21 Boscastle Road
London, NW5 1EG

Structural Engineering Report & Subterranean Construction Method Statement

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revision:	P1	prepared by:	Ed Davenport Engineer BEng (Hons)	checked by:	Sarah Wadley Senior Engineer MEng (Hons) CEng MIStructE	approved by:	Sarah Wadley Senior Engineer MEng (Hons) CEng MIStructE
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Non-Technical Summary

Elliott Wood Partnership LLP has worked on a number of projects in the area and is aware of both the underlying soil and groundwater; the basement extension has been designed with this in mind. The basement extension should have no adverse effect on the local hydrogeology and the site specific site investigation provides further evidence of this.

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 house or the adjoining properties. Based on our current knowledge of the building and the ground movement assessment completed by Fairhurst, if the works are carried out in this manner, then the likelihood of damage to the property and adjacent properties should be limited to Category 0 to Category 1 as set out in CIRIA report 580.

A construction traffic management plan has been completed by Finkernagel Ross Architects in February 2016 which gives advice on the likely programme, vehicular access and site set-up.

All reports have led to the same conclusion: the construction of the basement extension will not have any significant adverse effect on the property, neighbouring properties, groundwater, surface water or slope stability.

1.0 Introduction

1.1 Elliott Wood Partnership LLP is a firm of Consulting Structural Engineers approximately 120 strong operating from offices in central and south west London and Nottingham. Residential developments of all scales have been central to the workload of the practice with many in the Greater London area. In particular Elliott Wood Partnership LLP has been producing designs for basements to both existing and new buildings. To date this numbers approximately 500 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.

1.2 Elliott Wood Partnership LLP were appointed by the Clients, Barbara Storch and Mayamiko Kachingwe, to advise on the structural implications of the construction of a new basement extension beneath a site containing 21 Boscastle Road. The following report has been prepared to help ensure that the property and neighbouring properties are safeguarded during the works. The report provides information in accordance with the requirements outlined in the Supplementary Planning Document CPG4 "Basements and lightwells" dated July 2015, which supports Camden Development Policy DP27 “Basements and lightwells” and forms part of the wider Local Development Framework (LDF). It includes information on the site, the proposed alterations and their impact on the site, the building and adjoining buildings and provides information on how the basement will be constructed.

1.3 Elliott Wood Partnership LLP 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.

1.4 A preliminary desk study has been completed to establish the general ground conditions and history of the building. The ground conditions and ground water levels have also been confirmed by a site investigation.

1.5 The site specific site investigation was completed by Fairhurst in December 2015 and comprised of 2no. augered boreholes and 4no. hand-dug trial pits. Fairhurst have also completed the Basement Impact Assessment in accordance with Supplementary Planning Document CPG4.

2.0 Description of Existing Buildings and Site

2.1 No.21 Boscastle Road is a four storey terraced residential building on the Western side of Boscastle Road. Historic maps suggest the property is likely to have been constructed in the 19th Century, with the earliest map studied dated 1895 showing the site to be developed with the existing buildings and those surrounding it. It is also outlined in the document “Dartmouth Park Conservation Area Appraisal and Management Statement” (available on the London Borough of Camden’s website) that Nos. 19-29 Boscastle Road were built in 1873 by a builder named Tambling.

2.2 The buildings are not Listed, however they are situated in the Dartmouth Park Conservation Area in the London Borough of Camden.

2.3 The existing building at No.21 Boscastle Road is a four storey residential property. It is rectangular on plan with a single frontage onto Boscastle Road and is mid-terrace. It shares party walls with No.19 and No.23 Boscastle Road to the south and north respectively. There is also an existing cellar beneath the property at basement level which covers approximately 25% of the footprint of the main house.

2.4 A visual inspection of the condition of the existing building has been carried out, albeit without any opening up works completed. The building appears to be in reasonable condition and is traditionally constructed with timber floors supported on load bearing internal, front and rear walls. The floors span front to back between the front and rear walls and the load bearing spine walls in the centre of the building.

2.5 The overall stability of the buildings appears to be provided by the cellular layout of the masonry walls and diaphragm action of the timber floors at each level.

2.6 Access is gained to the site from the front of the property via Boscastle Road.

2.7 Public sewer records have been obtained from Thames Water and these are included in the appendix.

2.8 A CCTV survey will be required to determine the location, size and condition of the existing drainage network. The survey should continue through to the connections to the public sewer network to prove connectivity.

3.0 Ground Conditions

3.1 Geological maps show that the site is situated in an area of London Clay. The maps available from the British Geological Survey indicate that the site lies directly on top London Clay with no superficial deposits, while historical borehole records from the surrounding area provide more detail, indicating that made ground is experienced down to depths of between 0.3m and 1.0m, underlain by London Clay onwards.

3.2 A site investigation was carried out by Fairhurst in December 2015 which comprised of 2no. boreholes. The borehole drilled to the rear of the property (BH1) was taken from a ground level of approximately 53.30mSD down to 15m below ground level. The borehole drilled to the front of the property (BH2) was taken from a ground level of approximately 52.30mSD down to 10m below ground level. 4no. trial pits were also dug in order to ascertain the foundations to existing building.

3.3 Ground conditions recorded in BH1 consisted of a 0.9m thick layer of made ground on top of a 1.2m thick layer of clay described as 'Reworked London Clay', all underlain by London Clay down to the 15m depth at which the borehole was terminated. BH2 indicated 0.5m of made ground underlain by London Clay to the terminating depth of 10m. Water was not encountered in BH2, however in BH1 it was measured at a depth of 5.47m below ground level. Standpipe monitoring has subsequently been carried out and water was still not found in BH2, while in BH1 the level had risen to 3.21m below ground level. Given the ground conditions, the water levels observed in BH2 are likely to be the result of perched water in the made ground due to rainfall, which has gradually filled the borehole over the two week period of monitoring.

The presence of water in the future could be subject to seasonal variation. However, at present, significant inflows of groundwater are unlikely to be experienced within the basement excavation.

3.4 The trial pits indicate that the main house is founded on corbelled brickwork strip foundations. Along the party wall with No.19 these footings were seen down to approximately 0.8m below existing ground floor level in TP4. Along the party wall with No.23, the footings were seen down to a depth of approximately 1.1m below existing ground floor level in TP3. The existing cellar walls are founded on mass concrete strip footings around its perimeter at existing cellar floor level (51.21mSD).

3.5 The site investigation concludes that a safe bearing capacity of 180kN/m^2 can be safely used for the design of conventional spread foundations below the proposed basement floor which is adequate for the proposed development and potential construction loads. Elliott Wood have produced a summary of the expected line loads for the proposed works and these have been inputted into the ground movement assessment. The ground movement analysis has shown that the settlement is within acceptable limits and spread footings are an acceptable approach.

3.6 There are trees located in both the front and rear gardens, however these are not proposed to be removed.

4.0 Desk Study Summary and Observations

4.1 The results of our desk study are as summarised below;

- The building appears to be in the vicinity of the historic Fleet river (reference Lost Rivers of London, Nicholas Barton).
- The site is located within Flood Zone 1 as shown on the latest Environment Agency Flood Maps, which indicates that the property is at low risk from flooding (reference; www.environment-agency.gov.uk). The property does not appear to be located in any of the London Borough of Camden's critical drainage areas, and Boscastle Road is not listed as a street at risk from flooding, as such a flood risk assessment is not thought to be required.
- The site does not appear to be in the vicinity of any London Underground infrastructure or railway lines.
- There are no records of historical bomb damage to No.21 Boscastle Road during World War II, however the houses on the opposite (east) side of Boscastle Road are marked on maps as having experienced "Blast damage, minor in nature" (reference, The LCC London Bomb Damage Maps 1939-1945, LTS).
- Public Sewer records have been obtained from Thames Water and there does not appear to be any Thames Water assets within the proposed site.

