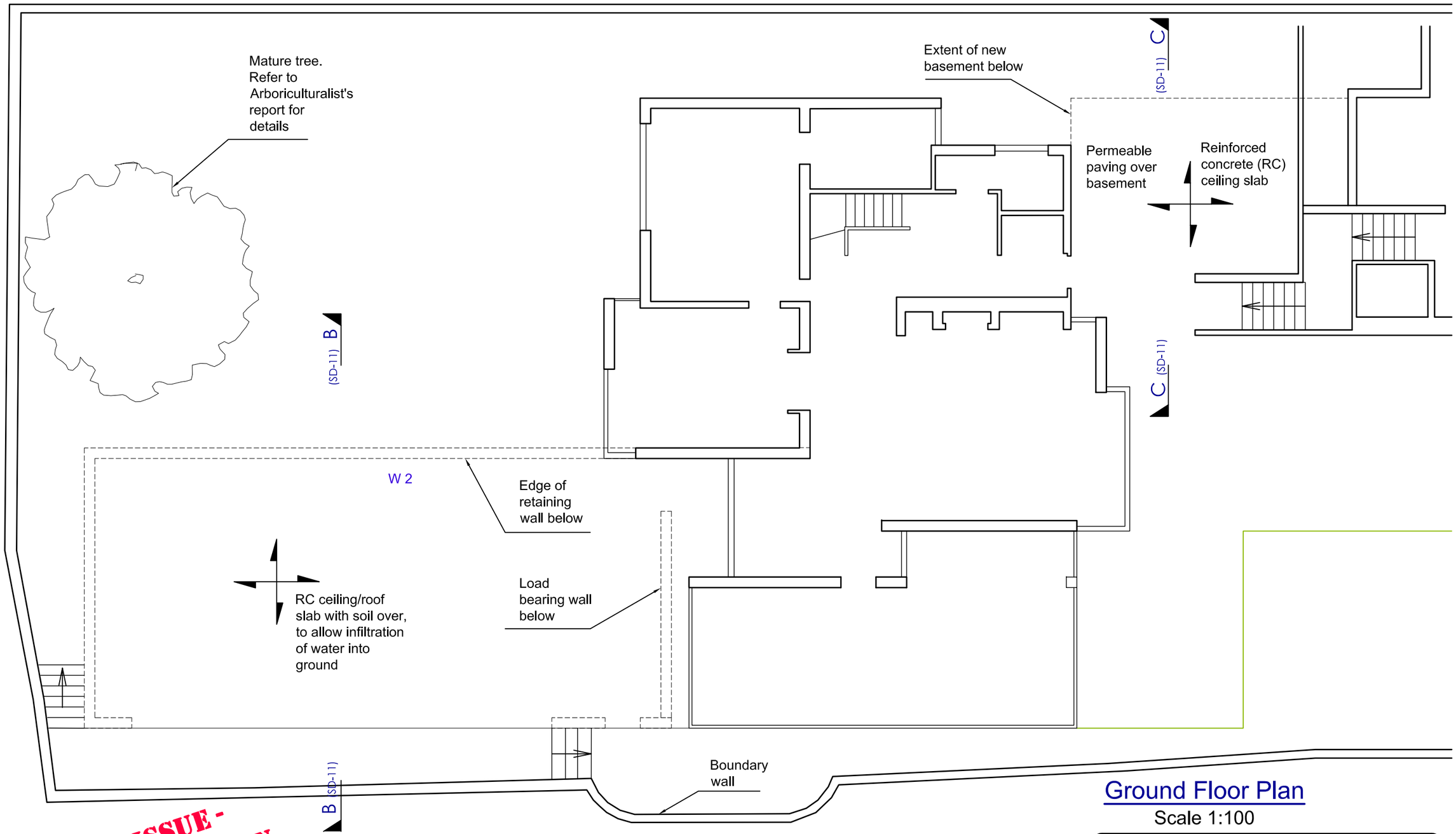


Client: Nadia Gobova

Project: 26 West Hill Park

Title : Structural Scheme Design - Lower Ground Floor Plan

No. 25 West Hill Park



Ground Floor Plan

Scale 1:100

- PLANNING ISSUE -
NOT FOR CONSTRUCTION

Rev	Date	Amendments
1	05.06.2017	Battered soil proposal removed
-	21.04.2017	First issue for comment

Job No. 161206	Drawn GW	Scale As shown @ A3
Dwg No. SL-20	Chk'd -	Rev. 1
		Date April 2017

Croft Structural Engineers
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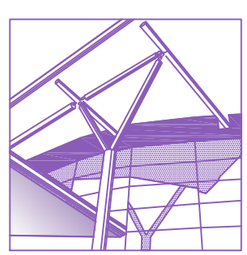
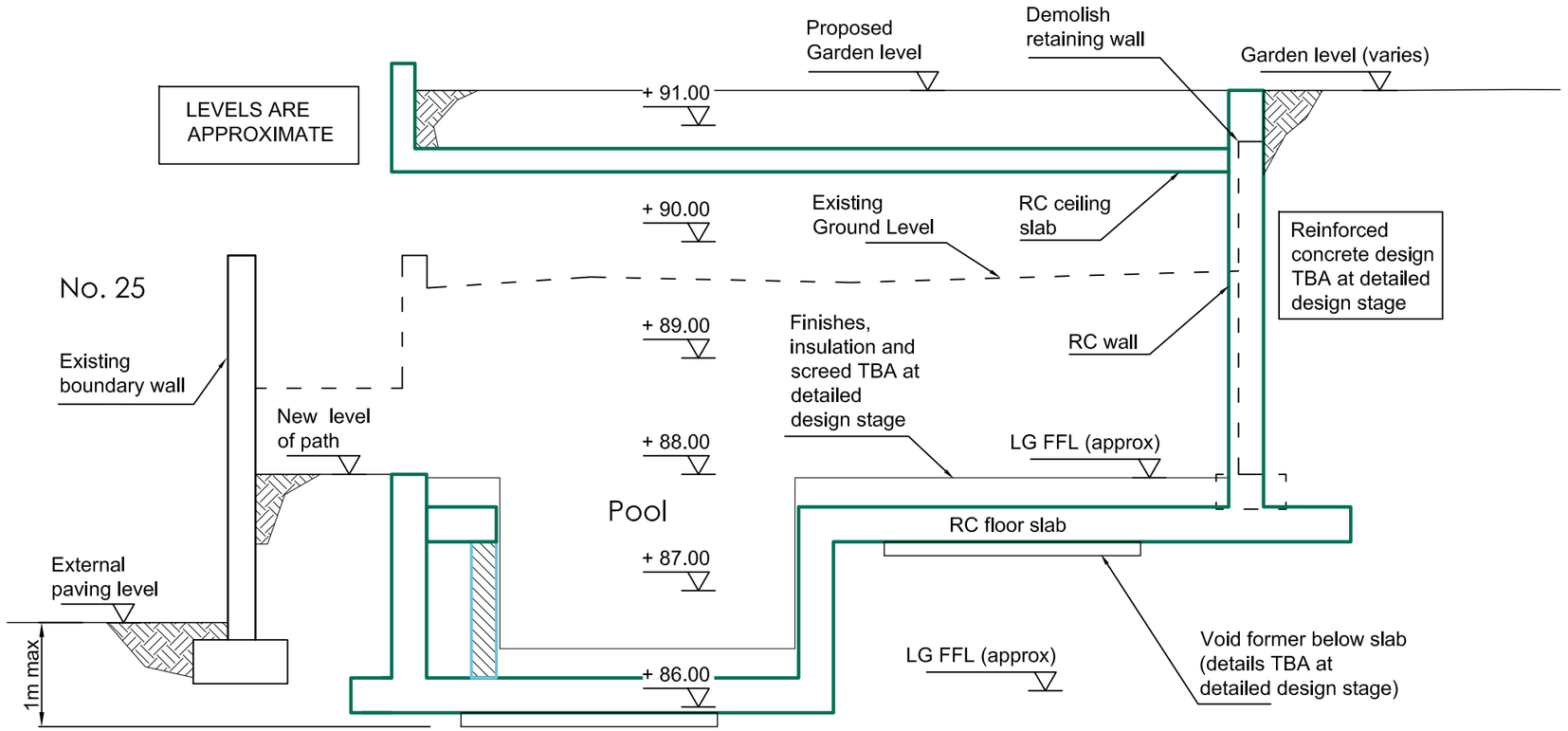
020 8684 4744
www.croftse.co.uk



Client: Nadia Gobova

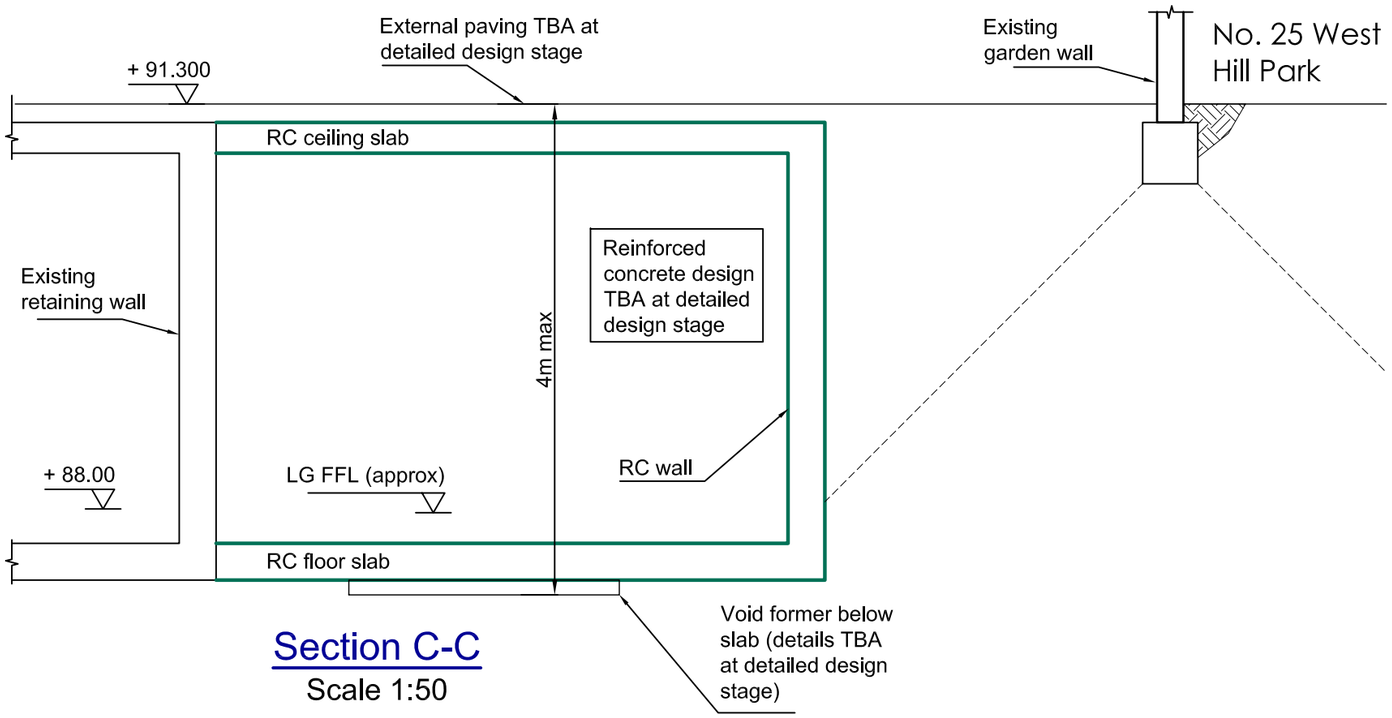
Project: 26 West Hill Park

Title : Structural Scheme Design - Ground Floor Plan



Section B-B (Through Pool)

(1:50)



Section C-C

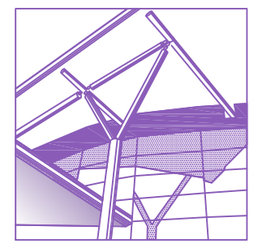
Scale 1:50

- PLANNING ISSUE -
NOT FOR CONSTRUCTION

Rev	Date	Amendments
1	05.06.2017	For Planning submission
-	21.04.2017	First issue for comment

Job No. 161206	Drawn GW / Chk'd -	Scale As shown @ A3
Dwg No. SD-11	Rev. -	Date April 2017

Croft Structural Engineers
Clockshop Mews,
r/o 60 Saxon Rd,
London, SE25 5EH.
020 8684 4744
www.croftse.co.uk



Client: Nadia Gobova

Project: 26 West Hill Park

Title : Structural Scheme Design - Sections

CROFT STRUCTURAL ENGINEERS

Appendix D: Monitoring Proposals

Job Number: 161206

CROFT STRUCTURAL ENGINEERS

Croft Structural Engineers
Clock Shop Mews
Rear of 60 Saxon Road
London SE25 5EH

T: 020 8684 4744
E: enquiries@croftse.co.uk
W: www.croftse.co.uk

Structural Monitoring Statement

Site:

26 West Hill Park
Camden
N6 6ND

Client:

Mrs Konopleva
c/o
Nadia Gobova

Revision	Date	Comment
-	05.06.2017	First Issue

CROFT STRUCTURAL ENGINEERS

Contents

CROFT STRUCTURAL ENGINEERS

1. Introduction

Basement works are intended at 26 West Hill Park. This statement describes the procedures for the Principal Contractor to follow to observe any movement that may occur to the existing properties, and also describes mitigation measures to apply if necessary.

2. Risk Assessment

The purpose of this risk assessment is to consider the impact of the proposed works and how they impact the rear boundary wall and the flank wall of the neighbouring building (ie the flank wall of No 25 West Hill Park, closest to the front basement). There are varying levels of inspection that can be undertaken and not all works, soil conditions and properties require the same level of protection.

