

MAURYA STRUCTURAL ENGINEERS LTD **CHARTERED STRUCTURAL ENGINEERS**

214 WHITBY ROAD
SOUTH RUISLIP, HILLINGDON, HA4 9DY
STRUCTURAL ENGINEER'S REPORT FOR PLANNING APPLICATION

NOVEMBER 2021

CONTACT
MAURYA STRUCTURAL ENGINEERS
E: hra.consulting@hotmail.co.uk

Registered in England Number: 10471031
Our Ref: 783/11.1

1. Introduction

- Maurya Consulting Ltd. has been appointed by Ms Casey Farquhrson to assist with their planning application for a proposed basement with single storey extension to the rear of the property. This report provides a construction method statement supported by sketch details to highlight our structural proposals.

2. Ground Condition

- The British Geology Survey map of this location indicates that the site is directly underlain by solid deposits of the Lambeth Group, which comprises a complex of vertically and laterally varying gravels, sands, silts, and clays deposits. Underlying the Lambeth Group is identified as a secondary 'A' aquifer. (Appendix A).
- The existing building is likely to have simple spread foundations bearing on the solid Lambeth Group deposits. The ground conditions indicated above are based only on published geological information and the Desk Study which was carried out by JOMAS Engineering Environmental on 15th July 2021. The ground conditions will need to be confirmed by trial pit and borehole investigation in the next design stage.
- The site is located within an Environment Agency Flood Zone 2. The Desktop Study has identified this area at 'low' risk of groundwater flooding. A relatively shallow groundwater should be anticipated.

3. Existing Building Type and Condition

- The existing building is three-storey and of traditional brick construction. The building currently occupies an IT café.
- The form of construction is traditional load bearing masonry, with timber floors and a pitched roof construction with dormers to the front and rear. There is currently no basement level.
- There is a single storey terraced area to the rear of the property with stairs access.

4. Proposed Structural Works

- The proposed works to the building comprises of the construction of a new single storey rear outbuilding with single level basement.
- The basement level is proposed to house a new cold storage room, whilst the ground floor houses an additional kitchen area.
- The proposed roof is to be of 'green roof' construction and to accommodate a tubular skylight.

5. Basement Construction Method Statement

Introduction

- The BGS map of this location indicates that the site is directly underlain by solid deposits of the Lambeth Group, which comprises a complex of vertically and laterally varying gravels, sands, silts, and clays deposits.
- The construction of the basement will be by the top-down method. This method has been chosen to minimise the risk of disruption to the adjacent boundary and to the rear garden.
- All access to the site for plant and material will be from the rear.
- Any foundations adjacent to the new basement will require underpinning to the depth of the proposed basement foundations.
- The underpinning to the walls will be constructed in sections of maximum length of 1000mm with no more than a quarter of a wall being unsupported at any one time. In practice shorter sections might be appropriate. This will be decided by the SE as work proceeds.

Underpinning of existing foundation

- The first stage in the construction of the basement is the underpinning of the existing foundations under the rear wall of the existing building.
- The underpinning will be undertaken by digging down to the required depth to provide working space using a mini digger where deemed appropriate, or else by hand. Excavating below the existing foundations will then take place by hand. Hand excavation will be by a combination of mechanical and hand held shovels as determined by soil conditions. Care will be taken to avoid disruption or damage to the existing foundations during the excavation process.
- Where operatives are required to enter excavations shoring will be installed and extended downward as work proceeds. At no time will operatives be allowed to enter unshored excavations.
- Once the foundation depth for the underpinning section is reached and tunnelling below the existing foundation is completed, horizontal starter bars will be introduced into adjacent sections by forcing them into the soil or by the use of couplers or the Kwikastrip system. These are tried and tested methods for this process. Starter bars will also be left projecting into the future basement floor slab. These bars will be surrounded and covered in sand initially after their installation so as to protect them during subsequent backfilling whilst allowing their easy recovery.
- Vertical formwork will be introduced to within 75mm of the underside of the existing footing. 4 days after concreting, the 75mm gap beneath the underside of the existing footing and the top of the concrete will be dry packed with concrete containing a water-proofing and non-shrink additive.
- As part of the dry packing process the main concrete section will have to be roughened to expose the coarse aggregate to ensure that a proper bond is achieved. The specific method for achieving this is to be proposed by the contractor and approved by Engineer.
- The work will be carried out in a managed sequence with:

