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CA5084.04

May 2018

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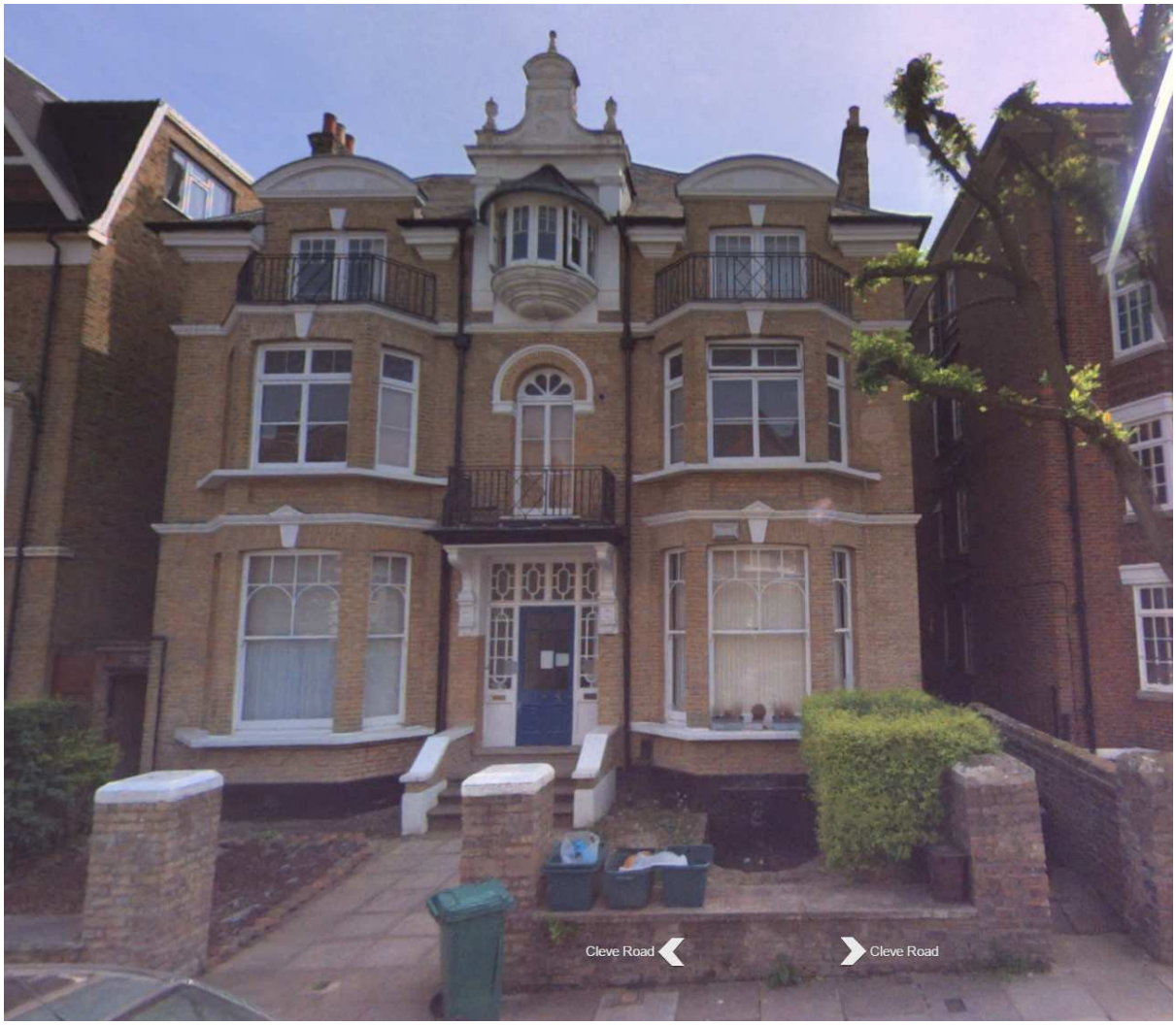


Proposed Construction Strategy

Proposed local lower ground level construction
at the rear of an existing five story house.

INTRODUCTION

5 Cleve Road, London NW6 3RN is an existing detached five story Victorian house, including a lower ground floor and accommodation in the loft space.