5.0 Proposed Alterations

5.1 The proposed works involve the construction of new rear single storey extension and to carry out a number of internal alterations to the remainder of the house.

The proposed works also include an extension to the existing cellar to form a full-width basement extension beneath the full footprint of the existing main house, extending out approximately 1.5m beyond the existing main house's rear elevation.

5.2 The rear elevation and ground floor structure of the main house will be altered to incorporate the new basement extension, while the existing structure from first floor upwards will be modified to accommodate a full-height void behind the rear-elevation containing structural glass elements to the Architect's detail.

5.3 L-shaped reinforced concrete underpins will be used to underpin the main house along the party wall with No.19 Boscastle Road around the perimeter of the basement. The reinforced concrete underpins will be designed to support the surcharge from the soil and neighbouring building.

5.4 Mass concrete underpins will be used to underpin the main house along the party wall with No.23 Boscastle Road. A reinforced concrete lining wall will be constructed against the mass concrete underpins which will be designed to support the surcharge from the soil and neighbouring building.

5.5 The basement retaining walls to the front and rear of the building will be formed from reinforced concrete cast in an underpin sequence to avoid undermining existing structures above.

5.6 A reinforced concrete slab will be constructed at basement levels and at ground floor level outside the footprint of the main building to provide permanent propping to the underpins and lining walls, resisting lateral ground loads.

5.7 The basement floor has been designed as a reinforced concrete suspended slab spanning across the width of the basement. This is in line with the recommendations set out in the site investigation report. A ground movement assessment has been completed and the levels of movement are within acceptable limits.

5.8 The groundwater level has been monitored using standpipes and has been found to be at approximately 50.06mSD in BH1 to the rear of the property, while BH2 did not indicate any presence of water within it. The proposed basement has an excavation level of approximately 49.60mSD at its deepest location which is just below the level of the water recorded during standpipe monitoring. Given that the water seen in BH1 is most likely perched rainwater that has entered the borehole from the layer of made ground above, it is unlikely that inflows of groundwater will be experienced during excavation. Based on the standpipe monitoring to date, and assuming water levels remain consistent with those recorded to date, any inflows that do occur should not be significant. The Fairhurst report also suggests that the likely in flows should be suitably controlled by sump pumping.

If groundwater is experienced during excavation, suitable control of any inflows would be achieved using sump pumping. If required, a detailed method statement for this process will need to be prepared by the Contractor for comment by all relevant parties including party wall surveyors and their engineers. Water levels in the Standpipe will be periodically measured prior to start onsite. Trial underpins will be dug when the contractor first starts on site to confirm the stability of the soil and to further investigate the presence of any groundwater inflows.

6.0 Basement Waterproofing

6.1 The proposed basement will be designed to achieve a Grade 3 level of waterproofing protection as outlined in BS 8102:2009.

6.2 The reinforced concrete underpins, lining wall and basement slabs will be cast using water resistant concrete to form an initial barrier with an internal drained cavity system as a primary barrier against possible water ingress. As part of the system, any water that seeps through will be collected in a sump to be pumped up to high level where it will drain under gravity into the main drainage system.

7.0 Party Wall Matters

7.1 The proposed works development falls 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 Party Wall awards. 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 notifiable under the Act. The resolution of matters under the Act and provisions of the Party Wall Awards will protect the interests of the owners.

7.2 The proposed works on the site of No.21 Boscastle Road will be developed so as not to inhibit any works on the adjoining properties. This will be verified by the Surveyors as part of the process under the Act.

8.0 Hydrological Statement Summary

8.1 The ground investigation has indicated that water is not likely to be encountered during the excavation of the basement down to formation level. As previously discussed, water was not encountered in either of boreholes BH1 and BH2 during drilling at approximately 15.0m and 10.0m below ground level respectively. The water level in BH1 has since been found to have risen to 50.10mSD when reading standpipes during a programme of monitoring, but this is perched water due to rainwater attenuated within the made ground above, therefore although the depth of the proposed basement excavation is positioned around the level of this water, it would appear that any impact on the groundwater is likely to be minimal and is unlikely to have any noticeable effect on groundwater flow.

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

9.0 Ground Movement Assessment

9.1 A ground movement assessment has been completed by Fairhurst which takes into account both the long and short term effects of the proposed basement.

9.2 The analysis has concluded that the proposed basement excavations should not have an unacceptable impact on the adjacent properties at No.19 and No.23 Boscastle Road. In each case, these buildings are predicted to have category 0 to 1 very slight damage at worst. The above damages are within the acceptable damage levels set out in the London Borough of Camden's subterranean development policies.

9.3 In order to mitigate the risk of Category 1 'Very Slight' damage to the surrounding properties, the temporary works installed during the works will be designed to support the surcharge from the soil and surrounding buildings. A ground movement monitoring system will also be installed to the adjoining properties No.19 and No.23 Boscastle Road, with trigger values set to allow the works to be controlled appropriately in the event of ground movement occurring (as outlined in section 14.0).

With the implementation of these mitigation measures, any damage caused to the property and surrounding properties should be limited to Category 0 to 1 damage at worst.

10.0 Conclusions

10.1 It is intended that the above measures and sequence of works are adopted for the eventual design and construction of the proposed works.

10.2 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. The Contractor will need to ensure that adequate supervision and monitoring is provided throughout the works particularly during the excavation and demolition stages. A specification and indication of monitoring requirements is given in section 14.0.

10.3 To this end, EWP will have an on-going role during the works on site to monitor that the works are being carried out generally in accordance with our design and specification. This role will typically involve fortnightly site visits during the main structural works. A written site report will be provided to the design team, Contractor and Party Wall Surveyor.

10.4 It is assumed that the above measures and sequence of works are taken into account in 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 house or the adjoining properties. Based on our current knowledge of the building and the ground movement assessment completed by Fairhurst, if the works are carried out in this manner then the likelihood of damage to the adjacent properties should be limited to Category 0 to 1 as set out in CIRIA report 580.

Construction Method Statement

11.0 Construction Method Statement (to be read in conjunction with drawings in Appendix 1.0)

Some of the issues that affect the sequence of works on this project are:

- The stability of the existing building;
- The stability of adjoining and adjacent buildings and road;
- Forming sensible access onto the site to minimise disruption to the neighbouring residents; and
- Providing a safe working environment.

The proposed works involve the construction of an extension to the existing cellar to form of a new basement level beneath the footprint of No.21 Boscastle Road. This basement extension will be linked to the main house via a staircase at existing ground floor level. The works also include an extension of the existing rear additions to the house and a reconfiguration of the layouts at the upper levels. It is expected that these works will be completed in a "bottom up" construction sequence.

The undertaking of such projects to existing buildings is specialist work and EWP will be involved in the selection of an appropriate Contractor with the relevant expertise and experience for this type of project.

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 weekly site visits at the very beginning of the Contract and fortnightly thereafter. A written report of each site visit is provided for the Design Team, Contractor and Party Wall Surveyor.

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 works starting on site.

Please refer to section 13.0 for noise, vibration and dust assessment with proposed associated mitigation methodologies.

Stage 1: Site Set-Up

Erect a fully enclosed painted plywood 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 to progress.

Stage 2: Enabling Works

All walls to be demolished as part of the works should be accurately surveyed prior to demolition with materials retained where possible.

A movement monitoring system will be installed to the adjoining buildings at No.19 and No.23 Boscastle Road. A detailed specification for the monitoring is given in section 14.0.