- No adjacent section being open within 7 days of a previous section being completed
- Not more than 20% of underpinning beneath any length of wall taking place at one time.
- A section will be deemed to be completed 72 hours after dry packing is finished.
- After completion of the underpinning, each section will be temporarily back filled with selected compacted excavated material to provide interim stability during the works. Compaction will be achieved with a vibrating plate compactor. It is of a paramount importance that adequate compaction is achieved. The thickness of each layer and the number of passes will be determined onsite as work proceeds. Backfilling must be complete before the next sections are opened up.

Procedure for the basement

- To retain the ground temporary sheet piling will be installed as marked up on the sketches in Appendix B. by pushing the sheet piles into position. This may require predrilling which is to be determined by the specialist sub contractor. Pile depths are to be determined by contractor design.
- By pre drilling and pushing in rather than just driving the piles, the effects of vibration will be minimised. Similarly if significant vibration is encountered as a result of machine excavation the work adjacent to the boundaries will revert to hand excavation.
- Begin excavation in stages, the underpins and temporary sheet pile wall or similar temporary works are to be propped laterally, likely by a temporary steel waler beam and diagonal corner braces, as the excavation progresses.
- During excavation, it is prudent to ensure not to undermine the neighbouring property foundations. If necessary, excavations are to be progressed in a 'hit and miss' sequencing adjacent to the existing foundations.
- Once the basement is fully excavated, prepare the ground at the basement formation level. Construct basement floor slab.
- Continue to cast the concrete walls bottom up in sections removing props at each level to ground floor level. Once ground floor slab has been cast, all temporary props may be removed.
- Cut back the existing footing and Install filter drain system to specialist design making sure that supplier visits site sufficiently to warrant their system.
- Install waterproofing system.
- This sequence is indicated graphically on 803-Sk03.
- It should be noted that the method described above is only one of many that could be chosen as the design develops. The final design of all temporary support works is the responsibility of the Contractor, and his proposals will be developed at a later stage and reviewed by Engineers at the appropriate time.

6. Health & Safety, CDM and Party Wall Requirements

- If the recommendations included within this report are to be subsequently taken forward to detailed design / scheduling and / or construction; before any work can commence, there is a duty on designers, within the definition of the Construction (Design and Management) Regulations 2015, to ensure that Clients are aware of the specific duties they are required to carry out under the provisions set out in the CDM Regulations. HSE's Client Guidance document INDG 411 which can be found on www.hse.gov.uk sets out clear and concise guidance as to the role the Client plays in a project, and also what is expected of other disciplines involved in the project.
- The Party Wall etc Act 1996 provides owners of buildings with certain rights and obligations to adjoining owners for work in relation to party walls or similar structures. Therefore, the requirements of the act will be adhered to which will require party wall agreements with all adjoining owners prior to the works commencing. This may include the Highways Department of the city council.
- All noisy work on site will be carried out in accordance with guidance provided by the local authority. It is intended that site hours will be Monday to Friday – 8am to 6pm, Saturday – 8am to 1pm, Sunday and public holidays – no working.
- The site hoarding will assist in acting as a noise barrier. All machinery, tools and equipment will be well maintained and silenced where possible for items such as compressors, generators, and power tools. Stationary noise sources will be shielded with acoustic barriers where considered necessary.
- In all cases, the best practicable means of minimising noise will be used, and the guidance given in British Standard BS 5228: Parts 1, and 2 (1984) and Part 4 (1986) entitled 'Noise control on construction and open sites' will be used where practical.
- In the event that a complaint or concern is raised, an immediate review will be completed to remove the problem wherever possible and to establish what levels of noise have been emitted from the site.
- These actions may include reducing the operating hours, re-siting the equipment, changing the method of working or providing temporary barriers.