This application intends to create further residential accommodation, by excavating to the rear of the property. This will include extending the existing lower ground floor and excavating a further half story depth as part of the new extension, to provide a full height room at the centre only, of the rear extension. Light wells are to be formed to the front, side (reopen existing) and the rear (as a private garden) of the lower ground level, as shown on the Architects plans.

The existing property comprises loadbearing external and party solid brick walls and suspended timber floors and roof. It has a solid concrete lower ground floor slab. The basement will be accessed via new stairs, between the existing building and in the new accommodation at the rear.

This structural report describes the investigation and construction method of the proposed basement.

DESK STUDY AND SITE WALK OVER

A desk study has been carried out to review any possible hindrances to the development. Historically we have found no evidence to indicate that the land had a former use with buildings on it. The maps of the area illustrated in CA5085.02 and .06 show that we are away from local water sources, any local excavations for railways etc. and that no bombs were recorded as having dropped in the immediate area.

The site walk over allowed us to inspect the boundaries of the property and its structural condition, together with inspecting the trial holes.

SOIL STRATA AND DESIGN CONSIDERATIONS

A soil report that forms part of this submission has been carried out by Southern Testing Environmental and Geotechnical Consultants. The works comprised excavating trial holes and drilling bore holes, to confirm the nature of the existing ground. It forms Stage 3 of the Basement Impact Statement.

The report confirms that the ground is shallow topsoil over London clay with the minimum allowable ground bearing capacity of 125 kN/m2 at 3 m depth, but only 50 kN/m2 at 2.0 m depth – the level of our proposed new lower ground level foundation slab. Our calculations use this limit. We are satisfied that the geology is capable of supporting both the loads of the proposed construction and also the necessary temporary works.

The Environment Agency flood risk map shows the location to be in flood zone 1 and hence is not at risk of flooding. We have produced a flood risk report (CA5085.07) which does however highlight a risk of flooding from local drainage, which is a long term issue rather being than a likely problem during the construction works.

The soil report discusses water ingress in the trial holes. This will be pumped as the works proceed, if required although the water is likely to be perched in the topsoil and so we don't anticipate continual water flows.

Curing time (a minimum of 72 hours) is allowed before an adjacent bay is constructed. As we are away from the adjacent properties, the risk of differential movement between the basement and the neighbour's foundations is none existent.

The main risk area will be the insertion of structural steel 'picture frames' to replace the existing rear elevation wall, in our client's property. This will be done in conjunction with a temporary works procedure, to be designed by Cooper Associates as part of the super structure works. The steelwork will be installed before ant of the rear excavation works commence.

These temporary works comprise a series of heavy duty, braced 'slimshore props' which support steel needles, through the upper rear wall; typically at one metre centres. The props are temporally supported on sacrificial insitu concrete bases. The new steels for the permanent frame will be spliced to ensure that they are in manageable lengths.

It is proposed to excavate a battered back hole over the location of the rear external works as is illustrated in our drawing CA5085/02. The central basement area will then be formed in metre wide strips of ground slab and retaining wall, to allow horizontal propping of the head of the sections of wall. When the propped RC box is complete, (done in a hit and miss sequence) the lower ground retaining walls will be formed as shown in our drawing.

There is no risk to the stability of the existing or the adjacent buildings during or as a result of these works, as the working procedures that are to be adopted have been

established and used successfully over many decades. Our proposed works are away from the neighbour's detached properties.

The works are limited to the area of the building and in the garden of the property. Any utilities and other infrastructure immediately adjacent to the construction will be exposed, adequately supported and be reinstated (using appropriate specialist subcontractors where necessary) as part of the works. The construction of each retaining wall is done in short sections. This maintains the stability of the adjacent ground.

We are thus satisfied that the temporary and permanent works will have no significant impact on the structural integrity and natural ability for movement of the existing and surrounding structures, utilities, infrastructure and any man-made cavities, such as tunnels.

CONSIDERATION OF GROUND MOVEMENT

The geotechnical report referred to provides parameters for calculating the uplift as a result of any ground heave following removal of the London clay, required to form the basement. Previously, when we have had this heave calculated and when we have discussed the problem with geotechnical consultants; the amount of heave and hence ground slab upwards deflection that takes place as a result of forming a single story (3 m depth) basement excavation is of the same order as we allow for, when designing the deflection on a typical domestic suspended floor.