The removal of spoil is described in the construction traffic management plan completed by Finkernagel Ross Architects in February 2016

Stage 3: Demolition of Existing Structure and Internal Soft Strip

Carefully remove the existing suspended timber floor at ground floor level in the main house and the existing cellar floor slab to allow the underpinning works to commence. Remove the existing drainage where necessary.

Stage 4: First Stage of Underpinning to Party Walls

In order to install the beam supporting the rear elevation in the permanent case, underpins each side of the basement, which the beam spans between, must first be installed. A total of 5m of underpins on each side of the proposed basement are required to distribute the beam's loads to the ground.

Dig trial underpins for inspection by Elliott Wood Partnership to check how well the existing soil is cemented, ground water levels and flows, and in particular the ability of the ground to "stand up" whilst the individual underpin is completed. Given our experience on nearby projects we would expect that localised trench sheeting and props will need to be installed within the underpin shaft.

The underpins to the party wall with No.19 are to be formed in reinforced concrete down to proposed basement formation level, while the underpins to the party wall with No.23 are to be formed using mass concrete (with a reinforced concrete lining wall to be cast to the inside of these later during Stage 15). The reinforcement in the reinforced concrete underpins will be tied in the toe first followed by the stem.

Underpins will be cast in maximum 1 metre sections, left to cure for 3 days and then dry-packed to the underside of the wall with 3:1 sharp sand to cement dry-pack well rammed in. The exact sequence of underpinning will be advised by the Contractor as it will relate to their sequence of construction.

Where necessary suitable temporary sumps should be excavated at all stages within the excavation to allow groundwater to be collected and pumped out. Filters should be installed to ensure that the migration of fines is limited.

The temporary propping to the central bund will remain in place and be removed as part of the bulk excavation. This method of construction will be used to limit any horizontal ground movement associated with the construction of the underpins and limits the risk of the underpinning works on the neighbouring buildings.

Stage 5: Temporary Needle Propping to Existing Rear Elevation

Temporary mass concrete pad footings are to be cast each side of the existing rear elevation along its length to ground floor level.

Temporary steel needle beams are to be installed and propped off the temporary footings and the reinforced concrete underpin toes cast in Stage 4. These will support the rear elevation until the steelwork has been installed to support it in the permanent case.

Stage 6: Install Steelwork to support Rear Elevation

The steel beam supporting the rear elevation wall in the permanent case is designed to span across the basement and can now be installed.

The temporary needle propping installed in Stage 5 may now be removed and the openings for the needles made good.

Stage 7: Install Steelwork at Ground Floor Level

The steelwork supporting the internal spine walls, ground floor joists and chimneys in the permanent case can now be installed.

The beams located over the cellar will be temporarily supported along their length by the existing cellar wall, until they are connected to rest of the permanent steelwork once installed.

The beam under the spine wall, spanning between party walls must be temporarily supported at one end (the party wall with No.23) until the mass concrete underpins under have been installed in Stage 8.

Ensuring the chimneys are temporarily supported, install the steel beams to support them in the permanent case.

Stage 8: Second Stage Underpinning to Party Walls and Elevations

Construct the remaining underpins to the party walls down to proposed basement formation level, using mass concrete to underpin the party wall with No.23 and reinforced concrete beneath the party wall with No.19.

Sacrificial mass concrete underpins are to be cast down to proposed basement formation level to support the front elevation in the temporary case.

Underpins forming the basement wall beneath the rear elevation and the proposed front lightwell will be formed in reinforced concrete down to basement formation level and cast in maximum 1 metre sections. This completes the underpinning works to the perimeter of the proposed basement.

The temporary propping to the central bund will remain in place and be removed as part of the bulk excavation. This method of construction will be used to limit any horizontal ground movement associated with the construction of the underpins and limits the risk of the underpinning works on the neighbouring buildings.

Stage 9: Complete First Stage of Bulk Excavation

Complete the bulk excavation down to existing cellar floor level installing temporary props and waling beams to the underpinning across the width of the basement as required. Holes will be made in the existing cellar wall to enable the props to span the full width of the basement. The temporary props will remain in place until all basement and ground floor structures are in place and have cured sufficiently.

The existing cellar wall and footings can now be demolished.

Stage 10: Complete Second Stage of Bulk Excavation

Complete the bulk excavation down to basement formation level installing temporary props and waling beams to the underpinning across the width of the basement as required.

Stage 11: Temporary Needle Propping to Bay Window

Temporary mass concrete pad footings are to be cast on the internal side of the existing front elevation to basement formation level.

Temporary steel needle beams are to be installed with the internal ends being propped off the temporary footings, and the external ends bearing onto the top of the new reinforced concrete lightwell wall installed in Stage 8. These will support the front elevation over whilst it is extended down to the new basement level.

Stage 12: Downward Extension of Bay Window

The sacrificial mass concrete underpins installed in Stage 8 can be demolished. The new thickening under the bay window can now be formed ensuring it is tied into the underpin toes as required.

The proposed basement bay window can now be built up to the underside of the existing front elevation above in masonry to match existing.

The temporary needle propping may now be removed and the openings for the needles made good.

Stage 13: Cast the Basement Slab

Any drainage runs should be installed and permanent sumps for cavity drainage cast.

Install Cordek Cellcore heave protection and then cast the reinforced concrete suspended slab. Once this has cured sufficiently the lateral propping directly above the slab can be removed. The higher levels of lateral propping should be retained.

Stage 14: Lining Wall Construction

The reinforced concrete lining wall is to be constructed to the full height of the basement walls in two lifts.

Sequentially remove the mid-level temporary propping across the width of the basement and cast the lining wall up to half of the proposed height in 1m sections. Once this has cured sufficiently, repeat the process for the second lift of the lining wall.

All temporary propping across the basement will have now been removed and the basement structure will be complete.

Stage 15: Completion of Works

The superstructure works to the building and in the garden area can be commenced following the completion of the basement works. These works are typical for a residential building of this scale.

Noise, Vibration and Dust Mitigation

12.0 Noise, Vibration and Dust

The Supplementary Planning Document "Basement Development in Westminster" states that any basement works should be completed in such a way as to ensure that "suitable measures to control the emission of dust and dirt during construction and ensure works will not generate noise audible at the site boundaries outside of permitted working hours" are in place.

The proposed basement at No.21 Boscastle Road is a basement extension beneath the full footprint of the main house extending out by approximately 1.5m beyond the existing rear elevation. The construction works involve the demolition of existing concrete floor slabs, underpinning beneath party walls and the front and rear elevations, as well as excavation and the construction of the basement shell. A more detailed sequence of the works has been given in section 12.0. Those most likely to be affected by noise, dust and vibration will be the immediate neighbours at No.19 and No.23 Boscastle Road. The properties opposite No.21 Boscastle Road are remote from the proposed development and are therefore less likely to be affected, however need to be considered. There may be some impact on other residents on Boscastle Road due to the related construction traffic but this should be minimal.

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

12.1 Mitigation Measures for Demolition of Existing Cellar Walls and Slab

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.

As both properties are in terraces careful consideration needs to be given to minimise noise and vibration transfer to the adjoining properties. The contractor should ensure that where any slab is adjacent to the boundary the concrete slab should be diamond saw cut first along the boundary to isolate the slab from any adjoining structures.

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.

12.2 Mitigation Measures for Underpinning works to the Perimeter

The underpin shafts will be excavated using hand tools where possible. At the base of the underpin shaft it may be found that compressed air tools are required due to the compaction of the ground. Care should be taken in selecting a suitable air compressor that keeps noise to a minimum. The air compressor should be located within the site and behind a hoarding to minimise noise transfer to the adjoining properties.

