ALPHA
STRUCTURAL ENGINEERS

Basement Impact Assesment

Project No	24685
Description	Ground Floor Extension & New Basement
Client Name	
Address	102 Green Lane Northwood Middlesex HA6 1AJ
Date	12.2024
Prepared By	Kemal Erturk

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1. Introduction

Introduction

This report has been prepared for Mr.Kais in relation to the proposed basement extension and lightwell's proposed to the front and rear of the property at
102 Green Lane Northwood Middlesex HA6 1AJ.

No responsibility is accepted to any third party for all or part of this study in connection with this or any other development.

Alpha Engineers Ltd was appointed by its client to provide a Basement Impact Assessment (BIA) to achieve Planning Approval at said property.

This report has been structured to cover the topics outlined below:

1. Identify the location of the development in relation to an aquifer or a water course; explain how it will impact on flooding and drainage including measures to reduce the risk of flooding to the proposed basement and neighbouring properties;

2. Provide details of ongoing drainage measures and their maintenance regimes; include appropriate basement construction methods to maintain the structural stability of the host building and neighbouring properties;

3. Include details of how noise, disruption and vibrations to neighbouring properties would be minimised, during the construction process.

4. The assessment should also detail the programme duration, construction vehicles' routing and movements, the number and types of construction vehicles; site access and egress arrangements, and any temporary arrangements proposed for the highway.

5. Basement developments must consider the impact of the proposal on flooding, ground water and surface runoff, structural stability and basement flooding."

Note that the structural 'design' is sufficiently comprehensive for planning purposes only.

It is not intended as a fully worked up design to comply with current Building Regulations

Documents Provided to Alpha Engineers Ltd for the BIA

The following documents have been referred to during the preparation of this report:

1. Drawings of the Existing Structure prepared by
Phiras Alkurdi <admin@archicon.co.uk>

2. Drawings of the Proposed Structure prepared by
Phiras Alkurdi admin@archicon.co.uk

2. About Us

ALPHA
STRUCTURAL ENGINEERS

About us

Alpha Engineers ltd

Alpha Structural Engineering was established in 2022. Our team has structural engineers, cad technicians and +40 years experienced as consultant structural engineers. Our director, Kemal Erturk, has finished more than +1000 projects in UK (mainly residential).

Our primary focus is on providing the Structural Drawings & Calculations to comply with Building Regulation Part A (Structure). The most common project types are;

- Extension
- Loft Conversion
- Basement Conversion
- New Development
- Wall Removal
- Chimney Removal

We have extensive experience in successfully completing basement projects across the London area. This expertise makes us particularly well-equipped to handle the unique challenges posed by London clay and similar ground conditions.

Services

- Structural Drawings & Calculations to comply with Building Regulation Part A (Structure).
- Steel Structure & Connection Design
- Foundation Design (Trench/strip/raft/pad)
- Steel Frame Design or simple beam design
- Catnic/concrete lintel design
- Timber Structure Design
- Concrete Structure Design

info@alphaengineers.co.uk
+44 7900060358

My professional Organisation Memberships.

- ICE (Institution of Civil Engineers, Membership No: 92850631)

https://www.ice.org.uk/

to check my membership, you need to contact with ICE and ask for my membership number

- CABE (Chartered Association of Building Engineers, Registrant Number: 69797623)

https://cbuilde.com/

to check my membership, you need to contact with CABE and ask for my membership number

The company's professional indemnity and public liability insurance

https://www.dropbox.com/scl/fo/34r4jx90vuha3sct3a1nc/ALOAmiNqV3RfBhMCPJKBuZc?rlkey=648se7dh3eutceu2c4bt8owta&dl=0

3. Existing Structure

The Property in question is an existing two Storey Detached Property. The only recorded use for the property is for residential accommodation. The existing Structure is of traditional construction, comprising loadbearing masonry party, front and rear elevation walls. These walls support a timber pitched roof and timber suspended floors. There are a few areas where the structure is slightly questionable however the proposed internal alterations and exterior remedial works will resolve these issues.

The existing bressummer beam will be exposed and its condition verified as part of the works. If the bressummer beam is found to be defective or undersized it will be replaced. The floor and roof have been inspected by a Structural Engineer from Alpha Enigneers ltd. For the most part the structure is in a good condition for a property of this age.

As mentioned above there are some areas where works are required to make the existing property structurally safe. These include new ground floor rear extension, installation of new skylights, internal load bearing-wall openings and new basement.

The existing foundations are in the form of traditional trench footings

Trial holes to be excavated to expose the existing foundations before the construction stage. The trial holes will also allow the geotechnical engineers to confirm the soil property present on site. A trial hole log will be provided as part of the soils report that is being prepared. The structural calculations provided by Alpha Engineers relating to basement are subject to the findings of the soil investigation report.

Please refer to Appendix A for the site location and site photos. Please refer to Appendix B for the existing and proposed drawings.

4. Assessment of Flooding, Aquifer's & Water courses

Determine the proximity of the development to an aquifer or a watercourse; describe its effects on flooding and drainage, including strategies to mitigate flood risks to the proposed basement and adjacent properties.

Basement developments must evaluate the proposal's influence on flooding, groundwater, surface runoff, structural stability, and basement water ingress.

The proposed development is located in Flood Zone 1. The site is not at fluvial flooding

IMPACT QUESTION	ANSWER	JUSTIFICATION	REFERENCE
1.Will the proposed developmentbe subject to flooding?	NO	The proposed development is located in Flood Zone 1. The site is not at fluvial flooding	APPENDIX C MP1. ENVIRONMENT AGENCY MAP
2. Is the site located directly above an aquifer?	NO	The site is not directly situated under an aquifer as the bed rock is defined as un-productive.	APPENDIX C MP2 & MP3. AQUIFER DESIGNATION MAP (BEDROCK)
3. Will the proposed basement extend beneath the water table?	NO	No groundwater was recorded in the boreholes records.	APPENDIX D
4. Is the site more than 100m from the nearest watercourse/well or spring?	YES	The site is further than 100m from the nearest water course	-
5. Will the proposed basement development result in a change in the proportion of hard surface/paved areas?	YES	The proposed development will increase the proportion of the Site that is built on; therefore the proportion of impermeable surfaces will increase	-
6. As part of the site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to ground (e.g. via soakaways and/or SUDS)?	NO	there will be no increase of water transfer from surface to ground as a result of these proposed works.	
7. 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 level of any local pond?	NO	There are no local ponds or springs hydraulically connected to the site.	-
8. 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?	YES	The changes in the extent of buildings on the Site and the implementation of a drainage scheme to attenuate runoff in an underground facility will result in a decrease to the profile of surface water received by adjacent properties. There are no downstream watercourses in proximity to the site that could be affected.	

9. Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	NO	The quality of surface water being received by adjacent properties or downstream watercourses will not be affected by the proposed development.	
10. Is the Site in an area known to be at risk from surface water flooding or is it at risk from flooding, for example because the proposed basement is below the static water level of a nearby surface water feature?	NO	The site is not located in a surface water flood risk area for an event with a probability of between 0.1% and 1.0% each year. The development is not at risk of surface water flooding.	APPENDIX C MP.4 SURFACE WATER
11. As part of the Site drainage, will more surface water (e.g. rainfall and runoff) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?	NO	The volume of surface water from buildings and hardstanding will not discharge to the ground	

There is no evidence of a historic watercourse near the site, and no groundwater was encountered during the site investigation, which reached a depth of 3.3m below ground level. This indicates that the proposed basement and lightwells will not affect the groundwater, which is free to flow beneath the basement. It is worth noting that, despite the groundwater level being lower than the basement and not encountered during the investigation, we still recommend designing the basement to resist hydrostatic pressure.

The site is not directly located above an aquifer, as the bedrock is classified as unproductive. Borehole records for the area indicate groundwater strikes at a depth of 10m below ground level in the clay. There is no watercourse, well, or spring within 100m of the site. However, the proposed change in permeable area will impact the volume of rainfall discharging into the ground.

The proposed development will incorporate an underground drainage system to attenuate runoff and mitigate the impacts identified during the scoping stage, including changes to inflows, hard-surfaced areas, and surface water flows. There is no identified risk of surface water flooding to the proposed development.

5. Structural Stability

Structural stability

The proposed development includes ongoing drainage measures, supported by a comprehensive maintenance regime to ensure their effectiveness. Additionally, appropriate basement construction methods will be implemented to maintain the structural stability of the host building and neighboring properties.

For detailed structural measures, please refer to Appendix E, which contains our structural method statement. This statement evaluates how the structural stability of the existing structure will be maintained during both construction and permanent works. Appendix E also includes the following: Basement Retaining Wall Calculations, General Details, Underpinning Hit-and-Miss Layout, and Underpinning Sequence Drawings. Furthermore, it provides general construction notes and additional information outlining the regulations to which the construction must adhere.

Given the underlying geology and the potential influence of trees on the proposed development, seasonal shrink-swell effects are likely. Precautions against soil shrinkage and swelling, as well as uplift on basement foundations, will be implemented in compliance with NHBC Standards Chapter 4.2.

The development will deepen the foundations on the site, although the foundation depths of adjacent properties remain unknown. The basement design will account for the loading from adjacent buildings and incorporate measures to prevent any ground movement, ensuring the stability of all surrounding structures.

6. Noise, Disruption and Vibrations

Include details of how noise, disruption and vibrations to neighbouring properties would be minimised, during the construction process.

Vibrations:

Due to the sectional staged approach for constructing the basement, the risk of movement between the basement and the neighbour's foundations is negligible.

We are not able to state that the neighbours will have no damage however the existing properties are in good order and we consider (based on previous projects of this nature) that any cracking would be within Category 1 of the Burland Scale. This is defined as fine cracks which are easily treated during normal decoration and forms part of the BRE Digest 251.

Noise and Disruption:

The contractor must ensure that working hours adhere to Hillingdon's council's code of practise for construction sites. The contractor must identify and implement measures to minimise noise and vibration impacts throughout the construction process. Such measures are related to but not limited to the selection of plant. For example, selecting plant with the lowers decibels possible and using acoustic dampening methods such as acoustic screens and covers whenever possible.

We suggest that the excavation is carried out using small plant or by hand, no large machinery is to be used.

The main contractor and any subcontractors shall take reasonable steps to minimise any noise disruption to adjacent occupiers.

1. Design and use of site hoardings and sound shielding around noisy work areas. Keep doors and windows closed where possible.

2. Where it is necessary to carry out noisy activities, identify any adjacent neighbours in advance and give notice.

3. Operatives working in noisy areas will be monitored to ensure they are wearing the necessary protective equipment and that they are not exceeding their permitted exposure periods. Careful selection of quiet equipment and processes, programming, and the use of local screening of plant:

4. Use, where practical, electrically powered tools rather than air powered tools - electrical tools do not need a compressor unit;

5. Use relatively low power handheld breaking tools for demolitions.

6. Use, where practical, non-percussive methods for removing concrete, including diamond saws, diamond drills, concrete bursters and concrete crunchers;

7. Using cutting methods for demolition, such as sawing or water-jetting, to eliminate the use of high volume pneumatic and hydraulic breakers, before further breaking down of demolition materials is carried out off-site using conventional techniques.

8. Adoption of manual excavation techniques instead of diesel powered excavators, where appropriate.

All plant and equipment associated with the construction works should be properly maintained, provided with effective silencers and operated in such a manner as to avoid causing excessive noise emission.

Where plant has been designed to operate with engine covers to reduce noise, these should be used and remain closed while the plant is in operation.

Unless otherwise directed by the project manager, items of plant in intermittent use should be shut down during idle periods.

No externally audible radios or other audio equipment will be allowed on site. Audible warning systems, such as vehicle reversing sirens, would normally be set to as low a setting as it compatible with safety requirements. The transport of materials on or off site should be generally taking place during normal daytime working hours and would use routes agreed in the Construction Traffic Management Plan.

Site personnel should be informed about the need to minimise noise to the neighbouring community as well as about the health hazards of exposure to excessive noise. Their training should include advice relating to the proper use and maintenance of tools and equipment, the positioning of machinery on site to reduce noise emissions to neighbouring communities, and the avoidance of unnecessary noise when carrying out manual operations and when operating plant and equipment. Construction contractors should adhere to the codes of practice for construction working set out in BS 5228 'Code of Practice for noise and vibration control on construction and open sites' insofar as these are reasonably practicable and applicable to the construction works.

Dust management and mitigation:

Water should be used as a suppressant to reduce the amount of dust created during construction activities for example when diamond disk cutters are used and when excavation is carried out, the ground should be lightly wetted prior to digging. The contractor should ensure that they comply with The Control of Pollution Act, 1972; The Health & Safety at Work Act, 1974; The Environmental Protection Act, 1990; Construction Design and Management Regulations, 1994 and The Clean Air Act, 1993.

The contractor should ensure that Noise, vibration, and dust monitoring is implemented, and all skips are covered.

The contractor shall make reasonable attempts to wash and clean vehicles before leaving site and to make sure vehicles are not left idling.

Measures shall be taken to avoid creating a dust nuisance including the following practices:

1. Provision of easily cleaned hard-standing areas for vehicles
2. Demolition activities will use water as a dust suppressant;
3. Adjacent road surfaces will be frequently swept clean;
4. All loads delivered to or collected from the site will be covered where appropriate;
5. All road vehicles will be requested to comply with set emission standards;
6. Skips will be securely covered;
7. The air quality within the site will be continually monitored

8. Establishing and enforcing appropriate speed limits over all unmade surfaces.

Management of Mud and site runoff

Measures will be adopted to prevent site runoff of water or mud these are listed below:

Measures shall be taken to minimise mud on roads. These will include, but not necessarily be limited to:

1. The provision of easily cleaned hard-standings for vehicles parking next to the site. This also serves to minimise dust nuisance;

2. The provision of wheel washing facilities

3. The use of an approved mechanical jet washer to clean the site hard-standing and any mud or debris deposited by the site vehicles on roads or footpaths in the vicinity of the site.

4. The adequate sheeting of each load of spoil removed, to prevent spoil falling off during its journey; and measures will be taken to ensure that mud and detritus is not swept into gullies.

Fly-tipping will not be permitted. Loads must only be deposited at licensed tips or to designated sites. Deposition will be in accordance with the requirements of the Environment Agency under the Landfill (England and Wales) Regulations 2002.

7. Logistics and Site Management

Logistics and Site Management

The assessment should also detail the programme duration, construction vehicles' routing and movements, the number and types of construction vehicles; site access and egress arrangements, and any temporary arrangements proposed for the highway.

The contractor will be required to submit their own Construction Management Plan and Site Waste Management Plan prior to the work commencing on site. The contents of this plan must be in accordance with the London Borough of Hillingdon's guidance and be agreed by them. The Contractor will be required to follow the principles and adhere to The London Borough of Hillingdon's Code of Practice for Construction Sites as well as the requirements of this basement impact assessment in relation to sequencing and temporary works.

The contractor shall be required to establish a local point of contact for any enquires and or complaints relating to the construction works and nominate a member of staff to liaise with the Council, local residents and commercial operators.

They will be required to circulate a regular newsletter explaining the forthcoming programme of works, progress so far and key events scheduled in the next phase of works. Prior to any unavoidable noisy periods of activity, the contractor will be required to write to the local residents to inform them of these works.

The main contractor shall display on the site boundary details of their name, address and telephone number, together with an indication of the likely duration of the works.

The Contractor shall avoid road closures where practical. As the site is set back from the main road and accessed via a passageway with a courtyard to the rear, this area can be used for vehicular access and parking whilst unloading etc. For any necessary road closures, the Contractor shall follow the council's procedures with regards to advance notification.

The contractor will need to produce a Traffic Management Plan. This should carefully consider vehicle movements and their impact on other road users, pedestrians, residents and the environment. Mitigation measures should be implemented where necessary.

Access to the site is to be via the front of the property on Hinton Road. All personnel, plant and equipment will be brought to and from site via this route. The size of plant and construction methods used will reflect this constraint.

Deliveries and collections will be scheduled to coincide with normal working hours and the Contractor shall aim to stagger vehicle movements to avoid queueing outside the site access point.

The contractor will be required to be signed up to the Considerate Constructors Scheme.

The contractor will be required to demonstrate due diligence and commitment toward minimising environmental disturbance to local residents and will be required to complete the work in accordance with the Considerate Constructors Scheme standards.

All temporary works are to be designed by an engineer with appropriate qualifications.

Movements of surrounding structures should be monitored throughout construction, the results reviewed, and action taken to mitigate movements greater than anticipated.

A temporary hoarding will be erected to safely secure the site.

In terms of vehicles a list has been provided below of anticipated vehicles:

Mini excavator, Site vans, Delivery lorries/trucks, Conveyors (Not a vehicle but is a form of plant), Concrete mixer truck for deliveries Skip delivery trucks.

With regards to the duration of the works the estimated completion time for a project of this type is 10 months. Below is a rough program detailing anticipated scheduling of the various phases.

Month 1: Prelims, Mobilisation, Commencement works.

Month 2: Demolition and strip out as the same time Excavation can commence.

Month 3: Remaining excavation & commencement of underpinning formed of the reinforced concrete retaining wall as per our design

Month 4: Underpinning continues, Underground drainage and pumps

Month 5: Installation of the Underground drainage and pumps continues

Month 6: Completion of the Basement Structure and the commencement of the demolition and steel works to the upper floors

Month 7: First Fix Electrical works and plastering

Month 8: Second Fix and Decoration at the same time refurbishing of the windows can be carried out Month 9: Stairs, and lightwell decoration, Joinery, skirtings, architraves and floors

Month 10: Installation of carpets and completion of snagging works.

8. Construction Sequence Plan

Construction Sequence Plan

General Scope. It is proposed to construct a basement and refurbish the existing structure at 102 Green Lane Northwood Middlesex HA6 1AJ.

