JOHN CAINE – CHARTERED STRUCTURAL ENGINEER

Basement Impact Assessment – Stages 1 and 2, Screening and Scoping for

15 Chalcot Gardens, London NW3

For

Mr Jack Street,

15 Chalcot Gardens,

London NW3

By

John Caine – BSc.Dip.Geo. C.Eng. M.I.Struct.E

82 Elers Road,

Ealing,

London W13 9QD

OL8 **September 2020**

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Drawing No. 003 - Existing Elevations

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Appendix D) Underpinning drawing No. S1 rev A and Sketches SK1 and SK2.

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1. Introduction

The proposal at 15 Chalcot Gardens, London NW3 is to lower the existing lower ground floor level by 1.0m and 0.75m in order to achieve a greater floor to ceiling height to this detached house. There is no proposal to extend the footprint of the lower ground floor beyond the present perimeter of the house.

Refer to Appendix A for the following Architects drawings for the proposed works to the existing lower ground floor:

- Drawing No. 001 - Existing Ground and Lower Ground Floor Plan
- Drawing No. 003 - Existing Elevations
- Drawing No. 004 - Proposed Ground and Lower Ground Floor Plans
- Drawing No. 006 - Proposed Elevations
- Drawing No. 007 - Existing and Proposed Section A-A

This Basement Impact Assessment report has been prepared to comply with Camden Council Planning Guidance for Basements with the first two Stages 1- Screening and Stage 2- Scoping being considered to check if the proposed basement works will have any impact on adjacent properties and the water environment.

The Stage 1 - Screening is focused on Ground water flows, Land Stability and Surface flows and flooding.

The Stage 2 -Scoping stage of the BIA study looks at the impact the potential impact of the proposed scheme on Geological, Hydrogeological and Hydrological matters.

However, the Structural detailing of the proposed lowering of the lower ground floor has been developed and Drawings and Sketches relating to this work are included within this report in order to provide a more detailed report.

2. Topography of the site

The site is relatively level from front to back and across the width of this detached property and as such the lowering of the existing lower ground floor level will have no impact on the ground stability for this level site.

3. Public services at the site including drainage layout

The Underground CCTV Survey Drawing is included in Appendix B. There are no proposals to change the existing below ground drainage system to this property as the invert levels of the existing manholes can accommodate the proposed Lower Ground Floor levels.

4. Physical site restrictions

There are no physical site restrictions to the proposed lowering of the basement level within this detached house. All of the works are to be undertaken within the foot print of the existing house with the lower ground floor level being lowered by approx. 1.0m for the majority of the lower ground floor level and 0.75m lower to the remaining area of the lower ground floor level.

5. Site investigation and ground water

A site investigation has been undertaken with the excavation of three trail pits to the external corners of the site to expose the existing foundations to the perimeter walls. Refer to Appendix C for the Trial Pit logs Sketches SKTP1,SKTP2 and SKTP3. The Trail Pits confirmed the depth and profile of the foundations which will influence the width of underpinning required to maintain the same foundation width to the base of the underpinning. The trial pits excavation which extended down to a depth of 1.0m below existing ground level revealed a consistent clay subsoil.

All of the trial pits were founded in a light brown clay stratum.

No ground water at the bottom of the excavations for the Trail pits and the proposed lowering of the existing lower ground floor level will not have any impact on the any ground water flows or surface water flows as we are not building beyond the perimeter walls of this detached house.

There is no known record of flooding at this property.

Existing underpinning was encountered in Trial Pits 1, 2 and 3. The concrete underpinning was approx. 400mm thick with the top of the underpinning being 450mm below external ground level in Trail Pits 1 and 2 and 150mm below ground level in Trail Pit 3. This results in the underpinning being 900mm below the existing ground level to Trial Pits 1 and 2 and 650mm below external ground level to Trail Pit 3.

It is possible that the underpinning was undertaken due to the shallow depth of the existing stepped brick footing.

6. Structural design of the basement

The proposal is to lower the level of the existing lower ground floor level by approx. 1.0m and 0.75m to achieve a greater head height. This will be achieved by underpinning the external and internal basement walls in a traditional sequence as shown on the drawing S1-rev A and Sketches SK1 and SK2 refer to Appendix D as well as referring to the General Notes for Conventional Underpinning noted as SK3 in Appendix E.

Given the presence of existing underpinning in the it will be necessary to underpin the underpinning.

All of the underpinning works will be undertaken from within the existing lower ground floor.

The width of the new underpinning is intended to be the same as the existing external and internal walls foundations so no changes occur to the applied bearing pressure onto the subsoil.

The underpinning will be undertaken in a traditional sequence where 1.0m wide pins will be formed with a significant space between pins as per the suggested underpinning drawing numbered S1-rev A, refer to Appendix D.

7. Ground movement assessment

Given the proposed basement works is a shallow 1.0m excavation within the existing lower ground floor level with the underpinning being founded at a lower level within the same site footprint there are no anticipated ground movement or land stability issues which will effect this detached property or the two adjacent detached properties which as located approx. 3.0m from the gable walls of 15 Chalcot Gardens. Refer to the Architect section drawing numbered 007 in Appendix A through 15 Chalcot Gardens and the two adjacent properties which demonstrates that the lowering of the lower ground floor level by the 1.0m depth does not undermine or surcharge these properties.

8. Appraisal of the host structure and foundations

The writer has inspected the existing structure and foundations and found no visible signs of structural damage or distress within the property.

The house dates back to approx. the 1920's and is constructed with loadbearing external and internal walls which support timber floors. Stud walls are present at the top floor of the property which also has a dual pitched tiled roof.

9. Suggested sequence of basement works

The drawing numbered S1- rev A in Appendix D indicates the suggested sequence of underpinning to the house. The General Underpinning Notes for Conventional Underpinning in Appendix E provides advise on the time required between the casting of the reinforced pins and the placing of the dry pack into the gap between the top of the concrete pin and the underside of the concrete pin. The underpinning of the external walls is the starting point working towards the internal walls. All of the underpinning work will be done by hand with external windows being used at lower ground floor level to get the excavated spoil out from the lower ground floor level.

10. Conclusions

It can be seen from this report and the attached information that the proposed lowering of the existing lower ground floor to 15 Chalcot Gardens, London NW3 will not have any detrimental impact on the two adjoining properties or on the Geological or Hydrogeological aspects of the subsoils and ground water at this site.

Yours Sincerely,

John Caine – BSc.Dip. Geo, C.Eng.M.I.Struct.E

Chartered Structural Engineer

Appendix A):

Architects Drawings:

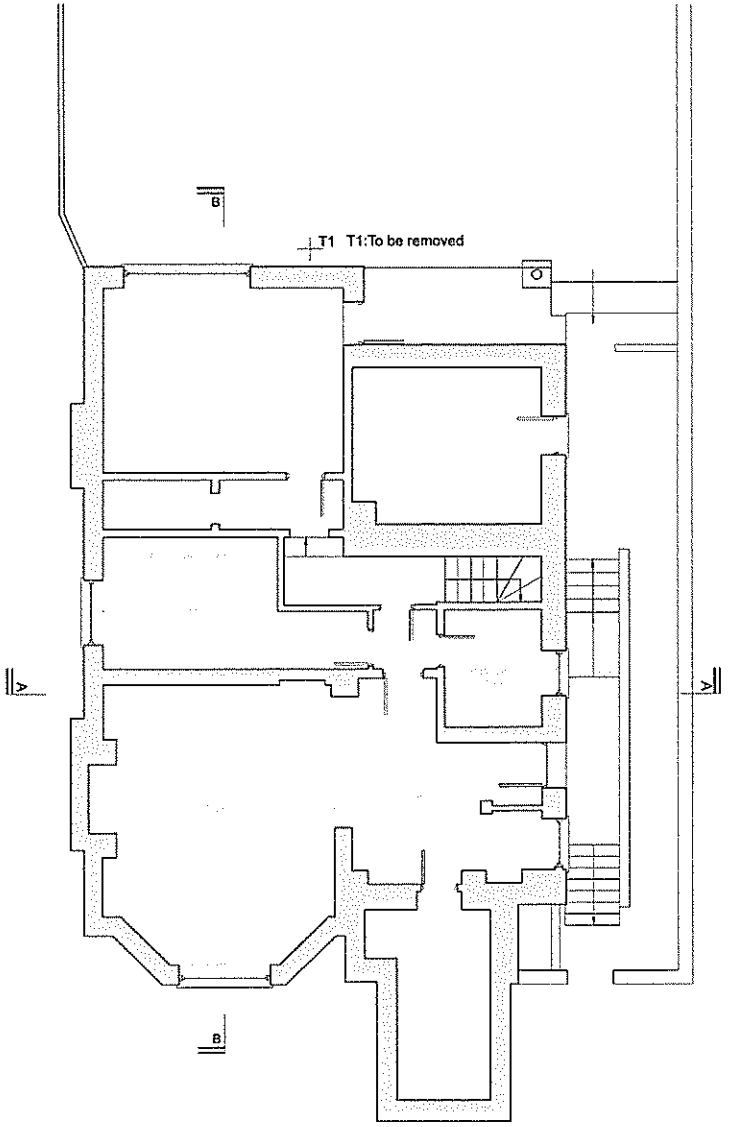
- Drawing No. 001 - Existing Ground and Lower Ground Floor Plans
- Drawing No. 003 - Existing Elevations
- Drawing No. 004 - Proposed Ground and Lower Ground Floor Plan
- Drawing No. 006 – Proposed Elevations
- Drawing No. 007 - Existing and Proposed Section A-A

