



12 CROMWELL AVENUE

LONDON N6 5HL

STRUCTURAL METHODOLOGY STATEMENT

**PREPARED FOR
PAUL SIMON HOMES**

Date: OCTOBER 2023

**Ref: 19435
Prepared by: DO
Checked by: DG**

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1 Brief

- 1.1 The Structural Engineering design brief was to produce a structural methodology statement and a feasibility study into creation of a new formal basement and rear extension to an existing two storey semi-detached house at 12 Cromwell Avenue, London N6 5HL. The existing building is a two storey (ground and first) house. The house sits on a site which is approximately level with the public highway to the front and which is roughly level between the front and rear of the site.



(Figure 1: Aerial view of site)

- 1.2 To the right side of the site, the house shares a party wall with 10 Cromwell Avenue, whilst to the right side the building is separated from 14 Cromwell Avenue by a driveway which gives access to 14A Cromwell Avenue, a house of newer construction (construction date unknown) which is set back from the road.
- 1.3 The proposed works will involve the conversion of the existing cellar space beneath the main body of the house into a fully habitable area. These works will include increasing the floor-to-ceiling height by approximately 800mm. At the rear of the building a new patio at the level of the basement will be created. A new lightwell at the front of the house will provide light into the new basement space. The works will require limited structural alterations to the superstructure to suit minor internal alterations.
- 1.4 This report is to be read in conjunction with the following reports and drawings:
 - Halstead Associates Drawing No. 19435/PL01, Basement Plan October 2023
 - Halstead Associates Drawing No. 19435/PL02, Underpinning Sections October 2023
 - Site Analytical Services Geotechnical Desk Study Ref. 23/37377 September 2023
 - Site Analytical Services Basement Impact Assessment Ref. 23/37377-2 September 2023

