halstead ASSOCIATES

2 & 3 AKENSIDE ROAD

LONDON

NW3 5BS

STRUCTURAL FEASIBILITY STUDY

FOR PROPOSED BASEMENT EXTENSIONS

Ref: 15773/DO/mf

Date: FEBRUARY 2015

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1.00 BRIEF

1.01 The Structural Engineering design brief was to produce a feasibility study into the formation basement extensions to a pair of existing three storey (ground, first and second) semi-detached houses. The basements will be formed under the full footprint of each house and will also extend into the rear garden of each.

1.02 This Report is to be read in conjunction with Halstead Associates Drawing Nos. 15773/FS01, FS02, FS03 and FS04.

1.03 This report is also to be read in conjunction with Site Analytical Services reports as follows:

Basement Impact Assessment - Ref: 14/22906-2
Report on a Ground Investigation – Ref: 14/22906
Phase I Preliminary Risk Assessment – Ref: 14/22906 – 1

2.00 SITE INVESTIGATIONS

2.01 A geotechnical investigation was carried out in December 2014, which incorporated two 8m deep boreholes (one in the front driveway of No. 2 Akenside Road and the second in the rear garden of No. 3 Akenside Road). Also included in the investigative works were the installation of standpipes within the boreholes to allow for monitoring of the groundwater.

2.02 This boreholes revealed a thin covering of made ground, in the order of 700mm thick over a narrow band of Coarse Sand (400mm thick in Borehole 1 only) and very stiff sandy clay below, extending to the full extent of the borehole.

2.03 Groundwater was not initially encountered within Borehole 1, whilst within Borehole 2 a seepage was noted at 4m below ground level. Subsequent monitoring over a 5 week period within the boreholes found groundwater to have stabilised at depths of 2.68m and 1.85m below ground level in Boreholes 1 and 2 respectively.

3.00 BASEMENT FORMATION

3.01 It is expected that the basements would be formed using two different methods of construction depending upon their locations on the site. Underneath the footprint of each building, it would be necessary to form the basement by constructing panels of insitu reinforced concrete retaining wall, incorporating a section of the basement slab for lateral stability, in maximum 1m wide panels. These panels would be constructed in a pre-determined sequence in a similar way to a traditional underpinning operation, as noted on Drawing No. 15773/FS01. By doing so, any risks of the existing building above ground level being affected by the works would be minimised.

3.02 The formation level for each basement excavation would likely be in the order of 3 - 3.5m below existing ground floor levels. It is likely, therefore, that the excavations would be within the depth of the groundwater when referring to previous Section 2.03, and it is therefore likely that local pumping out of excavations would be required.

3.03 In line with good health and safety practice all excavations would be fully shored and propped during the excavation of material and the fixing of reinforcement bars prior to the casting of concrete.

3.04 Outside the footprint of the buildings it is envisaged that the basement would be formed by first casting a line of contiguous piling around the perimeter, which would subsequently act as a retaining wall to enable the excavation of soil in these areas. Prior to soil excavation a reinforced concrete capping beam would be cast along the length of the contiguous piling in line with current standard practice.

3.00 BASEMENT FORMATION (Cont'd)

It is expected that the design of the contiguous piling would be such that the piles would act as free cantilevers to avoid the need for temporary propping which would only serve to complicate the basement works. Following the excavation down to basement formation level, a reinforced concrete slab would be cast, along with integral reinforced concrete facing wall against the contiguous piling.

3.05 In order to link the two sections of basement works it would be necessary to install steel beams and columns underneath the main rear wall of the existing house. The timing of these works would be such that they would follow the underpinning to the main house but would be carried out before the excavation of the contiguous piled section of the basement works.

3.06 At 3 – 3.5m depth down to formation level, it is not expected that the recovery of the over consolidated clays would be significant. Notwithstanding, the basement slab to the works would be designed to resist both soil heave pressures and also theoretical groundwater pressures.

4.00 WATERPROOFING

4.01 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 internal face of the retaining walls and basement slab. Any inflow of groundwater that may result would then be directed to an internal sump and then pumped as necessary into the surface water system.

