68 ELSWORTHY ROAD, LONDON, NW3 3BP

CONSTRUCTION METHOD STATEMENT TO SUPPORT PLANNING APPLICATION FOR NEW REAR EXTENSION AND BASEMENT

Job No: 233950

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Form

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Form has undertaken over 300 projects involving subterranean development, both new build and retrospective, using numerous techniques and sequences of construction. This extensive design, site and local geology/hydrology experience has positioned the practice as one of London's leading subterranean engineering design consultants.

Many of our subterranean projects are in the London Boroughs of RBKC, Westminster, Camden, Hammersmith & Fulham and Wandsworth, making us familiar with the most recent requirements of subterranean development.

Form has designed multi-level basements using techniques including open dig, underpinning (mass and 'L' shaped R.C. special foundations), temporary and permanent steel sheet piling, temporary and permanent concrete piled retaining walls, top-down construction and tunnelling.

TERMS OF REFERENCE

We were appointed in January 2024 by the property owner in collaboration, to prepare a supporting Structural Design Statement in support of a Planning Submission for proposed alterations at 68 Elsworthy Road, NW3 3BP, London.

Contents

Introduction

Purpose of Report

This report has been prepared as a supporting document to the planning application for the refurbishment of the property known as 68 Elsworthy Road, which currently consists of a three-storey detached residential dwelling. The proposals involve the construction of a new rear extension, remodelling of roof and a new basement. This report presents an outline structural scheme for the construction of the new basement and considers the outline construction methodology of the superstructure.

This report and the structural information produced to date are based on a visual inspection of the existing building and review of the proposed architectural plans. Trial pit investigations have been undertaken to investigate the existing foundation details along the boundaries, the details of which recorded within the GEA site investigation report and are considered in our proposals.

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Health and Safety

The consideration of Health and Safety, including all necessary risk assessments, will conform to the requirements of the Health and Safety Act 1974 and the Construction (Design and Management) Regulations 2015. The Planning Supervisor will be made aware of any consequences of the design to Health and Safety through risk assessments. The CDM risk register will be continuously updated during the project and at key stages such package tenders and the issue of construction status information. In-house quality assurance, calculation and drawing checking procedures, as well as our responsibility under the CDM regulations are set out in the FORM's Operational Procedures and ensure compliance with our ISO 9001:2015 & ISO 14001:2015 accreditation.

Non-Technical summary

The methodology described in this report for constructing the basement at 68 Elsworthy Road is based on tried and tested and traditional methods to achieve a swift construction programme with minimal disruption.

The appointed contractor is expected to be an experienced groundworker who has a proven track record in delivering basement projects with temporary works sequencing.

Accordingly, these works should have no significant effect on the stability of the building or adjacent properties. A ground movement assessment has been carried out by GEA which concludes that the predicted damage to the neighbouring properties would generally be "Negligible" with some areas of "Very Slight", which falls within acceptable limits.

A Basement Impact Assessment (BIA) has been prepared by Geotechnical Environment Associates (GEA), this report concludes that the basement and its construction methodology will have no adverse consequences on the local hydrogeology.

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1 Planning Policy

The table below provides a non-technical executive summary covering key aspects of the London Borough of Camden's planning requirements for Basements and Lightwells GPG4 and DP27, which also ties in with Camden's preferred policy DP20. The key aspects have been divided into specific headings to ensure all requested information has been provided for the planning application.

Extract Descriptions of Key Aspects from Camden Development Policies Basements and Lightwells GPG4 and DP27:	Reference Location within this Report	Compliance to GPG4/ DP27 Policy
A. The **Desk Study** information and an analysis of the findings in relation to the proposals. A thorough desk study has been completed and presented in the Construction Method Statement main text; it includes: a. The site history; b. The age of the property; c. The site survey; d. The geology and ground conditions –from the site investigation and British Geological Society borehole logs; e. Historic River Courses; f. Underground Infrastructure; i. Services; ii. Drains; iii. Tunnels; iv. Nearby basement developments in the area have been considered.	 Section 2 Section 2 Section 2 Section 2 Section 2 Section 2 Section 2	 ✓
B. An appraisal of the **existing building structural arrangement** including previous alterations and any obvious defects, asses the condition and location of **adjoining buildings.**	Section 2 and 3	✓
C. Assessment of a **site investigation** which is demonstrated to be relevant to the site together with **trial pits** showing existing foundations and the material they are founded on, for all walls which may be impacted by the proposed scheme. If **groundwater** is present, levels are to be monitored for a period of time.	Section 2,3 and Appendix B GEA reports	✓
D. Details of the engineering design which is advanced to detailed proposal stage: a. Ground conditions and ground water; b. Existing trees and infrastructure; c. Drainage; d. Flooding; e. Vertical and horizontal loading; f. Structural engineering general arrangement and details; drawing showing underpinning, piled walls etc	Section 2,3	✓
E. An analysis of the **upper aquifer** (when it exists) and how the basement may impact any groundwater flow.	Section 2 and refer to BIA report	✓
F. Details of **flood risk, surface water flooding, critical drainage areas** and how these have been addressed in the design. A full flood report assessment to represent areas determined to be at risk.	Section 2.1.5 and Civilistix drainage strategy and FRA Report	✓
G. An Assessment of **movement** expected and the effect of adjoining or adjacent properties, covering both short term and long-term effects. H. Design and construction to limit damage to all buildings to a maximum of Category 2 as set out in CIRA Report 580	Refer to BIA and GMA Report prepare by GEA. Max Category 1 concluded.	✓

