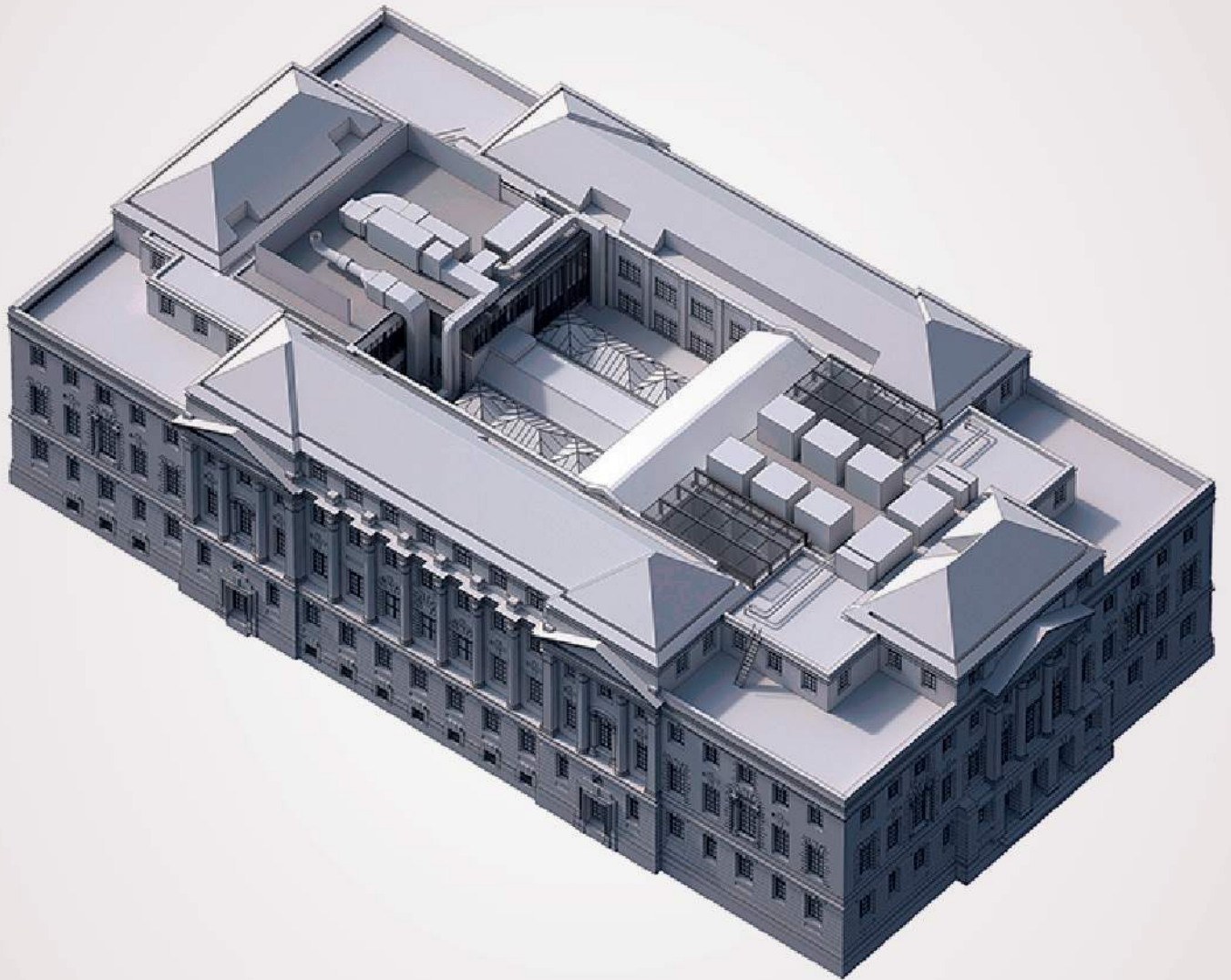


CAMDEN TOWN HALL

LENDLEASE CONSULTING (EUROPE) LTD ON BEHALF OF
LONDON BOROUGH OF CAMDEN

BASEMENT IMPACT ASSESSMENT
18 APRIL 2019





Camden Town Hall

Basement Impact Assessment

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CAMDEN TOWN HALL BASEMENT IMPACT ASSESSMENT

FOR

LONDON BOROUGH OF CAMDEN
PROJECT NUMBER: 4254
DATE: 17/04/2019

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Revision	Date	Status
Name:	Andrew Garland	
Engineering Qualifications:	CEng, MIStuctE	
Signed:		
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1 Non technical Summary

The site location is in the in the London Borough of Camden, Judd St, WC1H 9JE. It is bounded to the north by Euston Road, to the west by Judd Street, to the South by Bidborough street and to the East by Tonbridge walk. The site may be additionally located by National Grid Reference 530140, 182800. The location of the site can be seen in Figure 1.1.

The site covers a roughly rectangular area measuring approximately 85 m by 46 m.and is occupied by the Camden Town Hall.

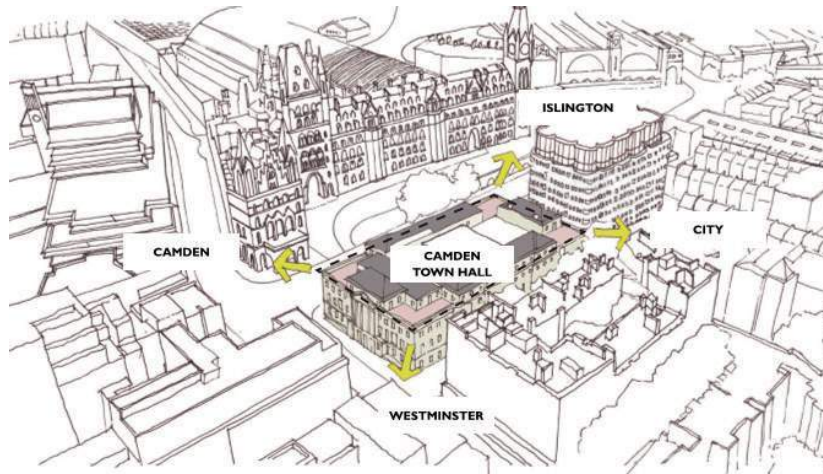


Figure 1.1 Location of the Site

The proposed development comprises the refurbishment and repurpose of the existing building that the houses the Camden Town Hall. As part of the new development a number of works associated with the existing basement will be carried out:

- Two attenuation tanks to collect the rainwater are introduced below the basement slab.
- A number of lift pits as part of the new lifts will be formed.
- Lowering part of the GF slab.
- New drainage routes below the basement slab will be created.