Materials and debris present within the structures will consist predominantly of bricks, plaster and soil. The contractor will ensure that they are safely removed from the site and that they are disposed of at an appropriate licenced waste site.

Alpha Engineers does not take any responsibility for the construction sequence should the contractors work vary from what has been described below.

It is the contractors' obligation to contact Alpha Engineers should there be any doubts over the demolition sequence or the drawings.

Preparation works before the structural demolition. All workers employed to work on the project will be briefed about the project and be informed of the potential hazards by attending site induction sessions.

All equipment will be tested and properly stored and maintained over the duration of the demolition. Protective screen covers will be placed, where necessary.

At all times during the construction works, the works will be supervised by a competent supervisor that will be appointed by the main contractor.

Only the required workers are to be present during any demolition works. Access points will be established and only worker(s) who have been inducted with the authority of the Project Manager or supervisor may enter these zones. Preparation works before the structural demolition.

All workers employed to work on the demolition will be briefed about the project and be informed of the potential hazards by attending site induction sessions.

Construction sequence It is proposed to install the steel beams at ground floor level and fully support the superstructure before excavating and constructing the new basement.

Party wall Underpinning It is proposed to underpin the existing party walls at the perimeter of the building by casting concrete bases below the existing foundations.

The projecting existing foundations should be carefully cut off using a handheld hammer and steel chisel after drypacking.

The underpinning will be carried out with individual bases being cast in the hit and miss sequence as shown in the drawings provided.

- A bay should be excavated and then cast with concrete using braced timber shutters at the sides, maintain a 50mm gap below the underside of the cleaned footing to allow for drypack. Allow for minimum 24 hours to cure and then before excavating the second adjacent bay, underpin/dry pack as the first bay.

The stems and bases are joined by distribution reinforcement hence every third bay, a full width Slimshor prop should be used to restrain the RC walls during the construction. Once the ground slab has been casted, both the Slimshor and Acrow propscan can be safely removed. Temporary works specification: the structural specification of the permanent works is provided by the permanent works Engineer.

By following our construction sequence, the following material will be used. - 203UC 46kg/m steel needles – at minimum S275 steel should be used - Super Props – They can be hired from HSS (www.hss.com/hire/p/super-prop). Similar props could be used, once approved by the Engineer. At minimum they should have a minimum safe working load of 118kN .

9. Conclusion

This Basement Impact Assessment has comprehensively analyzed and addressed the typical challenges associated with basement extensions. The report outlines practical and effective mitigation strategies to minimize the risks inherent to such works, including structural stability concerns and potential disturbances to neighboring properties. It provides detailed sequencing methods designed to maintain the integrity of the existing and surrounding structures throughout the construction process.

The report emphasizes best practices to ensure minimal disruption to neighboring properties, promoting a considerate and professional approach. A structural scheme and construction sequence have been meticulously prepared to demonstrate that the proposed works can be executed safely by a competent contractor adhering to the guidance within this report. We strongly recommend employing a contractor with a proven track record and expertise in basement construction, as these works require a high level of specialization and technical proficiency.

The construction methods detailed in this report represent industry-standard practices for basement extensions and have been rigorously tested and validated. The accompanying Structural Method Statement has been intentionally designed to simplify the construction process, making it both straightforward and efficient. This approach prioritizes buildability while maintaining a high standard of safety and structural integrity, ensuring the project is delivered successfully without compromising quality.

By adhering to the recommendations and methodologies provided in this report, the proposed works can be completed efficiently and with minimal risk, ensuring the satisfaction of all stakeholders involved.

10. APPENDIX A
Site Location Map & Photos of the site

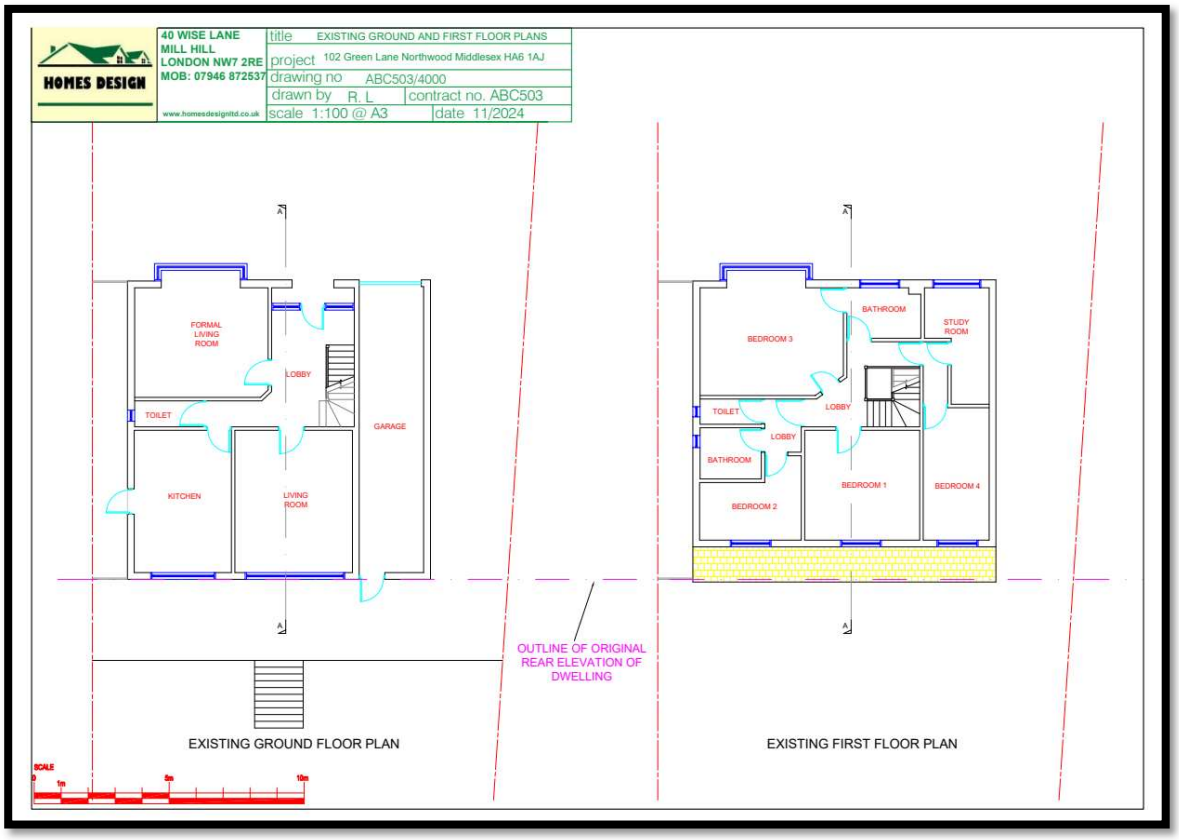

1:1250
OS MAP SCALE
94
96
98
102
26 to 28
23 to 25
20 to 22
23
24
CERVANTES COURT
19 to 17
14 to 16
12 to 10
N

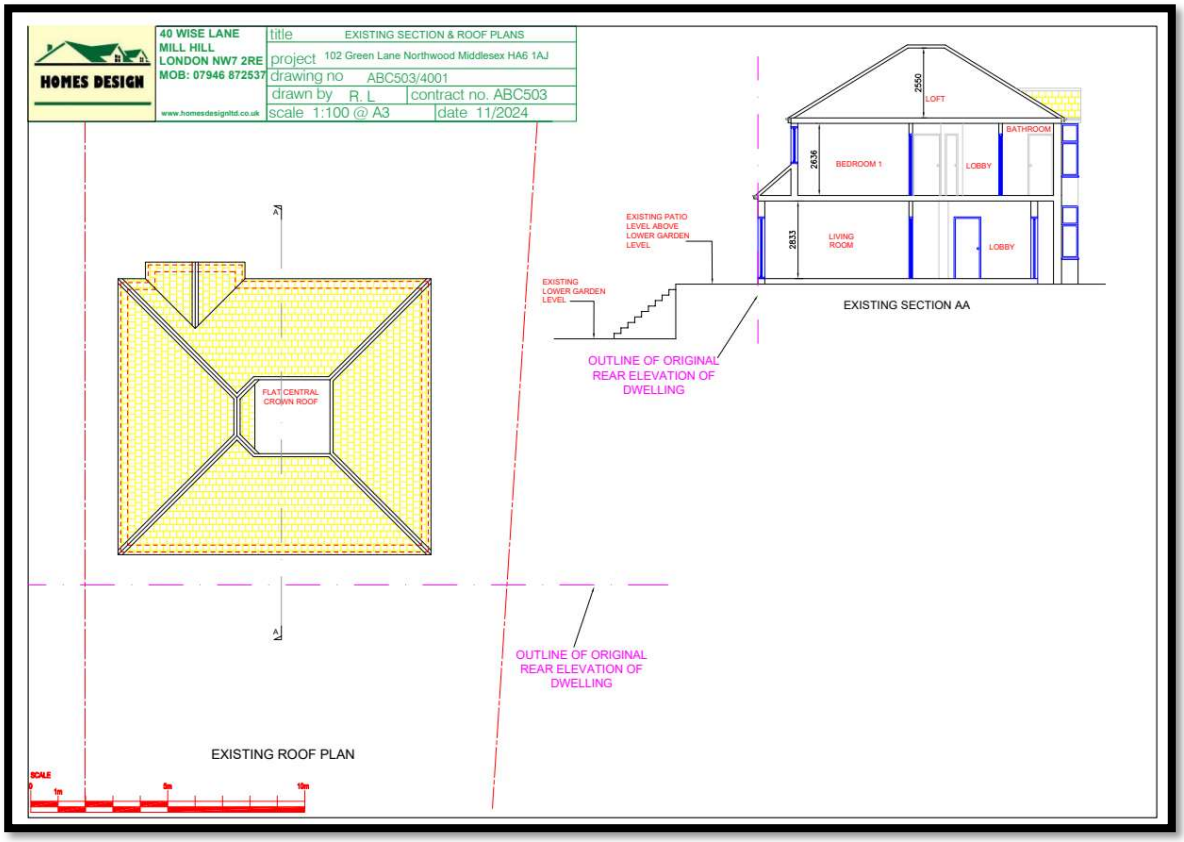
AA1. OS MAP

AA1. Photo 3

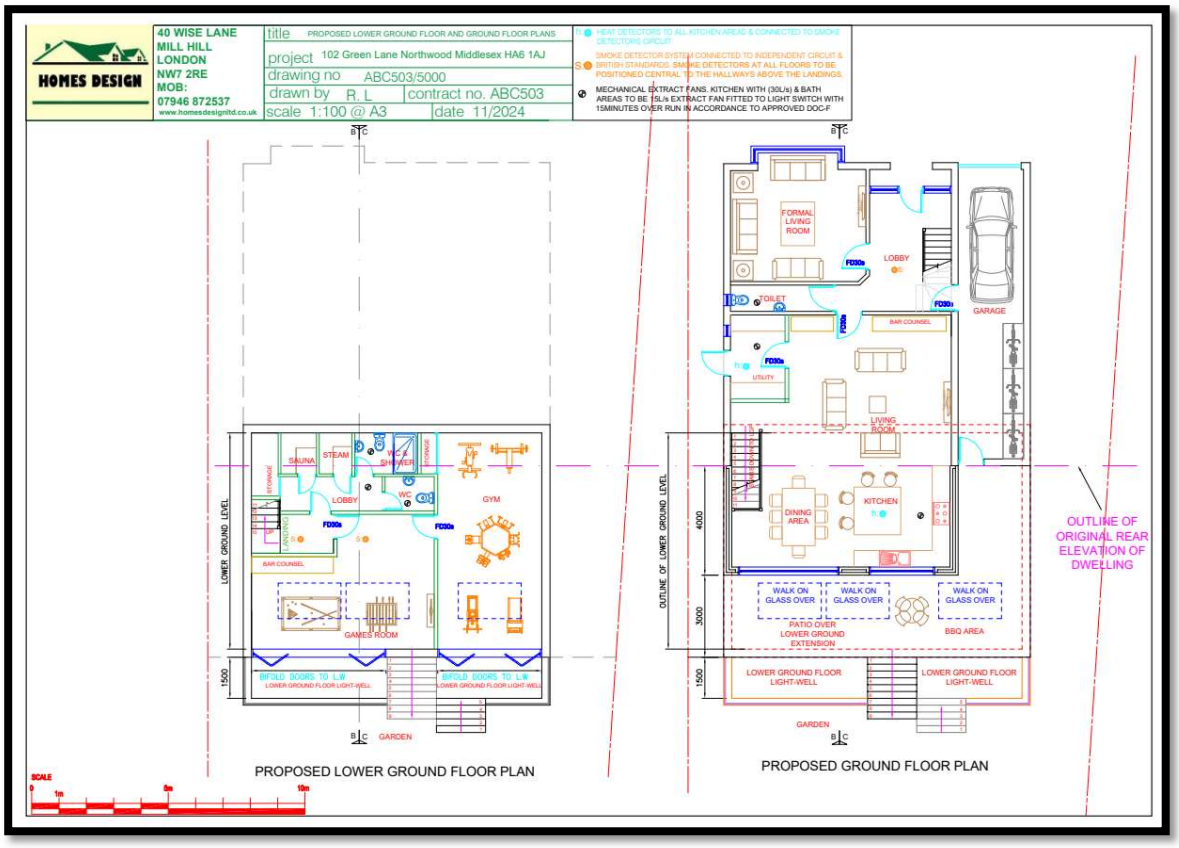
AA1. Photo 5

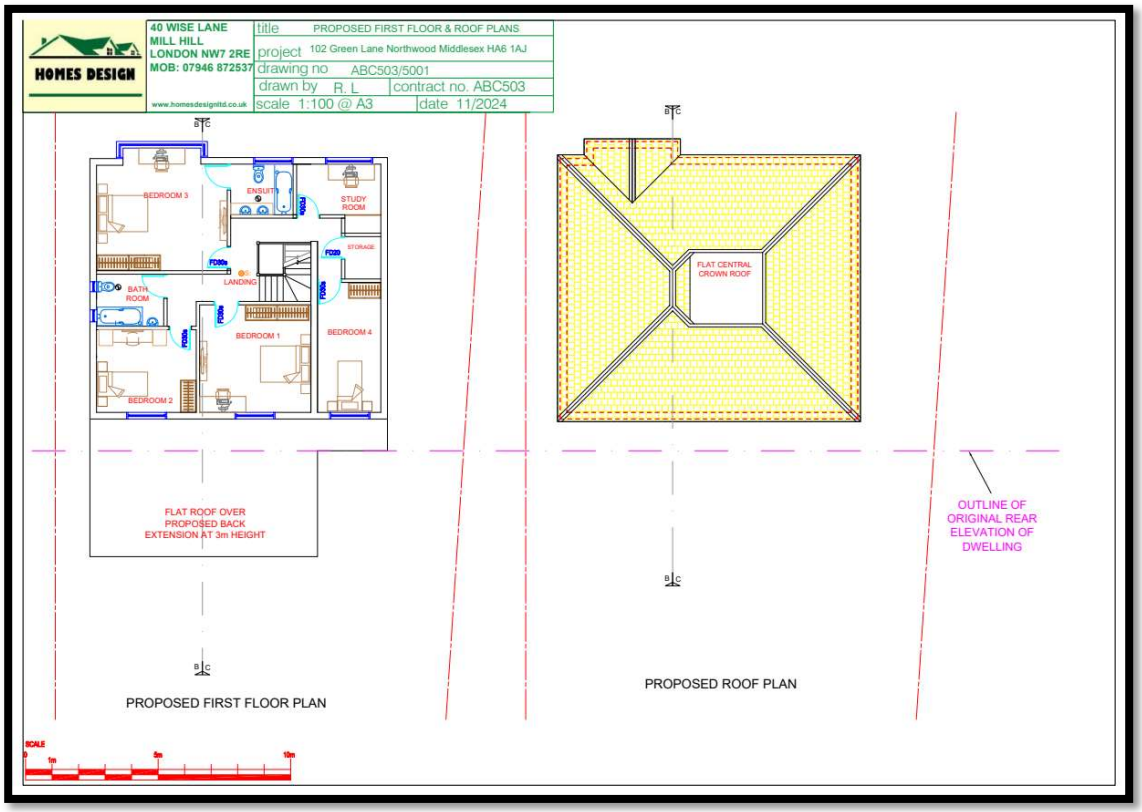
11. APPENDIX B
Architect's Scheme Drawings


HOMES DESIGN
40 WISE LANE
MILL HILL
LONDON NW7 2RE
MOB: 07946 872537
www.homesdesignltd.co.uk
title EXISTING GROUND AND FIRST FLOOR PLANS
project 102 Green Lane Northwood Middlesex HA6 1AJ
drawing no ABC503/4000
drawn by R. L
contract no. ABC503
scale 1:100 @ A3
date 11/2024
FORMAL LIVING ROOM
LOBBY
TOILET
GARAGE
KITCHEN
LIVING ROOM
BEDROOM 3
BATHROOM
STUDY ROOM
TOILET
LOBBY
LOBBY
BATHROOM
BEDROOM 1
BEDROOM 4
BEDROOM 2
OUTLINE OF ORIGINAL REAR ELEVATION OF DWELLING
EXISTING GROUND FLOOR PLAN
EXISTING FIRST FLOOR PLAN
SCALE
0
1m
5m
10m