Monitoring Level Proposed	Type of Works.
Monitoring 1 Visual inspection and production of condition survey by Party wall surveyors at the beginning of the works and also at the end of the works.	Loft conversions, cross wall removals, insertion of padstones Survey of LUL and Network Rail tunnels. Mass concrete, reinforced and piled foundations to new build properties

Monitoring 2 Visual inspection and production of condition survey by Party Wall Surveyors at the beginning of the works and also at the end of the works. Visual inspection of existing party wall during the works. Inspection of the footing to ensure that the footings are stable and adequate.	Removal of lateral stability and insertion of new stability fames Removal of main masonry load bearing walls. Underpinning works less than 1.2m deep
Monitoring 3 Visual inspection and production of condition survey by Party Wall Surveyors at the beginning of the works and also at the end of the works. Visual inspection of existing party wall during the works. Inspection of the footing to ensure that the footings are stable and adequate. Vertical monitoring movement by standard optical equipment	Lowering of existing basement and cellars more than 2.5m Underpinning works less than 3.0m deep in clays Basements up to 2.5m deep in clays
Monitoring 4 Visual inspection and production of condition survey by Party Wall Surveyors at the beginning of the works and also at the end of the works. Visual inspection of existing party wall during the works. Inspection of the footing to ensure that the footings are stable and adequate. Vertical monitoring movement by standard optical equipment Lateral movement between walls by laser measurements	New basements greater than 2.5m and shallower than 4m Deep in gravels Basements up to 4.5m deep in clays Underpinning works to Grade I listed building
Monitoring 5 Visual inspection and production of condition survey by Party wall surveyors at the beginning of the works and also at the end of the works. Visual inspection of existing party wall during the works. Inspection of the footing to ensure that the footings are stable and adequate. Vertical & lateral monitoring movement by theodolite at specific times during the projects.	Underpinning works to Grade I listed buildings Basements to Listed building Basements deeper than 4m in gravels Basements deeper than 4.5m in clays Underpinning, basements to buildings that are expressing defects.
Monitoring 6	

Visual inspection and production of condition survey by Party wall surveyors at the beginning of the works and also at the end of the works. Visual inspection of existing party wall during the works. Inspection of the footing to ensure that the footings are stable and adequate. Vertical & lateral monitoring movement by electronic means with live data gathering. Weekly interpretation	Double storey basements supported by piled retaining walls in gravels and soft sands. (N<12)
Monitoring 7 Visual inspection and production of condition survey by Party wall surveyors at the beginning of the works and also at the end of the works. Visual inspection of existing party wall during the works. Inspection of the footing to ensure that the footings are stable and adequate. Vertical & lateral monitoring movement by electronic means with live data gathering with data transfer.	Larger multi-storey basements on particular projects.

3. Scheme Details

This document has been prepared by Croft Structural Engineers Ltd. It covers the proposed construction of new basement at the front and rear of the existing building.

Scope of Works

The works comprise:

- Visual monitoring of the rear boundary wall with No 25 Merton Lane and the closest wall of 25 West Hill Park.
- Attachment of Tell tales or Demec Studs to accurately record movement of significant cracks.
- Attachment of levelling targets to monitor settlement.
- The monitoring of the above instrumentation is in accordance with Appendix A. The number and precise locations of instrumentation may change during the works; this shall be subject to agreement with the Principal Contractor (PC).
- All instruments are to be adequately protected against any damage from construction plant or private vehicles using clearly visible markings and suitable head protection e.g. manhole rings or similar. Any damaged instruments are to be immediately replaced or repaired at the contractors own cost.
- Reporting of all data in a manner easily understood by all interested parties.
- Co-ordination of these monitoring works with other site operations to ensure that all instruments can be read and can be reviewed against specified trigger values both during and post construction.
- Regular site meetings by the Principal Contractor (PC) and the Monitoring Surveyor (MS) to review the data and their implications.
- Review of data by Croft Structural Engineers

In addition, the PC will have responsibility for the following:

- Review of methods of working/operations to limit movements, and
- Implementation of any emergency remedial measures if deemed necessary by the results of the monitoring.

The Monitoring Surveyor shall allow for settlement and crack monitoring measures to be installed and monitored on various parts of the structure described in Table 1 as directed by the PC and Party Wall Surveyor (PWS) for the Client.

Item	Instrumentation Type
Boundary and flank wall	
Settlement monitoring	Levelling equipment & targets
Crack monitoring	Visual inspection of cracking, Demec studs where necessary

Table 1: Instrumentation

General

The site excavations and substructure works up to finished ground slab stage have the potential to cause vibration and ground movements in the vicinity of the site due to the following:

a) Removal of any existing redundant foundations / obstructions;
b) Installation of reinforced concrete retaining walls under the existing footings;
c) Excavations within the site

The purpose of the monitoring is a check to confirm building movements are not excessive.

This specification is aimed at providing a strategy for monitoring of potential ground and building movements at the site.

This specification is intended to define a background level of monitoring. The PC may choose to carry out additional monitoring during critical operations. Monitoring that should be carried out is as follows:

a) Visual inspection of the boundary wall and neighbour's flank wall and any pre-existing cracking
b) Settlement of the boundary wall

All instruments are to be protected from interference and damage as part of these works.

Access to all instrumentation or monitoring points for reading shall be the responsibility of the Monitoring Surveyor (MS). The MS shall be in sole charge for ensuring that all instruments or monitoring points can be read at each visit and for reporting of the data in a form to be agreed with the PWS. He shall inform the PC if access is not available to certain instruments and the PC will, wherever possible, arrange for access. He shall immediately report to the PC any damage. The Monitoring Surveyor and the Principal Contractor will be responsible for ensuring that all the instruments that fall under their respective remits as specified are fully operational at all times and any defective or damaged instruments are immediately identified and replaced.

The PC shall be fully responsible for reviewing the monitoring data with the MS - before passing it on to Croft Structural Engineers - determining its accuracy and assessing whether immediate action is to be taken by him and/or other contractors on site to prevent damage to instrumentation or to ensure safety of the site and personnel. All work shall comply with the relevant legislation, regulations and manufacturer's instructions for installation and monitoring of instrumentation.

Applicable Standards and References

The following British Standards and civil engineering industry references are applicable to the monitoring of ground movements related to activities on construction works sites:

1. BS 5228: Part 1: 1997 - Noise and Vibration Control on Construction and Open Sites -Part 1.Code of practice for basic information and procedures for noise and vibration control, Second Edition, BSI 1999.
2. BS 5228: Part 2: 1997 - Noise and Vibration Control on Construction and Open Sites -Part 2.Guide to noise and vibration control legislation for construction and demolition including road construction and maintenance, Second Edition, BSI 1997.
3. BS 7385-1: 1990 (ISO 4866:1990) - Evaluation and measurement for vibration in buildings - Part 1: Guide for measurement of vibrations and evaluation of their effects on buildings, First Edition, BSI 1990.
4. BS 7385-2: 1993 - Evaluation and measurement for vibration in buildings - Part 2: Guide to damage levels from ground-borne vibration, First Edition, BSI 1999.
5. CIRIA SP 201 - Response of buildings to excavation-induced ground movements, CIRIA 2001.

SPECIFICATION FOR INSTRUMENTATION

General

The Monitoring Contractor is required to monitor, protect and reinstall instruments as described. The readings are to be recorded and reported. The following instruments are defined:

a) Automatic level and targets: A device which allows the measurement of settlement in the vertical axis (Total Stations for similar). To be installed by the MS.

b) Tell-tales and 3 stud sets: A device which allows measurement of movement to be made in two axes perpendicular to each other. To be installed by the MS.

Monitoring of existing cracks

The locations of tell-tales or Demec studs to monitor existing cracks shall be agreed with Croft Structural Engineers.

Instrument Installation Records and Reports

Where instrumentation is to be installed or reinstalled, the Monitoring Surveyor, or the Principal Contractor, as applicable, shall make a complete record of the work. This should include the position and level of each instrument. The records shall include base readings and measurements taken during each monitoring visit. Both tables and graphical outputs of these measurements shall be presented in a format to be agreed with the CM. The report shall include photographs of each type of instrumentation installed and clear scaled sections and plans of each instrument installed. This report shall also include the supplier's technical fact sheet on the type of instrument used and instructions on monitoring.

Two signed copies of the report shall be supplied to the PWS within one week of completion of site measurements for approval.

Installation

All instruments shall be installed to the satisfaction of the PC. No loosening or disturbance of the instrument with use or time shall be acceptable. All instruments are to be clearly marked to avoid damage.

All setting out shall be undertaken by the Monitoring Surveyor or the Principal Contractor as may be applicable. The precise locations will be agreed by the PC prior to installation of the instrument.

The installations are to be managed and supervised by the Instrumentation Engineer or the Measurement Surveyor as may be applicable.

Monitoring

The frequencies of monitoring for each Section of the Works are given in Appendix A.

The following accuracies/ tolerances shall be achieved:

Wall settlement	±1.5mm
Crack monitoring	±0.75mm

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REPORT OF RESULTS AND TRIGGER LEVELS

General

Within 24 hours of taking the readings, the Monitoring Surveyor will submit a single page summary of the recorded movements. All readings shall be immediately reviewed by Croft Structural Engineers prior to reporting to the PWS.

Within one working day of taking the readings the Monitoring Contractor shall produce a full report (see below).

The following system of control shall be employed by the PC and appropriate contractors for each section of the works. The Trigger value, at which the appropriate action shall be taken, for each section, is given in Table 2, below.

The method of construction by use of sequential underpins limits the deflections in the walls of nearby buildings.

The trigger limits are shown in the following table.

During works measurements are taken, these are compared with the limits set out below:

MOVEMENT		CATEGORY	ACTION
Vertical	Horizontal		
0mm-3mm	0-5mm	Green	No action required
3mm-6mm	5-8mm	AMBER	Detailed review of Monitoring: Check studs are OK and have not moved. Ensure site staff have not moved studs. If studs have moved reposition. Relevel to ensure results are correct and tolerance is not a concern. Inform Party Wall surveyors of amber readings. Double the monitoring for 2 further readings. If stable revert back. Carry out a local structural review and inspection. Preparation for the implementation of remedial measures should be required. Double number of lateral props
6-8mm	8-10mm		Implement remedial measures review method of working and ground conditions
>8mm	>10mm	RED	Implement structural support as required; Cease works with the exception of necessary works for the safety and stability of the structure and personnel; Review monitoring data and implement revised method of works

Table 2 – Movement limits between adjacent sets of Tell-tales or stud sets

Any movements which exceed the individual amber trigger levels for a monitoring measure given in Table 2 shall be immediately reported to the PWS, and a review of all of the current monitoring data for all monitoring measures must be implemented to determine the possible causes of the trigger level being exceeded. Monitoring of the affected location must be increased and the actions described above implemented. Assessment of exceeded trigger levels must not be carried out in isolation from an assessment of the entire monitoring regime as the monitoring measures are

inter-related. Where required, measures may be implemented or prepared as determined by the specific situation and combination of observed monitoring measurement data.

Standard Reporting

1 No. electronic copy of the report in PDF format shall be submitted to the PWS.

The Monitoring Surveyor shall report whether the movements are within (or otherwise) the trigger levels indicated in Table 2. A summary of the extent of completion of any of the elements of works and any other significant events shall be given. These works shall be shown in the form of annotated plans (and sections) for each survey visit both local to the instrumentation and over a wider area. The associated changes to readings at each survey or monitoring point shall be then regulated to the construction activity so that the cause of any change, if it occurs, can be determined.

The Monitoring Surveyor shall also give details of any events on site which in his opinion could affect the validity of the results of any of the surveys.

The report shall contain as a minimum, for each survey visit the following information:

a) The date and time of each reading:
b) The weather on the day:
c) The name of the person recording the data on site and the person analysing the readings together with their company affiliations;
d) Any damage to the instrumentation or difficulties in reading;
e) Tables comparing the latest reading with the last reading and the base reading and the changes between these recorded data;
f) Graphs showing variations in crack width with time for the crack measuring gauges; and
g) Construction activity as described. It is very important that each set of readings is associated with the extent of excavation and construction at that time. Readings shall be accompanied by information describing the extent of works at the time of readings. This shall be agreed with the PC.

Spread-sheet columns of numbers should be clearly labelled together with units. Numbers should not be reported to a greater accuracy than is appropriate. Graph axis should be linear and clearly labelled together with units. The axis scales are to be agreed with the PC before the start of monitoring and are to remain constant for the duration of the job unless agreed otherwise. The specified trigger values are also to be plotted on all graphs.

The reports are to include progress photographs of the works both general to the area of each instrument and globally to the main Works. In particular, these are to supplement annotated plans/sections described above. Wherever possible the global photographs are to be taken from approximately the same spot on each occasion. The locations of these points should be agreed with the Party Wall Surveyor and Monitoring Surveyor at detailed design stage.

Erroneous Data

All data shall be checked for errors by the Monitoring Surveyor prior to submission. If a reading that appears to be erroneous (i.e. it shows a trend which is not supported by the surrounding instrumentation), he shall notify the PC immediately, resurvey the point in question and the neighbouring points and if the error is repeated, he shall attempt to identify the cause of the error. Both sets of readings shall be processed and submitted, together with the reasons for the errors and details of remedial works. If the error persists at subsequent survey visits, the Monitoring Surveyor shall agree with the PC how the data should be corrected. Correction could be achieved by correcting the readings subsequent to the error first being identified to a new base reading.

The Monitoring Surveyor shall rectify any faults found in or damage caused to the instrumentation system for the duration of the specified monitoring period, irrespective of cause, at his own cost.

Trigger Values

Trigger values for maximum movements as listed in Table 2. If the movement exceeds these values then action may be required to limit further movement. The PC should be immediately advised of the movements in order to implement the necessary works.

It is important that all neighbouring points (not necessarily a single survey point) should be used in assessing the impact of any movements which exceed the trigger values, and that rechecks are carried out to ensure the data is not erroneous. A detailed record of all activities in the area of the survey point will also be required as specified elsewhere.

Responsibility for Instrumentation

The Monitoring Surveyor shall be responsible for: managing the installation of the instruments or measuring points, reporting of the results in a format which is user friendly to all parties; and immediately reporting to all parties any damage. The Monitoring Surveyor shall be responsible for informing the PC of any movements which exceed the specified trigger values listed in Table 2 so that the PC can implement appropriate procedures. He shall immediately inform the PWS of any decisions taken.

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APPENDIX A
MONITORING FREQUENCY

INSTRUMENT	FREQUENCY OF READING
Settlement monitoring and Monitoring existing cracks	**Pre-construction** Monitored once. **During construction** Monitored after every pin is cast for first 4 no. pins to gauge effect of underpinning. If all is well, monitor after every other pin. **Post construction works** Monitored once.

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APPENDIX B

An Analysis on allowable settlements of structures (Skempton and MacDonald (1956))

The most comprehensive studies linking self-weight settlements of buildings to structural damage were carried out in the 1950's by Skempton and MacDonald (1956) and Polshin and Tokar. These studies show that damage is most often caused by differential settlements rather than absolute settlements. More recently, similar empirical studies by Boscardin and Cording (1989) and Boone (1996) have linked structural damage to ground movements induced by excavations and tunnelling activities.

In 1955 Skempton and MacDonald identified the parameter $\delta\rho/L$ as the fundamental element on which to judge maximum admissible settlements for structures. This criterion was later confirmed in the works of GRANT *et al.* [1975] and WALSH [1981]. Another important approach to the problem was that of BURLAND and WROTH [1974], based on the criterion of maximum tensile strains.

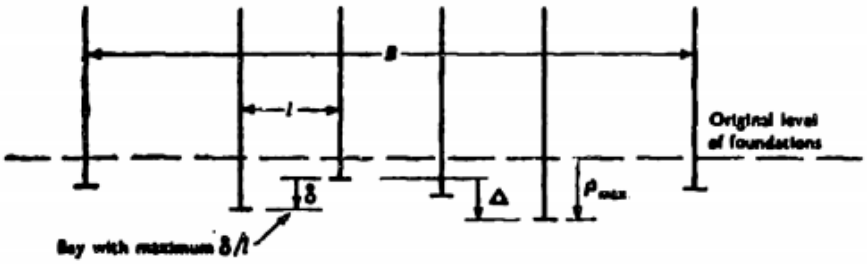

Figure 2.1 – Diagram illustrating the definitions of maximum angular distortion, δ/l, maximum settlement, ρ_{max}, and greatest differential settlement, Δ, for a building with no tilt (Skempton and MacDonald, 1956).