In this case, a BIA Ground Movement Assessment has been carried out by Southern Testing and is included as part of this submission. We do not consider that the calculated displacements cause any concern.

We have an adjacent Horse Chestnut tree to the right hand rear of the property (T001). Trial holes carried out by our Arbroculturalist showed that we would not cut through any significant roots, when we construct the proposed project. In order to reduce this risk further and to protect against clay heave, to the lower ground floor level of construction, adjacent to the tree is to be suspended on mini piles and will span over a layer of Cellcore anti heave protection (see CA5085/01 and /02). The central localised basement area is deep enough and far enough from the tree to go below any anti heave requirements, in accordance with NHBC guidelines.

In this case all of the basement works are being carried out to the rear of the existing property and not against any

neighbouring properties, with the exception of the front elevation lightwells, that are forward and away from the adjacent properties. The front lightwells will be constructed in a hit and miss sequence.

The building already has a lower ground floor (as have the neighbours on each side), which we are proposing to continue at the same level, in the new rear extension. We will drop the ground level over a local, rear central area only, by approximately 2 metres, including the slab thickness, below this existing lower ground level.

The neighbours already have the same lower ground floors as our property as is indicated on our drawings CA5085/01 and 02. Although the new works are beyond the rear of the neighbours properties, its probable that the excavation to the rear of our building will require a 3 metre notice on the neighbours, although not a 6 metre notice.

We consider that it is reasonable to state that the neighbours' properties will have no damage (category 0 of the Burland Scale as below) from our proposed works (given a normal degree of care by the appointed Contractor) as we are not excavating immediately against their properties.

Table 1 Classification of visible damage to walls with particular reference to ease of repair of plaster and brickwork or masonry

Crack width is one factor in assessing category of damage and should not be used on its own as a direct measure of it.

Category of damage	Description of typical damage *Ease of repair in italic type*
0	Hairline cracks of less than about 0.1 mm which are classed as negligible. *No action required.*
1	Fine cracks which can *be treated easily using normal decoration.* Damage generally restricted to internal wall finishes; cracks rarely visible in external brickwork. Typical crack widths up to 1 mm.
2	*Cracks easily filled. Recurrent cracks can be masked by suitable linings.* Cracks not necessarily visible externally; *some external repointing may be required to ensure weather-tightness.* Doors and windows may stick slightly and *require easing and adjusting.* Typical crack widths up to 5 mm.
3	Cracks which *require some opening up and can be patched by a mason. Repointing of external brickwork and possibly a small amount of brickwork to be replaced.* Doors and windows sticking. Service pipes may fracture. Weather-tightness often impaired. Typical crack widths are 5 to 15 mm, or several of, say, 3 mm.

Fig 2, Table 1 of BRE Digest 251

The existing property is in good order (Late Victorian, Early Edwardian) and we consider (based on previous projects of this nature) that any cracking to *our clients property* would be within Category 1 of the Burland Scale. This is defined as fine cracks which are easily treated during normal decoration and forms part of the BRT Digest 251. Any damage would result from the installation of the rear elevation structural frame rather than the retaining wall works.

A Party Wall Award will be in place before the works commence due to three metre notice requirements. This will record any existing damage and will identify any fresh damage, in the event that any did occur.

The ground in the area is predominantly level and thus there is no risk of slope instability beyond the site. The method of construction avoids any risk of slope instability within the site.

Damage or the potential for damage will be monitored on a daily basis by the visual inspection of the existing walls of the property. In the event that any fresh damage is noted or that the neighbours report any damage, work on site will be suspended temporarily until the neighbours damage is inspected. Once the magnitude and source of the damage has been established, a decision will be made on if to recommence the work or if it is necessary to continue to suspend the works, until further preventative methods are agreed to mitigate any additional movement. If the cracking is beyond trivial (hairline, caused by obvious reasons) then the decision to start work again will be made in conjunction with the Party Wall Surveyors and the Structural Engineers.

Although our recommendation is that monitoring can be done on a visual basis, backed up with a daily written log, this monitoring requirement will in fact be decided by the party wall surveyors acting for our and the neighbours properties. If they have any concerns, then they may require monitoring pins and accurate level monitoring to be carried out by a specialist company.