7. TEMPORARY WORKS

- All temporary works associated with the structural support of the adjacent surrounding properties during the basement construction will be designed by the contractor to the appropriate British Standard taking into account the requirements of the structural design, in particular the construction methodology herein.
- The installation of the above will be exactly in accordance with the project structural engineer's drawings; in particular the following will be adhered to:
 - Specified sequences of work
 - Temporary foundation requirements
 - Health and safety requirements
- Other temporary works, where mentioned in this CMS, shall be designed and installed in the same way as described above.
- It should be noted that the contractor's installation of temporary works - in particular any sheet piling – will be undertaken in such a way as to reduce vibration affecting adjacent structures to an absolute minimum

8. Design Drawings

The following drawings are attached:

803 – Sk01 - Proposed Floor layouts (Appendix B)

803 – Sk02 – Proposed Sections (Appendix B)

803 – Sk03 - Anticipate Construction Sequence (Appendix B)

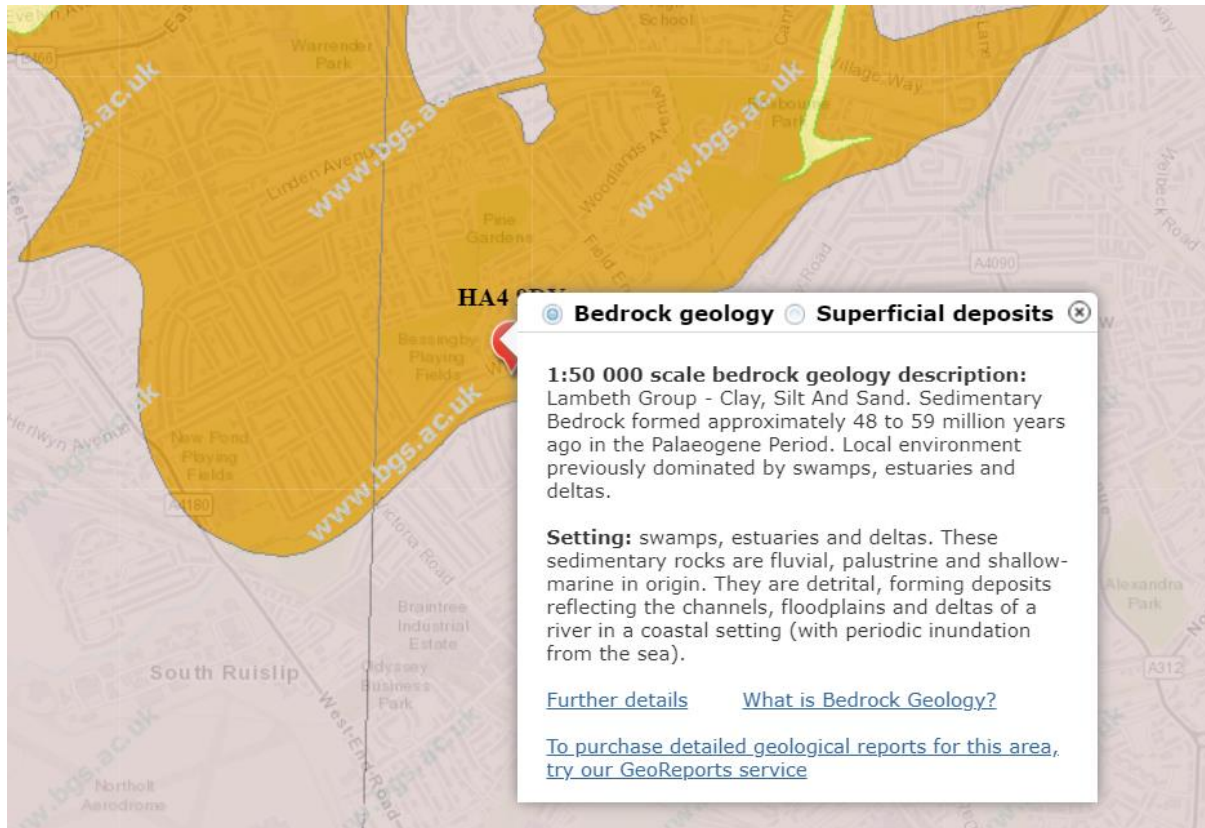
Ramesh Ramji

On behalf of Murya Structural Engineers

R Ramji (BEng. C.Eng. M.I.Struct.E)