5.00 PARTY WALLS

5.01 Party Wall Agreements may be necessary, depending upon the proximity to adjacent buildings.

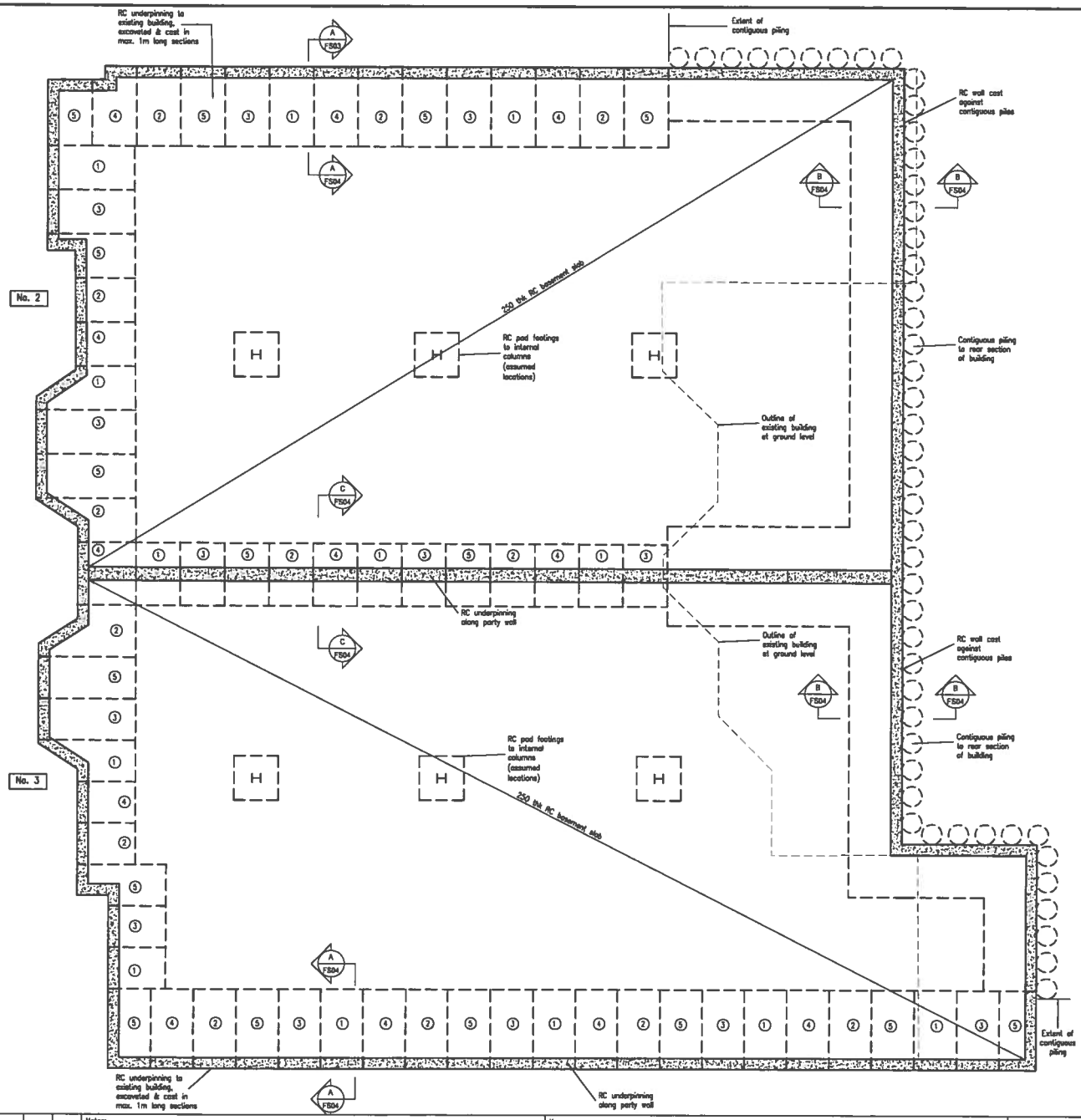
6.00 TEMPORARY WORKS

6.01 A competent Contractor, experienced in this form of residential basement construction must be used, and a Temporary Works Coordinator should be employed to ensure that the stability of the ground and adjoining buildings is maintained though out the construction process.