Figure 1: Diagram illustrating the definitions of maximum angular distortion, δ/l, maximum settlement, p_{max}, and greatest differential settlement ,Δ , for a building with no tilt (Skempton and MacDonald, 1956)

The differential settlement is defined as the greatest vertical distance between two points on the foundation of a structure that has settled, while the angular distortion, is the difference in elevation between two points, divided by the distance between those points.

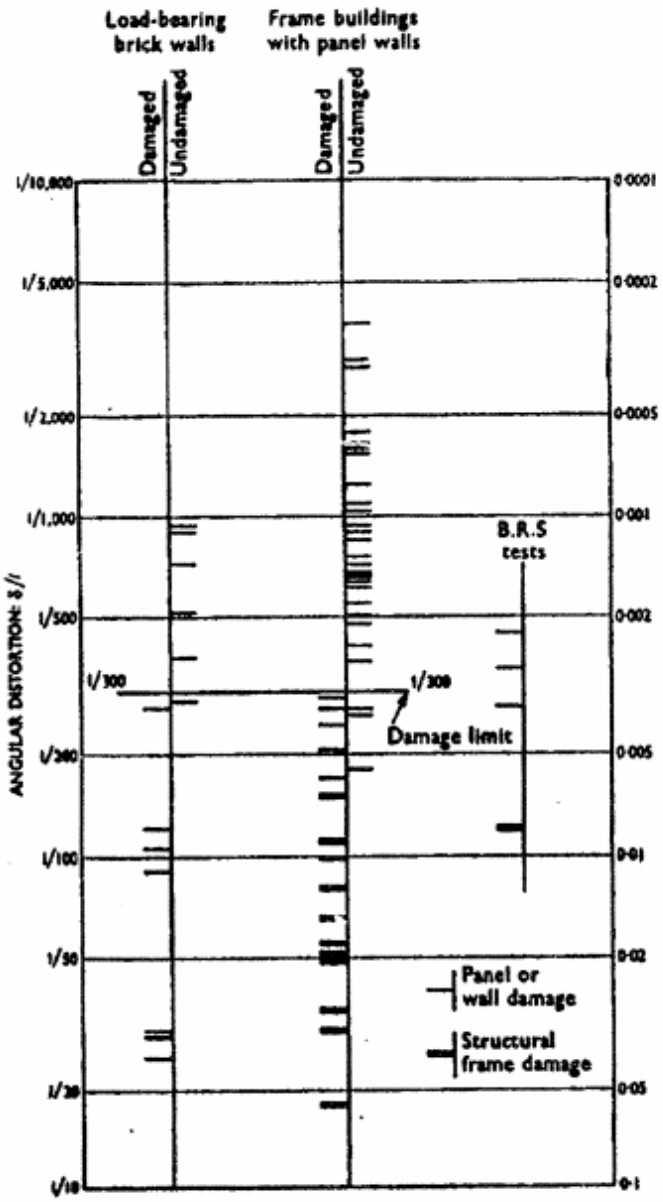

Figure 2: Skempton and MacDonald's analysis of field evidence of damage on traditional frame buildings and loadbearing brick walls

Data from Skempton and MacDonald's work suggest that the limiting value of angular distortion is 1/300. Angular distortion, greater than 1/300 produced visible cracking in the majority of buildings studied, regardless of whether it was a load bearing or a frame structure. As shown in the figure 2.

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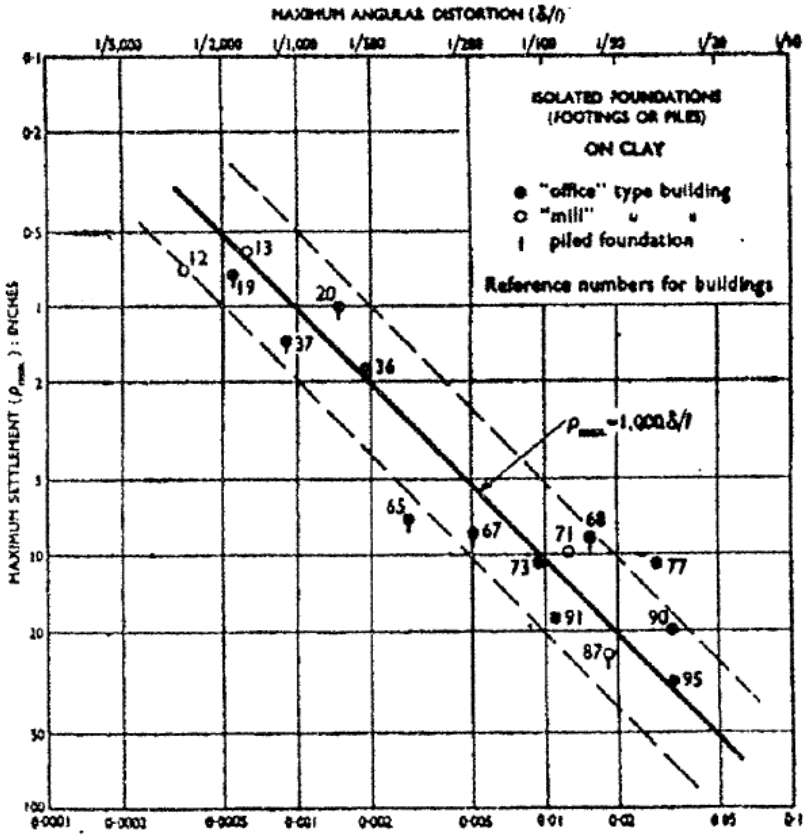
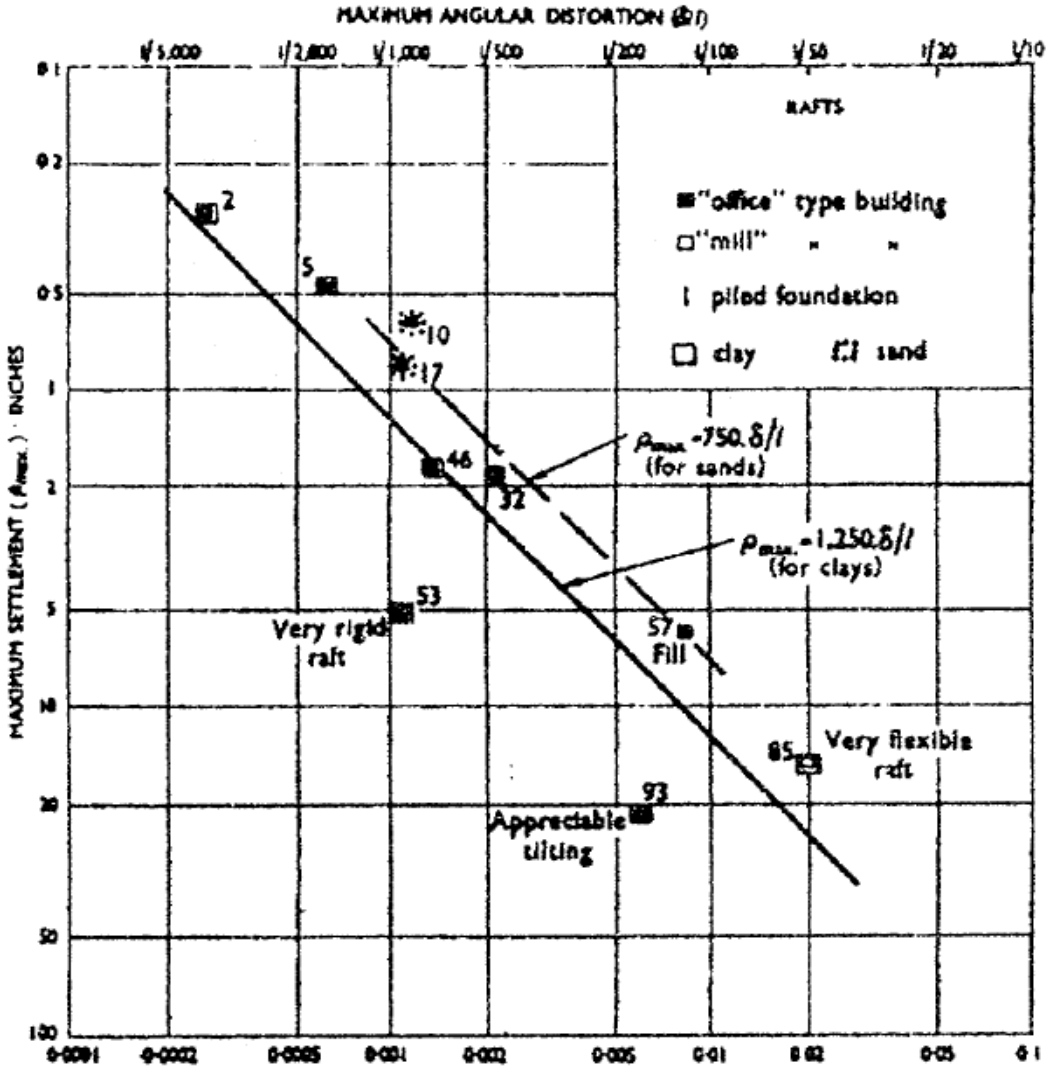
Other key findings by Skempton and MacDonald include limiting values of δ/l for structure, and a relationship between maximum settlement, ρ_{max} and δ/l for structures founded on sands and clays. The charts below show these relations for raft foundations and isolated footings.





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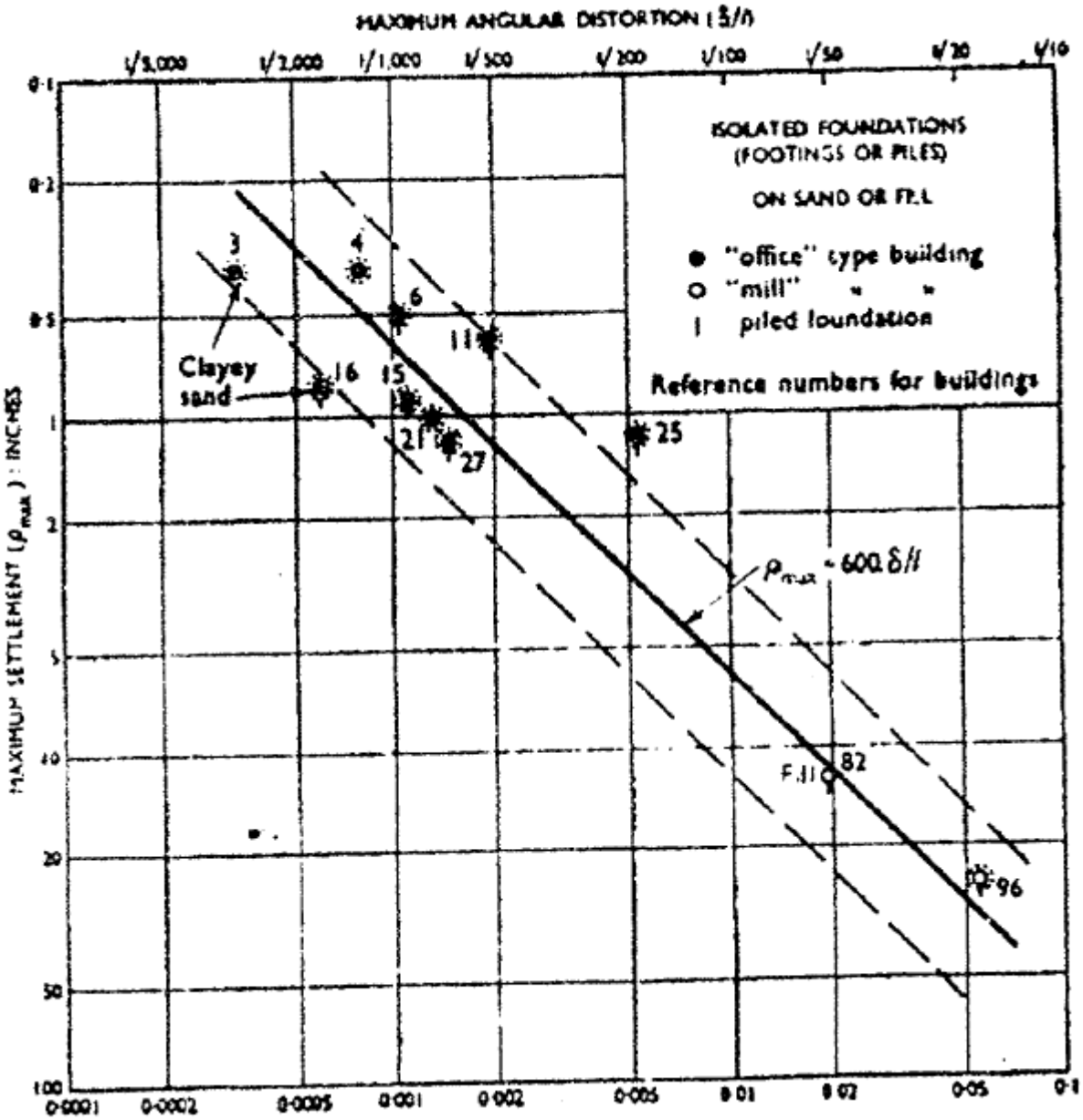

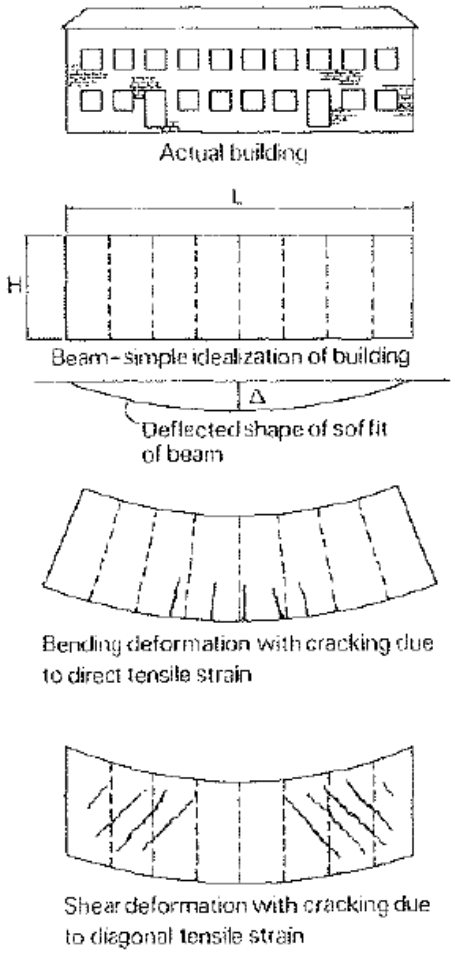

TABLE I

Angular distorsion	Characteristic situation
1/300	Cracking of the panels in frame buildings of the traditional type, or of the walls in load-bearing wall buildings;
1/150	Structural damage to the stanchions and beams;
1/500	Design limit to avoid cracking;
1/1000	Design limit to avoid any settlement damage.

