

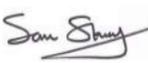
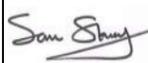


elliottwood

13 Netherhall Gardens NW3 5RN

Structural Engineering Report and Subterranean Construction Method Statement

engineering a better **society**

		Remarks:	For Information				
Revision:	P3	Prepared by:	Simon Lee Engineer MSc BSc (Hons)	Checked by:	Gary Povey Associate Director BSc CEng MIStructE	Approved by:	Gary Povey Associate Director BSc CEng MIStructE
Date:	24/04/2020	Signature:		Signature:		Signature:	
Revision:	P4	Prepared by:	Edward Gould Engineer MEng (Hons)	Checked by:	Samuel Stacey Associate MEng (Hons) CEng MIStructE	Approved by:	Samuel Stacey Associate MEng (Hons) CEng MIStructE
Date:	18/08/2021	Signature:		Signature:		Signature:	

Contents

Our practice	2
Non-Technical Summary	3
Introduction.....	3
Description of Existing Building and Site Conditions.....	3
Proposed alterations	4
Existing and Proposed Below Ground Drainage.....	5
Party Wall Matters	5
Hydrogeological Statement Summary.....	5
Basement Impact Assessment Summary	5
Structural Monitoring Proposals.....	6
Construction Method Statement.....	6
Noise, Vibration and Dust Mitigation	8
Conclusions	8

Appendices

A Proposed Structural Drawings	A
B Suggested Construction Sequence Drawings	B
C Lost Rivers of London.....	C
D Thames Water Asset Search.....	E
E Underpin Structural Calculations	F

Our practice

Elliott Wood work with likeminded people to
engineer a better society

Our portfolio is extraordinarily diverse, and we particularly enjoy those projects which provide the opportunity to engineer for the common good – from making dramatic improvements to the life of a town or city, through to nurturing a new generation of exceptional engineers in our own in-house academy.

Despite more than twenty years in practice, we continue to be curious and find ways to pass on the benefit of our collective experience. We foster enquiring minds and share ideas because we know that this knowledge can make a real difference to our clients.

Engineering is often about the unseen: much of what we do is hidden when a building is complete. But engineering is not a necessary evil – it's much cleverer than that. Our role is to demystify the invisible workings of a structure, to reveal unexpected opportunities and to make the existing engineering work harder.

We value both technical and creative thinking and are activists for a new kind of engineering profession in which our craft is pivotal to the design process. We are no ordinary engineers.

Reveal / Materialise / Impact

Engineers make a difference

We like to be involved at the start of our clients' creative and commissioning journey, because we are concerned that not enough people are realising the full potential of their buildings. They are only working with what they can see.

Our process challenges usual perceptions of the engineer's role because we help clients to see the unseen and achieve results beyond the aspirations of the brief – and which have a positive legacy for their wider communities.

Reveal

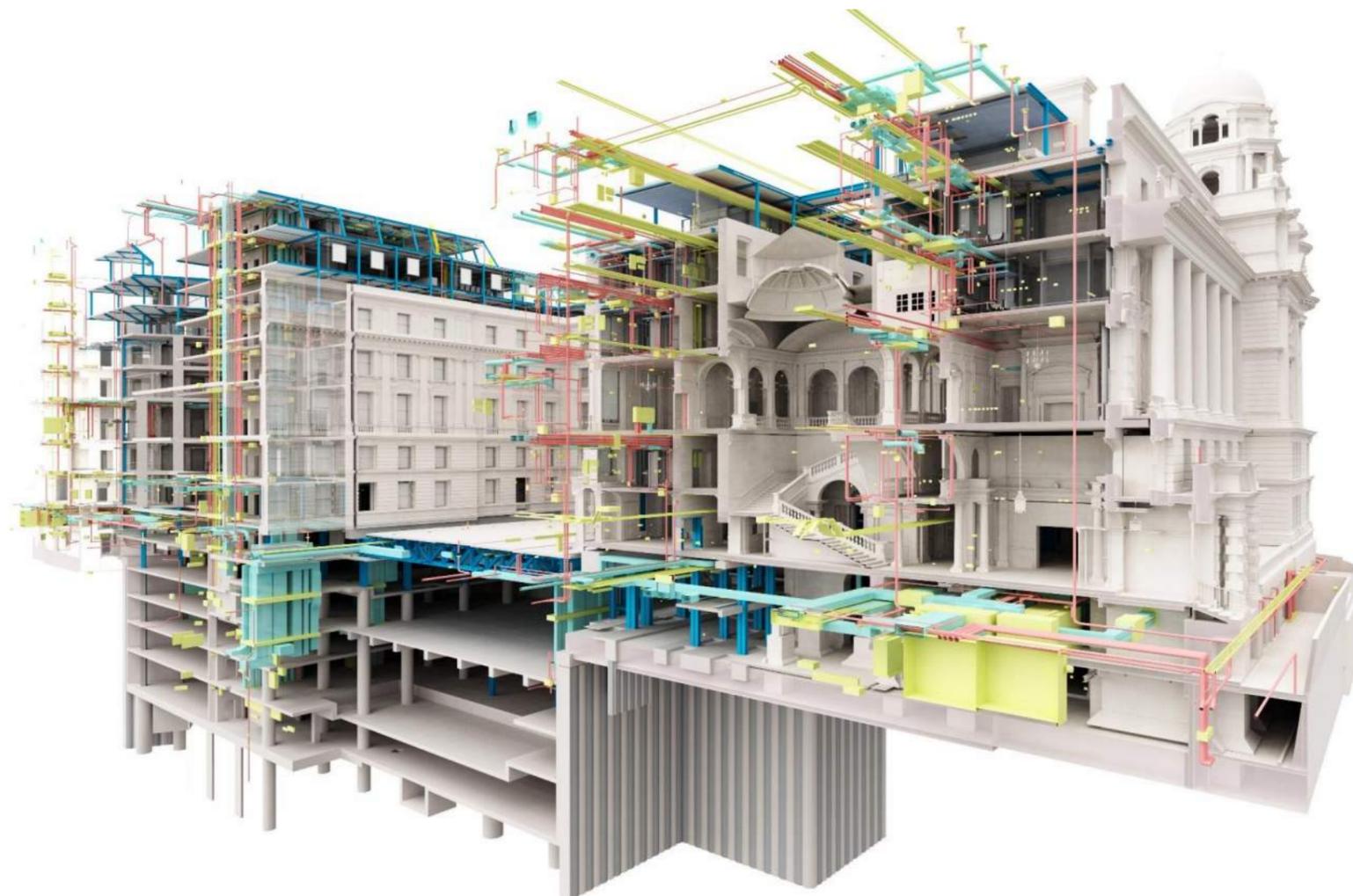
We ask questions. With innovative thinking, we reveal the unexpected opportunities in an already ambitious brief.

Materialise

We give ideas life. Using expertise and imagination, we materialise new assets for our clients.

Impact

We make a difference. Our work not only benefits our clients, it has a positive impact on society as a whole.



One

Non-Technical Summary

1.1

Elliott Wood Partnership Ltd (EWP) has worked on a number of projects in the area and therefore has good knowledge of both the underlying soil and groundwater; the basement has been designed with this in mind. A site-specific site investigation as well as and a basement impact assessment (BIA) has been carried out by Geotechnical and Environmental Associates (GEA) and it has concluded that the basement will have no adverse effect on the local hydrology.

If the works are properly undertaken by suitably qualified contractors, they will pose no significant threat to the structural stability of the existing building or the adjoining properties. The BIA has been completed by GEA in accordance with CIRIA C760. Based on the predicted ground movements, the properties surrounding the site are not expected to suffer any damage greater than CIRIA C760 Damage Category 0 (Negligible). All reports have led to the same conclusion: If constructed properly the construction of a new basement on the site will not have any adverse effect on the property, neighbouring properties, groundwater, surface water or slope stability.

Two

Introduction

2.1

EWP is a firm of consulting structural and civil engineers approximately 120 strong operating from their head office in Southwest London. Residential developments of all scales have been central to the workload of the practice with many in the Greater London area. In particular, EWP has been producing designs for basements to both existing and new buildings for several years. To date, this numbers approximately 600 sites many of which have been in the London Borough of Camden. Our general understanding of the development of London, its geology, and unique features together with direct experience on many sites puts us in a strong position to advise clients on works to their buildings and in particular the design and construction of their basement.

2.2

EWP were appointed by the building's owner to advise on the structural implications of the proposed construction of a new basement on the site of 13 Netherhall Gardens, NW3 5RN. The following report has been prepared to ensure that the property and neighbouring properties are safeguarded during the works. The scheme meets the requirements outlined in the Supplementary Planning Document CPG4 "Basements and light wells"

dated March 2018, which supports Camden Development Policy DP27 "Basements and light wells" and forms part of the wider Local Development Framework (LDF). The report includes information on the site, the proposed developments and their impact on the site, the building and adjoining buildings and provides information on how the works will be constructed.

2.3

EWP has extensive experience of projects of this type and has previously produced planning reports for other properties in the area. We also have a comprehensive understanding of the underlying ground conditions in the area gained from the numerous basement projects we have completed in the London Borough of Camden including a basement on nearby Nutley Terrace.

2.4

This statement focuses on the proposed subterranean works as opposed to the superstructure works and should be read in conjunction with all other relevant design and specialist supporting documents.

2.5

A preliminary desk study has been completed to establish the general ground conditions and history of the existing building – refer to section 3.

2.6

The Contractor will provide a detailed method statement including all temporary works before the works can commence on site. The Contractor is to accept full responsibility for the stability and structural integrity of the works during the contract and provide temporary support as necessary. The Contractor shall also prevent overloading of any completed or partially completed elements.

Three

Description of Existing Building and Site Conditions

3.1

The existing building is a detached five storey building which is entered at ground level at the front and has a lower ground floor level towards the rear. The construction comprises of solid masonry walls and timber floors and roof. Stability is provided via the cellular layout of the masonry shear walls. The foundations appear to consist of mix of corbel and concrete spreader footings. Some intrusive opening up works have been undertaken in certain areas, but further investigations will be undertaken to confirm the existing structure during construction.

3.2

The building footprint is generally rectangular with the entrance to the building located on the east elevation.

The existing building and neighbouring properties are not registered on the Camden Borough Listed building register, but they are situated in the Fitzjohn Netherhall conservation area.

3.3

The site is bounded by the main road Netherhall Gardens to the east, No. 11 Netherhall Gardens a three-storey residential property to the south and Imperial Towers a five-storey apartment block to the north.

3.4

Network Rail's Belsize New Tunnel runs in a roughly west-east alignment intersecting the southeast corner of the site. The assumed depth of the of the tunnel crown is approximately 15.0m below ground level. Further surveys will be required to confirm the position of the tunnel.

Network rail have been informed of the proposals and should be notified of the works by others during the planning process.

3.5

A site investigation has been completed by GEA in October 2018 consisting of a desk study two boreholes and 11 trial pits. The investigation indicated that beneath the moderate thickness of made ground the underlying ground is London Clay to the full depth of the investigations at 30.0m. The made ground typically extended to a depth of 1.4m.

3.6

Ground water was not encountered during the investigation. Subsequent ground water monitoring by GEA has confirmed that standpipes were dry for the three weeks after installation.

3.7

The ground at the east of the site towards the Netherhall Gardens is relatively level and begins to fall towards the middle of the site.

There is an existing 2.5m high retaining wall along the northern boundary of the site. The ground to the adjacent Imperial Towers is approximately 2.5m lower than number 13. The ground level to number 11 south of the site is relatively level with number 13.

Towards the rear of the existing building the ground slopes steeply towards the northwest of the site. The site boundary to the north of the site currently consists of a 2.5m high retaining wall that retains the ground on number 13 side of the boundary. The height along the retaining wall reduces towards the west.

3.8

The existing building is in a dilapidated state and there are signs of movement in the form of cracked masonry and unlevel floors. A visual site survey has been undertaken by VW Burgess. Existing damages and proposed repair works have recorded and where deemed necessary these will be undertaken prior to the basement works.

As part of their site investigation works GEA have investigated the likely cause of the structural damage which is expected to be ground movement. The ground investigation shows the underlying soils to be clays with high volume change potential. This, along with the presence of nearby trees, is likely to be a contributing factor to ground movement below and adjacent to the existing footings. Japanese knotweed had also been present on the site. This would have also contributed to the movement and structural damage of the existing foundations. This has since been investigated and is currently being removed by a specialist company.

Trial pits were conducted by GEA which encountered what is suspected to be underpinning of the existing foundations suggesting that movement had been identified and attempts were made to rectify the ground movement. GEA suspect that the ongoing movement is a result of the above contributing factors not being sufficiently mitigated by the previous underpinning attempts. Proposals to address ground movement are discussed in section 4.

3.9

The results of our desk study can be summarised as follows:

- The building appears to be near the historic Tyburn and Westbourne rivers (reference Lost Rivers of London, Nicholas Barton (refer to Appendix B).
- Network Rail's Belsize New Tunnel runs below ground from the south to the east of our site.
- There is no record of historical blast bomb damage to the property (reference to UXO Zetica map: <https://zeticauxo.com>).



Figure 1. Site plan

Four

Proposed alterations

4.1

The trial pits conducted by GEA encountered evidence of historical underpinning to rectify ground movement beneath the existing foundations. To limit any further movements GEA recommend that the existing foundations should be underpinned to a sufficient bearing depth.

4.2

The proposed works involve underpinning the existing building creating a lower ground floor towards the front of the building and forming a new single storey basement towards the rear. It is also intended to remodel the upper levels of the building, but this report will focus on the substructure works as part of the basement application.

4.3

The new single storey basement at the rear will extend approximately 4.2m below lower ground floor level. This is 2.95m deeper than the existing foundations and is deemed sufficient by GEA to address the issue of ground movement of the existing foundation. The perimeter walls towards the rear will be formed using contiguous piled walls to retain the ground behind it. The majority of the basement walls under the existing building will be formed from L-shaped reinforced concrete (RC) underpins cast in max 1.0m wide sections in a traditional 5-stage sequence.

4.4

The reinforced underpins have been designed as cantilever retaining walls to resist the soil, surcharge, and hydrostatic pressures in the permanent case. Horizontal propping will be used to provide stability in the temporary case.

4.5

The reinforced concrete basement walls have been designed to span top and bottom, with permanent structural floors to prop the basement wall in the permanent case.

4.6

The basement slab has been designed as a suspended RC slab supported on the RC edge thickenings of the underpins. The slab will be suspended over a compressible void former to mitigate the effects of heave from the underlying clay soils. The slab will be designed to resist any hydrostatic pressure that may be exerted on the underside of the slab.

Five

Existing and Proposed Below Ground Drainage

5.1

Sewer records have been obtained from Thames Water to confirm the location, size, and depth of the surrounding sewer network. The records confirm that a 914x610mm combined water sewer runs from south to north in Netherhall Gardens. Sewer records are located in Appendix C.

5.2

A CCTV Drainage survey of the existing on-site drainage network was undertaken by WinCan which confirmed that the site drains via a single 150mm diameter combined water outfall to the Thames Water sewer in Netherhall Gardens. The outfall manhole was measured to be approximately 4.0m deep.

5.3

In order to protect the new basement from risk of sewer surcharge, it is proposed to connect the foul appliances at lower ground floor level and the new basement level to a private packaged foul pumping station. The foul water discharge from the pump will connect to the existing outfall manhole and then drain via gravity to the Thames Water sewer network. The pumping station will be appropriately sized for emergency storage in accordance with Part H of the Building Regulations and include dual pumps (duty and standby), non-return valves and alarm/telemetry.

5.4

Drainage from ground floor level and above will be designed to drain via gravity and exit the building via a suspended drainage network to be detailed by the M&E engineer.

Six

Party Wall Matters

6.1

The proposed works fall within the scope of the Party Walls Act 1996. Procedures under the Act will be dealt with in full by the Employers Party Wall Surveyor. The Party Wall Surveyor will prepare and serve necessary Notices under the provisions of the Act and agree on Party Wall Awards in the event of disputes. The Contractor will be required to provide the Party Wall Surveyor with appropriate drawings, method statements and other relevant information covering the works that are notable under the Act. The resolution of matters under the Act and provisions of the Party Wall Awards will protect the interests of all owners.

6.2

The structural design for 13 Netherhall Gardens will be developed so as not to preclude or inhibit similar, or indeed any work on the adjoining properties. This will be verified by the Surveyors as part of the process under the Act.

Seven

Hydrogeological Statement Summary

7.1

Groundwater was not encountered during the boring operations carried out by GEA in October 2018. Subsequent groundwater monitoring has shown that the boreholes were dry down to 30m and hence ground water inflows are not likely to be an issue.

7.2

The basement slab at the rear is founded at approximately 4.2 m below ground level. It is therefore possible that perched water may be encountered during the construction of the basement, although based on the monitoring completed this is unlikely. Localised pumping will be implemented to deal with perched water during the construction of the basement if present. As the ground has a low permeability it was advised that this would be a suitable method of controlling the water. The relevant filters will be installed on the pumps to ensure that the migration of fines is limited.

7.3

Arup's Subterranean Development Scoping Study (para 5.1), June 2008, notes that the impact of subterranean development on groundwater flow is negligible as groundwaters flows will find an alternative route if blocked by a subterranean structure.

Eight

Basement Impact Assessment Summary

8.1

The land stability, groundwater and surface flow assessments have been carried out by GEA. The assessments conclude that if properly constructed, the proposed development is should not result in any specific land/slope stability issues or surface flooding issues.

8.2

A ground movement assessment has also been conducted by GEA. This conclude that if the works are properly carried out then the likelihood of damage to the adjacent properties should be limited to 'negligible' as set out in CIRIA Report 760, which is within acceptable limits.

8.3

The Basement Impact Assessment has concluded that the proposed basement excavation should not result in any specific land or slope stability issues if properly undertaken.

Nine

Structural Monitoring Proposals

9.1

The following outlines a proposed monitoring scheme that will need to be confirmed with the Contractor and party wall surveyors prior to the basement works commencing.

9.2

The Contractor shall provide tri-axial monitoring to all structures and infrastructures adjacent to the basement excavation at the time of excavation and construction.

9.3

The Contractor is to ensure the monitoring locations are free from all obstructions prior to the surveyor's visit, to allow readings to be taken.

9.4

Monitoring shall be completed as follows:

- 1) 2no. readings (one week apart) prior to any works being started to establish a base reading.
- 2) On a weekly basis during the excavation and construction of the basement until all underpins have been completed; and 3no. consecutive readings show no significant movement.
- 3) Fortnightly until all major structural works are completed, and temporary works removed; and 3no. consecutive readings show no significant movement.
- 4) On a monthly basis thereafter for a 3-month period following completion of the notifiable works, unless otherwise agreed with the adjoining Owner's surveyor.