The spoil will be removed from the excavation using an electrically powered conveyor. The contractor will need to ensure that this is regularly serviced and inspected to ensure any noise from this is kept to a minimum. The conveyor will be located as far from the neighbouring properties as practicable. In order to minimise dust, skips and conveyors should be covered or completely enclosed to ensure that dust cannot escape.

12.3 Mitigation Measures for Bulk Excavation

Due to the size of the basement it is likely that some 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.

12.4 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.

12.5 Dust Control

In order 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.

Structural Monitoring Proposals

13.0 Monitoring and limits on ground movements during excavation and construction

13.1 The Contractor shall provide monitoring on all the external retained elevation walls of No.21 Boscastle Road throughout their height as well as the immediately adjacent flank and return walls of No.19 and No.23 Boscastle Road during the basement construction.

13.2 Monitoring shall be completed as follows:

1) One month prior to any works being started to provide a base reading.
2) At the start and end of every shift during the excavation and until the basement slab and lining wall has been cast.
3) On a monthly basis thereafter for a 6 month period following completion of the notifiable works.

13.3 Cumulative movement of survey points must not exceed:

a. Settlement
Code amber trigger values: +/-6mm
Code red trigger values: +/-10mm

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

13.4 Movement approaching critical values:

Code amber trigger value:

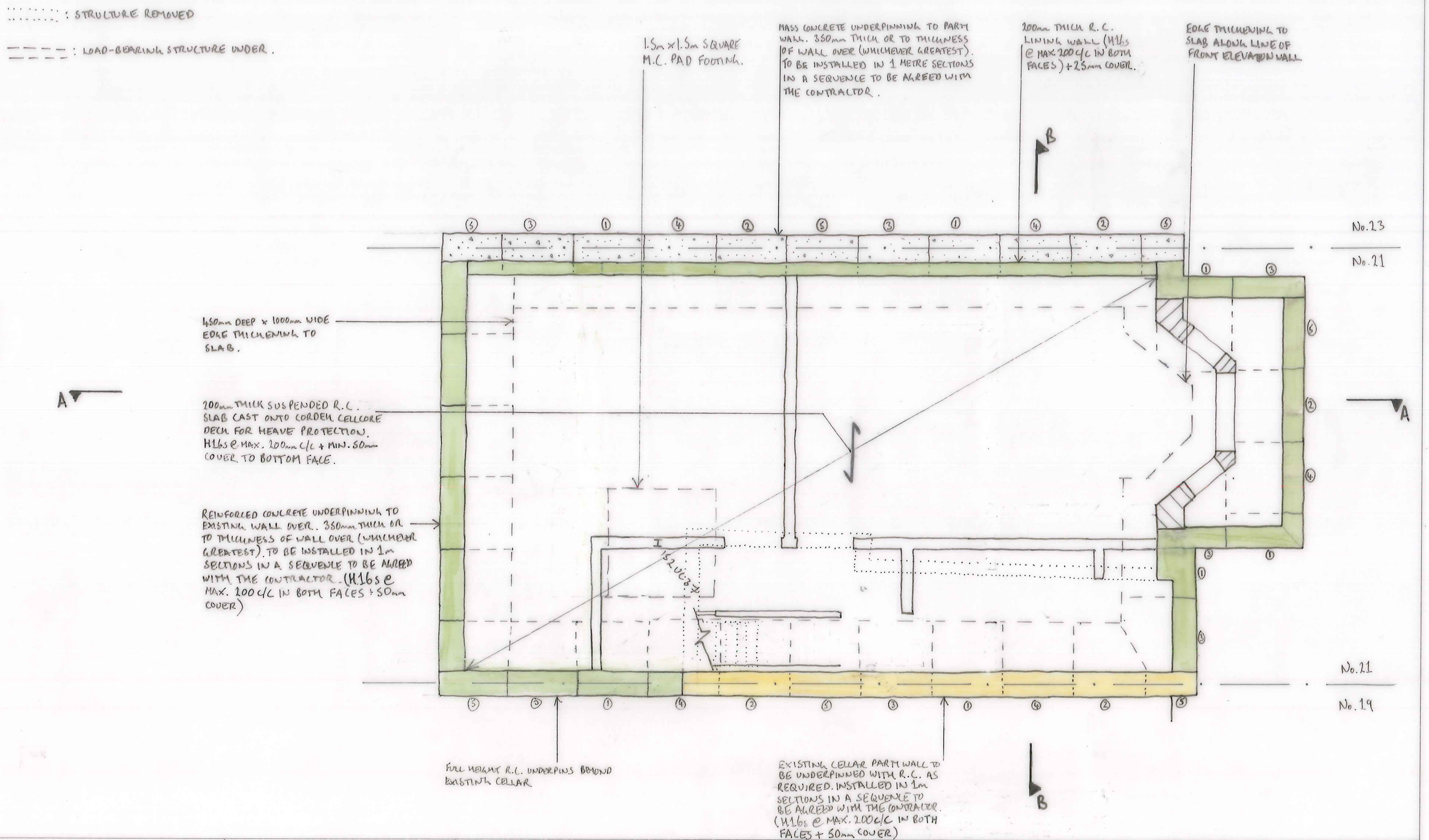
All interested parties, including the Adjoining Owner's Surveyor and his Engineer should be informed and further actions immediately agreed between two of the three Surveyors and implemented by the Building Owner. Notwithstanding the Party Wall requirements, the Contractor is to appoint, and to have permanently on site, a suitably qualified Structural Engineer who will be responsible for the reviewing of the movement monitoring results at the start and end of each day and provide immediate advice, remedial works and design as necessary in the event of movement being noted. The Contractor is to ensure that he has 24 hour/7 days a week access to emergency support provision including but not limited to additional temporary props, needles, waling beams and concrete supply at the start of the excavation and prior to any likelihood of this trigger value being reached. If this value is reached the Contractor, and his Engineer, must without delay provide all interested parties with his plan to implement any emergency remedial and supporting works deemed necessary. The Contractor must be ready to carry out these works without delay if the movement continues and approaches the trigger value above.

Code red trigger value:

All interested parties including Adjoining Owner's Surveyor and Engineer will be informed immediately. Works will stop and be made safe using methods and equipment agreed at the above stage. The Contractor is to ensure that the movement has stopped as a result of the implemented remedial works designed and installed at this stage. The requirements of the Party Wall Act will also ensure that two of the three Surveyors and their advising Engineers shall then enter into an addendum Award, setting out whether or not the Building Owner's works can re-commence and when, and if so agree additional precautions or modifications to the proposals prior to re-commencement.

