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BASEMENT IMPACT ASSESSMENT

20A FERNCROFT AVENUE

LONDON

NW3 7PH

CLIENT: Mr Elliot Graff
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London, NW3 7PH

JOB NO: P19-461

DATE: 12th December 2019 – Rev 0

Revision History

Revision	Date	Author	Checked	Notes

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EXECUTIVE SUMMARY

The Basement Impact Assessment (BIA) is prepared in accordance with London Borough of Camden's Local Plan 2017, Camden Local Planning Policy A5 Basements, Camden Planning Guidance Basements March 2018, London Borough of Camden SFRA URS July 2014 and London Borough of Camden, Camden Geological, Hydrogeological and Hydrological Study.

The Basement Impact Assessment is separated into six sections covering 1.0 Introduction, 2.0 Structural Appraisal, 3.0 Hydrogeological Review, 4.0 Drainage and Surface Water Flow Appraisal 5.0 Flood Risk Assessment and 6.0 Conclusions.

The Introduction provides the screening aspect with Figures 1, 2 and 3 noting Yes or No if the basement is likely to have any effect on the surrounding area and referenced to each of the relevant sections 2.0, 3.0, 4.0 and 5.0, within which are provided the scoping and details of potential impact and any mitigation measures with Recommendations and Conclusions within section 6.0.

A topographic survey is available and Simpson Associates have also undertaking works on similar sites in the area. The trial hole and soil investigation and ground water monitoring from this site and nearby sites were reviewed against the site requirements along with local BGS borehole records. These provide the necessary site specific data to undertake the Basement Impact Assessment and to allow for the detailed design to be undertaken following Planning Approval.

The type of construction for forming the new basement in the temporary and permanent stages has been reviewed with an outline methodology included to demonstrate feasibility.

Existing site material is being recycled and utilised within the new construction with demolition material to be used as hard-core and bricks salvaged for re-use to assist in the construction process. Existing top soil will be retained and reused.

The BIA concludes that the proposed basement works may be carried out safely and without adverse effect on the adjacent structures, local hydrogeology and surface water flow or increase local flooding risk. The risks noted within the BIA, even though they are only slight, can be further mitigated by diligent detailed design and implementation to include the installation of additional surface water drainage, careful detailed installation of temporary works, a suitable on site monitoring procedure and use of experienced contractors and an experienced design consultant team.

1.0 INTRODUCTION

1.1 This Basement Impact Assessment has been prepared by Simpson Associates as requested by Trace Architects as part of the Planning Application for the proposed refurbishment of 20A Ferncroft Avenue.

1.2 The information contained within this Basement Impact Assessment (BIA) is prepared in accordance with London Borough of Camden's Local Plan 2017, Camden Local Planning Policy A5 Basements, Camden Planning Guidance Basements March 2018, London Borough of Camden SFRA URS July 2014 and London Borough of Camden, Camden Geological, Hydrogeological and Hydrological Study.

1.3 The BIA report is authored by Chris Martin who is qualified as MEng, CEng, MIStructE. The attached GCG Hydrogeological Assessment is reviewed by J. A. Davis who is qualified as EuroGeol, CGeol, BSC, MSc, DIC, FGS The GCG Ground Movement Impact Assessment is authored by Dr Apollonia Gasparre who is qualified as Dott Ing, PhD, DIC, CEng, MICE.

1.4 The purpose of this Basement Impact Assessment document is to review and outline the key points for the safe construction of the proposed refurbishment of 20A Ferncroft Avenue.

1.5 It also sets out how the refurbishment of the ground floor and construction of the basement will be achieved and how the neighbouring buildings and the local environment and amenity will be protected.

1.6 The topics covered within the BIA are Structural Stability and Movement Assessment, Method of Construction, Hydrogeological, Drainage & Surface Water Flow, Flood Risk and Phased Construction forming part of the Temporary Works during basement construction.

1.7 We have visited site on a number of occasions to review feasibility of the proposed works, undertaken trial holes and opening up work to the existing building, a site walk around the surrounding area and undertaken desktop reviews of information by third parties.

1.8 This BIA document is not the final design information but is intended to demonstrate that each of the aspects of the design and construction has been carefully considered. All aspects will be subject to detailed design once Planning Approval is granted.

1.9 The existing property is on the east end of a semi-detached single residential building over three floors located on the north side of Ferncroft Avenue approximately midway between Platts Lane and Hollycroft Avenue (refer to Appendix A).

1.10 The site slopes from north to south by 3m. The property is located towards the front of the plot setback 8m from Ferncroft Avenue with a garden that extends 20m behind the existing rear of the building (refer to Appendix A, B & C).

1.11 The site is 45.3m long and 6m wide being rectangular in shape and orientated approximately South-West to North-East. The nearest adjoining properties are 20 Ferncroft Avenue to the North-West boundary and 22 Ferncroft Avenue to the South-East boundary. Number 20 is part of the semi-detached and adjoined to 20A. Number 22 is detached (refer to Appendix A, B & C).

1.12 The proposed alterations include extending the ground floor 3.7m behind the existing building and construction of a basement below the building foot print with light well to the front (refer to Appendix B).

1.13 The floor levels taken from the topo survey drawings confirm the existing ground floor is approximately 50.9m at the front stepping up to approximately 51.5m at the rear of the property. The external level at the front, back of pavement, is approximately 49.9m and the rear garden level is approximately 52.5m and steps up to 53.0m at the rear garden terrace (refer to Appendix C).

1.14 The proposed works will involve forming a new basement under the whole property with a small front light well and a small extension beyond the rear of the building into the garden. The proposed basement involves underpinning of existing building walls and party wall to number 20 Ferncroft Avenue. The proposed scheme also includes a small rear extension at ground floor, removal of existing walls at ground floor and installing new support steels (refer to Appendix D & E).

1.15 The basement and underpinning works will be installed in an agreed sequence of construction as works proceed and as the ground is excavated to basement formation level 47.850 (refer to Appendix D & E).

1.16 The following screening stages in Figures 3, 4, and 5 taken from CPG4 are reviewed to see the effect of the basement works on the surrounding area and the relevant scoping stages are noted in the adjacent contents items referenced to within this BIA report, which then outlines any possible impacts and any mitigation necessary to reduce the impact of the basement on the surrounding area.

1.17 Figure 3 - Subterranean (ground water) flow screening chart

Q 1a: Is the site located directly above an aquifer?	Yes	See Content 3.0, 4.0, 5.0
Q 1b: Will the proposed basement extend beneath the water table surface?	Yes	See Content 2.0, 3.0, 4.0
Q 2: Is the site within 100m of a watercourse, well (used/disused) or potential spring line?	No	See Content 3.0,
Q 3: Is the site within the catchment of the pond chains on Hampstead Heath?	No	See Content 3.0
Q 4: Will the proposed basement development result in a change in the proportion of hard surfaced/paved areas?	No	See Content 4.0
Q 5: As part of the site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?	No	See Content 4.0
Q6: Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to, or lower than, the mean water level in any local pond (not just the pond chains on Hampstead Heath) or spring line.	No	See Content 2.0, 3.0, 4.0

Figure 4 - Slope stability screening chart

Q 1: Does the existing site include slopes, natural or manmade, greater than 7° ? (approximately 1 in 8)	No	See Content 2.0, 3.0
Q 2: Will the proposed re-profiling of landscaping at site change slopes at the property boundary to more than 7° ? (approximately 1 in 8)	No	See Content 2.0, 3.0
Q 3: Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7° ? (approximately 1 in 8)	No	See Content 2.0, 3.0
Q 4: Is the site within a wider hillside setting in which the general slope is greater than 7° ? (approximately 1 in 8)	No	See Content 2.0, 3.0
Q 5: Is the London Clay the shallowest strata at the site?	No	See Content 2.0, 3.0,
Q 6: Will any tree/s be felled as part of the proposed development and/or are any works proposed within any tree zones where trees are to be retained?	Yes	See Appendix P
Q 7: Is there a history of seasonal shrink-swell subsidence in the local area, and/or evidence of such effects at the site?	No	See Content 2.0
Q 8: Is the site within 100m of a watercourse or a potential spring line?	No	See Content 3.0, 4.0
Q 9: Is the site within an area of previously worked ground?	No	See Content 2.0, 3.0
Q 10: Is the site within an aquifer? If so, will the proposed basement extend beneath the water table such that dewatering may be required during construction?	Yes	See Content 3.0, 4.0
Q 11: Is the site within 50m of the Hampstead Heath ponds?	No	See Content 3.0
Q12: Is the site within 5m of a highway or pedestrian right of way?	No	See Content 2.0
Q 13: Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	Yes	See Content 2.0
Q 14: Is the site over (or with the exclusion zone of) any tunnels e.g. railway lines?	No	See Content 2.0

Figure 5 - Surface flow and flooding screening chart

Q 1: Is the site within the catchment of the pond chain on Hampstead Heath?	No	See Content 3.0, 5.0
Q 2: As part of the proposed site drainage, will surface water flows (e.g. volume of rainfall and peak run-off) be materially changed from the existing route?	No	See Content 3.0 4.0
Q 3: Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?	No	See Content 4.0
Q 4: Will the proposed basement result in changes to the profile of the inflows (instantaneous and long-term) of surface water being received by adjacent properties or downstream watercourses?	No	See Content 2.0, 3.0, 4.0, 5.0
Q 5: Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	No	See Content 3.0, 4.0, 5.0
Q 6: Is the site in an area identified to have surface water flood risk according to either the Local Flood Risk Management Strategy of the Strategic Flood Risk Assessment or is it at risk from flooding, for example because the proposed basement is below the static water level of nearby surface water feature?	No	See Content 3.0, 4.0, 5.0

1.18 The Client will appoint a Project Manager to oversee the nominated building contractor and will liaise with London Borough of Camden and local residents to ensure the impact of the proposals are fully understood and mitigated as far as possible.

1.19 Safety both on site and adjacent to the site is of paramount importance and the method of construction proposed has taken this into account.

1.20 Simpson Associates are retained as consulting civil and structural engineers for the project. The company was formed in 1955 and is a private company wholly owned by the directors. Our expertise covers all building types and we have particular experience of working in Central London locations where sites have tight urban constraints.

2.0 STRUCTURAL APPRAISAL

2.1 A review of how best to construct the basement taking into account the existing brick walls and footings exposed from the site investigation works was undertaken and it was concluded that the most efficient form of construction would be a five bay phased sequence of underpinning to the perimeter, with the construction of the new ground floor slab using a "Pynford Beam" process to cast a new slab under the internal load bearing walls without temporary beams. This then forms the construction of a ground floor slab bracing the underpinned walls prior to the phased excavation of the basement to minimise any disturbance to the existing and surrounding buildings (refer to Appendix D & E).

2.2 The basement will be excavated using the front light well as a mole hole with the basement slab cast in sections to brace the bottom of the underpinned walls and form the permanent foundations with retaining walls to form watertight box (refer to Appendix D & E).

2.3 The process for installing each phased bay and remainder of works is as shown below and as shown on drawings P19-461 SK02-SK08 (refer to Appendix D & E).

2.4 SEQUENCE OF WORKS

- Install monitoring points on site and the surrounding area and take base readings.
- Contractor to review proposed underpinning and excavation sequence and supply full method statements to Project Engineer for approval.
- All excavation is to be undertaken from within the existing building envelope and site boundary.

Installation of Underpinning Bay Type One (for a five bay sequence repeated as Type One)

- Ground floor to be removed in sections to allow access to perimeter walls for underpinning.
- Mass concrete in underpinning legs shall be grade C20, 20mm maximum aggregate size, with a minimum cement ration of 275kg per meter cube and a free water/cement ratio of 0.65. Note that this specification is suitable for sulphate conditions up to class 2 (of B.R.E DIGEST 363).
- Underpinning pins shall be excavated in bays not exceeding 1m in length, concreted, and dry-packed up to the underside of existing footing before proceeding to the next leg in the sequence. The sequence of construction is as given on the plan; like numbered legs may be constructed simultaneously. Deviation from the stipulated sequence or configuration of legs may be permitted at the discretion of the engineer, but under no circumstances shall the unsupported length of the structure to be underpinned exceed 20%, ie not more than 1 bay in 5 bays to be unsupported at any one time.
- The concrete in underpinning legs shall be placed immediately after the excavation is complete and has been approved by the Engineer and local authority building inspector. If

delay is anticipated, the excavation shall be blinded to protect the bottom and prop the underside of the existing footing, or a further 150mm layer removed immediately prior to concreting.

- The underside of the existing footing shall be thoroughly cleaned and if irregular carefully trimmed to create an essential flat and horizontal surface that will not impede the placement of dry pack mortar.
- Care is to be taken to avoid water lying in the foundations.
- Concrete shall be placed employing a shutter or other means to avoid segregation of the mix, and vibrated to ensure proper compaction. Shuttering shall be provided, as required, to restrict overspill into access excavation.
- 75mm thickness dry packing shall be carried out not earlier than 24 hours after casting the leg. Dry pack mortar (1:3 sulphate-resisting Portland cement/sharp sand, mixed with sufficient water to produce 'earth damp' consistency) shall be rammed in so as to completely fill the void with dense, compact material.
- Allow 24 hours minimum between concreting & dry-packing over.
- Allow 24 hours minimum between dry-packing and excavation of the next pin in the sequence.
- Joint faces between pours to be cast shuttered with 75mm shear key or cast against previous cast surface after removal of any soil and laitance.
- Backfilling of excess excavation to be either lean-mix concrete (nominally 15:1 all-in aggregate to ordinary Portland cement) or selected fill.
- Backfilling of pin working space to be by using selected granular fill (which may include as-dug material), taking care to compact it in layers not exceeding 200mm in thickness. In all other situations lean-mix concrete shall be used, unless specific directions are given otherwise.
- Care shall be taken to avoid damage to service connections to the building, gas, water and electrical mains shall be properly supported and protected when exposed, and re-buried or sleeved in accordance with the requirements of the relevant statutory authority. Drainage connection shall be similarly protected to avoid damage, but where temporary disconnection is unavoidable this must be by arrangement with the Contract Administrator. In any event reconnection of services should be made at the end of each working day.
- All works to be overseen at all times by competent staff and signed-off by the contractor's temporary works coordinator.
- The drawing shows a suggested sequence which the Contractor is to follow or submit a revised sequence to the Engineer in good time to allow for comment and/or approval.