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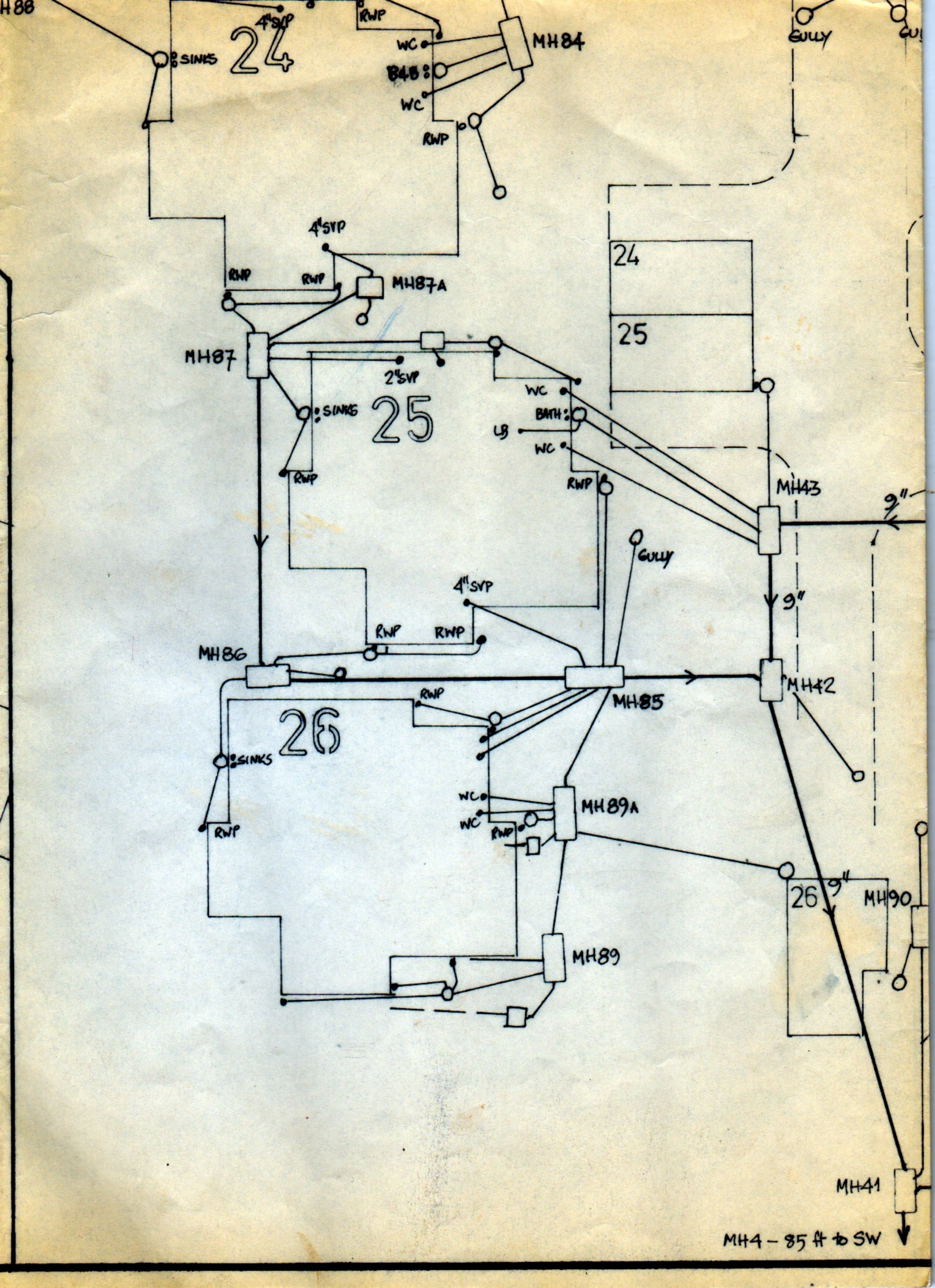
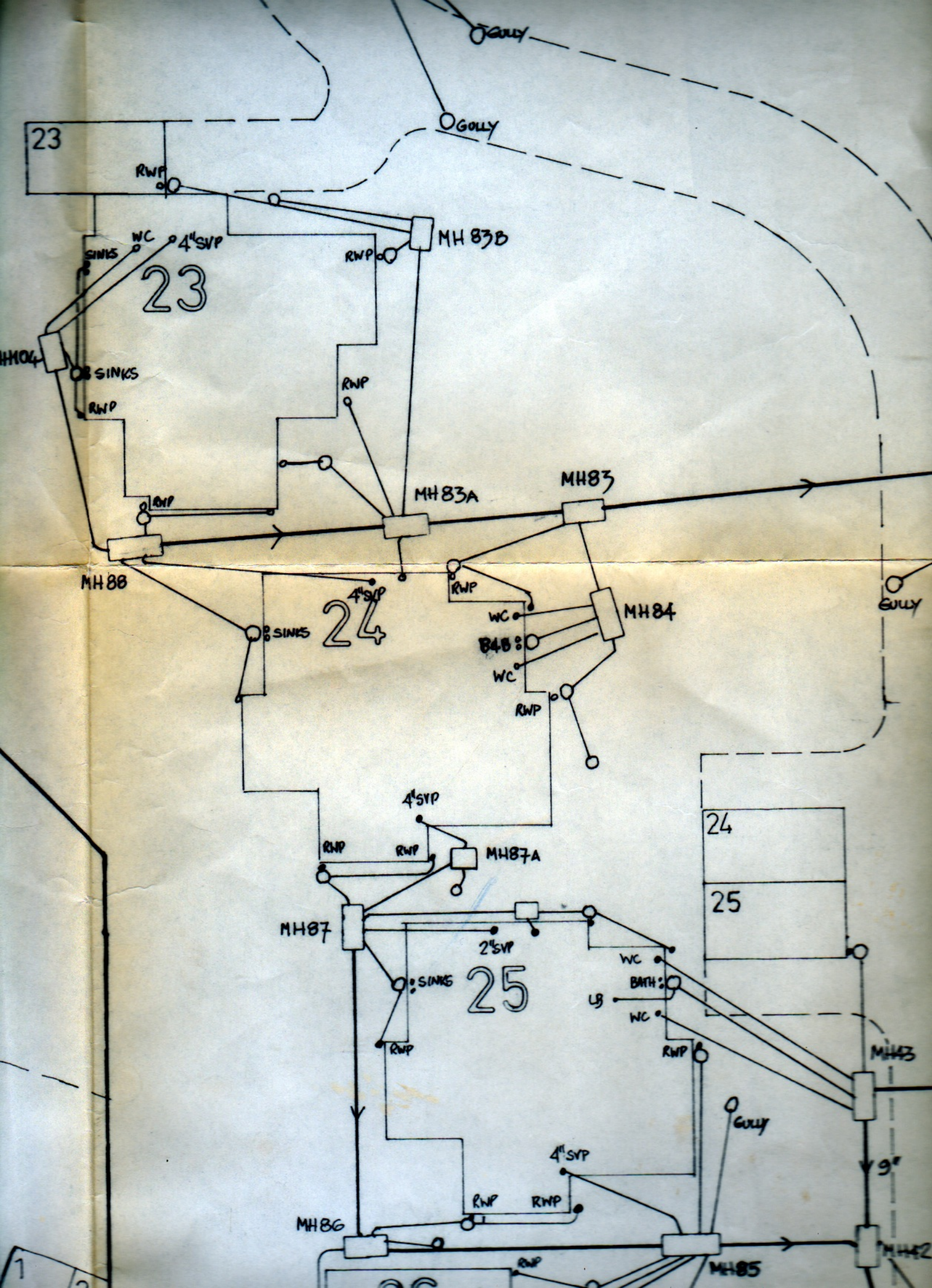
Appendix E: Outline Construction Programme

The Contractor is responsible for the final construction programme

Task	Month										
	1	2	3	4	5	6	7	8	9	10	11
Monitoring of adjacent structures											
Enabling works											
Demolition											
Bulk excavation											
Basement construction											
Superstructure construction											



4"SVP
RWP
SINKS
24
MH84
WC
WC
RWP
GULLY
24
25
4"SVP
RWP
RWP
MH87A
MH87
2"SVP
SINKS
25
WC
BATH
LB
WC
RWP
MH43
9"
9"
GULLY
4"SVP
RWP
RWP
MH86
MH85
MH42
RWP
26
SINKS
RWP
WC
WC
RWP
MH89A
26
9"
MH90
MH89
MH41
MH4 – 85 ft to SW


GULLY
GULLY
23
RWP
WC
4"SVP
SINKS
MH 83B
RWP
23
MH84
SINKS
RWP
RWP
MH83A
MH83
RWP
MH88
4"SVP
RWP
GULLY
24
SINKS
MH84
WC
B4B
WC
RWP
4"SVP
RWP
RWP
MH87A
24
25
MH87
2"SVP
WC
SINKS
BATH
25
LB
WC
RWP
RWP
MH83
GULLY
4"SVP
9"
RWP
RWP
MH86
MH85
RWP
1

Appendix B

Rainfall runoff calculations

Critical Storm Duration and volume requirements

The table below presents storage volumes for the 1 in 100 year plus climate change (40%) used to assess the impact of the proposed development and calculate the required storage volumes for the critical storm duration for attenuation features, limited to a maximum discharge rate of 1 l/s. According to calculations, the 0.75 hour storm is the critical storm duration when applying a discharge rate of 1 l/s.

Table 8: Critical Storm Durations and storage requirements associated with the development

Rainfall event duration (Hours)	Outflow to 1 l/s (m^3)	Inflow from impermeable surfaces (m^3)	Storage Required for Critical Storm Duration (m^3)
0.25	0.90	5.52	4.62
0.5	1.80	7.08	5.28
0.75	2.70	7.98	5.28
1	3.60	8.63	5.03
2	7.20	11.07	3.87
3	10.80	12.64	1.84
4	14.40	13.75	-0.65
5	18.00	14.58	-3.42

Greenfield Site Run-Off Calculations usng the IoH124 method

Greenfield peak run-off rate (QBAR):

Parameters	Input	Units	Comments
Area	50	ha	mimimum 50ha
SAAR	676	mm	FEH CD ROM (NERC, 2009)
SPR	0.10	N/A	Soil run-off coefficient
Region	6	N/A	Region on Hydrological area map

QBAR

$$Q_{BAR(rural)} = 1.08AREA^{0.89}SAAR^{1.17}SPR^{2.17}$$

Where:

$Q_{BAR(rural)}$	is the mean annual flood (a return period of 2.3 years) in l/s
AREA	is the area of the catchment in km² (minimum of 0.5km²)
SAAR	is the standard average rainfall for the period 1941 to 1970 in mm
SPR	is the soil run-off coefficient

$Q_{BAR(rural)}$ can be factored by the UK Flood Studies Report regional growth curves to produce peak flood flows for any return period.

$Q_{BAR(rural)}$	=	8.06	l/s for 50ha site
Divided by 50 to scale down	=	0.16	l/s/ha
Actual Area of the entire Site	=	0.01	ha

Return Periods (Growth curves obtained from DEFRA report)

Return Period		Growth Factor	l/s/ha	Peak site run-off rate (l/s)
1	**$Q_{BAR(rural)}$ x**	**0.85**	**0.14**	**0.002**
2	$Q_{BAR(rural)}$ x	0.88	0.14	0.00
5	$Q_{BAR(rural)}$ x	1.28	0.21	0.00
10	$Q_{BAR(rural)}$ x	1.62	0.26	0.00
25	$Q_{BAR(rural)}$ x	2.14	0.35	0.00
30	**$Q_{BAR(rural)}$ x**	**2.24**	**0.36**	**0.004**
50	$Q_{BAR(rural)}$ x	2.62	0.42	0.01
100	**$Q_{BAR(rural)}$ x**	**3.19**	**0.51**	**0.01**
200	$Q_{BAR(rural)}$ x	3.86	0.62	0.01

Greenfield total run-off volume:

= actual area of the entire site x SPR x 6 hour rainfall depth

Return Period	6 hour rainfall (mm) from FEH CD-ROM	Area (ha)	SPR	Total run-off (m^3)
2.3 (QBAR)	28.99	0.01	0.10	0.4
1	25.87	0.01	0.10	0.3
10	46.73	0.01	0.10	0.6
30	62.41	0.01	0.10	0.8
100	86.37	0.01	0.10	1.1

Summary

Entire site area:	0.012	ha
Climate Change Factor	40%	

	Current	*Proposed*
Permeable Surface (ha)	0.012	0.000
Impermeable Surface (ha)	0.000	0.012

1 in 1 year

Greenfield run-off volume total: 0.32 m^3

RUN-OFF During a 1 in 1 year 6 hour event:	**Greenfield Site**	**Current Development**	**Proposed Development**	**Proposed Development +CC**
From permeable surfaces (using GF total run-off) (m^3)	0.32	0.32	0.00	0.00
From impermeable surfaces (m^3)		0.00	3.28	4.59
TOTAL run-off produced from Site (m^3)	0.32	0.32	3.28	4.59

Difference between greenfield site and proposed +cc development (m^3):	**4.28**
	1356%
Difference between current and proposed +cc development (m^3):	**4.28**
	1356%
Peak Greenfield run-off rate that must not be exceeded in the run-off from the proposed development (l/s):	**0.00**

1 in 10 year

Greenfield run-off volume total: 0.57 m^3

RUN-OFF During a 1 in 1 year 6 hour event:	**Greenfield Site**	**Current Development**	**Proposed Development**	**Proposed Development +CC**
From permeable surfaces (using GF total run-off) (m^3)	0.57	0.57	0.00	0.00
From impermeable surfaces (m^3)		0.00	5.70	7.98
TOTAL run-off produced from Site (m^3)	0.57	0.57	5.70	7.98

Difference between greenfield site and proposed +cc development (m^3):	**7.41**
	1300%
Difference between current and proposed +cc development (m^3):	**7.41**
	1300%
Peak Greenfield run-off rate that must not be exceeded in the run-off from the proposed development (l/s):	**0.00**

1 in 30 year

Greenfield run-off volume total: 0.76 m^3

RUN-OFF During a 1 in 30 year 6 hour event:	**Greenfield Site**	**Current Development**	**Proposed Development**	**Proposed Development +CC**
From permeable surfaces (using GF total run-off) (m^3)	0.76	0.76	0.00	0.00
From impermeable surfaces (m^3)		0.00	7.83	10.96
TOTAL run-off produced from Site (m^3)	0.76	0.76	7.83	10.96

Difference between greenfield site and proposed +cc development (m^3):	**10.19**
	1339%
Difference between current and proposed +cc development (m^3):	**10.19**
	1339%
Peak Greenfield run-off rate that must not be exceeded in the run-off from the proposed development (l/s):	**0.00**

1 in 100 year

Greenfield run-off volume total: 1.05 m^3

RUN-OFF During a 1 in 100 year 6 hour event:	**Greenfield Site**	**Current Development**	**Proposed Development**	**Proposed Development +CC**
From permeable surfaces (using GF total run-off) (m^3)	1.05	1.05	0.00	0.00
From impermeable surfaces (m^3)		0.00	10.87	15.22
TOTAL run-off produced from Site (m^3)	1.05	1.05	10.87	15.22

Difference between greenfield site and proposed +cc development (m^3):	**14.17**
	1344%
Difference between current and proposed +cc development (m^3):	**14.17**
	1344%
Peak Greenfield run-off rate that must not be exceeded in the run-off from the proposed development (l/s):	**0.01**

Appendix C

STL Regulated Drainage and Water Search Report

Conveyancing searches
Indemnities
Technology

GeoSmart, No Branch
One Temple Quay
Temple Back East
Bristol
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Regulated Drainage & Water Search

Property Address:
26 West Hill Park, London, N6 6ND

Water Undertaker:
Thames Water Plc, PO Box 286, Swindon, SN38 2RA

Sewerage Undertaker:
Thames Water Plc, PO Box 286, Swindon, SN38 2RA

Date of search:	STL Reference:	Client Reference:
28/06/2017	2080534	66298, PO: 2174

Summary for Conveyancers

This summary identifies matters revealed which you may wish to highlight to your client or investigate further. It is intended as a snapshot of the information contained in the search, should in no way be considered legal advice, and should be taken in context with the full search information and with your client's planned use and enjoyment of the property.