2 Site Information

2.1.1 The Site, Location, and Existing Building

The site is currently occupied by a 1900'S single detached house located on Elsworthy Road (Figure 1). The property is not listed, but the site is within a conservation area. The existing building consist of three storeys and is constructed from solid brick walls and joisted floors. Figure 2 shows the front view of the house from Elsworthy Road.

Figure 1: Site Location Map

Figure 2: Front View of Site

2.1.2 Site History

Looking at the historic OS maps there is a record of a building appearing on the site on the map for between 1892-1914, as shown in Figure 3 and 4.

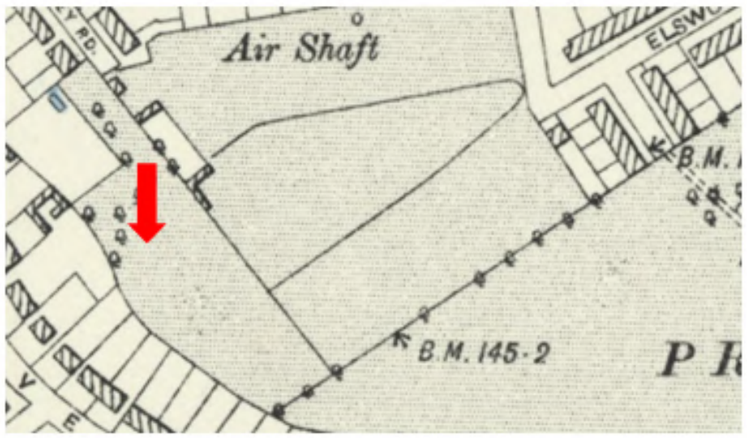

Figure 3: 1888-1913

Figure 4: 1892-1914

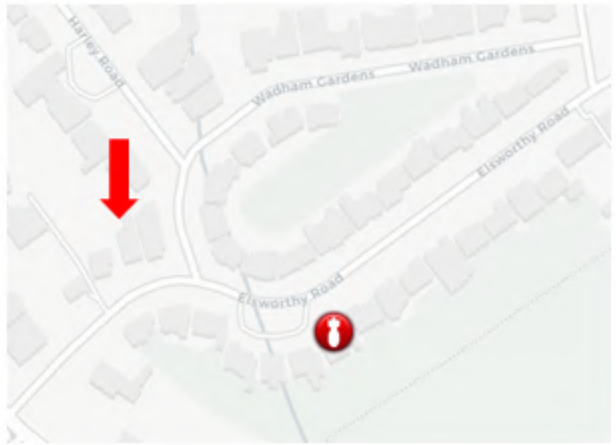

Figure 5: World War 2 Bomb Map

As can be seen from the bomb map in Figure 5, no bombs were dropped on the site during WW2. However, bombs did drop very near the site down Avenue Road. As seen by the map. The London County Council Bomb Damage Maps 1939-1945 (Figure 6) shows that there was blast damage – minor in nature to the property and the neighbouring properties.

Figure 6: London County Council Bomb Damage Maps 1939-1945

2 Site Information

2.1.3 Ground Conditions/Geology

With reference to British Geological Survey website (BGS) the site is underlain by London clay– Clay, Silt and Sand (Figure 7). The BGS website has no superficial deposits recorded at the site location.

A site- specific investigation in the form of a Borehole, a Window sample and four trial holes was carried out to establish the profile and depth of the existing foundations and the soil conditions. The locations and results of which can be found in the appendix of this document. Table 1 shows a summary of the soil conditions found.

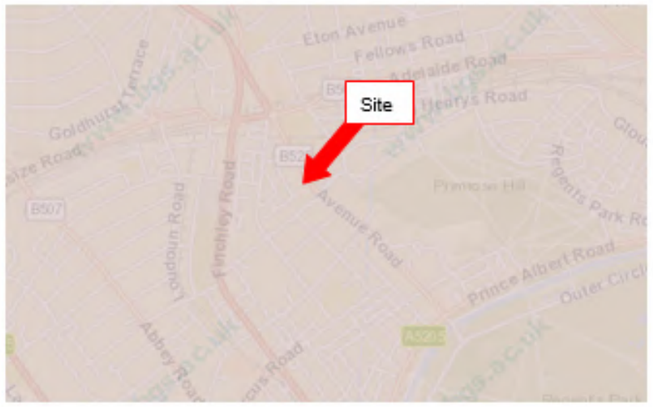

Figure 7: Bedrock Geology Underlying the Site

No groundwater was encountered during the site investigation carried out by GEA. Further monitoring is in progress.