NOTES

Indicative Survey for planning purposes only

SITE LOCATION PLAN

1:1250



EXISTING LOWER GROUND FLOOR

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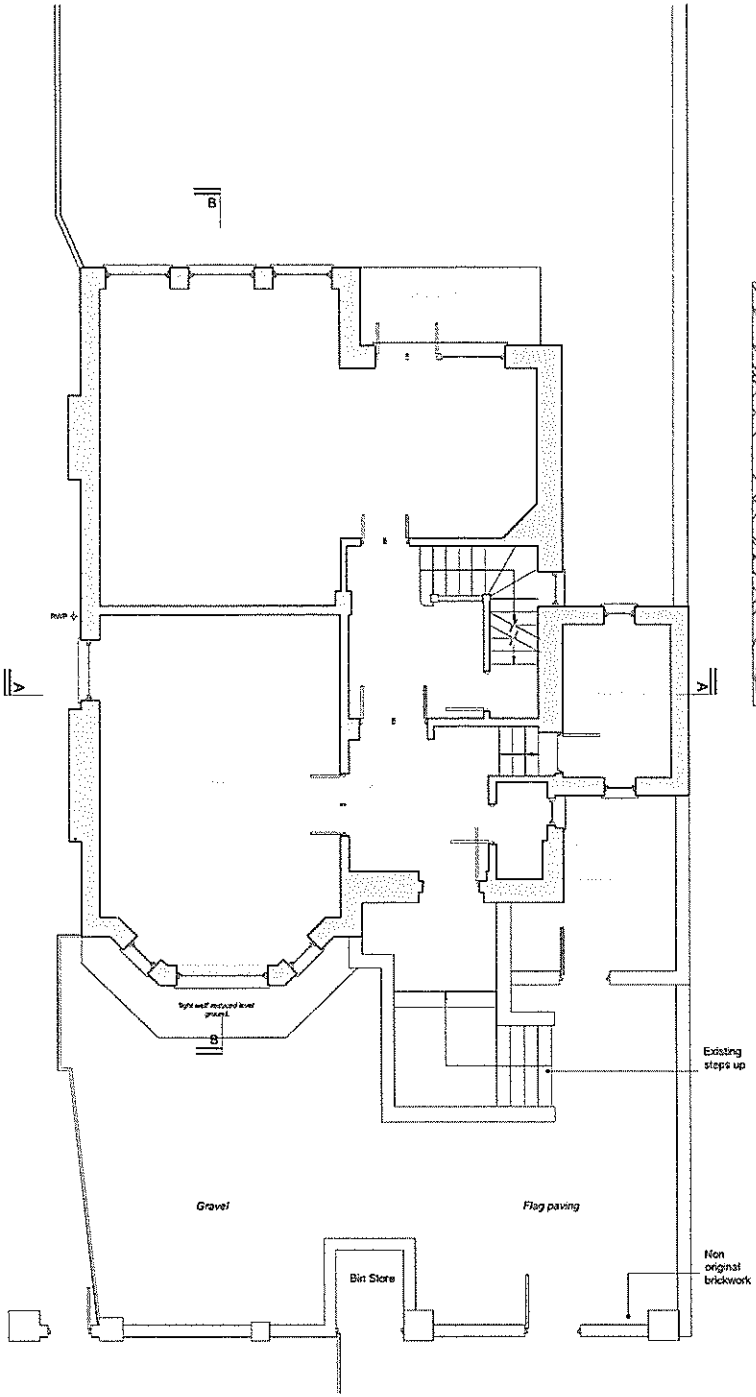

EXISTING RAISED GROUND FLOOR

1:100 0 5m

Mermaid House
2 Puddle Dock
Blackfriars
EC4V 3DB

t: 020 7332 2666

project
15 Chalcot Gardens
London, NW3

client
Jack Steel

drawing title
Existing Ground & Lower Ground Floor Plans

drawing status
Survey

scale	date	drawn by	checked by
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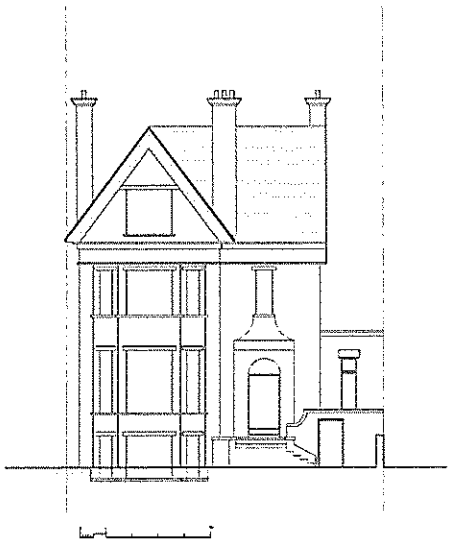
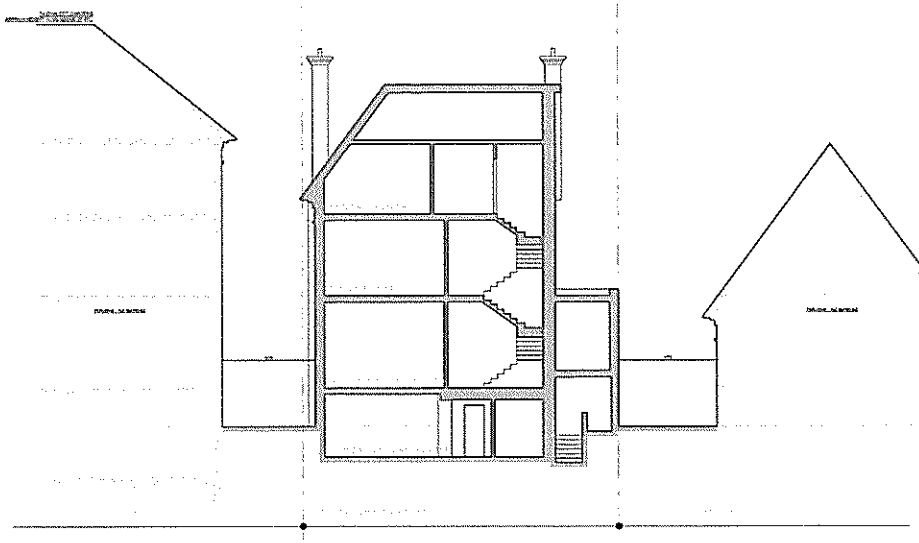
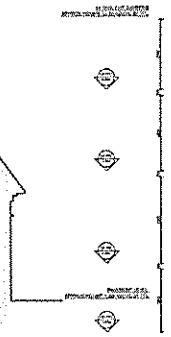
job no.	drawing no.	revision
20005	001	P7







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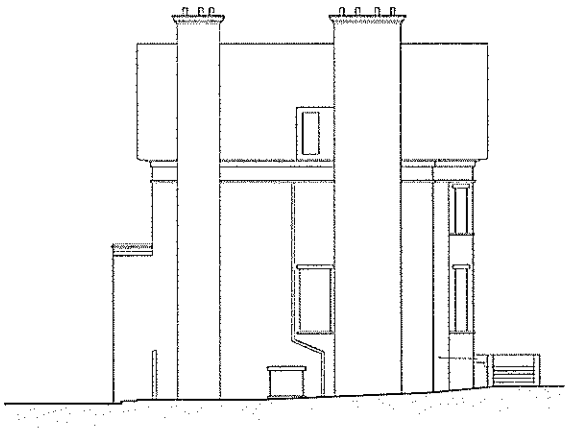

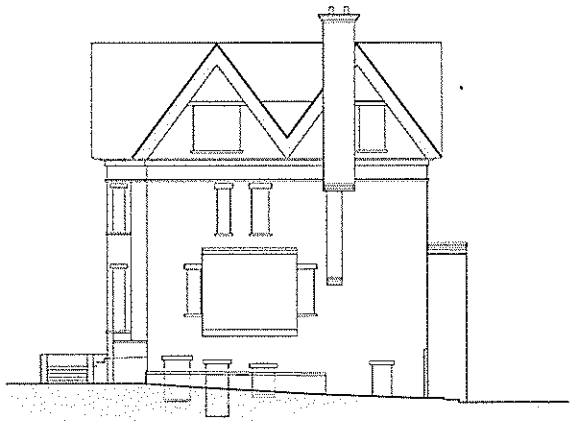

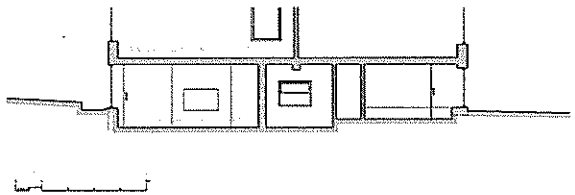

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PROJECT
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London, NW3