	Maps	
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

	Drainage	
2.1	Does foul water from the property drain to the public sewer?	Yes
2.2	Does surface water from the property drain to the public sewer?	Yes
2.3	Is a surface water drainage charge payable?	Refer to Vendor
2.4	Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundaries of the property?	No
2.4.1	Does the public sewer map indicate any public sewage pumping station 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?	Yes
2.5.1	Does the public sewer map indicate any public pumping station within 50 metres (164.04 feet) of any buildings within the property?	Insured
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 any 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?	Insured
2.9	Please state the distance from the property to the nearest boundary of the nearest sewage treatment works	Insured

	Water	
3.1	Is the property connected to mains water supply?	Yes
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 this property at risk of receiving low water pressure or flow?	Insured
3.5	What is the classification of the water supply for the property?	See report
3.6	Please include details of the location of any water meter serving the property	See report

	Charging	
4.1.1	Who is responsible for providing the sewerage services for the property?	Thames Water
4.1.2	Who is responsible for providing the water services for the property?	Thames Water
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 report
4.5	Will the basis for charging for sewerage and water services at the property change as a consequence of a change of occupation?	Insured

Question 1.1

Where relevant, please include a copy of an extract from the public sewer map

A copy of an extract from the public sewer map is included in which the location of the property is identified

Guidance Notes:

Pipes that are shown on the public sewer map as sewers, disposal mains or lateral drains are defined as those for which a Sewerage Undertaker holds statutory responsibility under the Water Industry Act 1991. A Sewerage Undertaker is not generally responsible for rivers, water courses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only. Sewers or lateral drains 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 that these details are checked with the developer, if any. Please note that following the private sewer transfer on 1 October 2011 there may be additional public assets other than those shown on the public sewer map.

Question 1.2

Where relevant, please include a copy of an extract from the map of waterworks

A copy of an extract from the map of waterworks is included in which the location of the property is identified

Guidance Notes:

Pipes that are shown on the map of waterworks as water mains, resource mains or discharge pipes are defined as those for which a Water Undertaker holds statutory responsibility under the Water Industry Act 1991. Water Undertakers are not responsible for private water mains or private service 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. The extract of the map of waterworks shows 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.

Public Sewer & Water Map

- Public Combined Sewer
- Public Foul Sewer
- Public Surface Water Sewer
- Abandoned Public Sewer
- Water Pipes
- Sewer Publicly Maintained under Section 24 Public Health Act 1936
- Section 104 Surface Water Sewer
- Section 104 Foul Sewer
- Decommissioned Water
- Public Sewage Pumping Station

This map is provided by STL Group Ltd and must be used in conjunction with the search results attached. Please note, the boundary may have been adjusted from the plan provided so that it reflects the National Polygon dataset provided by the Land Registry. This dataset covers all registered titles (freehold and leasehold) in England and Wales and shows the indicative shape and position of each boundary. The information shown on the map is based on data obtained from various sources but the position of any water company apparatus must should be regarded as approximate. Service pipes, private sewers and drains are generally not shown. This map should not be used for detailed design of any proposed works and users of this map are strongly advised to commission their own survey of the area before carrying out any works to establish the actual position of all apparatus.

Question 2.1

Does foul water from the property drain to the public sewer?

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

Guidance Notes:

The above answer is inferred from the proximity of a public sewer as indicated on the enclosed map. If the inference is wrong, the attached Information Accuracy Indemnity covers an adverse entry.
For confirmation, please refer to billing information, form TA6 or the Property Details Questionnaire which confirms connection to mains drainage. Sewerage Undertakers are not responsible for private drains and private sewers 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 and may have shared responsibility with other users if the property is served by a private sewer which also serves other properties if not connected to the public sewerage system. These 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. An extract from the public sewer map is enclosed. This will show known public sewers and lateral drains in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or private sewers connecting the property to the public sewerage system. If foul water does not drain to the public sewerage system the property may have private facilities in the form of a septic tank, cesspit or other type of treatment plant.

Question 2.2

Does surface water from the property drain to the public sewer?

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

Guidance Notes:

The above answer is inferred from the proximity of a public sewer as indicated on the enclosed map. If the inference is wrong, the attached Information Accuracy Indemnity covers an adverse entry.
For confirmation, please refer to billing information, form TA6 or the Property Details Questionnaire which confirms connection to mains drainage. Sewerage Undertakers are not responsible for private drains and private sewers 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 and may have shared responsibility with other users if the property is served by a private sewer which also serves other properties. These 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 Undertaker records do not distinguish between foul and surface water connections to the public sewerage system. If on inspection the buyer finds that the property is not connected for surface water drainage, the property may be eligible for a rebate of the surface water drainage charge. Details can be obtained from the Water Company. An extract from the public sewer map is enclosed. This will show known public sewers and lateral drains in the vicinity of the property and it should be possible to estimate the likely length and route of any private drains and/or private sewers connecting the property to the public sewerage system. If surface water does not drain to a public sewer the property may have private facilities in the form of a soakaway or private connection to a watercourse. Please note, the property may drain to a Sustainable Urban Drainage System (SuDs), please refer to the Local Authority Search for further information.

Question 2.3

Is a surface water drainage charge payable?

Please refer to vendor or pre-contract documents and/or your own survey of the property

Guidance Notes:

Where surface water charges are payable but upon inspection the property owner believes that surface water does not drain to the public sewerage system, an application can be made to the Water Company to end surface water charges.

Question 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. Please note, it has not always been a requirement for such public sewers, disposal mains or lateral drains to be recorded on the public sewer map. It is therefore possible for unidentified sewers, disposal mains or lateral drains to exist within the boundaries of the property. However on 1 October 2011 private sewers were transferred into public ownership. There may therefore be additional public sewers, disposal mains or lateral drains which are not recorded on the public sewer map but which may prevent or restrict development of the property.

Guidance Notes:

The approximate boundary of the property has been determined by reference to the plan provided. The presence of a public sewer, disposal main or lateral drain running within the boundary of the property may restrict further development. The Sewerage Undertaker 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 considered to be not an 'as constructed' record. It is recommended these details are checked with the developer.

Question 2.4.1

Does the public sewer map indicate any public sewage pumping station within the boundaries of the property?

The public sewer map included indicates that there is no public sewage pumping station within the boundaries of the property.

Guidance Notes:

The presence of a public sewage pumping station 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. Please note that private pumping stations built prior to 1 July 2011 which serve more than one property and pump to the existing public sewer are eligible for transfer into public ownership as of 1 October 2016. Pumping stations installed after 1 July 2011 remain the responsibility of the homeowner unless they are the subject of an adoption agreement. Please note that the Water Company may not have been made aware of all the pumping stations which meet the adoption obligation criteria and therefore there may be pumping stations not recorded on the public sewer map.

Question 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 is a public sewer within 30.48 metres (100 feet) of a building within the property. On 1 October 2011 private sewers were transferred into public ownership, there may therefore be additional lateral drains and/or public sewers which are not recorded on the public sewer map but are within 30.48 metres (100 feet) of a building within the property.

Guidance Notes:

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. The presence of a public sewer within 30.48 metres (100 feet) of any buildings within the property can result in the Local Authority requiring a property to be connected to the public sewer. The measure is estimated using the map provided and the water company records, between the building(s) within the boundary of the property and the nearest public sewer.

Question 2.5.1

Does the public sewer map indicate any public pumping station within 50 metres (164.04 feet) of any buildings within the property?

Not answered - This information is not available, if an answer had been available which was adverse at the date of this report the Information Accuracy Indemnity attached would apply.

Guidance Notes:

The presence of a public sewage pumping station 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. Please note that private pumping stations built prior to 1 July 2011 which serve more than one property and pump to the existing public sewer are eligible for transfer into public ownership as of 1 October 2016. Pumping stations installed after 1 July 2011 will remain the responsibility of the homeowner unless they are the subject of an adoption agreement. Please note that the Water Company may not have been made aware of all the pumping stations which meet the adoption obligation criteria and therefore there may be pumping stations not recorded on the public sewer map.

Question 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 indicate that sewers serving the property are not the subject of an existing adoption agreement or an application for such an agreement.

Guidance Notes:

On 1 October 2011 all foul Section 104 sewers laid before 1 July 2011 were transferred into public ownership, excluding those that discharge to a privately owned sewage treatment or collection facility. All surface Section 104 sewers that do not discharge to a public watercourse were also transferred. Water Companies' mapping records are currently being reviewed and updated and may not yet reflect this change, therefore there may be additional public sewers, disposal mains or lateral drains which are not yet recorded on the public sewer map or public sewers that still show as Section 104 sewers.

Question 2.7

Has any 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 please note 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. The attached Information Accuracy Indemnity covers adverse entries at the date of this report where data is not available.

Guidance Notes:

Buildings or extensions erected over a public sewer, disposal main or lateral drain in contravention of building controls or which conflict with the provisions of the Water Industry Act 1991 may have to be removed or altered. On 1 October 2011 the majority of private sewers, disposal mains and lateral drains, connected to the public network as of 1 July 2011, transferred to public ownership. Therefore there may be formerly private sewers and lateral drains that have been built over, however the sewerage undertaker may not have approved or been consulted about any plans to erect a building or extension on the property or in the vicinity of these. Please also refer to vendor or pre-contract documents and/or your own survey of the property.

Question 2.8

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

Not answered - If an answer had been available which was adverse at the date of this report the Information Accuracy Indemnity attached would apply.

Guidance Notes:

A sewer is 'overloaded' when the flow from a storm is unable to pass through it due to a permanent problem (eg. flat gradient, small diameter). Flooding as a result of temporary problems such as blockage, 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 reported 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 and therefore would be excluded from the report.

Question 2.9

Please state the distance from the property to the nearest boundary of the nearest sewage treatment works

Not answered - If an answer had been available which was adverse at the date of this report the Information Accuracy Indemnity attached would apply.

Guidance Notes:

The nearest sewage treatment works will not always be the sewage treatment works serving the catchment within which the property is situated.

Question 3.1

Is the property connected to mains water supply?

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

Guidance Notes:

The above answer is inferred from the proximity of a public water main as indicated on the enclosed map. If the inference is wrong, the attached Information Accuracy Indemnity covers an adverse entry. For confirmation, please refer to billing information, form TA6 or the Property Details Questionnaire which confirms connection to mains water, and information regarding whether a water meter is installed. Details of private supplies are not kept by the Water Undertaker. We recommend the situation is checked with the current owner of the property.

Question 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.

Guidance Notes:

The approximate boundary of the property has been determined by reference to the plan provided. The presence of public water main, resource main or discharge pipe within the boundary of the property may restrict further development within it. Water Undertakers 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.

Question 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 indicate 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.

Guidance Notes:

Where the property is part of a very recent or ongoing development and the water mains and service pipes are not the subject of an adoption application, buyers should consult with the developer to confirm that the Water Undertaker will be asked to provide a water supply to the development or to ascertain the extent of any private water supply system for which they will hold maintenance and renewal liabilities.

Question 3.4

Is this property at risk of receiving low water pressure or flow?

Not answered - If an answer had been available which was adverse at the date of this report the Information Accuracy Indemnity attached would apply.

Guidance Notes:

'Low water pressure' means water pressure below the regulatory reference level which is the minimum pressure when demand on the system is not abnormal.

Question 3.5

What is the classification of the water supply for the property?

To check the average water hardness of water supplied to the property please visit https://www.thameswater.co.uk/help-and-advice/water-quality/Check-the-water-quality-in-your-area

Guidance Notes:

The hardness of water depends on the amount of calcium in it - the more it contains the harder the water is. There is no UK or European standard set for the hardness of drinking water. More information on water hardness can be found on the Drinking Water Inspectorates' website: http://www.dwi.gov.uk
If the property is in a hard water area, you may wish to refer to the vendor or pre-contract documents and/or your own survey of the property to establish if a water softener has been installed.

Question 3.6

Please include details of the location of any water meter serving the property

Please refer to vendor or pre-contract documents and / or your own survey of the property. For further information regarding the water meter serving this property please contact:

Thames Water Plc
PO Box 286
Swindon
SN38 2RA
Tel: 0845 9200 888
www.thameswater.co.uk

Question 4.1.1

Who is responsible for providing the sewerage services for the property?

Please refer to vendor or pre-contract documents and / or your own survey of the property. The Sewerage Undertakers for the area are:

Thames Water Plc
PO Box 286
Swindon
SN38 2RA
Tel: 0845 9200 888
www.thameswater.co.uk

Question 4.1.2

Who is responsible for providing the water services for the property?

Please refer to vendor or pre-contract documents and / or your own survey of the property. The Water Undertakers for the area are:

Thames Water Plc
PO Box 286
Swindon
SN38 2RA
Tel: 0845 9200 888
www.thameswater.co.uk

Question 4.2

Who bills the property for sewerage services?

Thames Water Plc
PO Box 286
Swindon
SN38 2RA
Tel: 0845 9200 888
www.thameswater.co.uk

Question 4.3

Who bills the property for water services?

Thames Water Plc
PO Box 286
Swindon
SN38 2RA
Tel: 0845 9200 888
www.thameswater.co.uk

Question 4.4

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

Water and sewerage companies' full charges are set out in their charges schemes which are available from the company free of charge upon request.

Guidance Notes:

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.