Table 1: Summary of soil strata from Borehole in front garden

Stratum	Depth to Top of Stratum (m BGL)	Typical Thickness (m)
MADE GROUND/TOPSOIL Made ground, brick and concrete fragment and occasional ash fragments	0	0.8 to 1.0
LONDON CLAY Soft becoming firm slightly fissured brown CLAY	0.80	1.0
LONDON CLAY Stiff fissured brown Clay with bluish grey veins, selenite crystals and occasional partings of orange-brown fine sand	1.80	2.0
LONDON CLAY FORMATION Stiff fissured brown CLAY with occasional bluish grey veins and occasional selenite crystals	3.8	Not proven. Borehole terminated at 7.45m BGL

The construction methods proposed within this report and associated structural proposals are appropriate for the geology and are capable for supporting the structural loads of the subterranean development, the techniques that will be used for the construction are well established in the industry and high levels of workmanship are to be expected from the experienced ground worker to be appointed. Refer to Appendix A for the proposed sequence of works.

2.1.4 Slope Stability

A Topological survey of the site has been conducted by Point BIM Surveys. The site has gentle slope from the front to back of the rear garden with a level difference of approximately 2.75m over 62.0m which gives a slope of 4.45% and is not considered to be a problem in terms of slope stability.

2.1.5 Hydrology

A desk top study of "The Lost Rivers of London" indicates that the River Tyburn historical route is seen to run approximately 100m to the West, along Avenue Road. The Tyburn main source originates near Shepherds Hill, Hampstead. The historical river is now situated within an underground conduit known as The Kings Scholars Pond Sewer. The proposed basement works will not be influenced or affect this conduit which now runs along Avenue Road at 100m + distance away from the site.

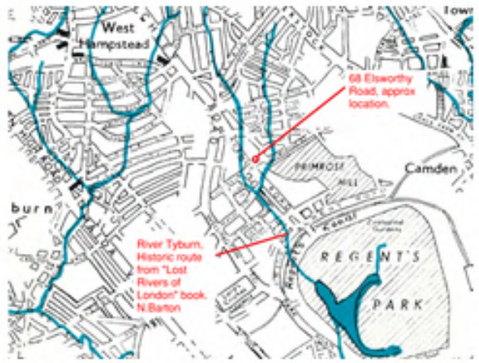

Figure 8: Location of Lost River Tyburn Relative to the Site

Figure 9: Location of KSP sewer and Bazalgette's mid and low-level sewers

A check on the Environment Agency website has shown that the site is within Flood Zone 1. This indicates that the site is at low risk of tidal and fluvial flooding. An FRA report has been carried out and has been included in the planning application. The report demonstrates that the proposed development is at a low risk of flooding.

The site is in the outer zone (zone 2) of ground water source protection zone according to the Environment Agency website.

The site has gentle slope from the front to back of the rear garden with a level difference of approximately 2.75m over 62.0m which gives a slope of 4.45% and is not considered to be a problem in terms of slope stability.

2 Site Information

2.1.6 Hydrogeology

The site hydrogeology can be summarised as follows:

- The Environment Agency has produced an aquifer designation system consistent with the requirements for the Water Framework Directive. The designations have been set out for superficial and bedrock geology and are based on the importance of aquifers for potable water supply, and their role in supporting surface water bodies and wetland ecosystems.
- The London Clay Formation has been classified as a non-productive stratum (formerly non-aquifers). It comprises of rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.
- There are no recorded surface water abstractions within 2km of the site.

2.1.7 Arboriculture

An arboriculture report has been prepared By Landmark Trees and this will be submitted as part of this planning application. The report summarises that the proposals will have no, or very little impact on the trees and is therefore considered acceptable.

The report outlines precautionary and protective measures which should be adhered to before and during works.

2.1.8 Existing Utilities

2.1.9 Mains Water

A Thames Water Asset Search has been carried out to locate the mains water and drainage routes within the site and near the site. The full results can be found in Appendix D which shows that there is not main water route running through the site and therefore Thames Water will not need to be consulted.

2.1.10 Underground Drainage

The Thames Water Asset Search confirms that there are no combined sewer routes that run through the property as shown in Figure 10. Therefore, Thames Water will not need to be consulted in this regard. A CCTV survey has been carried out to inform the drainage strategy.