EFFECT OF LIGHTWELL AND HARDSTANDING CONSTRUCTION ON GROUND WATER

Typically we do not find the water table when excavating in this area as has been confirmed by the borehole carried out at the nearby property and the fact that adjacent properties have original Victorian basements, which have not in themselves flooded. As the ground is an impermeable London Clay, water

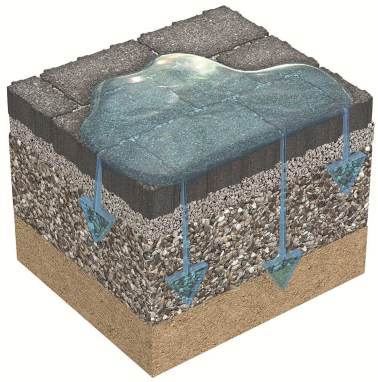
flow below ground is limited. Some water was encountered n the ground investigation however this appears to be water perched above the clay layer and will be pumped away at the beginning of the works.

Although a lower ground level is being constructed, water flow only exists because of rainwater. Surface and foul water is already collected by an existing drainage system.

Southern Testing have produced a Hydrology Flow statement that forms part of this submission.

The accompanying Architects drawing No 1238/ESP-001 shows an existing site plan with the existing hardstanding illustrated. A second plan 1238/ASP-001 illustrates the proposed site plan with hardstanding, permeable drainage areas, green roof and soft landscaping all identified, with their square metre plan areas noted.

The front external area is already hard standing over more than half of its area, including the side passageway against number 3 and 7. This will be replaced with the two drained front lightwells shown. These have a strip of soft landscaping in front of them both and running down the side against number 3. The Refuge area and associated paths will be paved in a permeable paving system, such as this example.



Hence the area of hard standing to the front will be reduced in area and will be correctly drained.

The property is being extended to the rear. An existing 10 sqm existing extension is being demolished and the paving to the side passage against number 7 will be lifted and will be replaced by a permeable paving where appropriate.

The side passageways are already covered in concrete hardstanding and the drainage to these areas will be improved as it will be new. At the rear there is a large garden – fig 7. Although this is being reduced in area, the majority of the garden is still being retained.

The rainwater runoff collected in the new lightwells and on the new roofs will be discharged into holding tanks (see Architects ASP-001 drawing) in the rear garden, to be used for irrigation or to be released into the local rainwater system, when there is less demand on the system.

The existing foul drainage is collected by an existing sewer system. This will also collect any discharge from the additional accommodation in the basement, again using a pumped system if necessary.

BASEMENT DESIGN AND CONSTRUCTION METHOD

It is intended that the basement will be constructed by a specialist contractor who is experienced in this form of construction and is capable of successfully dealing with the issues that basement construction presents.

The Contractor will be required to prepare a Construction Management Plan to address matters such as: water, waste, noise and vibration, dust, emissions and odours, ground contamination, wildlife and features and archaeology; where appropriate. They will also be required to be part of The Considerate Constructors Scheme.

The lower ground retaining walls are designed to follow the floor plan of the new rear external walls, projecting out as necessary at the front lightwells. Steel beams and columns (the new structural picture frame), bearing off new concrete foundations will be constructed to support the remaining upper parts of the rear elevation.

Deeper retaining walls will be constructed for the small internal basement areas at the centre of the extension. Refer to drawings CA5085/01 and /02.

Party wall or three metre notice agreements will be prepared for both of the side neighbours, in order to protect their interests.

Hoarding will be erected at the front of and within the curtilage of the site, to accommodate a working space and a skip.

Conveyor belts will be located to transfer spoil from the rear of the property, into the skip. This waste will be sent to licensed disposal sites only, with appropriate documentation being retained as part of the working procedures.

The existing lower ground floor already exists and although the ground slab may be reduced marginally in level, the existing walls are not being underpinned.

Thw hit and miss approach is only required to the rear extension beyond the existing building. This area is beyond the rear of the neighbours buildings, hence there is no risk of undermining the neighbours property. Works to the rear to form the new gardens will be completed by battering back the ground as necessary.

The rear dropped garden will be designed as 'floating' in that the garden retaining walls will be able to accommodate the ground movement and the garden level will allow water to pass into the ground.