The aim of this report is to assess if the proposed works will have a detrimental impact on the surroundings with respect to the groundwater and land stability and in particular to assess whether the development will affect the stability of neighbouring properties, local and regional hydrogeology and whether any identified impacts can be appropriately mitigated by the design of the development.

In the current document the following assessments are presented:

- Desk Study
- Screening
- Additional assessments
 - Site investigation brief
 - Consultation with adjacent infrastructure/asset owners
 - Surface water drainage strategy / SUDS assessment
 - Impact assessment

The ground and groundwater conditions beneath the site have been established based on borehole records from neighbouring sites. Based on these data the soil strata is made ground of depth up to 3.5m on top of London Clay which extends to a depth of 25m. Groundwater is present at a depth of 12m. A site specific investigation will be carried out to establish the site soil properties in more detail.

The proposed works are limited to local small areas at the footprint of the site and are not expected to have an impact on the land stability, hydrological and hydrogeological environment.

CIRIA750 guide provides a distance behind the retaining wall to negligible movement as a multiple of the excavation depth. Based on this the proposed works will cause negligible movement to the neighbouring structures, thus there is no requirement to carry out any further assessment.

Furthermore the BIA has concluded that the proposed development will not cause any impact to the hydrological and hydrogeological environment.

2 Introduction

The purpose of this assessment is to consider the effects of the proposed basement works at Judd St, London, WC1H 9JE on the local hydrology, geology and hydrogeology and potential impacts to neighbours and the wider environment. The site location is presented in Figure 2.1



Figure 2.1 Aerial view of the Site

The BIA approach follows current planning procedure for basements and lightwells adopted by London Borough of Camden and comprises the following elements (CPG Basements):

- Desk Study
- Screening
- Site investigation, interpretation and ground movement assessment.
- Impact Assessment

2.1 Authors

This assessment has been carried out by Andrew Garland a BEng in Civil Engineering, chartered engineer (CEng), MStrcutE, Director at AKT II with 21 years of experience.

2.2 Sources of Information

The following baseline data have been referenced to complete the BIA in relation to the proposed development:

- Site walkovers
- Current/historical mapping
- Geological mapping
- Hydrogeological data
- Current/historical hydrological data
- Flood Risk mapping
- LB Camden, Strategic Flood Risk Assessment
- LB Camden, Floods in Camden, Report of the Floods Scrutiny Panel (2013)
- LB Camden, Planning Guidance (CPG) - Basements (March 2018)
- LB Camden, Camden Geological, Hydrogeological and Hydrological Study - Guidance for Subterranean Development (produced by Arup, 2010)
- LB Camden, Local Plan Policy A5 Basements (2017)
- LB Camden's Audit Process Terms of Reference

2.3 Existing and Proposed Development

The site is located in Camden opposite St Pancras Renaissance Hotel. The site elevation varies from 18m to 20m and the slope angle is 1° from west to east and north to south. The site occupies an area of approximately 3500 m² and is rectangular in shape.

The existing building that sits on the site is the Camden Town Hall and is used as for the civic and democratic functions of the council of Camden.

The proposed project is to refurbish the existing building and continue to house the Camden Council at ground floor, first floor and basement. The Camden Centre will be refurbished into an events venue while part of the basement would accommodate an SME workspace and the second and third floor will accommodate new commercial offices.

Due to the proposed refurbishment and repurpose of the building, all the Council's functions have recently been relocated to 5 Pancras Square and some of them will return upon completion of the project

The existing building is of a stone clad steel framed construction.

Directly to the North of the site is the Grade I listed St Pancras Station and Chambers and the St Pancras Renaissance Hotel. Adjacent to this on either side are the Grade I listed British library and Kings Cross Station. To the east side on Tonbridge walk is the old Town Hall Annex, which is being converted into a hotel. On the South and west are office and residential buildings.

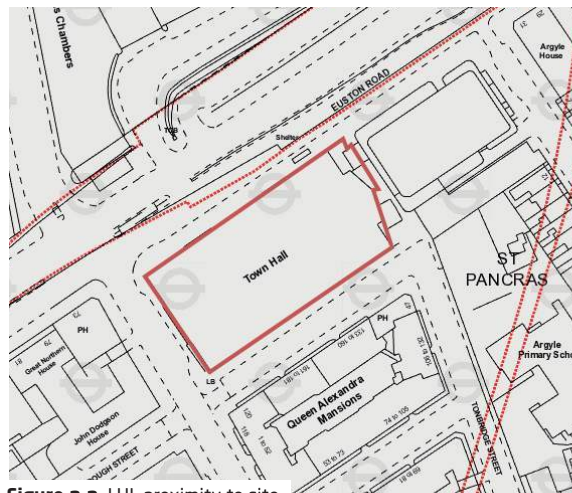


Figure 2.2 LUL proximity to site

On the south side of the building on Bidborough Street a number of trees is present and will be protected in accordance with Camden Local Plan - A5 Basements.

Underground Infrastructure present close to the site includes the metropolitan line which runs along Euston Road. London Underground has been consulted and their correspondence is presented in Appendix 2.

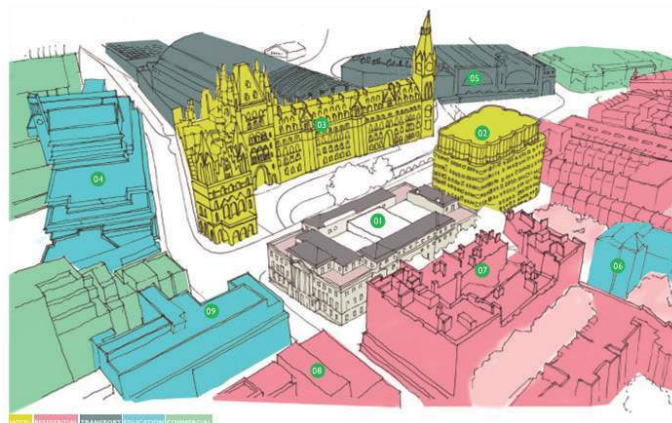


Figure 2.3 Site Location

2.3.1 Proposed Development

The proposed development Drawings are presented in Appendix 1. A total number of four lift pits and two attenuation tanks below the existing basement slab will be created for which a maximum excavation depth of 2m will be required. This is shown in Figure 2.4.