Figure 10 Thames Water Combined Sewer Route Relevant to Site Location

2.1.11 Gas and Electrical

A Utility Survey will need to be carried out. Any services that require to be diverted will be replaced by modern day standards where necessary as determined by the Mechanical and Electric Engineer for the project. All services that are required to pass through the new structure will be sleeved and articulated accordingly to allow for future movements and settlements of the surrounding structure.

2 Site Information

Underground Structures

2.1.12 London Underground

It can be seen from the figure below that the TfL Overground line from the system runs approximately 100m to the South of the site. It can Also be Seen from the map in figure that the Metropolitan lines run approximately 200m from the Southwest of the site. Due to the distance, it will not be necessary to inform the London Underground Asset Protection department to check alignments, as agreed works will not affect any existing tunnels or access shafts.

Figure 11 Map showing Site Location Relevant to London Underground Structures

2.1.13 Crossrail 1 and 2 safeguarding zone

As can be seen from the map in *Figure 9*, the site is approximately 1.8km away from the nearest Crossrail 1 (Elizabeth Line) Tunnel. Due to this large distance, Transport for London will not need to be contacted.

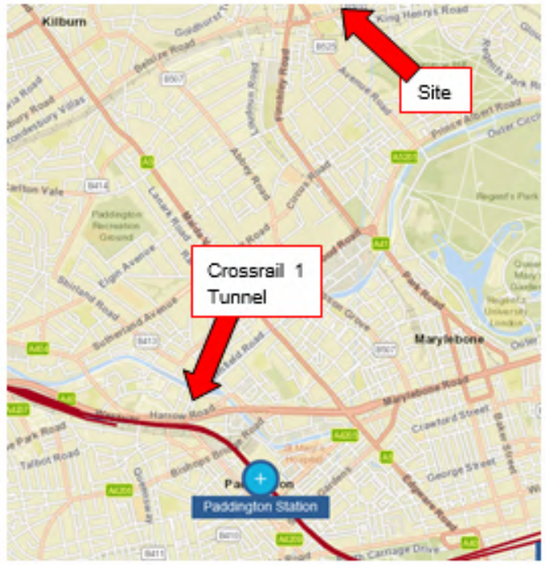

Figure 9: Map Showing Site Location Relevant to Cross Rail 1, Elizabeth Line.

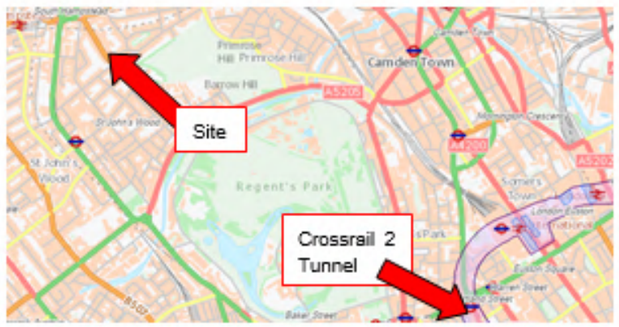

Figure 13: Map showing Site Location Relative to Cross Rail 2, Safeguarding Zone

2.1.14 Primrose Hill Tunnel

Primrose Hill Tunnel is a 1,164-yard (1,064 m) railway tunnel on the West Coast Main Line, approximately 2 miles (3.2 km) from Euston station. It is located in South Hampstead in the London Borough of Camden, just north of Primrose Hill park and consists of two bores. The tunnel is approximately 200m North of the site. The tunnel proximity is not a cause for concern.

2.1.15 Nearby Basements consideration and Ground Water Flows

The nearest basement works seen to be consented are at 70 Elsworthy Road. It is not known if this basement was constructed, however the waterflows in the London Clay and their impact from basements are as noted by Arup in their scoping document (June 2008) to be negligible. A full Hydrogeological statement has been prepared by GEA within their BIA document to demonstrate that ground water flows should not have an adverse effect on adjacent properties or ground water flows around the site.

2 Site Information

Boundary Conditions

2.1.16 South Boundary – Front

- The front boundary is with the pavement of Elworthy Road. A front garden is present with a lawn, shrubs, and trees present.
- A dwarf brick wall runs between the property and the pavement.

Figure 10: South (Front) Boundary

2.1.17 North Boundary – End of Rear Garden

The rear garden extends to the North and has a boundary brick wall (TBC) that separates the land between No. 70 and the rear garden of 28 Elsworthy Road (Figure 16).

