77 Avenue Road, London

Structural Preliminary Methodology Statement

1.0 Introduction

1.1 This report is to support the planning application for the proposed development at 77 Avenue Road, London, as submitted by Coupdeville Architects.

1.2 This letter aims to address the requirements of the London Borough of Camden Basements and Lightwells Planning Guidance Document CPG4.

2.0 Proposed Works

2.1 Coupeville Architects has proposed to demolish the existing 20th century building and replace this with a new 21st century eco-friendly and energy efficient showcase building. The new building arrangement is expressed on Coupdeville Architects drawings. It can be seen that the proposed basement and sub basement floors have been located to best fit in with the existing topography of the site. The sides of the proposed basement and sub basement have been situated inbound of the site boundary, this facilitates the forming of the basement and sub basement floors with the use of either a secant or contiguous piled retaining wall. The secant or contiguous piled retaining wall would be used as temporary and permanent retaining walls. This would avoid the need to underpin the adjacent houses and allows all works to be undertaken in the demise of the site. Once the secant or contiguous piled walls have been installed the ground can then be excavated safely to the required formation level. A reinforced concrete raft or piled foundation can then be formed within the bounds of the retaining walls. This would then allow for a reinforced concrete inner lining wall and reinforced concrete slab to be constructed to form a platform to construct the superstructure on.

3.0 Site Conditions

3.1 A series of trial pits are to be dug on the site within the rear garden of the property to a depth of 1.5m to ascertain the existing ground conditions. However, based on our knowledge of the area we would expect to see firm brown/orange sandy silty CLAY which then changes to stiff brown/orange sandy silty CLAY at depth. This is subject to a full site investigation being carried out to depth with boreholes at a later date.

3.2 With this type of clay and based on our experience within the area we would anticipate we would anticipate a bearing capacity of around 140KN/m^2 is achievable at a depth of 6m, which reduces to around 60KN/m^2 at 1m below ground level. Clays can possess high plasticity and are therefore particularly susceptible to volume change. The level of volume change potential should be provided and precautions for soil shrinkage and soil heave will then be incorporated into the design. This is subject to a full site investigation being carried out to depth with boreholes and sufficient testing carried out at a later date.

3.3 Ground water seepage was not observed in the trial pits however it is expected that there will be ground water seepage within the depth of the proposed double basement. A full site investigation will identify the level of this seepage, this will aid the construction technique requirement with regards to dewatering of the double basement.

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3.4 Analysis of the soils for acidity and water soluble sulphate and consideration BS8500[7.1] of an ACEC class should be carried out to ensure the new concrete elements have the required protection against the ground.

3.5 Due to the current use and age of the existing building it is most probable that all excavated material will be accepted at an Inert Waste Landfill. However, contamination testing certificates will be required prior to the disposal of excavated materials.

3.6 A hydrological report will be required to satisfy the London Borough of Camden Basements and Lightwells Planning Guidance Document CPG4.

4.0 Structural Design

4.1 The four different grades of basement are defined in BS 8102:1990 '*Protection of Structures against Water from the Ground*'. This code of practice defines the different usage types and level of moisture provided by various forms of construction. In addition to the grade numbering defined in BS8102, CIRIA Report 140 introduces terms for these grades. The four grades are outlined below:-

Grade 1 'Basic Utility'
Basement usage is for car parking, plant rooms (excluding electrical equipment) and retail storage areas. The performance level allows for some seepage and damp patches to be tolerated.

Grade 2 'Better Utility'
Basement usage is fro workshops, plant rooms (requiring drier environment) and retail storage areas. The performance level allows no water penetration but high humidity is tolerated.

Grade 3 'Habitable'
Basement usage is ventilated residential and working areas including offices, restaurants and leisure centres. The performance level is a dry environment but with no specific control of moisture vapour.

Grade 4 'Special'
Basement usage is for archives and stores requiring a controlled humidity environment. The performance level is a totally dry environment with strict control of moisture vapour.

Based on the above the proposed double basement is classified as Grade 3.

4.2 Ground water seepage is assumed to be present within the depth of the proposed double basement. Suitable waterproofing and calculations will be required to satisfy the structural design and integrity. In addition, as mentioned above, a hydrological report will be required to assess the impact of the basement on the water course. The basement structure will need to be protected from the ingress of water. BS 8102[7.2] suggests three types of basement protection; Type A – Tanked Protection, Type B – Structural Integral Protection, Type C – Drained Protection. Each has varying degrees of performance and a hybrid version may be deemed most appropriate. The use of additives to enhance the performance of structural concrete may dictate the concrete mix design and constituents.