Temporary Works for the existing building.

During these works, the structure above will be propped as necessary to maintain support, using heavy duty slimshore props off either the new concrete slab or cast concrete bases, to carry the main structure and Accrow props to carry the local areas of timber, etc. This applies mainly to the time where the new structural frame will be installed within the rear elevation walls, rather than during the retaining wall works – and has been described in a section above.

The propping works will be carried out a section at a time (complete one half of the rear elevation, before propping and continuing on the other half) so that the building remains stable at all times, with negligible deflection of the structure above.

In particular - a foreman with experience of basement and structural refurbishment construction will be in attendance during the works.

Waterproofing will be achieved by the use of a waterproof concrete additive and a lining system, taking water to a mechanically pumped sump.

The works will be designed by a Charted Structural Engineer and will comply with current Building Control requirements.

Prepared by:

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Fig 3: Photo shows that the neighbours are separate properties and that the right hand neighbour (7 Cleve Road) is a more modern Mansion Block

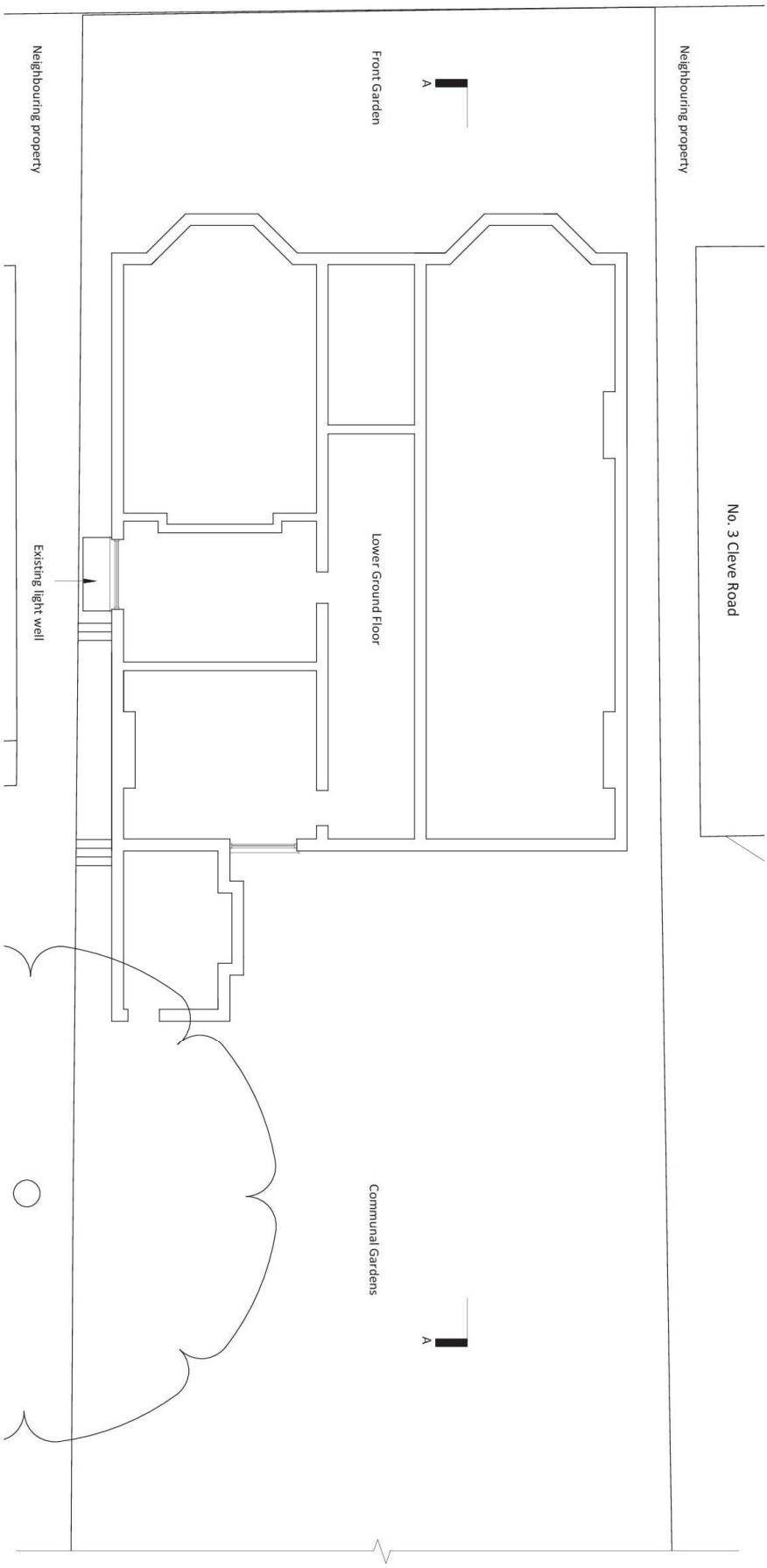

Fig 4: The existing property plan shows the neighbours buildings.