9.5

Cumulative movement of survey points must not exceed:

- a. Settlement
Code amber trigger values: +/-5mm
Code red trigger values: +/-10mm

- b. Lateral displacement
Code amber trigger values: +/-4mm
Code red trigger values: +/-8mm

9.6

Movement approaching critical values:

Code amber trigger value:

All interested parties, including the Adjoining Owner's Surveyor and his Engineer should be informed. The contractor will consider the cause of the movement and submit plans to limit movement thereafter. Further actions immediately agreed between the Party Wall Surveyors.

Code red trigger value:

All interested parties including Adjoining Owner's Surveyor and Engineer will be informed immediately. Works will stop in the affected area immediately, and if required actions will be taken to make the works safe. Actions to limit movement thereafter to be proposed by the Contractor for comment and any required remedial works shall be completed as soon as possible.

9.7

Reporting:

Contractor to provide an interpretive report highlighting any movement in diagrammatic form. Report to show full tri-axial movements data for each monitoring point, with comparisons made against base reading and previous reading.

Ten

Construction Method Statement

Assumed sequence of construction

It is assumed that the below measures and assumed sequence of works are considered in the eventual design and construction of the proposed works. The below sequence should be read in conjunction with the drawings in Appendix A.

10.1

Key considerations to be addressed when establishing the sequence of works in this project are:

- The stability of the ground
- Maintaining stability of the existing and adjacent properties property throughout the works
- Forming sensible access onto the site to minimise disruption to the neighbouring residents; And
- Providing a safe working environment.
- Maintain the integrity if Network Rail Belsize tunnel

10.2

Once the works commence EWP will have an on-going role on site to monitor that the works are being carried out generally in accordance with our design and specification. This role will typically involve regular site visits with a written report being completed following each site visit.

10.3

Details of Elliott Wood appointment is in Appendix F.

10.4

The Contractor is entirely responsible for maintaining the stability of all existing buildings and structures, within and adjacent to the works, and of all the works from the date of possession of the site until practical completion of the works. A full set of temporary works drawings and calculations will be provided by the Contractor and will be reviewed by EWP prior to work starting on site.

10.5

The proposed works involve underpinning the existing lower ground floor and the construction of the new basement to the rear. It is assumed the basement works will be completed in a bottom-up construction sequence. All temporary works should be undertaken in such a way that the loads being transmitted to the existing structure and/or ground will ensure a load path that does not overstress supporting areas.

10.6

All demolition and excavation work will be undertaken in a carefully controlled sequence, taking into account the requirement to minimise vibration and noise. The use of non-percussive instruments should be used whenever possible.

10.7

The following methodology has been based on the existing structure as per our drawings which will need to be confirmed prior to the works.

Assumed sequence of work to be read in conjunction with suggested construction sequence drawings in Appendix B.

Stage 1 Site set up

- Erect site hoarding. The services within the site should be identified and isolated as necessary. All below ground obstructions should also be removed to allow the works in progress. Contractor to propose hoarding area.
- Reduce ground level at rear for pile rig access

Stage 2 Enabling works

- Install piling mat within the proposed area of the piling
- Provide access to piling rig and install piling mat to enable piling at rear
- Movement monitoring system will be installed to the existing boundary retaining wall. An assumed specification for the movement monitoring is outlined in section 9; the adopted specification will need to be agreed with the contractor and adjoining owner's party wall surveyors.
- Remedial and repair works to the superstructure shall be carried out to ensure the structure is safe to underpin.
- The principles of removal of spoil shall be agreed. Given the scope of works, it is likely that conveyor will be used to move the spoil from the holding areas within the excavation to the storage area.

Stage 3 Remove existing ground floor and installing ground floor composite decking

- Remove internal finishes where necessary and carefully remove the existing ground floor timber joists ensuring the existing masonry walls remain intact and in good condition.
- Install Ground floor composite decking to provide cover to basement construction. Composite decking to be temporary propped until permanent structures at basement are built.
- Install contiguous piles at the rear

Stage 4 Underpinning at front of property

- The external ground floor walls will be underpinned from the inside of the building where possible. All underpinning will be reinforced concrete underpins constructed in a traditional 5-stage underpinning sequence of a 1m maximum width. If the existing footings extend to the proposed basement slab level, it may be that no underpinning will be required in these areas, but this will be determined on site. Deeper underpins may have to be completed in two or three separate phases.
- The underpinning will be dry-packed to the underside of the wall with 3:1 sharp sand to cement dry pack, well rammed in. The underpins will then be left to cure for 3 days until the concrete has gained sufficient compressive strength. The exact sequence of the underpinning will be advised by the Contractor as it relates to their sequence of construction.
- The Contractor should undertake trial pits to confirm the exact depth of all existing foundations of the walls. Elliott Wood to inspect and check how well the existing soil is cemented and, in particular, its ability to "stand up" whilst the individual underpin is completed.

Stage 5 Install temporary works

- Temporary steel needles and props will be installed to support the rear elevation. These will be propped down onto key underpins or sacrificial mass concrete foundations. All temporary works to be designed by the contractor. Principle of temporary works to be agreed.
- Alternatively, the existing walls can be temporary underpinned with mass concrete and then be used to prop off temporary supports for the above superstructure.

Stage 6 Underpinning of existing lower ground floor walls at rear

- Contractor should ensure any temporary works to underpins at stage 4 to be adequately designed to enable multistage underpinning down to the proposed basement level.
- Similar to stage 4, the walls at the rear of the lower ground floor will need to be underpinned to the proposed basement slab level. The underpins will be reinforced concrete underpins constructed in traditional 5-stage underpinning sequence of 1m maximum width.

- If groundwater is encountered during excavation, measures are to be taken to control any inflows using suitable groundwater control methods such as localised dewatering or permeation grout.
- Excavate the central bund down to the level of the proposed high level temporary works – to be confirmed with the contractor.
- Install the temporary high level waling beams around the perimeter of the excavation against the RC pins.
- Install the high-level horizontal props across the excavation between the high-level waling beams. The horizontal props will provide temporary resistance to the lateral loads at the top of the basement structure until the RC ground slab has been cast and cured.
- Excavate to approximately 1.0m above basement founding level.
- Install the temporary low level waling beams around the perimeter of the excavation against the RC pins.
- Install the low-level horizontal props across the excavation between the low-level waling beams. The horizontal props will provide temporary resistance to the lateral load at the bottom of the basement structure until the RC base slab has been cast and cured.

Stage 7 cast of RC slab at basement

- Install below ground drainage and heave protection below basement slab.
- Cast the base slab between the underpin and retaining wall bases, including starter bars for the RC columns and walls within the basement. Once the base slab has been cured it will provide permanent resistance to lateral loads and so the low-level temporary works can be removed.

Stage 8 Cast RC walls and columns

- Cast RC walls and columns within the basement up to the proposed underside of the lower ground floor slab.

Stage 9 Construct superstructure

- Continue up the building and construct the superstructure.

Eleven

Noise, Vibration and Dust Mitigation

11.1 Noise, Vibration and Dust

The construction works will involve the demolition of the existing single storey side extension and underpinning the existing walls to form a new basement. A more detailed sequence of the works has been given in section 10. Those most likely to be affected by noise dust and vibration will be the immediate neighbours at 11 Netherhall Gardens and Imperial Towers.

Below we have described the mitigation measures that are proposed to keep noise, dust, and vibration to acceptable levels.

11.2 Mitigation measures for demolition of Existing Building

The breaking out of existing structures shall be carried out by diamond saw cutting and hydraulic bursting where possible to minimise noise and vibration to the adjacent properties. All demolition and excavation work will be undertaken in a carefully controlled sequence, taking into account the requirement to minimise vibration and noise. The contractor will need to utilise non-percussive breaking techniques where practicable.

Dust suppression equipment should be used during the demolition process to ensure that any airborne dust is kept to a minimum. Where practical, concrete should also be wetted down prior to and during breakout to further inhibit airborne dust.

11.3 Mitigation Measures for Bulk Excavation

Due to the size of the basement it is likely that mechanical plant will be required to complete the bulk excavation. The contractor should ensure that any mechanical plant is switched off when not in use and is subject to regular maintenance checks and servicing. An electrically powered conveyor will be used as detailed above.

11.4 Mitigation Measures for the Construction of the Concrete Basement Shell

The contractor should ensure that any concrete pours are completed within the permitted hours for noise generating works. The contractor should allow for a contingency period to ensure that concrete pours can be completed within these hours regardless of unforeseen circumstances such as batching plant delays and traffic congestion.

The fabrication and cutting of steelwork for the reinforced concrete underpins and slabs shall take place off site. If any rebar needs to be trimmed on site this should be completed using hydraulic or pneumatic tools instead of angle grinders.

11.5 Dust Control

To reduce the amount of dust generated from the site, the contractor should ensure that any cutting, grinding, and sawing should be completed off site where practicable. If cutting, grinding, and sawing is being carried out on site, surfaces are to be wetted down prior to and during these types of work whenever possible. Any equipment used on site should be fitted with dust suppression or a dust collection facility.

The contractor will be responsible for ensuring good practice with regards to dust and should adopt regular sweeping, cleaning, and washing down of the hoardings and scaffolding to ensure that the site is kept within good order. The Contractor selected will be a member of the Considerate Contractors Scheme. Contact details of the contractor who will be responsible for containing dust and emissions within the site will be displayed on the site boundary so that the local residents can contact the contractor to raise any concerns regarding noise and dust.

The building will be enclosed within suitable scaffold sheeting and any stockpiles of sand or dust-generating materials will be covered. Cement, fine aggregates, sand, and other fine powders should be sealed after use.

Twelve

Conclusions

12.1

It is intended that the above measures and sequence of works are adopted for the eventual design and construction of the proposed works. If the works noted above are properly undertaken by suitably qualified contractors, these works should pose no significant threat to the structural stability of the proposed buildings or the adjoining properties.

12.2

Detailed method statements and calculations for the enabling and temporary works will need to be prepared by the Contractor for comment by all relevant parties including party wall surveyors and their engineers. EW will need to ensure that adequate supervision and monitoring are provided throughout the works particularly during the excavation and demolition stages. A specification and indication of monitoring requirements is given in section 9.

12.3

A ground movement analysis has also been conducted by GEA. This concludes that if the works are properly carried out then the likelihood of damage to the adjacent properties should be within the acceptable limits, if the works are carried out in this manner, then the likelihood of damage to the adjacent properties should be limited to 'negligible' as set out in CIRIA Report 760.



elliottwood

Appendices

engineering a better society

A Proposed Structural Drawings



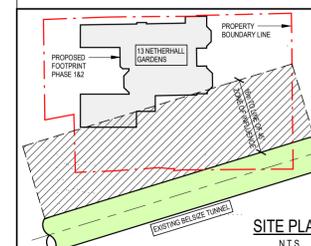
1-21 IMPERIAL TOWERS

This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

Do not scale from this drawing.

LEGEND

- EXISTING STRUCTURE
- NEW LOAD BEARING BLOCKWORK
- NEW LOAD BEARING BRICKWORK
- NEW MASS CONCRETE
- NEW REINFORCED CONCRETE
- NEW PRECAST CONCRETE
- NEW REINFORCED WATER RESISTANT CONCRETE
- PADSTONES
- NEW LOAD BEARING STUDWORK
- NON LOAD BEARING WALLS
- LOAD BEARING STRUCTURE BELOW
- EXISTING STRUCTURE TO BE REMOVED
- NEW STEEL BEAMS
- EXISTING STEEL BEAMS
- NEW LINTELS OVER OPENINGS
- DENOTES MOMENT CONNECTION



NOTES:

1. 'T' DENOTES TRANSITION UNDERPINS.

NOT FOR CONSTRUCTION

rev	date	by	chk	description
P3	23.08.21	BMc	EGo	Issued for information & comment
P2	24.04.20	IW	SL	Issued for information & comment
P1	30.01.19	MJS	SL	Issued for information & comment

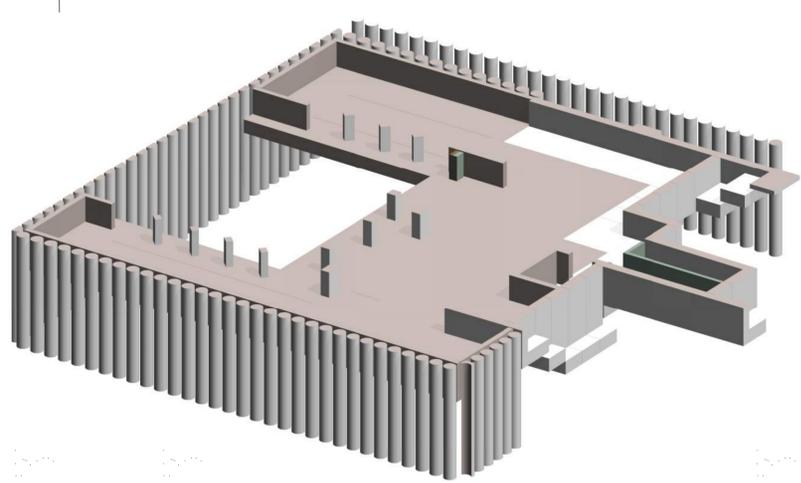
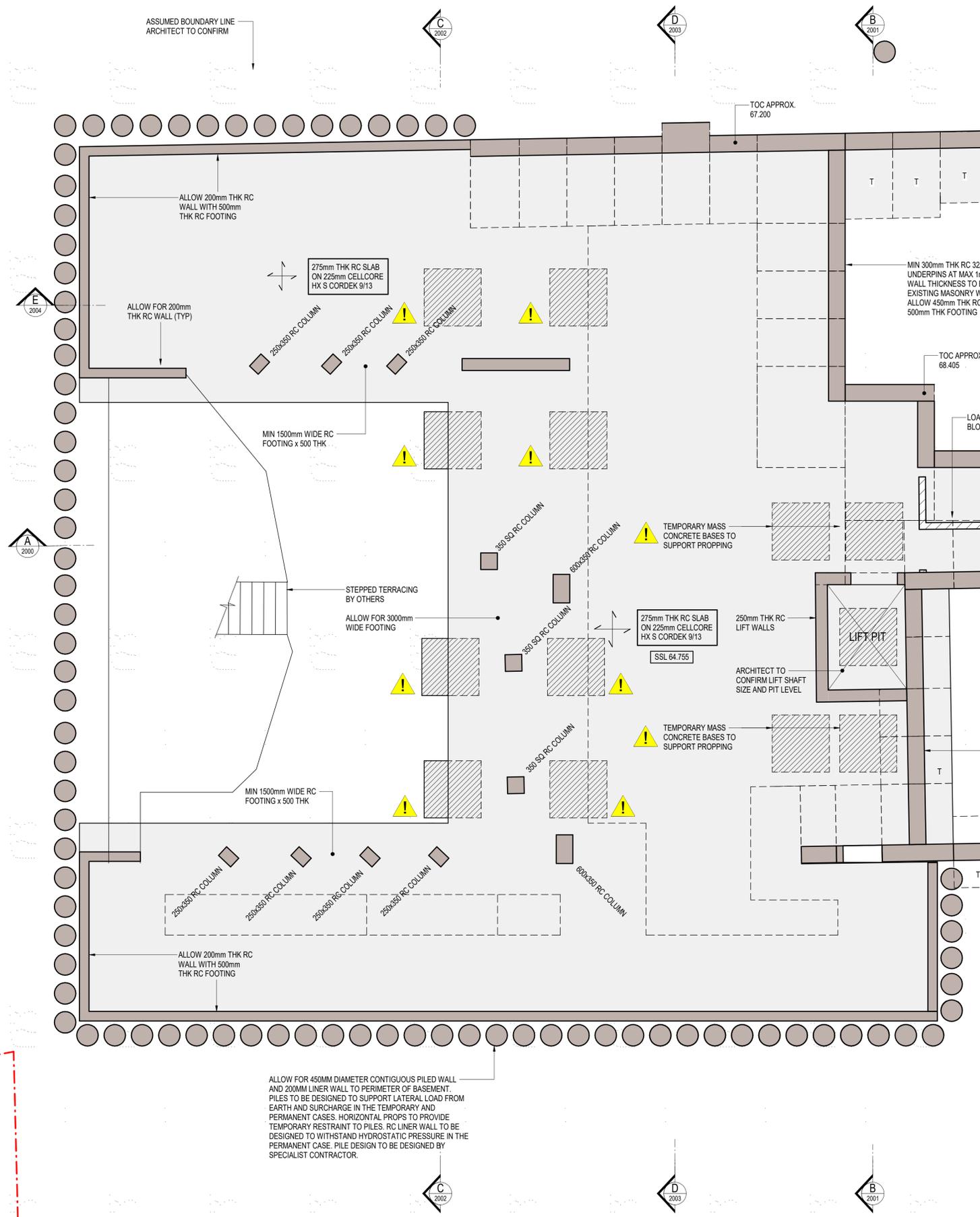


Elliott Wood Partnership Ltd
Central London • Wimbledon • Nottingham
Consulting Structural and Civil Engineers
(020) 7499 5888 • elliotwood.co.uk

Project
13 Netherhall Gardens,
London, NW3 5RN

Drawing title
Proposed Basement -
PHASE 1-2

Scale (s)	Date	Drawn
1:50@ 1:100@A3	September 2018	BMc
Drawing status	Status Revision	
Preliminary	S2	P3
Project no. 2180456- EW -00 -B2-DR -S -0800	Originator Zone Level Type Role	drg no.



ALLOW FOR 450MM DIAMETER CONTIGUOUS PILED WALL AND 200MM LINER WALL TO PERIMETER OF BASEMENT. PILES TO BE DESIGNED TO SUPPORT LATERAL LOAD FROM EARTH AND SURCHARGE IN THE TEMPORARY AND PERMANENT CASES. HORIZONTAL PROPS TO PROVIDE TEMPORARY RESTRAINT TO PILES. RC LINER WALL TO BE DESIGNED TO WITHSTAND HYDROSTATIC PRESSURE IN THE PERMANENT CASE. PILE DESIGN TO BE DESIGNED BY SPECIALIST CONTRACTOR.



1-21 IMPERIAL TOWERS

This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
Do not scale from this drawing.