client
Jack Street

drawing title
Existing Elevations

drawing status
Survey

scale	date	drawn by	checked by
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job no.	drawing no.	revision
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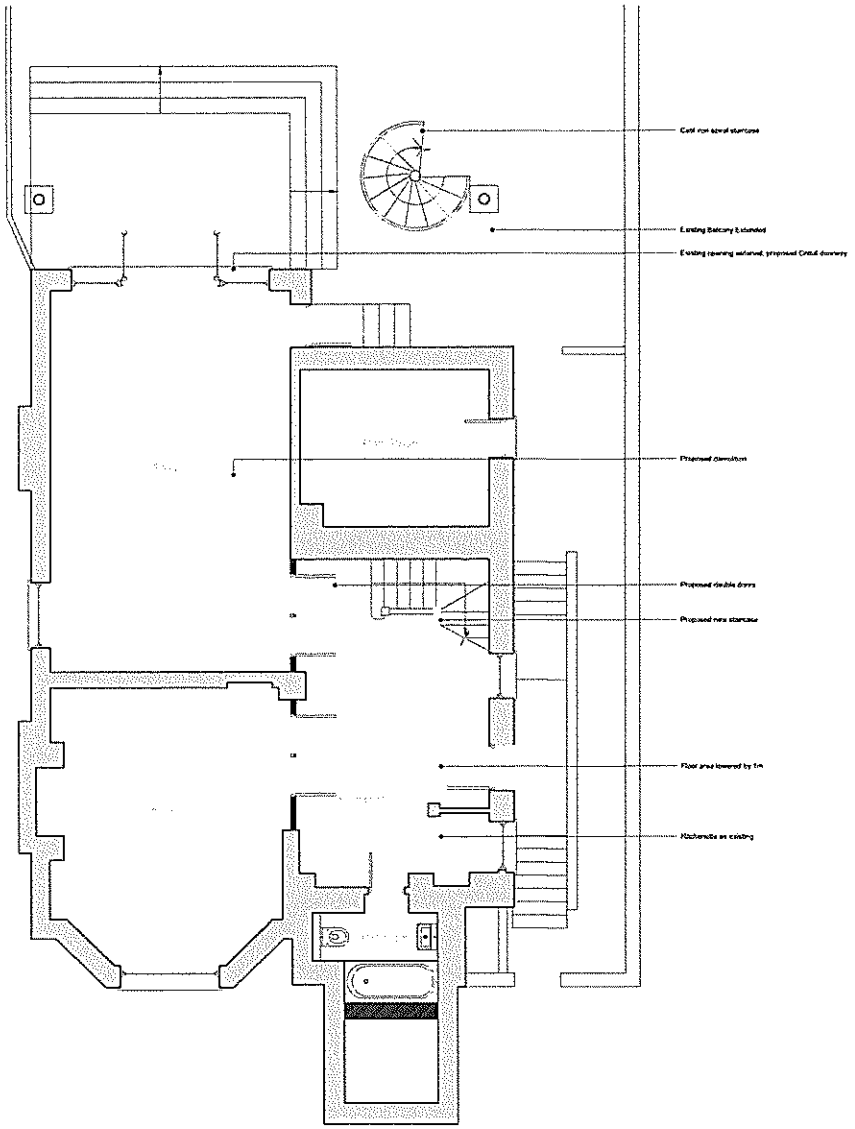
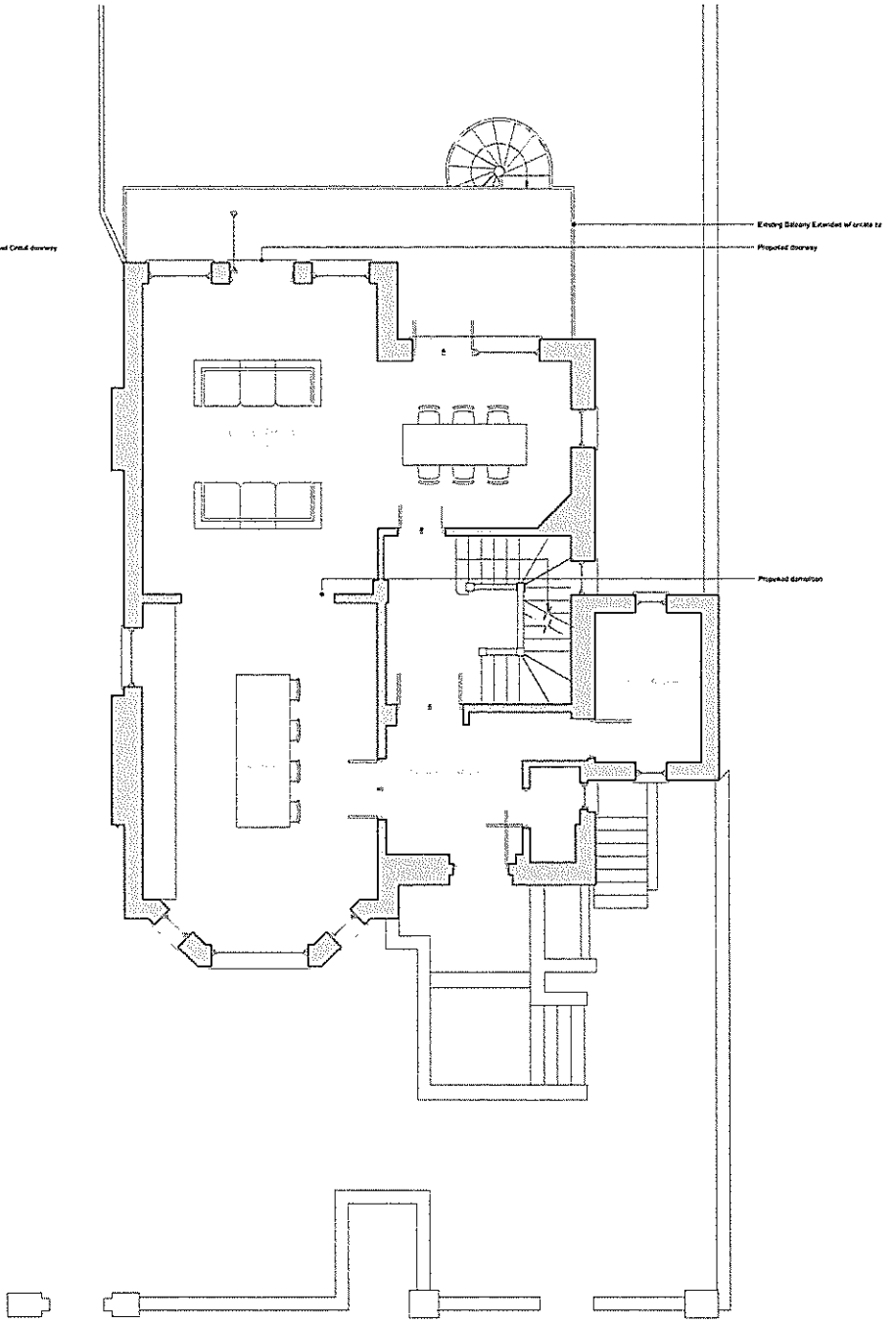
NOTES



PROPOSED BASEMENT FLOOR

0 1 5m



PROPOSED GROUND FLOOR

0 1 5m

Mermaid House 2 Puddle Dock Blackfriars London EC4V 3DS T: 020 7332 2400

project
15 Chalcot Gardens
London, NW3

client
Jack Street

Drawing title
Proposed Ground & Lower Ground Floor Plans

Drawing status
Survey

scale	date	drawn by	checked by
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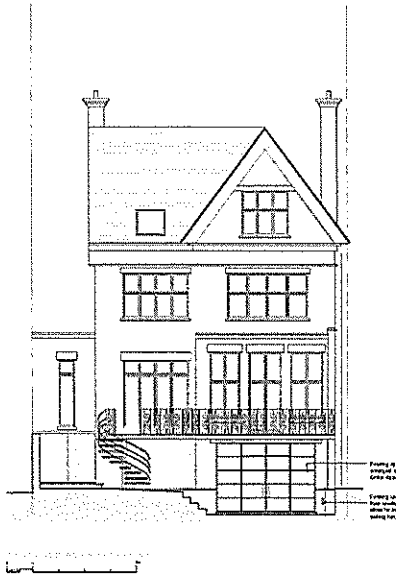
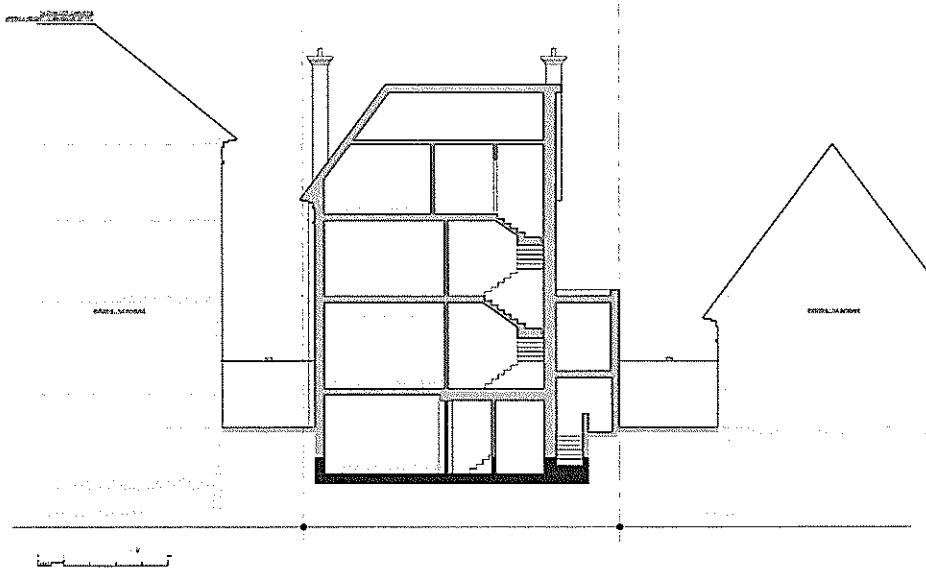
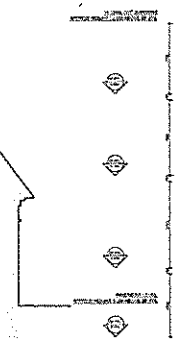
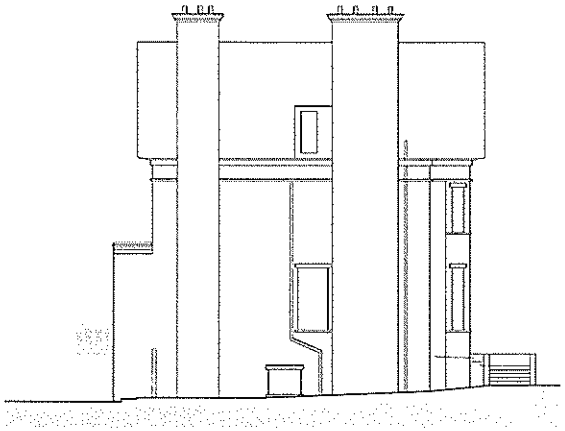
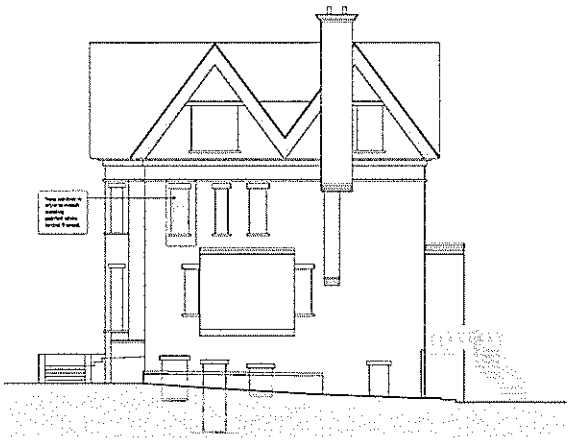
Indicative Survey for planning purposes only

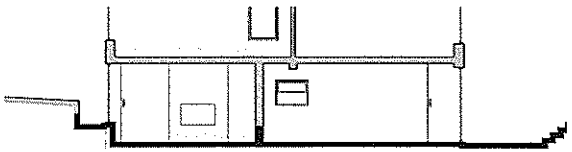












Mermaid House
2 Puddle Dock
Blackfriars
EC4V 3DB

t 020 7332 1888

project
15 Chalcot Gardens
London, NW3

client
Jack Street

drawing title
Proposed Elevations

drawing status
Comment

scale	date	drawn by	checked by
1:50 @ A1 1:100 @ A3	24/05/22		

job no.	drawing no.	revision
20005	006	P4

Only the original drawing should be read upon. Contractors, subcontractors and suppliers must verify all dimensions on site before commencing any work or making any shop drawings.