HOMES DESIGN
40 WISE LANE
MILL HILL
LONDON NW7 2RE
MOB: 07946 872537
www.homesdesignltd.co.uk
title EXISTING SECTION & ROOF PLANS
project 102 Green Lane Northwood Middlesex HA6 1AJ
drawing no ABC503/4001
drawn by R. L
contract no. ABC503
scale 1:100 @ A3
date 11/2024
FLAT CENTRAL CROWN ROOF
2550
LOFT
BATHROOM
2636
BEDROOM 1
LOBBY
EXISTING PATIO LEVEL ABOVE LOWER GARDEN LEVEL
2833
LIVING ROOM
LOBBY
EXISTING LOWER GARDEN LEVEL
OUTLINE OF ORIGINAL REAR ELEVATION OF DWELLING
EXISTING SECTION AA
OUTLINE OF ORIGINAL REAR ELEVATION OF DWELLING
EXISTING ROOF PLAN
SCALE
0
1m
5m
10m


HOMES DESIGN
40 WISE LANE
MILL HILL
LONDON NW7 2RE
MOB: 07946 872537
www.homesdesignltd.co.uk
title EXISTING ELEVATIONS
project 102 Green Lane Northwood Middlesex HA6 1AJ
drawing no ABC503/4002
drawn by R. L
contract no. ABC503
scale 1:100 @ A3
date 11/2024
EXISTING REAR ELEVATION
EXISTING FRONT ELEVATION
EXISTING PATIO LEVEL ABOVE LOWER GARDEN LEVEL
EXISTING LOWER GARDEN LEVEL
EXISTING LEFT SIDE ELEVATION
EXISTING RIGHT SIDE ELEVATION
OUTLINE OF ORIGINAL REAR ELEVATION OF DWELLING
SCALE
0
1m
5m
10m


HOMES DESIGN
40 WISE LANE
MILL HILL
LONDON
NW7 2RE
MOB:
07946 872537
www.homesdesignltd.co.uk
title PROPOSED LOWER GROUND FLOOR AND GROUND FLOOR PLANS
project 102 Green Lane Northwood Middlesex HA6 1AJ
drawing no ABC503/5000
drawn by R. L
contract no. ABC503
scale 1:100 @ A3
date 11/2024
h HEAT DETECTORS TO ALL KITCHEN AREAS & CONNECTED TO SMOKE DETECTORS CIRCUIT
S SMOKE DETECTOR SYSTEM CONNECTED TO INDEPENDENT CIRCUIT & BRITISH STANDARDS. SMOKE DETECTORS AT ALL FLOORS TO BE POSITIONED CENTRAL TO THE HALLWAYS ABOVE THE LANDINGS.
MECHANICAL EXTRACT FANS. KITCHEN WITH (30L/s) & BATH AREAS TO BE 15L/s EXTRACT FAN FITTED TO LIGHT SWITCH WITH 15MINUTES OVER RUN IN ACCORDANCE TO APPROVED DOC-F
SAUNA
STEAM
SHOWER
LOBBY
WC
GYM
BAR COUNSEL
GAMES ROOM
BIFOLD DOORS TO LWELL
LOWER GROUND FLOOR LIGHT-WELL
GARDEN
LOWER GROUND LEVEL
PROPOSED LOWER GROUND FLOOR PLAN
FORMAL LIVING ROOM
LOBBY
TOILET
GARAGE
UTILITY
LIVING ROOM
DINING AREA
KITCHEN
WALK ON GLASS OVER
PATIO OVER LOWER GROUND EXTENSION
BBQ AREA
OUTLINE OF LOWER GROUND LEVEL
4000
3000
1500
OUTLINE OF ORIGINAL REAR ELEVATION OF DWELLING
PROPOSED GROUND FLOOR PLAN
SCALE
0
1m
5m
10m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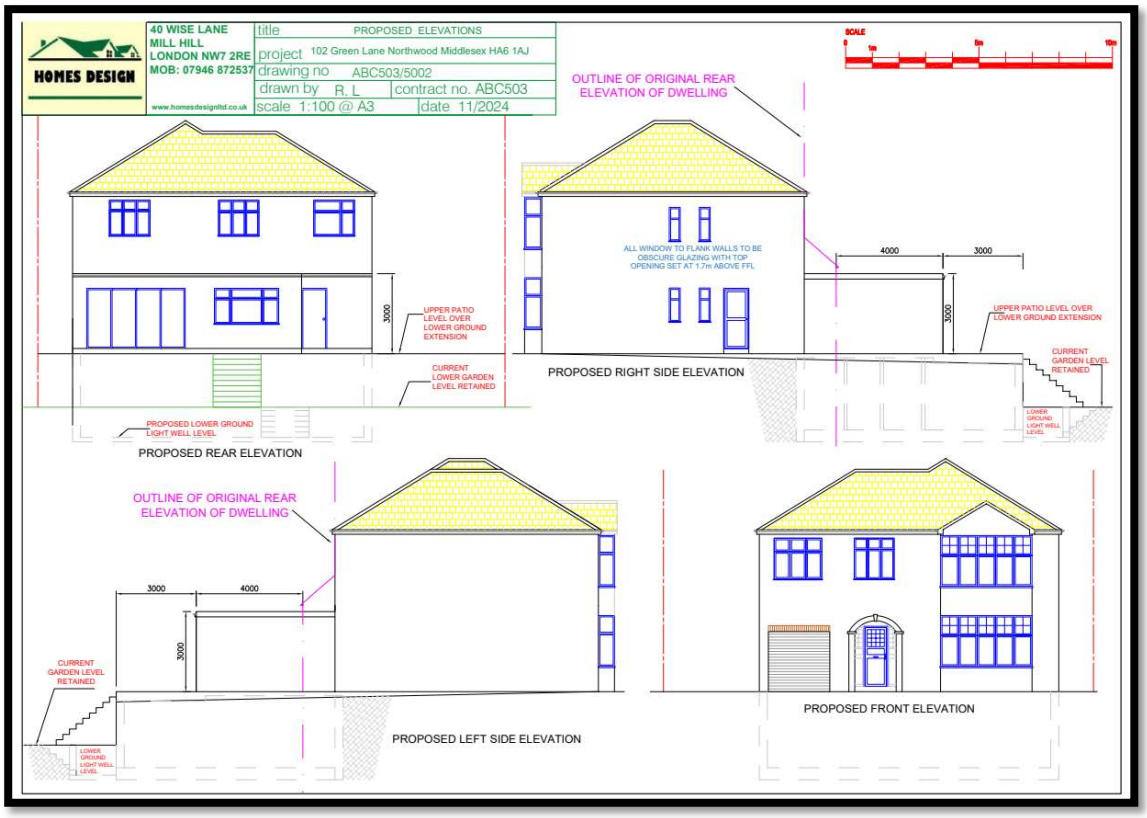
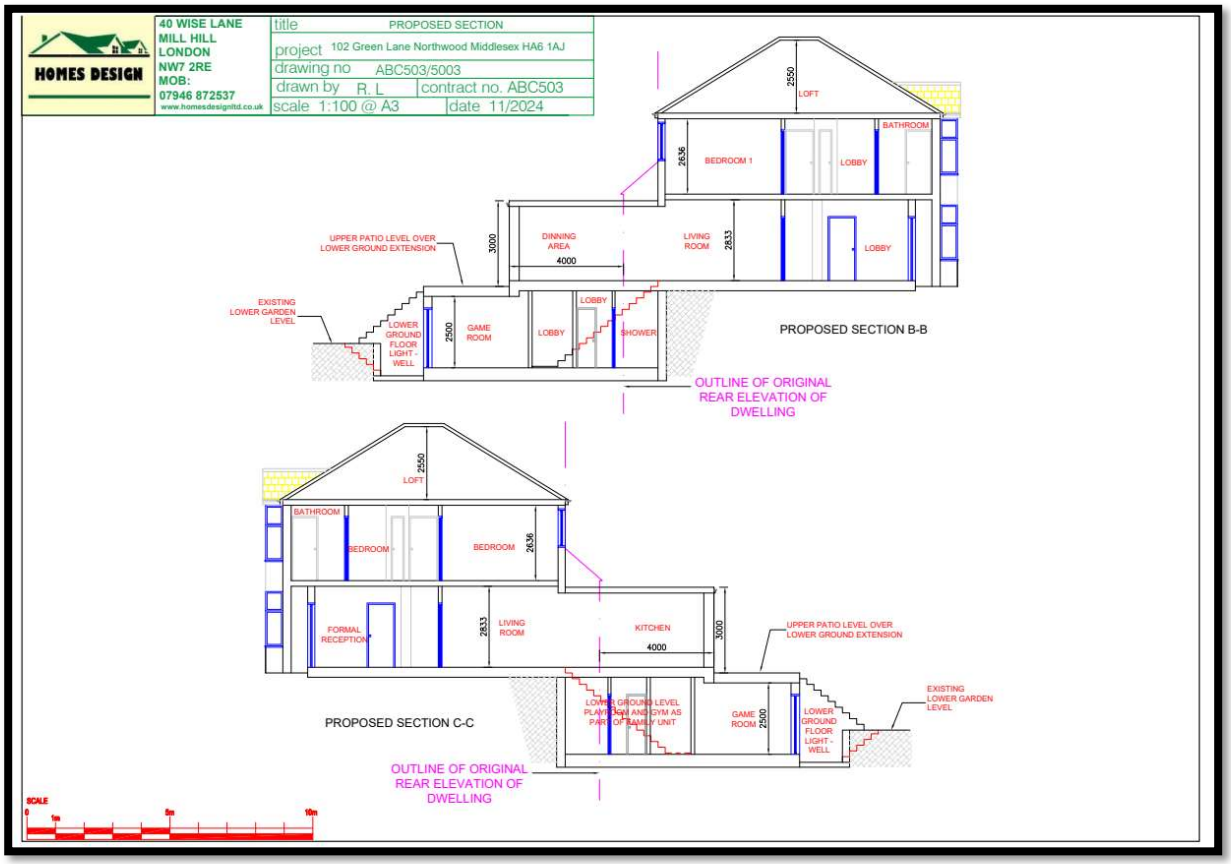
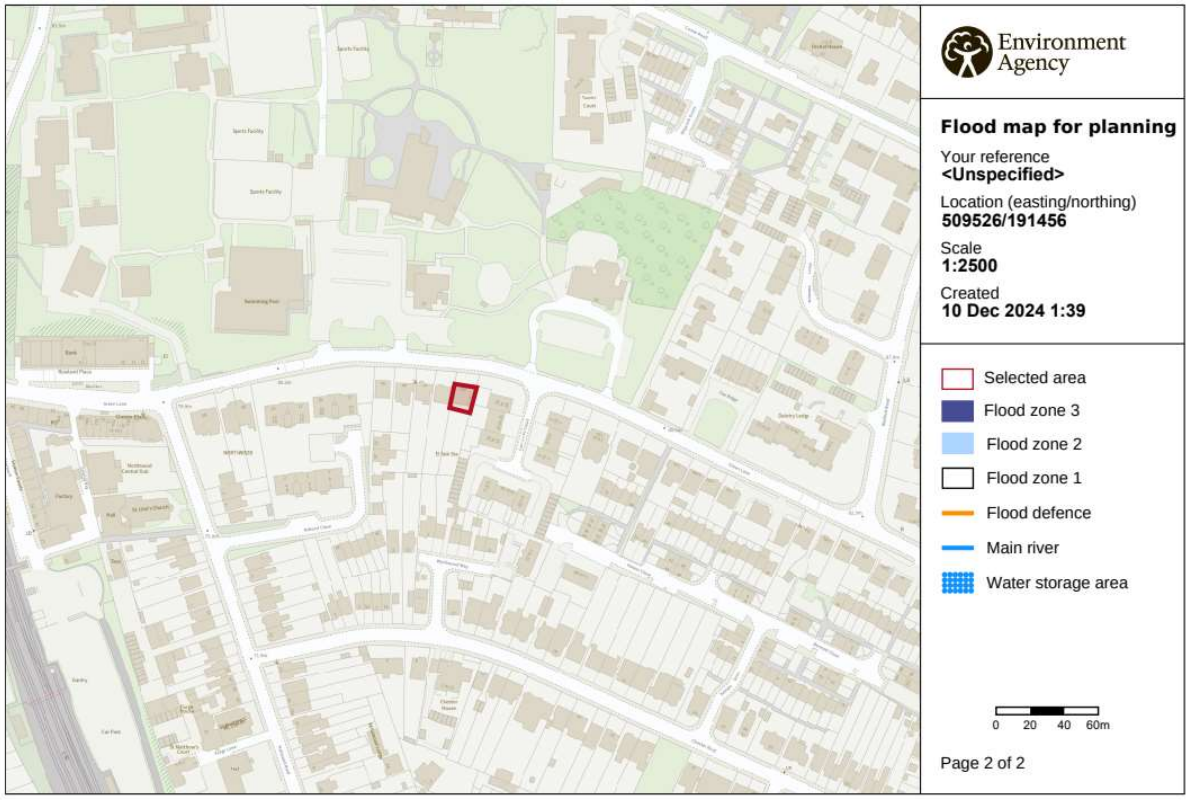
drawn by R. L
contract no. ABC503
scale 1:100 @ A3
date 11/2024
BEDROOM 3
ENSUITE
STUDY ROOM
STORAGE
LANDING
BATH ROOM
BEDROOM 1
BEDROOM 4
BEDROOM 2
FLAT ROOF OVER PROPOSED BACK EXTENSION AT 3m HEIGHT
PROPOSED FIRST FLOOR PLAN
FLAT CENTRAL CROWN ROOF
OUTLINE OF ORIGINAL REAR ELEVATION OF DWELLING
PROPOSED ROOF PLAN
SCALE

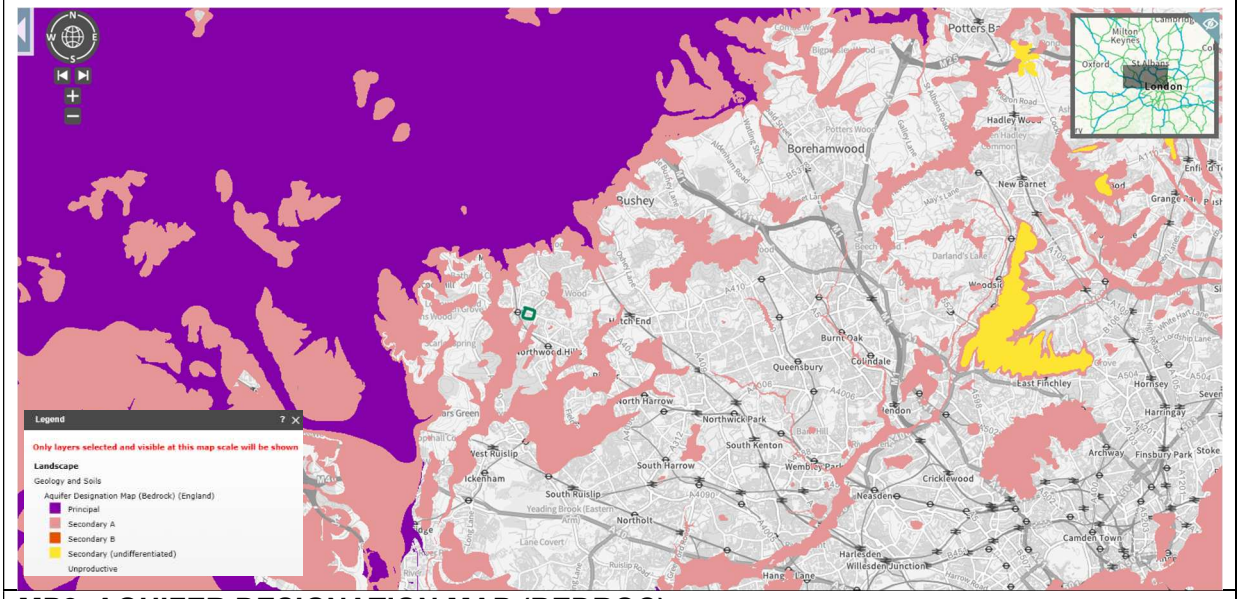

HOMES DESIGN
40 WISE LANE
MILL HILL
LONDON NW7 2RE
MOB: 07946 872537
www.homesdesignltd.co.uk
title PROPOSED ELEVATIONS
project 102 Green Lane Northwood Middlesex HA6 1AJ
drawing no ABC503/5002
drawn by R. L
contract no. ABC503
scale 1:100 @ A3
date 11/2024
SCALE
OUTLINE OF ORIGINAL REAR ELEVATION OF DWELLING
3000
UPPER PATIO LEVEL OVER LOWER GROUND EXTENSION
CURRENT LOWER GARDEN LEVEL RETAINED
PROPOSED LOWER GROUND LIGHT WELL LEVEL
PROPOSED REAR ELEVATION
ALL WINDOW TO FLANK WALLS TO BE OBSCURE GLAZING WITH TOP OPENING SET AT 1.7m ABOVE FFL
4000
3000
UPPER PATIO LEVEL OVER LOWER GROUND EXTENSION
CURRENT GARDEN LEVEL RETAINED
LOWER GROUND LIGHT WELL LEVEL
PROPOSED RIGHT SIDE ELEVATION
OUTLINE OF ORIGINAL REAR ELEVATION OF DWELLING
3000
4000
3000
CURRENT GARDEN LEVEL RETAINED
LOWER GROUND LIGHT WELL LEVEL
PROPOSED LEFT SIDE ELEVATION
PROPOSED FRONT ELEVATION


