Lyons | O'Neill
Structural Engineers

The Admiral Mann Public House, 9 Hargrave Place, London, N7 0BP

Job No. 14286

Basement Impact Assessment

February 2015

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Contents

Appendices

1. Introduction

The site address is Admiral Mann Public House, 9 Hargrave Place, London, N7 0BP. The approximate National Grid Reference of the site is TQ 29712 85042

Lyons O'Neill were appointed in December 2014 by the client, Woodham Properties Ltd., to produce a Basement Impact Assessment (BIA) to accompany the planning application produced by Genesis Architects.

The BIA has been produced in accordance with the guidance given within the Camden planning documents defined below:

- Camden Planning Guidance Document CPG4 : Basements and Lightwells,
- Camden Geological, Hydrogeological and Hydrological Study - Guidance for subterranean development, November 2010 (Arup)
- Camden Development Policy DP27: Basements and Lightwells

The report has been written by Lyons O'Neill, Structural Engineers, with Section 3 written jointly with Southern testing, Geotechnical Engineers.

Written by: Eamonn Keane MEng.

Signed: 

Written by: Ian Jewison BEng CEng MIStrucE

Signed: 

2. Existing Building and Site Constraints

2.1. Site

The site is referred to as Admiral Mann Public House, London, Hargrave Place, N7 0BP. The site is roughly rectangular in shape and measures approximately 23m long x 8m wide.

The topographic map shown on Figure 10 within Appendix E shows the site area as being at approximately 45 - 55m elevation above sea level.

The existing site is occupied by a three storey building, a single storey building and a two storey building adjacent to one another and linked via the open plan ground floor. The three storey high building sits on the corner of Hargrave Place and has an existing single storey basement, which is approximately 2.0m below ground level.

The existing property is located on flat ground. Along the eastern boundary is a single storey masonry building. A residential development has been approved at this site, though the full extent of which is unknown. The development is currently under construction.

To the west, there is a residential block of flats which is 4 stories high. This is located approximately 10m away from the site. The level of the land this is built on is approximately 1.5m lower than that at the Admiral Mann PH. Along the boundary between the 2 sites is a brickwork retaining wall, the height of which appears to vary along the length of the wall.

To the south there is a paved car park area which shares a boundary with the rear garden of terraced housing. The terrace is approximately 20m away from the Admiral Mann PH. To the north there is a four storey high block of residential flats with commercial spaces on the ground floor.

2.1.1. Historical Maps

The site history maps contained within Appendix D show that in 1870 the construction of Hargrave Place had been completed and the site appears to have been developed.

In 1916, the site appears to have remained the same with very little development on or around the site.

2.1.2. Bomb Blast Map

The bomb map within Appendix D shows that the site was not directly hit by any bombs, although this is not exhaustive information.

2.1.3. London Underground Map

The map within Appendix D shows that The Northern Underground Line runs approximately 250m to the west of the site, and the Victoria Underground line also runs approximately 250m to the east of the site. They will not be affected by the works.

2.2. Existing Structure

The existing structure of all three buildings is thought to comprise of solid load bearing masonry perimeter walls. Internal walls at ground and first floor level are thought to be a mixture of masonry and studwork, supporting timber joist floors. The roofs are assumed to be formed in timber, with the pitched roof likely to be in a trussed arrangement. All elements of the existing structure will be confirmed by opening up works at the start of the detailed design phase.

The below ground drainage to the building is thought to run out to Hargrave Place. This is to be verified using information from both Thames Water and a CCTV below ground drainage survey. The intention is to, where possible, re-use the existing connection to the main sewer.

3. Screening (Stage 1)

3.1. Introduction

As part of the pre planning application process for basements within Camden, there are 4 stages that are defined within the Camden documentation that must be worked through in order to be able to:

- demonstrate how the proposed construction will impact on the existing situation
- identification of items that need to be investigated further, further investigation of these items
- describe proposed mitigation measures.

Information required within the screening stage is contained within Sections 3.2 – 3.4 below.

3.2. Groundwater flow

Q1. Is the site located directly above an aquifer?