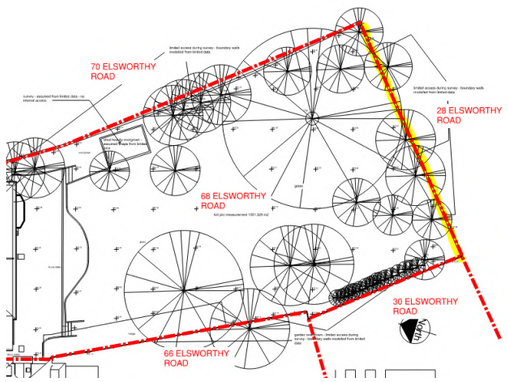

Figure 11: North (Rear) Boundary

2.1.18 East Boundary – With No.66 and partially No.30

- To the East boundary of the site is 66 Elsworthy Road.
- Figure 17 shows the boundary between the two properties looking towards the front. This photo shows a passageway giving access to the rear garden of 68 Elsworthy Road. The flank wall of 66 Elsworthy Road is approximately 1-2m away to the flanks and 1.0m away to the chimney stack shown. The building appears to be in a good condition with no signs of visible cracks or historical movement.
- Further along this boundary, towards the rear of the plot, the wall also separates and acts as a boundary between the land of 30 and 68 Elsworthy Road.

- *Figure 12: East Boundary with 66 Elsworthy Roady showing side passage and proximity of flank wall and chimney stack.*

2.1.19 West Boundary – With No.70

- To the West of the site sits No.70 Elsworthy Road.
- shows the boundary wall between the two properties at the that runs the full length of the property. The wall is assumed to be a solid 215mm thick brick wall on shallow foundations.
- The property of 70 Elsworthy Road presents a mews house to the Elsworthy Road elevation with an access driveway, the 70 site stretches to rear where a considerable size detached property exists.
- A search on Camden Council planning application website shows that No.70 has planning permission (2014) for the erection of a new three-storey single family dwelling house. The proposed basement connects the two.

Figure 13: West Flank Boundary showing proximity to Mews property and main house to No.70

3 Development Proposals

3.1.1 The Proposals

The existing property is not listed but is situated in the Elsworthy conservation area. It is proposed to extend the property to the rear which is to align with 66 Elsworthy Road property and provide a two-storey extension and remodel the rear roof to accommodate the proposal. A new basement is proposed below the existing house which will extend into the front and rear garden areas.

3.1.2 Existing Building, Condition, Substructure and Basement Construction Constraints

3.1.3 Existing Building and Investigations

The existing building has been inspected by the structural engineer and was found to be in a serious state of dis-repair and some areas of ceiling had already collapsed, even more ceiling areas have collapsed since the first inspection. The condition of the building is progressively worsening due to seasonal weather ingress and is now uninhabitable, caution should be exercised on entry by all visitors.

A site-specific soil and foundation investigation has also taken place. The existing foundations have been established as traditional spread type.

During the property inspection, the West façade was seen to be extensively covered in ivy which has overgrown significantly, and this has caused cracking and serious damage with associated water ingress to the roof and flank walls, on this basis it is considered necessary to remove this section of wall in its entirety and rebuild in an exact replica re-using the original brickwork as much as possible.

The rear wall will also need to be removed and a new steel frame will be added for stability purposes and to guide the load path down to the new basement structure.

The house will need to be carefully investigated at the outset to understand the extent of repairs required, check load paths and a further targeted check will be made on remaining elements to ensure there is no rot or decay present. The existing roof, floors and load bearing walls as indicated are to remain and be propped as necessary during the works as designed by the temporary works designer. The existing roof will also need to be fully overhauled, strengthened and steel frame elements inserted to achieve the new profile.

3.1.4 Constraints

The main structural constraint being the adjacent existing full height East side flank boundary wall to 66 Elsworthy Road.

To minimise the ground movement adjacent to this flank it is proposed to install a piled retaining wall along and around the line of the existing flank wall which is deemed to remain in position to preserve its heritage nature. The piled wall along this line shall be designed for the lateral surcharge from the adjacent 66 Elsworthy Road foundations, and where necessary, also from the retained single storey flank wall.

The piles (450/600mm expected) will be designed by a specialist to keep lateral deflections to a minimum and combined with top-down construction this will provide a stiff arrangement that should give acceptable category 1 movements as a maximum.

The structural proposals and sequence are described within this report and on noted the schematic drawings contained within **Appendix A**. The final sequence will be derived by the contractor and his temporary works designers. They have been developed by Form SD in conjunction with the architects to address the specific site constraints and characteristics including:

- The ground conditions.
- Minimal demolition approach.
- The stability of the neighbouring properties.
- Health and Safety considerations.
- The physical site constraints.

During the site set up the contractor will ensure that the main access route through the existing property is cleared. To reduce the impact of the development during construction we have identified several simple general measures that the contractor will be expected to undertake:

Noise:

For all operations identify working method that use equipment or modes of operation that produce less noise.

- Reduce the need for noisy assembly practices by assembling off site where possible.
- Keep noisy plant as far away as possible from the site boundaries.
- Adopt working hours to restrict noisy activities to certain periods of the day.
- Minimise the drop height into hoppers, lorries or other plant.

Dust:

- Reduce the amount of dust through, cutting, grinding, and sawing by assembling off site where possible.
- Equipment fitted with dust suppression, or a dust collection facility should be used.
- Stockpiles of sand or similar dust generating materials will be covered.