<u>Installation of “Pynford Beam” type temporary support and ground floor slab</u>

- Form 250mm wide by 350mm deep holes in internal walls as shown on drawing P19-461 SK02 & SK14. The bottom of the holes to be set at the proposed slab soffit level.
- Install sacrificial steel stools, 1No per hole. Stools to be grouted in place and left to cure.
- 350mm deep slots to be formed through internal walls between stools.
- When perimeter underpinning has been completed ground floor ground level to be reduced to slab soffit level or if underfloor void is present formwork is to be installed to slab soffit.
- Perimeter slots to be formed in all external load bearing walls to provide key into existing masonry.
- Slab reinforcement to be installed with reinforcement laid through slots in internal walls and into perimeter wall keys.
- Slab to be cast.
- 50mm gap between top of slab and bottom of wall to be grouted.

Installation of Basement slab and walls

- The front light well area is to be used as mole hole for installing the basement slab and retaining walls.
- Install and cast light well slab and RC walls (Bay 1).
- Excavate 3m into basement to formation level for Bay 2, install below ground drainage pipework, install 50mm concrete blind, install waterproof membrane and cast RC slab with 150mm high kicker to internal RC walls, install RC walls tied into ground floor slab (Bay 2).
- Allow 48 hours after casting Bay 2 and repeat for bays 3 to 7.

2.5 To the North-West Boundary, 20 Ferncroft Avenue is a 3 storey adjoining semi-detached property 12m wide by 16mm deep set back 9m from Ferncroft Avenue of solid masonry construction with timber floors and timber roof. The main house ground floor is raised above no. 20A (refer to Appendix A, E & F).

2.6 To the South-East Boundary, 22 Ferncroft Avenue is a 3 storey plus basement detached property 11m wide by 18m deep set back 9m from Ferncroft Avenue, of solid masonry construction with timber floors and timber roof. The main house ground floor is raised above no. 20A and is presumed to be a similar age. There is a 3.5m wide passage with a garage to the rear along the boundary with no. 20A (refer to Appendix A, E & F).

2.7 The nearest TfL or Network Rail tunnels are the Northern Line approximately 885m away to the East of the site and Network Rail lines 1.2km to the west of site. Neither will be affected by the works as shown on P19-461 SK09 (refer to Appendix G).

2.8 The Utilities in the public pavement along Ferncroft Avenue will not be affected by the works as they are set back from the basement 9m and the front light well 7.2m and are outside the zone of influence of the proposed works. The only utilities on site are those that serve the existing building and these will be dealt with as part of the works, maintained as necessary as part of the contractor site setup, temporarily capped and or diverting as required.

2.9 All properties that are adjacent to the proposed development will fall within The Party Wall Act 1996 which will require building condition surveys to be undertaken.

2.10 As part of the design and to control ground movement, a scheme will be agreed as part of the Party Wall Agreements to install a movement monitoring system to monitor movement during the course of the basement floor works. This will involve the location of monitoring nodes to be located along the surrounding ground, on the retained garden walls, on the existing building front and rear facade and also on adjacent property walls, where allowed, as part of the Party Wall Agreements. Readings will be taken at regular intervals and additional readings undertaken when specific works are planned as shown on P19-461 SK10 (refer to Appendix H).

2.11 The design of the MC underpinning bays and basement RC slab and walls are to be installed in a numbered bay sequence to minimise any structural disturbance to the adjoining properties, existing building or infrastructure as shown on P19-461 SK08 (refer to Appendix E).

2.12 All the proposed works are minor and within the normal type of construction that any competent contractor can undertake. From our experience of similar works undertaken in the area movement can be limited to the existing building and adjoining properties as Very Slight, as categorised by Category of Damage Table (CIRIA C760) Table 1.1 below.

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

Table 1.1

2.13 The estimated movements inside and outside the lower ground floor are considered on basis of structural loads, preliminary calculations, soil investigation design parameter, site levels and are considered to be minimal.

2.14 Excavation depth on site will be approx. 2.9m to 3.4m to slab formation with the excavation undertaken in sequenced bay stages. Movement would be expected to be minimal and lie within its original position and with good workmanship these movements are unlikely to result in damage greater than category 1 – Very slight.

2.15 The existing footings of No.20 Ferncroft are expected to be similar to No.20A which is a smaller property, but the buildings are of similar construction design and layout and the external ground levels are similar. Underpinning depths are approximately 2.5m to existing walls and pins will be installed with toes to maintain existing bearing area as shown on P19-461 SK02 to SK07 & SK08 (refer to Appendix E & F).

2.16 Investigation works have been undertaken by Risk Management Limited in the form of 2no. Boreholes 10.0m and 5.0m deep and 2no. trial holes at front and rear to confirm existing foundations, soil type, retaining wall design parameter and ground water levels monitored. The boreholes and trial holes confirm on site ground conditions and are approximately 600-700mm of made ground over London Clay Claygate Member (refer to Appendix E & I).

2.17 The site investigation works were undertaken on 13th and 14th August 2019. Further ground water monitoring visits were made on 21st August, 5th September and 18th September 2019 (refer to Appendix I).

2.18 As part of the desktop review a search of Camden Planning Portal adjoining building information has been obtained and also a site investigation for no. 22 Ferncroft undertaken in 2013 which provides additional information on the surrounding site conditions (refer to Appendix F).

2.19 A review of Land Stability with reference to The London Borough of Camden Geological, Hydrogeological and Hydrological Study Maps with site location indicated and local topography show the site surrounding area is 2.8 degrees and not in a slope angle area greater than 7 degrees (refer to Appendix A & J).

2.20 The Ground Movement Impact Assessment undertaken by Geotechnical Consulting Group dated December 2019 confirms that the works can be undertaken with minimal disturbance to the surrounding area and that anticipated movement is within the design parameters with the damage category 1 (Very Slight) in accordance with the Damage Category Table (Ciria C760) (refer to Appendix K).

3.0 HYDROGEOLOGICAL REVIEW

3.1 The surrounding site levels have been reviewed across the site and are approximately 2 deg and along Ferncroft Avenue fall in a North-West direction and are in the order of 100.100 to 96.200 OD with an approx. 2.8 degree. The ground level from Hollycroft Avenue to Ferncroft Avenue falls in a South-West direction in the order of 104.100 to 101.00 with an approx. 2.15 deg (refer to Appendix A & K).

3.2 The geology of the area is well known as summarised on the relevant geological sheets, being London Clay Formation Claygate Member and confirmed by the site investigation boreholes and trial holes (refer to Appendix I & K).

3.3 The site is located within a Secondary A Aquifer (refer to Appendix J & K).

3.4 It is noted that approximately 200m away to the North-East boundary is a tributary of the old Westbourne River which has been culverted and is too far away to be affected by the proposed works (refer to Appendix J).

3.5 Risk Management Ltd confirm that when undertaking the two boreholes ground water was encountered within the boreholes BH01 5.5m deep and DIS2 4.5m deep. Risk Management Limited have undertaken three return monitoring visits on 21st August and 5th and 18th September with water within the two boreholes at depths of BH01 - 4.35m, 5.39m & 5.43m and DIS2 - 2.57m, 2.71m & 3.67m in May and 1.91 (refer to Appendix I).

3.6 The ground water levels encountered on site would confirm that the majority of the basement will be above the water level with a small section of the rear basement being below the water level. The difference in water levels is further reviewed within GCG Hydrogeological Impact Assessment and considered to be Perched Ground Water to the rear of the site within the low permeability shallower clay deposits (refer to Appendix E & K).

3.7 Some local dewater may be required at the rear of the site and it is proposed to install 2no. temporary de-water wells to the rear of the basement whilst works are being undertaken (refer to Appendix K).

3.8 It is proposed the extracted water will be pumped to the back of the garden to a temporary soakaway. Pumps installed will have no fines filters so as not to remove any fines and volume of water pumped would be considered to be low and not have any effect on the surrounding building or local environment. The design of the de-water wells will be undertaken and installed by a specialist company and monitored as works progress.

3.9 The existing building has a circular wine cellar, installed about 3m (48.575) below the ground floor near the rear of the building and when installed no ground water was encountered (refer to Appendix C & E).

3.10 No. 22 Ferncroft Avenue installed a basement in 2014 and undertook soil investigations with 2 boreholes and encountered similar water levels and undertook localised dewater (refer to Appendix F).

3.11 The Hydrogeological Impact Assessment undertaken by Geotechnical Consulting Group dated December 2019 confirms that the proposed works are not expected to have any adverse effects on the local hydrogeology (refer to Appendix K).

3.12 The London Borough of Camden Geological, Hydrogeological and Hydrological Study Maps and the Camden SFRA Maps have been reviewed with site location indicated (refer to Appendix J).

4.0 DRAINAGE AND SURFACE WATER FLOW APPRAISAL

4.1 The existing site area is 282m² consisting of 162m² of non-permeable hard standing and 120m² of permeable soft standing (refer to Appendix L).

4.2 The proposed site area is 282m² consisting of 161m² of non-permeable hard standing and 109m² of permeable soft standing plus 12 m² of Brown roof build up (refer to Appendix L).

4.3 The increase in building area is offset by the new brown roof and permeable paving to the rear which will discharge to a surface water infiltration tank located within the rear garden (refer to Appendix L).

4.4 The profile of surface water inflow to adjacent properties or water courses will not be materially changed.

4.5 The existing site drainage is a combined FW/SW system that runs from the rear of the site to the front of the building beneath the ground floor slab and discharges into the public sewer system in Ferncroft Avenue.

4.6 The new basement will require new foul and surface water drainage pipework below ground which will collect at a pumping chamber for initial storage and then discharge pumped to high level to the existing gravity fed system manhole at the front of the site. All existing drainage above ground floor will remain the same and will be gravity fed to the existing manhole. The pumping chamber will be twin pumped with alarm system and battery backup in the event of pump failure.

4.7 The reduced rear garden paved area will collect surface water at a channel gully and then discharge to a surface water infiltration tank within the rear garden (refer to Appendix L).

5.0 FLOOD RISK ASSESSMENT

5.1 Reference to the Environment Agency maps confirms that the site is not within a flood zone area and is not at risk of flooding from local rivers/water features and defines the area as having a very low risk of flooding due principally to its geology and topography.

5.2 Thames Water have been consulted and confirm that there are no known incidents of historic flooding within the vicinity of the site from surcharging of the public drain system (refer to Appendix M).

5.3 Review of the GOV.UK maps for flooding from rivers, surface water and reservoirs indicates the site is not in an area at risk from flooding (refer to Appendix M).

5.4 The Kidderpore Reservoir is located approximately 65m south of site, but is a below ground reservoir with an invert level of 93.690 OSD and is not at risk of affecting the site if breached (refer to Appendix A).

5.5 Review of London Borough of Camden's SFRA confirms the site is not within any critical drainage area and not at risk from surface water flood, elevated groundwater flooding or within 100mm of surface water bodies. The SuDS drainage potential map notes the site is probably compatible for Infiltration SuDS (refer to Appendix J).

5.6 The use of permeable paving maintains the existing surface water runoff condition on site and the brown roof area will reduce surface water runoff from site. The effect of this is to slightly reduce volume of site run off discharging into the main drainage system and reduce the effects of any possible flooding further downstream (refer to Appendix L).

5.7 The soil investigation works undertaken on site and GCG Hydrogeological Impact Assessment confirms the existing ground water level and on site ground water flow. This will be maintained with the installation of the brown roof and surface water infiltration tank in the rear garden (refer to Appendix K & L).

6.0 CONCLUSIONS

6.1 Analysis of the various aspects of construction has been undertaken to demonstrate how the level of sequencing will enable the development to be constructed safely with ground movements within acceptable levels.

6.2 The stability of the adjacent properties and surrounding ground will not be affected by the basement works with the influence of adjoining building foundation depths taken into account during the initial design process as indicated on Simpson drawings and calculations(refer to Appendix D, E and O).

6.3 Geotechnical Consulting Group (GCG) have reviewed the information within the Basement Impact Assessment and provided Ground Movement Impact Assessment (GMA) confirming that damage to adjoining neighbours as being Category 1 (Very Slight) and a Hydrogeological Impact Assessment confirming the proposed works are not expected to have any adverse effects on the local hydrogeology (refer to Appendix K).

6.4 Prior to commencement a full schedule of condition will be carried out to all relevant buildings as defined within The Party Wall Act 1996 where the excavations may be within the influence zone of existing foundations and proposed movement monitoring of site and the surrounding area agreed (refer to Appendix H).

6.5 The soil investigation works and ground water monitoring carried out to date indicates that the construction of the basement level will not lead to a cut off of natural ground water flow.

6.6 The construction underpinning and basement level slab will be founded deeper within the London Clay Formation Claygate Member as are the existing footings and is not envisaged as having a detrimental effect on the local or surrounding hydrogeological conditions.

6.7 There is a slight reduction in hard standing areas as shown on Simpson drawingthis will slightly reduce surface water flow into the existing drainage system for the surrounding area and reduce flooding further downstream (refer to Appendix L).

6.8 There will not be any increase in foul water flow from the site.

6.9 Safety both on site and adjacent to the site is of paramount importance and the method of construction proposed has taken this into account.

6.10 The selection of the main contractor, sub-contractor and designer of temporary works will be based on having previous experience constructing similar projects and a requirement to provide programmes and method statements detailing the final sequence of construction prior to carrying out works on site. The main contractor is to be registered with The Considerate Constructors Scheme.