Appendices

Appendix 1.0 - Proposed Drawings



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

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rev	date	by	chk	description

drawing title
PROPOSED BASEMENT FLOOR PLAN

scale(s): 1:50@A3 | date: DEC'15 | drawn: EDa

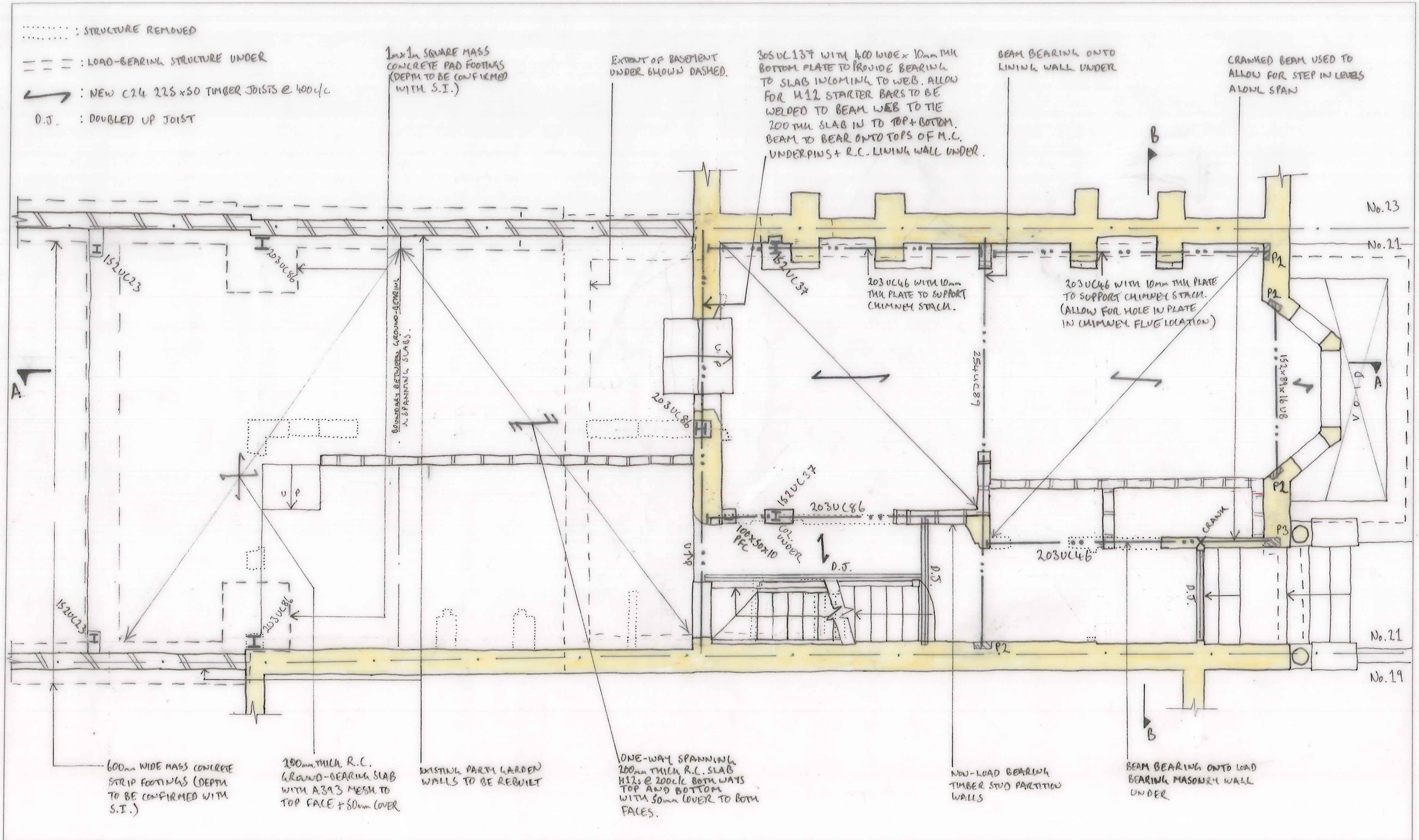
drawing status: PRELIMINARY

elliottwood

Elliott Wood Partnership LLP
Wimbledon • Central London • Nottingham
Consulting Structural and Civil Engineers
tel: (020) 8544 0033 info@elliottwood.co.uk www.elliottwood.co.uk

job title
21 BOSCASTLE ROAD, NW5 1EE

job no	drawing no	revision
2140872	S.01	P2



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

Do not scale from this drawing.

PADSTONE SCHEDULE

P2 = 440x100x215 DP

P3 = 215x300x215 DP

rev	date	by	chk	description

drawing title
PROPOSED GROUND FLOOR PLAN

scale(s) 1:50@A3 | date DEC'15 | drawn EM

drawing status PRELIMINARY

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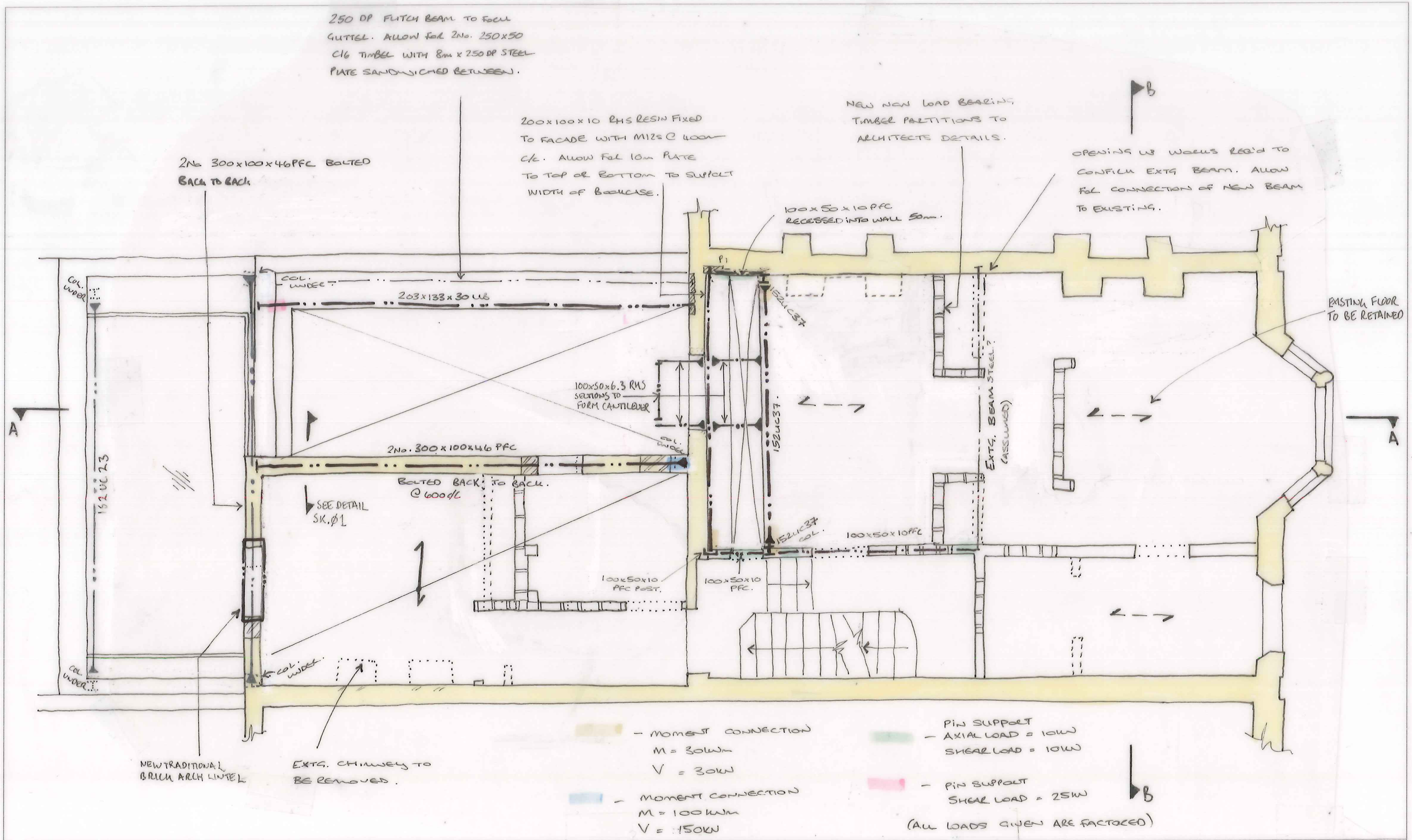
tel: (020) 8544 0033 info@elliottwood.co.uk www.elliottwood.co.uk