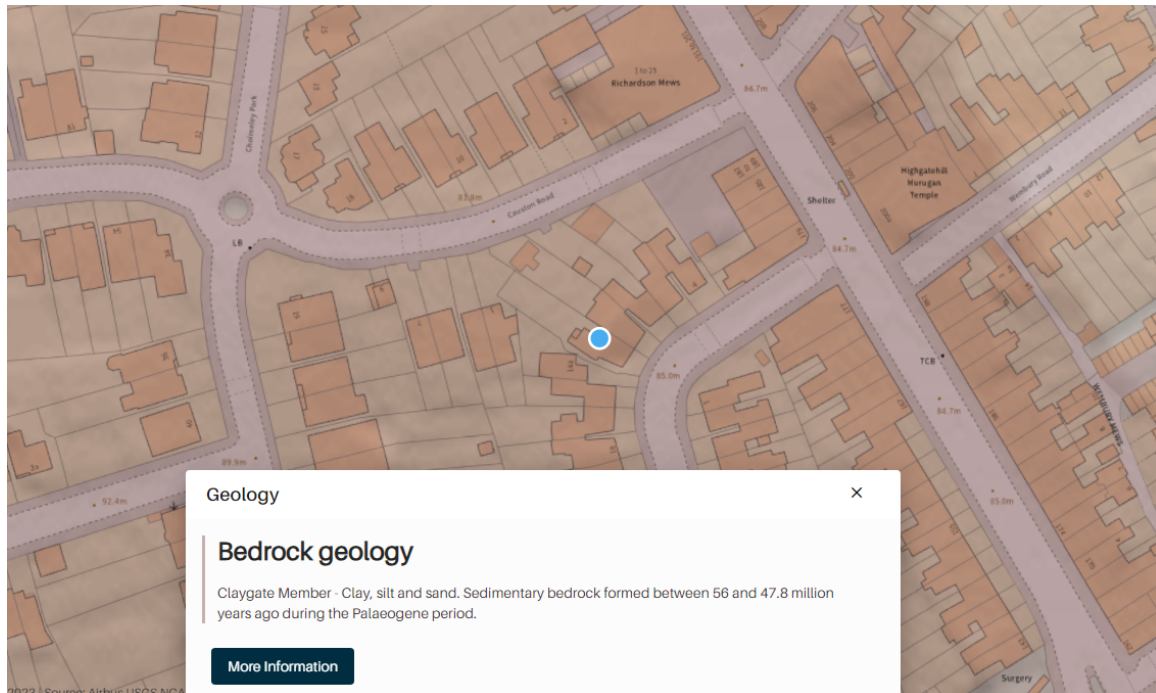
2 Screening

2.1 Structural Stability Screening Assessment

I.	Does the proposed basement involve underpinning of the existing building?	Yes
II.	Does the proposed basement extend lower than the adjacent structure to the right?	Yes
III.	Does the proposed basement extend lower than the Party Wall to the left?	N/A
IV.	Does the proposed basement extend below the Party Wall footing level to the right?	Yes
V.	Does the proposed basement extend lower than the building structure to the left?	Yes
VI.	Does the proposed basement undermine the public highway?	No

3 Site Investigation

- 3.1 This assessment has been informed by the results of a site investigation report prepared by Site Analytical Services Ltd (SAS), dated September 2023, together with a Geotechnical and Hydrological Basement Impact Assessment. These have shown that the proposed basement will not affect the existing ground water regime, and that the existing groundwater levels are expected to be below the level of the proposed basement floor with only localised pockets of surface water possible to appear following a heavy rainfall.
- 3.2 The British Geological Survey indicates that the site is directly underlain by solid deposits of the London Clay Formation, with potentially sacrificial deposits of made ground. The SAS investigations included two boreholes, one at the front of the building and one at the rear. Both boreholes found stiff clay at 1.8m-1.9m below external ground level. The existing cellar floor is circa 1.5 metres below the external ground level, with the existing footings found to be at least 700mm below the floor of the cellar (refer to trial pit sections). The building is therefore currently well supported on sound loadbearing strata and will continue to be supported following the works to the basement.



BGS extract

- 3.3 The Claygate Member soil strata is a generally stable material and not typically prone to collapse in short term excavations. Notwithstanding, in line with good construction practice, temporary shoring will be required in all underpinning excavations below the existing building.
- 3.4 No adverse groundwater conditions would be expected to occur which would significantly affect either construction of the new basement area or the completed structure. Groundwater was not encountered in the boreholes either during the initial drilling, nor was it encountered during the return monitoring visits to the property. Notwithstanding, the rate of flow of any ground water encountered would likely be low and slow moving owing to the cohesive nature of London clay. Excavations for the underpinning would not, therefore, be impacted by groundwater, with any inflows being controlled by localised pumping.
- 3.5 The depth of the excavations to form the new increased headroom to the basement area are such that ground recovery due to the removal of overburden is expected to be minimal. It is therefore considered appropriate to form the new floor with a groundbearing concrete slab of nominal thickness (approx. 150mm). The slab will be lightly reinforced to resist any shrinkage cracking.
- 3.6 To the front of the property an open excavation will be employed during the formation of the lightwell. There is sufficient space for the earth to be battered back to a safe angle. The contractor may need to consider limited temporary shoring for the section of the excavation closest to the boundary with 10 Cromwell Avenue to ensure that ground stability is maintained at all times.
- 3.7 The proposed excavations will be more than 3.0m of a public pavement, which is far enough to avoid traffic surcharge from the road or the light pavement traffic to the front cantilever retaining wall.
- 3.10 The party wall on the right hand side of the property is shared with No. 10 and will need to be underpinned. On the left hand side, the footings of the adjacent buildings, No. 14 and 14a Cromwell Avenue, are approximately 5.2 metres and 3.7 metres respectively away from the underpinning works. On this basis neither property is expected to be affected by the works. Additionally, neither property is sufficiently close for the surcharge loads from their foundations to be considered in the design of the underpinning.
- 3.11 The proposed increase in overall height of the basement is 800mm. Mass concrete underpinning will therefore be appropriate and it will not be necessary
- 3.12 According to the SI report, it is considered that deterioration of buried concrete due to sulphate or acid attack is likely to occur and that concrete is to be designed to ACEC Class AC-2s.