David Oates CEng BEng (Hons) MIStructE

APPENDIX A

Halstead Associates Drawing Nos. 15773/FS01, FS02, FS03 and FS04.



Rev.	Date	Revisions	By	Engineer

Notes:
1. The drawing is to be read in conjunction with all relevant Consultant's drawings and specifications.
2. For general notes, refer to Drawing No.

Key:
1.

FOR INFORMATION

Project: 2 & 3 AKENSIDE, LONDON, NW3 5BS
Title: PROPOSED BASEMENT PLAN & UNDERPINNING
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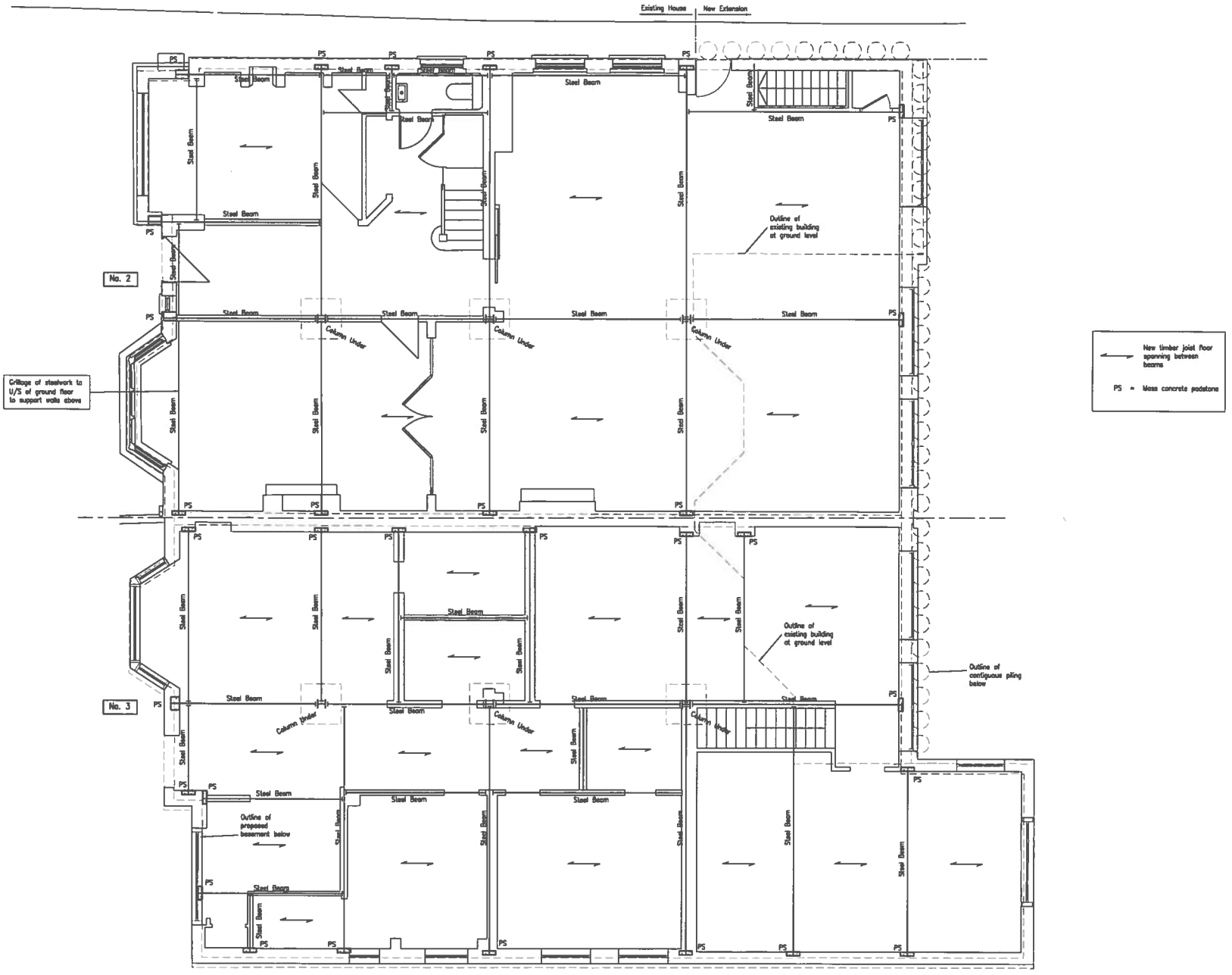
Drawn by:	JL
Checked by:	DO
Date:	Feb. 2015
Scale:	1:50 @ A1 U.N.O
Drawing No:	15773/FS01