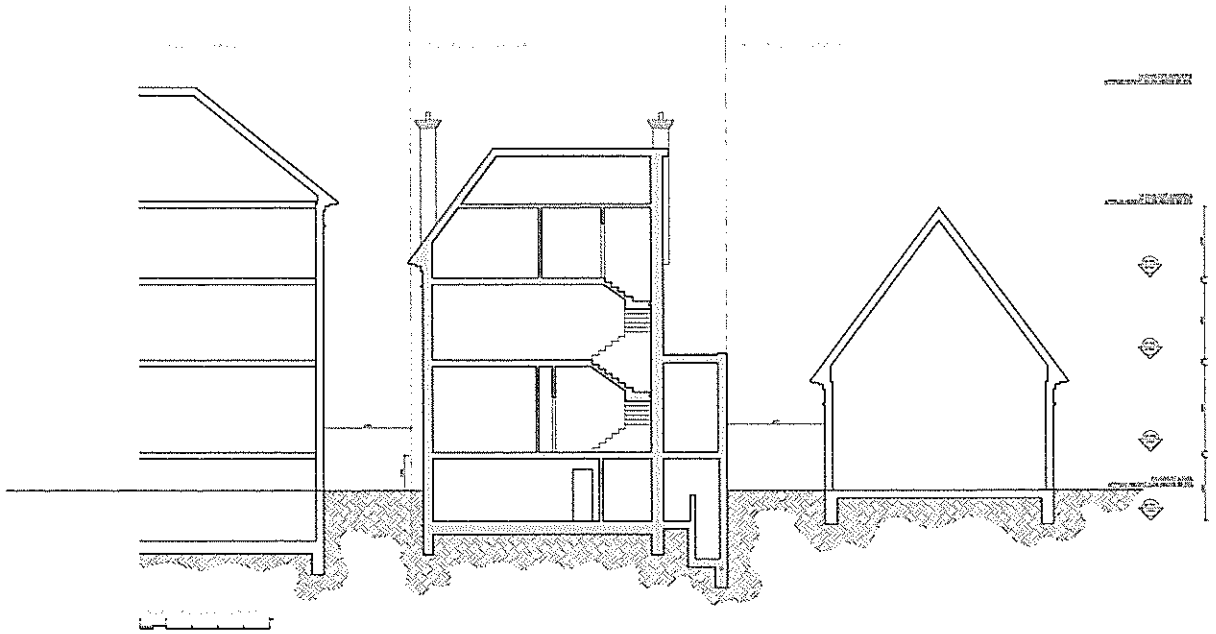
All shop drawings to be submitted to the architect for comment prior to fabrication.

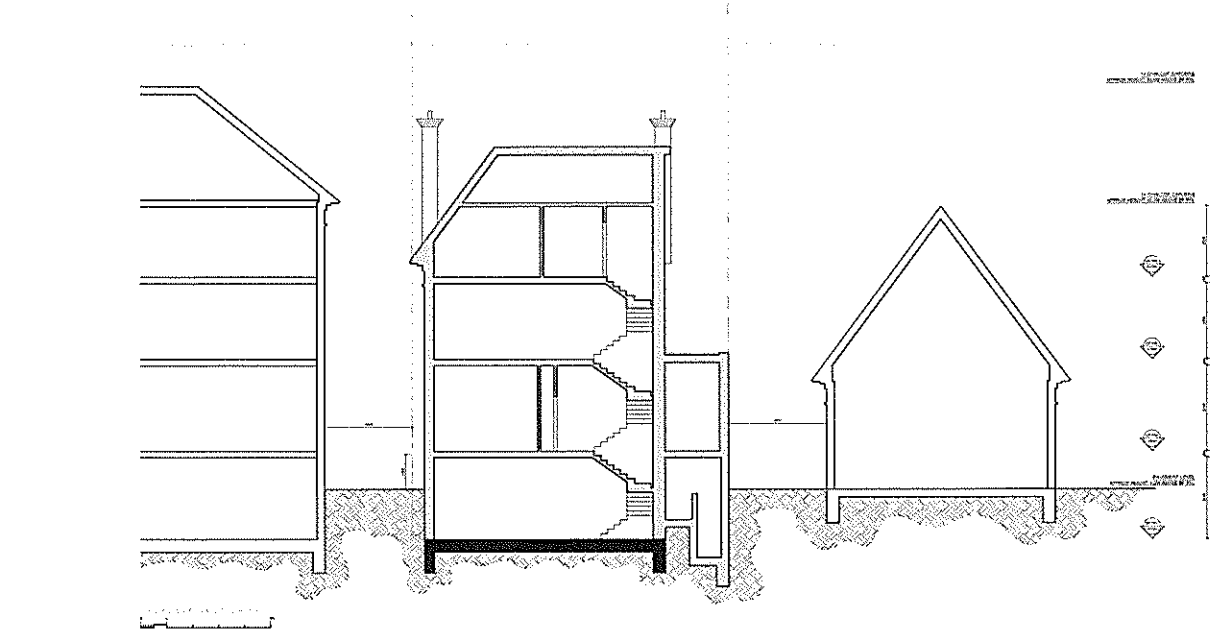
This drawing is to be read in conjunction with the architect's specification, bills of quantities, schedules, structural, mechanical & electrical drawings and all correspondence and is to be reported to the architect.

Do not scale from this drawing. Dimensions are in millimetres unless otherwise stated.

NOTES

Indicative Survey for planning purposes only





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London, NW3

client
Jack Street

drawing title
Existing & Proposed Section AA

drawing status
Planning

scale	date	drawn by	checked by
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job no	drawing no	revision
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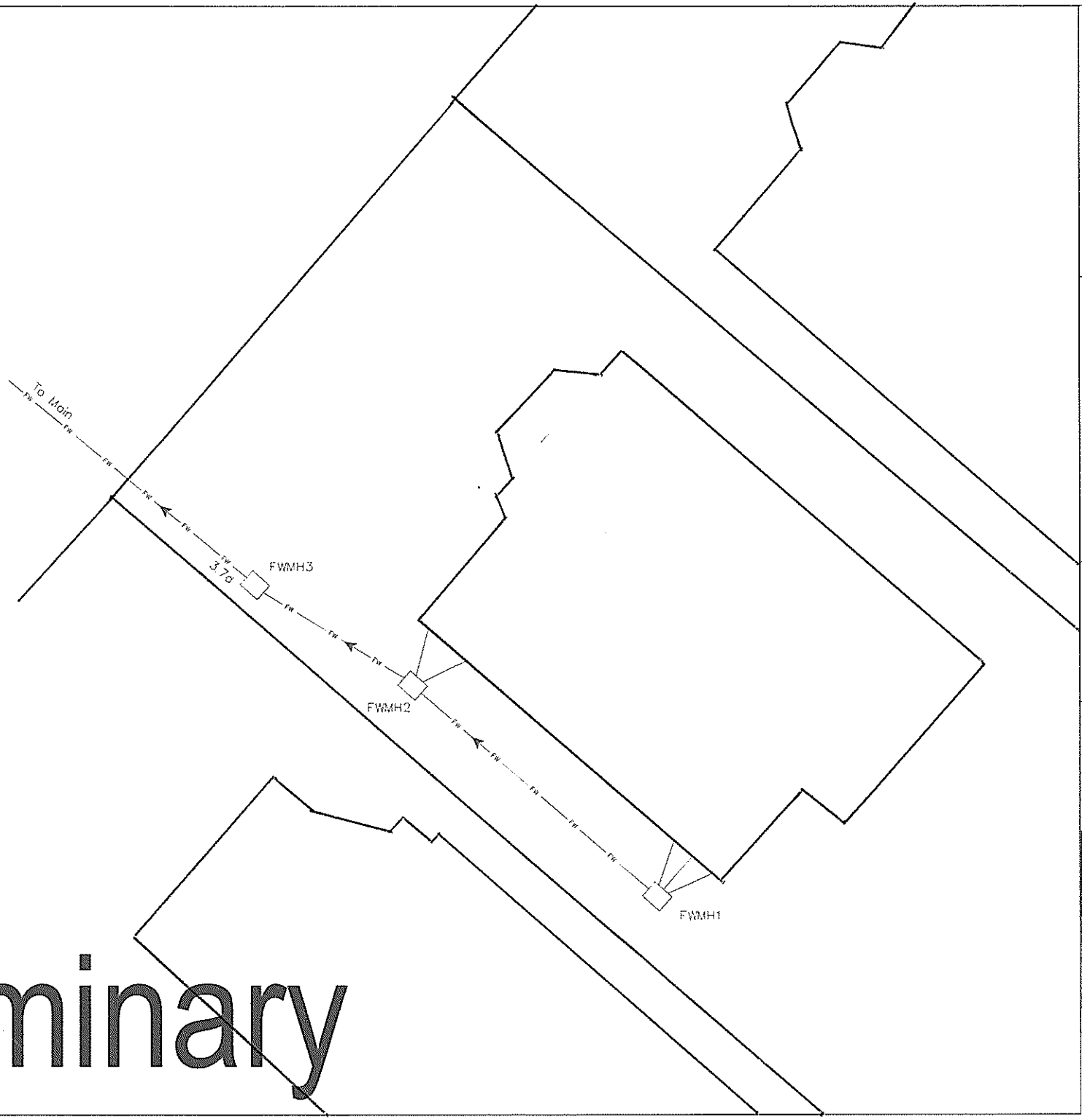
Appendix B): Underground CCTV Drainage Survey Drawing



Preliminary

IMPORTANT NOTES

All underground details shown have been identified from a non-intrusive survey. Cadmap Underground Surveying Ltd use electro-magnetic and/or ground penetrating radar (GPR) methods to investigate for underground utilities, services and features. Variations in ground conditions, depth and density of services and interference from surrounding features can affect the accuracies of the equipment used. As a result these methods are not infallible and we recommend that excavations are carried out to confirm any identifications, positions and depths.