6.11 One of the site requirements will be the selection of experienced site supervision staff and selection of plant and machinery based on minimising noise and vibration.

6.12 The project as currently envisaged is feasible in terms of the general construction process, structural stability, long term integrity of adjacent buildings and the existing site and surrounding infrastructure.

For and on behalf of

SIMPSON ASSOCIATES

CHRIS MARTIN
MEng, CEng, MIStruct

For and on behalf of

SIMPSON ASSOCIATES

GRAHAM BOSTON

Appendix A

SIMPSON P19_461_SK01_Site location plan and surrounding area.

DO NOT SCALE

MK	REVISION	BY	DATE
-	-	-	-

DRAWING STATUS

PLANNING

DRAWING TITLE

SITE LOCATION PLAN AND SURROUNDING AREA

PROJECT — Project Number - P19-461

20A FERNCROFT AVENUE,
LONDON,
NW3 7PH,

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Drawn	Ch'kd	Scales	Date
GB	Ch'kd	NTS	29.10.19

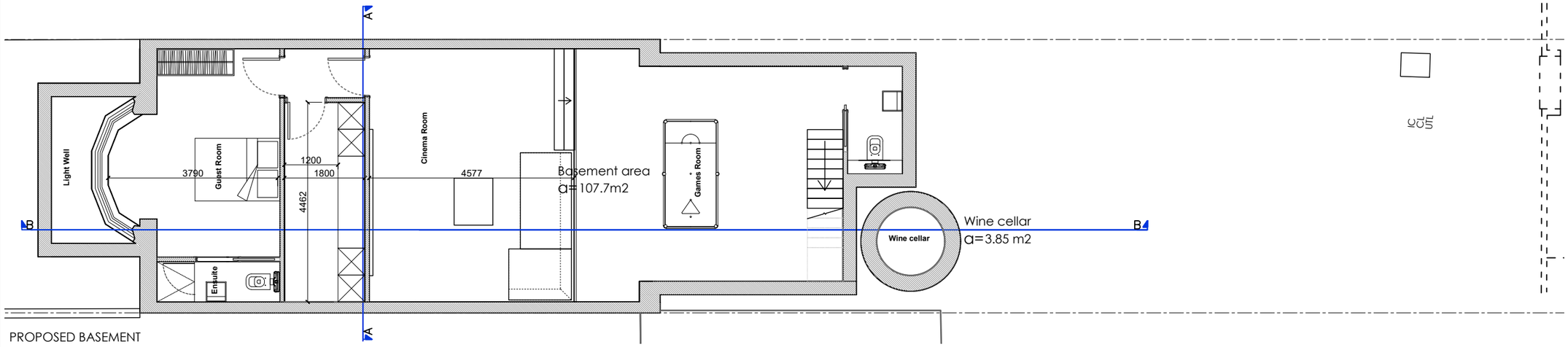
Purpose of Issue
BASEMENT IMPACT ASSESSMENT

Drawing Number	Revision
P19-461_SK01	-

A3

Appendix B

Architects drawings floor plans and sections.



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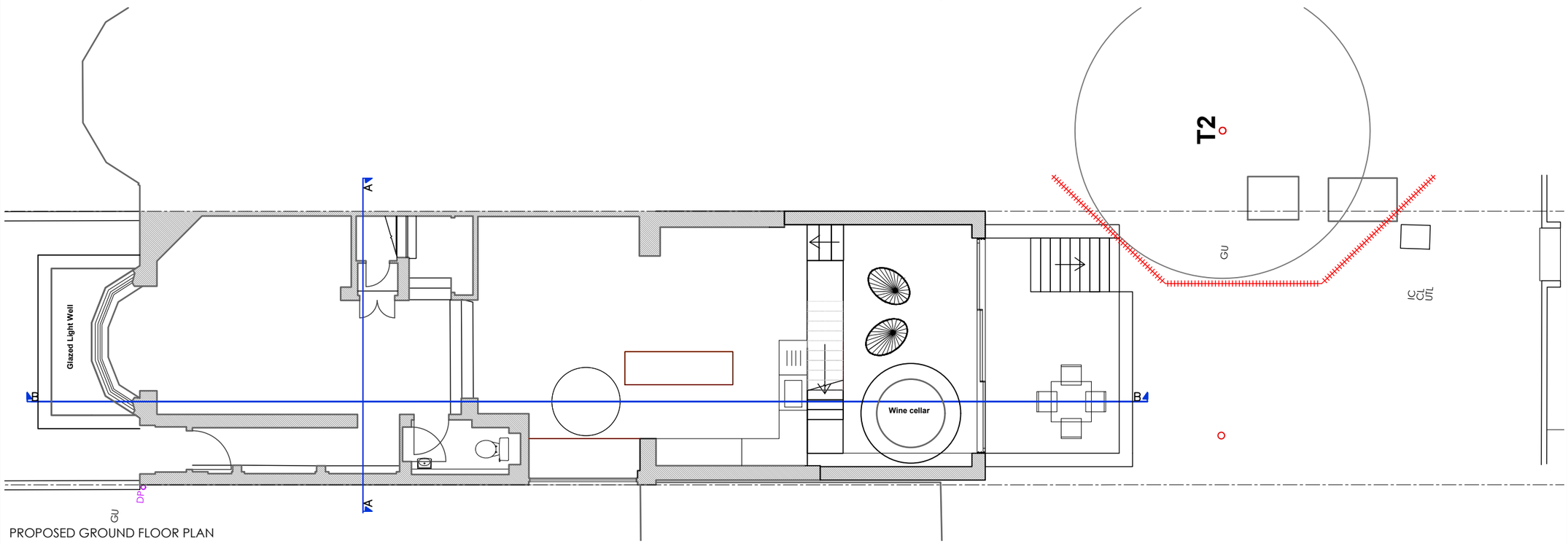
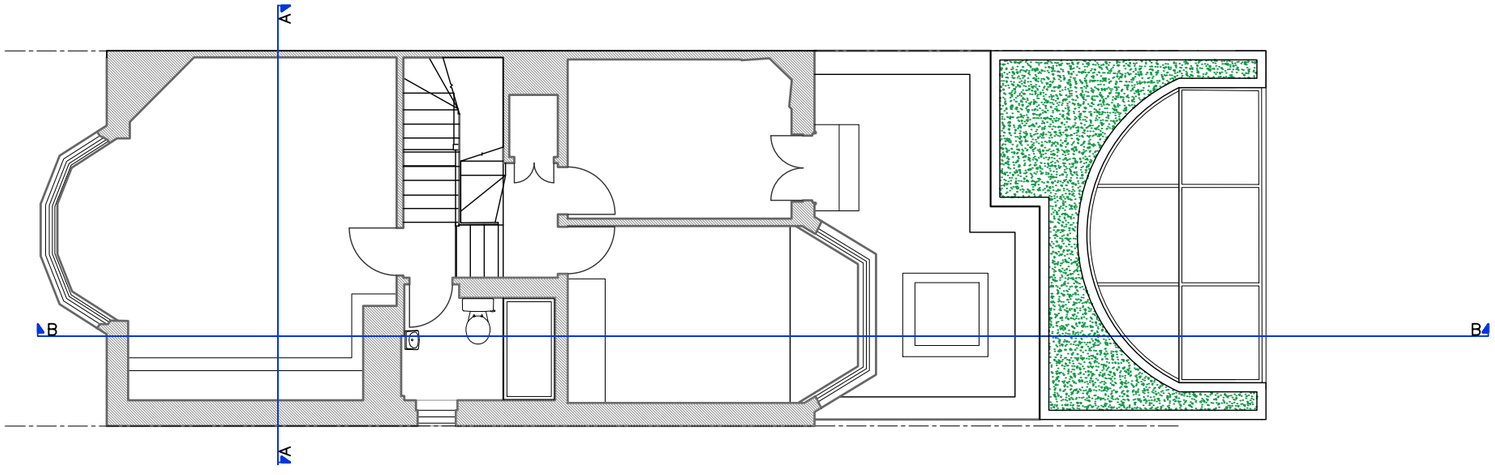


PROPOSED GROUND FLOOR PLAN



PROPOSED SECOND FLOOR/ SINGLE STOREY EXTENSION ROOF PLAN

N

0 5

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DATE	DEC 2019	CLIENT:
DRAWN	-	ELLIOT & ANNE-EVA
CHECKED	-	
SCALE@A3 SCALE@A1	1:100- A3 1:50 -A1	

BASEMENT PROPOSAL & REAR EXTENSION

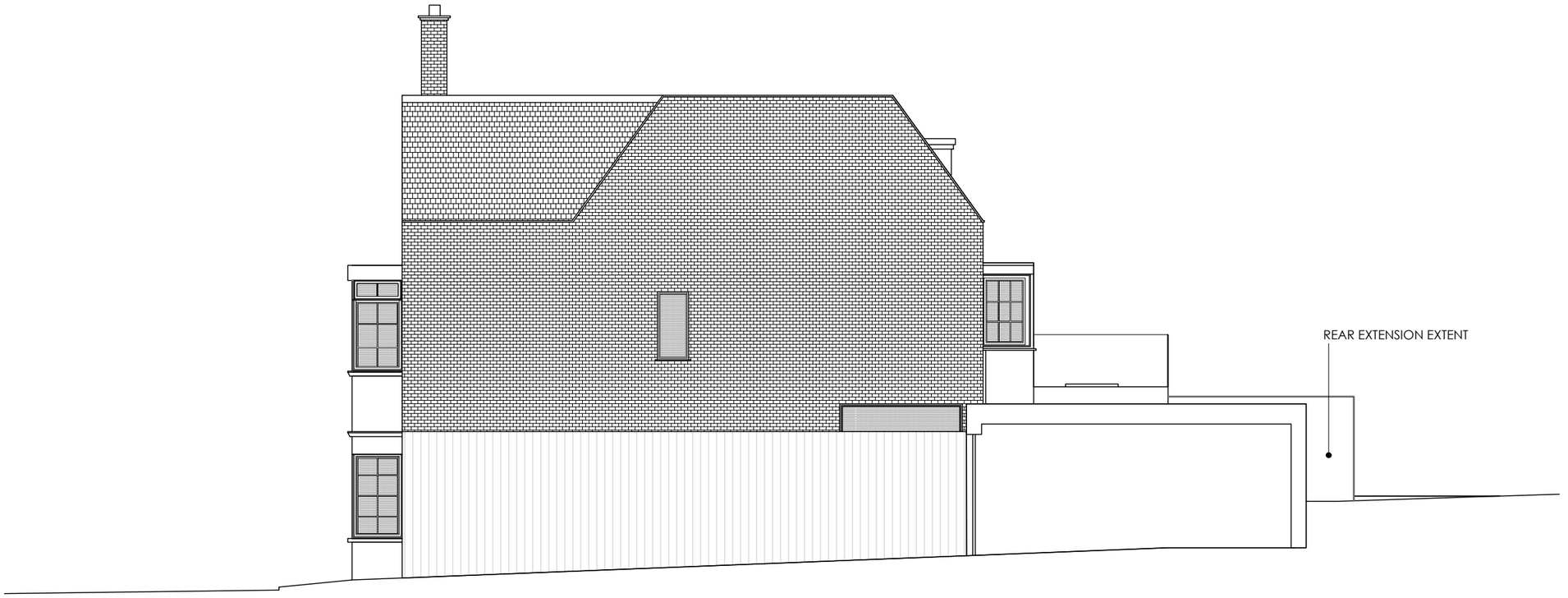
PROPOSED
PROPOSED PLANS

ADDRESS:

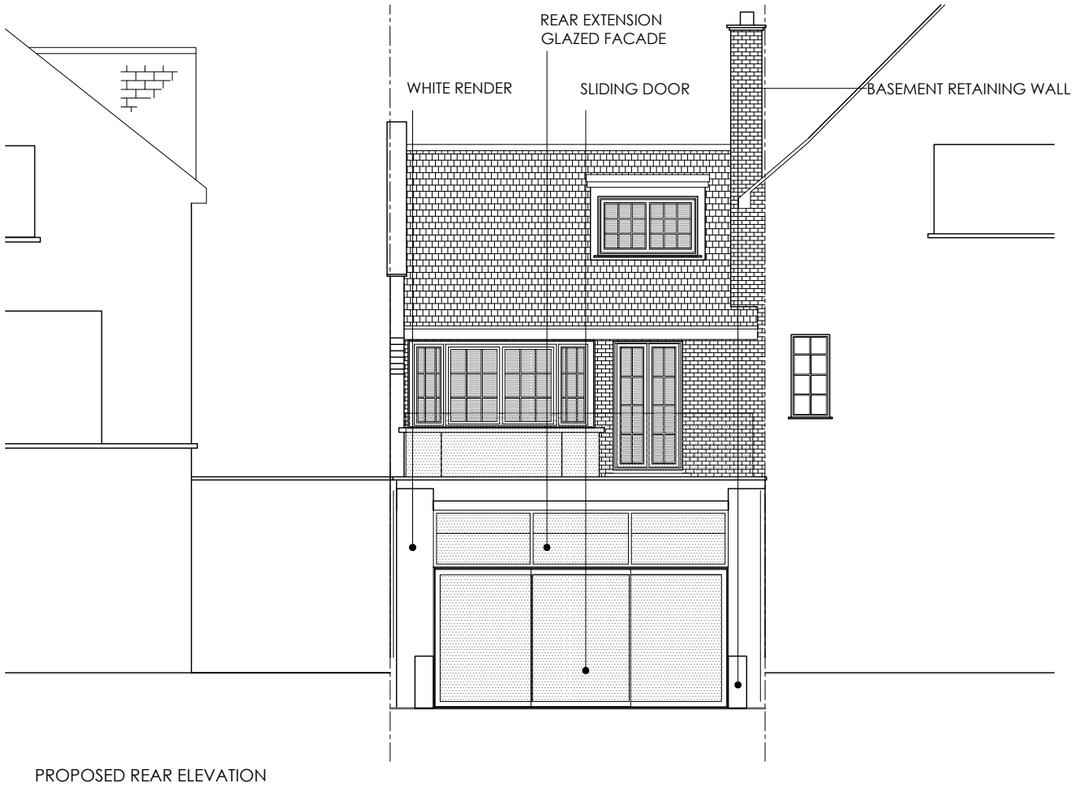
20a FERNCROFT AVENUE
LONDON, NW3 7PH

JOB No	DRAWING NUMBER
1053	PL05

A3 Sheet



PROPOSED SOUTH WEST SIDE ELEVATION



PROPOSED REAR ELEVATION

PROPOSED FRONT ELEVATION

0 5

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BASEMENT PROPOSAL & REAR EXTENSION

