

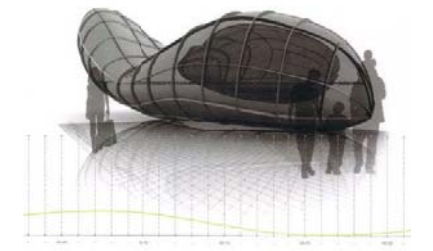
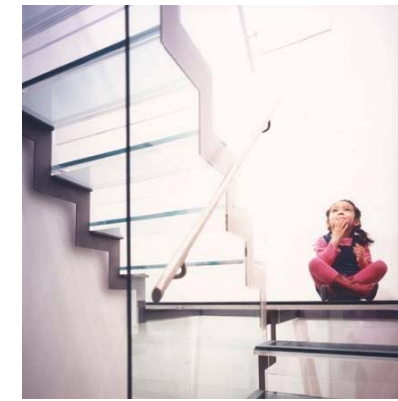


## 115 FROGNAL, LONDON

SUMMARY OF BIA & SI

Ref No: 24606

Date MAY '17





### Quality management

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<b>Client</b>	Paul Crocker / Delph Group
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<b>Document Status</b>	Preliminary
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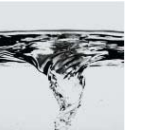
### Revision Status/ History

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## 1.0 INTRODUCTION

This report relates to the proposal to incorporate a single storey basement to a two-storey new-build domestic residence, located at 115 Frognal. It makes reference to the Basement Impact Assessment (BIA) completed by GEA, dated 22<sup>nd</sup> May 2017, ref. J16245.

Fluid Structures have been instructed by Paul Crocker of Delph Group to provide structural assistance with the basement impact assessment for the scheme.

## 2.0 ABOUT FLUID STRUCTURES

Fluid Structures is one of the UK's leading design orientated structural engineering practices. The firm was established in 1999 and gained an exemplary reputation for the quality of its engineering design. The sectors in which the company works regularly include residential, commercial, education and retail. Projects to date have ranged in value from £500,000 to in excess of £100 million. In 2004, Fluid Structures won the Institute of Structures prize for Exceptional Engineering.

Fluid's approach is characterised by a desire to develop engineering solutions that complement the architectural aspiration whilst also responding to the Client's core requirements and maintaining sensitivity to the original building, heritage and Planning Authorities.

The practice considers itself to be a technical design house and offers a number of areas of expertise that include:

- The appraisal and refurbishment of existing buildings and structures, including buildings of historic significance
- The design of complex basements and sub-structures
- Design of façade engineering including double façades and solar shading
- Value engineering reports on potential developments
- An in depth knowledge of construction materials including steel, concrete, timber, masonry, glass, aluminium and fabric
- Sustainable design solutions: working within the constraints of individual projects to minimise the carbon footprint of buildings and maximise their positive impact in relation to the environment, the economy and society at large.

## 3.0 THE SITE

The property is located on the road known as Frognal, approximately 200m north west of Hampstead tube station in the NW3 post code of London. The area is predominantly low density residential buildings. Photos of the existing building and surroundings can be seen overleaf in Figure 1.