The average household bill is, by definition, an average across all customers. Readings taken from a water meter are used to calculate metered sewerage charges, the volume charge for sewerage services is usually based on a percentage of total water supplied. To view the above information in full please visit the Office of Water Services (OFWAT) Website: http://www.ofwat.gov.uk Water and Sewerage Companies full charges are set out in their charges schemes which are available from the Company free of charge upon request.

Question 4.5

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

Not answered - If an answer had been available which was adverse at the date of this report the Information Accuracy Indemnity attached would apply.

Guidance Notes:

The Company may install a meter at the premises where a buyer makes a change of use of the property or where the occupier uses water for watering the garden, other than by hand (this includes the use of sprinklers) or automatically replenishing a pond or swimming pool with a capacity greater than 10,000 litres.

Glossary

'the 1991 Act' means the Water Industry Act 1991[61]

'**the 2000 Regulations**' means the Water Supply (Water Quality) Regulations 2000[62]

'adoption agreement' means an agreement made or to be made under Section 51A(1) or 104(1) of the 1991 Act[64]

'discharge pipe' means a pipe 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

'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[65]

'map of waterworks' means the map made available under Section 198(3) of the 1991 Act[67] 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[68], 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[69]; (b) by virtue of a scheme under Schedule 2 to the 1991 Act[70]; (c) under Section 179 of the 1991 Act[71]; or (d) otherwise; 'public sewer map' means the map made available under Section 199(5) of the 1991 Act[72]

'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

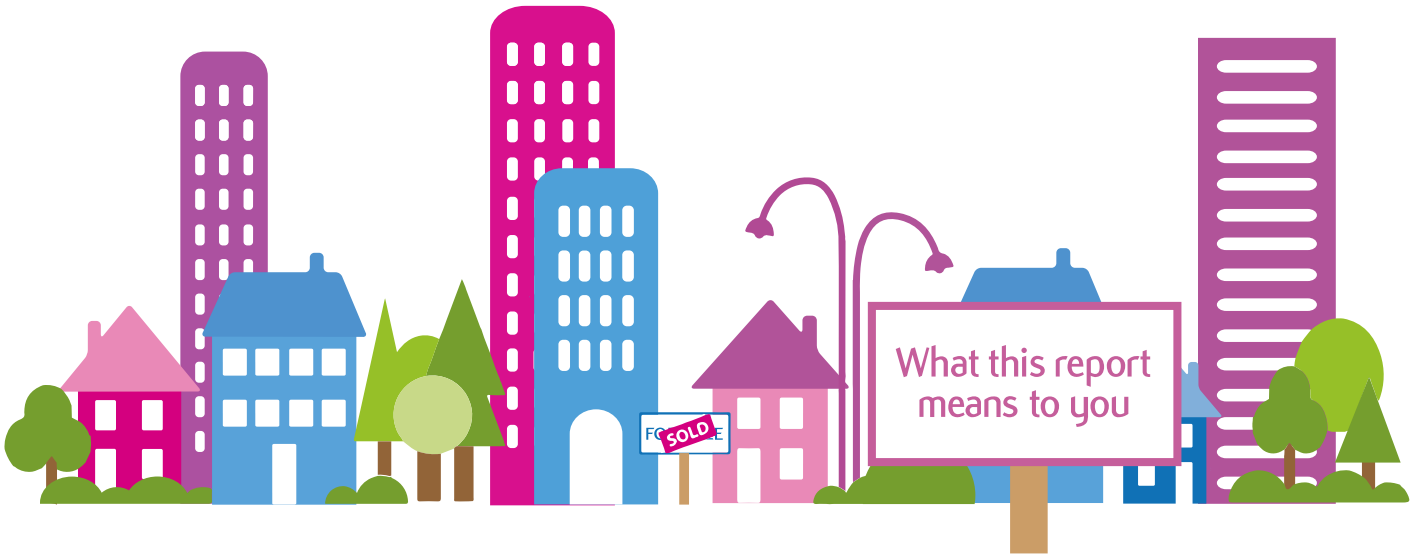
'water main' means (subject to Section 219(2) of the 1991 Act) any pipe, not being a pipe for the time being vested in a person other than the Water Undertaker, which is used or to be used by a Water Undertaker or licensed water supplier for the purpose of making a general supply of water available to 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 zone' 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

'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.



Information for Buyers

This section is a guide to the content of the regulated drainage and water search result. It should be read in association with the main report. This information should not be considered as legal advice and you should check with your conveyancer if you have any concerns about the search results.

Map of Public Sewers/Waterworks

What is a Map of Public Sewers or Map of Waterworks?	Water companies maintain maps of sewers and water pipes for which they are responsible. Most but not all sewer and water pipes within an individual property boundary are the property owner's responsibility.

Sewer & Water Maintenance

Are all Sewer & Water Pipes publicly maintained?	Sewer & Water Pipes can be either publicly or privately maintained. If they are publicly maintained, the local Sewerage or Water undertaker is responsible for repairs and maintenance. As from 1 October 2011 most lateral drains (see glossary) are now owned and maintained by the sewerage undertaker. Sewerage Undertakers are not responsible for any private drains and private sewers 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 and water pipes serving the property.

Sewers

What is a Foul Water Sewer?	Foul sewers/drains take foul sewage (waste from toilets, bathrooms and kitchens etc) away from your property.
What is a Surface Water Sewer?	Surface water sewers/drains take surface water (rainwater) away from your property (includes water from roofs and other impermeable surfaces within the curtilage of the property). In some cases, Sewerage Undertaker records do not distinguish between foul and surface water connections to the public sewerage system. If on inspection the buyer finds that the property is not connected for surface water drainage, the property may be eligible for a rebate of the surface water drainage charge. Details can be obtained from the Water Company.
What is a Combined Sewer?	Combined sewers carry both foul sewage and surface water away from your property.

Adoption Agreement

What does it mean if a sewer is subject to a Section 104 adoption agreement?

With new developments, the developer will typically lay new sewers which are 'subject to adoption'. Purchasers of new homes will want to know whether or not the property will eventually be connected to a public sewer. The adoption of private sewers and drains by the Sewerage Undertaker is subject to the developer complying with the terms of the adoption agreement made under the provisions of Section 104 of the Water Industry Act 1991. For newly built properties, where the property is part of a very recent or on-going development and the sewers are not the subject of an adoption application, buyers should consult with the developers to ascertain the extent of private drains & sewers for which they will hold maintenance & renewal liabilities.

Why do I need to know if there is a public foul sewer within 30.48 metres (100 feet) of any buildings within the property?

If foul water from the property does not drain to a public sewer, the presence of a public foul sewer within 30.48 metres (100 feet) of any buildings within the property can result in the local authority requiring the property to be connected to a public sewer if the existing arrangements are unsatisfactory.

Water Pipes

What are Water Pipes?

Water pipes (water mains, resource mains or discharge pipes) supply clean water to a property. The pipework can be either publicly or privately maintained. Water Undertakers are not responsible for private water mains or private service 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 the property is not connected to mains water supply we recommend the situation is checked with the current owner of the property. Details of private supplies are not kept by the Water Undertaker.

What does it mean if there are public water pipes or public sewers within the boundary of the property?

The presence of public water pipes or public sewers within the boundary of the property may restrict further development. The Water and/or Sewerage Undertaker also has a statutory right of access to carry out work on its assets, subject to notice. This may result in employees of the Water Company or Sewer Undertaker or its contractors needing to enter the property to carry out work. The approximate boundary of the property has been determined by reference to the plan provided.

Information

What is meant by the Private Sewer Transfer?

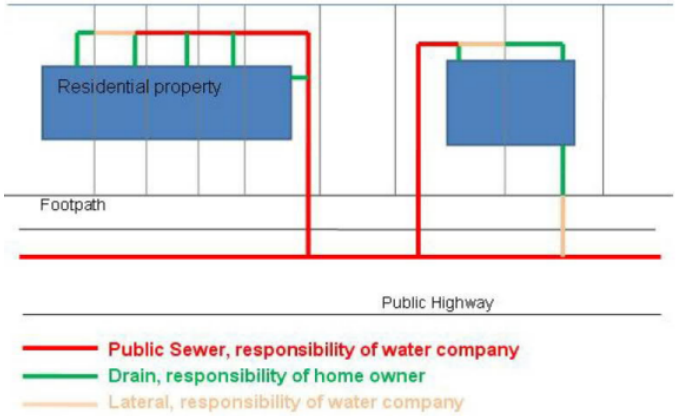
On 1 October 2011, the responsibility for many private sewers and lateral drains, which drain to a public sewer and may be located both within and beyond the property boundary, transferred to the water and sewerage companies.

The water and sewerage companies are currently undertaking an exercise to map these new public sewers and lateral drains. In the meantime however there may be additional public assets not shown on the public sewer map enclosed herein.

For further information visit:

http://www.ofwat.gov.uk/households/supply-and-standards/supply-pipes/

The following diagram illustrate an example of the impact of the new drainage arrangements:



Sustainable Urban Drainage System (SuDS)

What are Sustainable Urban Drainage Systems (SuDS)?	Sustainable Urban Drainage System (SuDs) are designed to drain surface water from a property or site in a natural more sustainable way, than through conventional networks of pipes and sewers, to local watercourses. SuDS slow down surface water run-off and reduce the risk of flooding, particularly during heavy rain. They also improve water quality and reduce the risk of pollution that can happen when foul sewers are overwhelmed by surface water, leading to dirty water being released into rivers.

Unanswered Questions

Why are certain questions not answered within this report?	This report is compiled using publicly available information (as defined by the Water Industry Act 1991). Where data is not publicly available, we provide an insurance policy (see attached). Where we infer certain answers (Q2.1, 2.2 and 3.1) we refer you to alternative sources of information, including billing information, form TA6 or the Property Details Questionnaire which confirms connection to mains drainage, if a septic tank is installed, and information regarding whether a water meter is installed. If both our inference and the form TA6, the Property Details Questionnaire or billing information are incorrect, then our insurance policy would apply.

stewart title

keyfacts

Regulated Drainage & Water Search Information Accuracy Indemnity Block Policy

POLICY SUMMARY

Policy Type
Regulated Drainage & Water Search Information Accuracy Policy

Policy Term
In Perpetuity from the Policy Date

The Insurer
Stewart Title Limited

Insurer's Address
6 Henrietta Street, London, WC2E 8PS

To the Policyholder. We assume the need to purchase this policy has resulted from legal advice provided to you. You should read this summary in conjunction with the full policy wording to ensure you are fully aware of the terms and conditions of the cover.

To the Intermediary. We recommend this document is provided to the Insured before the conclusion of the insurance contact.

SIGNIFICANT CONDITIONS OR EXCLUSIONS UNDER THIS POLICY

Full details of conditions and exclusions are detailed in the policy, but we would draw your attention to the following:
You, or anyone acting on your behalf, must not:

1. disclose the existence of this policy to any third party other than prospective purchasers, lenders, lessees and their legal advisers without our prior written consent
2. take or fail to take action which results in a Claim as this may prejudice your position and void the policy
3. take any steps to settle a Claim without our prior written consent.

UPDATING THE COVER

Requests to increase or extend cover can be considered. We are not permitted to provide advice or recommend how you proceed as you will need to make your own choice about this, with guidance from your intermediary.

RIGHTS TO CANCEL POLICY

This policy can be cancelled by contacting us within 14 days of the policy date, provided all interested parties (such as lenders holding a mortgage or charge on the Property) consent to cancellation. If you wish to cancel this policy, please write (quoting your policy number) to 'The Underwriting Manager' at the Insurer's Address.

HOW TO CLAIM

Please write (quoting your policy number) to 'The Claims Counsel' at the Insurer's Address or by email to ukclaims@stewart.com You must provide details to us of any potential Claim without delay, please read the full Claims conditions within the policy.

COMPLAINTS

Any complaint should be raised in the first instance with our General Counsel by

- Writing to the General Counsel at the Insurer's Address
- Telephoning 0207 010 7820

Details of our complaints handling procedure are available by contacting our General Counsel
If we are unable to resolve your complaint to your satisfaction, you may have the right to refer your complaint to the Financial Ombudsman Service at Exchange Tower, London E14 9SR. The Financial Ombudsman Service website address is www.financial-ombudsman.org.uk/

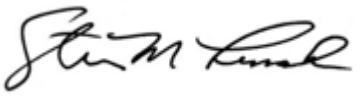
THE FINANCIAL SERVICES COMPENSATION SCHEME (FSCS)

We are covered by the FSCS. You may be entitled to compensation from the scheme if we cannot meet our obligations. This will depend on the type of business and the circumstances of the Claim.
Further information about compensation scheme arrangements is available from the FSCS who can be contacted at Financial Services Compensation Scheme, 10th Floor, Beaufort House, 15 St Botolph Street, London EC3A 7QU. The FSCS website may be viewed at www.fscs.org.uk

BASIS OF COVER

The Insured has paid or agreed to pay the Premium for this indemnity cover.
The Insured agrees to comply with the terms and conditions of the policy. Failure by the Insured to comply can lead to invalidation of the policy in whole or in part or reduce the amount of any Claim subsequently made.

Signed for and on behalf of Stewart Title Limited



Steven Lessack
CEO, Stewart Title Limited

Authorised Signatory

POLICY SCHEDULE

Policy Number
155853

Policy Date
As referred to on the bordereau per Property

Policy Term
In Perpetuity from the Policy Date

Property
Each property or parcel of land which is noted on the bordereau

Limit of Indemnity
See Additional Policy Clause(s) section below

Premium
See Additional Policy Clause(s) section below

THE INSURED
The party purchasing the Property at the Policy Date and any bank, building society or other similar lending institution holding a mortgage or charge on the Property ('the Lender') whether as a result of the purchase or as the result of the owner of the Property remortgaging it to the Lender

THE INSURER
Stewart Title Limited - (Company Reg 2770166), 6 Henrietta Street, Covent Garden, London, WC2E 8PS

THE DEFECT
The Insured has been provided with a Regulated Drainage & Water Search ('the Search') by the Organisation which may contain an Adverse Entry which materially affects the market value of the Property.

INSURED USE
Continued use of the Property for residential or commercial uses as in existence at the Policy Date

EXCLUSION(S)
Any Claim arising from or relating to:

i. any matter revealed in any other searches made available to the Insured or anyone acting on the Insured's behalf prior to the Policy Date
ii. any matter otherwise known to the Insured or anyone acting on the Insured's behalf prior to the Policy Date
iii. consequential loss
iv. environmental or contamination matters (including but not limited to the Environmental Protection Act 1990
v. any matter where the Insured or their legal advisors have not followed or acted upon the guidance notes provided in the Search

ADDITIONAL POLICY CLAUSE(S)
Definitions:

Adverse Entry - Any matter or matters which would have been disclosed in the Search and which were in existence on or before the Policy Date which adversely affect the market value of the Property but which were not disclosed in the Search due to:

i. the absence in the Search of answers to questions 2.5.1, 2.7, 2.8, 2.9, 3.3, 3.4 and 4.5 and/or
ii. incorrect information being given to the Organisation by the statutory authority or authorities responsible for maintaining the registers forming the subject matter of the Search and/or
iii. incorrect information being given by the Organisation to the Insured in respect of Questions 2.1, 2.2, 2.4.1 and 3.1 where the Organisation has interpreted data obtained from the statutory authority or authorities responsible for maintaining the registers but that interpretation is incorrect due to the negligence of, or an error by, the Organisation.