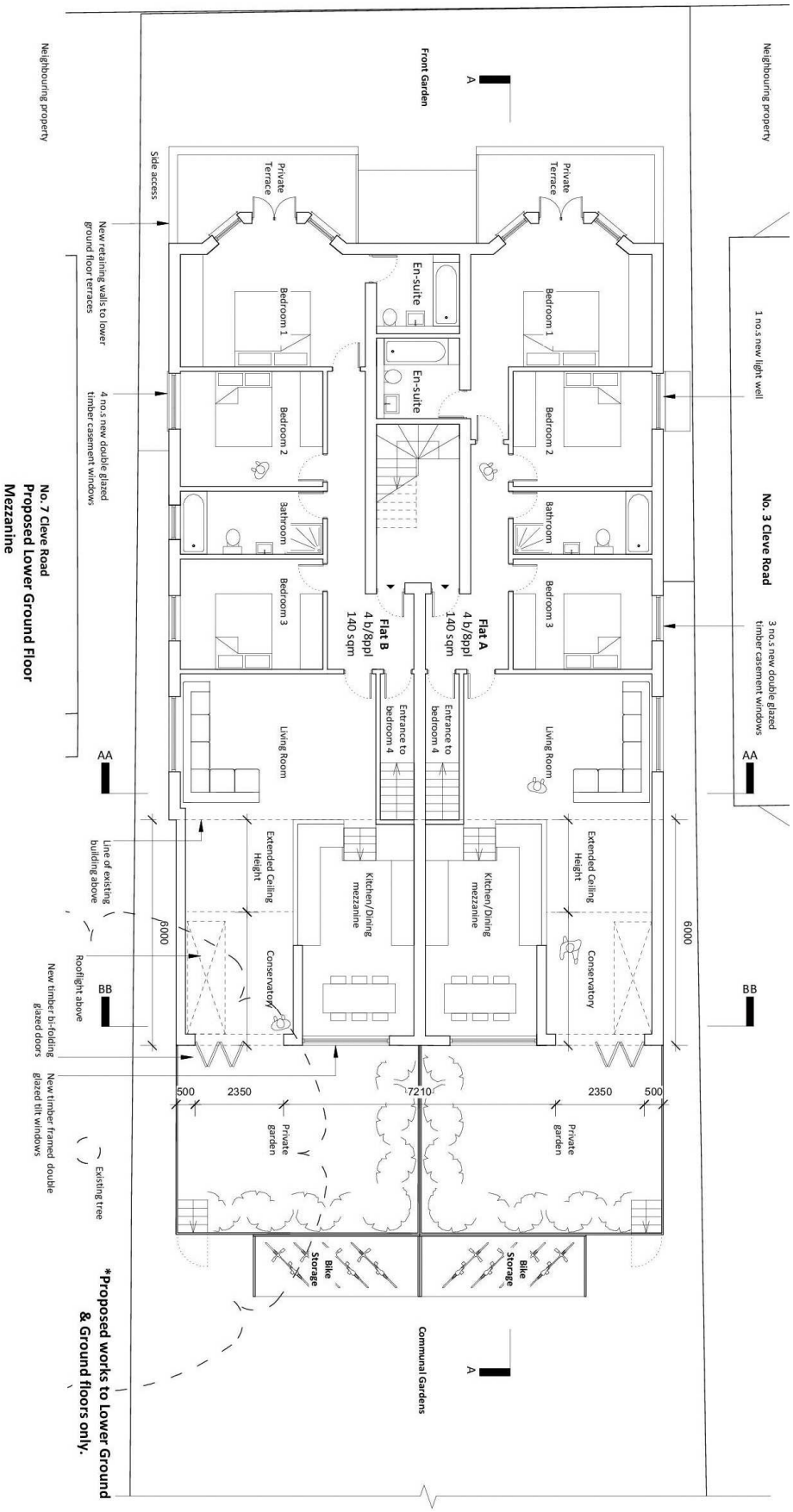

Fig 5: The proposed new works extend the lower ground floor to the rear of the building. The new basement area is below the two central 'kitchen / dining mezzanines' and so is away from the flank walls.