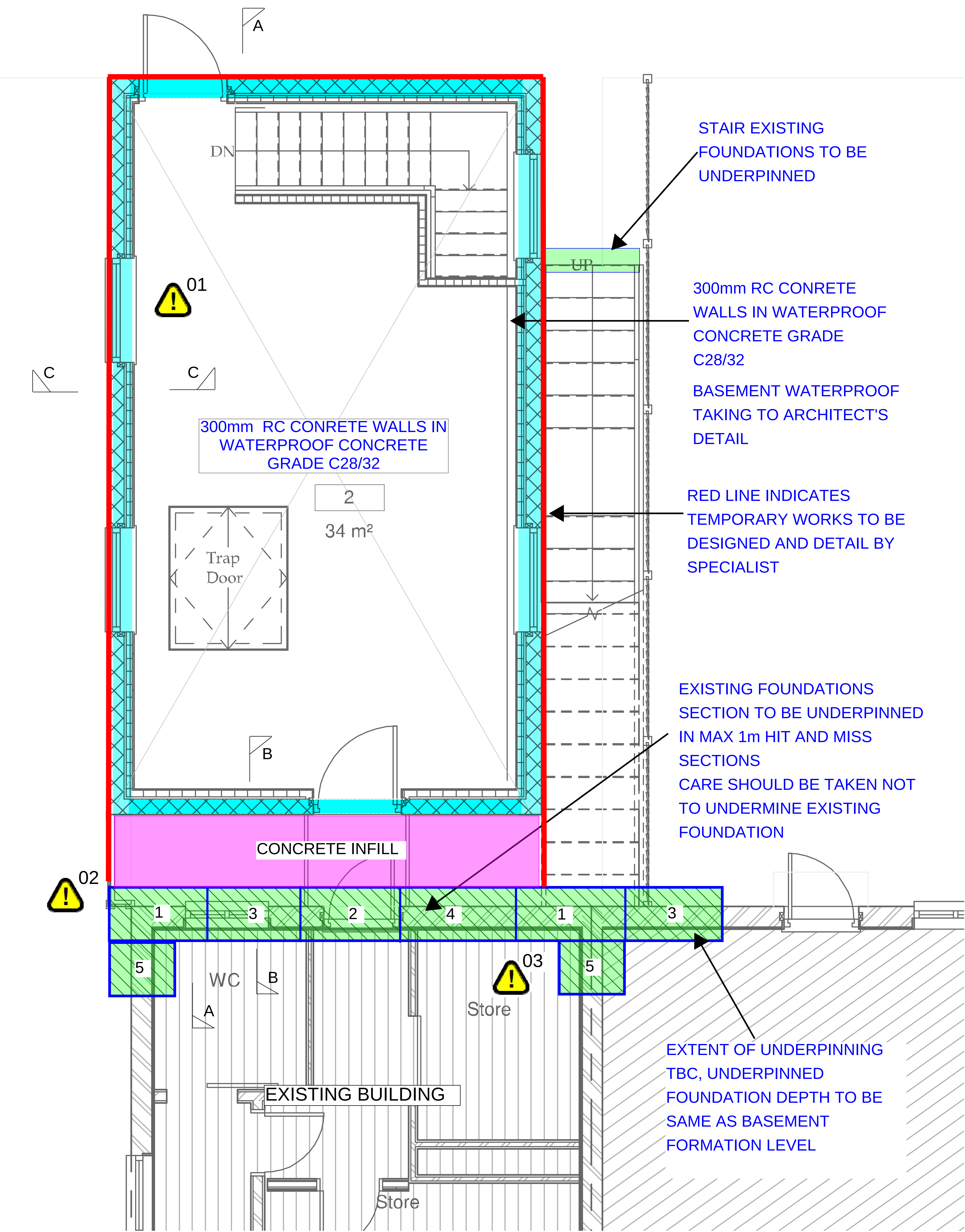
Appendix A - Desk Study Results

Geological Survey Map

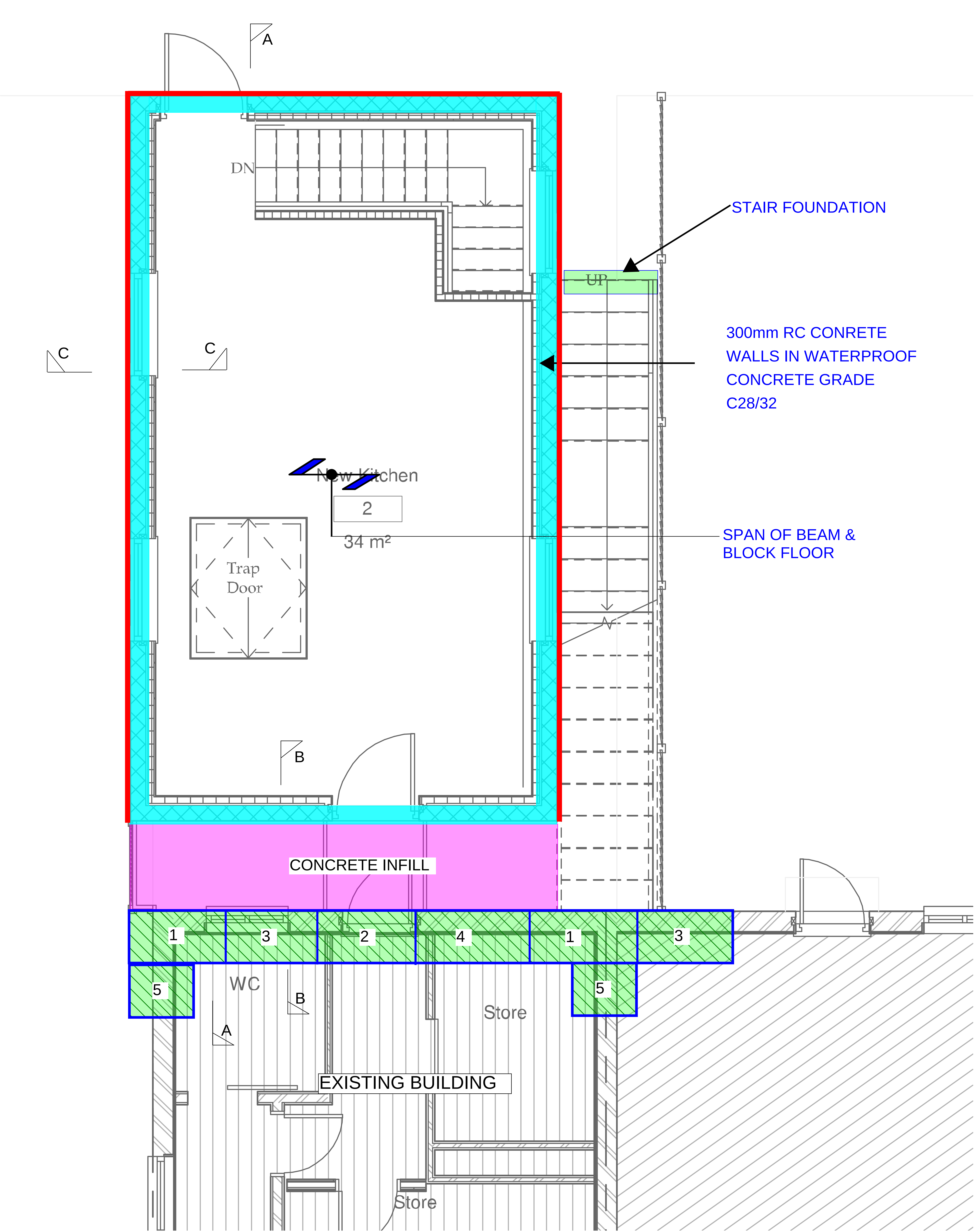


APPENDIX B

Drawings



BASEMENT LAYOUT



GROUND FLOOR LAYOUT

RISK IDENTIFICATION LEGEND	
01	Temporary stability of existing ground during excavation and construction of retaining wall. Specialist to design for temporary works and Contractor to provide method statement and risk assessment.
02	Temporary stability of existing ground during underpinning of existing foundations. Construct foundations in hit and miss sequence and Contractor to provide method statement and risk assessment.
03	Temporary stability of existing structure during erection of new structure and steelwork. Contractor to provide method statement and risk assessment.

IMPORTANT CDM / H & S NOTES