Organisation - STL Group Ltd

Regulated Search - A search requested by or on behalf of the Insured in the course of a purchase or remortgage transaction relating to the Property in response to which the Organisation in accordance with the Council of Property Search Organisations' 'Search Code' has undertaken enquiries and provided a report upon which the Insured relies.

LIMIT OF INDEMNITY
(Up to £ per Property)
£ 2,000,000.00

PREMIUM
(£ inclusive of IPT)
£0.75

MEMORANDUM OF ENDORSEMENT for Seller Cover

Definitions
The definitions referred to below shall be read as being in addition to those given or where repeated for the purpose of the cover provided to the seller under this Policy as an alternative to those in the Policy the Seller of the Property who has requested and paid for the Regulated Search in order to enable the sale of the Property to the Buyer;

Seller:
the Seller of the Property who has requested and paid for the Regulated Search in order to enable the sale of the Property to the Buyer;

Buyer:
the person(s), corporate or incorporate body, named as Buyer in the exchanged contract for the purchase of the Property on whose behalf a Regulated Search has been undertaken or who relies upon a Regulated Search carried out on behalf of the seller of the Property by the Organisation and who has subsequently purchased the Property following receipt of the Regulated Search.

Completion Date:
the date upon which the sale of the Property to the Buyer completed

Offer Price:
the lower of (i) the price agreed between the Seller and the Buyer for the sale of the Property prior to the Completion Date (ii) the highest valuation of the Property obtained by the Seller from an estate agent prior to marketing the property with the estate agent.

Sale Price:
the price actually paid by the Buyer to the Seller for the Property on the Completion Date as detailed in the exchanged contract.

Seller Cover
The cover under this Policy will be extended to provide the additional cover referred to below namely that:
The Seller shall have cover starting on the Completion Date for the matters referred to in sub paragraph (ii) under the definition of Adverse Entry in this policy by revealing an Adverse Entry which should not have been revealed ('the Error') and which is the sole and direct cause of the Buyer renegotiating the Offer Price of the Property to the Sale Price and as a result of which renegotiation the Seller has suffered loss.

Exclusions
The Company shall be not liable to indemnify the Seller for any Error:

1. not disclosed in the Search
2. in respect of any matter of which the Seller or his legal representative had Knowledge as at the date that contracts are exchanged with the Buyer for the purchase of the Property.
3. Any Adverse Entry which arises after the Effective Date
4. The cover for the Seller shall not apply where the transaction is a remortgage or the Property is used for commercial purposes

Conditions
All conditions referred to in the Policy shall apply.

This policy document and the bordereau form the basis of the Insured's policy and the contract between the Insured and the Insurer. Please read the documents and keep them safe.

COVER

In the event there is an Adverse Entry affecting the Property on the Policy Date directly arising from the Search which materially affects the market value of the Property as detailed in the Defect ("Claim") the Insurer will indemnify the Insured against:

a. The cost of remedying the Adverse Entry (including but not limited to the provision of a further indemnity policy to cover the specific risk(s) revealed by the Adverse Entry) and/or any sums paid pursuant to any voluntary settlement or compromise of a Claim with the prior written consent of the Insurer or any final order, decision, judgment or permanent injunction awarded against the Insured to free the Property from the Claim
b. Reduction in the market value of the Property used in accordance with the Insured Use the market value being the average of the estimates of two independent Valuers of the market value of the Property as defined from time to time in the guidelines issued by the Royal Institute of Chartered Surveyors at the date of a final order, decision, judgment or permanent injunction awarded against the Insured, or where the Insurer otherwise accepts liability, and being the difference between the market value of the Property as at the Policy Date on the assumption the Adverse Entry is unenforceable and the market value of the Property as at the Policy Date to the extent the Adverse Entry is held to be enforceable
c. Any shortfall in the amount required to discharge the outstanding debt under the mortgage or charge where the Insured is a mortgagee and exercises its rights under the mortgage or charge, or where the Insurer otherwise accepts liability
d. Any damages or compensation (including costs and expenses) awarded against the Insured in any proceedings brought against the Insured or agreed in any voluntary settlement or compromise of a Claim with the prior written consent of the Insurer
e. All other costs and expenses incurred by the Insured with the prior written consent of the Insurer including the costs of the Insurer in defending or settling the Claim on the Insured's behalf

GENERAL PROVISIONS

a. Any act or omission by the Insured, or anyone acting on the Insured's behalf, which in whole or in part induces a Claim under the policy may prejudice the Insured's position and could invalidate the policy in whole or in part or reduce the amount of any Claim.
b. The Insurers liability under this policy will not exceed the Limit of Indemnity (as increased by the Inflation Provision if applicable).
c. This policy shall be governed by and construed in accordance with the law of England and Wales and is subject to the jurisdiction of the courts of England and Wales.
d. The policy and any endorsement issued in respect of it are one contract and shall be read together.
e. The insured will not be entitled to abandon the Property to the Insurer.
f. Your information may be used for the purposes of insurance administration by the Insurer, its associated companies, by reinsurers and your intermediary. It may be disclosed to regulatory bodies for the purposes of monitoring and/or enforcing the Insurer's compliance with any regulatory rules/codes.
g. Your information may also be used for offering renewal, research and statistical purposes and crime prevention. It may be transferred to any country, including countries outside the European Economic Area for any of these purposes and for systems administration. Where this happens, we will ensure that anyone to whom we pass your information agrees to treat your information with the same level of protection as if we were dealing with it.
h. If you give us information about another person, in doing so you confirm that they have given you permission to provide it to us to be able to process their personal data (including any sensitive personal data) and also that you have told them who we are and what we will use their data for, as set out in this notice.
i. In the case of personal data, with limited exceptions, and on payment of the appropriate fee, you have the right to access and if necessary rectify information held about you.

NON-INVALIDATION

The interest in this policy of any Insured will not be invalidated by a breach of the policy terms or conditions by any other party unless:

a. Such party acted on the Insured's behalf or with the Insured's knowledge and consent
b. Where the Insured is a successor in title, they had knowledge of a breach of the policy terms or conditions or of previous non- disclosure or misrepresentation to the Insurer.

IMPORTANT CONDITIONS

In respect of each Property:

a. In deciding to accept this policy in exchange for the Premium and in setting the terms and premium, the Insurer has relied on the assumptions made being correct and any information given by the Insured (or anyone acting on the Insured's behalf). The Insured must ensure that, when answering any questions asked by the Insurer, any information provided is accurate and complete and the Insurer is informed of any assumptions which cannot be met.
b. If the Insured deliberately or recklessly provides the Insurer with false or misleading information, the Insurer may treat this policy as if it never existed and decline all claims.
c. If the Insured provides the Insurer with false or misleading information carelessly, the Insurer may:
    a. treat this policy as if it had never existed, and refuse to pay all claims and return the premium paid. However, the Insurer may only do so if it would not otherwise have provided the Insured with insurance cover at all;
    b. amend the terms of this insurance, and apply the amended terms as if they were already in place, if a claim has been adversely affected by the Insured's carelessness;
    c. reduce the amount the Insurer will pay on a claim in the proportion the premium the Insured has paid bears to the premium the Insurer would have charged for the policy; or
    d. take a similar proportionate action.
    The Insurer, or anyone acting on the Insurer's behalf, will write to the Insured if the Insurer intends to treat this policy as if it had never existed, or amend the terms of the policy.
d. If the Insured becomes aware that the information given to the Insurer is inaccurate, the Insured must inform the Insurer as soon as practicable.
e. The Insured (or anyone acting on the Insured's behalf) shall not at any time disclose the existence of this policy to any third party other than bona fide prospective purchasers, their lenders, lessees and respective legal advisers without the Insurers written consent
f. The Insured shall not discuss the Defect with any party without the Insurer's written consent, who, it is reasonable to believe can as a result of the discussion make a Claim.
g. A bordereau is provided to the Insurer by the Policyholder in Excel format setting out the address of the Property, the Limit of Indemnity (being the purchase price of the Property) and the Policy Date (being the date of exchange of contracts for the purchase of the Property by the Insured) and that the bordereau is sent to the Insurer at the Insurer's Address within 14 days of the month end following the Policy Date and payment for all properties listed on the bordereau paid either by cheque payable to Stewart Title Limited or by BACS to HSBC Bank Plc, 16 King Street, Covent Garden, London WC2E 8JF Account Name: Stewart Title Premium Collection Account, Sort Code 40-04-09, Account Number: 32024225 Reference:

In respect of Conditions 5, 6 and 7 above where the Insured fails to comply with these conditions the Insurer's liability under this policy may be limited to the extent the Insurer is compromised by any breach of these conditions

COMPLAINTS PROCEDURE

Any complaint should be raised in the first instance with our General Counsel by

- Writing to the General Counsel at the Insurer's Address
- Telephoning 0207 010 7820

Details of our complaints handling procedure are available by contacting our General Counsel.

If we are unable to resolve your complaint to your satisfaction, you may have the right to refer your complaint to the Financial Ombudsman Service at Exchange Tower, London E14 9SR. The Financial Ombudsman Service website is www.financial-ombudsman.org.uk

The existence, and your use of, this complaints process is without prejudice to your other rights under this policy and your rights in law.

RIGHT TO CANCEL POLICY

This Policy can be cancelled by contacting us within 14 days of the policy date, provided all interested parties (such as lenders holding a mortgage or charge on the Property) consent to cancellation. If you wish to cancel this policy, please write (quoting your policy number) to 'The Underwriting Manager' at the Insurer's Address.
We may at our discretion charge you for the time that you have been on cover including Insurance Premium Tax. Any refund of premium will be made to the party who paid the premium.

CLAIMS CONDITIONS

On becoming aware of any potential or actual Claim, the Insured will:

a. provide written notice and details to the Insurer at the Insurer's Address immediately of all known facts including all communications, correspondence and all court documents.
b. not admit any liability whatsoever or take steps to compromise or settle the Claim, without the written consent of the Insurer.
c. provide all information and assistance that the Insurer and/or any party professional or otherwise acting on the Insurer's behalf require at the Insured's own expense doing everything reasonably practicable with the Insurer's prior written consent to minimise any loss.

The Insured will not make any

a. admission, promise of payment or indemnity
b. application to a court, Upper Tribunal (Land Chamber) or the Land Registry without the written consent of the Insurer

DEALING WITH THE CLAIM

a. In dealing with the Claim the Insurer will at its discretion and cost be entitled to (whether or not the Insurer is liable under this policy):
   i. take or defend proceedings in any court or tribunal in the name of the Insured in any proceedings including the right to abandon or submit to judgment
   ii. exercise, in the name of the Insured, any rights or remedies available to the Insured in any proceedings including the right to abandon or submit to judgment
   iii. compromise, settle or compound the Claim and deal in such manner as it thinks fit
   iv. pay at any time to the Insured the amount of the Limit of Indemnity (as increased by the Inflation Provision if applicable) or any lesser amount for which the Claim can be settled and then relinquish control of and have no further involvement with the Claim.
b. The Insurer shall be under no obligation to pay the proceeds of any Claim paid under this Policy to any party other than the Insured and that the proceeds of any Claim shall be incapable of assignment.
c. If, at the time of the Claim, there is other insurance (whether incepted by the Insured or any other party) under which the Insured may be entitled to make a Claim, either wholly or partly in respect of the same interest or risk covered by this policy, the Insurer will not be liable to pay or contribute more than their rateable proportion of the Claim.
d. If the Insured shall make any Claim knowing the same to be false or fraudulent, as regards amount or otherwise, this policy shall become void and the Claim shall be forfeited.
e. The Insurer will be entitled to all rights and defences it may have in respect of a Claim notified by any Insured against any successor to that Insured.
f. Where the Insurer and the Insured cannot agree to the amount to be paid under this policy the matter shall be referred to an arbitrator to be appointed by the parties (or in default of agreement, in accordance with the law in force at the time). The making of an award by the arbitrator shall be a condition precedent to any right of action against the Insurer. The Insured will afford to the Insurer every reasonable assistance in this respect.
g. If the Insurer agrees or is obliged to make any payment to or on behalf of an Insured because of the risk insured by this policy the Insurer will immediately be subrogated to any rights which the Insured may have in relation to that risk.

THE FINANCIAL SERVICES COMPENSATION SCHEME (FSCS)

We are covered by the FSCS. You may be entitled to compensation from the scheme if we cannot meet our obligations. This will depend on the type of business and the circumstances of the Claim.

Further information about the compensation scheme arrangements is available from the FSCS who can be contacted at Financial Services Compensation Scheme, 10th Floor, Beaufort House, 15 St Botolph Street, EC3A 7QU. The FSCS website may be viewed at www.fscs.org.uk

Stewart Title Limited is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority. Registered in England and Wales No: 2770166. Registered office address: 6 Henrietta Street, London, UK, WC2E 8PS.

Important Consumer Protection Information

This search has been produced by STL Group Ltd, Orion Gate, 1st Floor, Guildford Road, Woking, Surrey, GU22 7NJ (tel: 01483 715355, fax: 01483 221854, email: info@stlgroup.co.uk) 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 UK
- sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practice 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 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 all search services comply with the law, registration rules and standards
- 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 he finds that you have suffered actual loss 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: www.tpos.co.uk / Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk

Please ask your search provider if you would like a copy of the Search Code.

STL Internal Complaints Procedure

STL has a formal internal complaints procedure for handling complaints speedily and fairly. If you wish to make a complaint, we will:

1. acknowledge your complaint within 5 working days of receipt
2. normally deal with it fully and provide a final response, in writing, within 20 working days of receipt
3. keep you informed by letter, telephone or email, as you prefer, if we need more time
4. provide a final response, in writing, at the latest within 40 working days of receipt
5. liaise, at your request, with anyone acting formally on your behalf

Complaints should be sent to: Julia Nightingale, Compliance Officer, STL Group Ltd, Orion Gate, 1st Floor, Guildford Road, Woking, Surrey GU22 7NJ / Tel: 01483 715355 / Fax: 01483 221854 / Email: info@stlgroup.co.uk

If you are not satisfied with our final response, or if we exceed the above timescales, you may refer the complaint to The Property Ombudsman scheme (TPOs) - Tel: 01722 333306 / Email : admin@tpos.co.uk. We will co-operate with TPOs during an investigation and comply with any decision the Ombudsman makes.

Revised 10 March 2017

STL Terms and Conditions

1 Definitions

In these Terms the following words shall have the following meanings:

1.1 "Client" means the seller, buyer, lender or lessee (or potential seller, buyer, lender or lessee) in respect of the Property who is the intended recipient of the Report.