HOMES DESIGN
40 WISE LANE
MILL HILL
LONDON
NW7 2RE
MOB:
07946 872537
www.homesdesignltd.co.uk
title PROPOSED SECTION
project 102 Green Lane Northwood Middlesex HA6 1AJ
drawing no ABC503/5003
drawn by R. L
contract no. ABC503
scale 1:100 @ A3
date 11/2024
2550
LOFT
BATHROOM
BEDROOM 1
2636
LOBBY
UPPER PATIO LEVEL OVER LOWER GROUND EXTENSION
3000
DINNING AREA
4000
LIVING ROOM
2833
LOBBY
EXISTING LOWER GARDEN LEVEL
LOWER GROUND FLOOR LIGHT - WELL
2500
GAME ROOM
LOBBY
LOBBY
SHOWER
PROPOSED SECTION B-B
OUTLINE OF ORIGINAL REAR ELEVATION OF DWELLING
2550
LOFT
BATHROOM
BEDROOM
BEDROOM
2636
FORMAL RECEPTION
2833
LIVING ROOM
KITCHEN
4000
3000
UPPER PATIO LEVEL OVER LOWER GROUND EXTENSION
LOWER GROUND LEVEL PLAYROOM AND GYM AS PART OF FAMILY UNIT
GAME ROOM
2500
LOWER GROUND FLOOR LIGHT - WELL
EXISTING LOWER GARDEN LEVEL
PROPOSED SECTION C-C
OUTLINE OF ORIGINAL REAR ELEVATION OF DWELLING
SCALE
0
1m
5m
10m

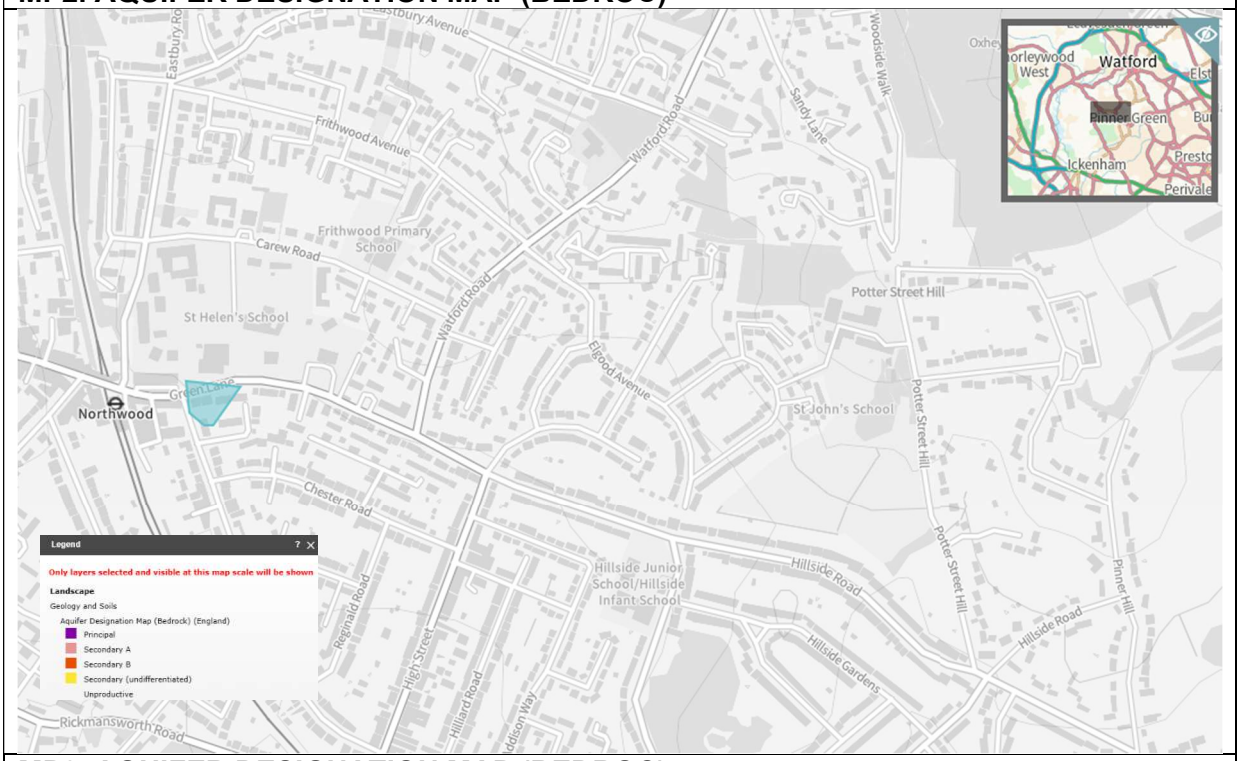
12. APPENDIX C
Ground, Surface water & Aquifer Maps



MP1. ENVIRONMENT AGENCY MAP



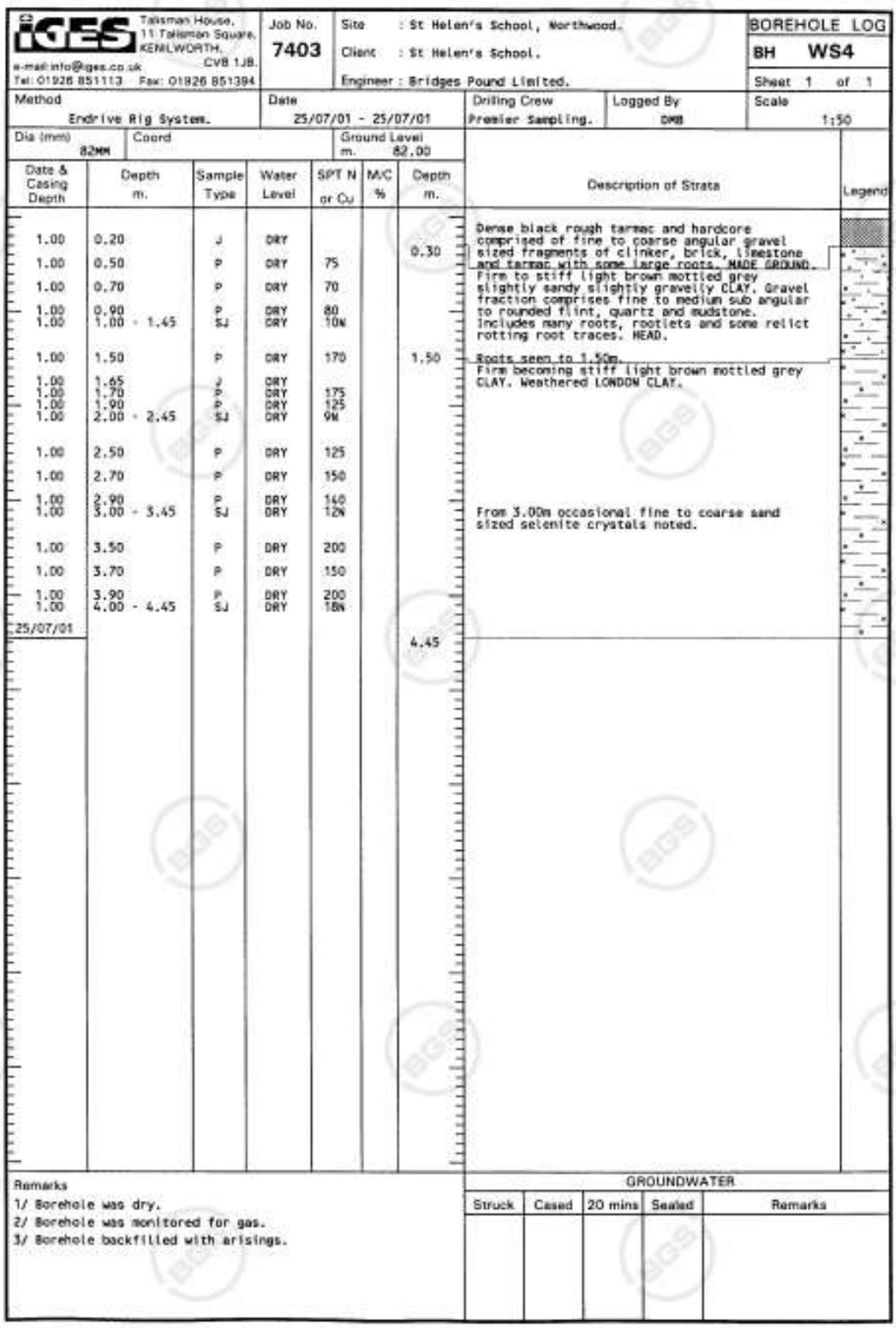
MP2. AQUIFER DESIGNATION MAP (BEDROC)



MP3. AQUIFER DESIGNATION MAP (BEDROC)

MP4. SURFACE WATER

13. APPENDIX D
Soil Investigation& Trial Holes



iGES
Talisman House, 11 Talisman Square, KENILWORTH, CV8 1JB.
e-mail: info@iges.co.uk
Tel: 01926 851113 Fax: 01926 851394

Job No. 7403
Site : St Helen's School, Northwood.
Client : St Helen's School.
Engineer : Bridges Pound Limited.

BOREHOLE LOG
BH WS4
Sheet 1 of 1

Method	Date	Drilling Crew	Logged By	Scale
Endrive Rig System.	25/07/01 - 25/07/01	Premier Sampling.	DMB	1:50

Dia (mm) 82MM | Coord | Ground Level m. 82.00

Date & Casing Depth	Depth m.	Sample Type	Water Level	SPT N or Cu	M/C %	Depth m.	Description of Strata	Legend
1.00	0.20	J	DRY			0.30	Dense black rough tarmac and hardcore comprised of fine to coarse angular gravel sized fragments of clinker, brick, limestone and tarmac with some large roots. MADE GROUND.	
1.00	0.50	P	DRY	75			Firm to stiff light brown mottled grey slightly sandy slightly gravelly CLAY. Gravel fraction comprises fine to medium sub angular to rounded flint, quartz and mudstone. Includes many roots, rootlets and some relict rotting root traces. HEAD.	
1.00	0.70	P	DRY	70				
1.00	0.90	P	DRY	80				
1.00	1.00 - 1.45	SJ	DRY	10N				
1.00	1.50	P	DRY	170		1.50	Roots seen to 1.50m.	
1.00	1.65	J	DRY				Firm becoming stiff light brown mottled grey CLAY. Weathered LONDON CLAY.	
1.00	1.70	P	DRY	175				
1.00	1.90	P	DRY	125				
1.00	2.00 - 2.45	SJ	DRY	9N				
1.00	2.50	P	DRY	125				
1.00	2.70	P	DRY	150				
1.00	2.90	P	DRY	140				
1.00	3.00 - 3.45	SJ	DRY	12N			From 3.00m occasional fine to coarse sand sized selenite crystals noted.	
1.00	3.50	P	DRY	200				
1.00	3.70	P	DRY	150				
1.00	3.90	P	DRY	200				
1.00	4.00 - 4.45	SJ	DRY	18N				
25/07/01						4.45		

Remarks
1/ Borehole was dry.
2/ Borehole was monitored for gas.
3/ Borehole backfilled with arisings.

GROUNDWATER

Struck	Cased	20 mins	Sealed	Remarks

BH1. BORE HOLE RECORD – 200 M AWAY FROM THE SITE LOCATION

14. APPENDIX E
Structural Method Statement

We have been instructed to provide a methodology for carrying out the construction works to form a basement ensuring continued structural stability throughout the construction process without adversely affecting the existing structure and the neighbouring properties. Therefore, we have completed a structural method statement otherwise known as an SMS. This SMS has been completed by Alpha Engineers ltd for use in support of the Basement Impact Assessment. The following method statement is related to the substructure works required for the construction of a basement and the underpinning of existing structural elements.

The works include the following alterations: new basement towards the rear running past the face of the rear extension, part of the works includes extensind the ground floor extension and internal alterations. This SMS only describes the construction of the basement works.

The basement retaining walls will follow the footprint of the existing external walls (partly). The basement construction will be completed in sections. These sections will be a maximum of 1000mm wide. Each strip is to be excavated and concreted. Minimum curing periods are to be observed to allow the sections to be stable before further works are carried out to the adjacent sections. Dry packing is to be completed tightly with expanding dry pack Conbex 100 or a similar (approved) expanding grout product if preferred by the Contractor.

Due to the sectional staged approach for constructing the basement the risk of movement between the basement and the neighbour's foundations is negligible.

There should be no risk to the stability of the existing or the adjacent building during or as a result of these works. The reinforced concrete underpinning and retaining walls are proposed to be carried out in a traditional hit and miss sequence. These will be connected with steel dowels in the normal manner for this type of construction. The retaining walls must be back propped until cured. It is a normal procedure to strike the shutter 24 hours after pouring the wall and to then back prop the concrete to the earth using trench props.

The underpin will be within Clay soils. These are usually stable in the medium term, for the width of excavation proposed during these works. Once underpinning the perimeter of the excavation has been completed, waling beams and lateral props will be introduced spanning the width of the basement. This will prevent inwards sliding of the newly formed underpinning and will allow the bulk excavation of the central bund to be carried out safely down to formation level and for the temporary props, initially taken back onto the central bund, to be removed.

The new basement slab will be designed as a reinforced concrete raft. Once installed and cured it will act as lateral propping to the opposite retaining walls and will tie the basement level together robustly. At that stage the temporary lateral props can be safely removed.

This method maintains the stability of the works and of the adjoining premises during construction and (given good workmanship by an experienced contractor) ensures that the proposed work does not have a detrimental impact upon the existing or adjoining structures.

We are not able to state that the neighbours will have no damage however the existing properties are in good order and we consider (based on previous projects of this nature) that any cracking would be within Category 1 of the Burland Scale. This is defined as fine cracks which are easily treated during normal decoration and forms part of the BRE Digest 251.

The new foundations will be designed in accordance the exact result of soil investigation report before the construction stage. As less than one story is being excavated, advice on previous projects from other geotechnical consultants is that any movement would be of the same (or less) order than we would allow when considering the deflection of a suspended floor. This has been confirmed by past basement projects in London Clay, where heave has not caused any problems with the clients house or their neighbours. In addition, settlement is not predicted to be a concern; the proposed basement will pose no significant threat to the structural stability of the existing property or adjoining premises.

As part of the party wall process, condition surveys of the adjoining properties will be prepared prior to the works commencing.

Due to access limitations the excavations will need to be hand dug using power tools. Only electric Kangos will be used; no compressors will be allowed. This will minimise any noise and vibrations to neighbouring properties. Special protection will not be required when these low impact techniques are employed.

Basement grade category 3 (habitable) will be required for the purpose of designing the waterproofing scheme. It is not practical to provide external tanking (as is preferred in new construction) given the sequential nature of the works. Therefore, an internal waterproofing strategy comprising a drained cavity system to details by others will be installed

It is envisaged that the existing utilities serving the property will be maintained throughout the works or diverted if required. The exact location of these services will be investigated prior to the works commencing on site. Any impact on these will be negligible. The utility owners will be contacted should their services have to be diverted.

There are no underground tunnels near the site which would affect the proposed works. There are no other known man-made cavities near the proposed basement extension.

The basement proposals do not involve felling any existing trees during construction.

The proposed method of construction eliminates the risk of any potential slope instability. It should be noted that the surrounding area is predominantly level which reduces any risk of slope instability.

In areas where the basement is to be excavated, the works will be carried out in such a way as to eliminate the impact on local drainage, sewerage and surface water levels. The fact that the works will be completed in a hit and miss fashion (in maximum 1m sections) will avoid damage or movement of the adjacent structures.

The basement will be constructed using concrete classed as grade C35. This is accepted as a watertight concrete mix. Used in conjunction with the internal cavity drainage system mentioned above, there will be two lines of waterproofing. This is in accordance with BS8102 for a basement of category 3 habitable space.

The amount of roof area and hardstanding will increase. Therefore, there will be increase in the amount of surface water that has to be collected by the updated drainage system.

As part of the works, the foul and rainwater drainage systems will be rerouted to the existing sewers. All of the new pipework will be below the proposed basement slab and sump pumps will be used where required.

All new suspended floors are to have 5 x 30 galvanised restraint straps. These will be installed at 1200mm centres to provide horizontal lateral restraint. This is to be additional to joist hangers. These restraints will ensure that the joists are tied adequately to the external walls.

These restraint straps are to be fitted over a minimum of 3 timber joists and noggins, in both any new floor and in any replacement works to the timber roof.

Access for the works will be through the front of the property

Proposed Construction Sequence

1. The excavation will progress from the rear towards the front with the spoil being removed via a conveyor and onto a skip placed on a suspended parking bay.

2. Excavate and install the 1st underpin base following the agreed sequence.

3. Continue underpinning whilst maintaining all new pins back-propped to the central earth mound.

4. With the perimeter fully underpinned and back propped to the central earth mound, install waling beams and lateral props spanning the width of the new excavation.

5. With the new underpinning laterally propped, reduce the central mound down to formation level. Remove the basement wall.

6. Install the below ground drainage followed by the new ground beams and pad foundation and then the basement slab. Cure 14 days prior to removing the lateral props.

7. Works to the upper floors are to be carried out on a floor by floor basis in order to maintain overall lateral stability of the party wall and the perimeter walls.

8. A drained cavity system; insulation and finishes will be installed to the basement, as detailed by others.

Any works carried out to the basement is to be supervised by a Structural Engineer throughout its duration.

The works to the basement is to be carried out by a specialist contractor who is experienced in dealing with the intricacies that occur during a basement construction. There is to be a project manager on site supervising the works who will be appointed by the main contractor.

We recommend that any contractor carrying out the works should be a member of **construction line, CHAS and the Considerate Construction Scheme.**

In terms of the party walls, it is important to protect the interests of the client carrying out the works and also of the adjoining property neighbours. Party Wall agreements are to be prepared to include condition surveys for both of the adjoining properties.

Detailed temporary works, permanent works drawings and construction sequence requirements will be designed by a Structural Engineer and will comply with current Building Control requirements.

Hoarding is to be erected at the front of the site to provide adequate working space and space for skips.

Sump pumps will be available during the excavation process to remove any water due to ponding. The superstructure is and will be watertight and therefore rainwater will not be directly affecting the excavations.

Reinforcing starter bars will be driven into the ground on each side. Shutters will be constructed to retain the wet concrete. Once the concrete is cast, leaving a 50 mm gap between the top of the concrete and the underside of the cleaned brick footing, the gap will be dry packed, but only after a minimum of 24 hours has been allowed for the concrete to cure. A further 48 hours must elapse before any further excavation can be carried out, within two bays of this new footing. A maximum of 20% of the building's footprint can be undermined at any one time.