Any areas on the drawing where services or features have not been shown are not necessarily clear of services or features but are an indication that no items have been identified during our investigations.

Cadmap Underground Utility Surveying Ltd have used all reasonable care to research available service records but the completeness or use of the service records supplied to or by Cadmap Underground Utility Surveying Ltd cannot be guaranteed. Therefore Cadmap Underground Utility Surveying Ltd cannot be held responsible for any features not stated as "Statutory Records"

All utility / service depths are in meters and are taken to the top of utility / service unless otherwise stated.

Drainage pipe sizes will be obtained without excavating the chamber and therefore should be treated as approximate as deep chambers. All pipe/pipe sizes are in mm unless otherwise stated. All pipe sizes are 100mm unless stated otherwise.

Underground services shown on this drawing are illustrated by a single service line. This single service line may actually represent multiple cables and /or ducts.

Cadmap Underground Utility Surveying Ltd accepts no responsibility for the completeness or accuracy of either the topographical survey or base mapping on this project.

All critical dimensions and measurements should be checked and verified with any errors or discrepancies notified to Cadmap Underground Utility Surveying Ltd immediately. The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated

The contractor must check and verify all site and building dimensions, levels, cellars and drainage details and connections prior to commencing work.

Do not scale from this drawing

LINE-TYPE KEY

Surface Water
Foul Water
Combined Sewer

ABBREVIATIONS

AAC		GV	Gas Valve
BH	Borehole	MC	Inspection Cover
BO	Bollard	LL	Invert Level
BK	Bollards	LV	Lamp Post
BT	British Telecom Cover	MH	Manhole
CAB	Cabinet	PE	Polyethylene
CATV	Cable Television Cover	RE	Rodding Eye
CC	Closed Circuit TV	OY	Outlet
CI	Cast Iron	SL	Silt Level
CL	Cover Level	STN	Survey Station
CS	Combined Sewer	SV	Stop Valve
DIA	Diameter	SW	Surface Water
DP	Down Pipe	TC	Top of Chamber Depth
ER	Earth Rod	UTL	Unable To Lift
UTT	Unable To Trace	UTP	Unable To Trace Further
BL	Blocked	OBV	Outlet Not Visible
PE	Polyethylene	CT	Obstructed Trace
EOT	End Of Trace		
North:			

SURVEY SUPPLIED BY OTHERS

Drawing Title:
Underground CCTV Survey

Site Address:
15 Chalcot Gardens,
Hampstead

Client:
Qickro

Surveyor	AP	Drawn By	CP	Verified By	SD	Date	03.09.20

CM No: CM/20/0428 Rev:

Scale: 1:50m @ A1 Date: September 2020

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Appendix C): Trail Pit Sketches SKTP1, SKTP2 and SKTP3

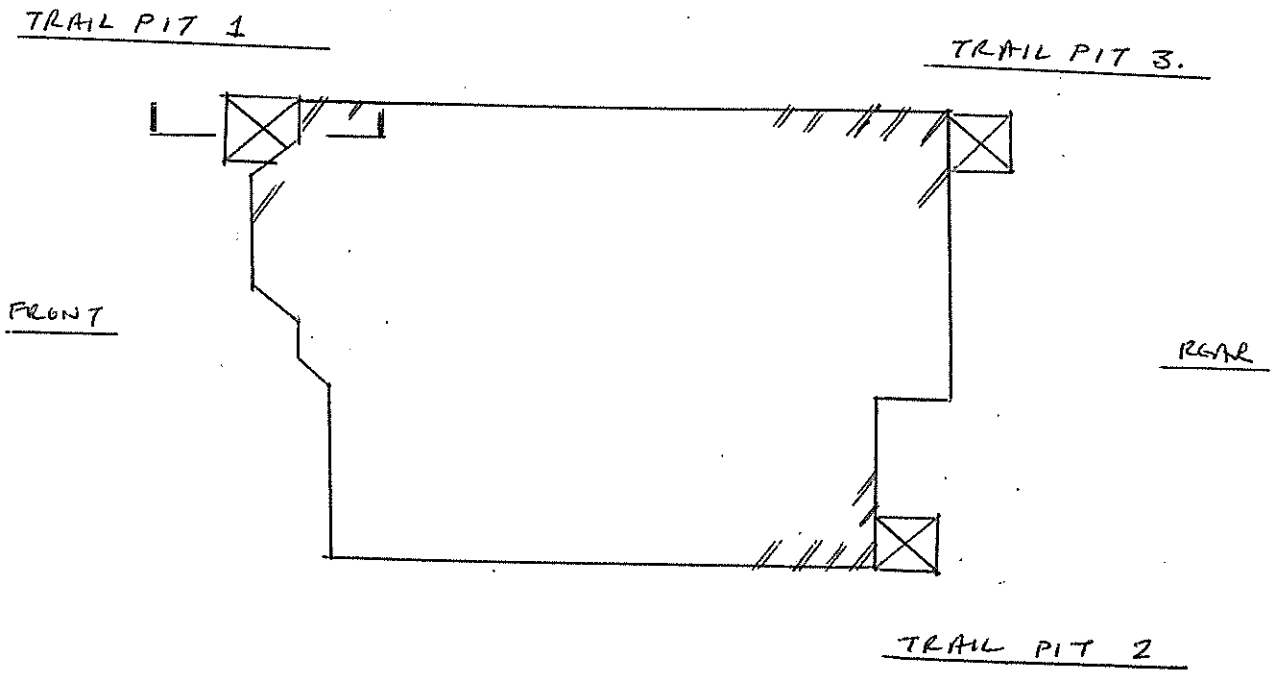
Job Title 15 CHALCOT GARDNS, NW3

Job No: 018 Date: AUG 2020

Sheet No: SKTP1

John Caine, C.Eng.
Structural Engineer

TRAIL PIT LOCATION PLAN



NOTE:

(1.) REFER TO SKETCHES SKTP2 & SKTP3 FOR TRAIL PIT LOGS.

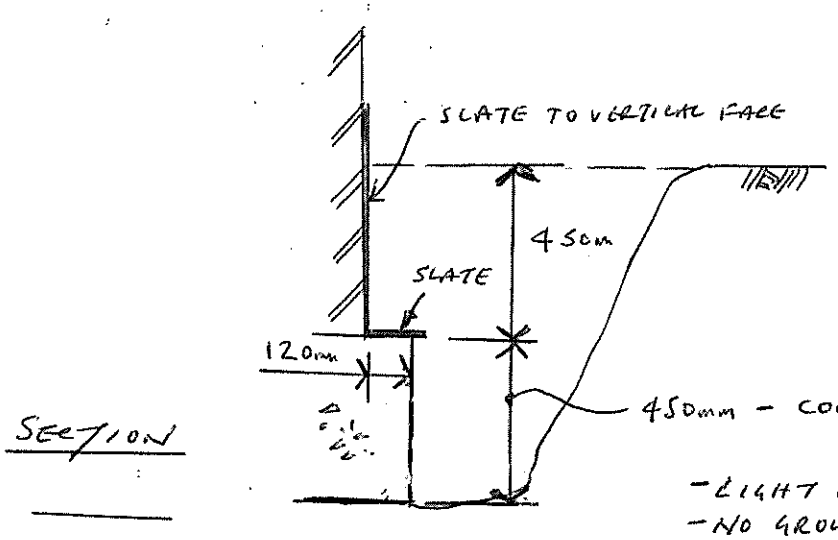
Job Title 15 CHALCOT GARDNS, NW3

Job No: OL Date: Aug 2020

Sheet No: SK TP2

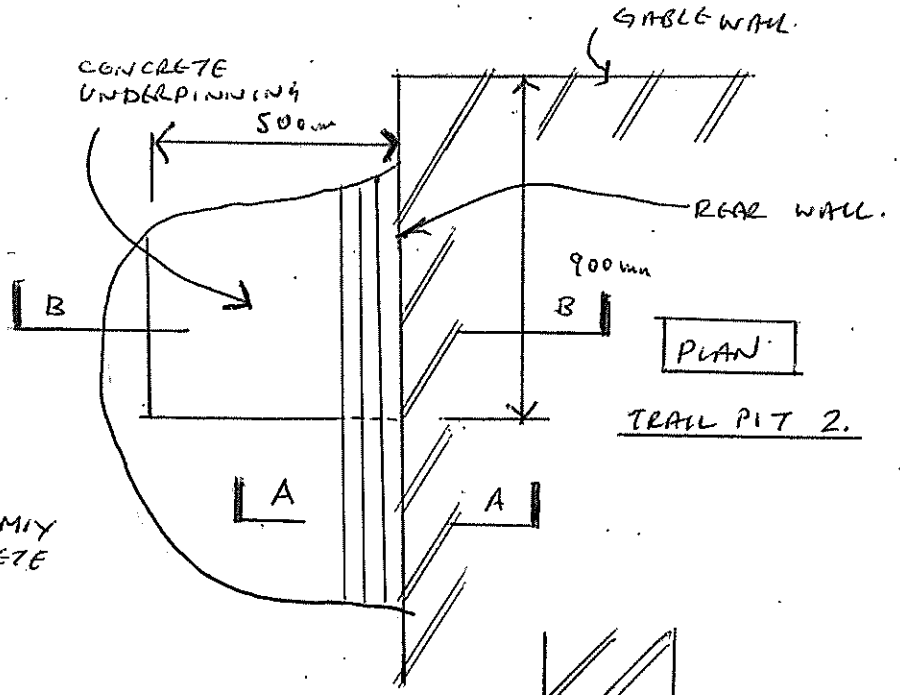
John Caine, C.Eng.
Structural Engineer

TRAIL PIT DETAILS



SECTION

TRAIL PIT 1.