Fig 6: The existing section shows that the lower ground level is at the same depth as the extensive rear garden.

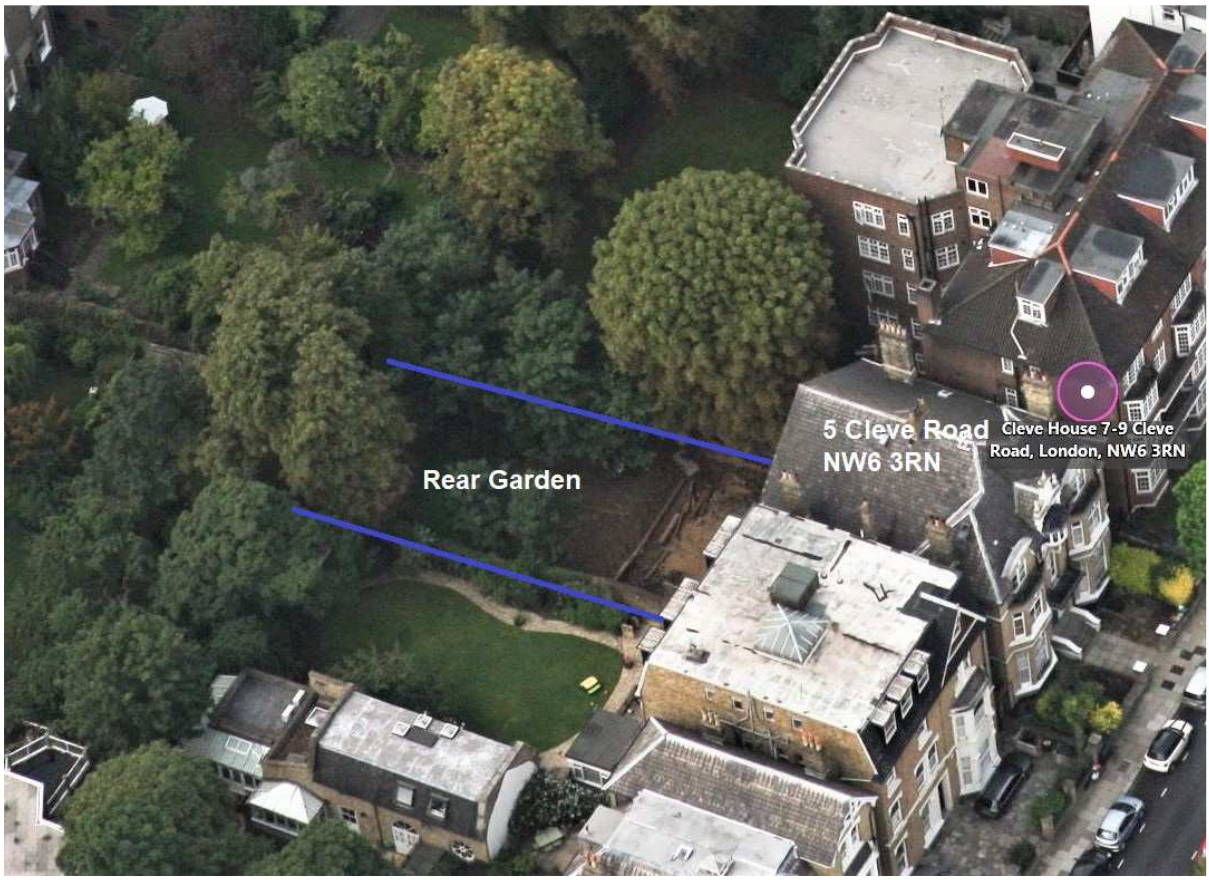

Fig 7: The majority of the extensive rear garden is retained.