job title
21 BOSCASTLE ROAD, NW5 1EE

job no 2140872 | drawing no S.02 | revision C3



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- MOMENT CONNECTION

rev	date	by	chk	description

drawing title: **PROPOSED FIRST FLOOR PLAN**

scale(s): 1:50@A3 | date: DEC'15 | drawn: EDh

drawing status: PRELIMINARY

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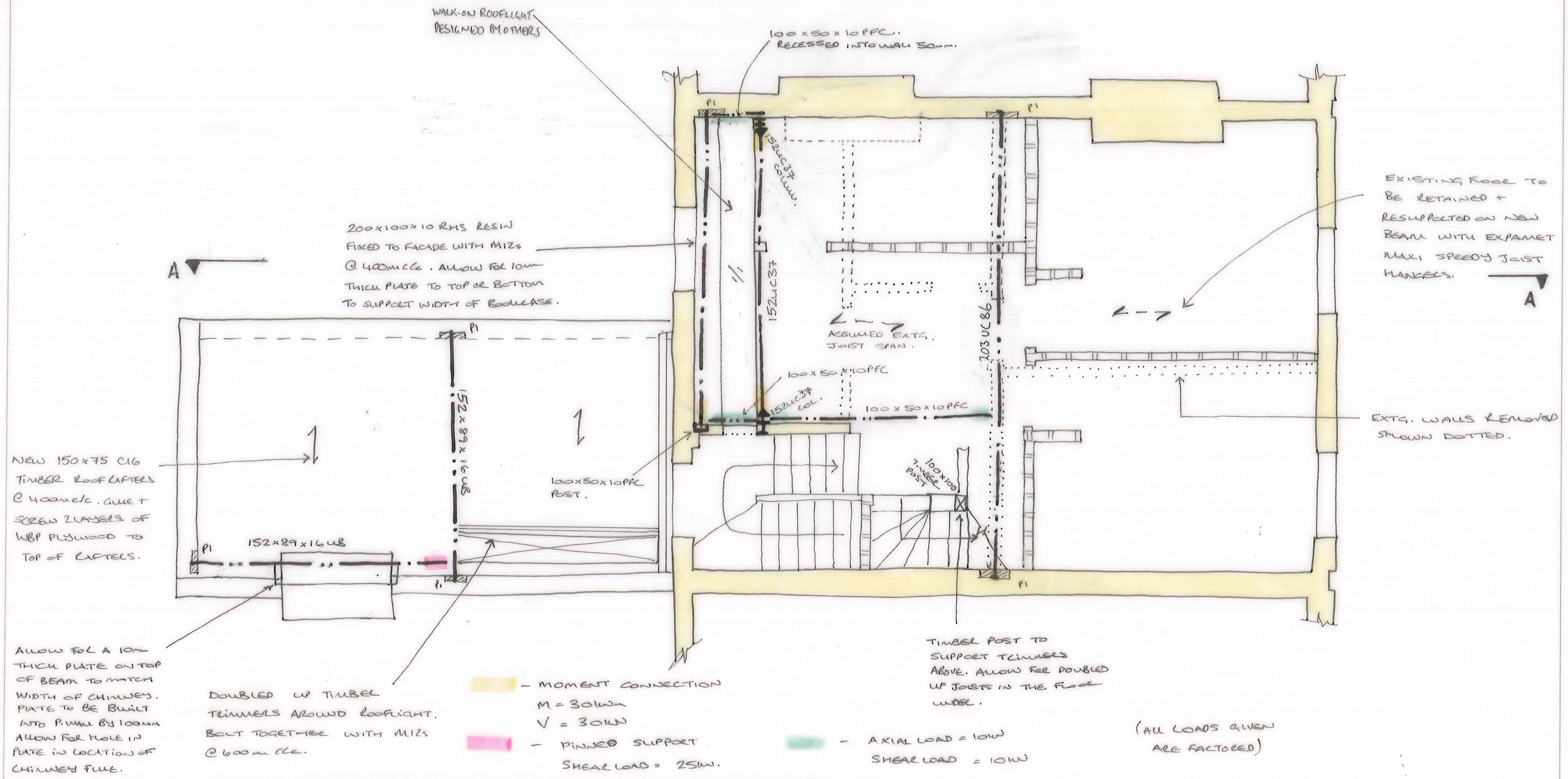
Wimbledon • Central London • Nottingham
Consulting Structural and Civil Engineers
tel: (020) 8544 0033 info@elliottwood.co.uk www.elliottwood.co.uk

job title: **21 BOSCASTLE ROAD, NW5 1EE**

job no	drawing no	revision
2140872	S.03	C4



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P1... 770x100x300 HIGH MC PADSTONE.

- MOMENT CONNECTION

rev	date	by	chk	description

drawing title: PROPOSED SECOND FLOOR PLAN

scale(s): 1:50@A3 | date: 08.01.15 | drawn: SWa.

drawing status: CONSTRUCTION

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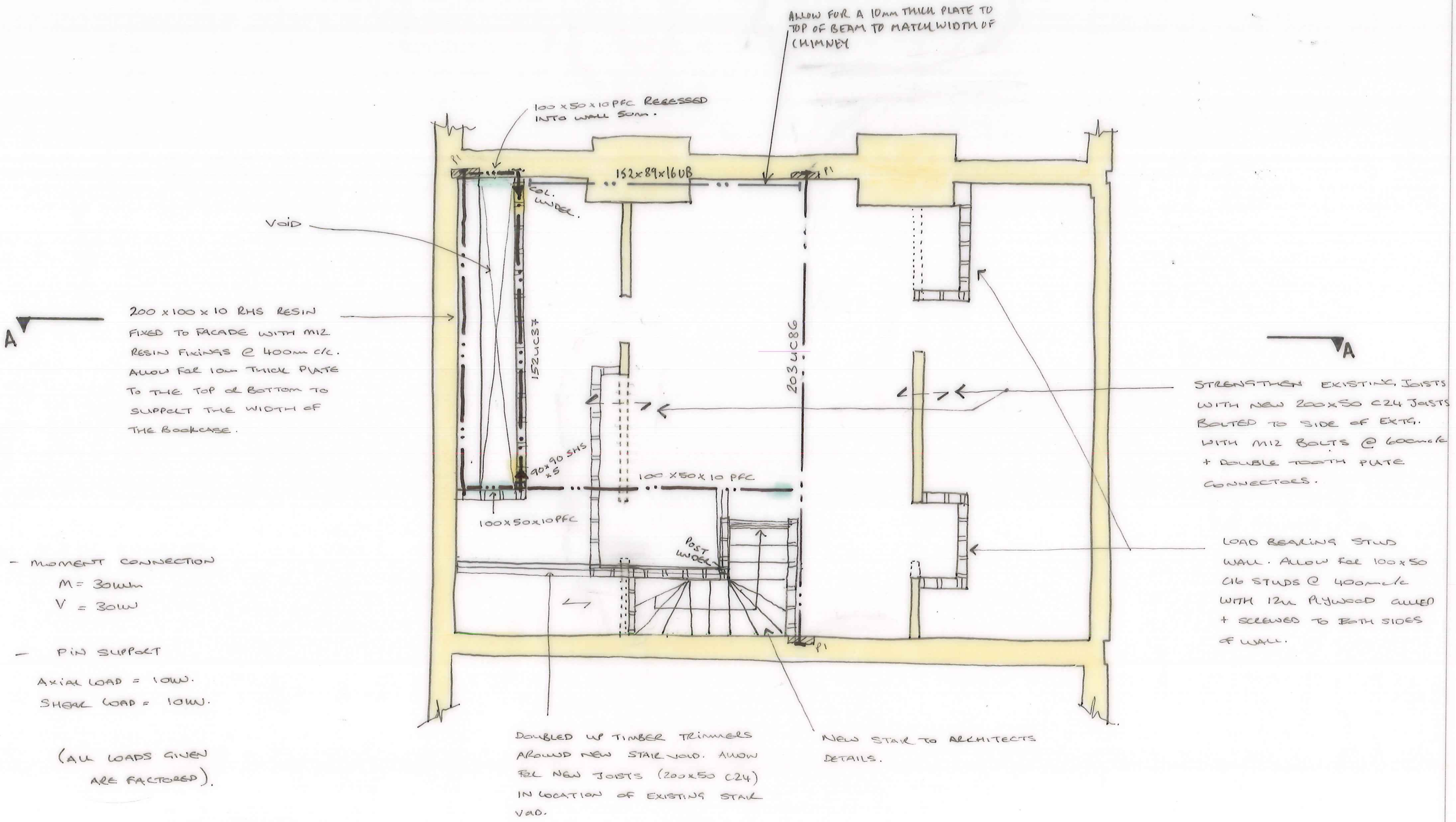
Elliott Wood Partnership LLP, 241 The Broadway, London SW19 1SD
Consulting Structural and Civil Engineers. www.elliottwood.co.uk
tel: (020) 8544 0033 fax: (020) 8544 0066 info@elliottwood.co.uk