While the works are ongoing, the structure above will be propped as determined by the appointed temporary works engineer to maintain support, using heavy Acrow props or other similar supports. These will be propped from either the new concrete slab or cast concrete bases, purpose built to carry the main structure and any local areas of loading.

All demolitions are to be adequately sign posted and any demolitions are to be zoned and fenced off to prevent any unauthorised access.

All site access it to be monitored and a signing in and out station must be set up at all site entrances where only authorised personnel will be able to entre site

15. Basement Retaining Wall Calculations & Structural Drawings

Design Philosophy – Basement Design

Geology

The site specific borehole information indicates stiff to very stiff clay below ground level. A safe ground bearing pressure of 100 kN/m has been used for the following calculation and this bearing capacity to be confirmed before the construction stage by a geotechnical engineer.

Retaining Wall Design

Retaining walls will be designed using “at rest” pressures to minimise the amount of movement in the walls. This will minimise the risk of damage to this and adjacent structures and when carried out in the correct sequence no structural damage is expected as experienced on many similar projects.

The basement retaining walls have been designed with the following geotechnical design parameters:

SOIL PARAMETERS

Dry soil = 18 kN/m3

Water = 10 kN/m3

$\varphi = 25^{\circ}$

Ground – bearing pressures below the underpinning bases will be calculated for the temporary condition. In the permanent condition, the new basement slab will be tied into the retaining wall bases, hence the entire substructure will act as a raft foundation. Ground – bearing pressures will not be an issue in this condition.

Water Table

We have had numerous borehole records for this area and therefore have made the assumption a high water table is not present, and to be confirmed by the soil investigation report.

An assumed accidental case will be assumed of 1.0 m below ground level for design of uplift on the slab and lateral forces on the retaining walls.

Temporary Works

The retaining walls will be designed where possible to be self supporting under soil loading in the construction stage of the project. The underpins will need to be propped during construction to avoid any sliding failure at the base.

In the permanent case the retaining wall bases will be propped by the basement slab therefore the most onerous design case is the temporary condition.

All temporary works design is to be carried out by the contractor.

The basement retaining walls will follow the footprint of the existing external walls, the basement construction is to be completed in sections. These sections are to be a maximum of 1000mm. Each strip is to be excavated, concreted curing periods are to be observed to allow the sections to stabilise before further works are carried out to the adjacent sections,

dry packing is to be completed tightly with expanding dry pack Conbex 100 or a similar product can be used if preferred.

Due to the sectional staged approach for constructing the basement the risk of long term differential movement between the basement and the neighbour's foundations is negligible.

There should be no risk to the stability of the existing or the adjacent building during or as a result of these works, since the reinforced concrete underpinning and retaining walls are proposed to be carried out in a traditional hit and miss sequence which are to be connected with steel dowels in the normal manner for this type of construction. Please note the walls must be back proposed until cured. It is normal procedure to strike the shutter 24 hours after pouring the wall and back prop the concrete to the earth using trench props.

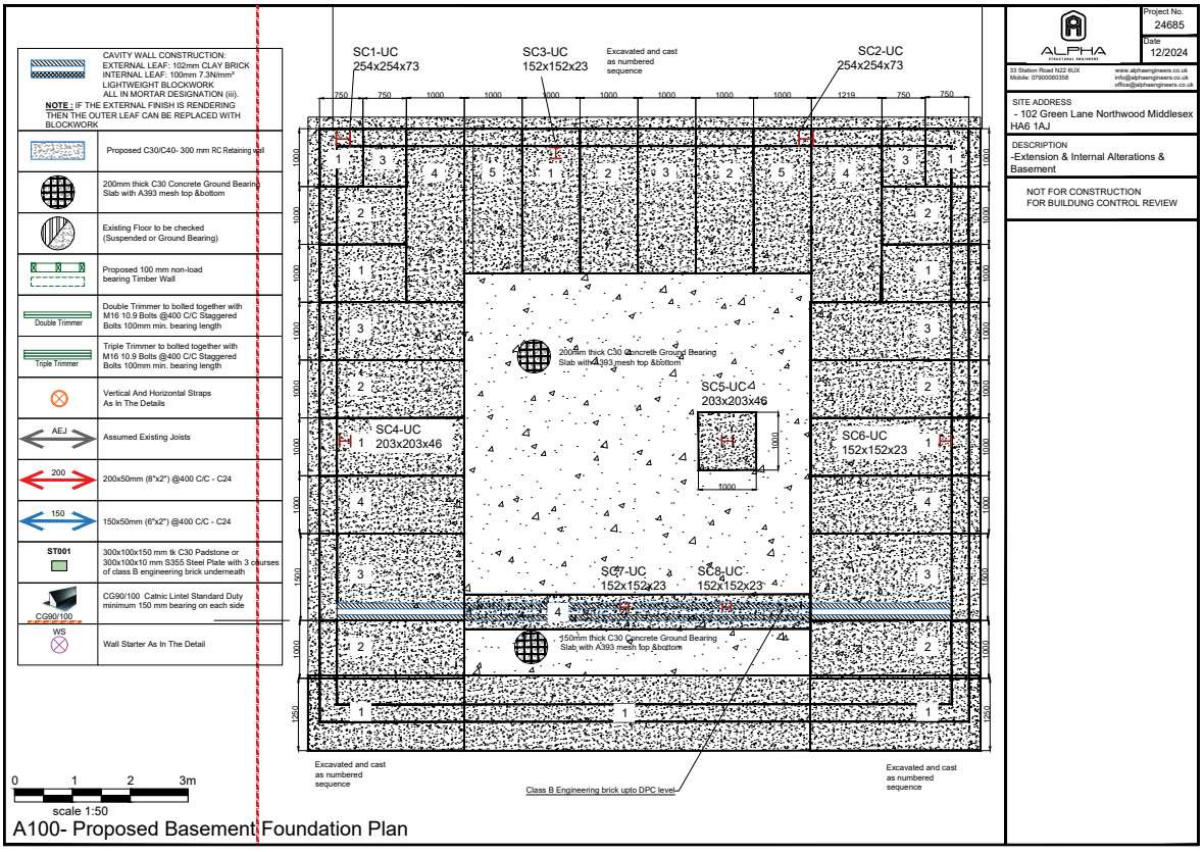
The underpins will be within the granular materials. Excavations in granular materials need to be carried out with care. The contractor will need sacrificial steel trench sheeting or concrete poling boards and props to support any pockets of weak ground encountered. Excavations for each underpin will require temporary support using timber boards and props. Once underpinning the perimeter of the excavation has been completed, waling beams and lateral props will be introduced spanning the width of the basement. This will prevent inwards sliding of the newly formed underpinning and will allow the bulk excavation of the central bund to be carried out safely down to formation level.

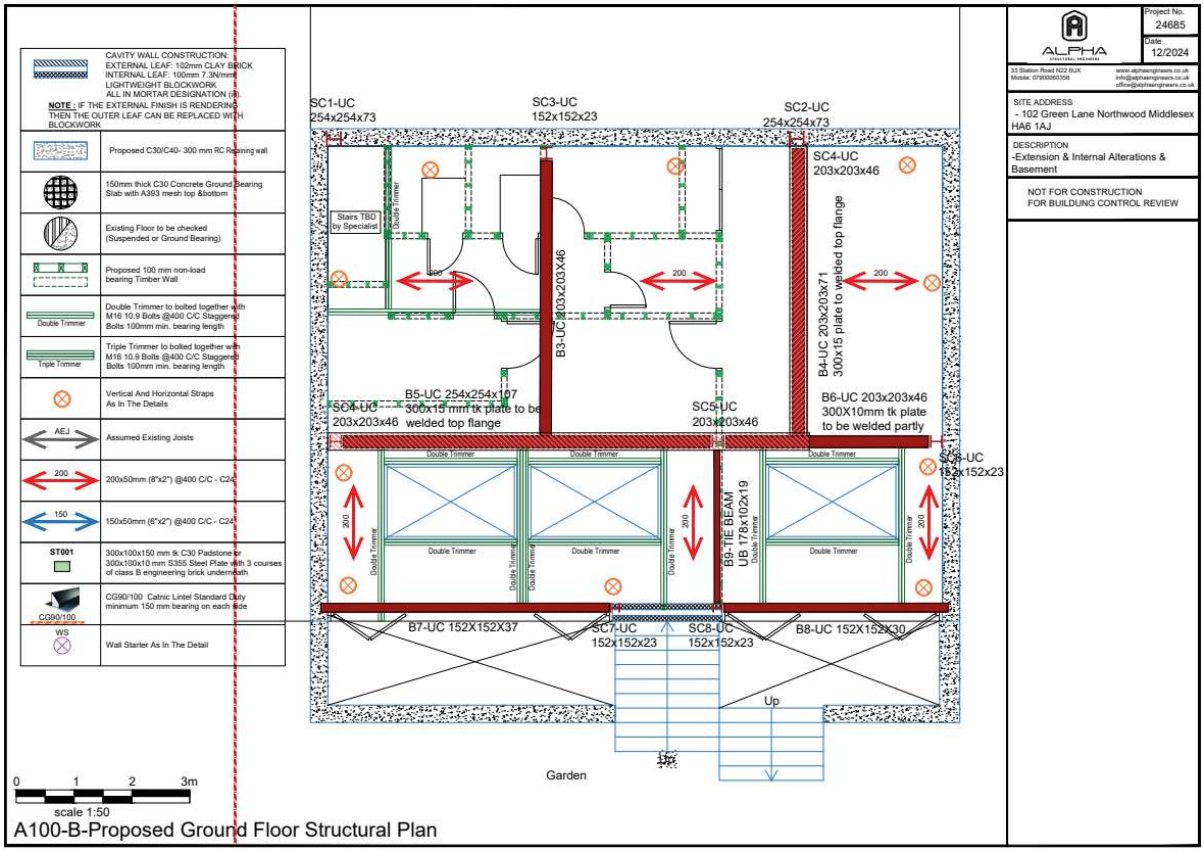
The new basement slab will be designed as a reinforced concrete raft. Once installed and cured it will act as lateral propping to opposite retaining walls and will be tying the basement level together. At that stage the temporary lateral props can be safely removed.

This method assists in maintaining stability of the works and of the adjoining premises during construction and under good workmanship ensures the proposed work does not have a detrimental impact upon the existing or adjoining structures.

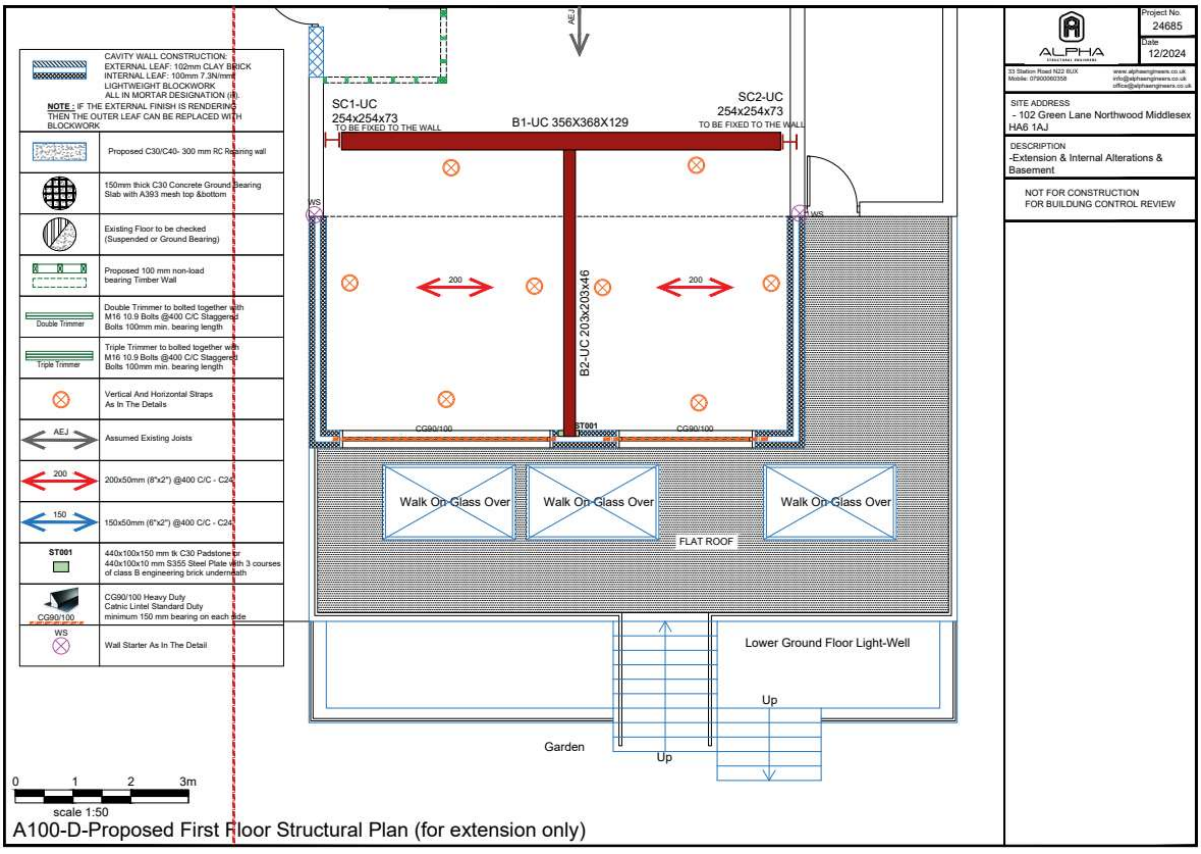
The new foundations will be designed in accordance with well-established permissible pressures. The granular soil underlying the basement is reasonably dense and provides adequate bearing strata for the new foundations. Settlement is not predicted to be a concern; the proposed basement will pose no significant threat to the structural stability of the existing property or adjoining premises.

Basement grade category 3 (habitable) will be required for the purpose of designing its waterproofing. It not practical to provide external tanking as in new construction given the sequential nature of the works. Therefore, an internal waterproofing strategy comprising a drained cavity system to details by others will be required. It is envisaged that the existing utilities serving the property will need to be maintained throughout the works or diverted if required. The exact location of these services will need to be investigated prior to the works commencing on site. Any impact on these will be negligible. The utility owners would have to be contacted should their services have to be diverted.


CAVITY WALL CONSTRUCTION:
EXTERNAL LEAF: 102mm CLAY BRICK
INTERNAL LEAF: 100mm 7.3N/mm² LIGHTWEIGHT BLOCKWORK
ALL IN MORTAR DESIGNATION (iii).
NOTE : IF THE EXTERNAL FINISH IS RENDERING THEN THE OUTER LEAF CAN BE REPLACED WITH BLOCKWORK
Proposed C30/C40- 300 mm RC Retaining wall
200mm thick C30 Concrete Ground Bearing Slab with A393 mesh top &bottom
Existing Floor to be checked (Suspended or Ground Bearing)
Proposed 100 mm non-load bearing Timber Wall
Double Trimmer
Double Trimmer to bolted together with M16 10.9 Bolts @400 C/C Staggered Bolts 100mm min. bearing length
Triple Trimmer
Triple Trimmer to bolted together with M16 10.9 Bolts @400 C/C Staggered Bolts 100mm min. bearing length
Vertical And Horizontal Straps As In The Details
AEJ
Assumed Existing Joists
200
200x50mm (8"x2") @400 C/C - C24
150
150x50mm (6"x2") @400 C/C - C24
ST001
300x100x150 mm tk C30 Padstone or 300x100x10 mm S355 Steel Plate with 3 courses of class B engineering brick underneath
CG90/100
CG90/100 Catnic Lintel Standard Duty minimum 150 mm bearing on each side
WS
Wall Starter As In The Detail
SC1-UC 254x254x73
SC3-UC 152x152x23
Excavated and cast as numbered sequence
SC2-UC 254x254x73
200mm thick C30 Concrete Ground Bearing Slab with A393 mesh top &bottom
SC5-UC 203x203x46
SC4-UC 203x203x46
SC6-UC 152x152x23
SC7-UC 152x152x23
SC8-UC 152x152x23
150mm thick C30 Concrete Ground Bearing Slab with A393 mesh top &bottom
Excavated and cast as numbered sequence
Class B Engineering brick upto DPC level
Excavated and cast as numbered sequence
0 1 2 3m
scale 1:50
A100- Proposed Basement Foundation Plan
ALPHA
Project No. 24685
Date 12/2024
SITE ADDRESS
- 102 Green Lane Northwood Middlesex HA6 1AJ
DESCRIPTION
-Extension & Internal Alterations & Basement
NOT FOR CONSTRUCTION
FOR BUILDUNG CONTROL REVIEW



A100-B-Proposed Ground Floor Structural Plan



A100-D-Proposed First Floor Structural Plan (for extension only)

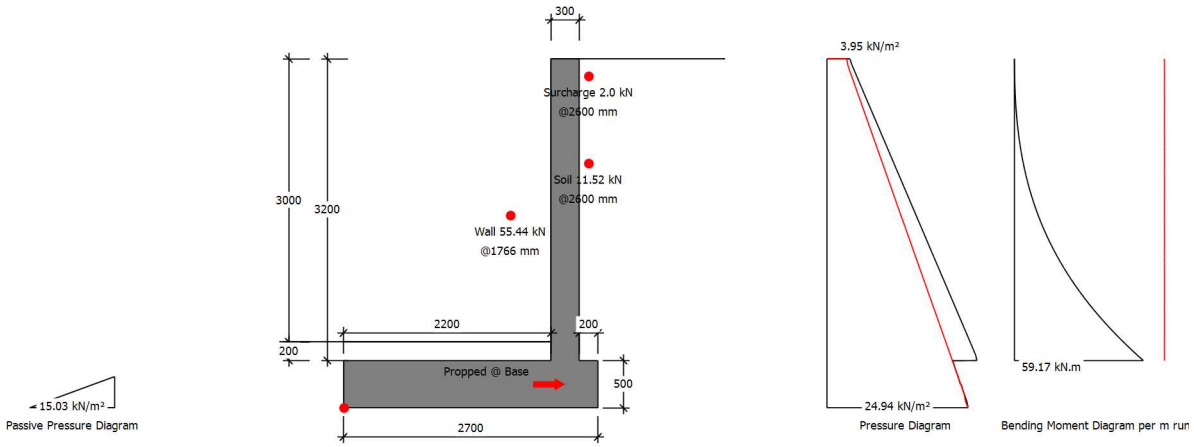
16. RETAINING WALL ANALYSIS (BS 8002:1994)