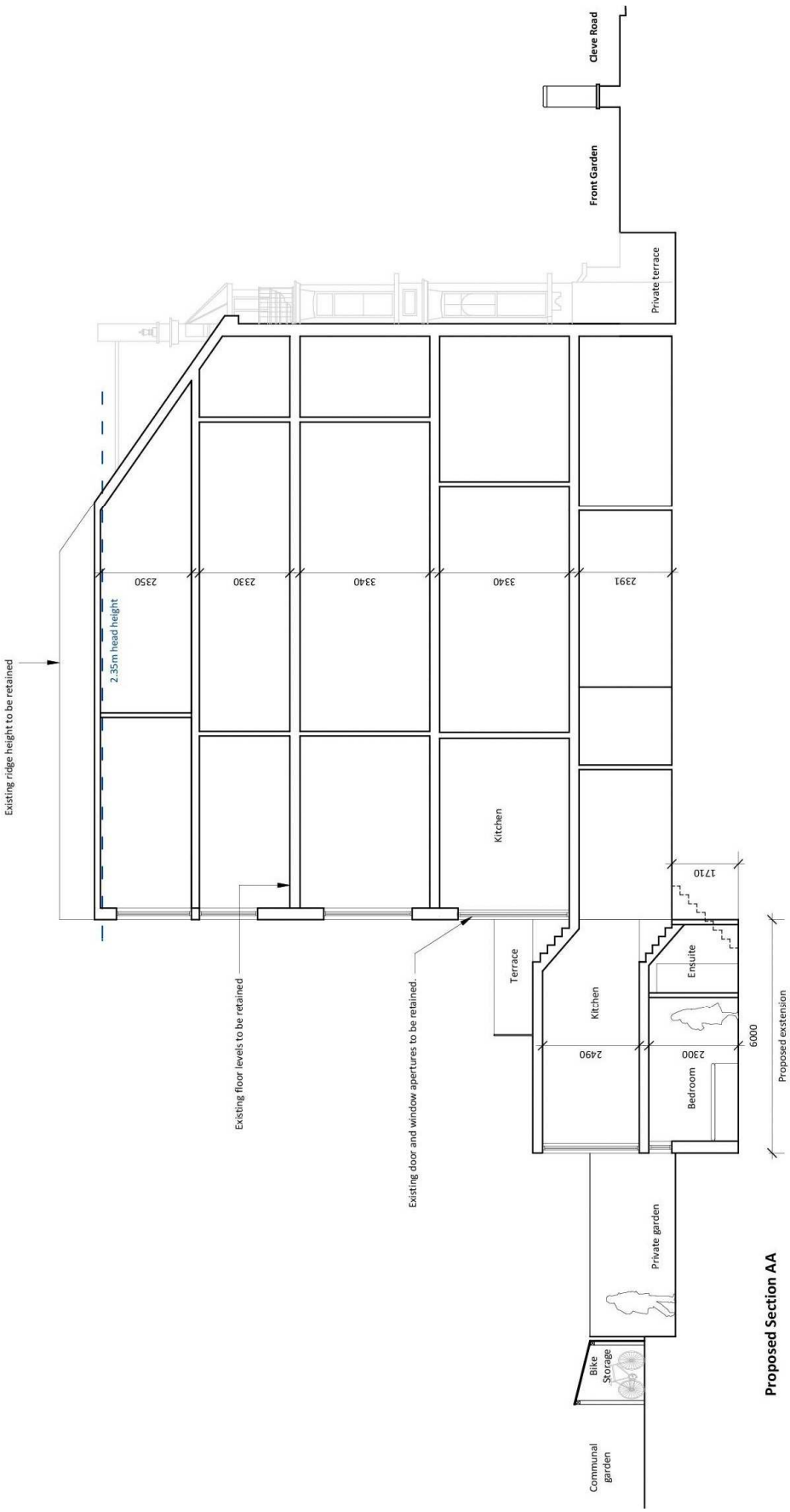

Fig 8: The proposed section shows that the new basement area - shown 1710 deeper than existing and over only the centre half of the width of the property - is not extensive.