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4.3 The ground water level shall be considered to be at ground level -1.0m when considering the horizontal pressures on the basement walls as stated in BS 8102[7.2].

4.4 Reinforced concrete is not resistant to the ingress of water vapour but it is generally accepted that water vapour is unlikely to increase the risk of dampness within heated basements.

4.5 An arboriculture survey would need to be undertaken to assess the impact of the basement and lower ground floors to any adjacent trees.

4.6 The design team will consider the mitigation of health and safety risks in accordance with the Construction (Design and Management) Regulations 2007.

5.0 Sustainable Design

5.1 The sub base to ground bearing basement and lower ground floor slabs will comprise recycled Type 1 aggregate.

5.3 All concrete will be specified to comprise a 30% replacement of Portland cement with Flyash or Ground Granulated Blast-furnace Slag (GGBS). These Portland cement replacement constituents are by-products of the coal power station and steel manufacturing processes respectively. Additional to the environmental benefits of using these constituents, other benefits include; the concrete will have greater compressive strength, increased chemical resistance and durability, substantially higher fire resistance, a rapid strength gain, and lower shrinkage. The use of Flyash or GGBS with concrete additives such as Caltite will have to be confirmed by the manufacture of any such additive.

5.4 If commercially viable to the UK markets, the design team will endeavour to specify Green Concrete, such as Novacem, which utilises a magnesium oxide based cement instead of the traditional carbon heavy Portland cement. Green Concrete absorbs more carbon dioxide than is omitted which and this will contribute to the long-term target of reducing 80% of Carbon Dioxide by 2050.

5.5 We believe the integration of the above elements will help satisfy the London Borough of Camden Basements and Lightwells Planning Guidance Document CPG4

6.0 Construction Techniques and Methodology

6.1 Given the location of the site and to help minimise the impact on adjacent buildings it is envisaged that continuous flight auger contiguous piles at regular centres would be used along the basement and sub basement floor wall line. Continuous flight auger piling systems are used to minimise vibration and noise. Once the reinforcement is placed and the concrete poured, vibrated and sufficiently cured, the ground can be excavated to formation level to create workable space for the construction of the remainder of the basement and sub basement floor.

6.2 A contiguous piled wall is a traditional method of ground retention to facilitate basement excavations and construction. Contiguous piling is an excellent form of ground retention on restricted city centre sites where there are adjacent roads and buildings tight against site boundaries. Bored contiguous piles would be augered down into the stiff clay layer.

The contiguous piles are generally installed with a 150mm gap between each pile to allow for vertical and plan location tolerances. Contiguous piles would be embedded into the impermeable stiff clay layer which should ensure ground water is cut off from outside the basement excavation. Ground

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water within the basement excavation will need to be gathered in local sumps and pumped out. To ensure verticality of the wall rotary drilling with casing is likely to be used and not continuous flight augering (CFA). Contiguous piled retaining walls can be used to carry vertical superstructure loads and hence form part of the permanent works.

Temporary propping of the wall during the basement excavation would be required. In the permanent situation the floors of the basement support the wall in resisting lateral earth and water pressures. Subject to detailed design it is envisaged that two rows of props would be required for the two storey basement, one located near the top of the wall and the other at mid height of the excavation depth.

There are a number of ways in which the temporary propping can be achieved, including:-

1. Soil anchors can be used, which would be installed through the retained earth. Soil anchors have the advantage of leaving no obstructions within the basement excavation. In the permanent condition the soil anchors would be decommissioned by distressing the tension forces present in the anchors. This is to ensure they do not impede any future development works outside the site boundaries. However, given the proximity of the adjacent properties and road and potential complications with regards to inserting these anchors under existing foundations and with the added risk of underground services/sewers/tunnels etc, this option has been discounted.

2. Traditional temporary steel props back into the excavation. These props are typically placed at 5m-6m centres on plan. Whilst not as expensive as soil anchors, this solution has the slight disadvantage of providing an obstruction during the basement works. Careful consideration during the sequencing of the works is required both during excavation and construction of the basement floors. Please refer to Photographs 1 and 2 below showing this type of propping:-