PROPOSED
PROPOSED ELEVATIONS

ADDRESS:

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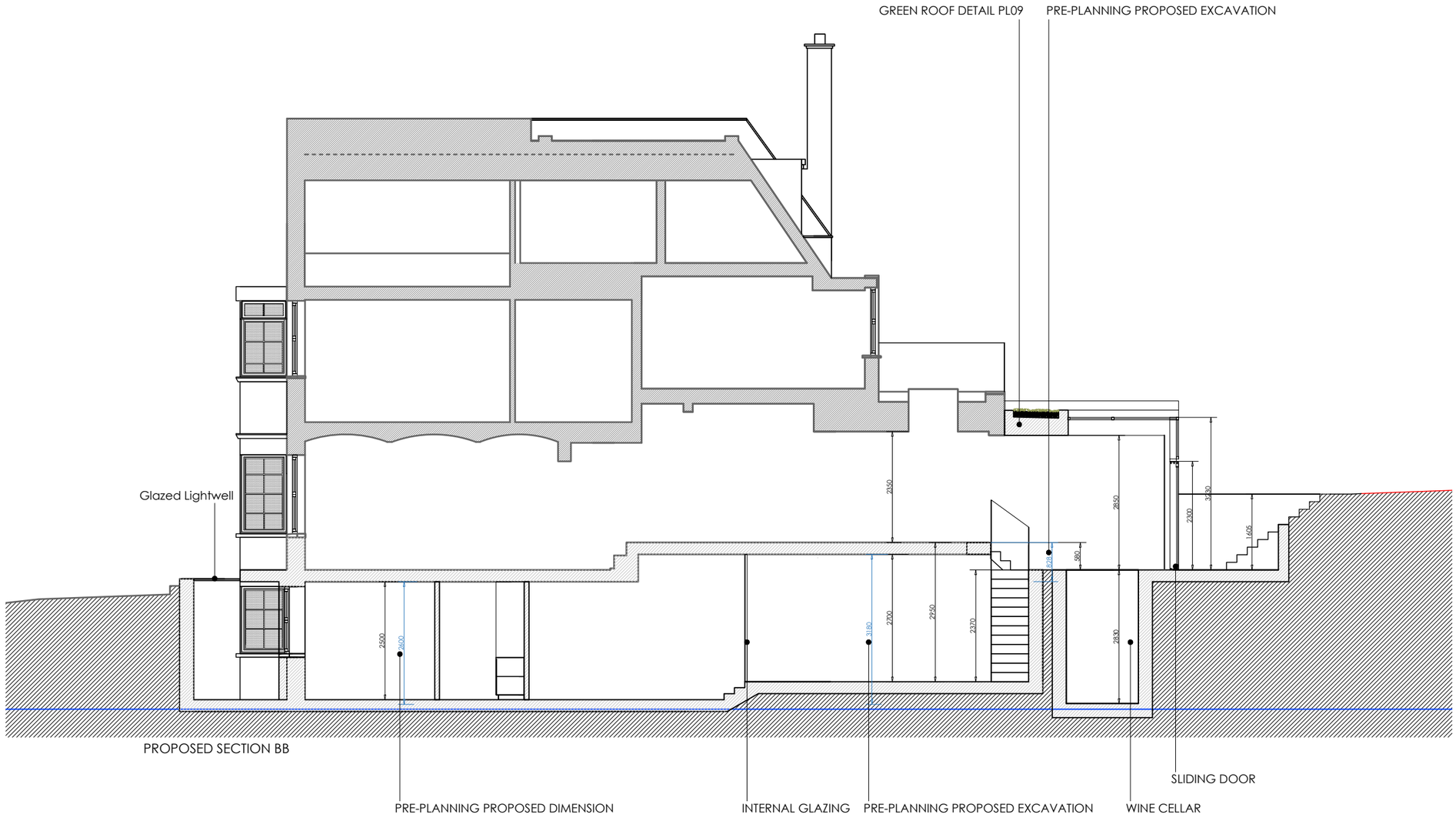
LONDON, NW3 7PH

JOB No	DRAWING NUMBER
1053	PL06

A3 Sheet



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SCALE@A3 SCALE@A1	1:100- A3 1:50 -A1	

BASEMENT PROPOSAL & REAR EXTENSION

PROPOSED
PROPOSED SECTIONS

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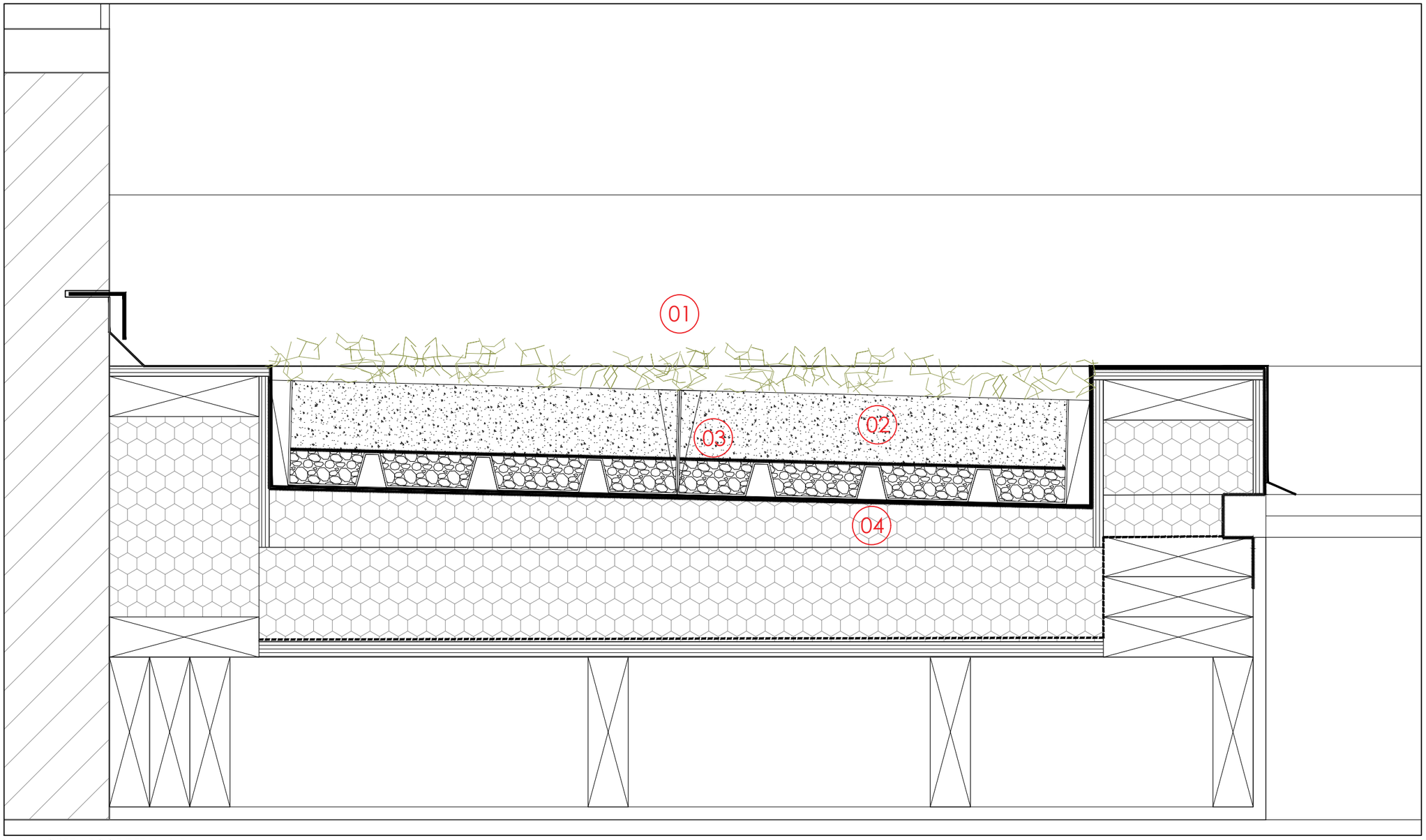
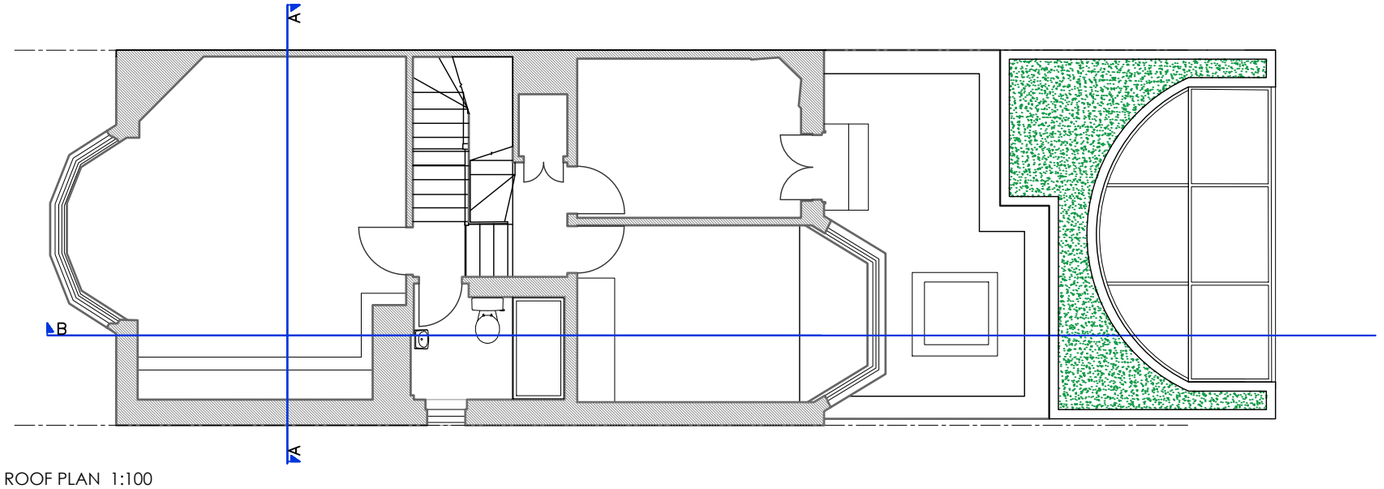
JOB No	DRAWING NUMBER
1053	PL07

A3 Sheet



SEDUM GREEN ROOF DETAIL 1:5



ROOF PLAN 1:100

01 SEDUM GREEN ROOF:
SEDUM VARIETY

02- GREEN ROOF SEDUM MODULAR TRAY
ON FILTER FLEECE.

03- DRAINAGE AND WATER STORAGE LAYER
PROTECTION LAYER & SEPARATION LAYER

04- WATERPROOF MEMBRANE

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SCALE@A3 SCALE@A1	As noted	

BASEMENT PROPOSAL & REAR EXTENSION

PROPOSED
SEDUM GREEN ROOF DETAIL

ADDRESS:
20a FERNCROFT AVENUE
LONDON, NW3 7PH

JOB No	DRAWING NUMBER
1053	PL09

A3 Sheet

Appendix C

Existing building site Topo, floor plans and sections

FERNCROFT AVENUE

990.000E
1000.000E
1010.000E
1020.000E
980.000N
970.000N
960.000N

TREE
GIRTH 0.70
SPRD 10.0

TREE
GIRTH 0.70
SPRD 10.0

49.15 49.95 49.79 49.41 50.09

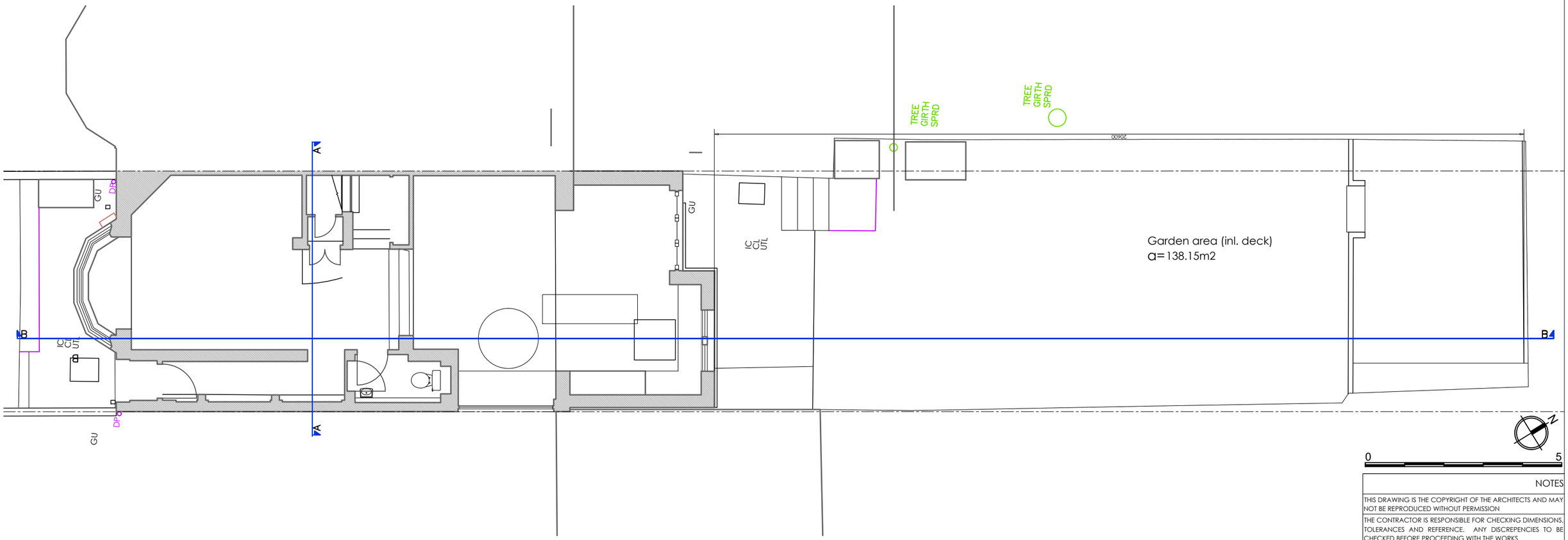
50.00 49.96 49.94 49.96 49.81 49.86 49.85 49.88 BT 49.89 49.60 49.54 49.56 49.61 49.58 49.53 49.59 49.63 49.70 49.79 49.78 49.77 49.75 SV 49.75 SV (TBM) 49.78 49.87 50.21 50.05 50.02 50.24 50.09 SV 50.07 49.94 50.22 50.33 50.43 50.30 50.61 50.59 50.59 50.68 50.69 50.76 IC CL 50.74 UTL IC CL 50.01 UTL GU 50.71 DP GU 50.75 DP 50.89 50.96