Figure 1 - Aerial Photo Identifying Location



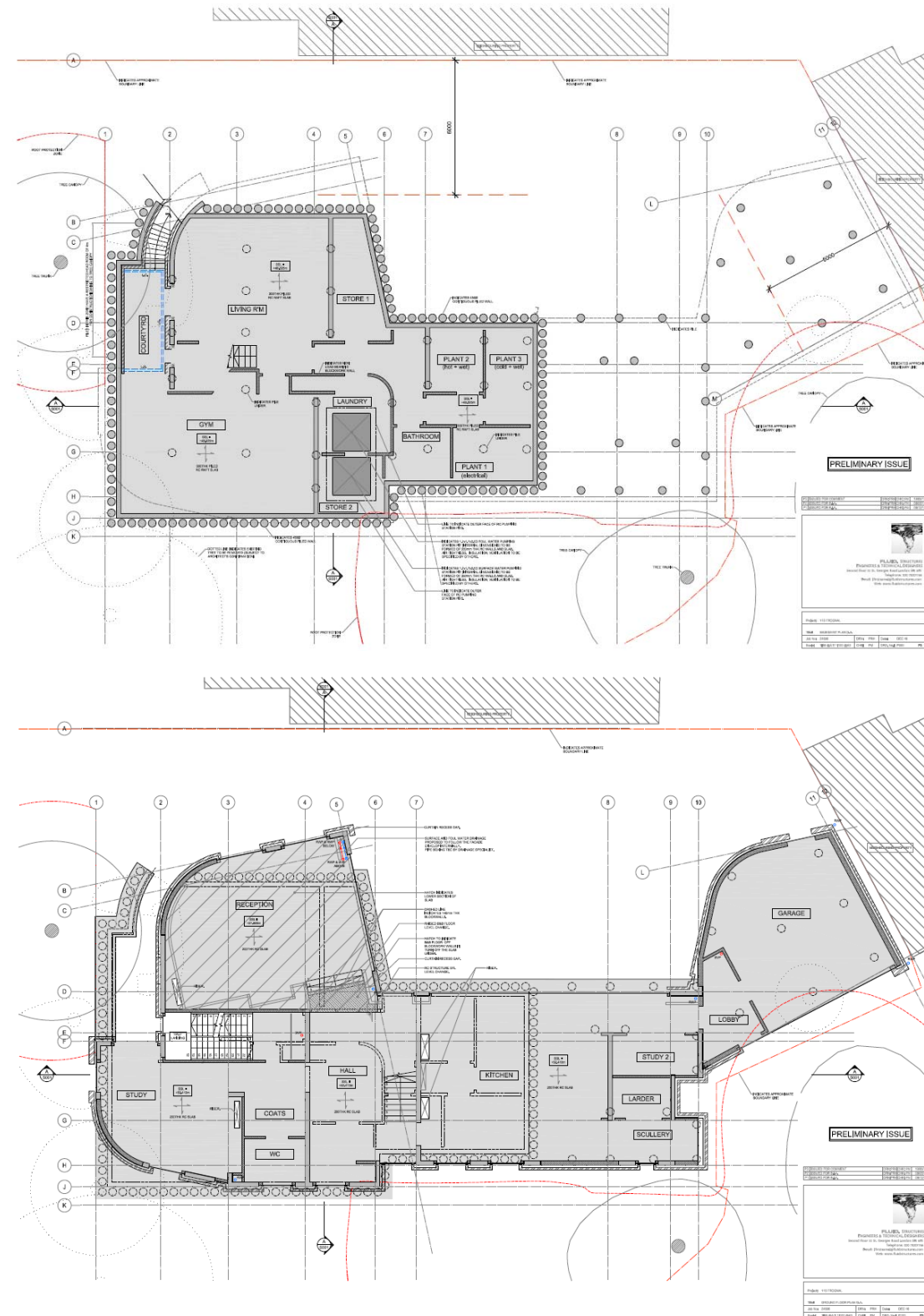
## 4.0 PROPOSED SCHEME & BASEMENT

A new build two storey property is proposed for the site of 115 Frognal. In addition to the two above ground storeys (footprint of circa 305m<sup>2</sup>), a single storey basement is proposed, which covers around 65% (205m<sup>2</sup>) of the ground floor footprint, and does not extend beyond the extent of the ground floor plate. Images of the proposed basement and ground floor can be seen overleaf in Figure 2, with the formal drawings included within the appendices.

The architects package provide a greater level of detail for the proposed scheme, and this should be read in conjunction with this report and the BIA.



Figure 2 - Basement & Ground Floor Plans



## 5.0 SUMMARY OF B.I.A. & S.I.

The text below represents a short summary of some key elements extracted from the site investigation and basement impact assessment completed by GEA. This information has helped steer the construction methodology down the chosen route, which is explained in Section 6.0.