LEGEND

- EXISTING STRUCTURE
- NEW LOAD BEARING BRICKWORK
- NEW MASS CONCRETE
- NEW REINFORCED CONCRETE
- NEW PRECAST CONCRETE
- NEW REINFORCED WATER RESISTANT CONCRETE
- PADSTONES
- NEW LOAD BEARING STUDWORK
- NON LOAD BEARING WALLS
- LOAD BEARING STRUCTURE BELOW
- EXISTING STRUCTURE TO BE REMOVED
- NEW STEEL BEAMS
- EXISTING STEEL BEAMS
- NEW LINTELS OVER OPENINGS
- DENOTES MOMENT CONNECTION



NOTES:

1. 'T' DENOTES TRANSITION UNDERPINS.
2. (00.000) DENOTES PROPOSED LEVELS

NOT FOR CONSTRUCTION

rev	date	by	chk	description
P3	23.08.21	BMc	EGo	Issued for information & comment
P2	24.04.20	IW	SL	Issued for information & comment
P1	30.01.19	MJS	SL	Issued for information & comment

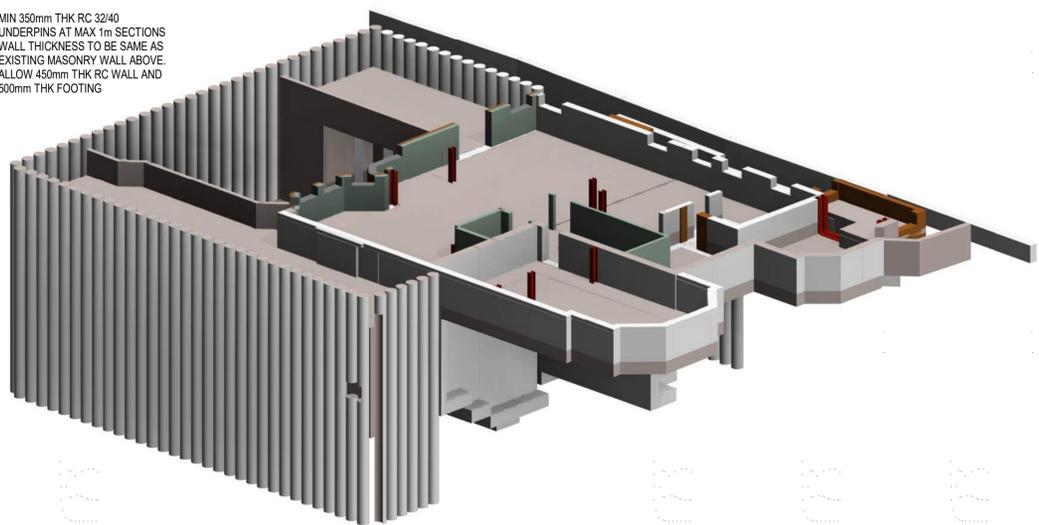
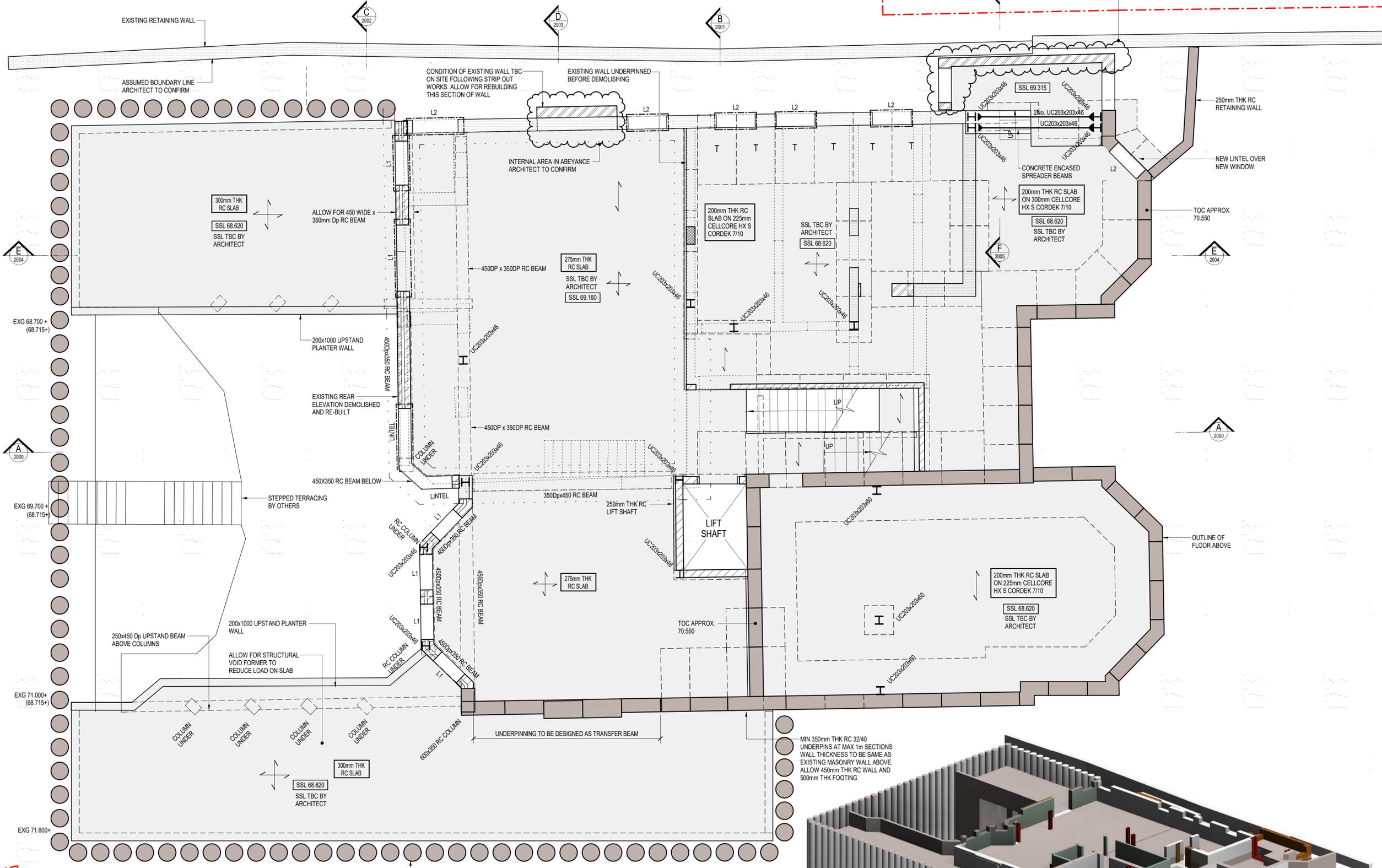
elliottwood engineering a better society

Elliott Wood Partnership Ltd
Central London • Wimbledon • Nottingham
Consulting Structural and Civil Engineers
(020) 7499 5888 • elliottwood.co.uk

Project
13 Netherhall Gardens,
London, NW3 5RN

Drawing title
Proposed Lower Ground Floor
Plan - PHASE 1-2

Scale (s)	Date	Drawn
1:50@ A1; 1:100@A3	September 2018	BMc
Drawing status	Status	Revision
Preliminary	S2	P3
Project no. 2180456- EW -00 -B1-DR -S -0900	Originator Zone	Level Type Role



ALLOW FOR 450MM DIAMETER CONTIGUOUS PILED WALL AND 200MM LINER WALL TO PERIMETER OF BASEMENT. PILES TO BE DESIGNED TO SUPPORT LATERAL LOAD FROM EARTH AND SURCHARGE IN THE TEMPORARY AND PERMANENT CASES. HORIZONTAL PROPS TO PROVIDE TEMPORARY RESTRAINT TO PILES. RC LINER WALL TO BE DESIGNED TO WITHSTAND HYDROSTATIC PRESSURE IN THE PERMANENT CASE. PILE DESIGN TO BE DESIGNED BY SPECIALIST CONTRACTOR.



1-21 IMPERIAL TOWERS

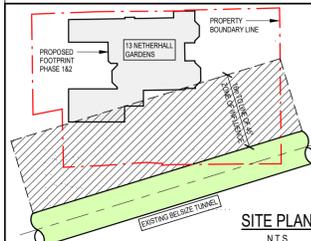
ARCHITECT TO CONFIRM ASSUMED GLAZED ROOF BY SPECIALIST

This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

Do not scale from this drawing.

LEGEND

- EXISTING STRUCTURE
- NEW LOAD BEARING BRICKWORK
- NEW MASS CONCRETE
- NEW REINFORCED CONCRETE
- NEW PRECAST CONCRETE
- NEW REINFORCED WATER RESISTANT CONCRETE
- PADSTONES
- NEW LOAD BEARING STUDWORK
- NON LOAD BEARING WALLS
- LOAD BEARING STRUCTURE BELOW
- EXISTING STRUCTURE TO BE REMOVED
- NEW STEEL BEAMS
- EXISTING STEEL BEAMS
- NEW LINTELS OVER OPENINGS
- DENOTES MOMENT CONNECTION



NOTES:

- CONTRACTOR TO ALLOW NEW FLOOR JOISTS TO LEVEL AREAS REQUIRED, ARCHITECT TO CONFIRM.

NOT FOR CONSTRUCTION

rev	date	by	chk	description
P3	23.08.21	BMc	EGo	Issued for information & comment
P2	24.04.20	IW	SL	Issued for information & comment
P1	30.01.19	MJS	SL	Issued for information & comment

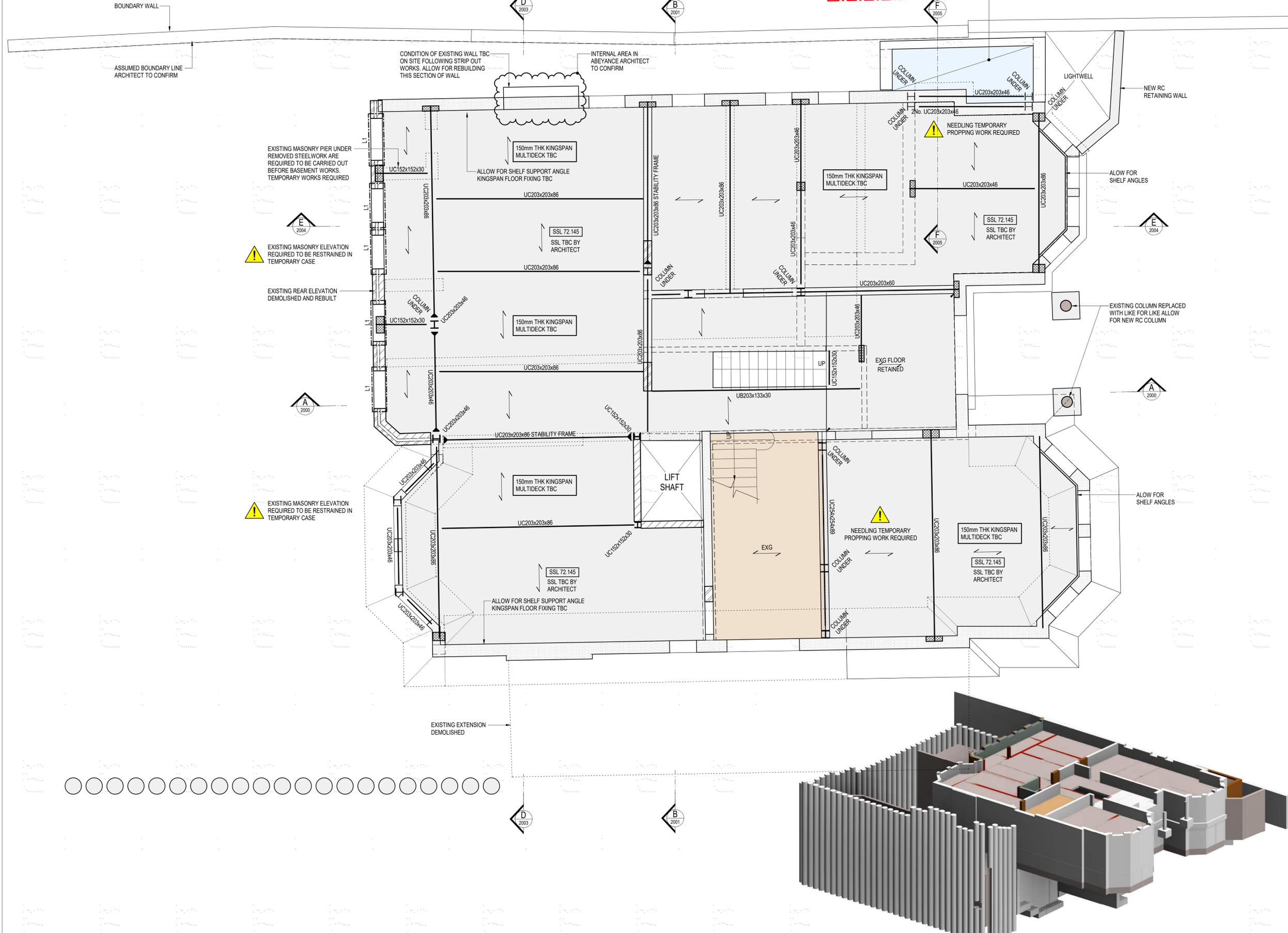
elliottwood engineering a better society

Elliott Wood Partnership Ltd
 Central London • Wimbledon • Nottingham
 Consulting Structural and Civil Engineers
 (020) 7499 5888 • elliottwood.co.uk

Project
 13 Netherhall Gardens,
 London, NW3 5RN

Drawing title
 Proposed Ground Floor Plan -
 PHASE 1-2

Scale (s)	Date	Drawn				
1:50@ A1; 1:100@A3	September 2018	BMc				
Drawing status	Status	Revision				
Preliminary	S2	P3				
Project no.	Originator	Zone	Level	Type	Role	drg no.
2180456-	EW	-00	-00	DR	-S	-1000





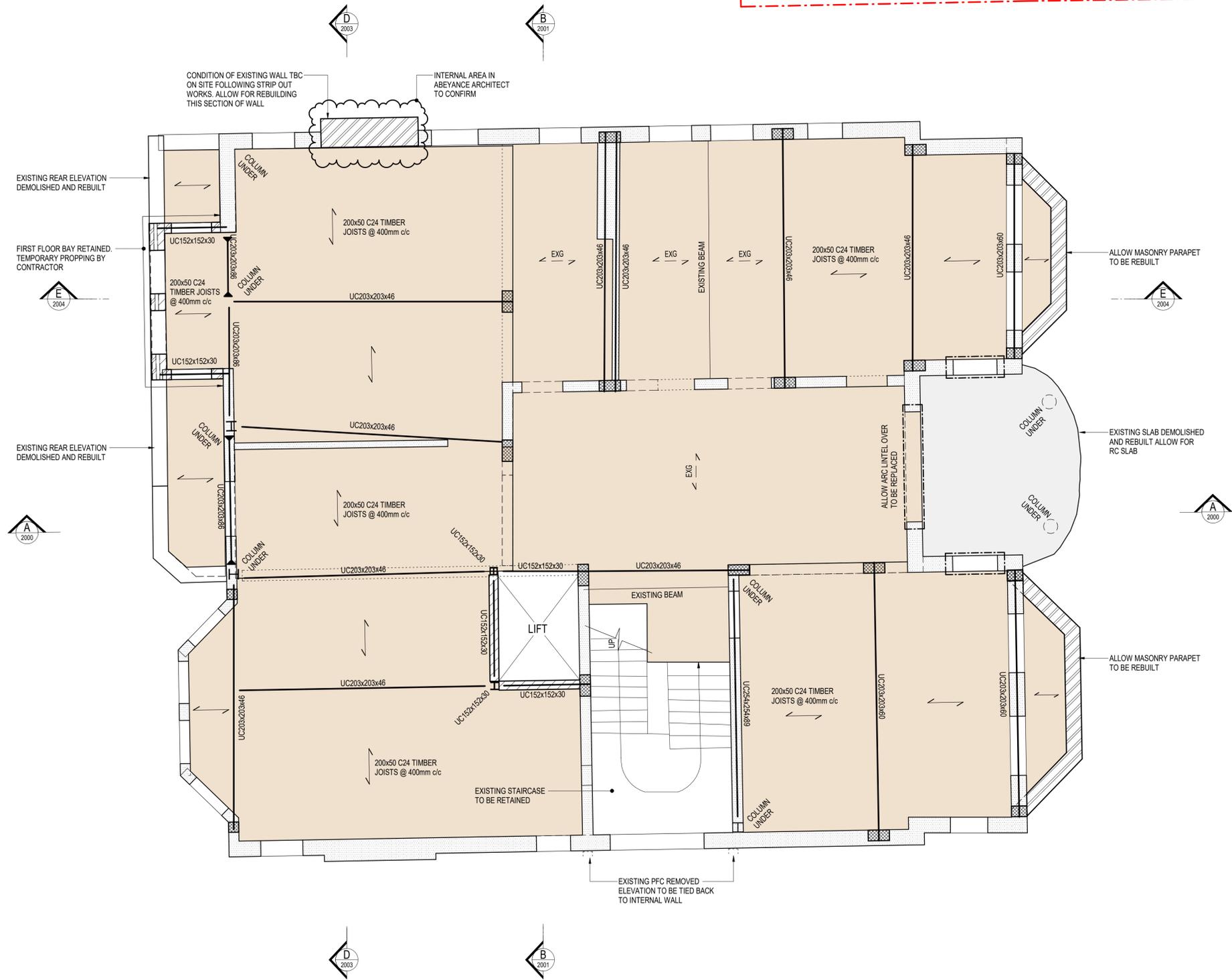
This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

Do not scale from this drawing.