1.2 "Code" means the Code of Practice for Search Compilers and Retailers as updated from time to time.

1.3 "Company" means a company registered at Companies House in respect of which STL has been instructed to provide a Service.

1.4 "Consumer" means any person acting for purposes other than their trade, business or profession.

1.5 "Intellectual Property Rights" means copyright, patent, design right (registered or unregistered), service or trade mark (registered or unregistered), database right, or other data right, moral right or know how or any other intellectual property right.

1.6 "Literature" means STL's brochures, price lists and advertisements in any type of media, including the content of the Website.

1.7 "Order" means the request for Services by You.

1.8 "Property" means an address or location for which STL is engaged to provide a Service.

1.9 "Report" means the report prepared by STL in respect of the Property or the Order.

1.10 "Service(s)" means the supply of services by STL to You including but not limited to property searches, reports and photographs, company searches, trade marks and domain name searches and other services from time to time and includes our instructions to a Supplier, on your behalf and the dissemination of the information subsequently provided by the Suppliers.

1.11 "Supplier" means any organisation or third party who provides data or information of any form to STL for the purposes of providing the Services.

1.12 "Terms" means these terms and conditions of business.

1.13 "VAT" means value added tax under the Value Added Tax Act 1994 and any similar replacement or additional tax.

1.14 "Website" means our website located at www.stlgroup.co.uk

1.15 "We", "Us", "Our" and "STL" are references to STL Group Ltd a company incorporated in England and Wales with registered number 01171409 and whose registered office is situated at Orion Gate, 1 st floor, Guildford Road, Woking, Surrey GU22 7NJ. VAT number GB677241712.

1.16 "You" and "Your" are references to the individual, company, partnership or organisation who accesses the Website or places an Order.

2 Agreement

2.1 The agreement between You and STL shall come into existence when STL accepts your completed Order by either sending you written confirmation or starting to provide you with the relevant Services ("Agreement"). Please read and check your Order before it is submitted so that any errors can be identified and corrected.

2.2 These Terms may be varied from time to time. The Terms in force at the time of the Agreement, in conjunction with any relevant Supplier terms and conditions (where STL is placing orders for searches as Your agent), shall govern the Agreement to the exclusion of all other terms and conditions. You should print a copy of these Terms for future reference.

2.3 By submitting an Order, you shall be deemed to have accepted these Terms and You agree to be bound by these Terms when You place any Order.

2.4 These Terms together with the Literature and Order comprise the whole agreement relating to the supply of the Services to You by STL.

2.5 If You are not a Consumer You acknowledge that You have not relied upon any representations save insofar as the same have been expressly incorporated in these Terms and You agree that you shall have no remedy in respect of any misrepresentation (other than fraudulent misrepresentation) which has not become a term of these Terms.

2.6 If You are a Consumer then, while We accept responsibility for statements and representations made by Our duly authorised agents, please ensure You ask for any variations from these Terms to be confirmed in writing.

3 Services

3.1 STL shall use reasonable care and skill in providing the Services to You and shall use only established and trusted suppliers where obtaining information or data from third parties in accordance with the Code.

3.2 We reserve the right to make any changes to the Services described in our Literature to conform with any applicable statutory requirements or any non-material changes which we reasonably deem appropriate in our sole discretion.

3.3 Our Services are provided solely for Your use, or the use of Your Clients on whose behalf You have commissioned the Services, and shall not be used or relied upon by any other party, without Our written consent.

3.4 You hereby agree that We will start performing the Services as soon as possible, following the formation of the Agreement, which is likely to be before the end of the fourteen working day period set out in clause 5.3.

4 Price and Payment

4.1 The price payable for the Services shall be in pounds sterling inclusive of VAT as set out in the Literature or Order, as applicable.

4.2 Payment is due in full from You within 30 days of the date of Our invoice (or as otherwise contracted). We will invoice You following the provision of the Service(s) or as otherwise notified to You at the point of order or as set out in the Literature.

4.3 STL reserves the right to amend its prices from time to time and the Services will be charged at the price applicable at the date on which an Order is submitted.

4.4 If You fail to pay Our invoice on or before the due date, STL may charge You interest on the late payment at the prevailing statutory rate pursuant to the Late Payment of Commercial Debts (Interest) Act 1998 until the outstanding payment is made in full.

5 Cancellation of Services

This Term 5 only applies if you are a Consumer.

5.1 If you are a Consumer, you have a legal right to cancel the Agreement under the Consumer Contracts (Information, Cancellation and Additional Charges) Regulations 2013, during the period set out in Term 5.3.

5.2 This cancellation right does not apply:

5.2.1 in the case of goods made to Your specifications, where these are personalised goods or by reason of their nature cannot be returned; or

5.2.2 where We have started work on the Services with Your agreement (given in Term 3.4).

5.3 As a Consumer Your right to cancel the Agreement starts on the date the Agreement is formed. You have fourteen working days to cancel the Agreement. If you cancel the Agreement within this period, and the exceptions set out in Term 5.2 do not apply, then You will receive a full refund of any price paid by You. The refund will be processed as soon as possible, and in any case within 30 days of the day on which you gave us notice of cancellation. You will not be liable for any further payment to us in respect of the Agreement.

5.4 To cancel the Agreement You must contact Us in writing at our registered office address by sending an email to info@stlgroup.co.uk

5.5 Following cancellation of the Agreement (save for cancellation in accordance with Term 5.3) You will remain liable for any costs, expenses and disbursements incurred by Us prior to receiving written notice of cancellation. Such costs, expenses and disbursements shall be invoiced and payable in accordance with Term 4.2.

6 Termination

6.1 STL may suspend or terminate any agreement with You without any liability to You with immediate effect if at any time:

6.1.1 You fail to make any payment due in accordance with Term 4;

6.1.2 If You repeatedly breach or commit or cause to be committed a material breach of these Terms; or

6.1.3 You commit a breach and You fail to remedy the breach within 7 days of receipt of a written notice to do so.

6.2 If an Agreement is terminated under this Term 6 and You have made an advance payment We will refund You a reasonable proportion of the balance as determined exclusively by Us having regard to the value of Services already provided to You.

7 Events Beyond Our Control

7.1 We reserve the right without notice or liability to You, to defer the date of performance (by a period equivalent to the period during which the Services could not be performed) or to cancel the provision of the Services or reduce the volume of the Services ordered by You if we are prevented from or delayed in the carrying on of Our business due to circumstances beyond Our reasonable control provided that, if the event in question continues for a continuous period in excess of 60 days, You shall be entitled to give notice in writing to us to terminate the Order.

8 Warranties and Limitation of Liability

8.1 Subject to Term 9 and Term 10 (as applicable), We provide warranties and accept liability only to the extent stated in this Term 8.

8.2 We do not exclude or restrict our liability for death or personal injury caused by our own negligence or any other liability the exclusion of which is expressly prohibited by law.

8.3 Unless otherwise indicated on the front page of the Report, We confirm that any individuals within Our business who conducted any searches has not knowingly had any personal or business relationship with any individual involved in the sale of or dealings with the Property.

8.4 In providing the Services You acknowledge and accept that:-

8.4.1 STL's only obligation is to exercise reasonable care and skill in providing the Services in accordance with the Code.

8.4.2 The Services do not include any information relating to the value or worth of the Property or the Company.

8.4.3 STL cannot warrant or guarantee that the Website or any website linked to or from the Website will be uninterrupted or error free or free of viruses or other harmful components and furthermore STL cannot warrant the performance of any linked internet service not operated by STL. Accordingly STL shall not be liable for any damage or loss whatsoever caused: by any virus, including damage to Your computer equipment, software, data or other property resulting from Your access to, use of or browsing of the Website; or as a result of downloading any material, data, text, images, video or audio from the Website; or by the contents of or Your access to, any website linked to the Website; or for inaccuracies or typographical errors of information or on the Website.

8.4.4 STL shall use reasonable endeavours to provide the Services within the timescale set out in the Literature.

8.4.5 Any services other than our Services, which are advertised in the Literature are for information only, and We are not responsible for any such services which You may use as a result of our recommendation or otherwise. Any such third party services may be subject to the terms and conditions of the relevant third party service provider.

8.5 In connection with the Report You undertake to make a reasonable inspection of any results set out therein to satisfy Yourself that there are no defects or failures. In the event that there is a material defect You will notify Us in writing of such defect as soon as possible after its discovery.

8.6 Any claim relating to data or information obtained from a Supplier shall in the first instance be made against the Supplier (with such assistance from STL as may reasonably be required) and only if such a claim cannot be made against the Supplier will You make a claim against STL.

9 Our Liability if you are a Business
This Term 9 only applies if you are not contracting as a Consumer

9.1 We only supply the Reports for use by You and Your Clients, and You agree not to use the Reports for any re-sale purposes unless You have obtained Our prior written consent.

9.2 Nothing in these Terms limits or excludes Our liability for:

9.2.1 Death or personal injury caused by Our negligence;

9.2.2 Fraud or fraudulent misrepresentation;

9.2.3 Any loss or damage sustained as a direct consequence of Our negligence;

9.2.4 Breach of the terms implied by section 12 of the Sale of Goods Act 1979 (title and quiet possession); or

9.2.5 Defective products under the Consumer Protection Act 1987.

9.3 Subject to Term 9.2, We will under no circumstances whatever be liable to You (or any other party entitled to rely on the Report(s)), whether in contract, tort (including negligence), breach of statutory duty, or otherwise, arising under or in connection with the Agreement for:

9.3.1 Any loss of profits, sales, business or revenue;

9.3.2 Loss or corruption of data, information or software;

9.3.3 Loss of business opportunity;

9.3.4 Loss of anticipated savings;

9.3.5 Loss of goodwill; or

9.3.6 Any indirect or consequential loss.

9.4 Subject to Term 9.2 and Term 9.3, Our total liability to You in respect of all other losses arising under or in connection with the Contract, whether in contract, tort (including negligence), breach of statutory duty, or otherwise, shall in no circumstances exceed £10 million.

9.5 Except as expressly stated in these Terms, We do not give any representation, warranties or undertakings in relation to the Reports. Any representation, condition or warranty which might be implied or incorporated into these Terms by statute, common law or otherwise is excluded to the fullest extent permitted by law. In particular, We will not be responsible for ensuring that the Reports are suitable for Your purposes.

10 Our liability if you are a Consumer
This Term 10 only applies if you are a Consumer.

10.1 If We fail to comply with these Terms, We are responsible for loss or damage You suffer that is a foreseeable result of Our breach of these Terms or Our negligence, but We are not responsible for any loss or damage that is not foreseeable. Loss or damage is foreseeable if they were an obvious consequence of Our breach or if they were contemplated by You and us at the time We entered into the Agreement.

10.2 We only supply the Reports for private use. You agree not to use the Reports for any commercial, business or re-sale purposes, and We have no liability to You for any loss of profit, loss of business, business interruption, or loss of business opportunity.

10.3 We do not in any way exclude or limit Our liability for:

10.3.1 Death or personal injury caused by Our negligence;

10.3.2 Fraud and fraudulent misrepresentation;

10.3.3 Any breach of the terms implied by section 12 of the Sale of Goods Act 1979 (title and quiet possession);

10.3.4 Any breach of the terms implied by sections 13 to 15 of the Sale of Goods Act 1979 (description, satisfactory quality, fitness for purpose and samples); and

10.3.5 Defective products under the Consumer Protection Act 1987.

10.4 We have obtained insurance cover in respect of Our own liability for individual claims not exceeding £10 million per claim. Our liability is therefore limited to £10 million in respect of any single claim, event, or series of related claims or events and You are responsible for making your own arrangements for the insurance of any excess loss.

11 Intellectual Property Rights

11.1 You acknowledge that all Intellectual Property Rights in the Services are and shall remain owned by either STL or our Suppliers and nothing in these Terms purports to transfer, assign or grant any rights to You in respect of the Intellectual Property Rights.

11.2 You agree to indemnify Us against all liabilities, costs, expenses, damages and losses (including but not limited to any direct, indirect or consequential losses and all interest, penalties and legal costs (calculated on a full indemnity basis) and all other professional costs and expenses) arising out of or in connection with any claim for actual or alleged infringement of a third party's Intellectual Property Rights as a result of You including an Ordnance Survey plan within the Order.

12 Insurance

12.1 Our insurers are QBE Insurance (Europe) Ltd whose address is Plantation Place, 30 Fenchurch Street, London, EC3M 3BD. The level of cover provided by them for our Professional Indemnity Insurance is £10 million.

12.2 Our Professional Indemnity Insurance includes cover for errors and omissions in local authority and water company data and records used to compile our search reports.

12.3 Should we cease to trade for any reason, prior to that event, we shall execute run-off insurance cover under our Professional Indemnity Insurance for our past search products and services.

13 Complaints

13.1 Full details of Our Complaints Procedure are set out on Our Website. We will deal with any complaints made by You in accordance with the Complaints Procedure.

13.2 As per Our Complaints Procedure, should you not be satisfied with our final response or we have exceeded the response timescales pursuant to Our Complaints Procedure, you may refer your complaint to The Property Ombudsman Scheme. The Property Ombudsman Scheme's website is www.tpos.co.uk and email address is admin@tpos.co.uk.

13.3 We will co-operate fully with The Property Ombudsman Scheme during an investigation and comply with his final decision.

14 General

14.1 You shall not be entitled to assign the Agreement or any part of it without Our prior written consent.

14.2 We may assign the Agreement or any part of it to any person, firm or company provided that such assignment shall not materially affect Your rights under the Agreement.

14.3 The parties to these Terms do not intend that any term of Our Agreement shall be enforceable by virtue of the Contracts (Rights of Third Parties) Act 1999 by any person that is not a party to these Terms or a permitted assignee.

14.4 Failure or delay by Us in enforcing or partially enforcing any provision of the Agreement will not be construed as a waiver of any of Our rights under the Agreement.

14.5 Any waiver by Us of any breach of, or any default under, any provision of the Agreement by You will not be deemed a waiver of any subsequent breach or default and will in no way affect the other terms of the Agreement.

14.6 If any provision or part of a provision is held to be invalid or unenforceable by any court or other body of competent jurisdiction, that provision or part of that provision shall be deemed severable and the other provisions or the remainder of the relevant provision will continue in full force and effect.

14.7 Unless otherwise stated in these Terms, all notices from You to STL or vice versa must be in writing and sent to STL's registered office address as stipulated in Term 1.15 (or as updated from time to time) or Your address as stipulated in the Order.

14.8 In providing the Services and Reports We will comply with the Code.

14.9 Any personal information which you provide to us will be held in accordance with the Data Protection Act 1998 and other applicable regulations and only used in accordance with Our Privacy Policy (details of which are set out on Our Website).

14.10 The Agreement shall be governed by and construed in accordance with English law and shall be subject to the non-exclusive jurisdiction of the Courts of England and Wales. However, if You are a resident of Northern Ireland you may also bring proceedings in Northern Ireland, and if you are a resident of Scotland you may also bring proceedings in Scotland.

Revised 14 February 2017