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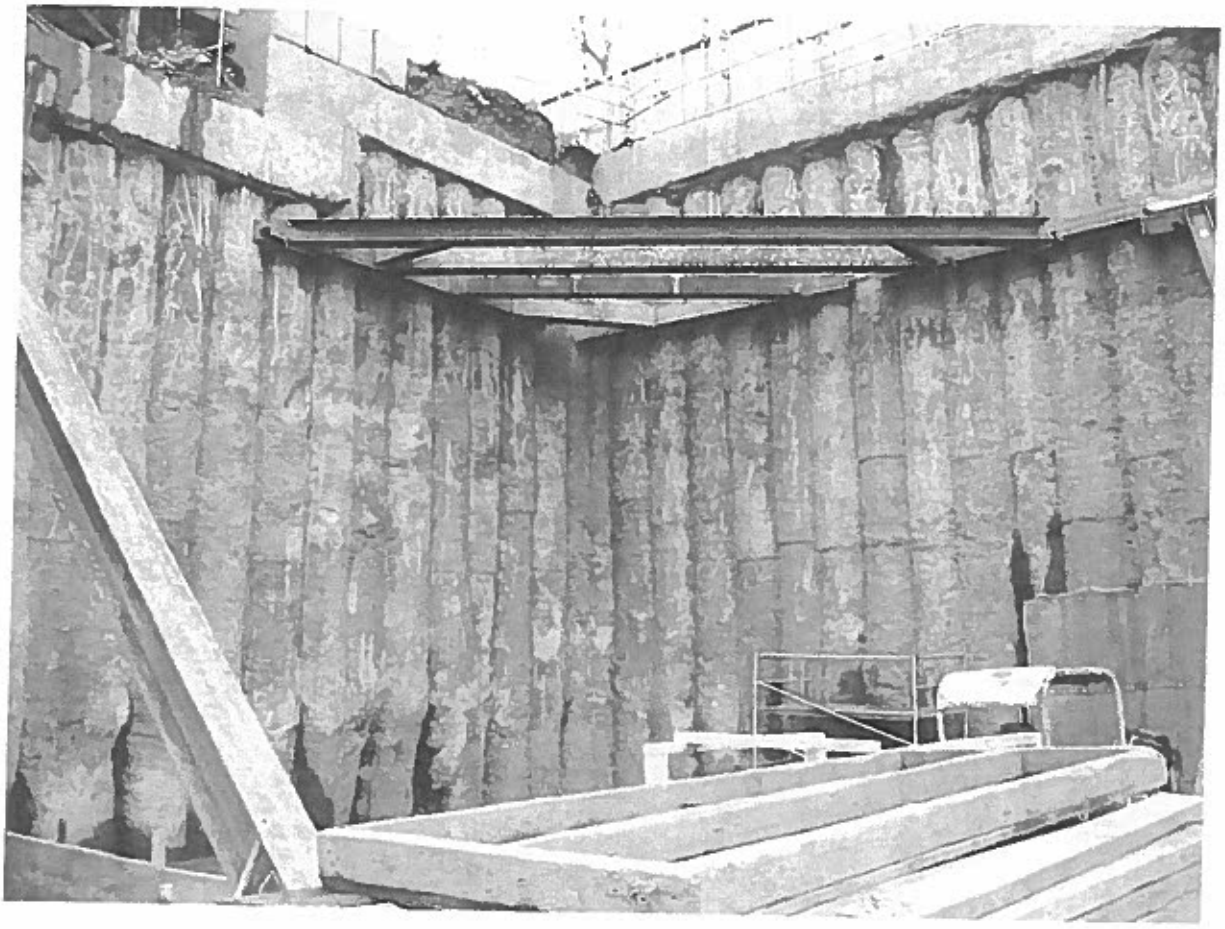