LEGEND

- EXISTING STRUCTURE
- NEW LOAD BEARING BLOCKWORK
- NEW LOAD BEARING BRICKWORK
- NEW MASS CONCRETE
- NEW REINFORCED CONCRETE
- NEW PRECAST CONCRETE
- NEW REINFORCED WATER RESISTANT CONCRETE
- PADSTONES
- NEW LOAD BEARING STUDWORK
- NON LOAD BEARING WALLS
- LOAD BEARING STRUCTURE BELOW
- EXISTING STRUCTURE TO BE REMOVED
- NEW STEEL BEAMS
- EXISTING STEEL BEAMS
- NEW LINTELS OVER OPENINGS
- DENOTES MOMENT CONNECTION

1. CONTRACTOR TO ALLOW NEW FLOOR JOISTS TO LEVEL AREAS REQUIRED, ARCHITECT TO CONFIRM
2. EXISTING FLOOR TO BE RE-LEVELLED. EXISTING TIMBER JOISTS RE-USED WHERE POSSIBLE. ALLOW FOR NEW 200x50 C24 TIMBER FLOOR JOISTS @ 400mm c/c
3. ALLOW FOR EXISTING MASONRY ARCH LINTEL TO BE REPLACED TO WINDOWS AT FRONT ELEVATIONS. ALLOW FOR EXISTING STEEL STRAPS TO BE REPLACED



NOT FOR CONSTRUCTION

rev	date	by	chk	description
P2	23.08.21	BMc	EGo	Issued for information & comment
P1	29.04.20	IW	SL	Issued for information & comment

elliottwood engineering
a better society

Elliott Wood Partnership Ltd
Central London • Wimbledon • Nottingham
Consulting Structural and Civil Engineers
(020) 7499 5888 • elliottwood.co.uk

Project
13 Netherhall Gardens,
London, NW3 5RN

Drawing title
Proposed First Floor Plan -
PHASE 1&2

Scale (s)	Date	Drawn				
1:50@ A1; 1:100@A3	September 2018	BMc				
Drawing status	Status	Revision				
Preliminary	S2	P2				
Project no.	Originator	Zone	Level	Type	Role	Drwg no.
2180456-	EW	-00	-01	DR	-S	-1010



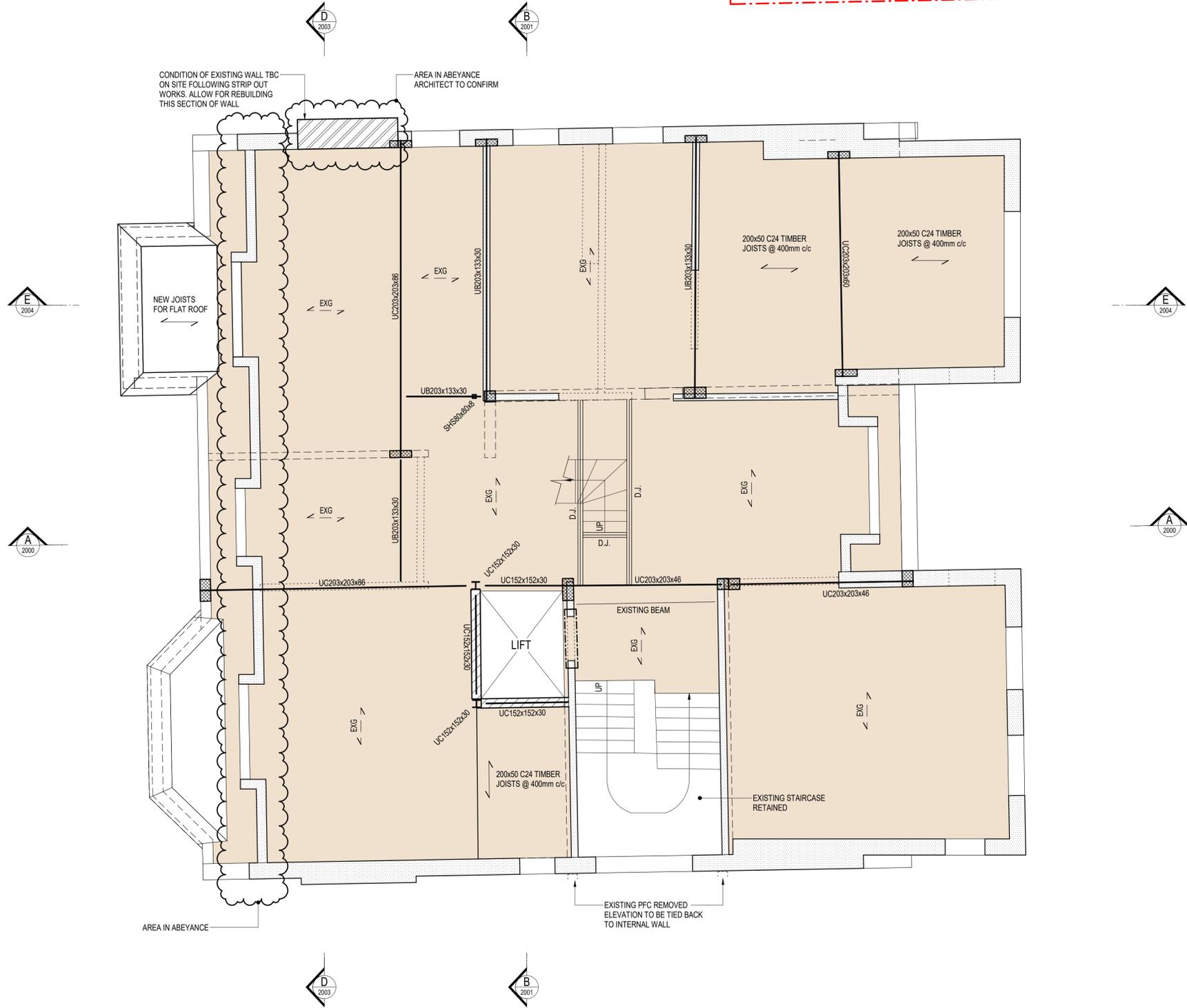
This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

Do not scale from this drawing.

LEGEND

- EXISTING STRUCTURE
- NEW LOAD BEARING BLOCKWORK
- NEW LOAD BEARING BRICKWORK
- NEW MASS CONCRETE
- NEW REINFORCED CONCRETE
- NEW PRECAST CONCRETE
- NEW REINFORCED WATER RESISTANT CONCRETE
- PADSTONES
- NEW LOAD BEARING STUDWORK
- NON LOAD BEARING WALLS
- LOAD BEARING STRUCTURE BELOW
- EXISTING STRUCTURE TO BE REMOVED
- NEW STEEL BEAMS
- EXISTING STEEL BEAMS
- NEW LINTELS OVER OPENINGS
- DENOTES MOMENT CONNECTION

1. CONTRACTOR TO ALLOW NEW FLOOR JOISTS TO LEVEL AREAS REQUIRED, ARCHITECT TO CONFIRM
2. EXISTING FLOOR TO BE RE-LEVELLED. EXISTING TIMBER JOISTS RE-USED WHERE POSSIBLE. ALLOW FOR NEW 200x50 C24 TIMBER FLOOR JOISTS @ 400mm c/c
3. ALLOW FOR EXISTING MASONRY ARCH LINTEL TO BE REPLACED TO WINDOWS AT FRONT ELEVATIONS. ALLOW FOR EXISTING STEEL STRAPS TO BE REPLACED



NOT FOR CONSTRUCTION

P2	23.08.21	BMc	EGo	Issued for information & comment
P1	29.04.20	IW	SL	Issued for information & comment
rev	date	by	chk	description

elliottwood engineering
a better society

Elliott Wood Partnership Ltd
Central London • Wimbledon • Nottingham
Consulting Structural and Civil Engineers
(020) 7499 5888 • elliottwood.co.uk

Project
13 Netherhall Gardens,
London, NW3 5RN

Drawing title
Proposed Second Floor Plan -
PHASE 1-2

Scale (s)	Date	Drawn				
1:50@ A1; 1:100@A3	September 2018	BMC				
Drawing status	Status	Revision				
Preliminary	S2	P2				
Project no.	Originator	Zone	Level	Type	Role	drg no.
2180456-	EW	-00	-02	-DR	-S	-1020



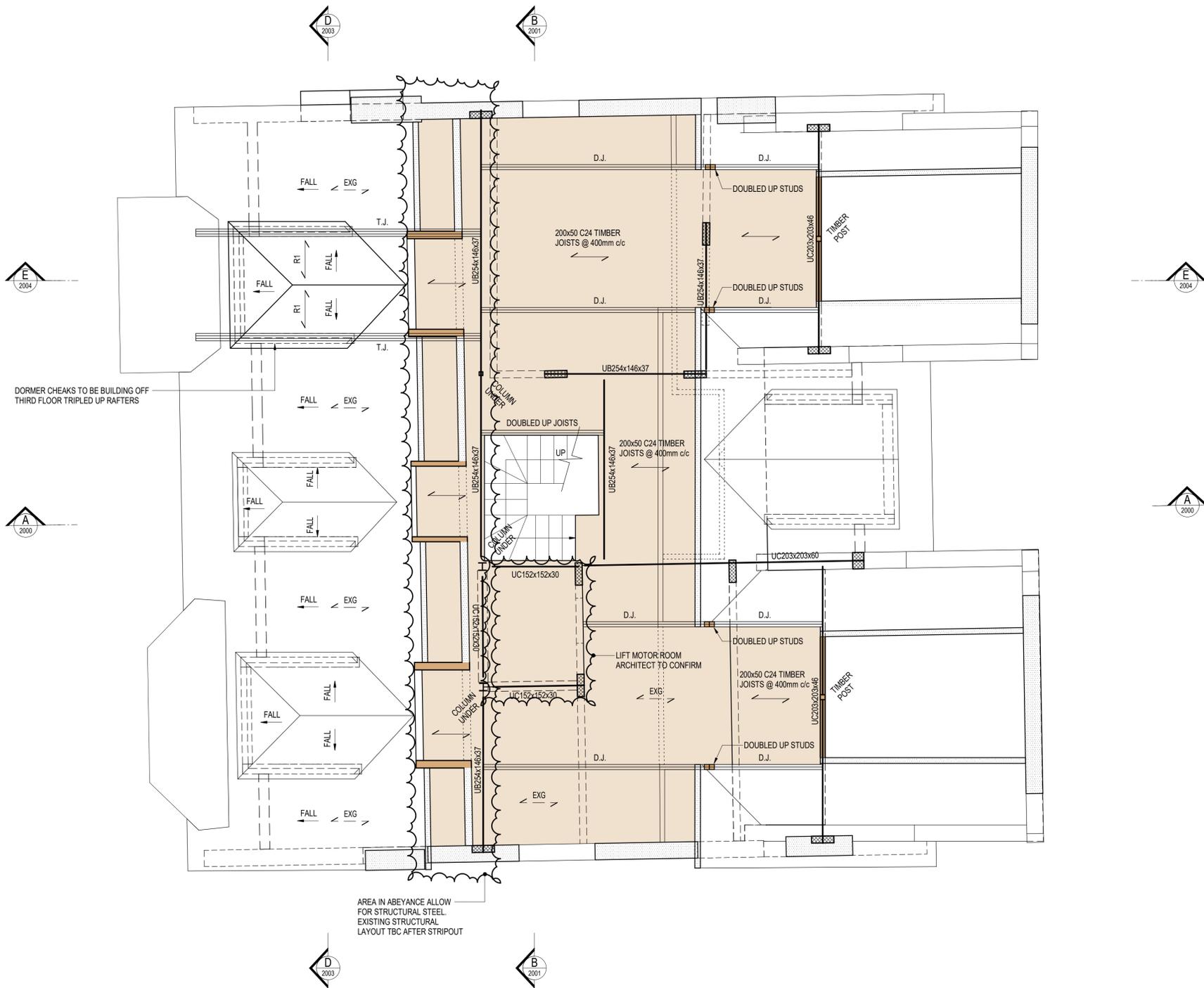
This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

Do not scale from this drawing.

LEGEND

- EXISTING STRUCTURE
- NEW LOAD BEARING BLOCKWORK
- NEW LOAD BEARING BRICKWORK
- NEW MASS CONCRETE
- NEW REINFORCED CONCRETE
- NEW PRECAST CONCRETE
- NEW REINFORCED WATER RESISTANT CONCRETE
- PADSTONES
- NEW LOAD BEARING STUDWORK
- NON LOAD BEARING WALLS
- LOAD BEARING STRUCTURE BELOW
- EXISTING STRUCTURE TO BE REMOVED
- NEW STEEL BEAMS
- EXISTING STEEL BEAMS
- NEW LINTELS OVER OPENINGS
- DENOTES MOMENT CONNECTION

1. CONTRACTOR TO ALLOW NEW FLOOR JOISTS TO LEVEL AREAS REQUIRED, ARCHITECT TO CONFIRM
2. EXISTING FLOOR TO BE RE-LEVELLED. EXISTING TIMBER JOISTS RE-USED WHERE POSSIBLE ALLOW FOR NEW 200x50 C24 TIMBER FLOOR JOISTS @ 400mm c/c
3. ALLOW FOR EXISTING MASONRY ARCH LINTEL TO BE REPLACED TO WINDOWS AT FRONT ELEVATIONS
ALLOW FOR EXISTING STEEL STRAPS TO BE REPLACED



NOT FOR CONSTRUCTION

P2	23.08.21	BMc	EGo	Issued for information & comment
P1	29.04.20	IW	SL	Issued for information & comment
rev	date	by	chk	description



Elliott Wood Partnership Ltd
Central London • Wimbledon • Nottingham
Consulting Structural and Civil Engineers
(020) 7499 5888 • elliotwood.co.uk

Project
13 Netherhall Gardens,
London, NW3 5RN

Drawing title
Proposed Third Floor Plan -
PHASE 1-2

Scale (s)	Date	Drawn
1:50@ A1; 1:100@A3	September 2018	BMc

Drawing status	Status	Revision
Preliminary	S2	P2

Project no.	Originator	Zone	Level	Type	Role	drg no.
2180456-	EW	-00	-03	DR	S	-1030

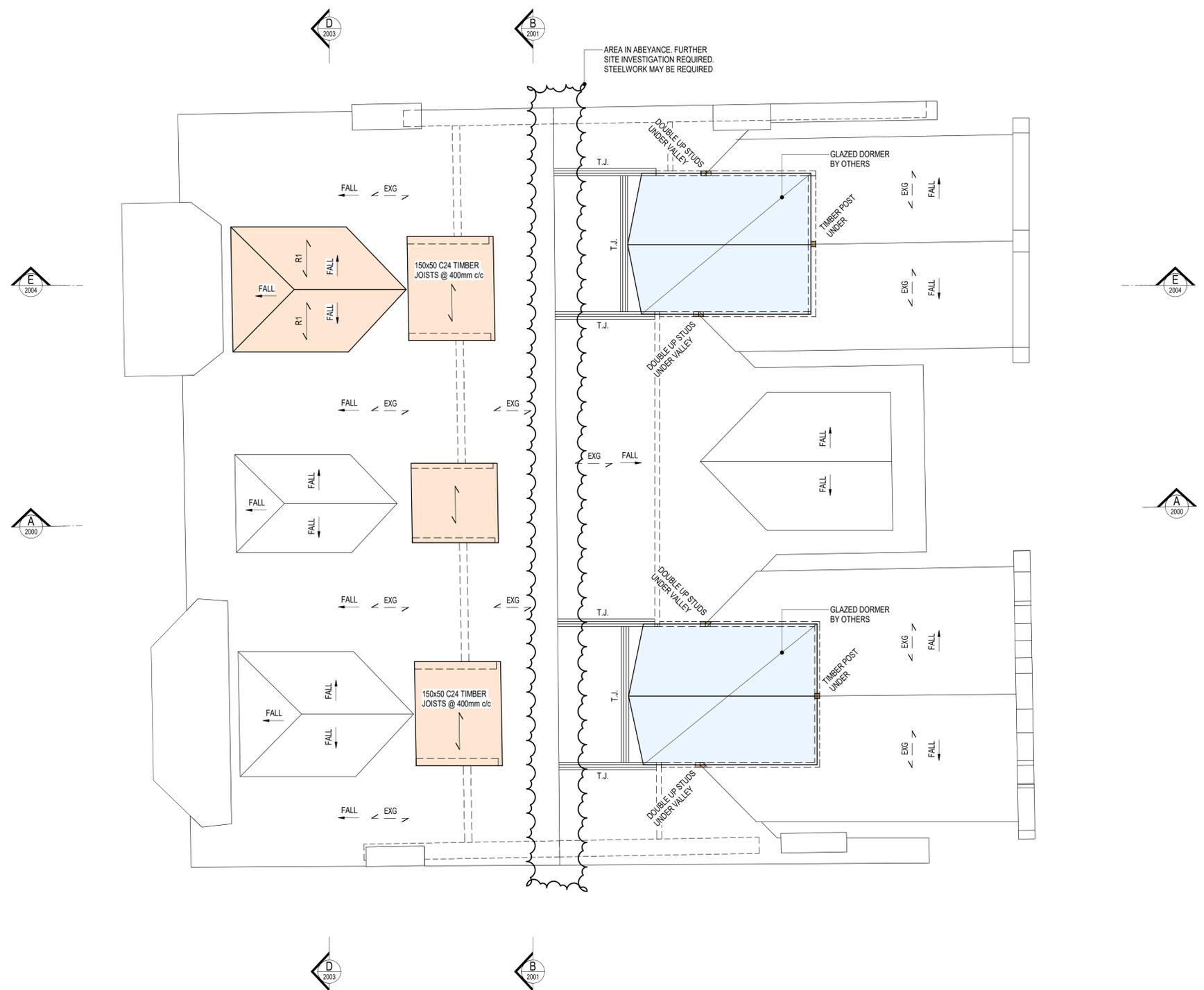


This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.

Do not scale from this drawing.

LEGEND

- EXISTING STRUCTURE
- NEW LOAD BEARING BLOCKWORK
- NEW LOAD BEARING BRICKWORK
- NEW MASS CONCRETE
- NEW REINFORCED CONCRETE
- NEW PRECAST CONCRETE
- NEW REINFORCED WATER RESISTANT CONCRETE
- PADSTONES
- NEW LOAD BEARING STUDWORK
- NON LOAD BEARING WALLS
- LOAD BEARING STRUCTURE BELOW
- EXISTING STRUCTURE TO BE REMOVED
- NEW STEEL BEAMS
- EXISTING STEEL BEAMS
- NEW LINTELS OVER OPENINGS
- DENOTES MOMENT CONNECTION



NOT FOR CONSTRUCTION

P2	23.08.21	BMc	EGo	Issued for information & comment
P1	29.04.20	IW	SL	Issued for information & comment
rev	date	by	chk	description

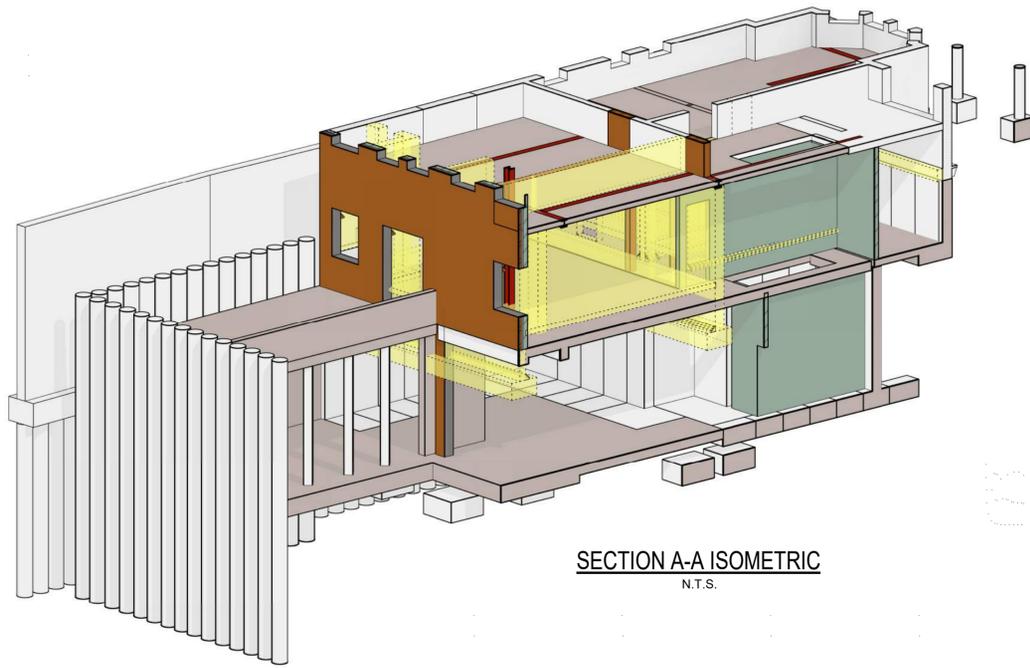


Elliott Wood Partnership Ltd
 Central London • Wimbledon • Nottingham
 Consulting Structural and Civil Engineers
 (020) 7499 5888 • elliotwood.co.uk