4 Formation of New Lowered Floor

- 4.1 The new finished floor level is to be set 800mm below existing, with the total floor build up being in the order of 325-350mm. The formation level will therefore be around 1150mm below the existing floor level. The base of the existing footings, as established via trial pit excavations, is 600mm and as such the entire footprint of the basement is to be underpinned. This will involve carrying out local excavations of around 1.0 -1.2m in width in a hit and miss sequence.
- 4.2 The sequencing of this work would be such that no more than 20% of a single wall elevation would be excavated at any given time. At the required excavation depth, limited shoring will be required to support earth faces.
- 4.3 The existing footing incorporates a mass concrete strip. This will assist in providing support to the brickwork above, thus limiting the risk of any loose overhead brickwork falling into the excavation and onto site operatives.
- 4.4 Shuttering will be required to the front face of the underpinning to create a finished line which is flush with the existing brickwork above. Concrete will be poured over and behind the shuttering up to a level approximately 75mm below the underside of the existing concrete strip. The remaining gap will be filled with dry pack mortar, which will cover the full width of the wall.
- 4.5 The suggested sequencing will involve underpinning to the internal loadbearing walls first, followed by underpinning on an area-by-area basis. As each area is completed then the reinforced concrete floor slab can be cast. The slab will act to prevent any possible lateral shift in the underpinning due to external earth pressures.
- 4.6 The Contractor will provide a method statement prior to commencement of work on site in which full details of hours, site set up and method for the formation of mass concrete underpinning sections will be detailed.

5 Formation of Rear Patio

- 5.1 The new rear patio is to be set approximately 1200mm below the current external levels in this area. The perimeter walls of the patio will therefore need to be formed in reinforced concrete, including those along the boundary line with 10 Cromwell Avenue.
- 5.2 The boundary wall is relatively short, at approximately 3.5 metres. Notwithstanding, a sequenced underpinning type approach will be adopted to ensure that overall ground stability is maintained at all times. Three pin sections are expected to be required.
- 5.3 The sequencing works to each pin is expected to be as follows:
- Excavate to formation level and install timber shoring to earth faces. Excavation to be large enough to cast full extent of wall base but not to be overdug.
 - Fix rebar for base slab (mesh reinforcement expected to be utilised – subject to detailed design). Include starter bars for wall stem. Cast concrete.
 - Fix rebar for wall stem and install front shutter. Cast concrete.
 - Repeat above for each pin. Adjacent pins to be tied together with dowel bars.
- 5.4 A similar approach will be required on the left side of the patio, where the new wall will sit directly under the flank wall of the rear outrigger of the house.

6 Ground Movement & Predicted Damage Category

- 6.1 Any ground works pose an elevated risk to adjacent properties. The proposed works undermines the adjacent property along the Party Wall line.
- 6.2 It is not expected that any cracking will occur during the works. However, our experience informs us that there is a risk of movement to the neighbours.
- 6.3 The adjoining property at 10 Cromwell Avenue is expected to have a similar basement/cellar area to that at No. 12. The impact of creating a slightly deeper foundation to No. 12 is therefore expected to be negligible with respect to differential movement.
- 6.4 To reduce the risk to the development:
- Employ a reputable firm for extensive knowledge of basement works.
 - Employ suitably qualified Consultants. Halstead Associates have extensive experience with basement constructions.
 - Provide method statements for the Contractors to follow.
 - Investigate the ground (refer to Site Analytical Services reporting).
 - Record and monitor the external properties. This would be done by a condition survey under the Party Wall Act before and after the works are completed.
- 6.5 The maximum level of cracking anticipated is Hairline cracking which can be made good with decorative repairs by the appointed contractor. Under the Party Wall Act damage is allowed (although unwanted) to occur to a neighbouring property as long as repairs are suitably undertaken to rectify this. To mitigate this risk, the Party Wall Act is to be followed and Halstead Associates can be appointed to act in this respect.

6.5 Burland Scale:

Extract from The Institution of Structural Engineers “Subsidence of Low-Rise Buildings”
Classification of visible damage to walls with particular reference to type of repair and rectification consideration.