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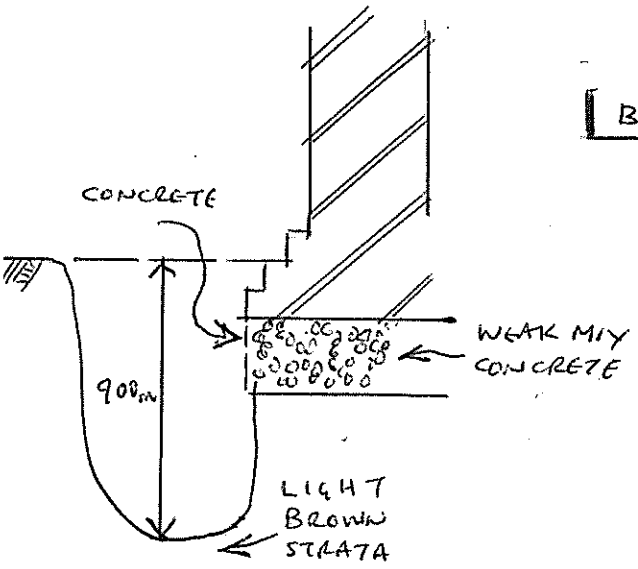
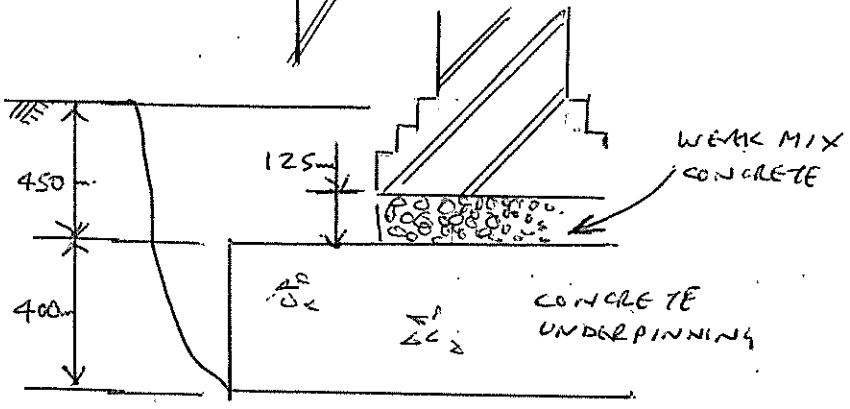


SECTION A-A

NOTE:-
NO GROUND WATER



SECTION B-B

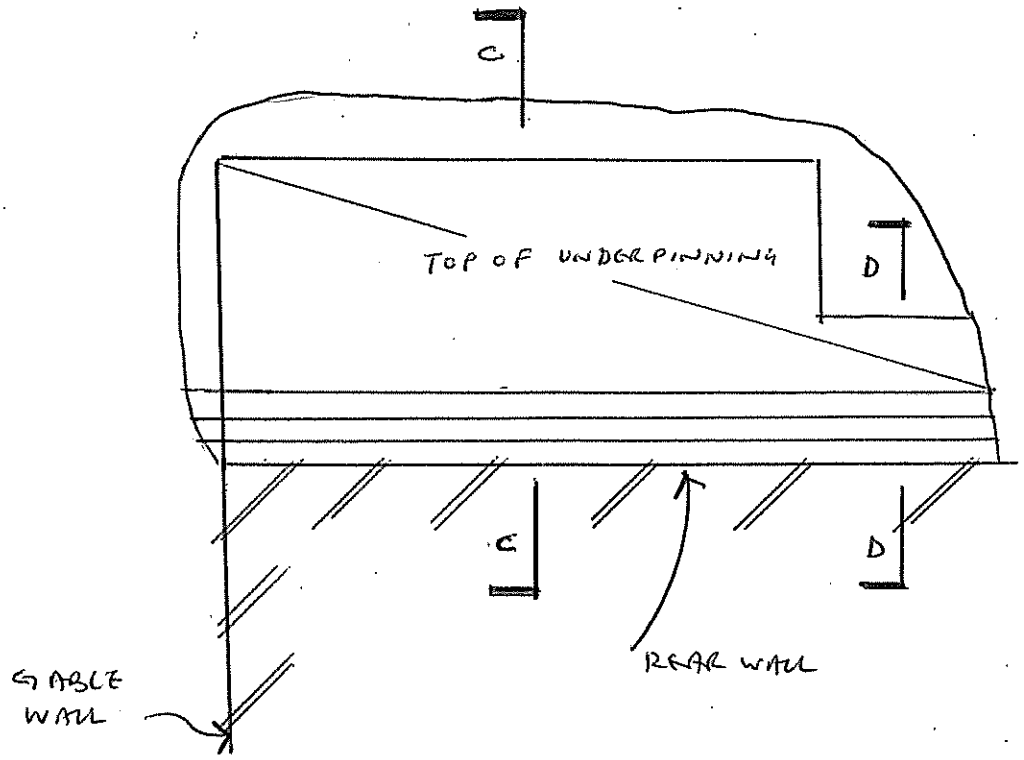
Job Title 15 CHALCOT GARDENS, LONDON NW3