Alpha Structural Engineers
79, Venice House,
Hatton Road,
Harrow HA0 1QL

Cloud dd298

Job Ref :
Sheet : /
Made by :
Date : 12 December 2024 / Ver. 2022.13.18
Checked :
Approved :

MasterKey : Retaining Wall Design to BS 8002 : 1994 and BS 8110 : 1997
MAIN RETAINING WALL
Reinforced Concrete Retaining Wall with Reinforced Base



Summary of Design Data

Notes	All dimensions are in mm and all forces are per metre run
Material Densities (kN/m³)	Soil 18.00, Concrete 24.00
Concrete grade	fcu 30 N/mm², Permissible tensile stress 0.250 N/mm²
Concrete covers (mm)	Wall inner cover 30 mm, Wall outer cover 30 mm, Base cover 50 mm
Reinforcement design	fy 500 N/mm² designed to BS 8110: 1997
Surcharge and Water Table	Surcharge 10.00 kN/m², Fully drained
Unplanned excavation depth	Front of wall 370 mm

† The Engineer must satisfy him/herself to the reinforcement detailing requirements of the relevant codes of practice

Additional Loads

Wall Propped at Base Level	Therefore no sliding check is required
† Dimensions	

Soil Properties

Bearing pressure	Premissable service pressure @ front 100.00 kN/m², @ back 100.00 kN/m²
Back Soil Friction and Cohesion	ϕ_b = Atn(Tan(30)/1.2) = 25.69°
Base Friction and Cohesion	δ = Atn(0.75xTan(Atn(Tan(30)/1.2))) = 19.84°
Front Soil Friction and Cohesion	ϕ = Atn(Tan(30)/1.2) = 25.69°

Loading Cases

G_{Soil}- Soil Self Weight, G_{Wall}- Wall & Base Self Weight, Fv_{Heel}- Vertical Loads over Heel,
P_a- Active Earth Pressure, $P_{surcharge}$- Earth pressure from surcharge, P_p- Passive Earth Pressure

Case 1: Geotechnical Design	1.00 G_{Soil}+1.00 G_{Wall}+1.00 Fv_{Heel}+1.00 P_a+1.00 $P_{surcharge}$+1.00 P_p
Case 2: Structural Ultimate Design	1.40 G_{Soil}+1.40 G_{Wall}+1.60 Fv_{Heel}+1.00 P_a+1.00 $P_{surcharge}$+1.00 P_p

Geotechnical Design

Wall Stability - Virtual Back Pressure

Case 1 Overturning/Stabilising	72.444/133.036	0.545	OK

Wall Sliding - Virtual Back Pressure

$Fx/(Rx_{Friction}+Rx_{Passive})$	0.000/(24.884+2.487)	0.000	OK
Prop Reaction Case 2 (Service)	52.5 kN @ Base		

Soil Pressure

Virtual Back	52.323/100 kN/m², Length under pressure 2.636 m	0.523	OK
Wall Back	67.848/100 kN/m², Length under pressure 2.033 m	0.678	OK

Alpha Structural Engineers
79, Venice House,
Hatton Road,
Harrow HA0 1QL

Cloud dd298

Job Ref :
Sheet : /
Made by :
Date : 12 December 2024 / Ver. 2022.13.18
Checked :
Approved :

Structural Design

Prop Reaction

Maximum Prop Reaction (Ultimate)	60.8 kN @ Base

Wall Design (Inner Steel)

Critical Section	Critical @ 0 mm from base, Case 2		
Steel Provided (Cover)	Main H10@125 (30 mm) Dist. H10@200 (40 mm)	628 mm²	OK
Compression Steel Provided (Cover)	Main H10@300 (30 mm) Dist. H10@300 (40 mm)	262 mm²	
Leverarm z=fn(d,b,As,fy,Fcu)	265 mm, 1000 mm, 628 mm², 500 N/mm², 30.0 N/mm²	252 mm	
Mr=fn(above,As',d',x,x/d)	262 mm², 35 mm, 23 mm, 0.09	68.8 kN.m	
Moment Capacity Check (M/Mr)	M 59.2 kN.m, Mr 68.8 kN.m	0.860	OK
Shear Capacity Check	F 49.0 kN, vc 0.461 N/mm², Fvr 122.1 kN	0.40	OK

Base Top Steel Design

Steel Provided (Cover)	Main H10@100 (50 mm) Dist. H10@100 (60 mm)	785 mm²	OK
Compression Steel Provided (Cover)	Main H10@100 (50 mm) Dist. H10@100 (60 mm)	785 mm²	
Leverarm z=fn(d,b,As,fy,Fcu)	445 mm, 1000 mm, 785 mm², 500 N/mm², 30 N/mm²	423 mm	
Mr=fn(above,As',d',x,x/d)	785 mm², 55 mm, 28 mm, 0.06	144.4 kN.m	
Moment Capacity Check (M/Mr)	M 2.0 kN.m, Mr 144.4 kN.m	0.014	OK
Shear Capacity Check	F 20.1 kN, vc 0.367 N/mm², Fvr 163.2 kN	0.12	OK

Base Bottom Steel Design

Steel Provided (Cover)	Main H10@100 (50 mm) Dist. H10@100 (60 mm)	785 mm²	OK
Compression Steel Provided (Cover)	Main H10@100 (50 mm) Dist. H10@100 (60 mm)	785 mm²	
Leverarm z=fn(d,b,As,fy,Fcu)	445 mm, 1000 mm, 785 mm², 500 N/mm², 30 N/mm²	423 mm	
Mr=fn(above,As',d',x,x/d)	785 mm², 55 mm, 28 mm, 0.06	144.4 kN.m	
Moment Capacity Check (M/Mr)	M 73.4 kN.m, Mr 144.4 kN.m	0.508	OK
Shear Capacity Check	F 52.1 kN, vc 0.367 N/mm², Fvr 163.2 kN	0.32	OK

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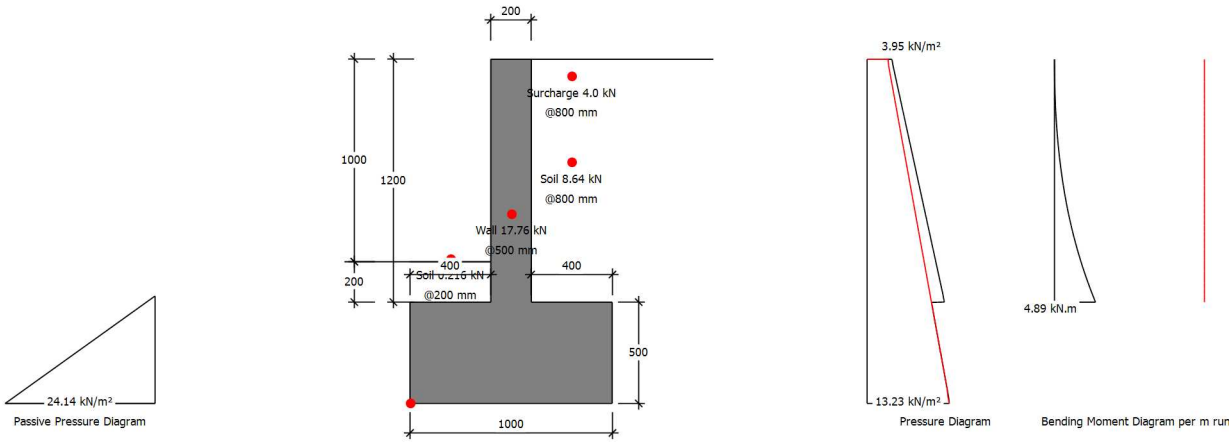
Cloud dd298

Job Ref :
Sheet : /
Made by :
Date : 12 December 2024 / Ver. 2022.13.18
Checked :
Approved :

MasterKey : Retaining Wall Design to BS 8002 : 1994 and BS 8110 : 1997
GARDEN RETAINING WALL
Reinforced Concrete Retaining Wall with Reinforced Base



Summary of Design Data

Notes	All dimensions are in mm and all forces are per metre run
Material Densities (kN/m³)	Soil 18.00, Concrete 24.00
Concrete grade	fcu 30 N/mm², Permissible tensile stress 0.250 N/mm²
Concrete covers (mm)	Wall inner cover 30 mm, Wall outer cover 30 mm, Base cover 50 mm
Reinforcement design	fy 500 N/mm² designed to BS 8110: 1997
Surcharge and Water Table	Surcharge 10.00 kN/m², Fully drained
Unplanned excavation depth	Front of wall 170 mm

† The Engineer must satisfy him/herself to the reinforcement detailing requirements of the relevant codes of practice

Soil Properties

Bearing pressure	Premissable service pressure @ front 100.00 kN/m², @ back 100.00 kN/m²
Back Soil Friction and Cohesion	ϕ_b = Atn(Tan(30)/1.2) = 25.69°
Base Friction and Cohesion	δ = Atn(0.75xTan(Atn(Tan(30)/1.2))) = 19.84°
Front Soil Friction and Cohesion	ϕ = Atn(Tan(30)/1.2) = 25.69°

Loading Cases

G_{Soil}- Soil Self Weight, G_{Wall}- Wall & Base Self Weight, Fv_{Heel}- Vertical Loads over Heel,
P_a- Active Earth Pressure, $P_{surcharge}$- Earth pressure from surcharge, P_p- Passive Earth Pressure

Case 1: Geotechnical Design	1.00 G_{Soil}+1.00 G_{Wall}+1.00 Fv_{Heel}+1.00 P_a+1.00 $P_{surcharge}$+1.00 P_p
Case 2: Structural Ultimate Design	1.40 G_{Soil}+1.40 G_{Wall}+1.60 Fv_{Heel}+1.00 P_a+1.00 $P_{surcharge}$+1.00 P_p

Geotechnical Design

Wall Stability - Virtual Back Pressure

Case 1 Overturning/Stabilising	9.588/19.035	0.504	OK

Wall Sliding - Virtual Back Pressure

$Fx/(Rx_{Friction}+ Rx_{Passive})$	14.105/(11.048+6.410)	0.808	OK

Soil Pressure

Virtual Back	66.144/100 kN/m², Length under pressure 0.926 m	0.661	OK
Wall Back	69.959/100 kN/m², Length under pressure 0.875 m	0.700	OK

Structural Design

Wall Design (Inner Steel)

Critical Section	Critical @ 0 mm from base, Case 2		
Steel Provided (Cover)	Main H10@300 (30 mm) Dist. H10@300 (40 mm)	262 mm²	OK
Compression Steel Provided (Cover)	Main H10@300 (30 mm) Dist. H10@300 (40 mm)	262 mm²	
Leverarm z=fn(d,b,As,fy,Fcu)	165 mm, 1000 mm, 262 mm², 500 N/mm², 30.0 N/mm²	157 mm	

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Mr=fn(above,As',d',x,x/d)	262 mm², 35 mm, 9 mm, 0.06	17.9 kN.m	
Moment Capacity Check (M/Mr)	M 4.9 kN.m, Mr 17.9 kN.m	0.274	OK
Shear Capacity Check	F 9.8 kN, vc 0.454 N/mm², Fvr 74.9 kN	0.13	OK

Base Top Steel Design

Steel Provided (Cover)	Main H10@100 (50 mm) Dist. H10@100 (60 mm)	785 mm²	OK
Compression Steel Provided (Cover)	Main H10@100 (50 mm) Dist. H10@100 (60 mm)	785 mm²	
Leverarm z=fn(d,b,As,fy,Fcu)	445 mm, 1000 mm, 785 mm², 500 N/mm², 30 N/mm²	423 mm	
Mr=fn(above,As',d',x,x/d)	785 mm², 55 mm, 28 mm, 0.06	144.4 kN.m	
Moment Capacity Check (M/Mr)	M 3.2 kN.m, Mr 144.4 kN.m	0.022	OK
Shear Capacity Check	F 14.4 kN, vc 0.367 N/mm², Fvr 163.2 kN	0.09	OK

Base Bottom Steel Design

Steel Provided (Cover)	Main H10@100 (50 mm) Dist. H10@100 (60 mm)	785 mm²	OK
Compression Steel Provided (Cover)	Main H10@100 (50 mm) Dist. H10@100 (60 mm)	785 mm²	
Leverarm z=fn(d,b,As,fy,Fcu)	445 mm, 1000 mm, 785 mm², 500 N/mm², 30 N/mm²	423 mm	
Mr=fn(above,As',d',x,x/d)	785 mm², 55 mm, 28 mm, 0.06	144.4 kN.m	
Moment Capacity Check (M/Mr)	M 3.7 kN.m, Mr 144.4 kN.m	0.026	OK
Shear Capacity Check	F 17.1 kN, vc 0.367 N/mm², Fvr 163.2 kN	0.10	OK

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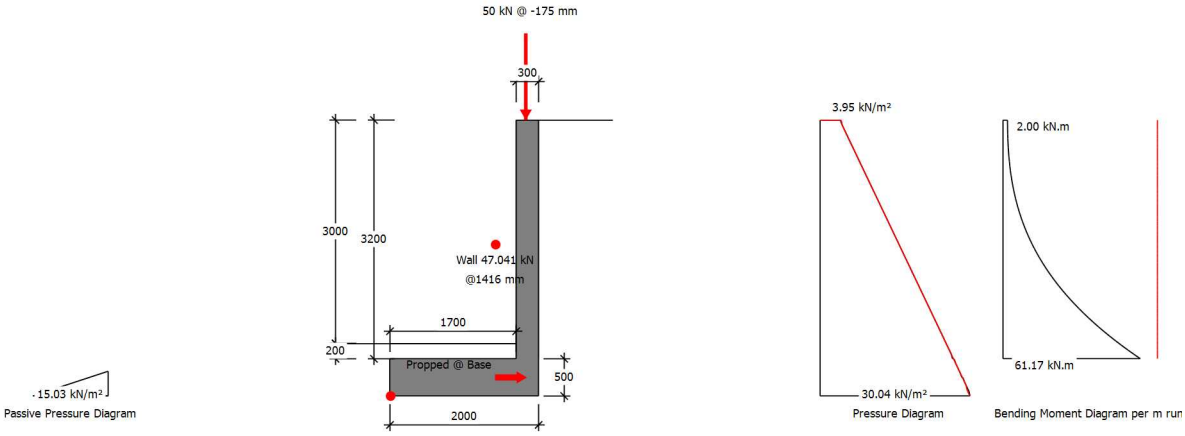
Checked :
Approved :

MasterKey : Retaining Wall Design to BS 8002 : 1994 and BS 8110 : 1997
MAIN RETAINING WALL- UNDER THE WALL
Reinforced Concrete Retaining Wall with Reinforced Base



Summary of Design Data

Notes	All dimensions are in mm and all forces are per metre run
Material Densities (kN/m³)	Soil 18.00, Concrete 24.00
Concrete grade	fcu 30 N/mm², Permissible tensile stress 0.250 N/mm²
Concrete covers (mm)	Wall inner cover 30 mm, Wall outer cover 30 mm, Base cover 50 mm
Reinforcement design	fy 500 N/mm² designed to BS 8110: 1997
Surcharge and Water Table	Surcharge 10.00 kN/m², Fully drained
Unplanned excavation depth	Front of wall 370 mm

† The Engineer must satisfy him/herself to the reinforcement detailing requirements of the relevant codes of practice

Additional Loads

Wall Propped at Base Level	Therefore no sliding check is required
Vertical Line Load	50 kN/m @ X -175 mm and Y 0 mm - Load type Live
† Dimensions	Ties, line loads and partial loads are measured from the inner top edge of the wall

Soil Properties

Bearing pressure	Premissable service pressure @ front 100.00 kN/m², @ back 100.00 kN/m²
Back Soil Friction and Cohesion	ϕ_b = Atn(Tan(30)/1.2) = 25.69°
Base Friction and Cohesion	δ = Atn(0.75xTan(Atn(Tan(30)/1.2))) = 19.84°
Front Soil Friction and Cohesion	ϕ = Atn(Tan(30)/1.2) = 25.69°

Loading Cases

G_{Wall}- Wall & Base Self Weight, Fv_{Heel}- Vertical Loads over Heel, P_a- Active Earth Pressure, $P_{surcharge}$- Earth pressure from surcharge, P_p- Passive Earth Pressure

Case 1: Geotechnical Design	1.00 G_{Wall}+1.00 Fv_{Heel}+1.00 P_a+1.00 $P_{surcharge}$+1.00 P_p
Case 2: Structural Ultimate Design	1.40 G_{Wall}+1.60 Fv_{Heel}+1.00 P_a+1.00 $P_{surcharge}$+1.00 P_p

Geotechnical Design

Wall Stability - Virtual Back Pressure

Case 1 Overturning/Stabilising	87.285/157.876	0.553	OK

Wall Sliding - Virtual Back Pressure

$Fx/(Rx_{Friction}+Rx_{Passive})$	0.000/(35.017+2.487)	0.000	OK
Prop Reaction Case 2 (Service)	63.3 kN @ Base		