THE DESIGNERS WOULD DRAW THE READERS ATTENTION TO KEY RESIDUAL HEALTH AND SAFETY RISKS THAT HAVE NOT BEEN ELIMINATED FROM THE DESIGNS SHOWN ON THE DRAWINGS BY THE DESIGN PROCESS.

- THESE RISKS ARE IDENTIFIED BELOW:
- THE CONTRACTOR IS TO UNDERTAKE THE WORK UNDER AN APPROVED METHOD STATEMENT.
 - THE CONTRACTOR IS REQUIRED TO LOCATE ALL EXISTING SERVICES PRIOR TO UNDERTAKING ANY WORK.
 - TEMPORARY WORKS ARE TO BE DESIGNED AND DETAILED BY THE CONTRACTOR.
 - THROUGHOUT THE COURSE OF WORKS THE STRUCTURAL STABILITY OF THE BUILDING IS TO MAINTAIN BY THE CONTRACTOR ALL TIMES.

ANY CONSTRUCTION PERSONNEL INCLUDING OPERATIVES INTENDING TO CONSTRUCT THE DESIGNS SHOWN ON THIS DRAWING SHOULD ENSURE THAT THEY HAVE BEEN REGULARLY AND THOROUGHLY BRIEFED BY THE PRINCIPAL CONTRACTOR ON ALL HEALTH AND SAFETY MATTERS AND HAVE SIGHT OF:

1. THE FULL DESIGNERS AND CONTRACTORS RISK ASSESSMENTS AND RISK REGISTERS.
2. THE DEVELOPED CONSTRUCTION HEALTH AND SAFETY PLAN
3. THE CONTRACTORS CONSTRUCTION

BASEMENT CONSTRUCTION METHOD STATEMENT

THE FIRST STAGE IN THE CONSTRUCTION OF THE BASEMENT IS THE PARTIAL DEMOLITION AND RESUPPORT OF THE EXISTING STRUCTURE ON TEMPORARY PROPPING.

THE BASEMENT IS BUILT BY UNDERPINNING THE EXISTING LOAD BEARING WALLS USING SEQUENTIAL MASS CONCRETE UNDERPINNING. THIS IS A PROGRESSIVE, LOW IMPACT AND PARTICULARLY SUITED TO SOILS AS ARE ANTICIPATED AT THIS SITE.

UNDERPINS WOULD THEN BE PROPPED Laterally, PROBABLY BY A TEMPORARY STEEL WALER BEAM AND DIAGONAL CORNER BRACES, AS THE EXCAVATION PROGRESSES.

ONCE THE BASEMENT IS FULLY EXCAVATED, THE INNER CONCRETE FOUNDATIONS, FLOOR SLABS AND CONCRETE LINING WALLS AND LIGHT WELL CAN BE BUILT.