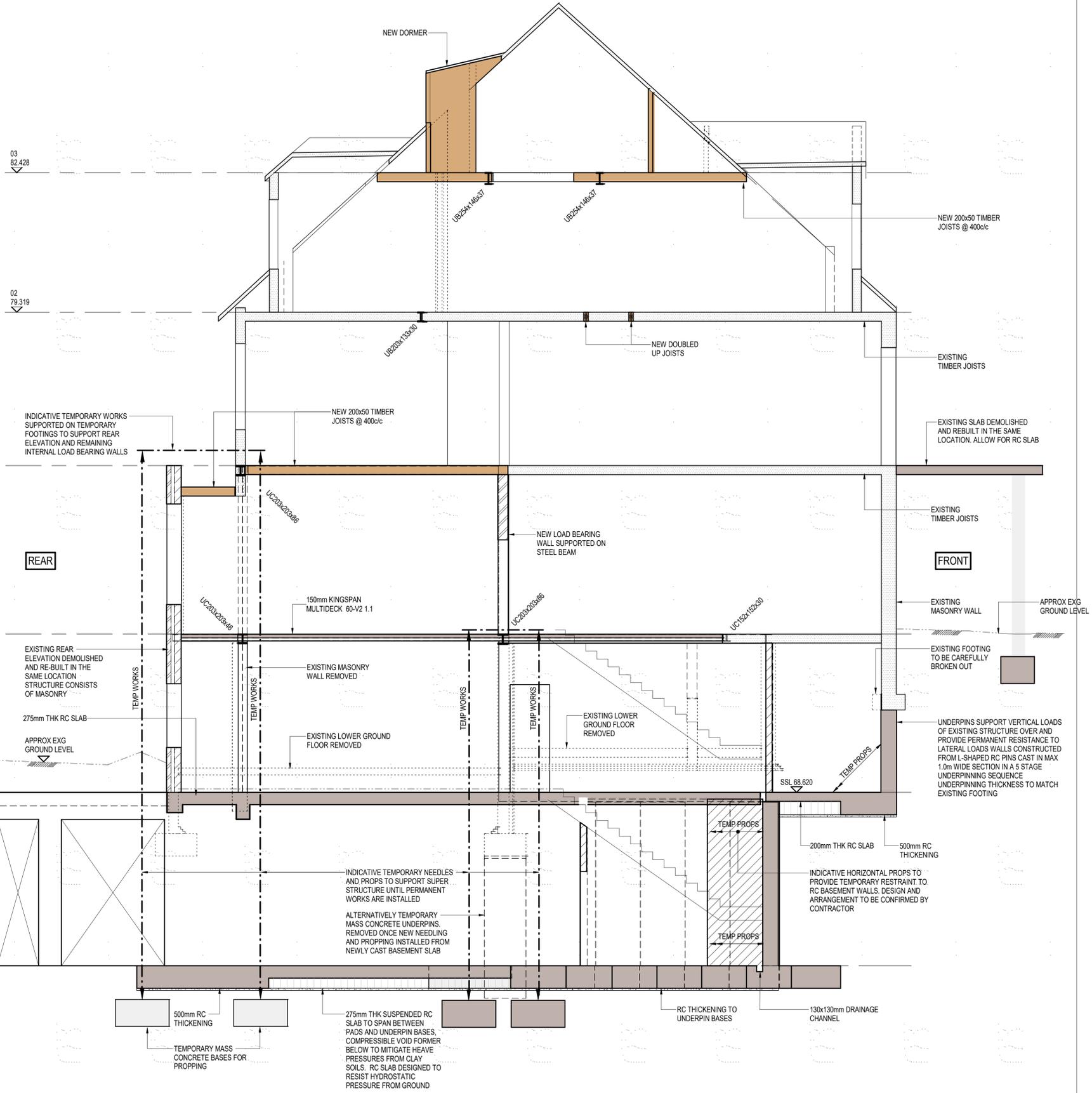
Project
 13 Netherhall Gardens,
 London, NW3 5RN

Drawing title
 Proposed Roof Plan -
 PHASE 1-2

Scale (s)	Date	Drawn				
1:50@ A1; 1:100@A3	September 2018	BMc				
Drawing status	Status	Revision				
Preliminary	S2	P1				
Project no.	Originator	Zone	Level	Type	Role	Drng no.
2180456-	EW	-00-04-	DR	-S-	1040	



SECTION A-A ISOMETRIC
N.T.S.



3D LEGEND

- EXISTING STRUCTURE
- EXISTING STRUCTURE TO BE REMOVED
- NEW REINFORCED CONCRETE
- NEW MASS CONCRETE
- NEW PRECAST CONCRETE
- NEW REINFORCED WATER RESISTANT CONCRETE
- NEW STRUCTURAL STEELWORK
- NEW LOAD BEARING BLOCKWORK
- NEW LOAD BEARING BRICKWORK
- NEW TIMBER
- NEW GLAZING

NOTE:
EMBEDMENT OF NEW PILES ON PROPOSED WORKS SIDE IS APPROXIMATELY 3m BELOW FORMATION LEVEL (SUBJECT TO FINAL DESIGN BY THE CONTRACTOR).

This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
Do not scale from this drawing.

LEGEND

EXISTING STRUCTURE	NEW MASS CONCRETE	EXISTING STRUCTURE TO BE REMOVED
NEW LOAD BEARING BLOCKWORK	PADSTONES	NEW STEEL BEAMS
NEW LOAD BEARING BRICKWORK	NEW LOAD BEARING STUDWORK	EXISTING STEEL BEAMS
NEW REINFORCED CONCRETE	NON LOAD BEARING WALLS	NEW LINTELS OVER OPENINGS
NEW PRECAST CONCRETE	LOAD BEARING STRUCTURE BELOW	DENOTES MOMENT CONNECTION

NOT FOR CONSTRUCTION

P1	23.08.21	BMc	EGo	Issued for information & comment
rev	date	by	chk	description

drawing title
Proposed Section A - A - PHASE 1&2

scale (s) date drawn
1:50@A1; 1:100@A3 December 2018 IW

elliottwood
Elliott Wood Partnership Ltd
Wimbledon • Central London • Nottingham
Consulting Structural and Civil Engineers
tel: (020) 7499 5898. www.elliottwood.co.uk

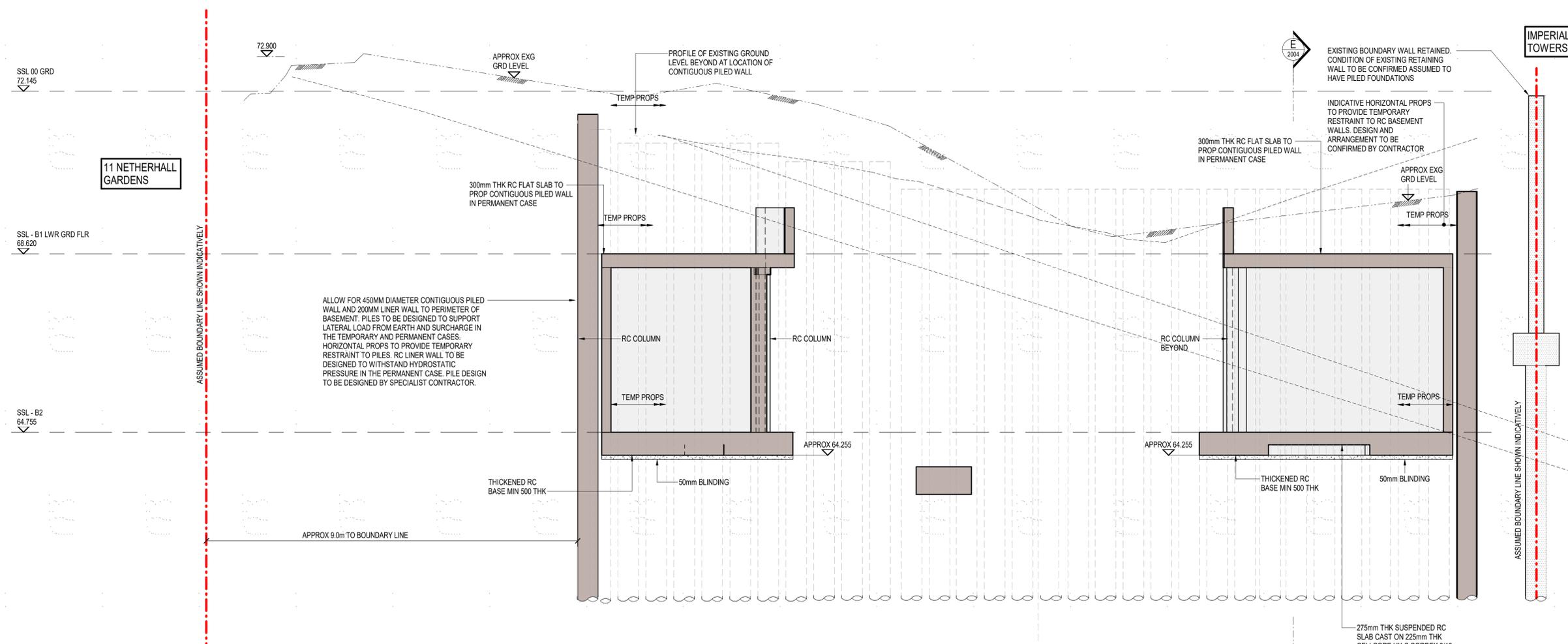
project
13 Netherhall Gardens,
London, NW3 5RN

drawing status status revision
Preliminary S2 P1

project no. originator zone level type role drg no.
2180456-EW-00-SE-DR-S-2000

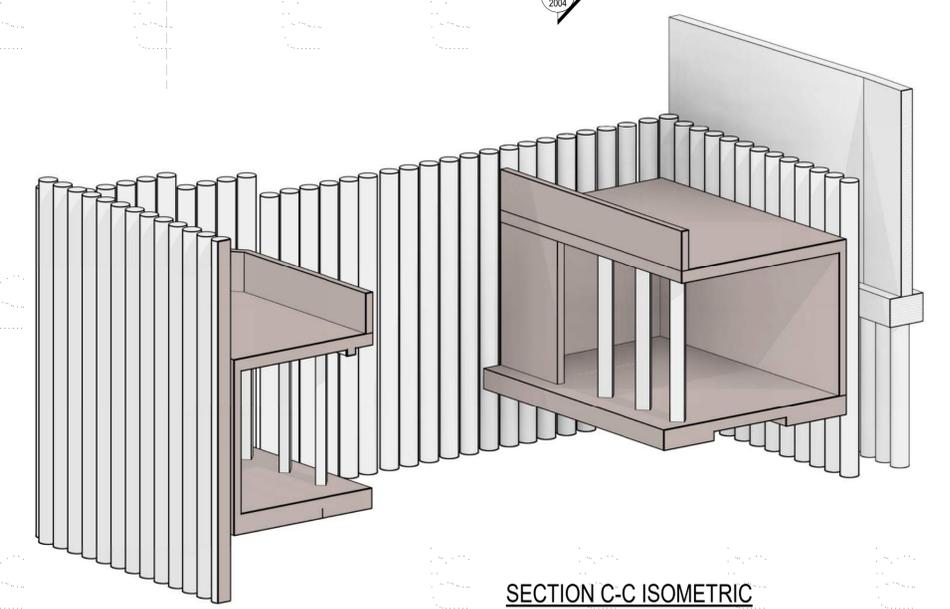
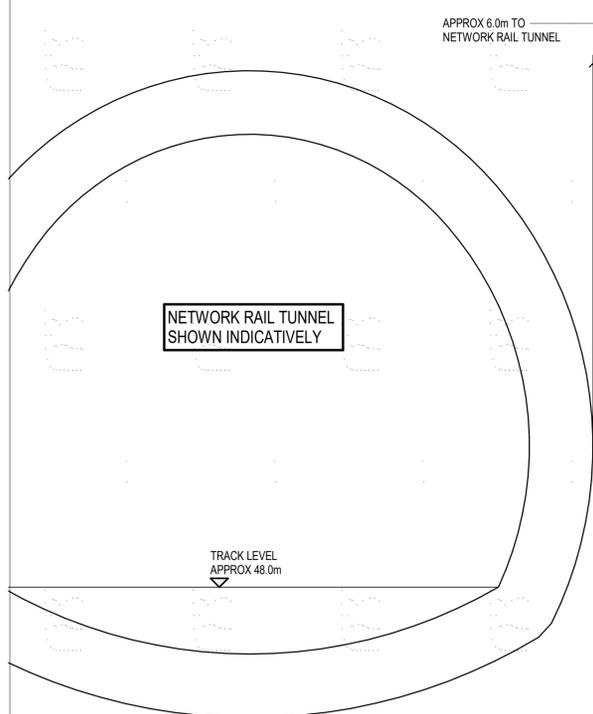
3D LEGEND

- EXISTING STRUCTURE
- EXISTING STRUCTURE TO BE REMOVED
- NEW REINFORCED CONCRETE
- NEW MASS CONCRETE
- NEW PRECAST CONCRETE
- NEW REINFORCED WATER RESISTANT CONCRETE
- NEW STRUCTURAL STEELWORK
- NEW LOAD BEARING BLOCKWORK
- NEW LOAD BEARING BRICKWORK
- NEW TIMBER
- NEW GLAZING



ALLOW FOR 450MM DIAMETER CONTIGUOUS PILED WALL AND 200MM LINER WALL TO PERIMETER OF BASEMENT. PILES TO BE DESIGNED TO SUPPORT LATERAL LOAD FROM EARTH AND SURCHARGE IN THE TEMPORARY AND PERMANENT CASES. HORIZONTAL PROPS TO PROVIDE TEMPORARY RESTRAINT TO PILES. RC LINER WALL TO BE DESIGNED TO WITHSTAND HYDROSTATIC PRESSURE IN THE PERMANENT CASE. PILE DESIGN TO BE DESIGNED BY SPECIALIST CONTRACTOR.

NOTE:
EMBEDMENT OF NEW PILES ON PROPOSED WORKS SIDE IS APPROXIMATELY 8m BELOW FORMATION LEVEL (SUBJECT TO FINAL DESIGN BY THE CONTRACTOR).



This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
Do not scale from this drawing.

LEGEND			
	EXISTING STRUCTURE		EXISTING STRUCTURE TO BE REMOVED
	NEW LOAD BEARING BLOCKWORK		NEW MASS CONCRETE
	NEW LOAD BEARING BRICKWORK		PADSTONES
	NEW REINFORCED CONCRETE		NEW LOAD BEARING STUDWORK
	NEW PRECAST CONCRETE		NON LOAD BEARING WALLS
			LOAD BEARING STRUCTURE BELOW
			NEW STEEL BEAMS
			EXISTING STEEL BEAMS
			NEW LINTELS OVER OPENINGS
			DENOTES MOMENT CONNECTION

NOT FOR CONSTRUCTION

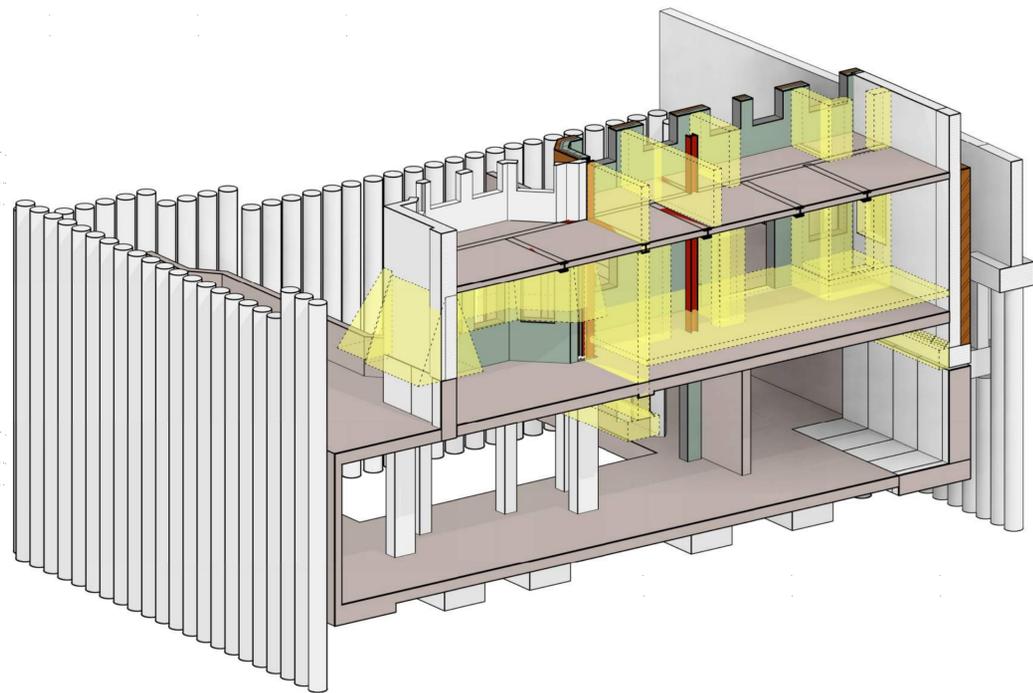
P1	23.08.21	BMc	EGo	Issued for information & comment
rev	date	by	chk	description

drawing title
Proposed Section C-C - PHASE 1&2

scale (s) _____ date _____ drawn _____
1:50@ A1; 1:100@A3 April 2020 IW

elliottwood
Elliott Wood Partnership Ltd
Wimbledon • Central London • Nottingham
Consulting Structural and Civil Engineers
tel: (020) 7499 5888. www.elliottwood.co.uk

project 13 Netherhall Gardens, London, NW3 5RN	drawing status Preliminary	status revision S2 P1
project no. 2180456-EW-ZZ-SE-DR-S-2002	originator zone level type role drg no.	