### 5.1 SOIL MAKE UP

- 1.2m topsoil / made ground
- Bagshot formation (~11.7m)
- Claygate member

### 5.2 WATER TABLE

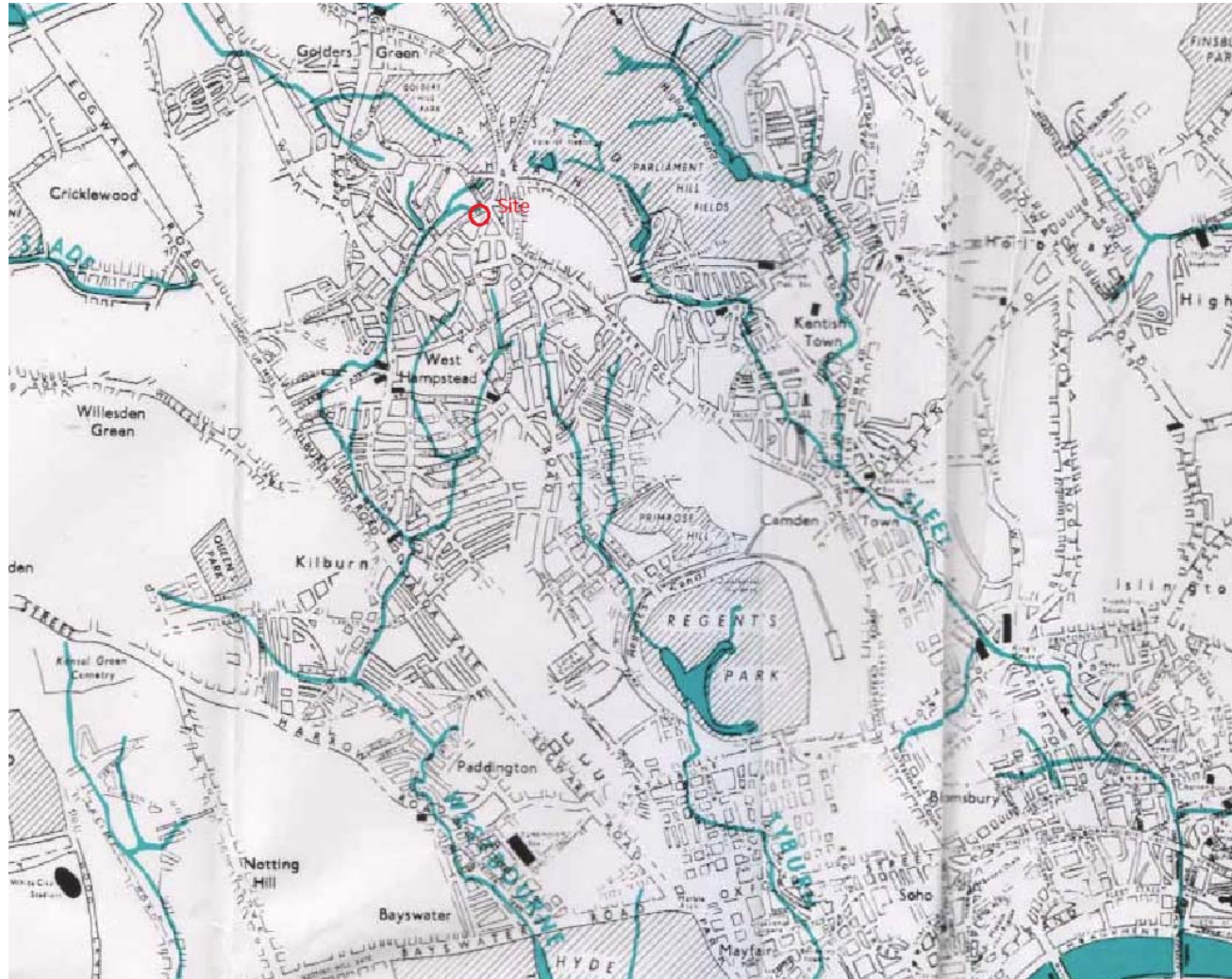
- Monitoring has found the ground water to be circa 8.15m below ground level

### 5.3 OTHER POINTS OF INTEREST

- Desiccated clay soils were found within the vicinity of the existing trees to a depth of 2.00m to 3.00m
- The site appears to be very close to the start of one of the tributary to the "lost" River Westbourne



Figure 3 - Lost Rivers Map Extract



## 6.0 STRUCTURAL IMPLICATIONS

It is proposed to construct the basement using a perimeter of contiguous piles to allow the basement excavation to be safely excavated, require minimal temporary propping and thus provide a unobstructed safe working area. Owing to the soil conditions and presence of trees, the remainder of the building outside of the basement footprint will also be founded on piles.

Contiguous piles have been opted for over secant owing to the relatively low water table (see Section 5.0). The water table has been monitored and found to be circa 8m below existing ground level, with our proposed excavation well above this.