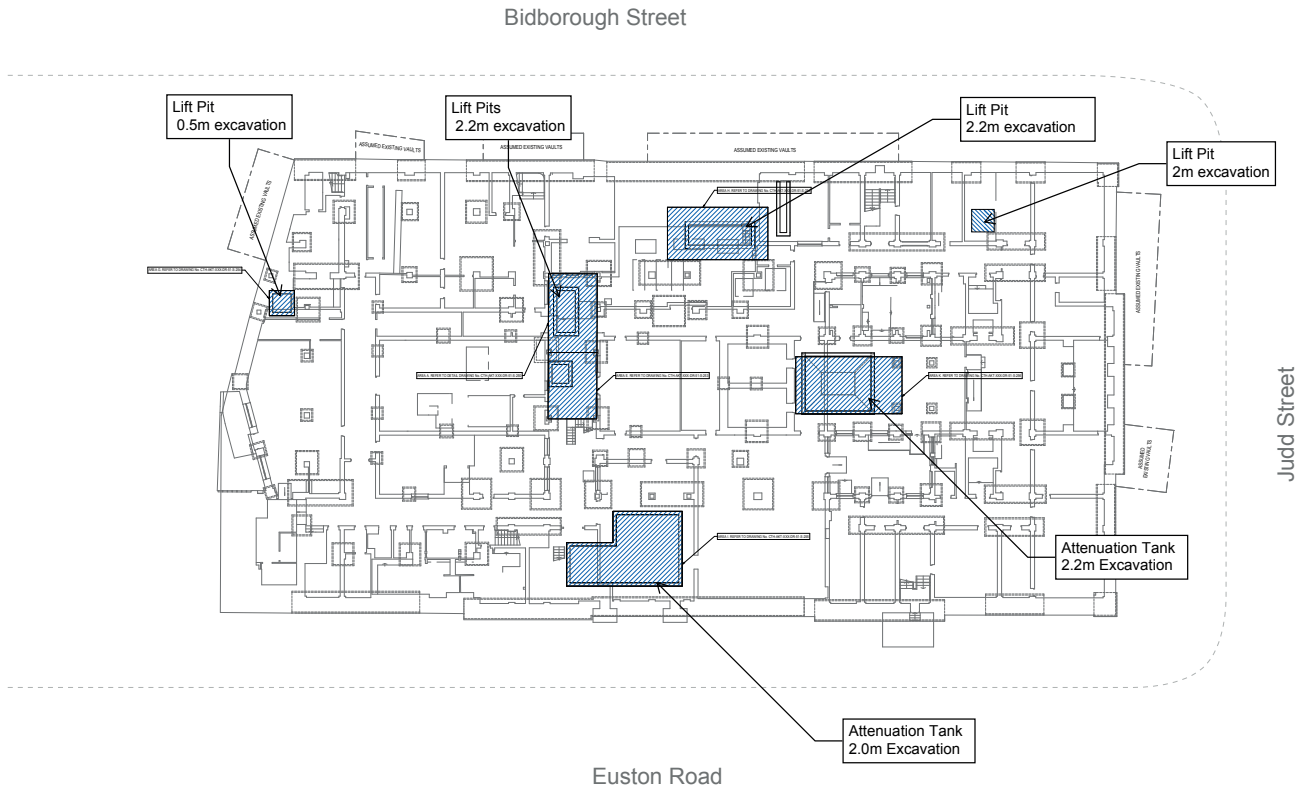


Figure 2.4 Proposed development below Basement slab

In the case of one of the new pits formation, potential local underpinning of the existing foundations has been identified based on the available archive drawings. This will be carried out in a similar way to the one presented at the Geological, Hydrogeological and Hydrological Study (GHHS) as depicted in Figure 2.5.

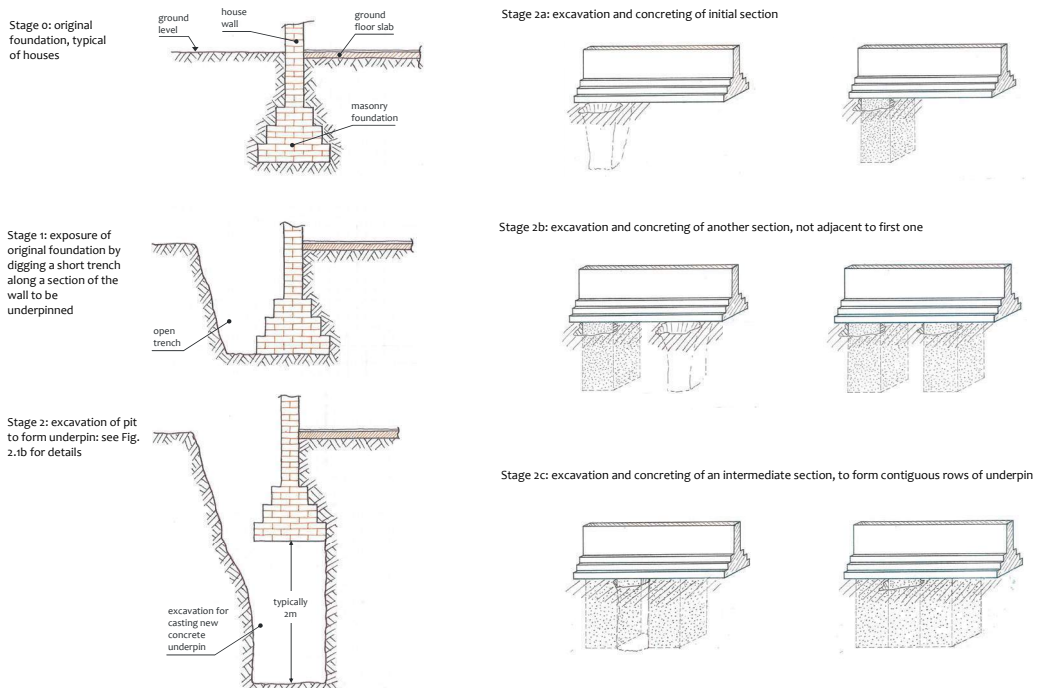


Figure 2.5 Indicative underpinning construction sequence

Furthermore a part of the GF slab will be demolished and a new slab will be formed at a lower level to provide level access to the street level. The extent of the demolition is shown in Figure 2.6