Soil Pressure

Virtual Back (No uplift)	Max(88.196/100, 8.840/100) kN/m²	0.882	OK
Wall Back (No uplift)	Max(87.621/100, 9.415/100) kN/m²	0.876	OK

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Structural Design

Prop Reaction

Maximum Prop Reaction (Ultimate)	63.2 kN @ Base

Wall Design (Inner Steel)

Critical Section	Critical @ 0 mm from base, Case 2		
Steel Provided (Cover)	Main H10@125 (30 mm) Dist. H10@200 (40 mm)	628 mm²	OK
Compression Steel Provided (Cover)	Main H10@300 (30 mm) Dist. H10@300 (40 mm)	262 mm²	
Leverarm z=fn(d,b,As,fy,Fcu)	265 mm, 1000 mm, 628 mm², 500 N/mm², 30.0 N/mm²	252 mm	
Mr=fn(above,As',d',x,x/d)	262 mm², 35 mm, 23 mm, 0.09	68.8 kN.m	
Moment Capacity Check (M/Mr)	M 61.2 kN.m, Mr 68.8 kN.m	0.889	OK
Wall Axial Design (N/Ncap)	N 112.3 kN, Ncap 3600.0 kN	0.031	OK
Wall Slenderness λ	Leff/tk =2.00x3200.0/300.0	21.3	OK
Kmin = (Nuz-N)/(Nuz-Nbal)	Min(1.0, 4000.0 - 112.3)/(4000.0 - 1687.9)	1.0	
M_{add}= N.Kmin.h.λ²/2000	112.3x1.0x300.0x21.3²/2000	7.6kN.m	
(M+Madd)/Mr_{Axial}	M+Madd 68.8 kN, Mr_{Axail}83.8 kN.m	0.820	OK
Shear Capacity Check	F 49.0 kN, vc 0.461 N/mm², Fvr 122.1 kN	0.40	OK

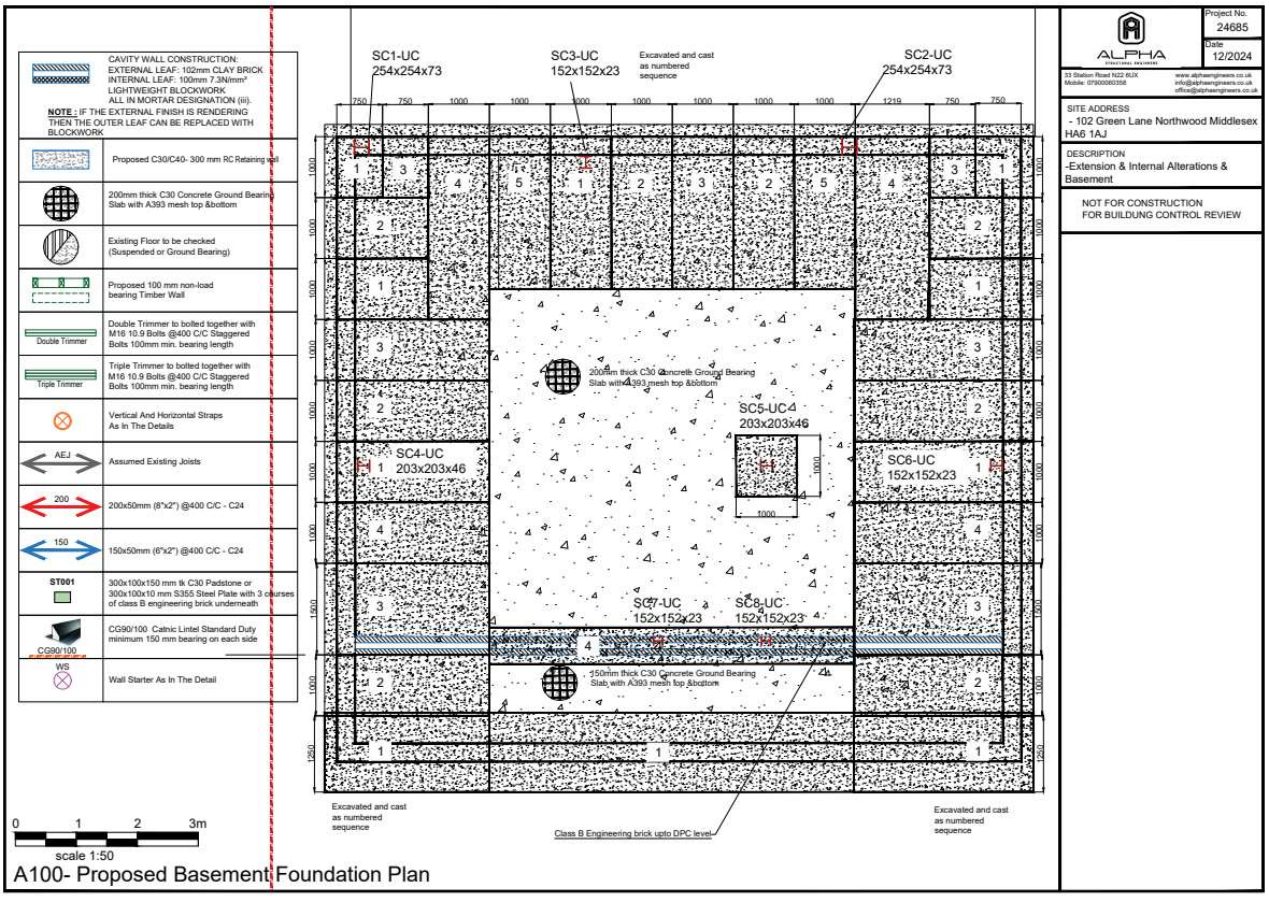
Base Top Steel Design

Steel Provided (Cover)	Main H10@100 (50 mm) Dist. H10@100 (60 mm)	785 mm²	OK
Compression Steel Provided (Cover)	Main H10@100 (50 mm) Dist. H10@100 (60 mm)	785 mm²	
Leverarm z=fn(d,b,As,fy,Fcu)	445 mm, 1000 mm, 785 mm², 500 N/mm², 30 N/mm²	423 mm	
Mr=fn(above,As',d',x,x/d)	785 mm², 55 mm, 28 mm, 0.06	144.4 kN.m	
Moment Capacity Check (M/Mr)	M 0.0 kN.m, Mr 144.4 kN.m	0.000	OK
Shear Capacity Check	F 0.0 kN, vc 0.367 N/mm², Fvr 163.2 kN	0.00	OK

Base Bottom Steel Design

Steel Provided (Cover)	Main H10@100 (50 mm) Dist. H10@100 (60 mm)	785 mm²	OK
Compression Steel Provided (Cover)	Main H10@100 (50 mm) Dist. H10@100 (60 mm)	785 mm²	
Leverarm z=fn(d,b,As,fy,Fcu)	445 mm, 1000 mm, 785 mm², 500 N/mm², 30 N/mm²	423 mm	
Mr=fn(above,As',d',x,x/d)	785 mm², 55 mm, 28 mm, 0.06	144.4 kN.m	
Moment Capacity Check (M/Mr)	M 75.0 kN.m, Mr 144.4 kN.m	0.519	OK
Shear Capacity Check	F 92.9 kN, vc 0.367 N/mm², Fvr 163.2 kN	0.57	OK

18. Underpinning Hit & Miss Layout

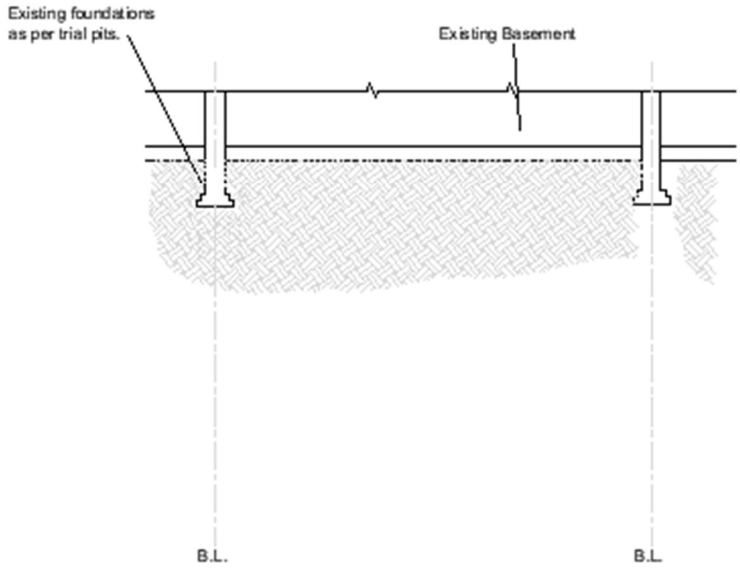

CAVITY WALL CONSTRUCTION:
EXTERNAL LEAF: 102mm CLAY BRICK
INTERNAL LEAF: 100mm 7.3N/mm²
LIGHTWEIGHT BLOCKWORK
ALL IN MORTAR DESIGNATION (iii).
NOTE : IF THE EXTERNAL FINISH IS RENDERING THEN THE OUTER LEAF CAN BE REPLACED WITH BLOCKWORK
Proposed C30/C40- 300 mm RC Retaining wall
200mm thick C30 Concrete Ground Bearing Slab with A393 mesh top &bottom
Existing Floor to be checked (Suspended or Ground Bearing)
Proposed 100 mm non-load bearing Timber Wall
Double Trimmer
Double Trimmer to bolted together with M16 10.9 Bolts @400 C/C Staggered Bolts 100mm min. bearing length
Triple Trimmer
Triple Trimmer to bolted together with M16 10.9 Bolts @400 C/C Staggered Bolts 100mm min. bearing length
Vertical And Horizontal Straps As In The Details
AEJ
Assumed Existing Joists
200
200x50mm (8"x2") @400 C/C - C24
150
150x50mm (6"x2") @400 C/C - C24
ST001
300x100x150 mm tk C30 Padstone or 300x100x10 mm S355 Steel Plate with 3 courses of class B engineering brick underneath
CG90/100
CG90/100 Catnic Lintel Standard Duty minimum 150 mm bearing on each side
WS
Wall Starter As In The Detail
SC1-UC 254x254x73
SC3-UC 152x152x23
Excavated and cast as numbered sequence
SC2-UC 254x254x73
200mm thick C30 Concrete Ground Bearing Slab with A393 mesh top &bottom
SC5-UC 203x203x46
SC4-UC 203x203x46
SC6-UC 152x152x23
SC7-UC 152x152x23
SC8-UC 152x152x23
150mm thick C30 Concrete Ground Bearing Slab with A393 mesh top &bottom
Excavated and cast as numbered sequence
Class B Engineering brick upto DPC level
Excavated and cast as numbered sequence
0 1 2 3m
scale 1:50
A100- Proposed Basement Foundation Plan
ALPHA
Project No. 24685
Date 12/2024
SITE ADDRESS
- 102 Green Lane Northwood Middlesex HA6 1AJ
DESCRIPTION
-Extension & Internal Alterations & Basement
NOT FOR CONSTRUCTION
FOR BUILDUNG CONTROL REVIEW

19. Underpinning Sequence Drawings

The Staged drawings below only relate to the procedure required for the underpinning & what temporary works are required to facilitate this

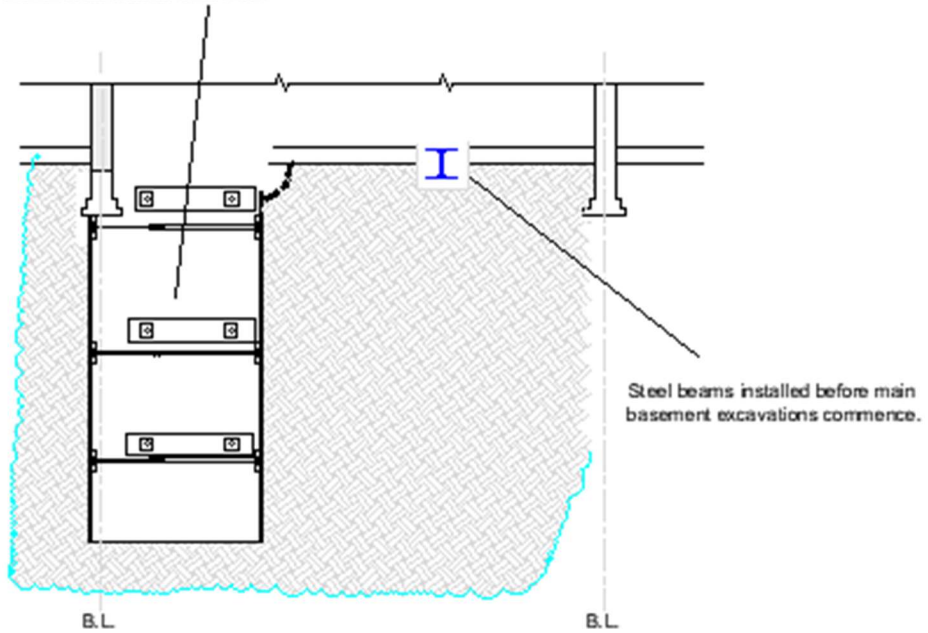
Contractor to ensure the existing ground floor structure is adequately supported prior to the excavations commencing.

Width of RC Wall to be a minimum of 350mm or to match width of supported wall if found to be wider

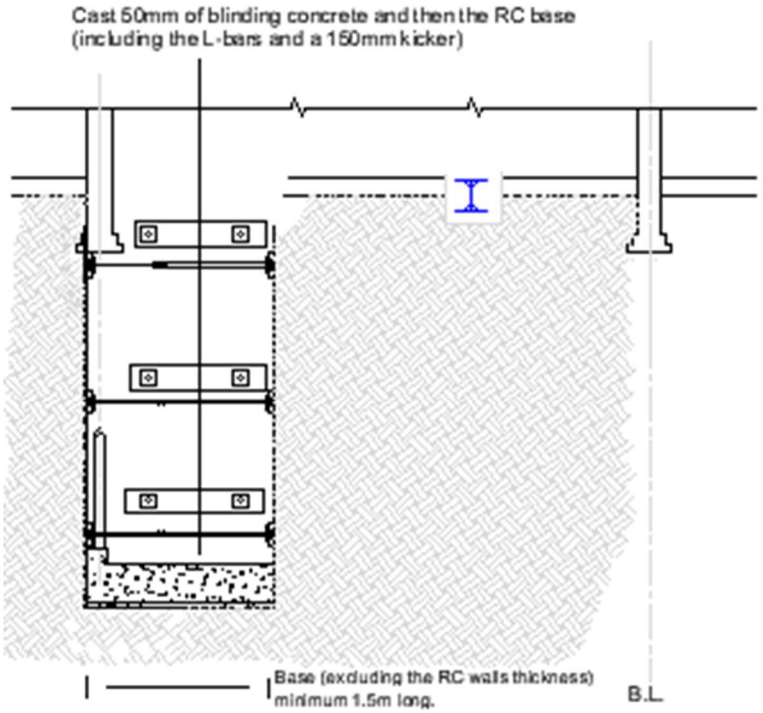


Stage 1 - Existing condition

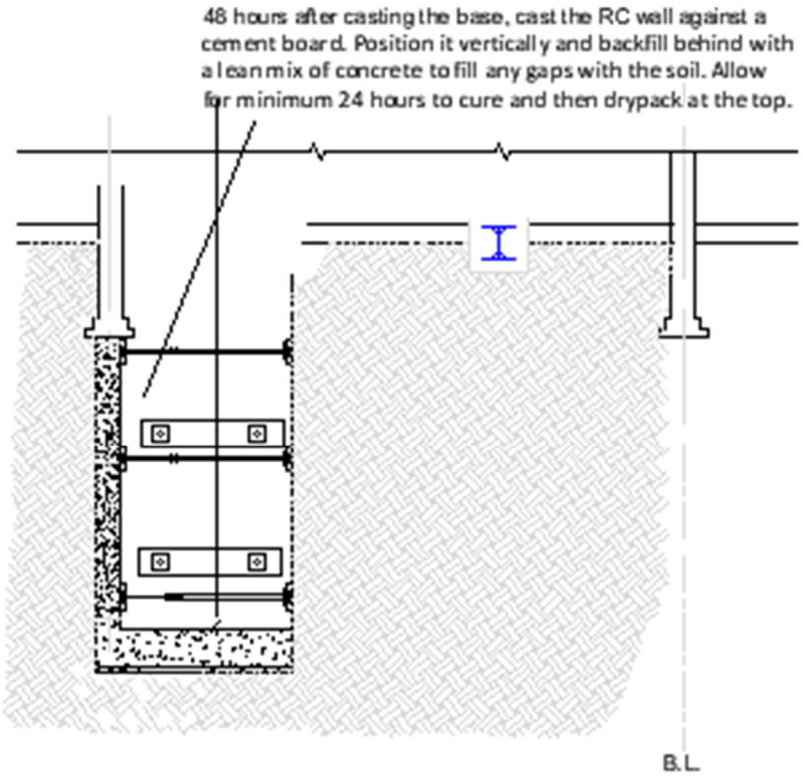
Contractor to saw cut the existing ground bearings slab adjacent to the PW and then to carefully demolish the existing ground bearing slab locally using a mechanical breaker. Excavate to form a maximum 1.2m wide shaft to underpin the existing foundations as per the underpin sequence.
Prop in both directions using pairs of Acrow Props onto 50 x 225 timbers onto 25mm ply sheets at maximum 1.2m c/c's.