SOIL
BRICK PAVING
CPS
SMALL WALL
GATE
PLANTS
ARCH
ELECTRIC
KITCHEN ISLAND
SKYLIGHT
CUPBOARD
SLIDING
BOOK SHELF
VAULTED CEILING
HIGHEST
CELLAR BELOW

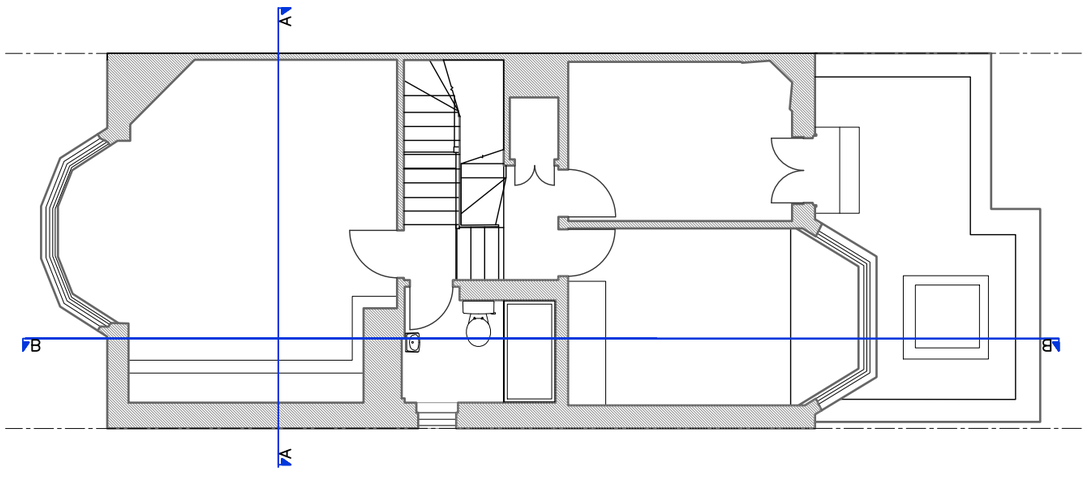
53.67 VAULTED CEILING BSL= 53.08
53.82 HIGHEST BSL= 53.68
53.82 HIGHEST BSL= 53.08
53.67 BSL= 53.25
53.79 BSL= 53.29
53.79
54.47 BSL= 54.30
54.47
53.88
DHL= 53.77 BSL= 53.72
C LEVEL= 52.57 H LEVEL= 53.74
C LEVEL= 77.71 H LEVEL= 54.42

51.52 GU 51.53 51.53 IC CL 51.53 UTL 51.74 51.95 52.15 52.34 52.45 52.37 52.48 52.59 52.53 52.73 52.69 52.66 53.07 53.10 53.09

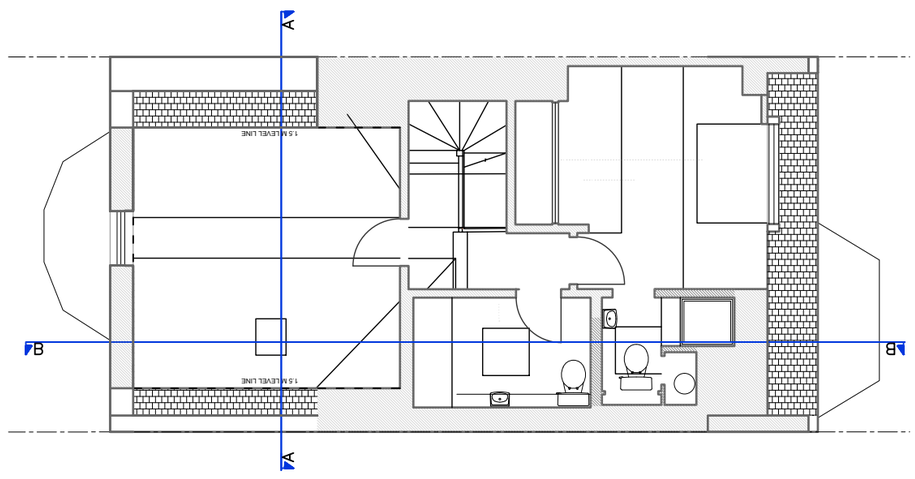
FENCE C/B H 2.0
FENCE C/B H 2.4
ELEVATION 1
GRASS
DECKING
TREE
GIRTH 0.20
SPRD 12.0
TREE
GIRTH 0.45
SPRD 14.0



EXISTING GROUND FLOOR PLAN



EXISTING FIRST FLOOR PLAN



EXISTING SECOND FLOOR PLAN

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DRAWN	-	ELLIOT & ANNE-EVA
CHECKED	-	
SCALE@A3 SCALE@A1	1:100- A3	1:50 -A1

BASEMENT PROPOSAL & REAR EXTENSION

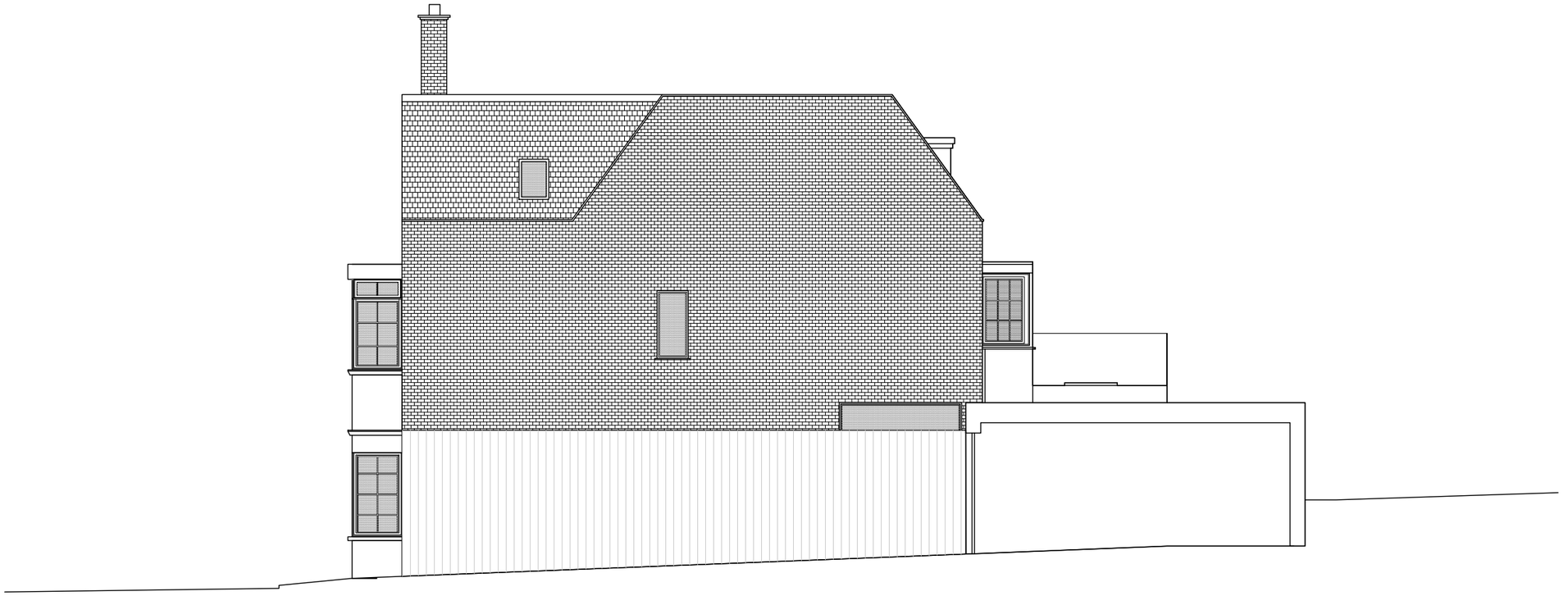
EXISTING
EXISTING PLANS

ADDRESS:

20a FERNCROFT AVENUE
LONDON, NW3 7PH

JOB No	DRAWING NUMBER
1053	PL02

A3 Sheet



EXISTING SOUTH WEST SIDE ELEVATION

EXISTING REAR ELEVATION

EXISTING FRONT ELEVATION

0 5

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BASEMENT PROPOSAL & REAR EXTENSION

EXISTING
EXISTING ELEVATIONS

ADDRESS:

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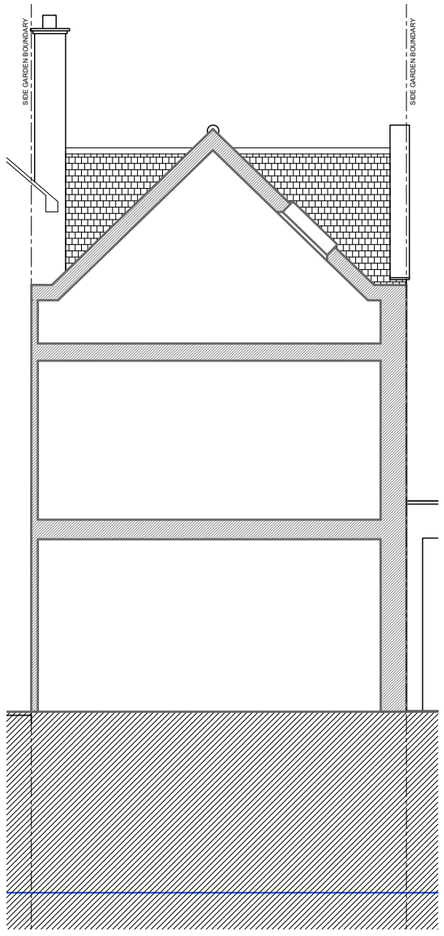
JOB No	DRAWING NUMBER
1053	PL03

A3 Sheet



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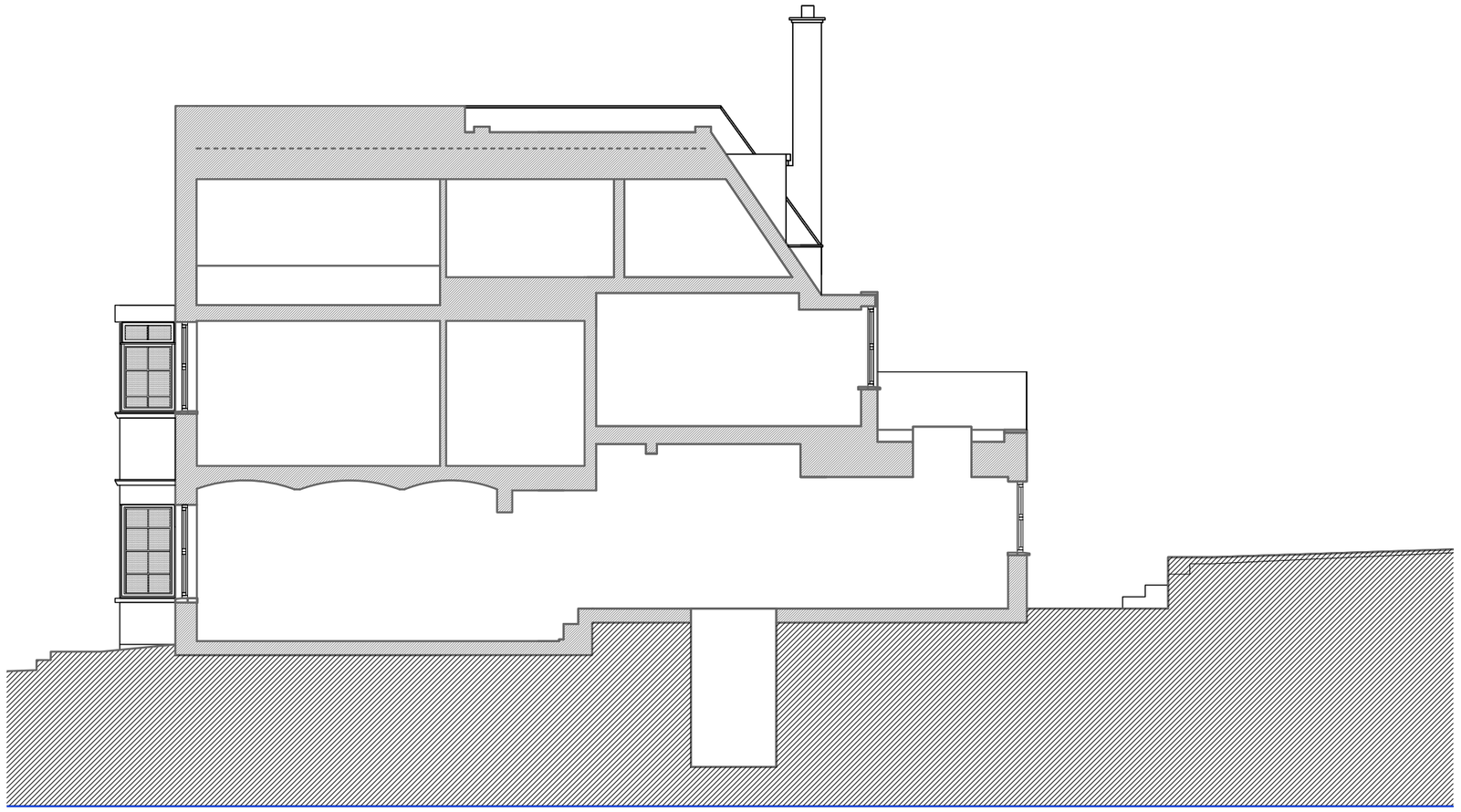