IT SHOULD BE NOTED THAT THE METHOD DESCRIBED ABOVE IS ONLY ONE OF MANY THAT COULD BE CHOSEN AS THE DESIGN DEVELOPS. THE FINAL DESIGN OF ALL TEMPORARY SUPPORT WORKS IS THE RESPONSIBILITY OF THE CONTRACTOR, AND HIS PROPOSALS WILL BE DEVELOPED AT A LATER STAGE AND REVIEWED BY ENGINEER AT THE APPROPRIATE TIME.

REFER SECTION DRAWING FOR UNDERPINNING NOTES

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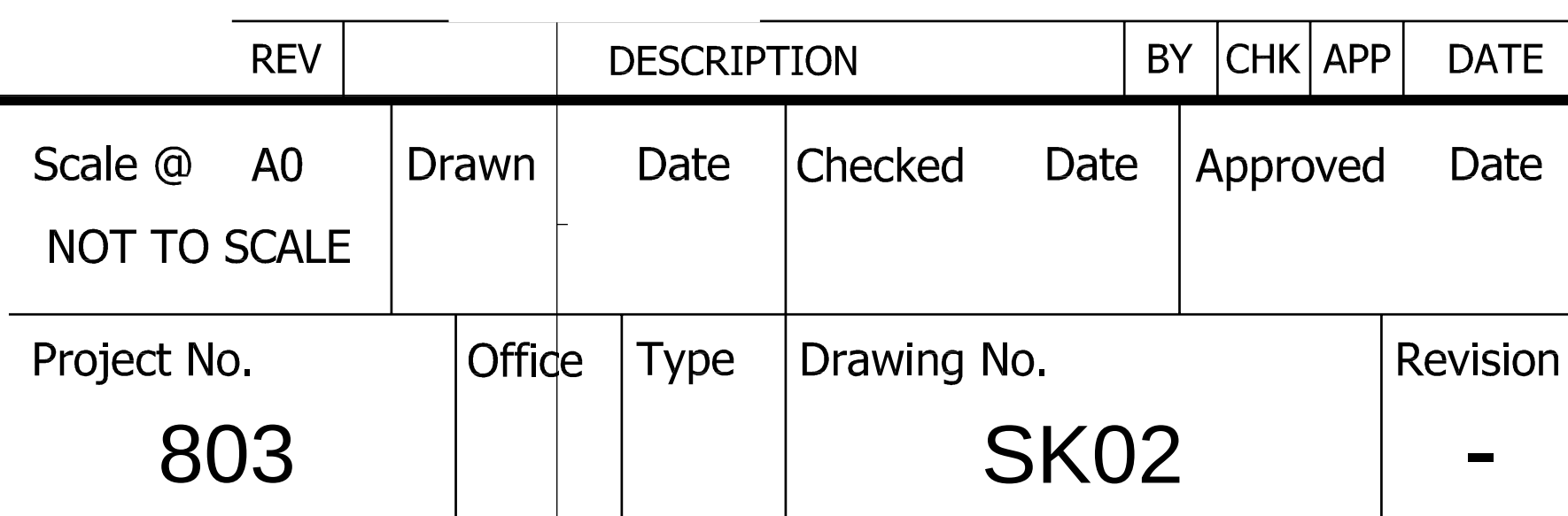
TEL: +44 (0)1162166266
MOB: +44 (0)7852593507
e-mail: hra.consulting@hotmail.co.uk

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214 WHITBY ROAD,
RUISLIP, HA4 9DY

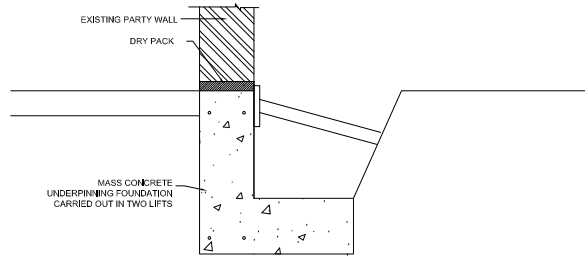
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PROPOSED STRUCTURAL
SKETCH PLANS