No. Figure 8: Camden Aquifer Designation Map, within Appendix E. The Bedrock geology underlying the site (London Clay Formation) is classified as Unproductive Strata; drift deposits or rock layers with low permeability that have negligible significance for water supply or river base flow.

Q1b. Will the proposed basement extend beneath the water table surface?

No. The maximum depth of the proposed basement floor level of approximately 3.0m below ground level will be above the groundwater table. Note that the existing basement is already at approximately 2.0m below ground level. The window samples were 3.0m in

depth and no groundwater was encountered. The site investigation only encountered perched water within the made ground.

Q3. Is the site within 100m of a watercourse, well or potential spring line?

No. The Lost Rivers of London Map in Appendix E shows that the site is approximately 500mm from River Fleet.

Q4. Is the site within the catchment of the pond chains on Hampstead Heath?

No. The site is outside of the catchment area for both the Highgate ponds and Hampstead Ponds, as defined by the Environment Agency.

Q5. Will the proposed basement development result in a change in the proportion of hard surfaced/paved areas?

No. The amount of hardstanding on the site will be the same as that within the existing condition.

Q6.As part of the site drainage, will more surface water than at present be discharged to the ground (soakaways and SUDS)

No. The discharge of surface water will remain the same.

Q7. Is the lowest point of the proposed excavation close to, or lower than, the mean water level in any local pond or spring line.

No. There are no surface water features within 100m of the site.

3.3. Slope Stability

Q1. Does the existing site include slopes, natural or manmade greater than 7 degrees?

No. The site is essentially flat.

Q2. Will the proposed re-profiling of landscaping at the site change slopes at the property boundary to more than 7°?

No. Remodelling of the site elevations is not proposed and there are no slopes on the site.

Q3. Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°?

No. Refer to the answer to Q1.

Q4. Is the site within the wider hillside setting in which the general slope is greater than 7°?

No. Figure 16: Slope Angle Map, within Appendix E, shows that the site is located outside of the area of the steep slopes within the area.

Q5. Is the London Clay the shallowest strata on the site?

No. The site is underlain by Made Ground overlying the London Clay Formation; the London Clay is the shallowest natural strata below the site. Refer to Figure 4: North Camden Geological Map Appendix E. The depth of the London Clay has been proven by the site investigation to be in excess of 3.0m below ground level.

Q6. Will any trees be felled as part of the proposed development and/or are any works proposed within any tree protection zones where trees are to be retained?

No. There are no trees on the site.

Q7. Is there a history of seasonal shrink-swell subsidence in the local area, and/or evidence of such effects at the site?

No. There are no known effects of seasonal shrinkage or swelling in the local area.

Q8. Is the site within 100m of a watercourse or a potential spring line?

No. Lost Rivers of London of London Map in Appendix E shows that the site is approximately 500mm from River Fleet.

Q9. Is the site within an area of previously worked ground?

No. Whilst there is overlying Made Ground, the site investigation has shown that the site geology is London Clay, indicating that the geology that the new building will be founded within virgin strata which has not previously been worked over.

Figure 4 in Appendix E shows the North Camden Geological Map, which confirms that the site sits outside of an area of previously worked ground.

Q10. Is the site within an aquifer? If so, will the proposed basement extend beneath the water table such that dewatering may be required during excavation?

No. Figure 8: Camden Aquifer Designation Map within Appendix E, shows that the site is located within the London Clay stratum which is an Unproductive Strata.

The Bedrock geology underlying the site (London Clay Formation) is classified as Unproductive Strata; drift deposits or rock layers with low permeability that have negligible significance for water supply or river base flow.

Q11. Is the site within 50m of Hampstead Heath ponds?

No. The site is not located within 50m of Hampstead Heath ponds.

Q12. Is the site within 5m of a highway or pedestrian right of way?

Yes. The edge of the proposed basement is approximately 3m from the edge of the pavement on Hargrave Place.

Q13. Will the proposed basement significantly increase the depth of foundations relative to neighbouring properties?