Vibration:

- For all operations identify working method that use equipment or modes of operation that do not vibrate.
- Reduce the need for assembly practices by assembling off site where possible.

Vibration and the monitoring there of is discussed further in the following sections.

3.1.5 Sub Structure and Basement Construction Techniques

A top-down method of construction is proposed, and a sequence is noted on the drawings, and this will allow works to progress on sub and super structure elements simultaneously once all necessary temporary works activities have been completed and the ground floor slab cast. This technique will also give the optimum solution of a stiff propping effect and help to keep surrounding ground movements to a minimum. Temporary piles/ plunge columns will also be utilised as part of the temporary works strategy. Where necessary the existing wall will be “stooled up” using Pynford techniques and this will allow the ground floor slab to be cast through and around internal existing load bearing elements deemed to remain. For the lower basement in the pool area two options are available for the lower floor slab. The 600mm slab can be either supported on bearing piles (as drawn) with a suitable void former to reduce the heave pressure or alternatively as ground bearing raft. Both options will be explored in more detail in the next stages. For the upper basement slab this will be a 450mm ground bearing raft foundation. For both slab cases, the uplift pressures from heave and water will be considered in detail during the next stages and tension piles provide as necessary. A safe ground bearing pressure of 135-150kN/M² is to be expected for the ground bearing raft area, further analysis would be carried out in the next stage and results refined in conjunction with GEA. Due to the proximity of the neighbouring properties and the sensitivity of the site location in a residential area, the demolition, excavation, underpinning and piling works have been identified as particularly sensitive operations and the following precautions outlined below will be taken. Prior to any of these operations commencing the site will be inspected by a Structural Engineer to ensure that procedures have been satisfactorily followed Further regular site inspections will be made by the Structural Engineer at key stages to inspect these operations.

3.1.6 Excavation

The soil from the bulk dig will be excavated and removed predominantly using 360 excavators. During the underpinning excavation will be undertaken using hand tools and mini diggers where possible. A sequence of work is provided on the schematic drawings. The site will be inspected by a Structural Engineer prior to the commencement of any excavation to ensure the following procedures have been implicated:

- All excavation shall be carried out by hand or utilising a micro excavator (maximum operating weight of 1.5 tonnes).
- Any compaction of hardcore shall only be carried out using non-vibrating methods.

3 Development Proposals

3.1.7 Piling

Contiguous piles will be used to form the retaining wall of the new basement, and these are suited well for the firm/stiff London Clay strata and have been used in the locality on similar projects basement project.

- Numerous rig options are available to the contractor to deal with site conditions, typically a KLEM type rig or Super Kitten are popular choices for this type of work and are well suited for access and manoeuvrability.

- The site will be inspected by a Structural Engineer prior to the commencement of any piling to ensure the following procedures have been followed. An experienced piling contractor is appointed to undertake the works and pile design.

- All method statements, drawings and calculations will be submitted to the engineer for review. All precautions taken to ensure that the works are to be carried out in a manner which minimises any noise and vibration must be described.

- Pile diameters of 450mm and 600mm are to be expected and the most efficient solution suited to the rig availability, site conditions and loadings will be derived by the appointed specialist.

- Bearing piles are also indicated for support to the 600mm lower basement pool slab and these may be substituted for a ground bearing raft following further heave and settlement analyses in the next stages.

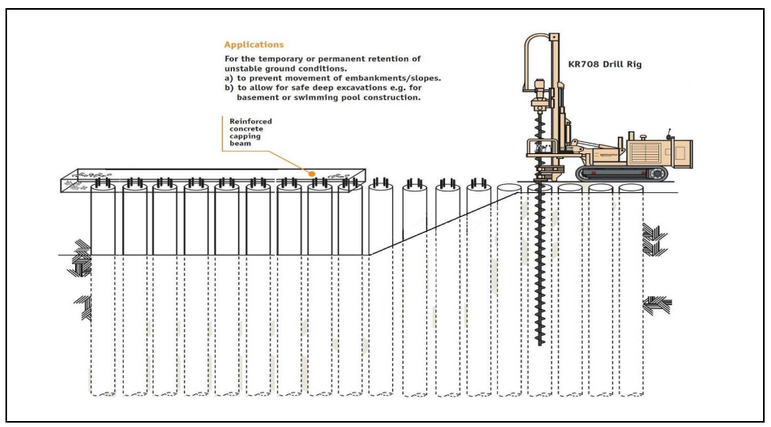

Figure 14: *Contiguous-Piled Wall Method of Construction*

3.1.8 Underpinning

The underpinning proposed is limited to the garden boundary walls only, between 66/68 and 68/70 boundary lines, and this is to facilitate construction of the capping beams and is subject to final checks on levels. The shallow mass concrete pins should not present a challenge to an experienced groundworks contractor. It is expected that the appointed contractor is also a member of ASUC as this will represent recognised expertise in the groundworks sector.