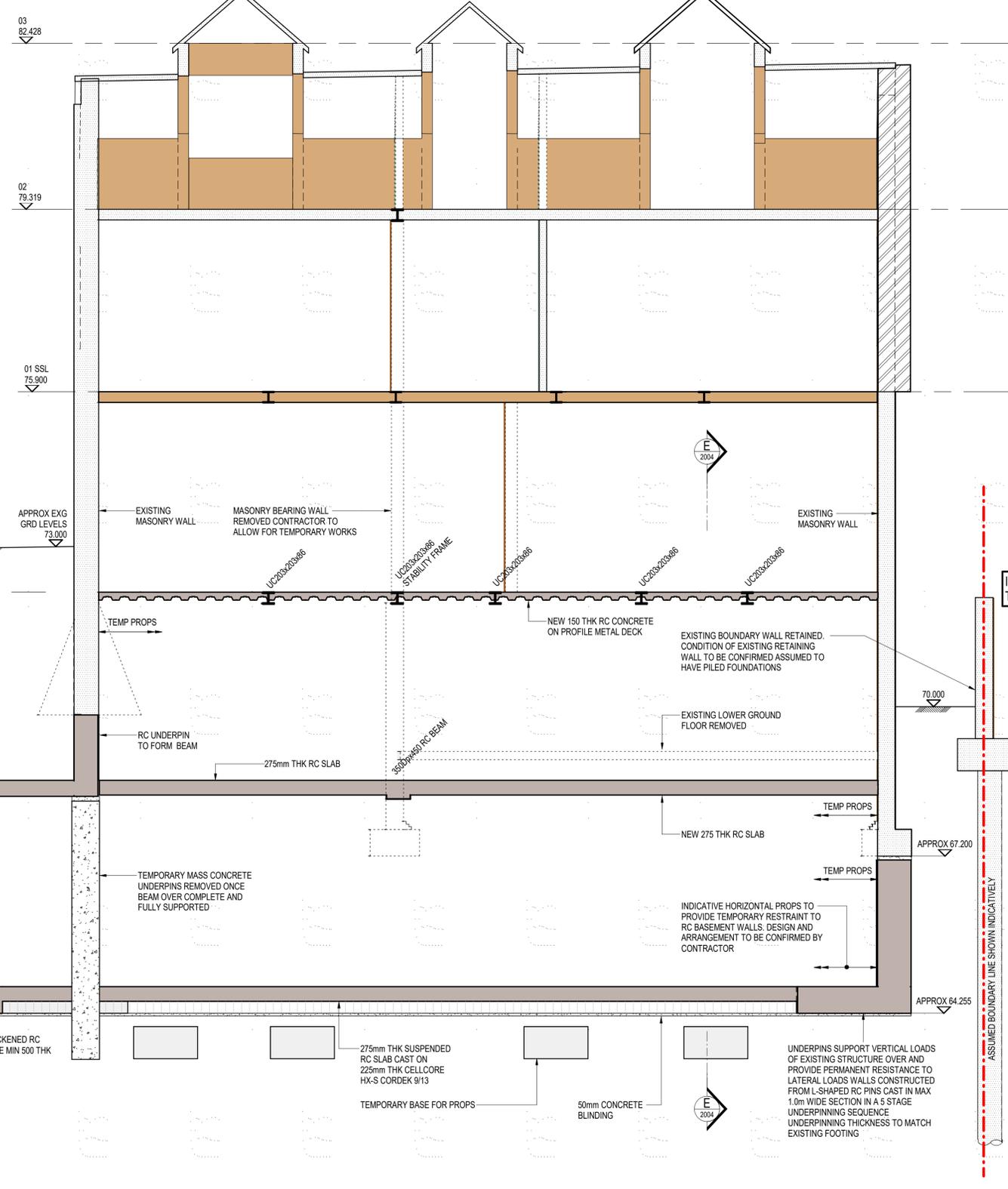
SECTION D-D ISOMETRIC

11 NETHERHALL GARDENS

3D LEGEND	
	EXISTING STRUCTURE
	EXISTING STRUCTURE TO BE REMOVED
	NEW REINFORCED CONCRETE
	NEW MASS CONCRETE
	NEW PRECAST CONCRETE
	NEW REINFORCED WATER RESISTANT CONCRETE
	NEW STRUCTURAL STEELWORK
	NEW LOAD BEARING BLOCKWORK
	NEW LOAD BEARING BRICKWORK
	NEW TIMBER
	NEW GLAZING

ALLOW FOR 450MM DIAMETER CONTIGUOUS PILED WALL AND 200MM LINER WALL TO PERIMETER OF BASEMENT. PILES TO BE DESIGNED TO SUPPORT LATERAL LOAD FROM EARTH AND SURCHARGE IN THE TEMPORARY AND PERMANENT CASES. HORIZONTAL PROPS TO PROVIDE TEMPORARY RESTRAINT TO PILES. RC LINER WALL TO BE DESIGNED TO WITHSTAND HYDROSTATIC PRESSURE IN THE PERMANENT CASE. PILE DESIGN TO BE DESIGNED BY SPECIALIST CONTRACTOR.

NOTE:
EMBEDMENT OF NEW PILES ON PROPOSED WORKS SIDE IS APPROXIMATELY 8m BELOW FORMATION LEVEL (SUBJECT TO FINAL DESIGN BY THE CONTRACTOR).



This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
Do not scale from this drawing.

LEGEND			
	EXISTING STRUCTURE		EXISTING STRUCTURE TO BE REMOVED
	NEW LOAD BEARING BLOCKWORK		NEW STEEL BEAMS
	NEW LOAD BEARING BRICKWORK		EXISTING STEEL BEAMS
	NEW REINFORCED CONCRETE		NEW LINTELS OVER OPENINGS
	NEW PRECAST CONCRETE		LOAD BEARING STRUCTURE BELOW
	NEW MASS CONCRETE		PADSTONES
	NEW LOAD BEARING STUDWORK		NON LOAD BEARING WALLS
	NEW LOAD BEARING WALLS		LOAD BEARING STRUCTURE BELOW
	NEW LOAD BEARING WALLS		DENOTES MOMENT CONNECTION

NOT FOR CONSTRUCTION

P1	23.08.21	BMc	EGo	Issued for information & comment
rev	date	by	chk	description

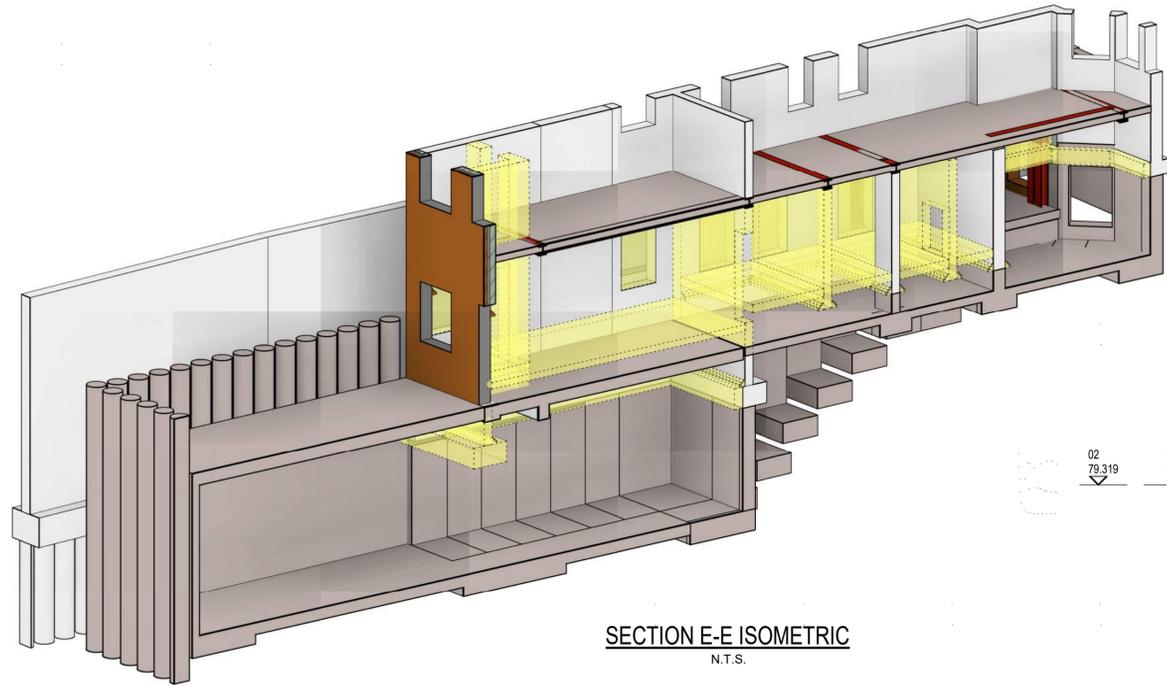
drawing title
Proposed Section D-D - PHASE 1&2

scale (s) 1:50@ A1; 1:100@A3
date April 2020
drawn IW

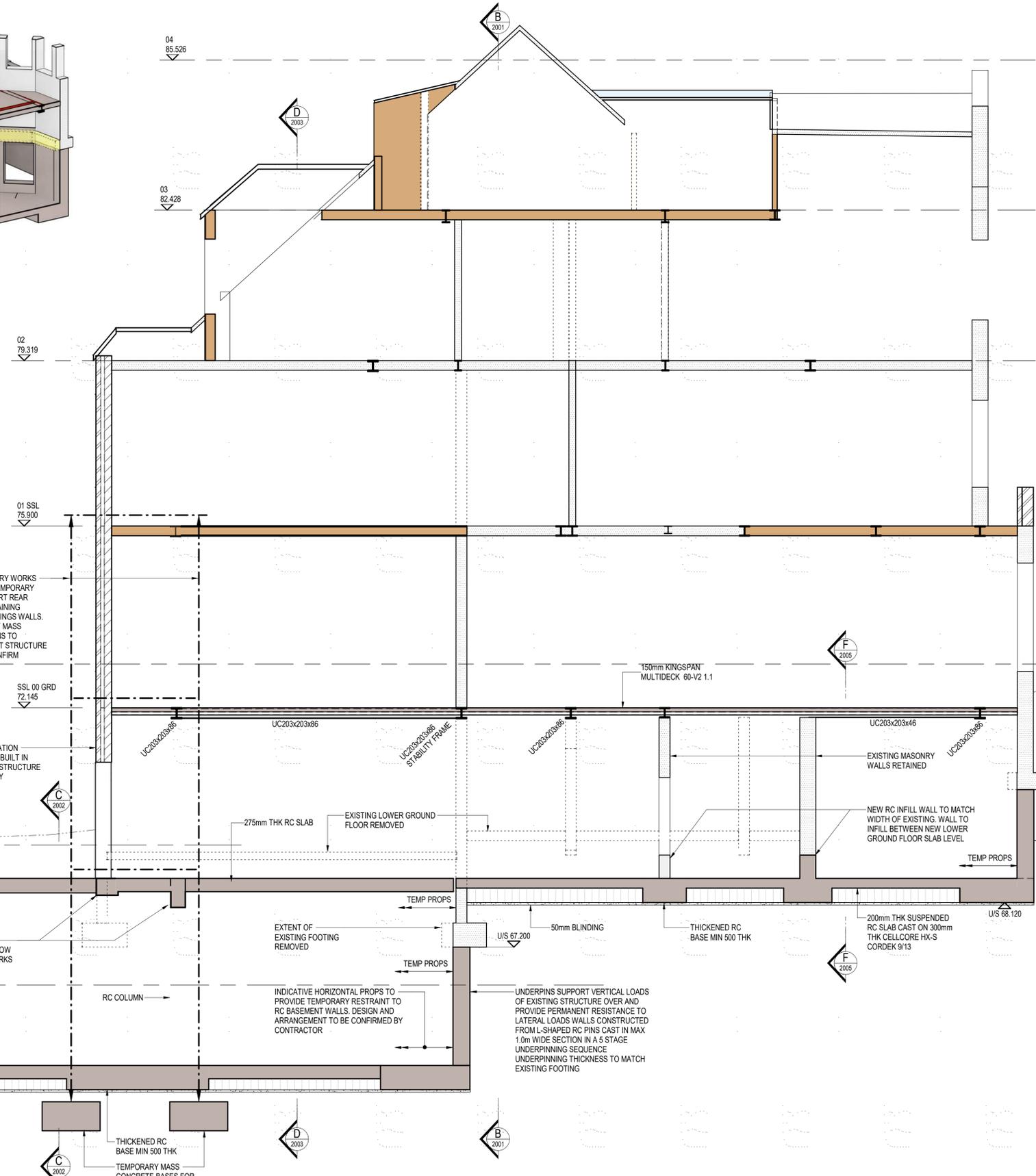
elliottwood
Elliott Wood Partnership Ltd
Wimbledon • Central London • Nottingham
Consulting Structural and Civil Engineers
tel: (020) 7499 5888. www.elliottwood.co.uk

project
13 Netherhall Gardens, London, NW3 5RN

drawing status Preliminary
status revision S2 P1
project no. 2180456-EW-ZZ-SE-DR-S-2003
originator zone level type role drg no.



SECTION E-E ISOMETRIC
N.T.S.



ALLOW FOR 450MM DIAMETER CONTIGUOUS PILED WALL AND 200MM LINER WALL TO PERIMETER OF BASEMENT. PILES TO BE DESIGNED TO SUPPORT LATERAL LOAD FROM EARTH AND SURCHARGE IN THE TEMPORARY AND PERMANENT CASES. HORIZONTAL PROPS TO PROVIDE TEMPORARY RESTRAINT TO PILES. RC LINER WALL TO BE DESIGNED TO WITHSTAND HYDROSTATIC PRESSURE IN THE PERMANENT CASE. PILE DESIGN TO BE DESIGNED BY SPECIALIST CONTRACTOR.

INDICATIVE TEMPORARY WORKS SUPPORTED ONTO TEMPORARY FOOTINGS TO SUPPORT REAR ELEVATION AND REMAINING INTERNAL LOAD BEARING WALLS. ALTERNATIVELY CAST MASS CONCRETE UNDERPINS TO TEMPORARY SUPPORT STRUCTURE CONTRACTOR TO CONFIRM

EXISTING REAR ELEVATION DEMOLISHED AND RE-BUILT IN THE SAME LOCATION STRUCTURE CONSIST OF MASONRY

APPROX EXG GROUND LEVEL

INDICATIVE HORIZONTAL PROPS TO PROVIDE TEMPORARY RESTRAINT TO RC BASEMENT WALLS. DESIGN AND ARRANGEMENT TO BE CONFIRMED BY CONTRACTOR

UNDERPINS SUPPORT VERTICAL LOADS OF EXISTING STRUCTURE OVER AND PROVIDE PERMANENT RESISTANCE TO LATERAL LOADS WALLS CONSTRUCTED FROM L-SHAPED RC PINS CAST IN MAX 1.0m WIDE SECTION IN A 5 STAGE UNDERPINNING SEQUENCE UNDERPINNING THICKNESS TO MATCH EXISTING FOOTING

UNDERPINS SUPPORT VERTICAL LOADS OF EXISTING STRUCTURE OVER AND PROVIDE PERMANENT RESISTANCE TO LATERAL LOADS WALLS CONSTRUCTED FROM L-SHAPED RC PINS CAST IN MAX 1.0m WIDE SECTION IN A 5 STAGE UNDERPINNING SEQUENCE UNDERPINNING THICKNESS TO MATCH EXISTING FOOTING

3D LEGEND	
	EXISTING STRUCTURE
	EXISTING STRUCTURE TO BE REMOVED
	NEW REINFORCED CONCRETE
	NEW MASS CONCRETE
	NEW PRECAST CONCRETE
	NEW REINFORCED WATER RESISTANT CONCRETE
	NEW STRUCTURAL STEELWORK
	NEW LOAD BEARING BLOCKWORK
	NEW LOAD BEARING BRICKWORK
	NEW TIMBER
	NEW GLAZING

NOTE: EMBEDMENT OF NEW PILES ON PROPOSED WORKS SIDE IS APPROXIMATELY 8m BELOW FORMATION LEVEL (SUBJECT TO FINAL DESIGN BY THE CONTRACTOR).

This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
Do not scale from this drawing.

LEGEND			
	EXISTING STRUCTURE		EXISTING STRUCTURE TO BE REMOVED
	NEW LOAD BEARING BLOCKWORK		NEW STEEL BEAMS
	NEW LOAD BEARING BRICKWORK		EXISTING STEEL BEAMS
	NEW REINFORCED CONCRETE		NEW LINTELS OVER OPENINGS
	NEW PRECAST CONCRETE		LOAD BEARING STRUCTURE BELOW
	NEW MASS CONCRETE		DENOTES MOMENT CONNECTION
	PADSTONES		
	NEW LOAD BEARING STUDWORK		
	NON LOAD BEARING WALLS		

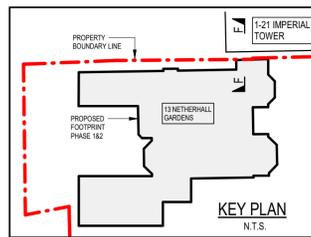
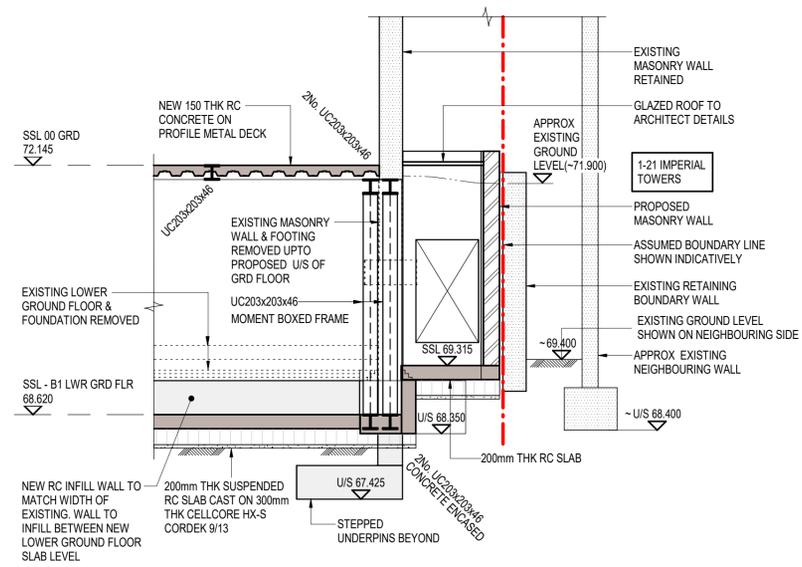
NOT FOR CONSTRUCTION

rev	date	by	chk	description
P1	23.08.21	BMc	EGo	Issued for information & comment

drawing title	
Proposed Section E-E - PHASE 1 & 2	
scale (s)	date
1:50@ A1; 1:100@A3	April 2020
drawn	iw

elliottwood
Elliott Wood Partnership Ltd
Wimbledon • Central London • Nottingham
Consulting Structural and Civil Engineers
tel: (020) 7499 5888. www.elliottwood.co.uk

project	
13 Netherhall Gardens, London, NW3 5RN	
drawing status	
Preliminary	S2 P1
project no.	
2180456-EW-ZZ-SE-DR-S-2004	
status revision	
project no. originator zone level type role drg no.	
2180456-EW-ZZ-SE-DR-S-2004	



This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
Do not scale from this drawing.