job title: 21 BOSCASTLE ROAD, LONDON NW5 1EG

job no: 2140872 | drawing no: S.04 | revision: C4



- MOMENT CONNECTION
M = 30kNm
V = 30kN

- PIN SUPPORT
AXIAL LOAD = 10kN.
SHEAR LOAD = 10kN.

(ALL LOADS GIVEN ARE FACTORED).

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Do not scale from this drawing.

P1... 770 x 100 x 300 HIGH MC PADSTONE.

▶ MOMENT CONNECTION.

rev	date	by	chk	description

drawing title
PROPOSED THIRD FLOOR PLAN

scale(s)	date	drawn
1:50@A3	12.01.15	SWR

drawing status
CONSTRUCTION

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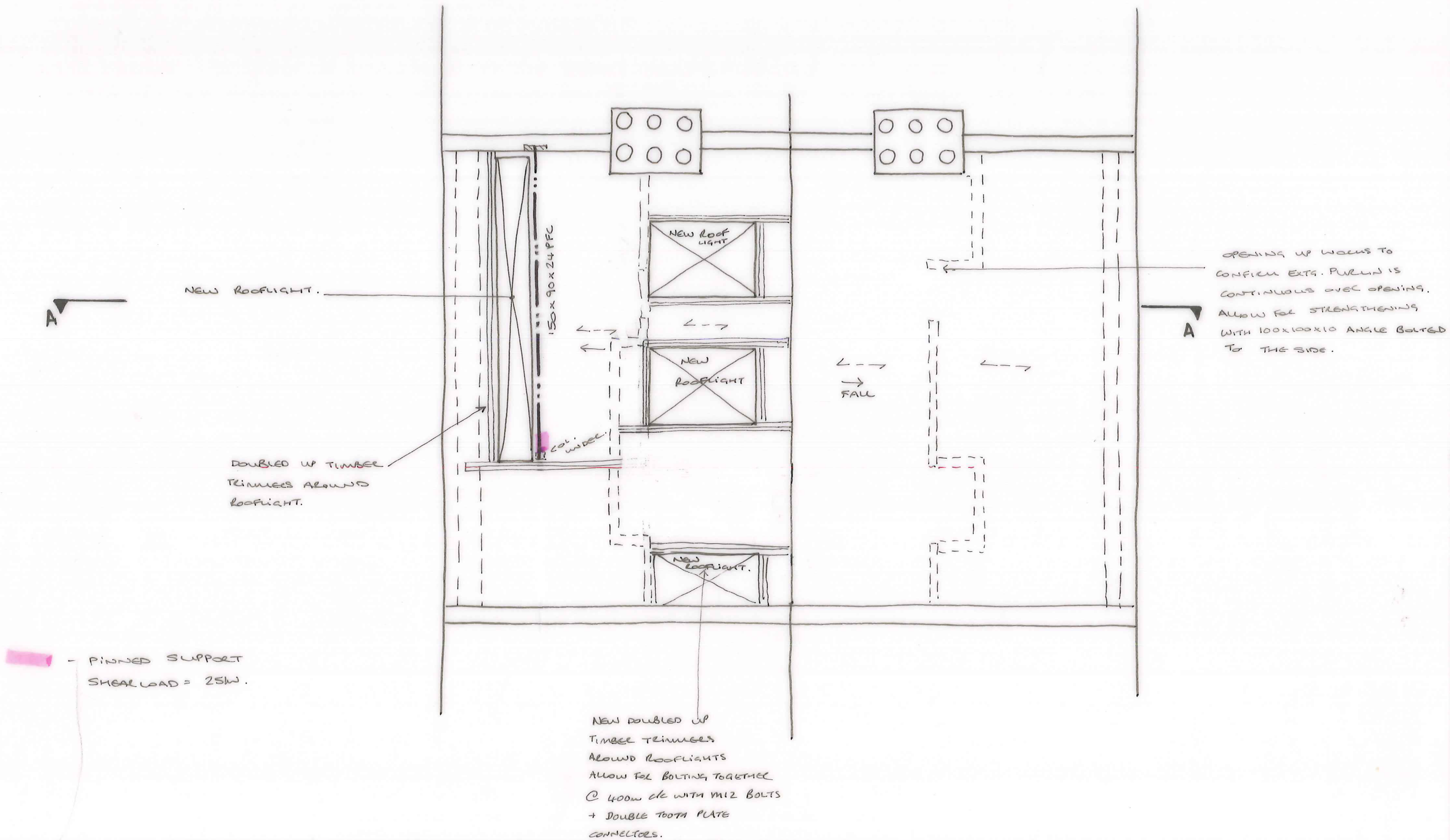
Elliott Wood Partnership LLP, 241 The Broadway, London SW19 1SD
Consulting Structural and Civil Engineers. www.elliottwood.co.uk
tel: (020) 8544 0033 fax: (020) 8544 0066 info@elliottwood.co.uk

job title
21 BOSCASTLE ROAD, LONDON, NW5 1EG

job no	drawing no	revision
2140872	S.05	C3



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Do not scale from this drawing.

rev	date	by	chk	description

drawing title: PROPOSED ROOF PLAN

scale(s)	date	drawn
1:50 @A3	14.01.15	SWG.