Photograph 1

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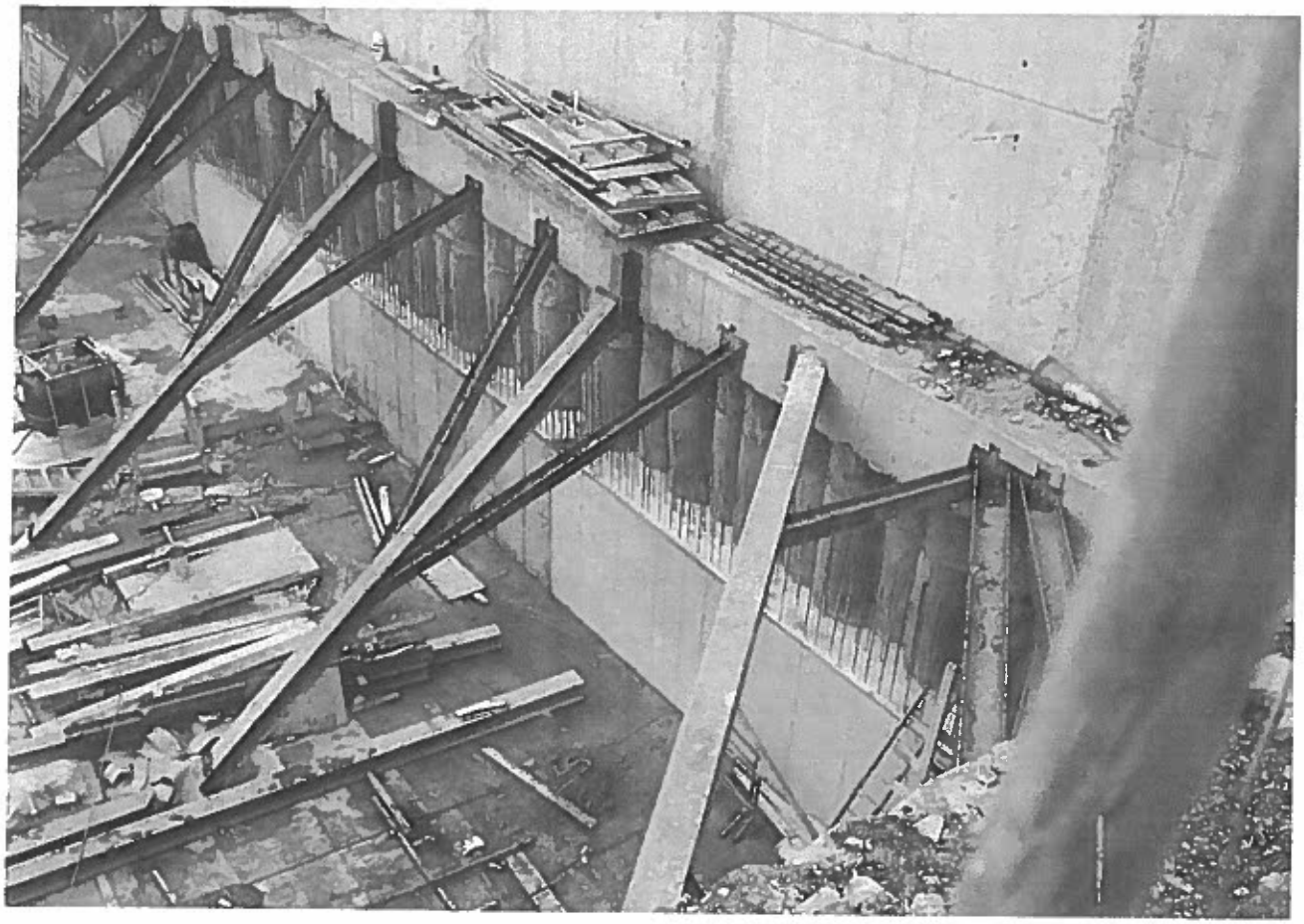

Photograph 2

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6.2 The contractor shall monitor the ground water within a standpipe on a daily basis throughout the duration of the ground works.

6.8 Waterproofing of the structure shall develop depending upon the protection regime opted for.

6.9 To ensure the requirements of the Construction (Design and Management) Regulations 2007 are met, the client shall be encouraged to employ a competent contractor with a knowledge and experience of working on developments similar those being proposed at 77 Avenue Road. The contractor shall adhere to the contract drawings and specifications, and any ancillary information issued with the contract documents. The contractor's working procedures shall be developed around the information presented in the full site investigation report that is to be carried out.

6.10 Any demolition works shall be carried out by competent and experienced persons only and in accordance with BS6187.

6.11 The Contractor will be encouraged to join the London Borough of Camden Considerate Builders scheme.

7.0 References

7.1 Code of Practice BS8500-1:2006 'Concrete – Complementary British Standard to BS EN 206-1, Part 1: Method of specifying and guidance for the specifier'
7.2 Code of Practice BS8102:2009 'Protection of structures against water from the ground'
7.3 Code of Practice BS8002:1994 'Design of earth retaining structures'
7.4 Code of Practice BS8004:1986 'Design of foundations'
7.5 Code of Practice BS8007:1987 'Design of Concrete Structures for Retaining Aqueous Liquids'
7.6 Code of Practice BS8110-1:1997 'Structural use of concrete – design and construction'
7.7 Code of Practice BS6187: 2011 'Demolition'
7.8 Building Regulations 2000 Approved Document A – Structure
7.9 Building Regulations 2000 Approved Document C – Site preparation and resistance to contaminants and moisture.
7.10 BRE Good Building Guide 72, Parts 1 and 2 – Basement construction and waterproofing
7.11 Ciria Report 139 – Water resisting basements

We hope that the above information is sufficient for your needs and that all aspects of the London Borough of Camden Basements and Lightwells Planning Guidance Document CPG4 have been addressed. However, if further information is required please contact the undersigned.

Yours faithfully,

I. Waddingham.

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