Job No: Date: Aug 2020

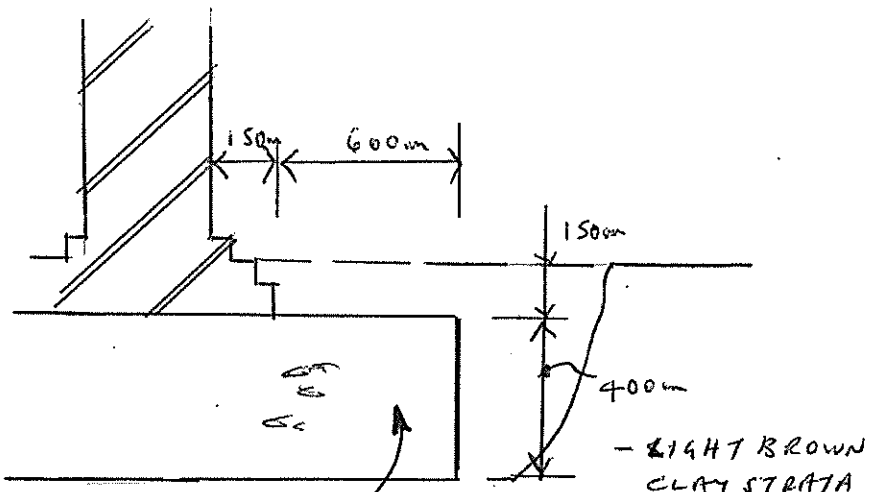
Sheet No: SKTP3

John Caine, C.Eng.
Structural Engineer

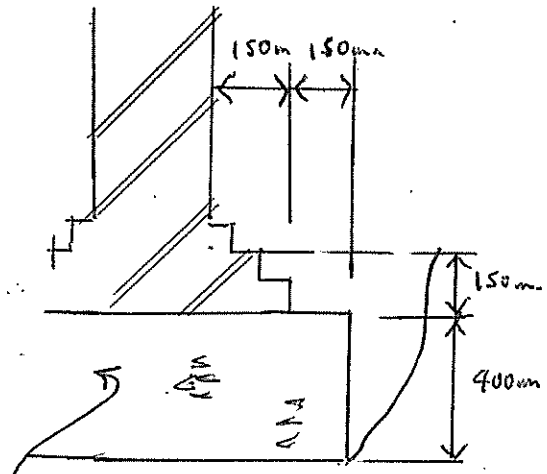
TRIAL PIT DETAILS



TRIAL PIT 3



Section C-C



Section D-D

NOTE:-

Appendix D): Underpinning drawing S1 -rev A and Sketches SK1 and SK2

Job Title 15 CHALCOT GARDENS, LONDON NW3

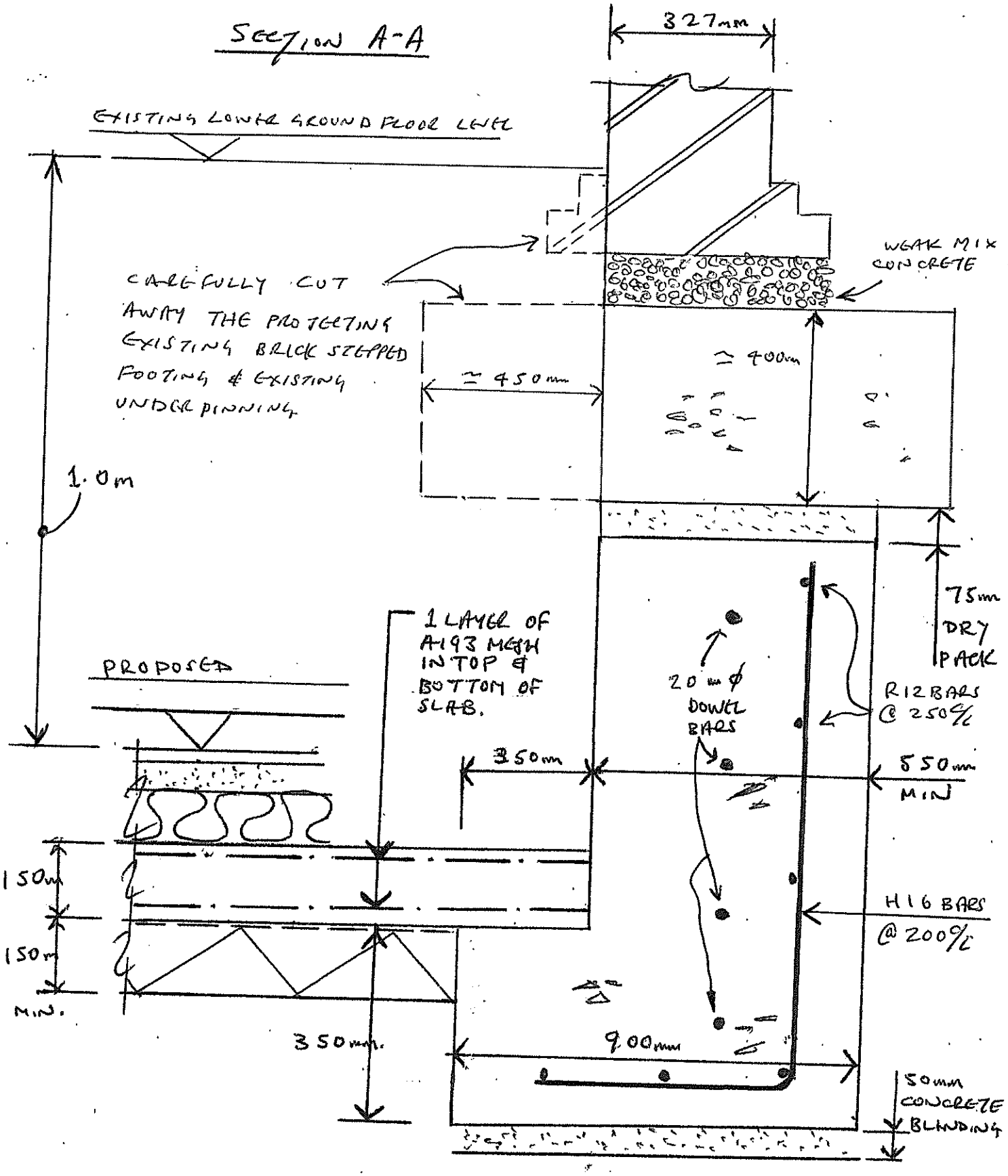
Job No: 0C8 Date: JULY 2020

Sheet No: SK1

John Caine, C.Eng.
Structural Engineer

TYPICAL EXTERNAL WALL UNDERPINNING DETAIL WHERE EXISTING UNDERPINNING IS PRESENT

SECTION A-A



Job Title 15 CHALCOT GARDNS, LONDON NW3

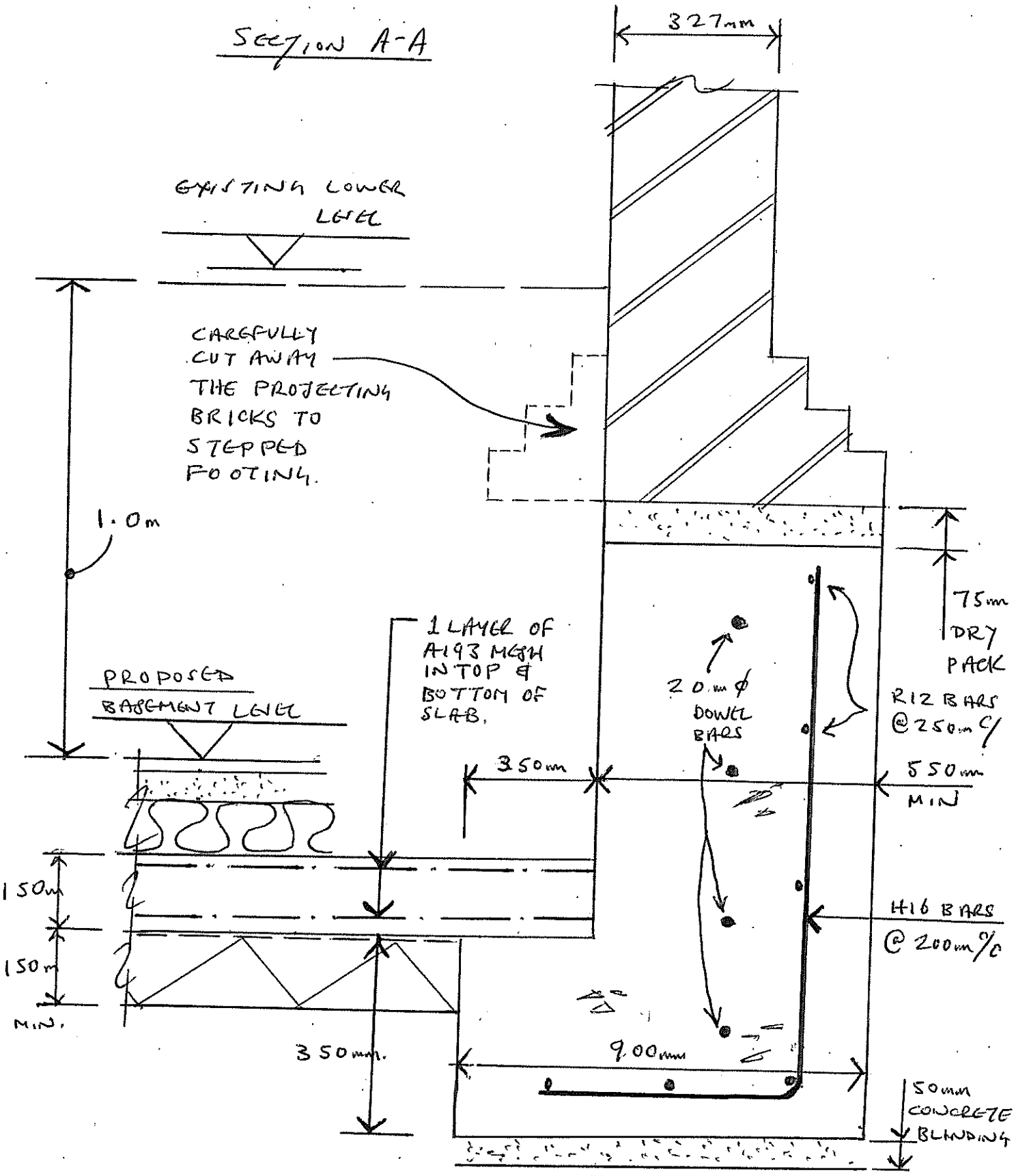
Job No: 0C8 Date: JULY 2020

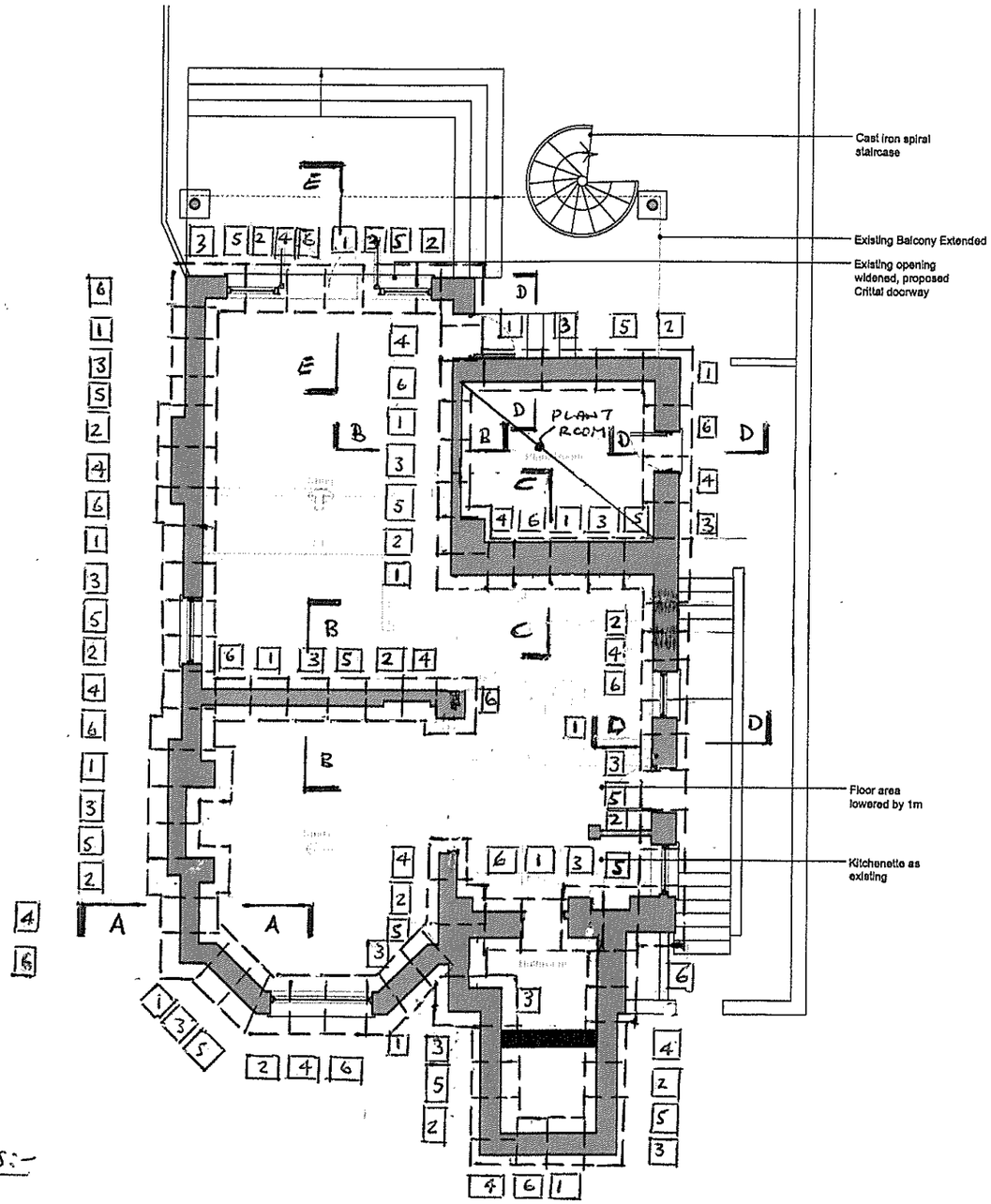
Sheet No: SK2

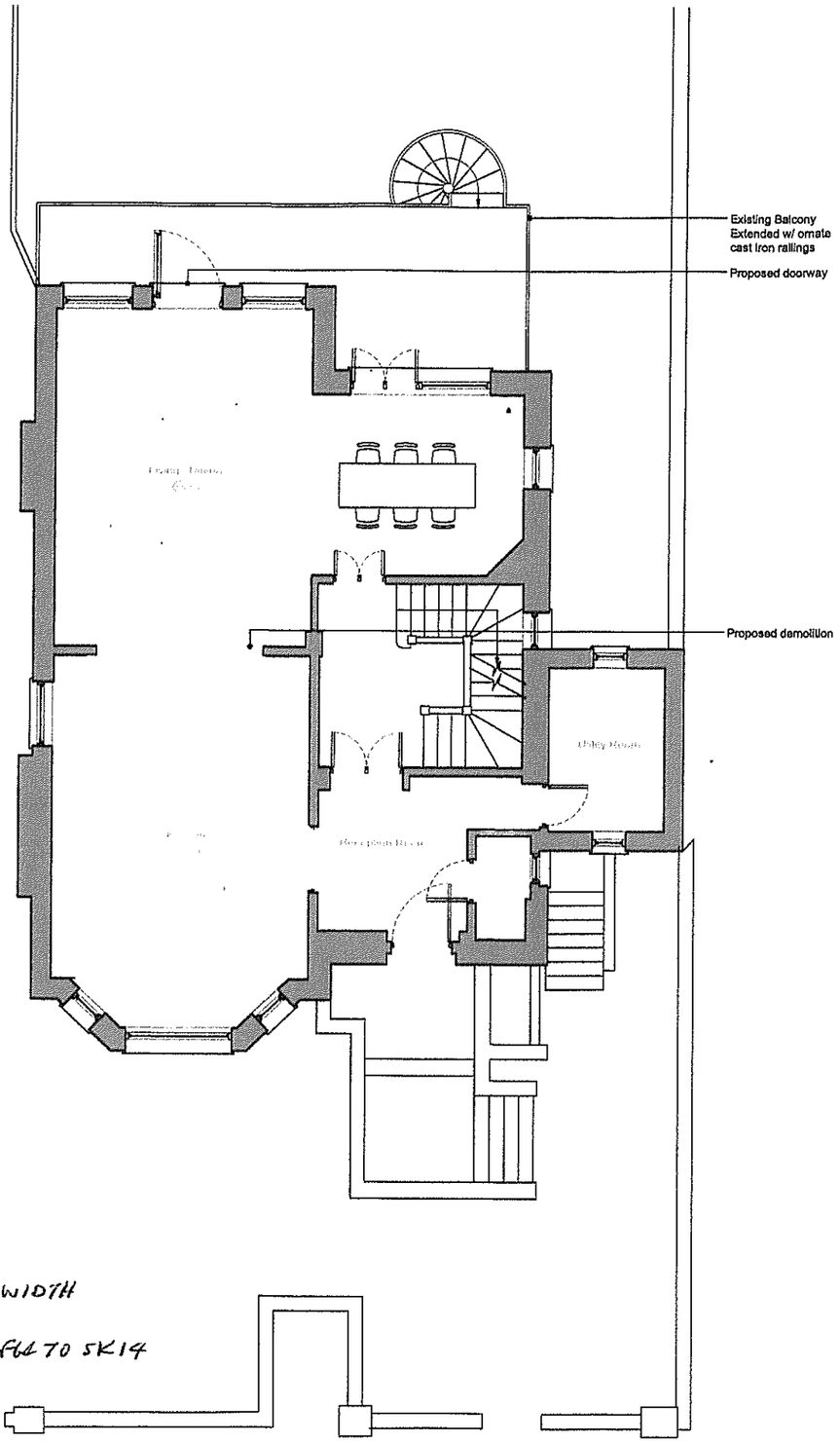
John Caine, C.Eng.
Structural Engineer

TYPICAL EXTERNAL WALL UNDERPINNING DETAIL WHERE EXISTING UNDERPINNING IS NOT PRESENT

SECTION A-A







NOTES

NOTES:-

(1) [6] INDICATES UNDERPINNING PIN NUMBER IN SUGGESTED SEQUENCE – 1·0m MAXIMUM PIN WIDTH

(2) REFER TO SKETCH SK7 FOR REINFORCEMENT & DOWEL DETAILS FOR UNDERPINNING. REFER TO SK14 FOR GENERAL NOTES FOR CONVENTIONAL UNDERPINNING.

(3) FOR SECTIONS A-A, B-B, C-C, D-D & E-E REFER TO SKETCHES SK2, SK3, SK4, SK5 & SK6.

(4) REFER TO SK13 FOR CONSTRUCTION ENGINEERS NOTES.

PROPOSED BASEMENT FLOOR

PROPOSED GROUND FLOOR

REV A: UNDERPINNING ADDED TO PLANT ROOF

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drawing title
Proposed Ground & Lower Ground Floor Plans

drawing status
Survey

scale	date	drawn by	checked by
1:50 @ A1 1:100 @ A3	24/05/20		

job no.	drawing no.	revision
20005	004	A

STRUCTURAL LAYOUT | S1

Appendix E): General Notes for Conventional Underpinning -SK3

1. All workmanship shall be in accordance with current British Standard requirements and shall comply with BS 8000: Workmanship on Building Sites.

2. Excavations shall be made by hand to the minimum depth show on the project drawings (specified in the tender enquiry) ensuring that no projections or foreign matter remains in the excavations. The required bearing strata will be stated on the project drawings. The required bearing strata will be stated on the project drawings and not less than 500mm below soil affected by root intrusion or leaking drains, or as otherwise directed by the Engineer.

3. Excavation shall be made from either or both sides of walls as necessary, or where arrows are shown the arrow is the designated side

4. Sides of excavations for underpinning/foundation construction are to be kept vertical and supported as necessary. Temporary supports to structures and propping of all excavations where necessary is to be designed and installed by the Contractor. The underside of all existing foundations shall be thoroughly cleaned of all debris and loose material prior to placing any concrete in the excavation.

5. All excavations for underpinning are to be bottomed-out immediately prior to the placement of concrete to avoid softening and deterioration of the founding stratum. Excavations are to be suitably protected during adverse weather conditions to prevent deterioration of the subsoil. Where adversely affected due to inadequate protection, the founding stratum shall be re-excavated to a firm base at no additional cost to the contract. If required the contractor shall utilise pumping to deep excavations free of water.

6. The Contractor shall plan a sequence of underpinning in maximum 1200mm long sections and shall ensure that not less than 3 days lapse between casting of a single underpin bay and the excavation of an adjacent bay. The Contractor shall submit his phasing proposals for the approval of the Engineer. The underpinning shall be sequenced such that no more than ¼ of the structure is unsupported at any time.

7. Underpins shall be cast to within a nominal 75mm of the underside of existing footings unless specified otherwise on the project drawings

8. The nominal 75mm gap between existing footings and new underpin bases shall be packed with a 3.1 sand/cement semi dry pack mix, well rammed by hand into place once the concrete underpin bases have adequately hardened. Hand ramming shall not be undertaken for a minimum of 24 hour after the casting of the underpin and a further 48 hours should elapse prior to excavation of immediately adjacent underpinning bays.