EXISTING SECTION BB

N

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CHECKED	-	
SCALE@A3 SCALE@A1	1:100- A3 1:50 -A1	

BASEMENT PROPOSAL & REAR EXTENSION

EXISTING
EXISTING SECTIONS

ADDRESS:

20a FERNCROFT AVENUE
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JOB No	DRAWING NUMBER
1053	PL04

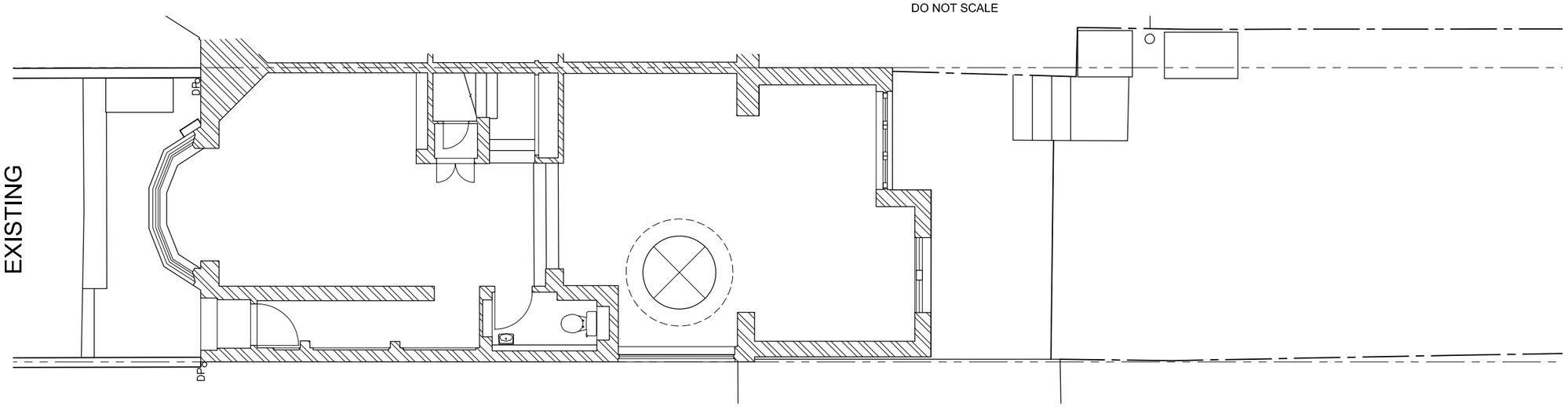
A3 Sheet

Appendix D

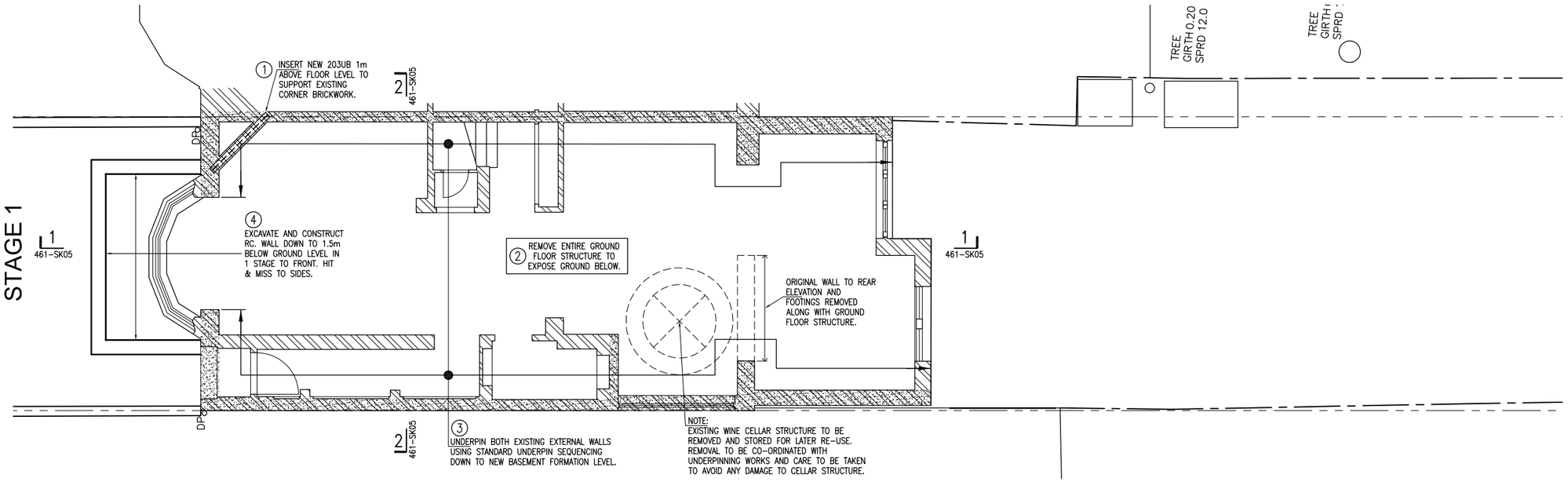
SIMPSON P19_461_SK02 to SK07_Sequencing Sketched 6 of 6

DO NOT SCALE

EXISTING



STAGE 1



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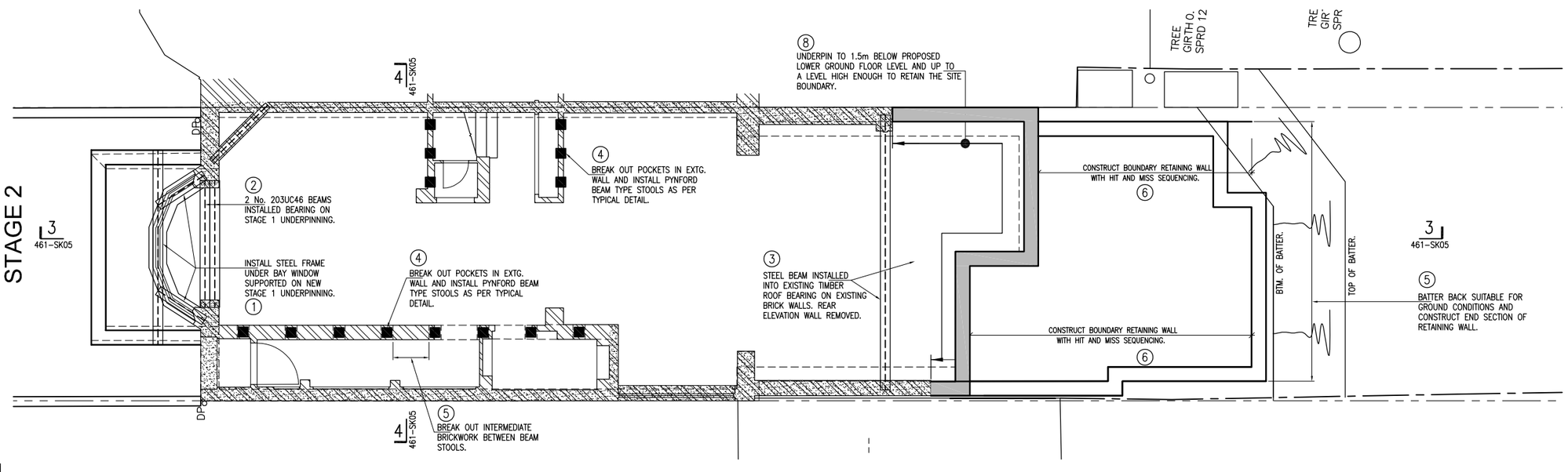

NOTES

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2. ALL SETTING OUT TO BE IN ACCORDANCE WITH THE ARCHITECTS DRAWINGS AND RELEVANT DETAILS AND VERIFIED WITH THE ARCHITECT PRIOR TO COMMENCEMENT OF SITE CONSTRUCTION.

3. FOR GENERAL NOTES REFER TO DRAWING No. P19-461-G-001.

4. FOR SECTIONS REFER TO DRAWING No. P19-461-SK05 to SK07.

CONTRACTOR IS TO DESIGN AND PROVIDE ADEQUATE TEMP. PROPPING TO THE EXISTING STRUCTURE FOR THE DURATION OF THE PROJECT, MONITOR ANY SETTLEMENT OR MOVEMENT AND HAVE A DETAILED PLAN TO MITIGATE ANY OCCURENCES.

MK	REVISION	BY	DATE
P3	Updated to latest Architects layouts	GB	12.12.19
P2	ISSUE FOR INFORMATION	IM	06.12.19
P1	ISSUE FOR CO-ORDINATION	IM	30.07.18

DRAWING STATUS

PRELIMINARY

DRAWING TITLE

PRELIMINARY SEQUENCING SKETCHES.
SHEET 1 OF 6

PROJECT Project Number P19-461

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Drawn	Ch'kd	Scales	Date
IM	CMM	1:50@A1	SEP.19

Purpose of Issue
FOR INFORMATION

Drawing Number P19-461-SK02 Revision P3

A1

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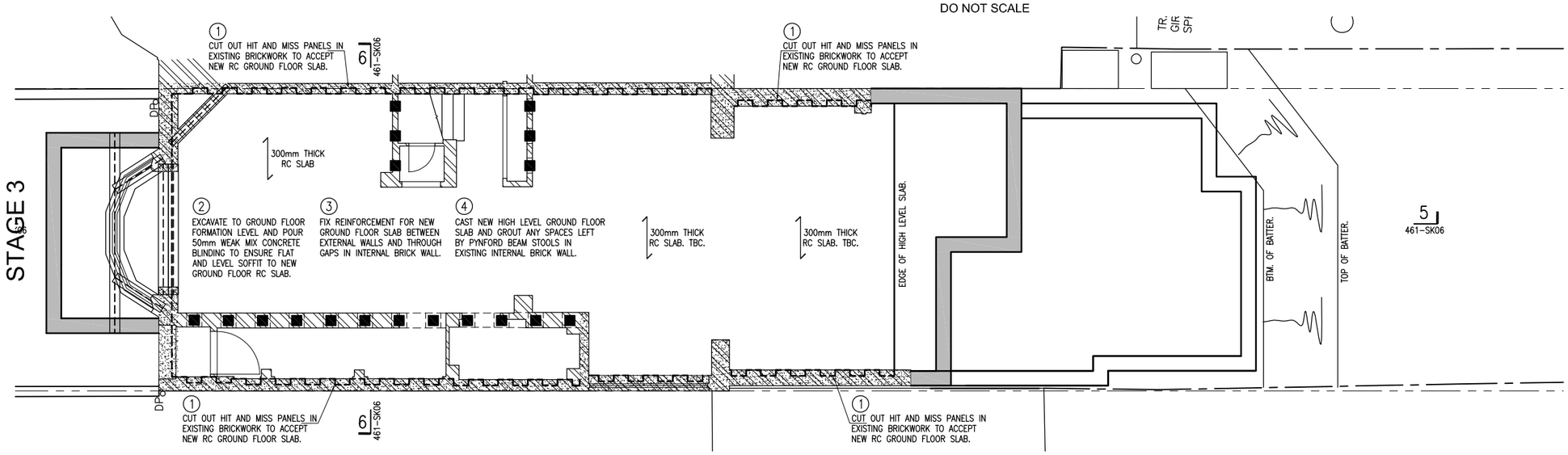