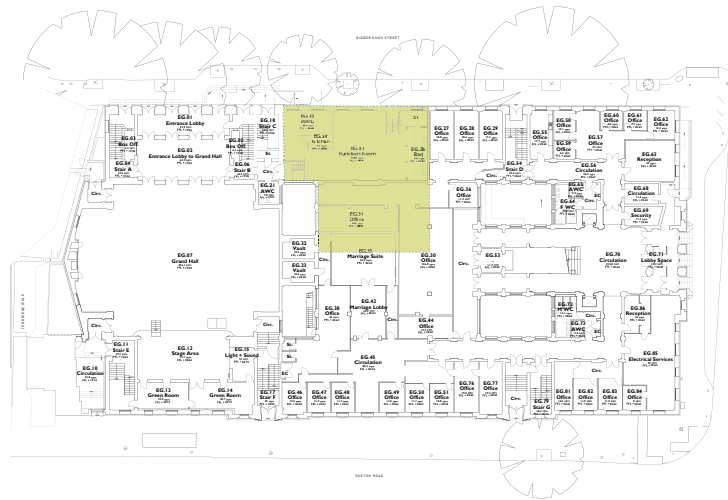
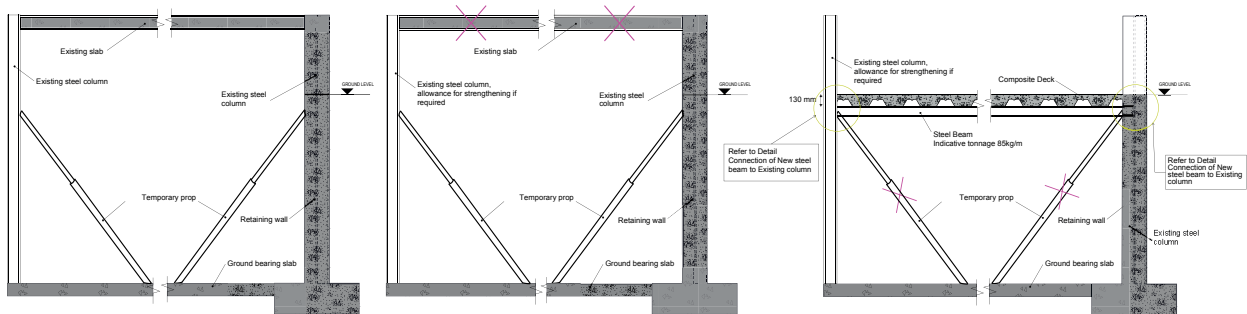


Figure 2.6 Part of GF slab to be demolished

The existing GF slab is expected to provide lateral restraint to the retaining wall on Bidborough Street. Therefore, temporary works will be required to restrain the retaining wall while the new GF slab is built. The proposed construction sequence to form the new slab is shown in Figure 2.7. Initially, temporary propping will be required, followed by demolishing the defined GF slab. In that stage any potential strengthening of the double height existing columns will take place. Finally, the new slab will be created and the props will be removed.



STEP 1:
- Place temporary props

STEP 2:
- Demolish existing slab
- Create door opening on left hand side
- Strengthen existing steel column if required

STEP 3:
- Build new ComFlor deck
- Remove temporary props

Figure 2.7 Construction sequence for new GF slab

3 Desk Study

3.1 Site History

Historically the site has been used for residential buildings. Ordnance survey of 1874 shows the site was occupied by individual terraced houses with gardens behind. OS maps from the rest of the 19th century show there were no real changes to the site although there was urban development in the surrounding area as shown in Figure 3.1 and Figure 3.2.

In 1934 Albert J. Thomas was selected as architect to design the new Town Hall. The structure was complete in 1937 containing the civic functions and a public assembly hall.

In April 1996 it was granted Grade II listed status for its special architecture and historic interest

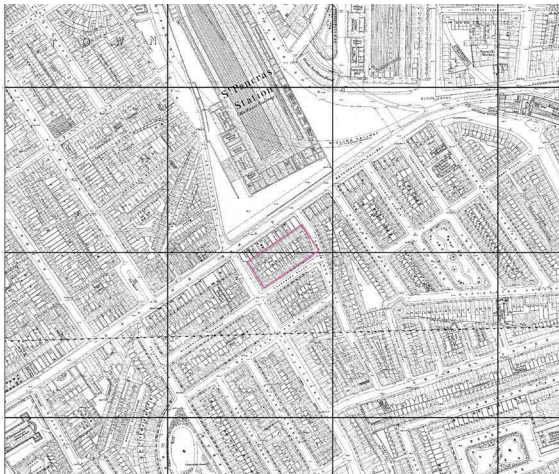


Figure 3.1 1874 OS Map

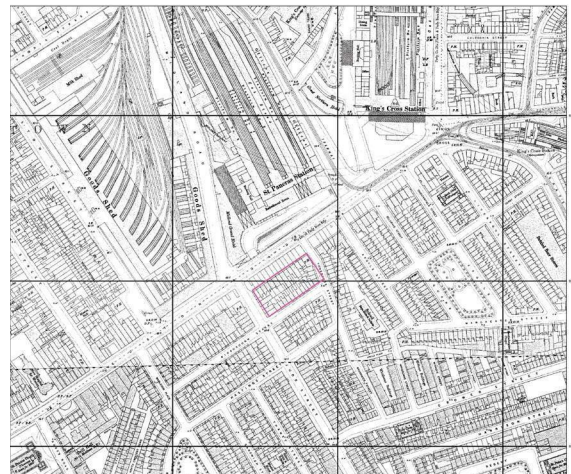


Figure 3.2 1895 OS Map

3.1.1 Anticipated Ground Conditions

Boreholes located in close vicinity to the site were obtained from the BGS archives. Although boreholes from the British Geological Survey (BGS) provide a good indication of the likely conditions on the site, it is recommended that a full site investigation is carried out in order to determine the ground conditions specific to the site and inform the foundation design.

Based on the Envirocheck geology maps and the BGS borehole logs, the site is underlain by Made Ground and London Clay.

The buildup of soil strata is anticipated to be as follows:

- Made ground of varying depth and composition
- London Clay with a reasonably consistent horizon within the site from 5 to 25m.