Category of damage	Approximate crack width	Limiting tensile strain	Definitions of cracks & repair types / considerations
0	Up to 0.1	0.0 – 0.05	HAIRLINE – Internally cracks can be filled or covered by wall covering and redecorated. Externally, cracks rarely visible & remedial works rarely justified
1	0.2 to 2	0.05 – 0.075	FINE – Internally cracks can be filled or covered by wall covering, and redecorated. Externally, cracks may be visible, sometimes repairs required for weather tightness or aesthetics. NOTE: Plaster cracks may, in time, become visible again if not covered by a wall covering.

7 Monitoring

- 7.1 Visual movement monitoring, level of monitoring and reporting strategy required are to be agreed subject to a Party Wall Surveyor's consultation before the works commence on site.

8 Waterproofing

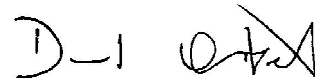
- 8.1 As this form of construction will not allow external damp proofing systems to be employed, it is envisaged that the Architect will opt for a proprietary drained cavity system to line the face of the retaining wall and slab. Any inflow of ground water which may result would then be directed to an internal sump and then pumped as necessary into the surface water system.

9 Party Walls

- 9.1 Given the proximity of adjacent buildings, Party Wall Agreements will be required with neighbouring home owners. Halstead Associates can be appointed to act on behalf of the Building Owner, thus providing a coordinated approach to the proposed works.

10. Temporary Works

- 10.1 The depth of the excavation works, along with the availability of working space within the existing basement, are such that involved temporary works are not expected to be required.
- 10.2 A competent contractor with experience with this type of construction will be expected to be able to provide a suitable approach to the shoring of underpinning excavations, which are expected to be no more than 1.5 metres below the existing basement floor level.
- 10.3 Whilst suggestions have been provided with this document for the sequencing of the works, it will be the responsibility of the Contractor and Temporary Works co-ordinator to provide detailed proposals for the methodology for the Structural Engineer and design team to review.