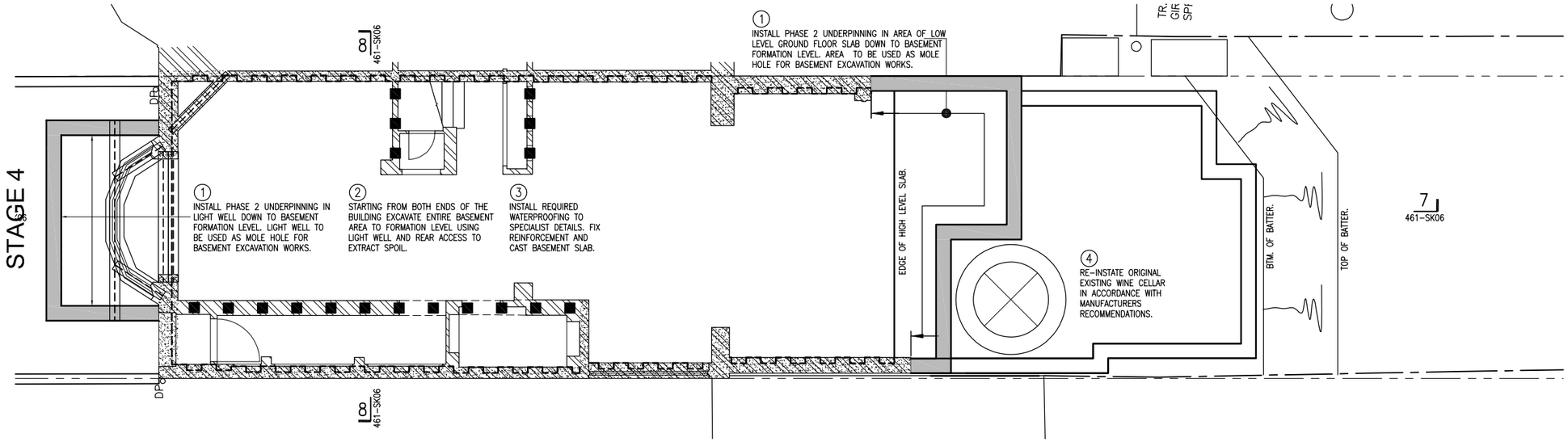

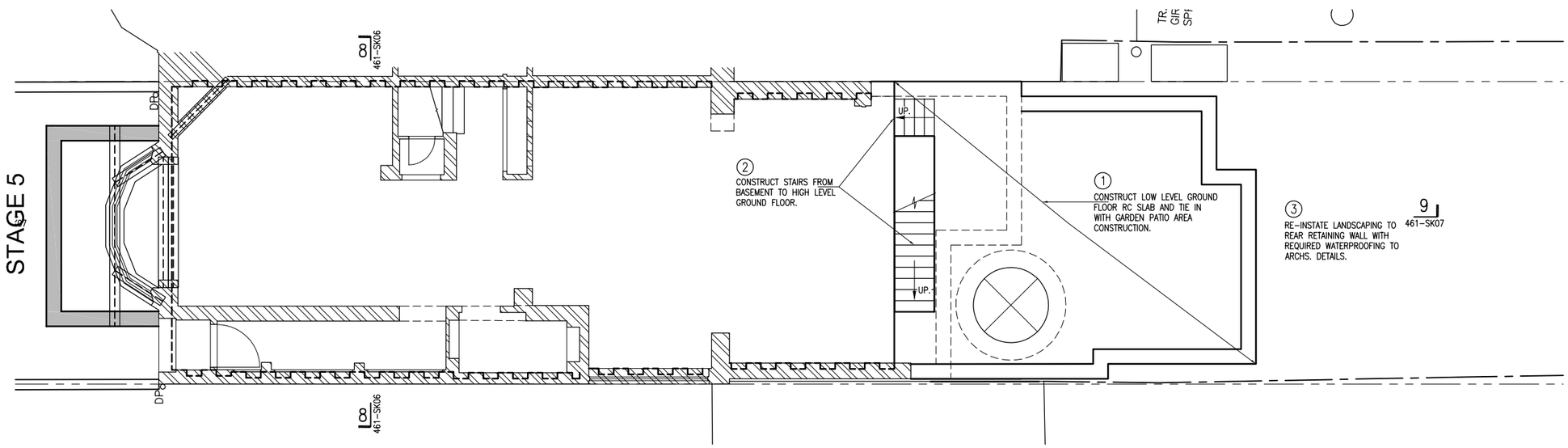

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3. FOR GENERAL NOTES REFER TO DRAWING No. P19-461-G-001.

4. FOR SECTIONS REFER TO DRAWING No. P19-461-SK05 to SK07

⚠ CONTRACTOR IS TO DESIGN AND PROVIDE ADEQUATE TEMP. PROPPING TO THE EXISTING STRUCTURE FOR THE DURATION OF THE PROJECT, MONITOR ANY SETTLEMENT OR MOVEMENT AND HAVE A DETAILED PLAN TO MITIGATE ANY OCCURENCES.

MK	REVISION	BY	DATE
P3	Updated to latest Architects layouts	GB	12.12.19
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DRAWING STATUS

PRELIMINARY

DRAWING TITLE

PRELIMINARY SEQUENCING SKETCHES.
SHEET 2 OF 6

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Purpose of Issue
FOR INFORMATION

Drawing Number P19-461-SK03 | Revision P3

A1

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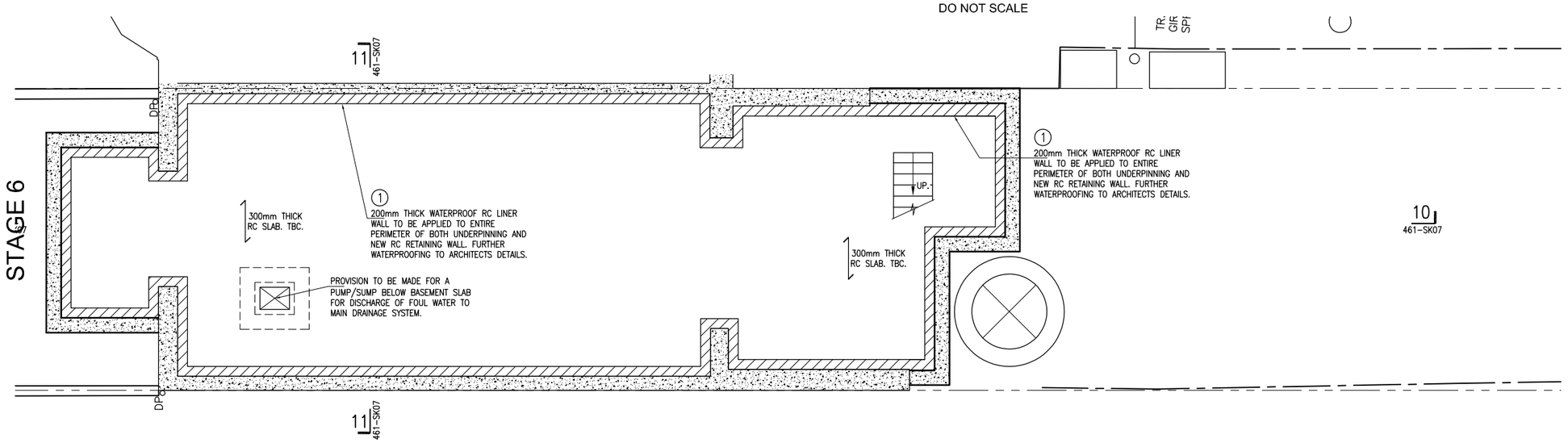

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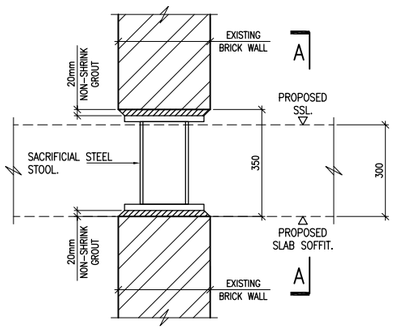
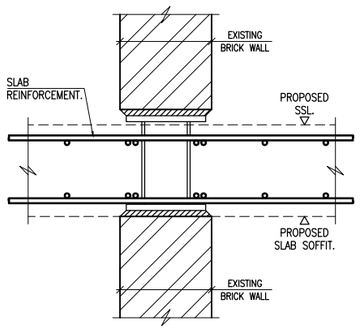
PLAN ON COMPLETED BASEMENT.



STEP 1.

CUT OUT 250 WIDE BY 350 HIGH POCKETS IN EXISTING BRICK WALL.

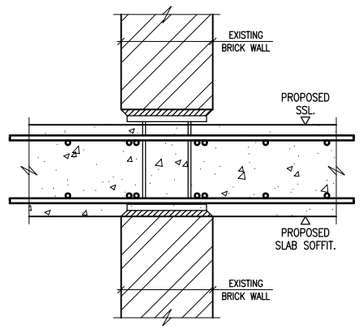
INSTALL SACRIFICIAL STOOL AND GROUT TOP AND BOTTOM WITH MIN. 20mm NON-SHRINK GROUT.



STEP 2.

REMOVE INTERMEDIATE SECTIONS OF EXISTING BRICK WALL AND MAKE GOOD ANY OVER CUT.

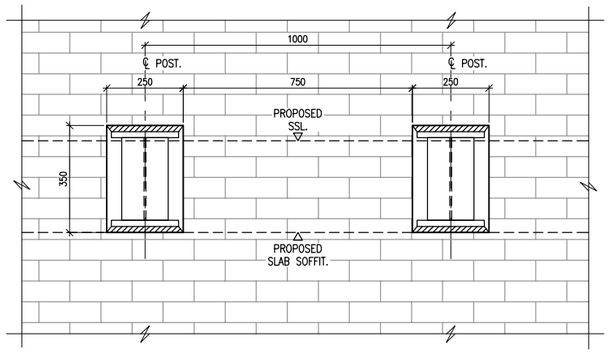
FIX GROUND FLOOR SLAB REINFORCEMENT.



STEP 3.

CAST NEW GROUND FLOOR RC SLAB.

ONCE CONCRETE HAS ACHIEVED DESIGN STRENGTH GROUT REMAINING OPENINGS IN EXISTING BRICKWORK WITH NON-SHRINK GROUT TO ACHIEVE UNIFORM BEARING OF EXISTING BRICKWORK ONTO NEW RC SLAB..



ELEVATION A-A.
TYPICAL ARRANGEMENT OF POST/POCKET.

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PRELIMINARY

DRAWING TITLE

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SHEET 3 OF 6

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Purpose of Issue

FOR INFORMATION

Drawing Number	Revision
P19-461-SK04	P3

A1

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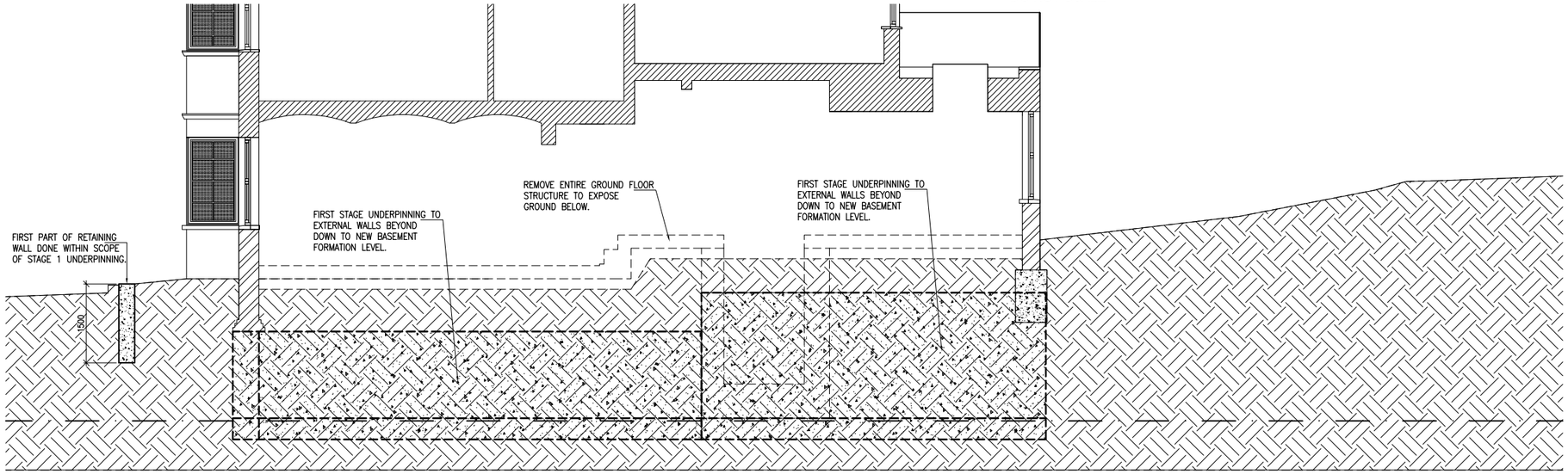

SECTION 1–1.