The excavation of the underpin will be carried out using hand tools and perhaps with the aid of a mini excavator to ensure operations are carried out as swiftly as possible.

Prior to the works commencing, all neighbouring occupiers will be consulted to ensure that the construction process results in minimal disruption/disturbance. All monitoring targets as agreed in the Party Wall award are to be in place in good time before works commence so base line readings can be taken.

3.1.9 Potential Ground Movement and Monitoring of Adjoining Properties During Construction.

A ground movement assessment has been carried out by GEA based on the outline schematic produced, as shown in Appendix A. The predicted results of which conclude that damage to neighbouring properties would generally be negligible/very slight and this maximum falls into the acceptable Category 1 limit.

The underpinning indicated on the drawings to the garden boundary wall is proposed as shallow mass concrete and is subject to a final check on site levels. The underpinning itself is considered low risk and should not cause any significant movements.

The contiguous pile retaining wall will be designed to permit only very small movements during the excavation and long term. The adoption of a top-down method is seen to be the optimal strategy to keep surrounding movement to a minimum.

Form will make regular site inspections and part of our appointment is to ensure that we have an ongoing role to inspect and review site operations and prepare monthly reports highlighting progress and any issues that need to be addressed.

Monitoring in 3 dimensions of the neighbouring buildings will be carried out before and during the works by the contractor and the findings will be reported to the adjoining surveyors periodically. The details of the monitoring regime will be agreed with the adjoining owners' surveyors as part of the party wall approval process.

Following base line readings, monitoring will take place once a week during basement and underpinning until all operations are completed.

When readings have shown to be stable and consecutive for 3 separate visits the frequency may reduce to fortnightly readings subject to agreement with Form

Fortnightly readings continue until such time that all major structural works are complete and temporary works systems have been removed and 3 separate consecutive readings indicate no significant trends of movement are occurring.

Readings can then reduce to a monthly basis for a further 3 months after structural completion subject to agreement with the adjoining owner's surveyor.

3.1.10 Trigger Limits and Actions:

To be agreed at the outset of the project with input from Geotechnical Engineers and Temporary Works designer.

Settlement Values (TBC):

Amber Trigger Readings: +/- 5mm

Red Trigger Readings: +/- 10mm

Lateral Values (TBC):

Amber Trigger Readings: +/- 5mm

Red Trigger Readings: +/- 10mm

- Amber Trigger Value: All team members, engineer and adjoining surveyors and their checking engineer to be advised of status. The contractor is to review the cause of the cause of the amber trigger and issue a revised strategy to limit any further movement. Surveyors to agree actions immediately.

- Red Trigger Value: All team members, engineer and adjoining owners checking engineer to be informed immediately. Works in the vicinity of the area to be stopped and appropriate actions taken as necessary to make the area safe. Subsequent actions to limit movement thereafter to be proposed by the contractor and to be agreed with all relevant parties. Remedial works put in hand ASAP.

3.1.11 Waterproofing and Drainage systems

An internal cavity drainage system will also be included. As the intended use of the basement is mixed including habitable space, a Grade 3 environment is required, complying with BS 8102.

Sump pumps and drainage will be required to remove any water ingress from the cavity drain system and these will be designed by an appointed waterproofing consultant.

Refer to drainage strategy for details of attenuation storage and flow rates. The system has been designed for 1 in 100-year storm + 40% climate change.

3.1.12 Superstructure

The superstructure framing has been indicated on the structural scheme drawings and is a mixture of steel framing, timber joisted floors, cavity walls and existing elements are to be retained as noted.

The arrangement is not overly complex and should not present any major issues for the contractor.

4 Site Management

This section of the report has been produced at planning stage and before the main Contractor has been fully appointed. It sets out the systems and procedures that the Contractor will utilise in controlling the construction operations on site, to ensure progress of the project in the most safe and efficient manner possible and to minimise impacts on the local environment and surrounding amenity.

Tendering Contractors will be made aware of the contents below (alongside any planning conditions). Once planning permission is granted, the appointed contractor will be responsible for the submission of a Construction Traffic Management Plan prior to commencement of development.

The engineer will make a site visit at each of the key points detailed in the sequence of construction. The ground worker will provide detailed method statements for the works and temporary propping to the basement for approval by the engineer prior to commencement of the works.

4.1.1 Excavation of Soil

The soil will be excavated and transferred to normal skips kept within the site boundaries in the front garden. The excavation of the basement will be undertaken by small excavators which will then transfer the waste to the skip to the front of the site. The frequency of vehicle movement will be confirmed by the chosen contractor and approved by the council before works commence. The footpath and street adjacent to the site will be cleaned each evening. Further information on the management of site activities is detailed in the Construction Management Plan.