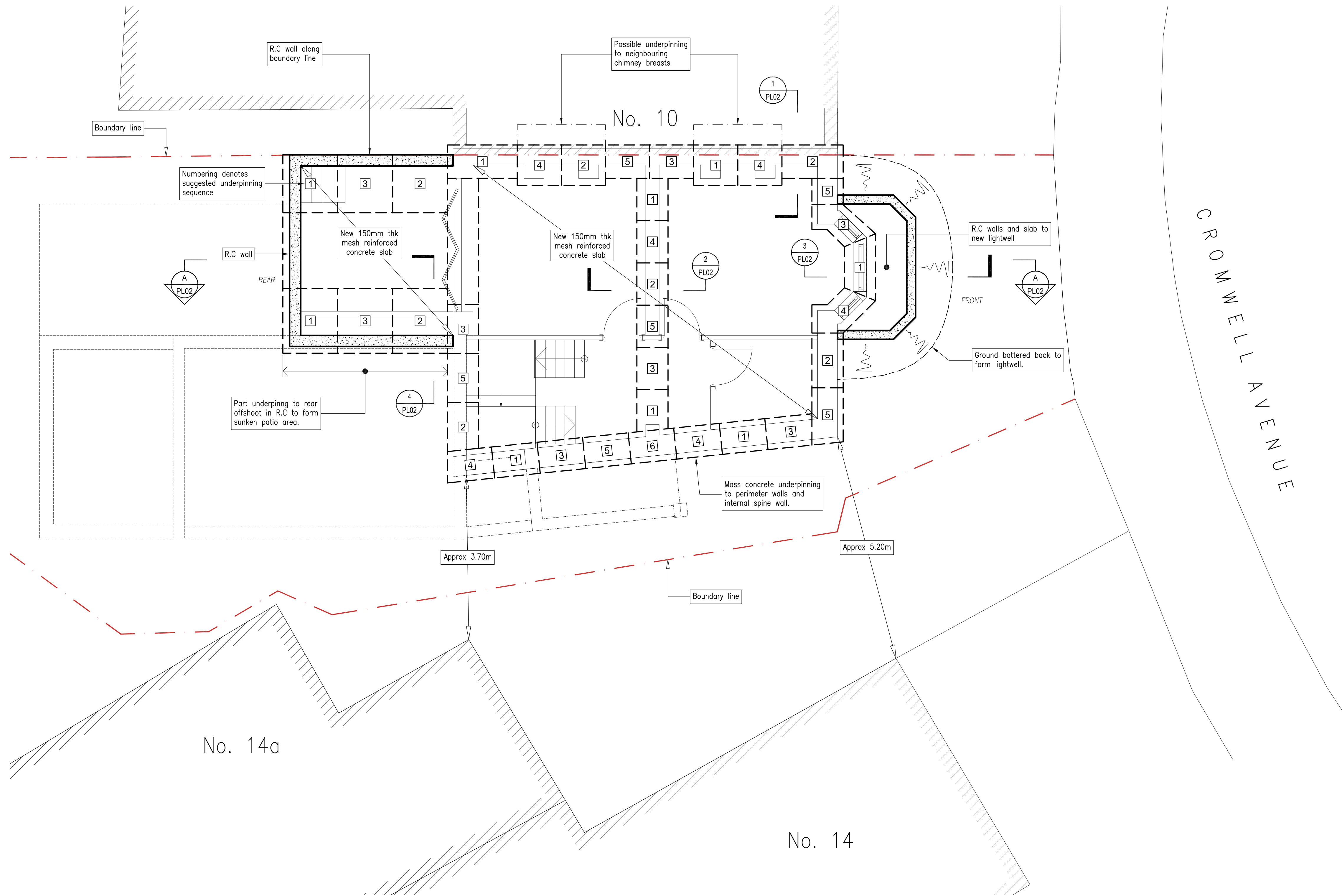


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David Oates CEng BEng (Hons) MStructE