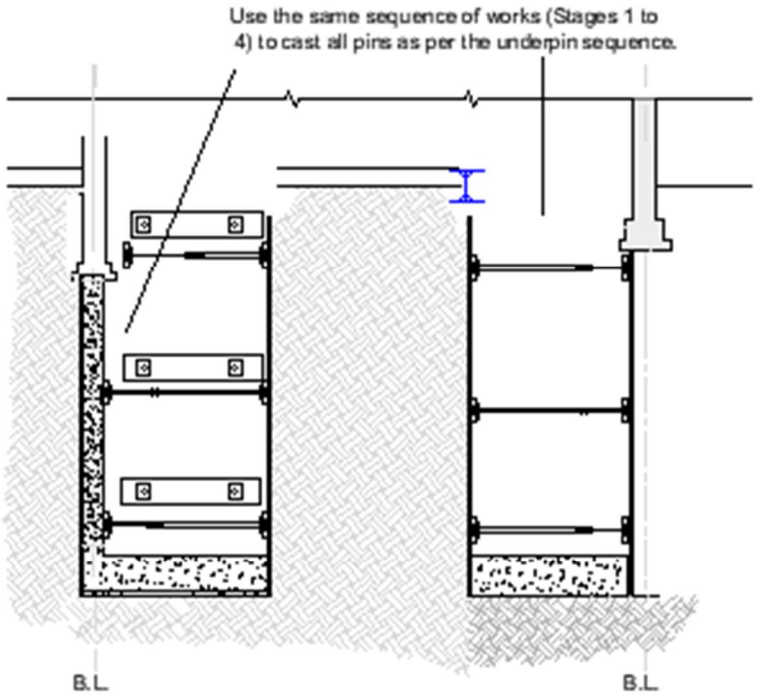
Stage 2 - Form a shaft



Stage 3 - Cast the RC base

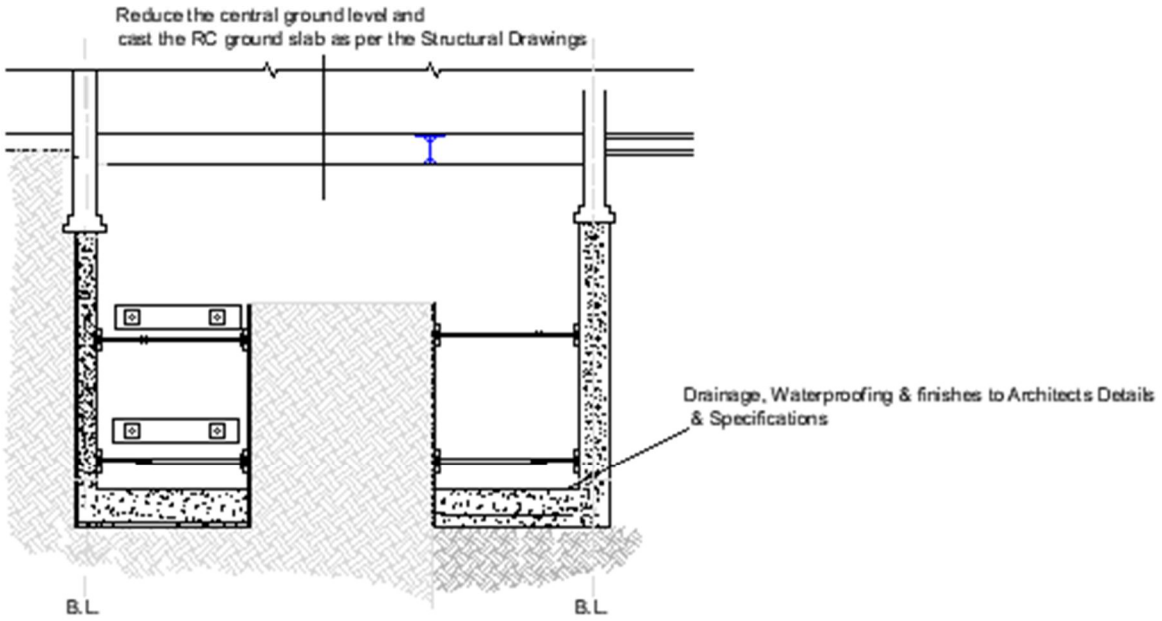


Stage 4 - Cast the RC wall

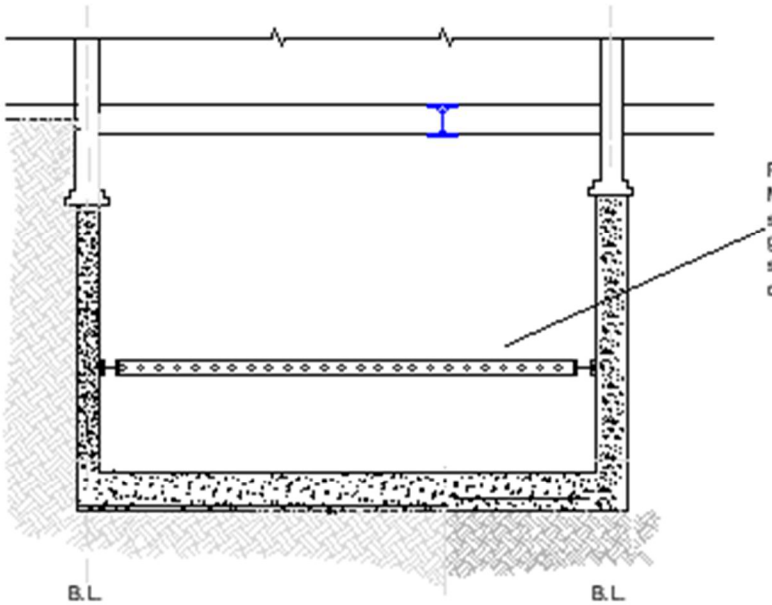


Stage 5 - Cast the remaining pins

Stage 3 - Cast the RC base



Stage 6 - Cast the RC slab



Stage 7 - Prop the RC walls

20. General Construction Notes

FOUNDATIONS & EXCAVATIONS

1. Where foundations are in clay soils and within the zone of influence of trees the depths are to be in accordance with N.H.B.C. guidelines 'Building Near Trees'. Where available, reference must be made to the soil report. All excavations are to be kept dry and the bottom of excavations for foundations must be protected from weathering.

2. Concrete for trench fill foundations is to be grade C30/35.

3. Where new foundations abut existing footings, the Contractor is to allow for local underpinning of the existing foundations.

4. Any drains or service ducts which passing through foundations are to be sleeved, with flexible couplings both sides of footings for drain runs. Tops of foundations may be reduced locally to allow services to pass over subject to Engineers approval with minimum 600mm depth of concrete below services. Precast concrete lintels may be used to support walls over, the Engineer must be consulted for lintel sizes. The Contractor must notify the Engineer if for any reason formation levels vary from those anticipated. Records of all final levels must be kept by the Contractor and issued to the Engineer if requested. The Contractor to agree with the Engineer the method of forming day-joints in foundations.

All foundations are to be agreed with building control, if the foundations cannot be agreed with building control then we will be required to provide additional calculations and designs, this would be an additional fee. To provide the calculations it would be necessary to conduct a trial hole and inspection site visit and if this is not adequate then it may be necessary to obtain a site investigation from a geotechnical engineer.

GENERAL SPECIFICATION FOR UNDERPINNING: -RESPONSIBILITIES

1.The Contractor to confirm with the Client that all required party wall awards are in place prior to works commencing.

2.The Contractor shall be completely responsible for the safety of the existing structure during the underpinning operations and he shall design, supply and erect all the temporary supports that may be required or prove necessary during the course of the work.

3.The details of such supports shall be agreed with the Engineer and other interested parties prior to their erection.

SURVEY AND CONDITION OF BUILDING

1. Before commencing work the Contractor shall request a copy of the Schedule of Conditions prepared as part of the party wall award or carry out an inspection and produce a Schedule of Conditions for the building to be underpinned. This shall be agreed with the Client / Architect / Adjoining owner before commencing work. Where necessary repairs shall be effected to enable the underpinning to be carried out.

PROTECTION

1. The Contractor shall protect the area in which the work is being carried out by the provision of suitable hoarding, fences etc.

2. Unless otherwise instructed by the Architect all work shall be carried out from within the site.

EXCAVATION

1. The underpinning shall be carried out in sections not exceeding 1000mm. The excavation and construction of the sections shall be carried out in a "hit and miss" pattern such that a maximum degree of support is offered to the wall at all times.

2. Unless otherwise stated on the drawings the underpinning shall be carried out for the whole width of the existing foundation.

3. Where excavations exceed 1000mm in depth or wherever it is found necessary or called for on the drawings, all excavations shall be fully planked and strutted. Reference should be made to Specification "Earthworks", in this regard.

4. The material providing the support to the remote earth face below the foundations shall, if necessary, be left in position. It must not therefore be subject to deterioration. Any gaps between this support and the earth face shall be filled with cementatious grout. All timber planking and strutting shall be removed.

5. The underside of the exposed foundations shall be thoroughly cleaned of all soil and other loose material before the section of underpinning is constructed.

6. Excavations which are left open overnight shall be blinded with 50 mm of 1.8 concrete with sulphate resisting cement.

7. If water is struck during excavation, excavation shall cease until a method of dewatering has been devised which will not be detrimental to the adjoining foundations & has been agreed with the Engineer.

RECORDS

1. The contractor shall keep an accurate record of the progress of underpinning operations which shall be available for reference at any time.

21. Additional Notes

Additional Notes

Building Regulations apply to all works of a structural nature. A set of these calculations should be submitted to an Approved Inspector or Local Authority Building Control for approval under the Building Regulations.

We would recommend that an early application is made for Full Plans Building Regulation approval. Should Building Control make any comments on the structural design please pass these back to us for consideration. There is a risk that they may raise queries which will require an amendment to our design so it is important to seek approval prior to commencing any work.

Should you commence work without Full Plans approval under the Building Act you do so at your own risk - we will not accept liability for alterations, costs or delays resulting from the need to address Building Control's requirements.

Planning consent may also be required for the works you are proposing. Unless you or your agent have already done so or you have made alternative arrangements, you should contact your Local Authority Planning Department, to check whether planning consent will be required.

These calculations relate only to the proposed works and their effect on the building structure. We have not considered the structural adequacy of other parts of the building except those directly affected by the proposed works or other areas where the calculations specifically identify design checks.

The structural design has been reviewed in accordance with regulation II of the Construction (Design and Management) Regulations 2015. My addition to the usual risks associated with building works and construction material, of which a competent and experienced building contractor should be aware, the following project specific health and safety risks have been identified:

• Demolition / excavation / drilling and cutting into existing structures or the ground should be carried out with extreme caution as there is a risk that unforeseen services will be encountered.

• All walls / beams / slabs / floor structures etc, which are to be demolished or removed should be assessed for any load bearing or stability function and temporary propping provided as necessary. The design of temporary works support is outside of our brief for the project.

• Any existing structure of fabric to be interfered with by the work should be assessed for the potential presence of asbestos and appropriate action is taken if discovered.

Where new beams are to be installed to support the existing structure, temporary support will be required. When new beams are installed, before removing temporary support, steel or hardwood wedges should be driven into the gap between the top of the new beam and the underside of the retained structure above. The remaining gap should then be packed with a 1:3 dry sand-cement mix or otherwise permanently filled to transfer the load from above. Even with these precautions, some inevitable deflection of the temporary and permanent structure support will occur and this may result in cracking to the structure above. This is normal and should be repaired and redecorated at the completion of the works. Such works should only be undertaken by an experienced and competent building contractor.

Where new foundations are required, the allowable bearing pressure of the soil at the proposed foundation depth should be assessed against the values assumed in the calculations - Table 10 of the approved document of the building regulations gives guidance in this regard.

References:

BS 648: 1994 Weights of Building Materials

BS 5950: Part I: 2000: Design a Structural Steelwork

BS 5977: Part I: 1981: Lintels Method of Assessment of Load

BS 5628: Part I: 2005: Structural use of Unreinforced Masonry

BS 5628: Part 3: 2005: Masonry - Materials, Components, Design & Workmanship BS 5268: Part 2: 2002: Structural use of Timber - Permissible Stress Design BS 6399: Part 1: 1996: Loading for Buildings: Dead and Imposed Loads

BS 6399: Part 2: 1997: Loading For Buildings: Wind Loads

BS 6399: Part 3: 1988: Loading for Buildings: Imposed Roof Loads

Construction Notes:

Concrete Mixes to be designated mixes to BS 8500. The method of placing and the workability of the mix is to be specified by the Contractor to the approval of Local Authority Building Control Admixtures shall not be used without prior approval.

Placing, compacting, finishing and curing to be in accordance with BS8000 Section 2.2

Mass concrete foundation to be mix ref. GEN3 unless stated otherwise in the site investigation report

The following calculations assume that the foundations bear at onto ground capable resisting a bearing pressure of 75kN/m2 without failure of excessive settlement. Where weaker soils are present on site foundation widths will need to be revised as appropriate.

Minimum block strength to be used in the works shall be 2.8 N/mm2. All blocks used below ground shall be suitable for such use

Mortar Designation: Above ground (iii) 1:1:6 Cement: Lime: Sand

Below ground (iii) 1:0.5:4.5 Cement: Lime: Sand

Where beam lengths and other span dimensions are quoted in the following calculations they are approximate and shall not be used as a basis for ordering materials. The main contractors shall make his own measured survey of the site to determine precise lengths and details for construction.

All dimensions and levels to be check by the builder before ordering any steelwork,

All steelwork is to be grade S275, shot blasted and painted with 2 coats of zinc phosphate primer or red oxide primer unless noted on drawing as galvanised or concrete encased.

All bolts are to be grade 8.8, all fabrications to be completed in accordance with BS5950.

All new timbers are to be Grade C24 unless noted as C16 on the drawing and must be tantalised. Paint all cut ends with timber preservative on site. Plywood must comply with EN636 Class 3.

All brickwork to be a minimum of 20.5n/mm2 in 1:1:6 Mortar

All concrete (except blinding concrete) is to be a minimum of 30n/mm2 with 20mm diameter aggregate and is to be mechanically vibrated when placed.

All concrete work must comply with BS8110.

Beam supporting cavity walls to have 15mm thick steel plates welded to top of beam and the width of the plate is to suit the width of the supported wall

All external walls to have straps at 2m c/c's horizontally and vertically for the roof

Timber joists with a span over 2.5m are to ha e one row of noggins at one third the span, noggins can be replaced with herringbone strutting.

All joists in walls are to be cross nailed.

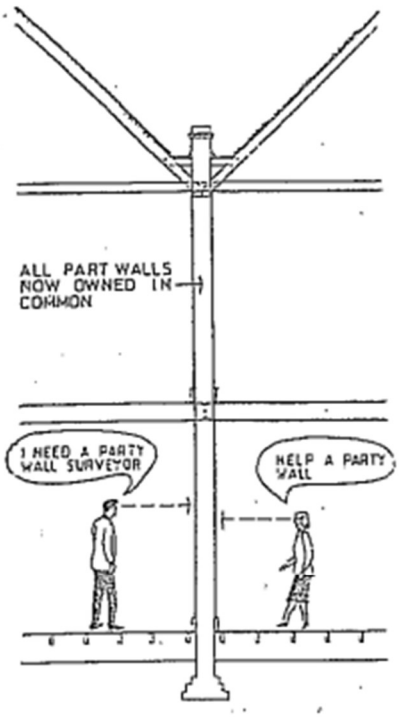
All studwalls parallel to the floor joists must be support by a minimum of a double joist which is to be bolted together using M12 bolts with dog toothed washers @ 500mm c/c

All beams are to be centrally loaded on pad-stone and beams are to extend to the end of any given pad-stone. The contractor must provide full details on their proposed temporary works, before commencing the structural works.

22. Apendix F Party Wall Act 1996:

PARTY WALL ETC ACT 1996

(EFFECTIVE 6/4/97)



THE ACT REQUIRES STRICT OBSERVANCE

PARTY WALL NOTICES REQUIRED FOR

- RAISING OR REBUILDING PARTY WALL
- INCREASED LOADING AND BEAMS
- DAMP PROOF INJECTION
- UNDERPINNING
- CHASING WALLS
- REMOVAL OF CHIMNEY BREASTS AND RAISE CHIMNEY STACK
- ANY OTHER WORKS WHICH AFFECT PARTY WALLS

THE ACT PROVIDES FOR

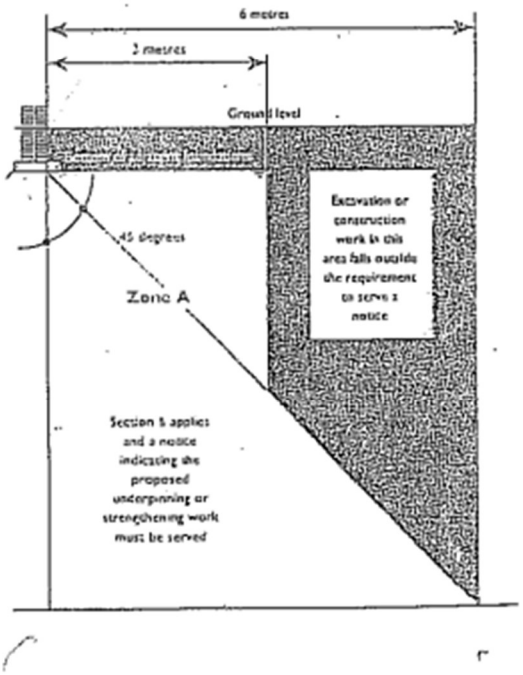
PARTY WALL AWARDS

COVERING:

- PROPOSED WORKS & RESTRICTION ON WORKS.
- PROTECTION & SECURITY
- MAKING GOOD DAMAGE
- RECORDING CONDITION BEFORE WORKS START
- INSURANCE: DISPUTES PROCEDURE
- ADDITIONAL WORKS

ADJOINING EXCAVATIONS

NOTICES REQUIRED FOR FOUNDATIONS WITHIN 3 METRES & 6 METRES OF ADJOINING PROPERTY.



LINE OF JUNCTION NOTICES

REQUIRED FOR CONSTRUCTION & REPAIR OF STRUCTURES BUILT TO BOUNDARY LINES