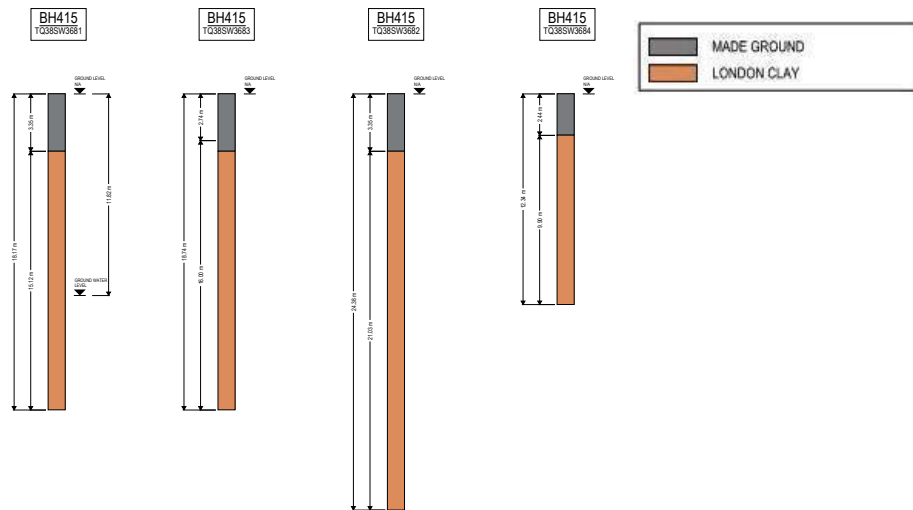


Figure 3.3 Existing borehole sections

Borehole	BGS Reference	Easting's	Northing's	Location relative to site	Estimate distance from site	Date
415	TQ38SW3681	530185	182829	NE	17m	16.11.1970
415	TQ38SW3683	530201	182819	NE	25m	18.11.1970
415	TQ38SW3682	530203	182838	NE	37m	12.11.1970
415	TQ38SW3684	530218	182813	NE	37m	19.11.1970

Table 1: BGS borehole records reviewed

Strata	Hydrogeological significance	Anticipated Aquifer Potential
Made Ground	Variable material that may contain some perched water	Variable
London Clay	The London Clay is an aquitard and therefore will not contain significantly large quantities of groundwater.	Unproductive Stratum

Table 2: Summary of Anticipated ground conditions

3.1.2 Unexploded Bombs

Many bombs that were dropped during the Second World War blitz did not explode on impact. Bomb detonators don't deteriorate and the explosives do not become inert with time. If unexploded bombs are still present on the site, they would present a health and safety and contamination risk. Figure 3.6, shows that a number of neighbouring buildings were directly hit and damaged by the blasts. The site shows blast damage, minor in nature, however there are no records of unexploded bombs in the area. As this area was heavily bombed during the war, there may still be a risk of unexploded bombs. However it is important to note that the site was developed before the war and therefore encountering unexploded bombs during the basements works is considered unlikely.

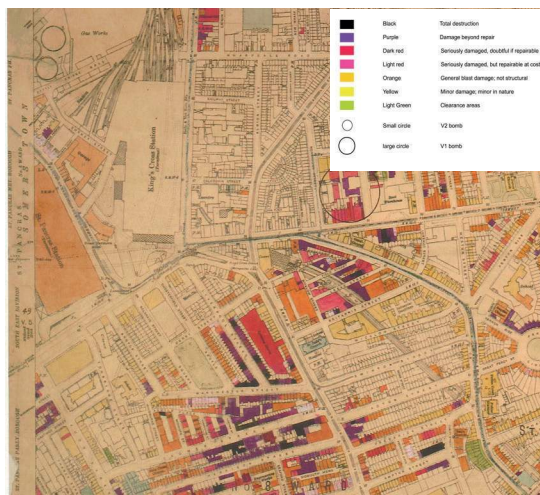


Figure 3.4 Kings Cross Damage Map

3.2 Geology

The British Geology Survey (BGS) map of the area indicates that the site is underlain by London Clay formation.

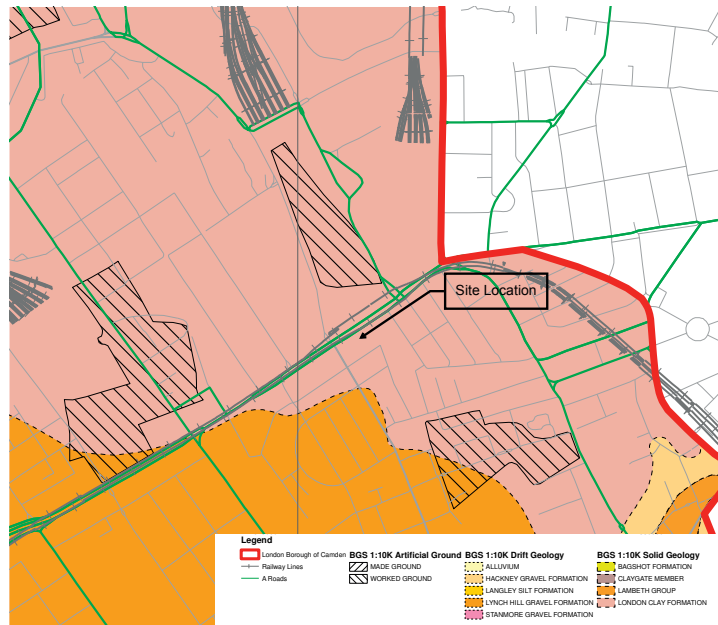


Figure 3.5 Geological Map of Camden

3.3 Hydrogeology

The geology underlying the site is classified as unproductive strata as shown in Figure 3.6. LB Camden data indicate the site is not within a groundwater source protection zones.

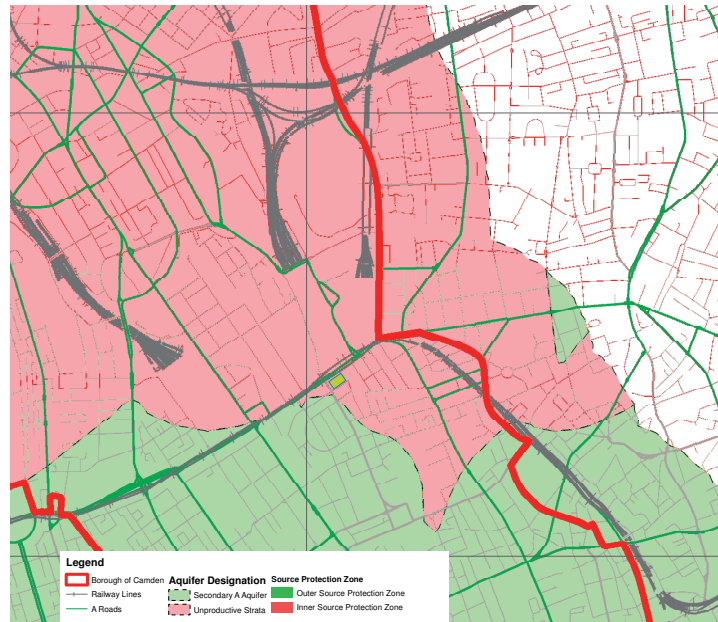


Figure 3.6 Camden Aquifer Designation Map

3.3.1 Ground Water Level

Information from borehole records on neighbouring sites indicates that ground water is present at a depth of 12 m. A site specific survey will be carried out in order to establish the presence of ground water level in more detail.