Rev.	Date	Revisions	By	Engineer

Notes:
1. The drawing is to be read in conjunction with all relevant Consultant's drawings and specifications.
2. For general notes, refer to Drawing No.

Key:
1.

FOR INFORMATION

Project: 2 & 3 AKENSIDE, LONDON, NW3 5BS	Drawn by: JL
Title: PROPOSED GROUND FLOOR PLAN	Checked by: DO
Client:	Date: Feb. 2015
Architect:	Scale: 1:50 @ A1 U.N.O
halstead ASSOCIATES CONSTRUCTION CONSULTANTS	Drawing No: 15773/FS02

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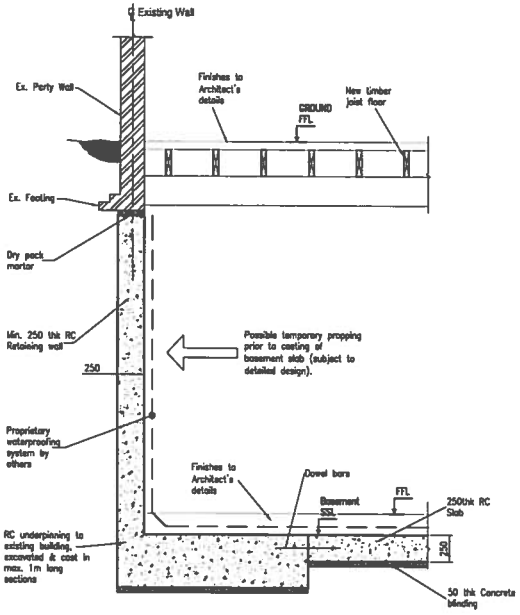

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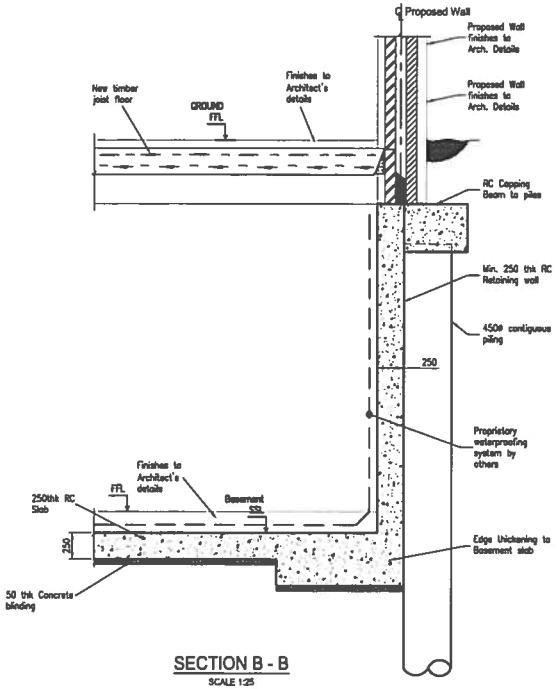

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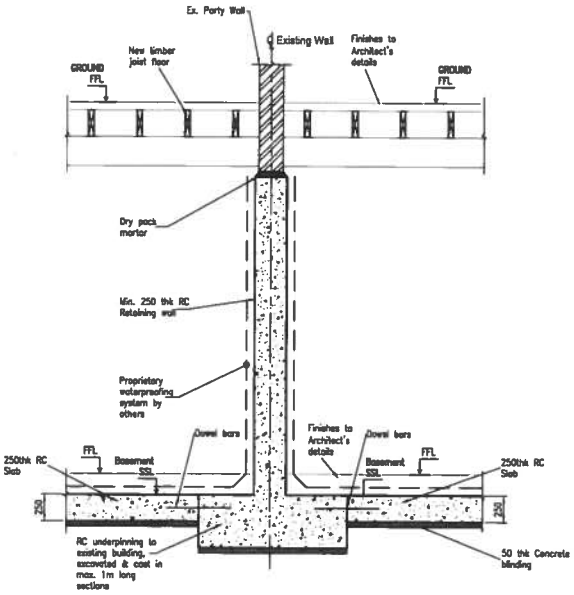