NOTES

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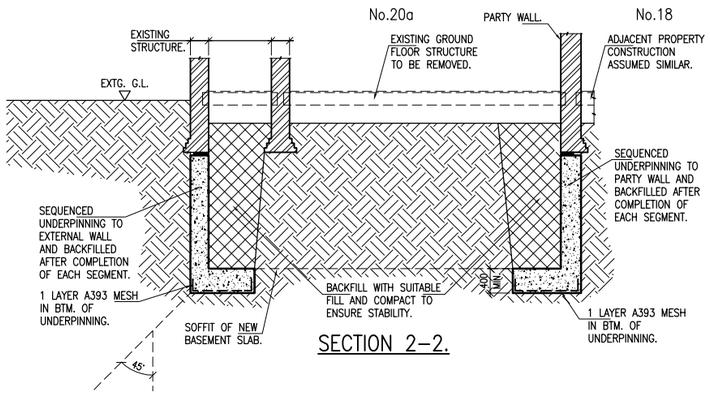

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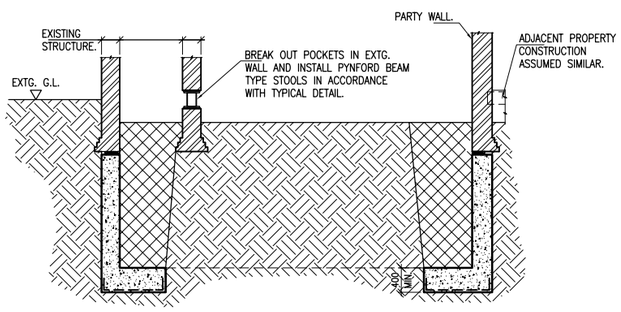
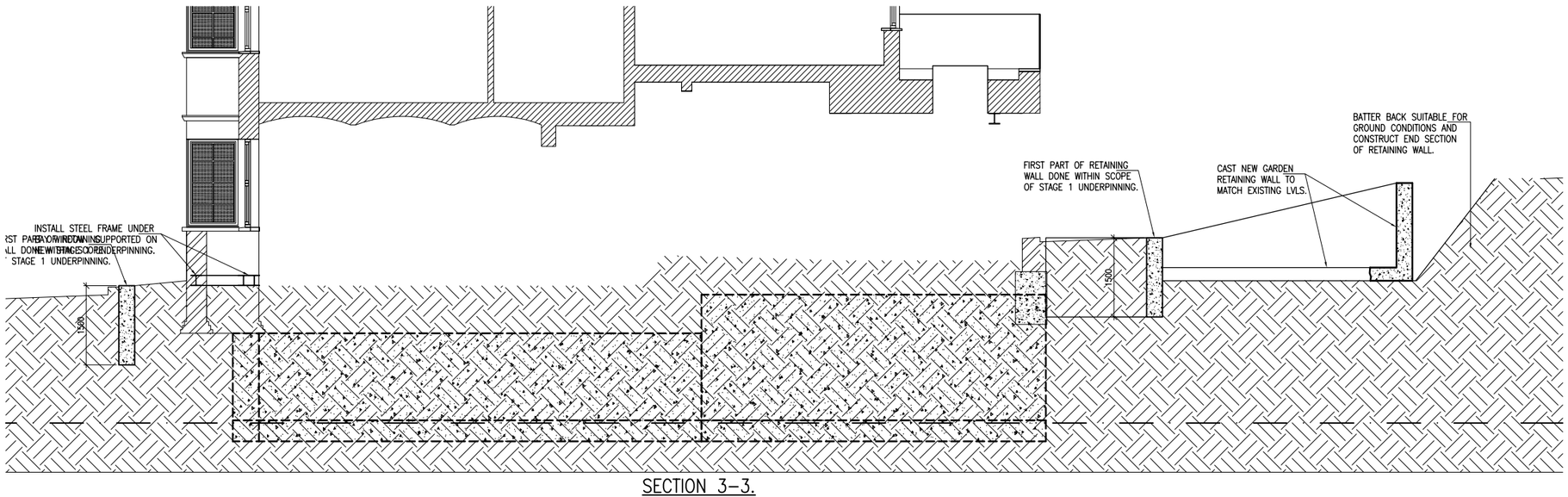


SECTION 4–4.



SECTION 3–3.

A1

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Purpose of Issue
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P19-461-SK05	P3

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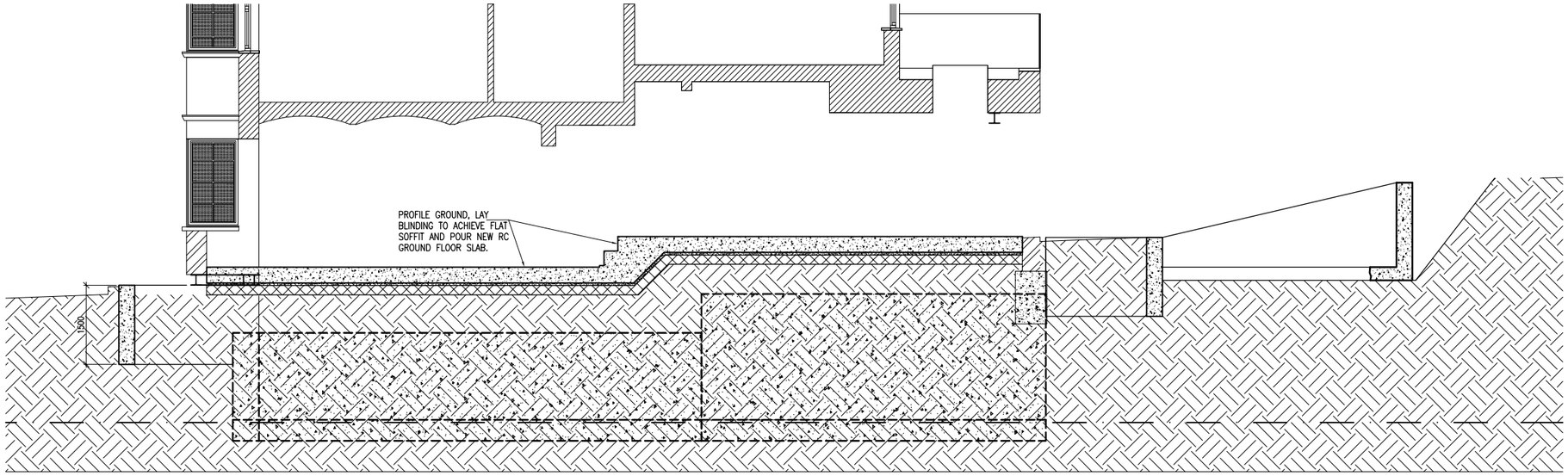

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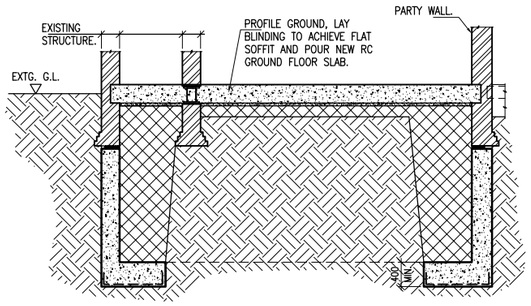

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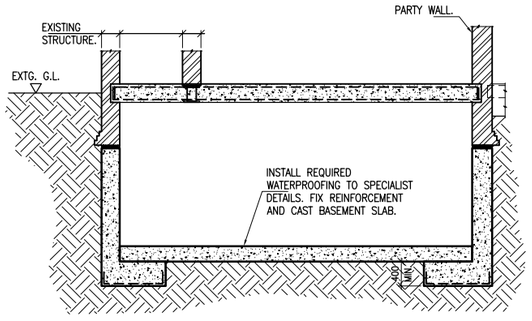

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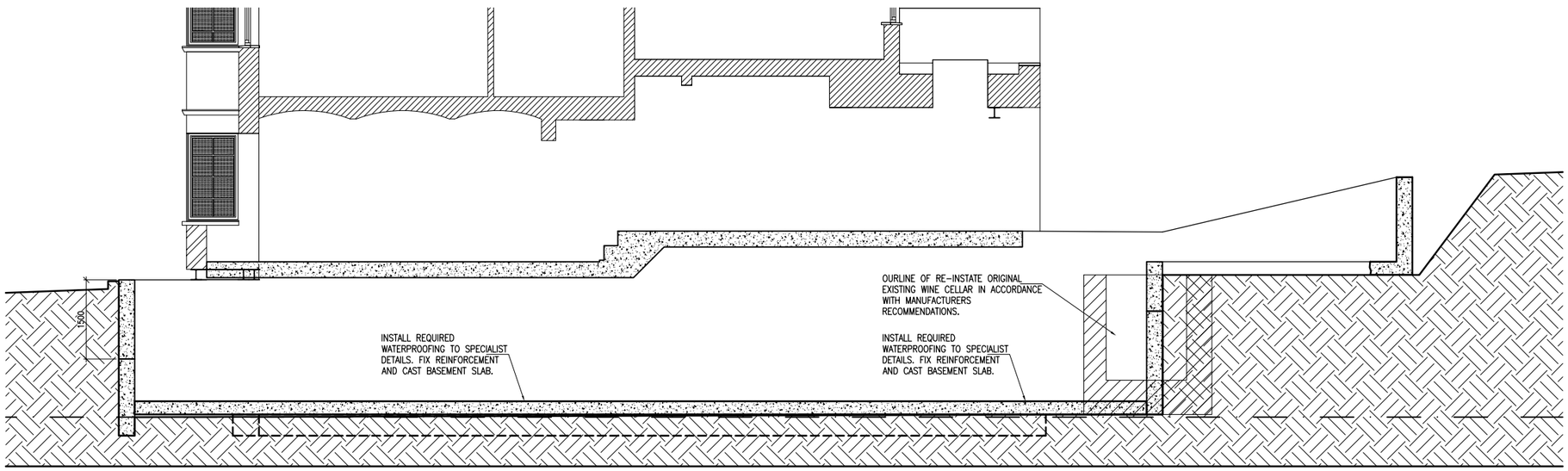

SECTION 7-7.

A1

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Purpose of Issue

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P19-461-SK06	P3

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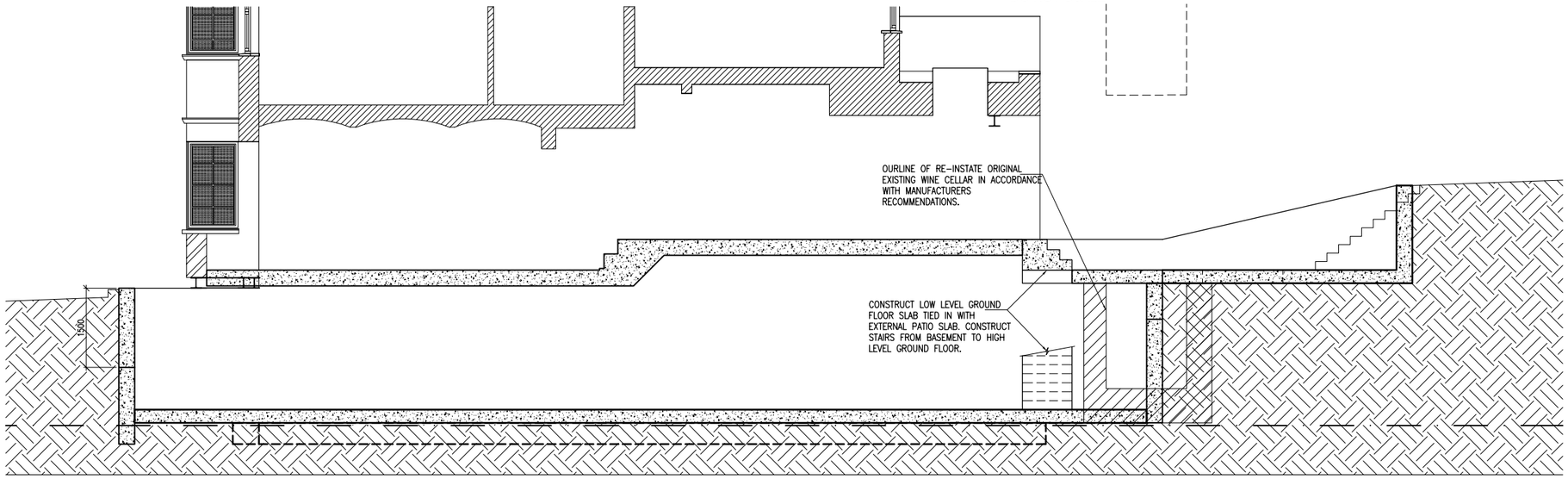
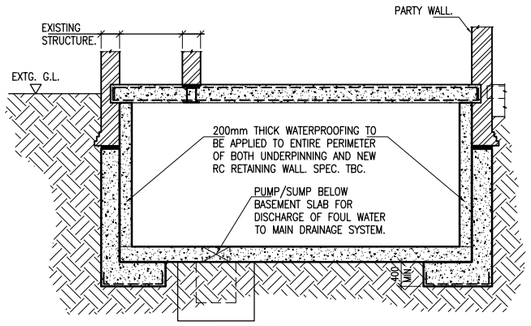


SECTION 9-9.



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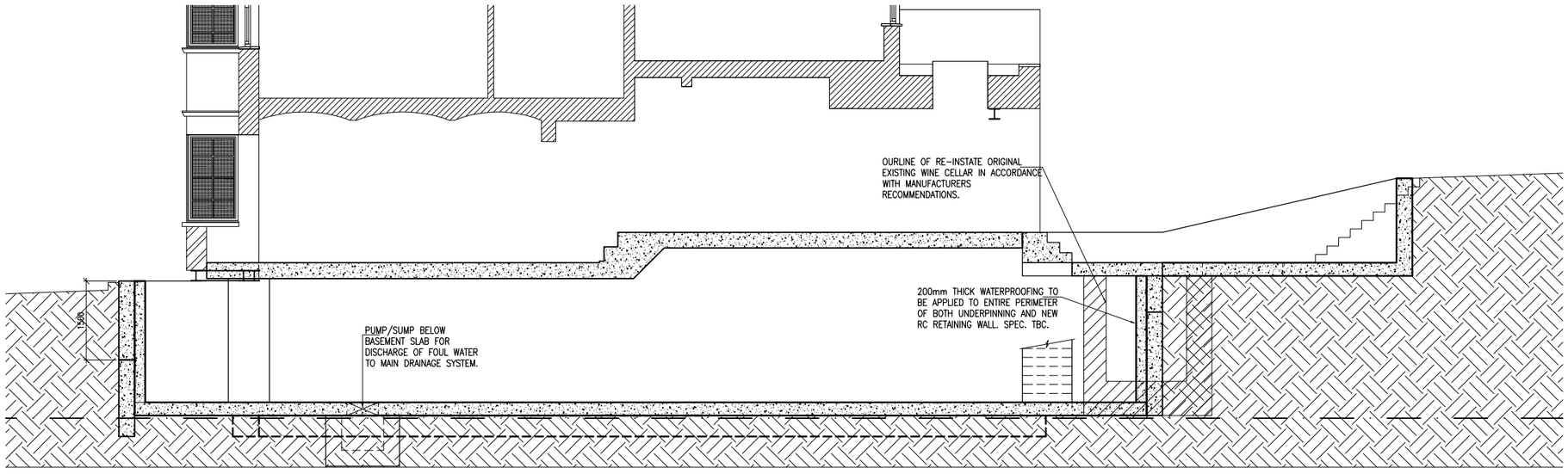

SECTION 10-10.

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Purpose of Issue

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P19-461-SK07	P3

A1

Appendix E

SIMPSON P19_461_SK08_Underpinning Sequence and sections A _ A & B _ B through building and adjoining properties