Yes. It is proposed to lower the foundations of the existing basement by approximately 1000mm to a total depth of approximately 3.0m below ground level. The only neighbouring property is on the east side. The foundation depths of adjacent properties are not known. The closest part of the neighbouring property on the east side is approximately 3.0m away from the edge of the proposed basement. There will therefore be a small amount of surcharge load that the retaining walls along these boundaries will be designed for, and this will be based on a conservative estimate of the existing loads.

Q14. Is the site over (or within the exclusion zone of) any tunnels, e.g railway lines?

No. There are no tunnels within the site boundary or within the wider proximity. The London Underground Northern and Victoria Line tunnels are located well away from the site. Refer to the London Underground Tube map within Appendix C.

3.4. Surface Flow and Flooding

Q1 Is the site within the catchment of the pond chains on Hampstead Heath?

No. Refer to Figure 14: Hampstead Heath Surface Water Catchments and Drainage Camden within Appendix E that shows the site is not located close to Hampstead Heath.

Q2. As part of the proposed site drainage, will surface water flows (e/g volume of rainfall and peak run-off) be materially changed from the existing route.

No. Existing surface water on the site flows into drainage gullies which are then linked to the existing below ground drainage system. This arrangement will not change in the proposed condition.

In the proposed condition, there will be a cavity drain running around the perimeter of the basement. The drainage serving the drained cavity to the perimeter of the basement will be pumped up to the ground level and then link in with the existing drainage at this level. Where possible, the existing connection of the surface water pipe to the sewer within the roadway will be maintained.

The extent and condition of the existing drainage will be investigated within the detailed design phase using a CCTV survey.

Q3. Will the proposed basement development result in a change in the proportion of hard surfaced/paved external areas?

No. The proposed works do not involve any alterations to external paved areas.

Q4. Will the proposed basement result in changes to the profile of the inflows (instantaneous and long term) of surface water being received by adjacent properties or downstream watercourses?

No. There is no run off in the existing condition affecting these properties. Under the new proposals this will not change - there will be no surface water being received by the adjacent properties either upstream or downstream of the development.

Q5. Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream properties?

No, as no changes are occurring to the surface water on the property, the neighbouring properties will experience no change to the surface water that they receive.

Q6. Is the site in an area known to be at risk from surface water flooding, or is it at risk from flooding, for example, because the proposed basement is below the static water level of a nearby surface water feature?

No. The site address has been checked against the list of streets at risk of surface water flooding, given within Camden Guidance Document CPG4: Basements and Lightwells, and has been shown not to be at risk of surface water flooding.

4. Scoping (Stage 2)

From the screening charts, Q13 of the Slope Stability produced a "yes" response.

The item will be carried forward into the scoping stage of the process.

The specific item is:

- The proposed basement increases the depth of foundations relative to neighbouring properties

4.1. Stability of neighbouring properties

The excavation and construction of the basement at the site has the potential to cause some movements in the surrounding ground. However, it is understood that ground movements and/or instability will be managed through the proper design and construction of mitigation measures.

The proposed development will also result in differential foundation depths between the site and adjacent property and as such the Party Wall Act will be used and considered during the design phase. For basement developments in densely built urban areas, the Party Wall Act (1996) will usually apply because neighbouring houses would typically lie within a defined space around the proposed building works. Specifically, the Party Wall Act applies

to any excavation that is within 3m of a neighbouring structure; or that would extend deeper than that structure's foundation; or which is within 6m of the neighbouring structure and which also lies within a zone defined by a 45° line from the foundation of that structure. The Party Wall process will be followed and adhered to during this development. Refer to Section 8 for more information on this.

5. Site Investigation and Study (Stage 3)

Stage 3 of the process covers the site specific site investigation to determine the site specific ground conditions and groundwater level.

5.1. Desk Top Study

The North Camden Geological Map shown in Figure 4 in Appendix E shows the site geology as London Clay. This ties up with copy of the British Geological Map for the North London area, in Appendix D, that shows the site as being well within the London Clay strata.

5.1.1. London Clay

London Clay is a well-known stiff (high strength) blue-grey, fissured clay, which weathers to a brown colour near the surface. It contains thin layers of nodular calcareous mudstone - "claystone" - from place to place, and crystals of water clear calcium sulphate (selenite) are common.