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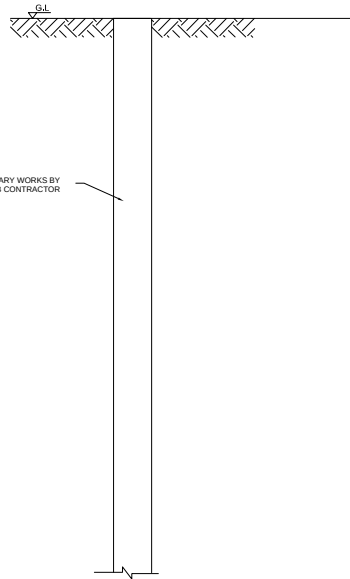
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STEP 1



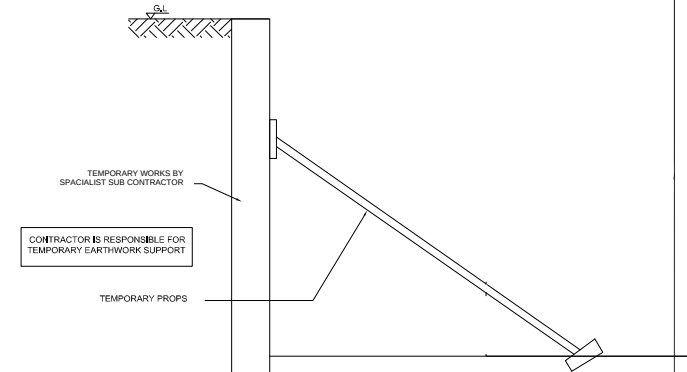
CAREFULLY EXCAVATE UNDERPINNING SECTION IN SHORT LENGTH WITH ADEQUATE TEMPORARY PROPS AND SHORE.
CAST OF MASS CONCRETE UNDERPINNING FOUNDATION CARRIED OUT IN TWO LIFTS.
PROP MASS CONCRETE UNDERPIN FOUNDATION LATERALLY, PROBABLY BY A TEMPORARY STEEL WALER BEAM AND DIAGONAL CORNER BRACES AS THE EXCAVATION PROGRESS

STEP 2



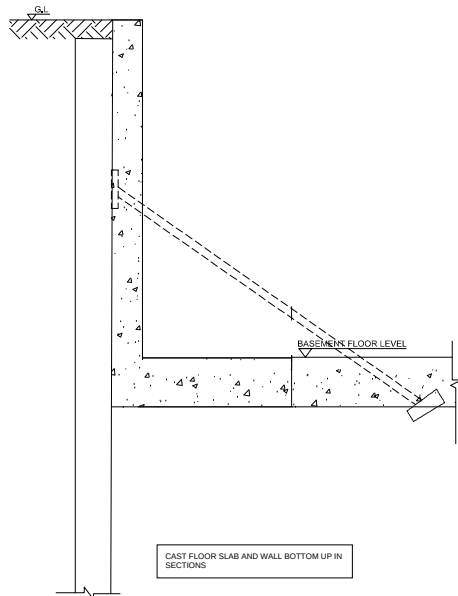
• INSTALL TEMPORARY WORKS

STEP 3

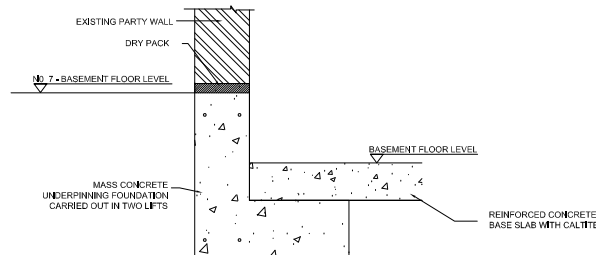


• CAREFULLY EXCAVATE BASEMENT WITH ADEQUATE TEMPORARY PROPS AND SHORE.

STEP 4



STEP 5



• CAST BASE SLABS
• ONCE THE BUILDING IS STABLE AND ARCHIVED PERMANENT CONDITION, CAREFULLY REMOVE TEMPORARY SUPPORTS.

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