3.4 Hydrology, Drainage and Flood Risk

The site is located within 550 m of surface water features and within 25m the old Fleet River. There are no potential impacts identified relating to the proximity of the site to these water features. The site is not within the catchment of the Hampstead Heath Pond Chain which is 3,5 km to the north-east of the site and there are no identified potential impacts.

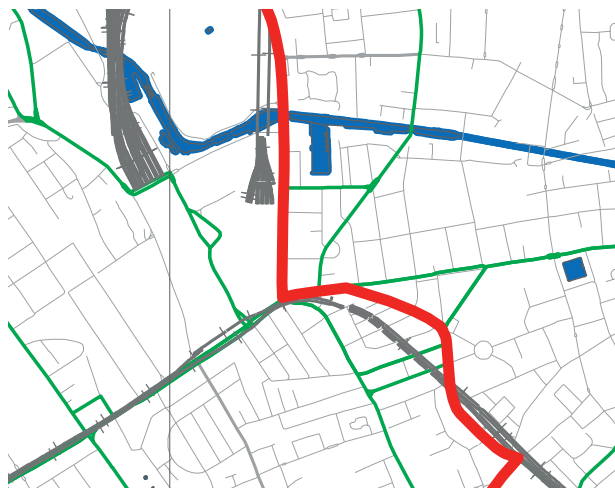


Figure 3.7 Site proximity to surface water

The site surface area is currently 100 percentage impermeable. The entire site is occupied by the Camden Town Hall building. The existing arrangement is to discharge surface water runoff via rainwater down pipes into the public sewers in Euston Road and Judd Street.

The proposed surface area will be 100% impermeable. As this is a refurbishment of an existing building the surfacing remains as existing. The proposals are to discharge surface water runoff to the public sewers in Euston Road and Judd Street as per existing drainage arrangement.

The site is classified as being at very low risk of surface water flooding/reservoir flooding/sewer flooding and is within a Local Flood Risk Zone 1, hence the potential impacts are minimum.



Figure 3.8 Flood Risk Map

4 Screening

Question	Response	Details
Is the site located directly above an aquifer?	No	Refer to Section 3.2
Will the proposed basement extend beneath the water table surface?	No	Refer to Section 3.3.1
Is the site within 100m of a watercourse, well (used/disused) or potential spring line?	No	Refer to Section 3.4
Is the site within the catchment of the pond chains on Hampstead Heath?	No	Refer to Section 3.4
Will the proposed basement development result in a change in the proportion of the hard surfaced / paved areas?	No	No Change in the footprint of the building
As part of site drainage will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?	No	The impermeable area will be the same
Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to, or lower than, the mean water level in any local pond (not just the pond chains on Hampstead Heath) or spring line?	No	Refer to Section 3.4

4.1 Slope Stability

Question	Response	Details
Does the existing site include slopes, natural or man-made greater than 7 degrees (approximately 1 in 8)?	No	Refer to Section 2.3
Will the proposed re-profiling of landscaping at the site change slopes at the property boundary to more than 7 degrees (approximately 1 in 8)?	No	There will be no change of the existing landscaping
Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7 degrees (approximately 1 in 8)?	No	
Is the London Clay the shallowest strata at the site?	Yes	Refer to Section 3.1.1
Will any trees be felled as part of the development and/or are any works proposed within any tree protection zones where trees are to be retained?	No	The proposed works will not affect any of the existing trees in the perimeter of the site
Is there a history of seasonal shrink-swell subsidence in the local area and/or evidence of such effects at the site?	No	There is no evidence of seasonal shrink-swell in the local area.
Is the site within 100m of a watercourse or a potential spring line?	No	Refer to Section 3.4
Is the site within an area of previously worked ground?	No	Refer to Figure 3.5
Is the site within an aquifer. If so, will the proposed basement extend beneath the water table such that dewatering may be required during construction?	No	Refer to Figure 3.6
Is the site within 50m of the Hampstead Heath Ponds?	No	Refer to Section 3.4
Is the site within 5m of a highway or pedestrian right of way?	Yes	Pedestrian footpaths are present around the site
Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	No	The impact to the surrounding buildings will be negligible
Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?	No	The site is in a safe distance from any tunnels

4.2 Surface Water and Flooding

Question	Response	Details
Is the site within the catchment of the ponds chains on Hampstead Heath?	No	Refer to Section 3.4
As part of the proposed site drainage, will surface water flows (e.g. volume of rainfall and peak run-off) be materially changed from the existing route?	No	The impermeable area will be the same
Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?	No	The proposed works are within the footprint of the existing building
Will the proposed basement result in changes to the profile of the inflows (instantaneous and long-term) of surface water being received by adjacent properties or downstream watercourses?	No	
Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	No	
Is the site in an area identified to have surface water flood risk according to either the Local Flood Risk Management Strategy or the Strategic Flood Risk Assessment or is it at risk from flooding, for example because the proposed basement is below the static water level of nearby surface water feature.	No	Refer to Figure 3.8

4.3 Non technical summary of Screening process

The screening Process has not identified any potential issues or any concerns that are deemed to be significant when applied to the proposed development.

5 Site Investigation/Additional Assessments

5.1 Site investigation

An Intrusive site investigation has been requested in order to obtain information for the following:

- Ground Properties
- Presence of Groundwater
- Existing foundation depths and geometry

The site investigation brief can be found in the Appendix 3. The results of the site investigation can be provided upon request.

5.2 Additional Assessments

As part of the new development a surface water drainage report has been carried out which describes the strategy regarding the new drainage of the proposed refurbishment. This can be found in Appendix 4.

A number of neighbour asset owners have been contacted regarding the proposed works and their correspondence is appended at the end of this report.