4.1.2 Local Environmental Considerations

All the works, particularly the sub-structure, are to be carried out in a manner which minimises any noise, dust, and vibration that may affect the neighbouring properties.

We have identified several simple general measures that the contractor will be expected to undertake to minimise theses impacts including:

4.1.3 Demolition

The demolition works are to take place within the hoarded confines of the site. Any scaffolding on the site perimeter is to be clad with monoflex sheeting above the 6-foot plywood hoarding line to minimise any dust or debris from falling onto the neighbouring streets.

To minimise dust and dirt from demolition, the following measures shall be implemented:

- All brickwork and concrete demolition work is to be constantly watered to reduce any airborne dust.
- Demolished materials are to be removed to a skip placed in the front of the site within the site boundaries, which will be emptied daily.
- The pavement to the front of the property is to be washed and cleaned down each day.
- Any debris or dust / dirt falling on to the street and public highway will be cleared as it occurs by designated cleaners and washed down fully every night.

4.1.4 Noise

The following measures should be followed to minimise noise due to demolition or construction:

- For all operations identify working method that use equipment or modes of operation that produce less noise.
- Reduce the need for noisy assembly practices by assembling off site where possible.
- Keep noisy plant as far away as possible from the site boundaries.
- Adopt working hours to restrict noisy activities to certain periods of the day.
- Minimise the drop height into hoppers, lorries or other plant.

4.1.5 Dust

The following measures should be followed to minimise dust due to demolition or construction:

- Reduce the amount of dust through, cutting, grinding, and sawing by assembling off site where possible.
- Equipment fitted with dust suppression or a dust collection facility should be used.
- Stockpiles of sand or similar dust generating materials will be covered.

4.1.6 Vibration

The following measures should be followed to minimise vibration due to demolition or construction:

- For all operations identify working method that use equipment or modes of operation that do not vibrate.
- Reduce the need for assembly practices by assembling off site where possible.

Building work which can be heard at the boundary of the site will not be carried out on Sundays and Bank Holidays and will be carried out within working hours as agreed with the council.

4.1.7 Rubbish Removal and Recycling:

An important part of the site management process involves site cleansing, rubbish removal, and recycling.

Materials such as stock-bricks, re-useable timbers, steel beams etc are to be recycled where possible.

To reduce and manage site waste:

- All material removed from site is to be taken to waste recycling stations and separated for recycling where possible. Records of the waste recycling will be provided by the recycling stations.
- Waste types to facilitate recycling activities.
- All Duty of Care and other legal requirements are complied with during the disposal of wastes.
- Suppliers are to be consulted to determine correct / appropriate disposal routes for waste products and containers.

It will be the responsibility of each contractor to keep the site area under his control safe from build-up of rubbish.

Form

Appendix A - PRELIMINARY STRUCTURAL SCHEME DRAWINGS WITH OUTLINE SEQUENCE

Form

Appendix B - GEA SI, BIA AND GMA REPORT

Form

Appendix C - THAMES WATER ASSET LOCATION SEARCH

Appendix D - BUILDING DAMAGE CLASSIFICATION TABLE

Classification of visible damage to walls (after Burland et al, 1977, Boscardin and Cording, 1989, and Burland, 2001)

Category of damage	Description of typical damage (ease of repair is underlined)	Approximate crack width (mm)	Limiting tensile strain, ε_{lim} (%)
0 Negligible	Hairline cracks of less than about 0.1 mm are classed as negligible	<0.1	0.0 to 0.05
1 Very slight	**Fine cracks that can easily be treated during normal decoration.** Perhaps isolated slight fracture in building. Cracks in external brickwork visible on inspection	<1	0.05 to 0.075
2 Slight	**Cracks easily filled. Redecoration probably required.** Several slight fractures showing inside of building. Cracks are visible externally and **some repointing may be required externally** to ensure weathertightness. Doors and windows may stick slightly.	<5	0.075 to 0.15
3 Moderate	**The cracks require some opening up and can be patched by a mason. Recurrent cracks can be masked by suitable lining. Repointing of external brickwork and possibly a small amount of brickwork to be replaced.** Doors and windows sticking. Service pipes may fracture. Weathertightness often impaired.	5 to 15 or a number of cracks >3	0.15 to 0.3
4 Severe	**Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows.** Windows and frames distorted, floor sloping noticeably. Walls leaning or bulging noticeably, some loss of bearing in beams. Services pipes disrupted.	15 to 25, but also depends on number of cracks	>0.3
5 Very severe	**This requires a major repair, involving partial or complete rebuilding.** Beams lose bearings, walls lean badly and require shoring. Windows broken with distortion. Danger of instability.	Usually >25, but depends on numbers of cracks	

Notes

1 In assessing the degree of damage, account must be taken of its location in the building or structure.

2 Crack width is only one aspect of damage and should not be used on its own as a direct measure of it.

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Appendix E – CALCULATIONS

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Appendix F - FRA