LEGEND			
	EXISTING STRUCTURE		EXISTING STRUCTURE TO BE REMOVED
	NEW LOAD BEARING BLOCKWORK		NEW STEEL BEAMS
	NEW LOAD BEARING BRICKWORK		EXISTING STEEL BEAMS
	NEW REINFORCED CONCRETE		NEW LINTELS OVER OPENINGS
	NEW PRECAST CONCRETE		LOAD BEARING STRUCTURE BELOW
	NEW MASS CONCRETE		DENOTES MOMENT CONNECTION
	PADSTONES		
	NEW LOAD BEARING STUDWORK		
	NON LOAD BEARING WALLS		

NOT FOR CONSTRUCTION

rev	date	by	chk	description
P1	23.08.21	BMc	EGo	Issued for information & comment

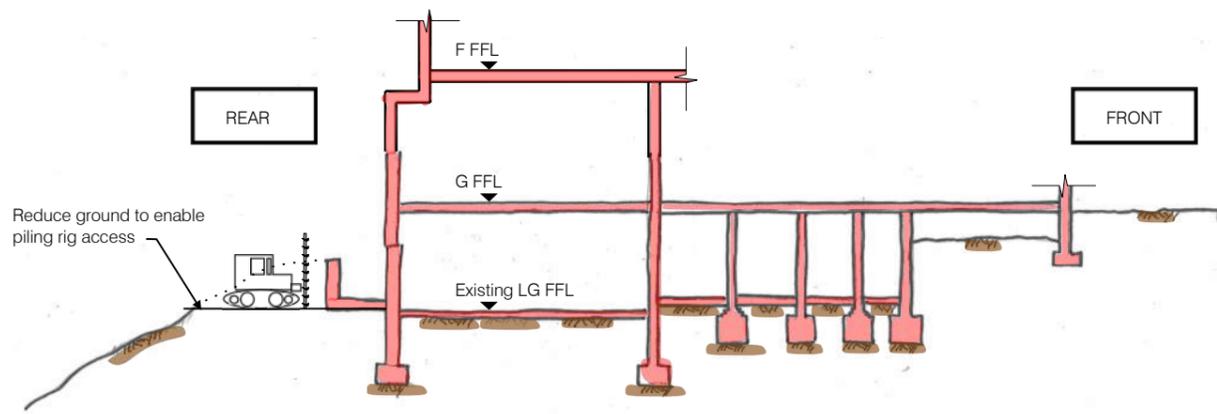
drawing title		
Proposed Section F-F - PHASE 1&2		
scale (s)	date	drawn
1:50@ A3	May 2020	IW

elliottwood

Elliott Wood Partnership Ltd
Wimbledon • Central London • Nottingham
Consulting Structural and Civil Engineers
Tel: (020) 7499 5888. www.elliottwood.co.uk

project		13 Netherhall Gardens, London, NW3 5RN	
drawing status	status	revision	
Preliminary	S2	P1	
project no.	originator	zone	level
2180456-EW-00-XX-DR-S-2005			

B Suggested Construction Sequence Drawings



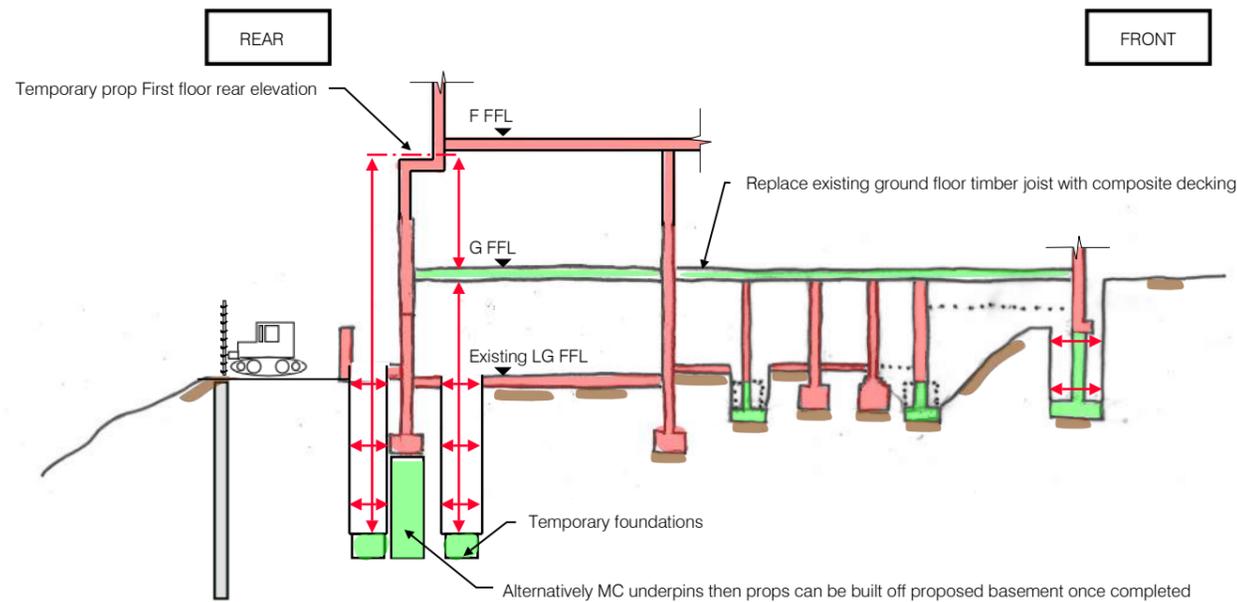
Stage 1 Site set up

- Erect site hoarding. The services within the site should be identified and isolated as necessary. All below ground obstructions should also be removed to allow the works in progress. Contractor to propose hoarding area.
- Reduce ground levels at rear for pile rig access

Stage 2 Enabling works

- Install piling mat within the proposed area of piling
- Movement monitoring system will be installed to the existing boundary retaining wall. An assumed specification for the movement monitoring is outlined in section 9; the adopted specification will need to be agreed with the contractor and adjoining owner's party wall surveyors.
- Remedial and repair works to the superstructure shall be carried out to ensure the existing structure is safe to underpin prior to works commencing.
- The principles of removal of spoil shall be agreed. Given the scope of works, it is likely that conveyor will be used to move the spoil from the holding areas within the excavation to the storage area.

Stage 1 to 2 - Site set up & enabling works



Stage 3 to 4 - Remove existing ground floor and install ground floor composite decking

Indicative construction sequence not for construction. Temporary works designs and sequence to be submitted by contractor for review by engineer prior to works

Stage 3 Remove existing ground floor and installing ground floor composite decking

- Remove internal finishes where necessary and carefully remove the existing ground floor timber joists ensuring the existing masonry walls remain intact and in good condition.
- Install Ground floor composite decking to provide cover to basement construction. Composite decking to be temporary propped until permanent structures at basement are built.

Stage 4 Underpinning at front of property

- The external ground floor walls will be underpinned from the inside of the building where possible. All underpinning will be reinforced concrete underpins constructed in a traditional 5-stage underpinning sequence of a 1m maximum width. If the existing footings extend to the proposed basement slab level, it may be that no underpinning will be required in these areas, but this will be determined on site
- The excavations for the underpinning will be backfilled and dry-packed to the underside of the wall with 3:1 sharp sand to cement dry pack, well rammed in. The underpins will then be left to cure for 3 days until the concrete has gained sufficient compressive strength. The exact sequence of the underpinning will be advised by the Contractor as it relates to their sequence of construction.
- The Contractor should undertake trial pits to confirm the exact depth of all existing foundations of the walls. Elliott Wood to inspect and check how well the existing soil is cemented and, in particular, its ability to "stand up" whilst the individual underpin is completed.

Stage 5 Install temporary works

This drawing is to be read in conjunction with all relevant architects, engineers and specialist drawings and specifications.

Do not scale from this drawing.

Key:

-  Existing Structure
-  Proposed Structure
-  Temporary works by others (Shown as indicative)

P2	17/04/20	SLe	GP	Preliminary
P1	29/01/19	SLe	AAAt	Preliminary
rev	date	by	chk	description

sketch title

Suggested construction sequence
West to East section 1 of 2

SKETCH

scale (s)	date	drawn
NTS	12 / 2018	SLe

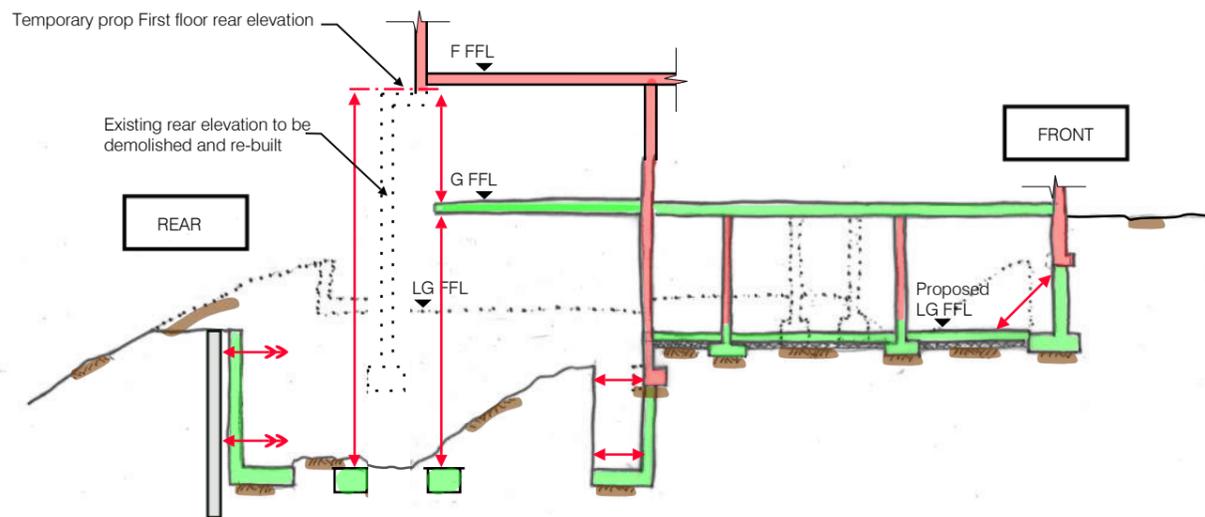
elliottwood

Elliott Wood Partnership Ltd
Wimbledon Central London Nottingham
Consulting Structural and Civil Engineers
tel: (020) 7499 5888. www.elliottwood.co.uk

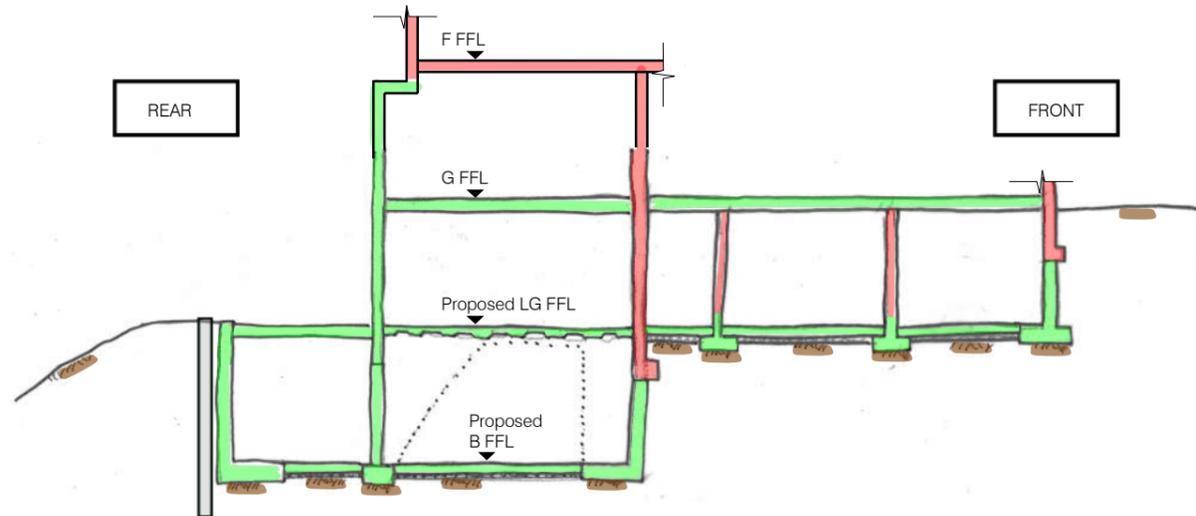
project

13 Netherhall Gardens

drawing status	status	revision				
Preliminary	S2	P2				
project no.	originator	zone	level	type	role	drg no.
2180456	EW	00	XX	SK	S	2001



Stage 5 to 6 - Install temporary works and underpin existing lower ground wall towards the rear



Stage 10 to 12 - Cast basement RC slab and wall

Indicative construction sequence not for construction. Temporary works designs and sequence to be submitted by contractor for review by engineer prior to works

Stage 6 Underpinning of existing lower ground floor walls at rear

- Similar to stage 4, the walls at the rear of the lower ground floor will need to be underpinned to the proposed basement slab level. The underpins will be reinforced concrete underpins constructed in traditional 5-stage underpinning sequence of 1m maximum width.
- Excavate the central bund down to the level of the proposed high level temporary works – to be confirmed with the contractor.
- Install the temporary high level waling beams around the perimeter of the excavation against the RC pins.
- Install the high level horizontal props across the excavation between the high level waling beams. The horizontal props will provide temporary resistance to the lateral loads at the top of the basement structure until the RC ground slab has been cast and cured.
- Excavate to approximately 1m above basement founding level
- Install the temporary low level waling beams around the perimeter of the excavation against the RC pins.
- Install the low level horizontal props across the excavation between the low level waling beams. The horizontal props will provide temporary resistance to the lateral load at the bottom of the basement structure until the RC base slab has been cast and cured.

Stage 7 cast of RC slab at basement

- Install below ground drainage and high heave protection below slab.
- Cast the base slab between the underpin and retaining wall bases, including starter bars for the RC columns and walls within the basement. Once the base slab has been cured it will provide permanent resistance to lateral loads and so the low level temporary works can be removed

Stage 8 Cast RC walls and columns

- Cast RC walls and columns within the basement up to the proposed underside of the lower ground floor slab.
- Cast lower ground floor slab once super structure has been cured

Stage 9 Construct superstructure

This drawing is to be read in conjunction with all relevant architects, engineers and specialist drawings and specifications.

Do not scale from this drawing.

Key:

-  Existing Structure
-  Proposed Structure
-  Temporary works by others (Shown as indicative)

P1 29/01/19 SLe AAt Preliminary

rev	date	by	chk	description

sketch title

Suggested construction sequence
West to East section 2 of 2

SKETCH

scale (s)	date	drawn
NTS	12 / 2018	SLe

elliottwood

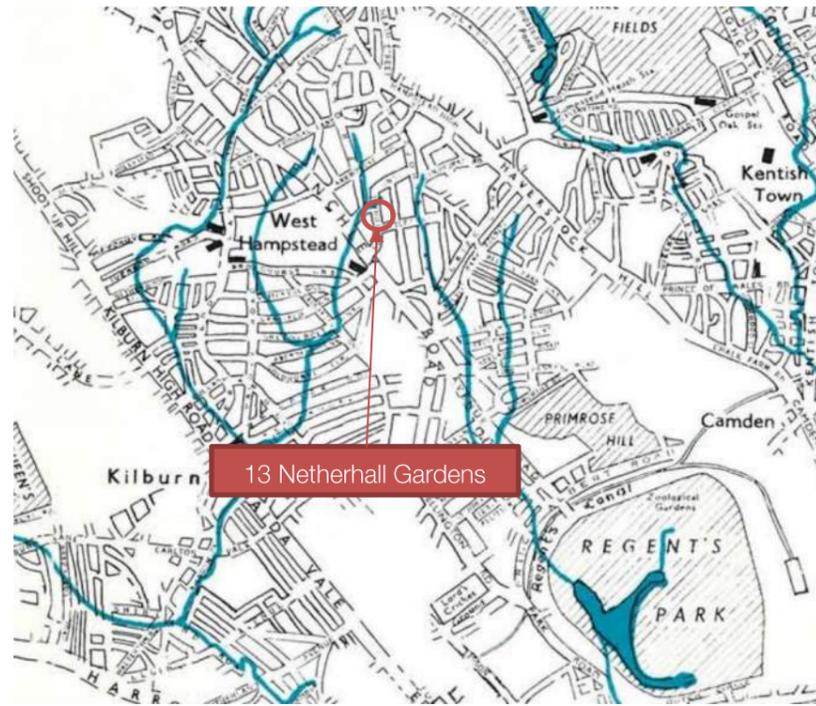
Elliott Wood Partnership Ltd
Wimbledon Central London Nottingham
Consulting Structural and Civil Engineers
tel: (020) 7499 5888. www.elliottwood.co.uk

project

13 Netherhall Gardens

drawing status	status	revision				
Preliminary	S2	P1				
project no.	originator	zone	level	type	role	drg no.
2180456	EW	00	XX	SK	S	1003

C Lost Rivers of London



13 Netherhall Gardens located near to the historic Tyburn and Westbourne rivers.

Ref: A portion of the map showing the course of the Lost Rivers Tyburn, and Westbourne taken from Lost Rivers of London

© 1962 and 1992 by Nicholas Barton, used by kind permission of Historical Publications Ltd

D Thames Water Asset Search



Elliott Wood Partnership LLP
241The Broadway
LONDON
SW19 1SD

Search address supplied Flat 1
Elm Tree House
13
Netherhall Gardens
London
NW3 5RN

Your reference 2180456

Our reference ALS/ALS Standard/2018_3879304

Search date 25 September 2018

Keeping you up-to-date

Notification of Price Changes

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

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



Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13



searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk



0845 070 9148



Search address supplied: Flat 1, Elm Tree House, 13, Netherhall Gardens, London, NW3 5RN

Dear Sir / Madam

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

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

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

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

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

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

Contact Us

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

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

Email: searches@thameswater.co.uk

Web: www.thameswater-propertysearches.co.uk

Waste Water Services

Please provide a copy extract from the public sewer map.

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

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

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

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

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

Clean Water Services

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

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

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



pressure test to be carried out for a fee.

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Payment for this Search

A charge will be added to your suppliers account.

Further contacts:

Waste Water queries

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

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

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

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Clean Water queries

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

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

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

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

Manhole Reference	Manhole Cover Level	Manhole Invert Level
4101	n/a	n/a
5101	n/a	n/a
201A	n/a	n/a
211A	n/a	n/a
3112	n/a	n/a
3111	n/a	n/a
3110	n/a	n/a
3109	n/a	n/a
2101	69.04	62.55
3108	n/a	n/a
3107	n/a	n/a
3106	n/a	n/a
3105	n/a	n/a
1101	n/a	n/a
1102	70.36	64.86
3102	n/a	n/a
321A	n/a	n/a
2803	55.99	52.04
2807	55.9	48.57
281F	n/a	n/a
18AH	n/a	n/a
18AG	n/a	n/a
18AD	n/a	n/a
18AJ	n/a	n/a
18AI	n/a	n/a
18BB	n/a	n/a
18AE	n/a	n/a
18AF	n/a	n/a
191C	n/a	n/a
191D	n/a	n/a
291A	n/a	n/a
1902	57.86	54.02
1903	n/a	n/a
191A	n/a	n/a
191B	n/a	n/a
191E	n/a	n/a
191F	n/a	n/a
2901	n/a	n/a
191G	n/a	n/a
191I	n/a	n/a
1916	n/a	n/a
2008	n/a	n/a
1005	n/a	n/a
2007	n/a	n/a
1004	n/a	n/a
0902	57.55	53.8
0001	61.45	58.7
0803	49.12	46.09
0804	51.78	46.19
1002	60.41	55.76
101A	n/a	n/a
1801	49.02	46.5
1901	56	50.41
1001	59.4	54.85
1905	58.3	55.92
191H	n/a	n/a
3801	n/a	n/a
3906	n/a	n/a
3903	72.04	69.19
4906	n/a	n/a
5902	73.36	69.41
4001	76.82	71.76
3001	70.81	64.89
3002	n/a	n/a
4002	82.58	76.52
1703	n/a	n/a
2802	n/a	n/a
2801	55.4	49.44
27CJ	n/a	n/a
271B	n/a	n/a
271C	n/a	n/a
3706	n/a	n/a
3705	n/a	n/a
27CI	n/a	n/a
3704	n/a	n/a
271A	n/a	n/a
27DA	n/a	n/a
271D	n/a	n/a
271E	n/a	n/a
281A	n/a	n/a
281B	n/a	n/a
281C	n/a	n/a
28CI	n/a	n/a
28CH	n/a	n/a
28CG	n/a	n/a
28CF	n/a	n/a
28CE	n/a	n/a
281D	n/a	n/a
281E	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
<p>The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.</p>		



ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

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

Sewer Fittings

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

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

Operational Controls

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

-  Control Valve
-  Drop Pipe
-  Ancillary
-  Weir

End Items

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

-  Outfall
-  Undefined End
-  Inlet

Other Symbols

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

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

Areas

Lines denoting areas of underground surveys, etc.