11 Appendix A – Drawings

1.1 Halstead Associates Drawing No:

- 19435/PL01 – Basement Plan
- 19435/PL02 – Basement Sections

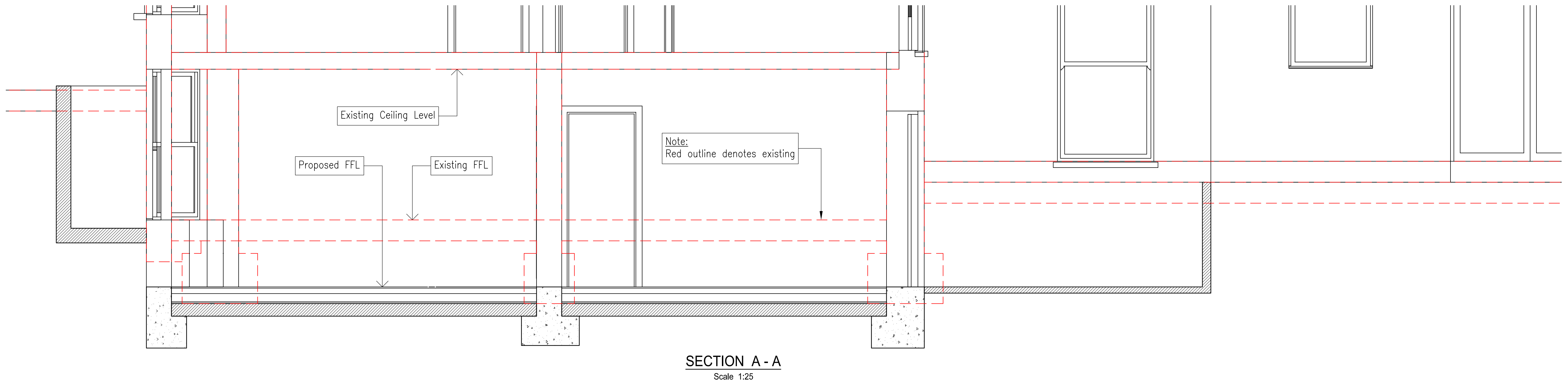
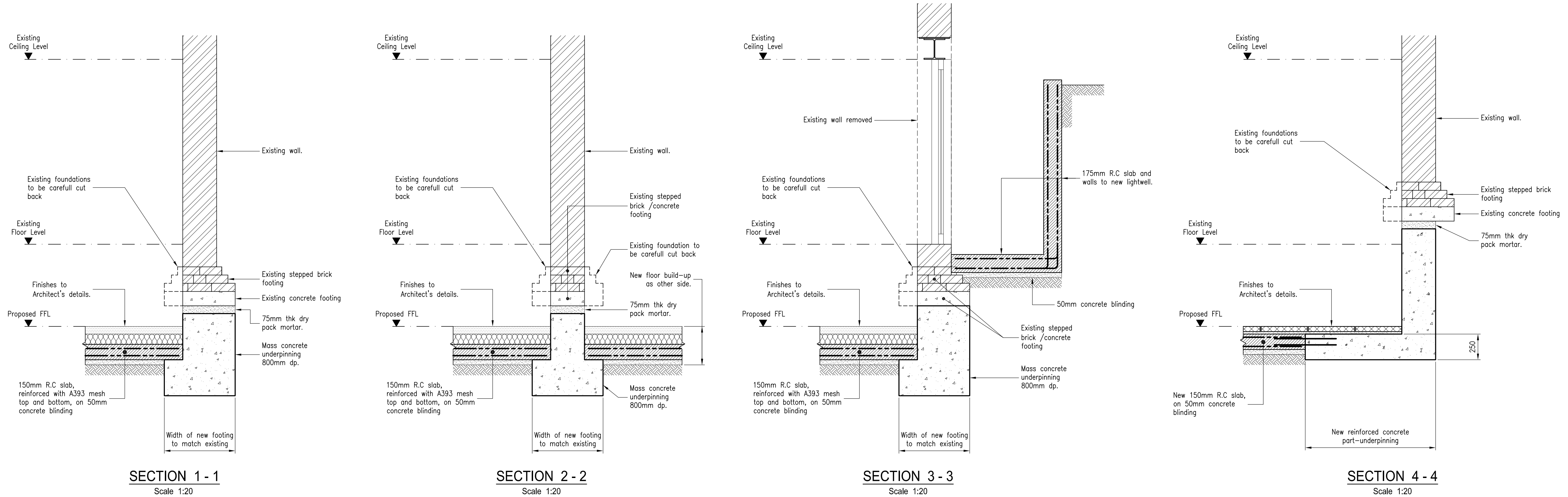


Rev.	Date	Revisions	By	Engineer

Notes:
1. The drawing is to be read in conjunction with all relevant Consultant's drawings and specifications.

PRELIMINARY

Project:	12 CROMWELL AVENUE, LONDON, N6 5HL	Drawn by:	KS
Title:	GA BASEMENT FLOOR PLAN	Checked by:	DO
Client:	Paul Simon Homes	Date:	October 2023
Architect:		Scale:	1:50 @ A1
 HALSTEADS est. 1972	CONSTRUCTION CONSULTANTS 1 Athenaeum Road, Whetstone, London, N20 9AA	Main Office: 020 8445 7721 office@halsteads.co.uk www.halsteads.co.uk	
		Drawing No:	19435/PL01



Rev.	Date	Revisions	By	Engineer

Notes:
1. The drawing is to be read in conjunction with all relevant Consultant's drawings and specifications.

PRELIMINARY

Project: 12 CROMWELL AVENUE, LONDON, N6 5HL	Drawn by: KS
Title: BASEMENT SECTIONS	Checked by: DO
Client: Paul Simon Homes	Date: October 2023
Architect: KS	Scale: As Shown @ A1
 HALSTEADS est. 1972	CONSTRUCTION CONSULTANTS 1 Athenaeum Road, Whetstone, London, N20 9AA Main Office: 020 8445 7721 office@halsteads.co.uk www.halsteads.co.uk
Drawing No: 19435/PL02	