9. Shuttering which may have been used in forming underpinning bases shall be removed prior to backfilling of working spaces unless approved by the Engineer as suitable permanent shuttering.

10. Working spaces adjacent to underpinning shall be backfilled with "approved suitable material arising from excavations" (see note 11 below) or where indicated otherwise on the drawings. Backfilling shall be in layers not exceeding 250mm.

11. Working spaces adjacent to underpinning beneath paths and supported floor slabs shall be backfilled with approved granular sub-base material placed in layers not exceeding 150mm and compacted used a wacker plate or similar. The Contractor may alternatively use compacted lean mix concrete to backfill voids.

12. "Suitable material arising from excavations" shall exclude loose granular and weathered softened or saturated cohesive materials, organic and deleterious material and other materials considered unsuitable by the Engineer. If required, suitable material approved by the Engineer shall be imported.

13. Drains and statuary services encountered in excavations are to be supported and protected during works, and where they cross underpin bays, flexible jointed split ducts are to be inserted for the full width of the underpin.

14. Unsuitable and excess material shall be removed form site.

15. It is the Contractors responsibility to ensure that the Local Authority is given adequate notice of inspections as the works progress.

16. The Contractor shall ensure that all excavations and other works on site shall be in accordance with current Health and Safety legislation and, where provided, the Health and Safety Plan and/or Hazard/Risk sheets issued with the tender document.

17. Shear keys or dowel bars shall be cast into the vertical side of underpins below the existing foundations to provide an adequate key. As a minimum Contractors shall allow for 6 number 12mm diameter mild steel dowels 900mm long in each face equally embedded into each base unless specified otherwise on the project drawings minimum cover to dowel bars to be 75mm

18. Unless specified otherwise on the project drawings, mass concrete underpinning shall be a standard mix type ST4 (20N strength) in accordance with BS 5328: Part 2: 1997: Methods for Specifying Concrete Mixes. The mix shall utilise 20mm maximum aggregate and have 75mm slump with a minimum cement content of 300kg/m'. Cement shall be Ordinary Portland Cement for granular soils and Sulphate /Resisting Cement to BS 4027 for clay soils unless specified otherwise

19. Unless specified otherwise on the project drawings concrete for reinforced elements shall be designated mix type RC35 (35N strength, moderate exposure) in accordance with BS 5328: Part 2: 1997: Methods of Specifying Concrete. Mixes shall utilise 20mm maximum aggregate, minimum cement content of 300kg/m' and maximum free water/cement ratio of 0.6. Cement shall be ordinary Portland Cement to BS 12 unless specified otherwise. Cover to reinforcement shall be as specified on the project drawings.

20. The new underpins shall be cast to the minimum width specified on the project drawings. Anti heave measures and slip membranes when required will be specified on the project drawings. Where specified anti-heave measures shall be placed to the internal and/or external faces of the new underpin as indicated on the project drawings and shall be outside the line of the existing foundations.

21. Where required, hardcore shall be a well graded (75mm to dust) chemically inert granular materiel (not demolition rubble) free from deleterious materials. Hardcore shall be compacted in layers not exceeding 150mm in thickness using suitable plant to achieve 95% compation. Selected excavated material may be used subject to prior agreement with the Engineer

Title:

GENERAL NOTES FOR CONVENTIONAL UNDERPINNING

John Caine, C.Eng.

Structural Engineer

Scales: N/A	Drg No.	Rev:
Date: JULY 2020	SK3	