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

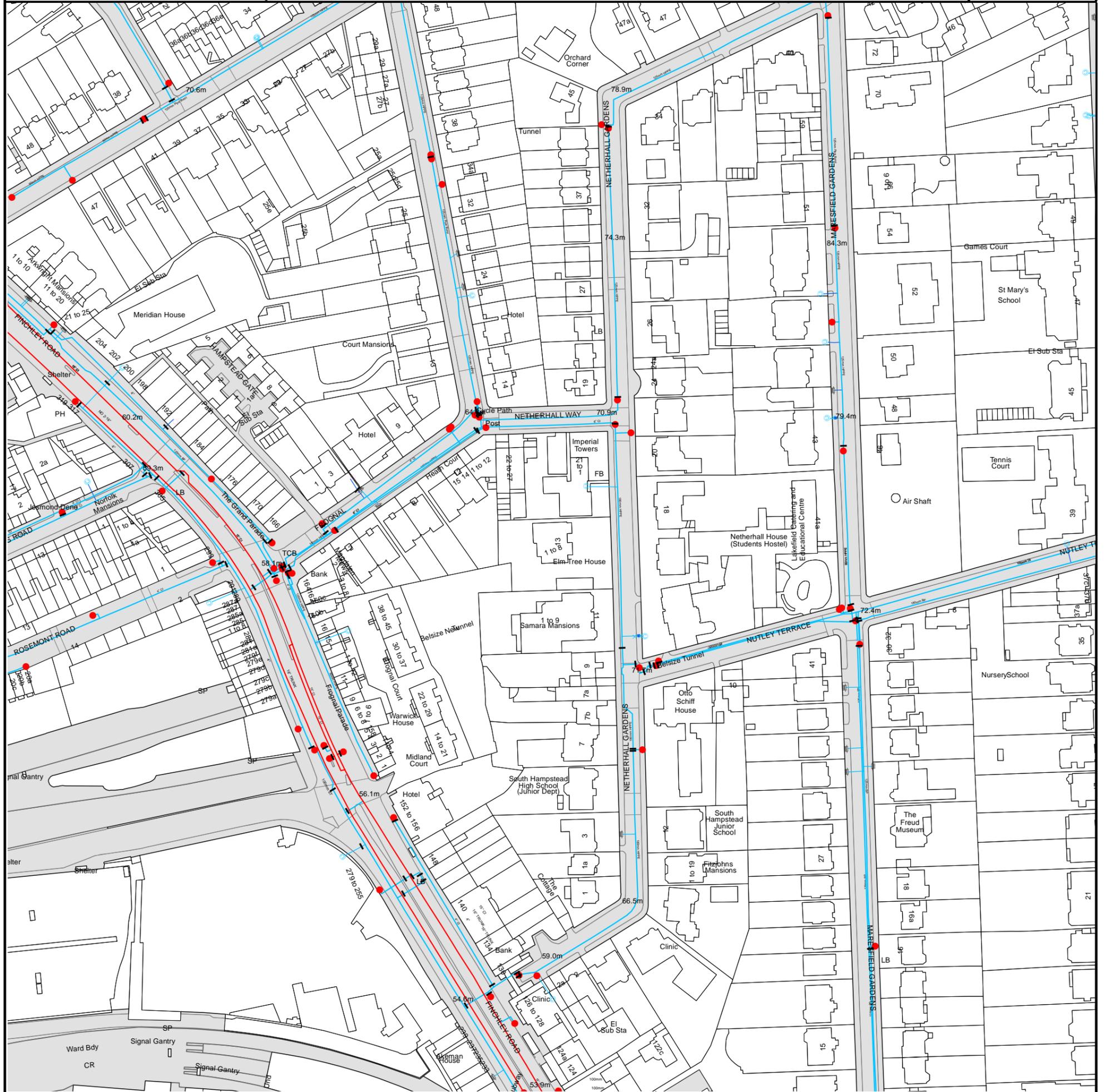
Other Sewer Types (Not Operated or Maintained by Thames Water)

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

Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plans are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
- 5) 'na' or '0' on a manhole level indicates that data is unavailable.
- 6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.

Asset Location Search Water Map - ALS/ALS Standard/2018 3879304



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 526310, 184975.

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.



ALS Water Map Key

Water Pipes (Operated & Maintained by Thames Water)

- 4"** **Distribution Main:** The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.
- 16"** **Trunk Main:** A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.
- 3" SUPPLY** **Supply Main:** A supply main indicates that the water main is used as a supply for a single property or group of properties.
- 3" FIRE** **Fire Main:** Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.
- 3" METERED** **Metered Pipe:** A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.
- Transmission Tunnel:** A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.
- Proposed Main:** A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

Valves

- | General Purpose Valve
- ◆ Air Valve
- ▲ Pressure Control Valve
- X Customer Valve

Hydrants

- Single Hydrant

Meters

- Meter

End Items

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

- | Blank Flange
-] Capped End
- Emptying Pit
- ⊖ Undefined End
- ≡ Manifold
- ⊙ Customer Supply
- ⊕ Fire Supply

Operational Sites

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

Other Symbols

- 📄 Data Logger

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

- Other Water Company Main:** Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.
- Private Main:** Indicates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
4. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
5. In case of dispute TWUL's terms and conditions shall apply.
6. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
8. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800

If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to her at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

Ways to pay your bill

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

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



Search Code

IMPORTANT CONSUMER PROTECTION INFORMATION

This search has been produced by Thames Water Property Searches, Clearwater Court, Vastern Road, Reading RG1 8DB, which is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered search firms maintain compliance with the Code.

The Search Code:

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the United Kingdom
- sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practise and quality standards within the industry for the benefit of consumers and property professionals
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.

By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you.

The Code's core principles

Firms which subscribe to the Search Code will:

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

Complaints

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

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

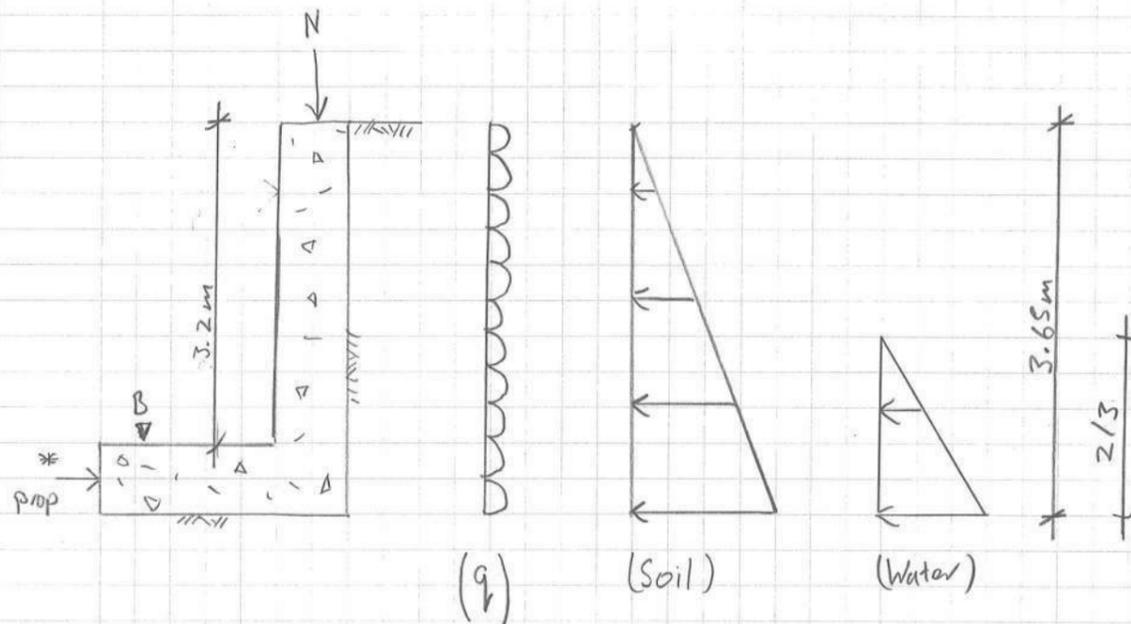
TPOs Contact Details

The Property Ombudsman scheme
Milford House
43-55 Milford Street
Salisbury
Wiltshire SP1 2BP
Tel: 01722 333306
Fax: 01722 332296
Email: admin@tpos.co.uk

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

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

E Underpin Structural Calculations

RC underpin check - under External wall (North)Cantilever RC wall
(permanent)

* underpin designed as cantilever retaining wall propped at base of retaining wall underpin.

Soil parameters

- London clay : Bulk density : 1950 kg/m³

Effective Friction Angle $\phi' = 24^\circ$

$$K_a = \frac{1 - \sin \phi'}{1 + \sin \phi'} = 0.42$$

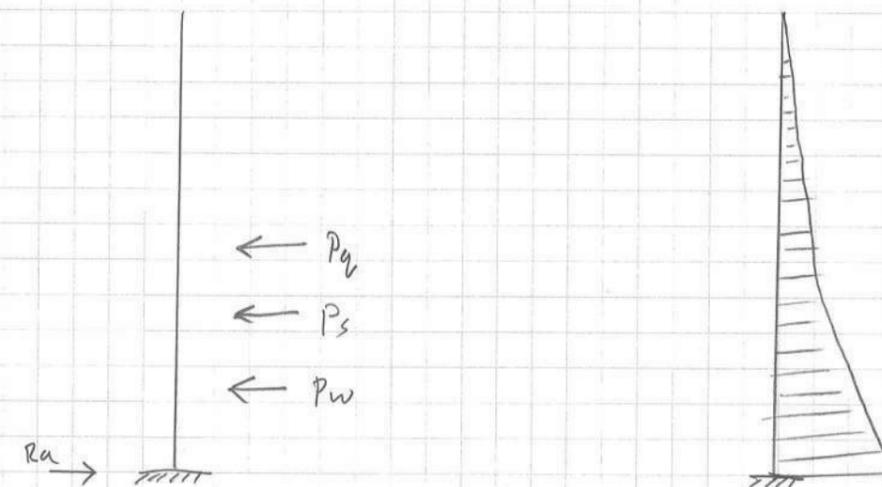
- Surcharge taken as $q = 0.5 \text{ kN/m}^2$

- GEA SI reported Ground water to be below proposed basement slab level. Ground water was monitored as dry down to the depth of 6.0m. The underpin retaining wall will conservatively taking account of perched water 2/3 height of the underpin.

$$P_q = q \times h \times K_a = 5.0 \text{ kN/m}^2 \times 3.65 \text{ m} \times 0.42 = 7.665 \text{ kN/m}$$

$$P_s = \frac{1}{2} \times K_a \times \text{density of Soil} \times h^2 = 0.5 \times 0.42 \times 1950 \text{ kg/m}^3 \times 3.65 \text{ m}^2 = 54.56 \text{ kN/m}$$

$$P_w = \frac{1}{2} \times \text{Water} \times h^2 = 0.5 \times 10 \text{ kN/m}^3 \times \left(\frac{2}{3} \times 3.65 \text{ m}\right)^2 = 29.6 \text{ kN/m}$$

Force Diagram and bending diagram

Tedds output:

$$M_{\max} = 283 \text{ kNm}$$

$$R_a = 245 \text{ kN}$$

Bending check

$$M_{ed \max} = 283 \text{ kNm}$$

Concrete grade : 32 N/mm²

$$d = 400 \text{ mm}$$

- Assumed Existing wall 400mm thick
- Assume 20mm ϕ bar

$$M_{rd} = 0.167 f_{ck} b d^2 = 0.167 \times 32 \times 1000 \times 400 \text{ mm}^2 = 855 \text{ kNm}$$

$$M_{rd} > M_{ed}$$

Reinforcement check

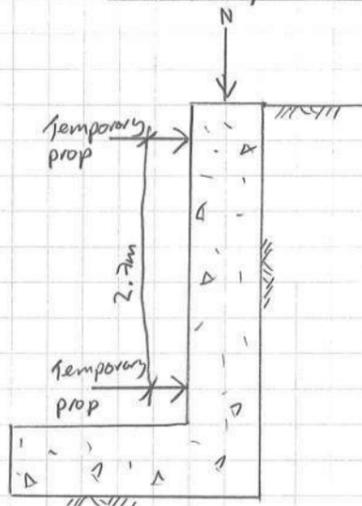
$$k_o = \frac{M_{ed}}{f_{ck} b d^2} = \frac{283 \text{ Nm} \times 10^6}{32 \text{ N/mm}^2 \times 1000 \text{ mm} \times 460 \text{ mm}^2} = 0.055$$

$$z = d \left[0.5 + \sqrt{0.25 - \left(\frac{3 k_o}{3.4} \right)} \right] = 400 \left[0.5 + \sqrt{0.25 - \left(\frac{3 \times 0.055}{3.4} \right)} \right]$$

$$z = 400 [0.95] = 380 \text{ mm}$$

Steel strength 500 N/mm^2

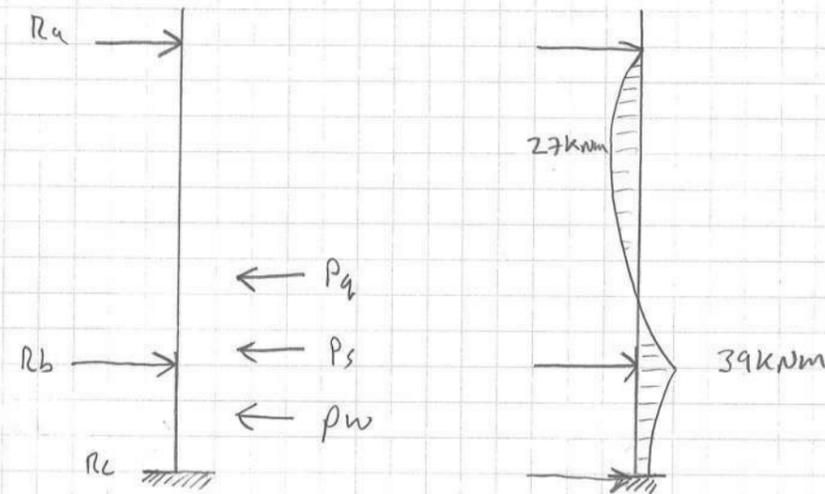
$$A_{s \text{ req}} = \frac{M_{ed}}{0.87 f_{yk} z} = \frac{283 \text{ kNm} \times 10^6}{0.87 \times 500 \text{ N/mm}^2 \times 380 \text{ mm}} = 1712 \text{ mm}^2/\text{m}$$

provide 20ϕ bars at 150 mm centres ($A_{s \text{ prov}}: 2094 \text{ mm}^2/\text{m}$)RC underpin check - temporary condition

Lateral load pressure same as permanent condition refer to page 1

proped underpin top and bottom.

Soil parameters same as permanent refer to page 1 of calc

Force diagram & bending diagram

Teds output

$$R_a = 40 \text{ kN}$$

$$R_b = 203 \text{ kN}$$

$$R_c = 13 \text{ kN}$$

$$M_{\text{max}} = 39 \text{ kNm}$$

$$M_{\text{min}} = 27 \text{ kNm}$$

Bending check

$$M_{ed \text{ max}} = 39 \text{ kNm}$$

$$\text{concrete grade } 32 \text{ N/mm}^2$$

$$d = 400 \text{ mm}$$

$$M_{rd} = 0.167 f_{ck} b d^2 = 0.167 \times 32 \text{ N/mm}^2 \times 1000 \text{ mm} \times 400 \text{ mm}^2 = 855 \text{ kNm}$$

$$M_{rd} > M_{ed}$$

Reinforcement check - temporary condition

$$k_o = \frac{M_{ed}}{f_{ck} b d^2} = \frac{39 \text{ kNm} \times 10^6}{32 \text{ N/mm}^2 \times 1000 \text{ mm} \times 400 \text{ mm}^2} = 0.0076$$

$$z = d \left[0.5 + \sqrt{0.25 - \left(\frac{3 k_o}{3.4} \right)} \right] = 400 \left[0.5 + \sqrt{0.25 - \left(\frac{3 \times 0.0076}{3.4} \right)} \right]$$

$$= 400 [0.99]$$

$$\text{take } z \text{ as } 0.95d = 380 \text{ mm}$$

Project name:

13 Netherhall Gardens

Project number:

2180456

Sheet:

3

Revision:

-

Date:

29-01-2019

Engineer:

SLe

Checked:

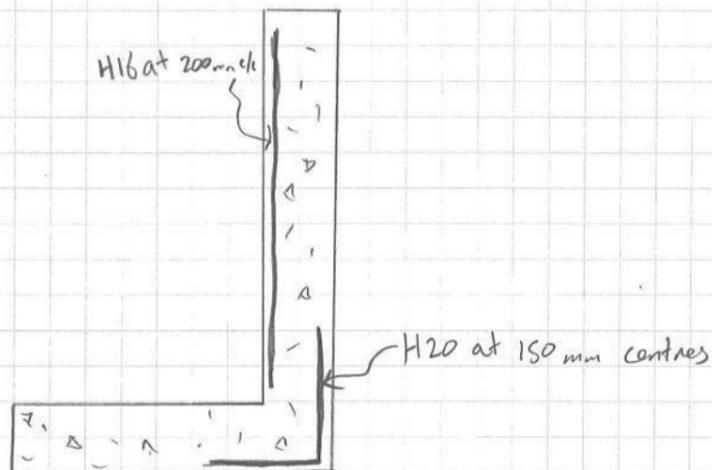
AAT

Steel strength = 500 N/mm^2

$$A_{s \text{ req}} = \frac{M_{\text{ed}}}{0.87 f_y k z} = \frac{39 \text{ kNm} \times 10^6}{0.87 \times 500 \text{ N/mm}^2 \times 380 \text{ mm}} = 236 \text{ mm}^2/\text{m}$$

$$A_{s \text{ min}} = 0.13\% A_c = 0.13\% \times 1000 \text{ mm} \times 400 \text{ mm} = 520 \text{ mm}^2/\text{m}$$

Provide min reinforcement 16ϕ at 200 centres





elliottwood | engineering
a better **society**

London
55 Whitfield Street
Fitzrovia
W1T 4AH
+44 207 499 5888

Wimbledon
241 The Broadway
London
SW19 1SD
+44 208 544 0033

Nottingham
1 Sampsons Yard
Halifax Place
Nottingham
NG1 1QN
+44 870 460 0061

www.elliottwood.co.uk