A flood risk assessment is not a requirement since site is within an area with low probability of flooding.

6 Construction Methodology/ Engineering Statements

6.1 Outline Geotechnical Design Parameters

The geotechnical parameters used for the design of the proposed works is based on conservative estimation of the site's soil parameter. A site investigation survey will be carried out and will inform the design in more detail and refine the design parameters. The results of the geotechnical survey can be provided upon request.

The brief for the site investigation can be found at Appendix 3.

6.2 Outline Temporary and Permanent Works Proposals

As already explained the proposed development regards to some local areas of the existing building for which the temporary and permanent works are outlined below

Attenuation Tanks

For the formation of the two new attenuation tanks part of the existing basement slab will be demolished, and the required volume will be excavated by using a trenchbox construction. Following that the attenuation tank will be formed using in situ concrete.

New lift Pits

The new lift pits will be created in a similar way to the attenuation tanks. The trenchbox construction technique will be used to form the required volume and the lift pit structure and new foundations will be formed with in situ concrete. The proposed structural details are shown in Appendix 1.

Lowering part of the GF slab

The proposed construction sequence to form the new slab is shown in Figure 6.1. Initially, temporary propping will be required, followed by demolishing the defined GF slab. In that stage any potential strengthening of the double height columns will take place. Finally, the new slab will be created and the props will be removed.

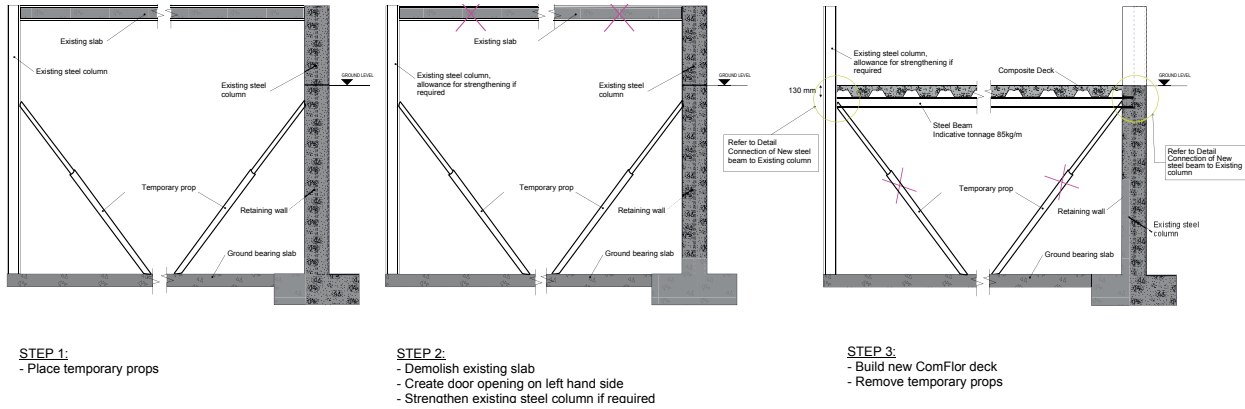


Figure 6.1 Construction sequence for new GF Slab

6.3 Ground Movement and Damage Impact Assessment

The proposed basement works will have a maximum excavation depth of 2.2 m. Table 6.3 of the CIRIA 760 guide, reproduced below, gives the distance behind the retaining wall to negligible movement as a multiple of the maximum excavation depth.

Movement type	High support stiffness (high propped wall, top-down construction)		Low support stiffness (cantilever or low-stiffness temporary props or temporary props installed at low level)	
	Surface movement at wall (per cent of max excavation depth)	Distance behind wall to negligible movement (multiple of max excavation depth)	Surface movement at wall (per cent of max excavation depth)	Distance behind wall to negligible movement (multiple of max excavation depth)
Horizontal	0.15	4	0.4	4
Vertical	0.1	3.5	0.35	3.5

The proposed works have a distance from the neighbouring buildings which is greater than four times the excavation depth, hence there is no requirement for further assessment.

7 Basement Impact Assessment

The ground conditions have been established based on information from the Environmental Agency and BGS data from adjacent sites. Site specific geotechnical details will become available with the site investigation survey.

The site is mainly flat with a footprint of approximately 3500 m². The existing building is founded at shallow foundations where each column sits on a pad as shown in Figure 7.1 and Figure 7.2. The foundation is formed with steel grillages encased in concrete pad footings bearing directly onto the soil.

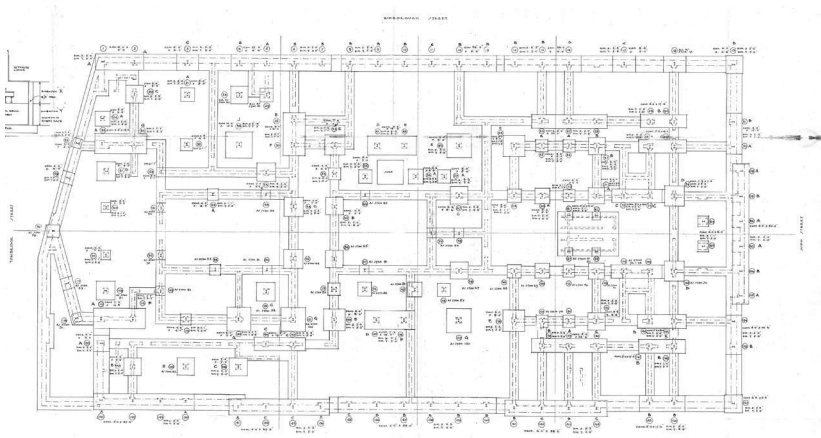


Figure 7.1 Archive drawing of Foundations layout

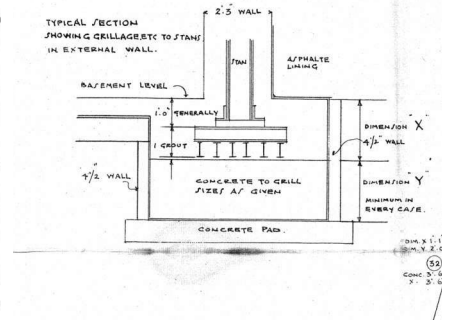


Figure 7.2 Archive Foundation concrete pad detail

The proposed development will be carried out in local areas of the existing building and will be accommodated between the existing foundation pads as shown in the following Figure.