drawing status: CONSTRUCTION

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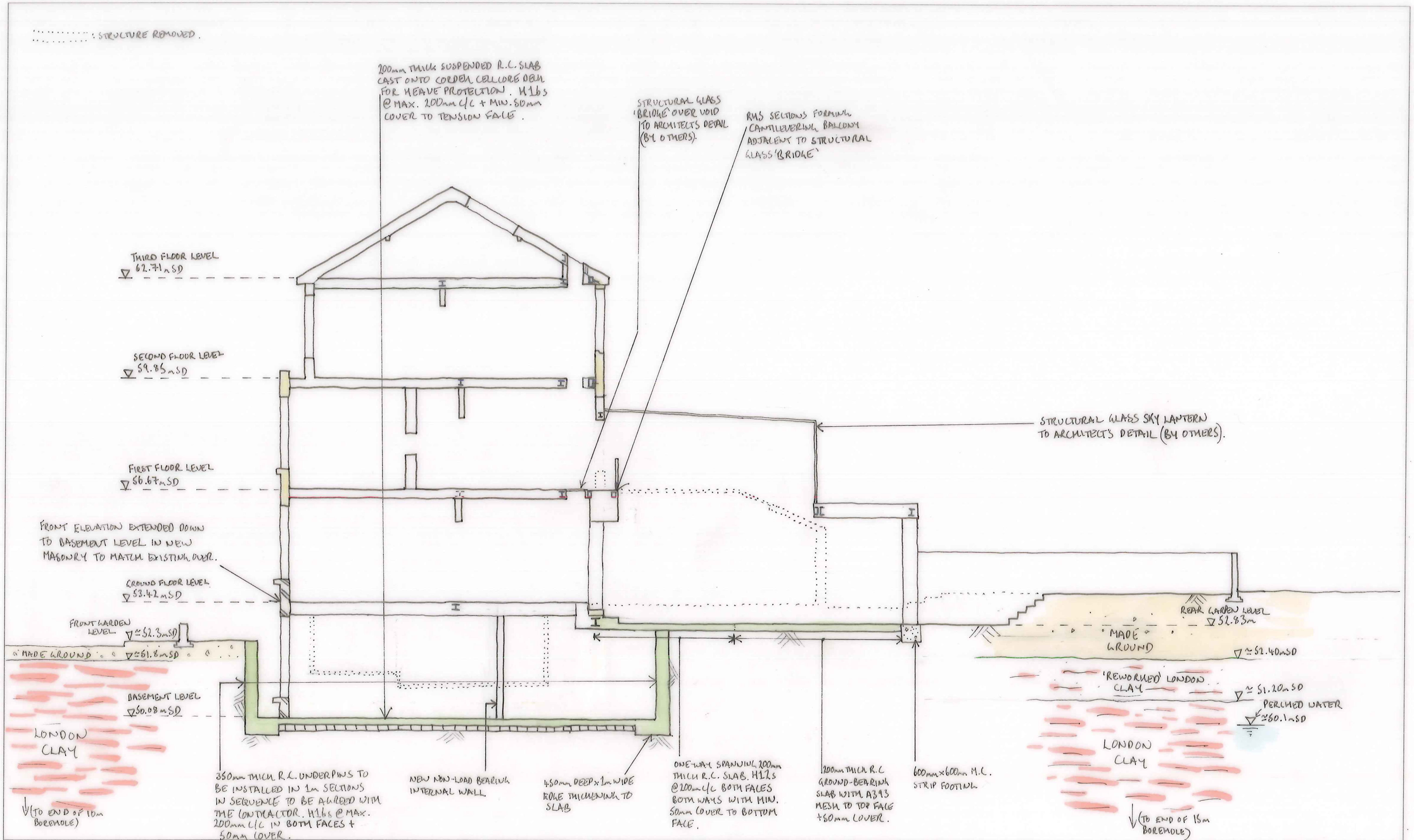
Elliott Wood Partnership LLP, 241 The Broadway, London SW19 1SD
Consulting Structural and Civil Engineers. www.elliottwood.co.uk
tel: (020) 8544 0033 fax: (020) 8544 0066 info@elliottwood.co.uk

job title: 21 BOSCASTLE ROAD, LONDON, NW5 1EG

job no	drawing no	revision
2140872	S.06	C3



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

Do not scale from this drawing.

rev	date	by	chk	description

drawing title
PROPOSED SECTION A-A

scale(s) 1:100@A3 | date DEC'15 | drawn Ella

drawing status PRELIMINARY

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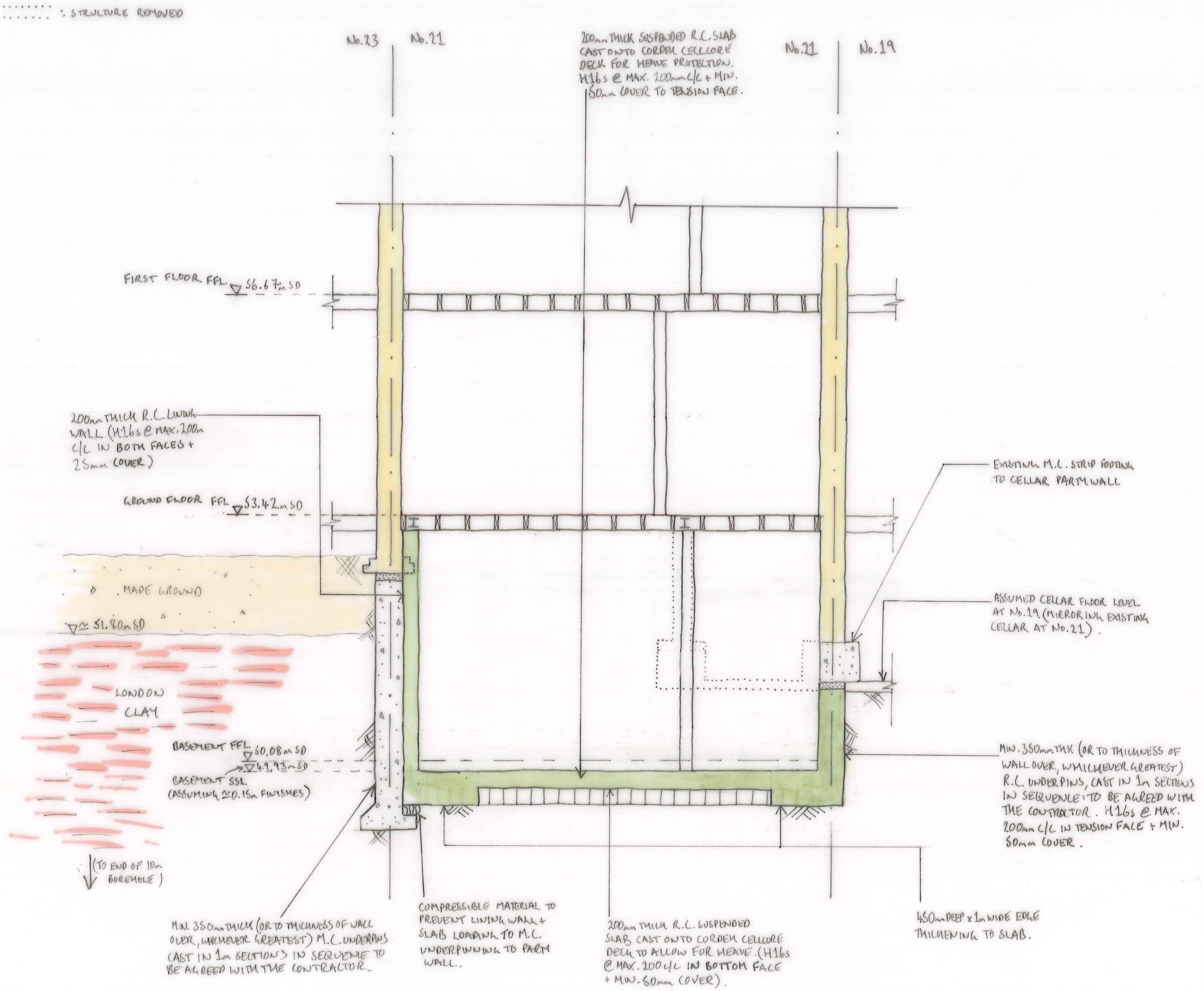
Wimbledon • Central London • Nottingham
Consulting Structural and Civil Engineers
tel: (020) 8544 0033 info@elliottwood.co.uk www.elliottwood.co.uk

job title
21 BOSCASTLE ROAD, NW5 1EE

job no	drawing no	revision
2140872	S.50	P1



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

Do not scale from this drawing.

rev	date	by	chk	description

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tel: (020) 8544 0033 fax: (020) 8544 0066 info@elliottwood.co.uk

job title
21 BOSCASTLE ROAD, NW5 1EE

drawing title
PROPOSED SECTION B-B

scale(s) 1:50@A3
date DEC '15
drawn EDA

drawing status
PRELIMINARY

job no 2140872
drawing no S.51
revision P1