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Rev.	Date	Revisions	By	Engineer

Notes:
1. The drawing is to be read in conjunction with all relevant Consultant's drawings and specifications.
2. For general notes, refer to Drawing No.

Key:
1.

FOR INFORMATION

Project: 2 & 3 AKENSIDE, LONDON, NW3 5BS
Title: PROPOSED SECTIONS
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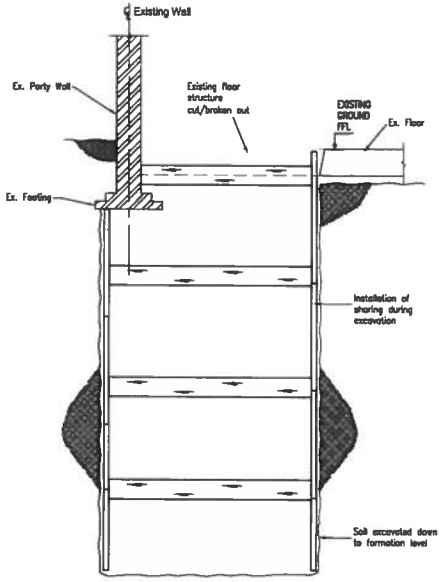
Scale: 1:50 @ A1 U.N.O
Drawing No: 15773/FS03



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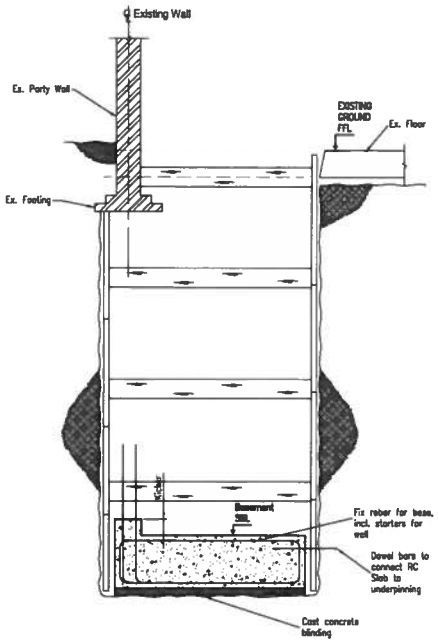

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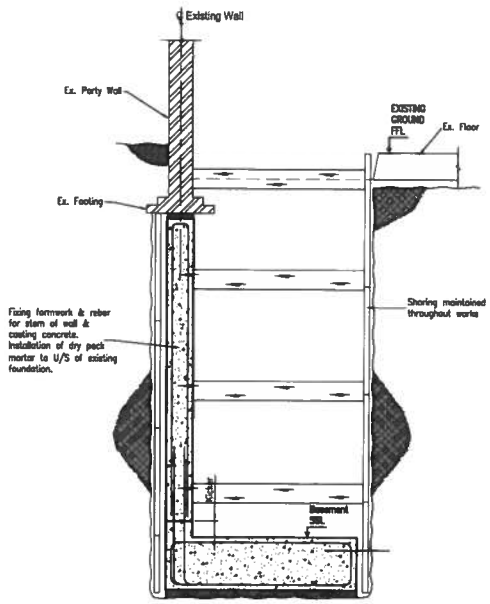

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Rev.	Date	Revisions	By	Engineer

Notes:
1. The drawing is to be read in conjunction with all relevant Consultant's drawings and specifications.
2. For general notes, refer to Drawing No.

Key:
1.

FOR INFORMATION

Project: 2 & 3 AKENSIDE, LONDON, NW3 5BS
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Scale: 1:50 @ A1 U.N.O
Drawing No: 15773/FS04