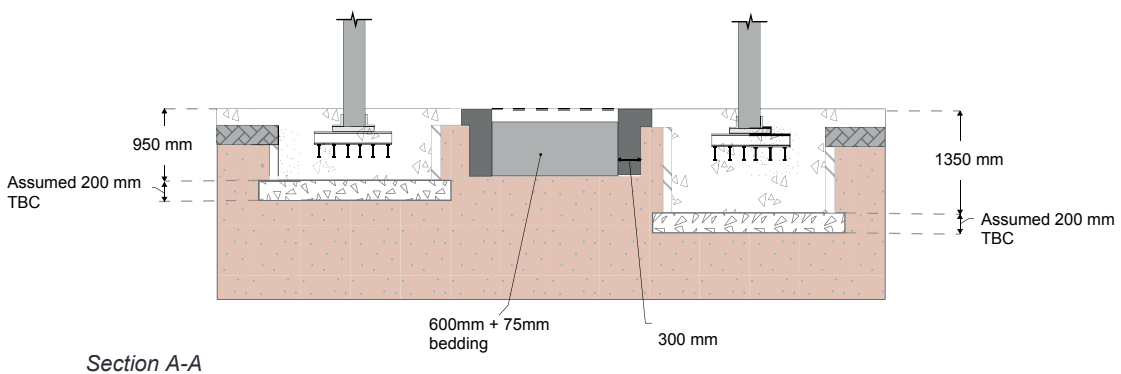


Figure 7.3 Section of new foundation for Goods Lift 1

Directly on the North the site is bounded by Euston Road with a distance of 9m to the existing building. In the remaining three sides the building is adjacent to public footpaths. Due to the limited extent of the proposed basement development it is considered that it will not have a detrimental effect on the stability of adjacent highways and footpaths.

Underground Infrastructure present close to the site includes the metropolitan line which runs along Euston Road. London Underground has been consulted and their correspondence is presented in Appendix 2.

No potential impacts to the neighbouring utilities and underground infrastructure have been identified.

7.1 Land Stability/Slope Stability

There is no evidence of seasonal shrink-swell, thus the risk of movement and damage to this development due to shrink and swell of the London Clay is considered to be negligible.

A ground movement assessment based on CIRIA C760 guide indicates that ground movements caused by the excavation and construction of the proposed development will be negligible to the surrounding structures as they fall outside of the zone of influence.

The BIA has concluded that there will not be risks or stability impact to the development and adjacent sites.

7.2 Hydrogeology and Groundwater Flooding

The BIA has concluded there is a very low risk of groundwater flooding and there will be no impacts to the wider hydrogeological environment.

7.3 Hydrology, Surface Water Flooding and Sewer Flooding

The BIA has concluded there is a very low risk of surface water/sewer flooding and there are no impacts to the wider hydrological environment.

Appendix 1

Structural Drawings



Appendix 2

Utilities Correspondence



Appendix 3

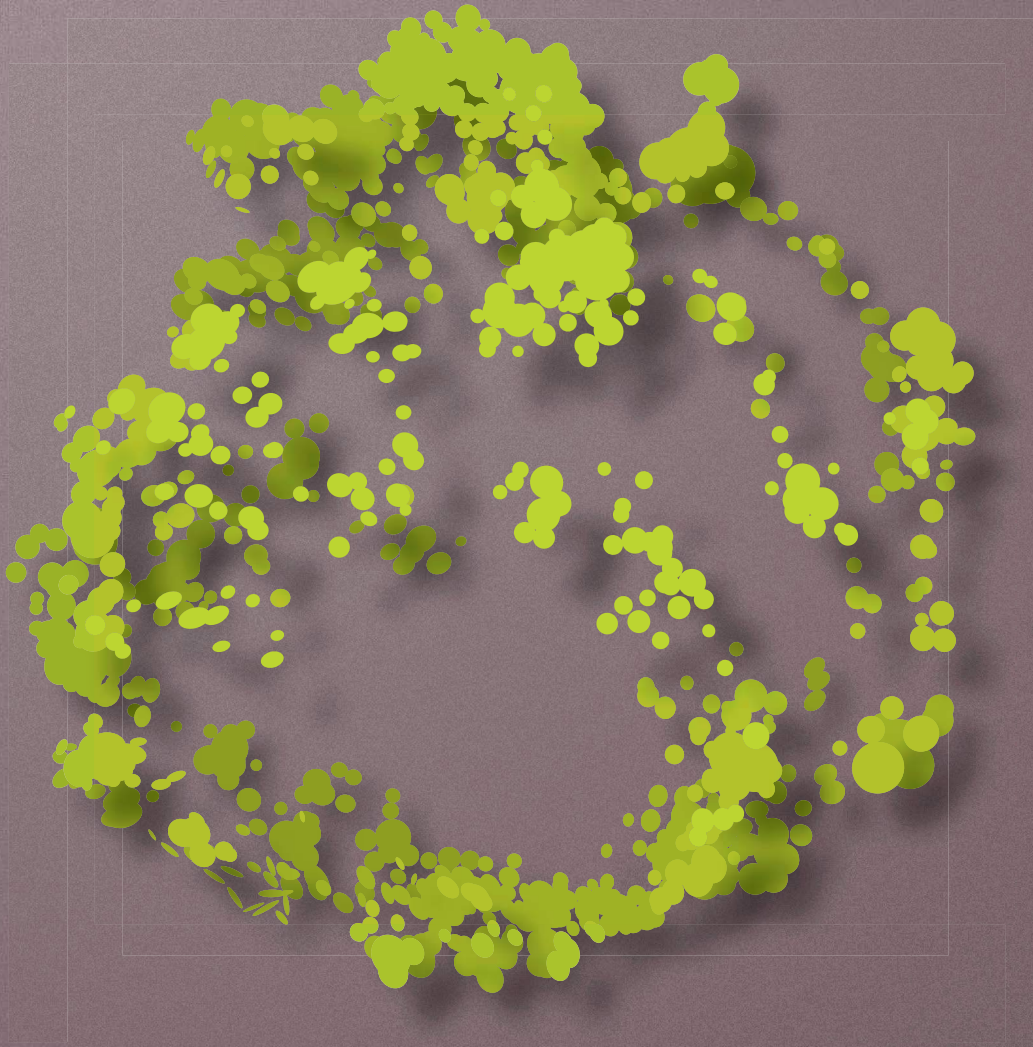
Site investigation & Fabric Brief



Appendix 4

Drainage Strategy





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