A suggested construction sequence for the basement formation is included in the appendices, including a plan drawing indicating suggested temporary propping locations. It would be possible to design the contiguous piles as unpropped cantilevers, such that no temporary propping is required, however this will decision will be made by the principal contractor.

## 7.0 PARTY WALL AND SURROUNDING STRUCTURES

The closest habitable building is 113 Frognal, for which it is proposed to keep our foundations a minimum of 6.0m away from the boundary. 113 has a single storey basement located inside the super-structure footprint, and archive drawings for this property are included within the appendices.

The garage structure to the 113 property, located to the west (the right hand side of the drawing plans), is close to our piled foundations and as such will need a party wall agreement in place prior to any works commencing in this area.

A ground movement analysis has been completed by GEA as part of their basement impact assessment, and found expected movement levels to be within acceptable limits.

## 8.0 MOVEMENT MONITORING

In order to ensure minimal impact on the structures surrounding the location of the proposed basement extension during the demolition and construction works, it is proposed that monitoring of movement is undertaken. The monitoring strategy should include targets set up around the perimeter of the basement, installed just above the capping beam line, and read from a fixed station. The fixed stations need to be in suitable locations away from the area of the works so as not to be affected by any local ground movements.

It is suggested that the monitoring is carried out as following:

- Initial visit for set up and datum readings after capping beam is installed but prior to any reduced dig / excavation.
- Weekly measurement during the excavation and basement construction.
- Once the ground floor slab is in place any lateral movement should effectively stop.

It is not proposed to incorporate inclinometers within the piles owing to the shallow nature of the basement.

Should any significant level differences or movements be observed to or found in readings, then it is recommended that monitoring is carried out at closer intervals. The frequency should also be increased if movements appear to be accelerating or if the established trend of movements appears to be changing unexpectedly. Additional readings should also be taken after severe storms and after any impact on the temporary structure.

Any cracks or other defects that are being monitored in the neighbouring structures will need to be left accessible and visible throughout.

Movements to be recorded should include:

- Displacements (x/y/z directions)
- Verticality/tilt
- Width of existing cracks (where present) using telltails

All readings are to be forwarded to the client and Fluid Structures on a regular basis together with a covering statement commenting on any issues that arise.



It is proposed that the trigger and action levels for lateral movement near the head of the piles are set at H/800 and H/600 respectively.

- An amber (trigger) level reading would allow structural alteration works to continue on site, but the Contractor's Temporary Works Engineer would be required to visit site within a period of 24 hours to assess the situation and to report back to Fluid Structures with their proposals accordingly. Using jacks on the ends of any temporary propping could serve to correct any movements.
- A red (action) level reading would result in works on site being stopped (subject to ensuring that the building is made safe with any required temporary works put in place). The Contractor's Temporary Works Engineer will again need to visit site within a period of 24 hours and advise on the situation and what action to take. No work is to re-start on site until a proposal has been agreed and accepted by all parties.

Please note that these threshold levels are based on structural criteria and not from the point of view of finishes (i.e. cracking to plaster or internal finishes may occur below amber trigger level), however, these are considered to be practical levels of movement within which a competent Contractor should be able to undertake the works.

The trigger and action levels are to be discussed and agreed upon between the Contractor, Fluid Structures, and the relevant Party Wall Surveyors, prior to commencing of the works.

## 9.0 RISK ITEMS & FURTHER INVESTIGATION

The following is a list of risk items that came to light during the writing of this report. It should not be considered exhaustive in nature, and does not claim to have captured all the risk items within the project.

- Condition survey of 113 Frogmal and garage
  - To date Fluid Structures have not had sight of a condition survey for the buildings on the site of 113 Frogmal. Any items of concern found in these surveys should be addressed as appropriate.
- Foundation assessment of garden wall adjacent to 113 Frogmal
  - Prior to construction of the basement commencing, it is recommended that the foundation of the garden wall is investigated to confirm soundness.

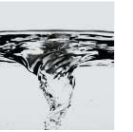
Owing to the relatively straight forward nature of the construction, these are seen as the primary risks.

## 10.0 FINAL CONCLUSIONS

The construction of the basement and superstructure is considered to be a relatively straight forward process for a competent contractor.

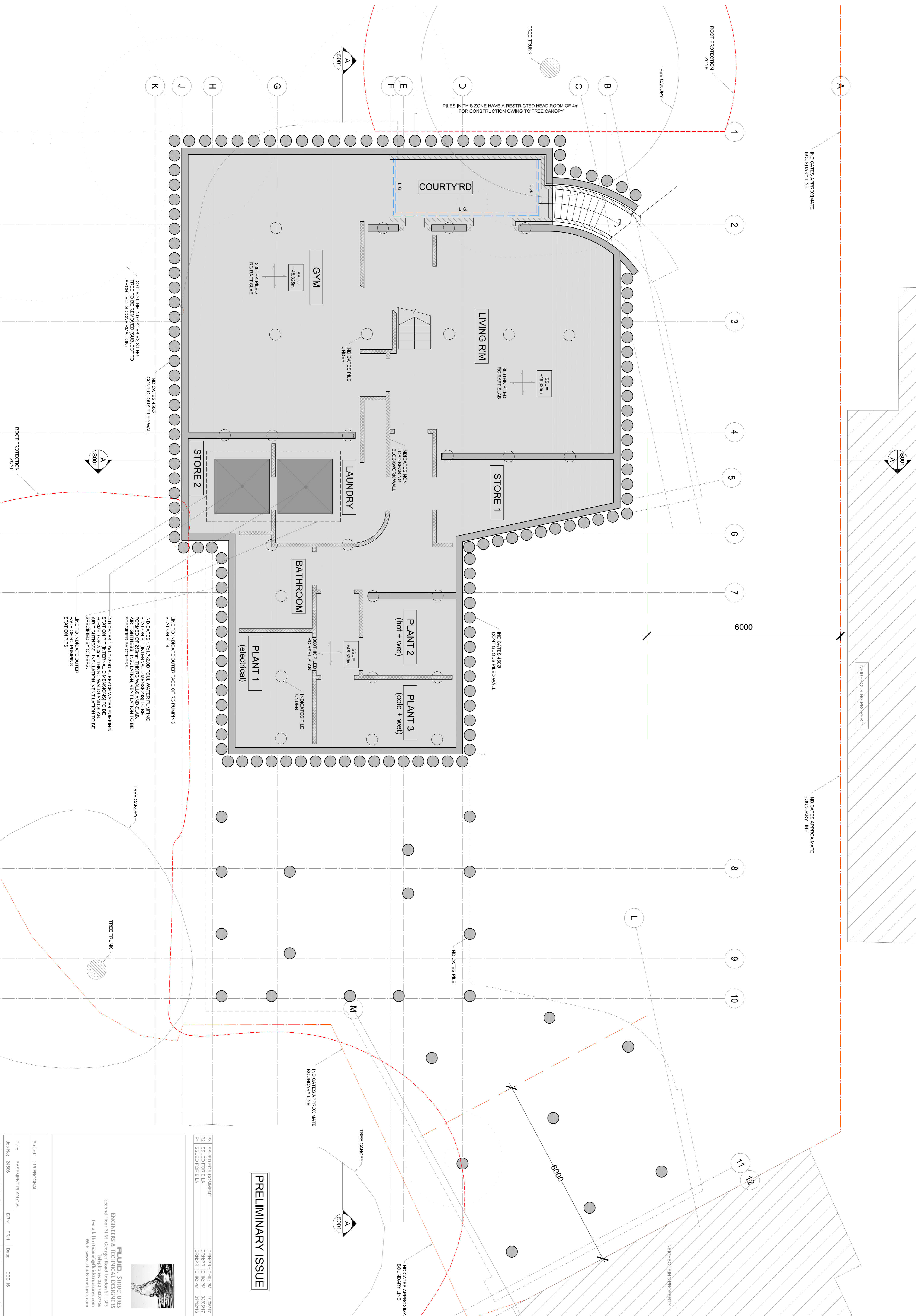
The basement impact assessment completed by GEA identifies a minimal impact by the introduction of the basement into the scheme.





## 11.0 APPENDIX A – PROPOSED BASEMENT AND GROUND FLOOR PLANS

(see overleaf)



**PRELIMINARY ISSUE**

P1 ISSUED FOR COMMENT  
 P2 ISSUED FOR E.I.A.  
 P3 ISSUED FOR E.I.A.

ISSUED FOR COMMENT  
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