All four of the plasticity tests carried out classified the natural London Clay soils as being NHBC HIGH Volume Change Potential (VCP). Therefore we would recommend that NHBC High Volume Change Potential (VCP) should be adopted for a general site classification with regards to the London Clay Soils on site.

5.1.2. Radon Risk

With reference to the BRE Guidance, no radon protection is required on this site.

5.2. Groundwater

Data from the Environment Agency and other information relating to controlled waters is summarised in Table 2. The groundwater vulnerability assessment is based on the most current data on the EA website.

The site is shown as being approximately 1.5km from Highgate ponds, along the western edge of Hampstead Heath. Figure 14 within Appendix E shows that the site sits well outside the catchment area of any of the Hampstead ponds.

The Highgate Ponds are located approximately 2.5km away. Local watercourses drain into and through these ponds, which turns into the River Fleet.

5.2.1. Lost Rivers

The Lost Rivers of London map shown within Appendix D shows an old tributary running approximately 500m from the site. At this distance the watercourse will not affect the works proposed at the site.

5.3. Site Investigation

A ground investigation was carried out by Southern Testing on the site in January 2015, and is summarised below, reference should be made to interpretive Ground Investigation Report prepared by Southern Testing for a detailed description of the works.

The investigation comprised of the following works:

- 2 No 3.0m deep boreholes drilled within the existing basement area using hand held window sampler equipment (WS1& WS2).
- 1 No. 3.0m deep borehole drilled from ground level using hand held window sampler equipment (WS3).
- Groundwater monitoring wells installed within WS1, WS2 & WS3 for groundwater monitoring purposes.
- A series of 7 foundation inspection trial pits.

The location of these trial holes is given within the copy of the site investigation interpretive report contained in Appendix G.

Whilst detailed descriptions of the soils encountered within the borehole, together with trial pit logs are given in Southern Testing's Investigation report, a condensed summary of the soil conditions encountered is given within Table 1 below, with depth below ground level (BGL) noted.

Trial Pits 1 - 4 were formed against the face of the basement perimeter walls. Trial Pits 1 and 2 on the north side of the basement confirmed the footings to the walls to be shallow brickwork footings, founded approximately 250 - 400mm below ground level within the made ground. Trial Pits 3 and 4 on the north side confirmed shallow footing founded 250-400mm below ground level within the London Clay.

Trial Pit 5 was formed against the eastern perimeter wall and return internal wall. It was not possible to confirm the depth of foundations here due to the location of a concrete drain run.

Trial Pit 6 was formed in the south perimeter corner on the west side of the site. The Trial Pit confirmed shallow brick corbelled footings at 580mm below ground level, above mass

concrete to 750mm below ground level.

Trial Pit 7 was formed in the south perimeter corner on the east side of the site. The Trial Pit confirmed shallow concrete footings to 540mm depth below ground level on the southern perimeter wall. The Trial Pit also confirmed mass concrete foundations below the eastern wall to a depth of 710mm below ground level.

5.4. Bearing Capacity

Where it is necessary to construct spread foundations or bases to retaining walls/underpinned sections as part of the proposed works, all foundations will penetrate any made ground and be formed within the underlying natural High Strength Clay materials. For foundations formed on these materials, the geotechnical engineers recommend than an allowable bearing capacity of 125kPa should be adopted.

5.5. Heave

Due to stress relief following the removal of the existing soils to form the basement structure(s), both immediate (undrained) and long term (drained) heave displacements can be expected to occur in the underlying London Clay. The magnitude of these is expected to be low due to the shallow depth of excavation. The immediate (undrained) heave displacements will occur as excavation of the basement takes place and before the construction of basement elements e.g. slabs etc. Accordingly, only the long term (drained) heave displacements will need to be catered for in design, to overcome the problem of uplift pressures forming.

To cater for the heave, a compressible material will be placed to the underside of the suspended basement slab. This will compress in the event of any upwards movement from the soil. Checks will also be made to ensure that the dead load applied to foundations will be sufficient to resist uplift forces (with concrete thickness being locally increased where additional dead load is required).

Depth to Base (m BGL)	Soil Type	Description
0-0.4/0.8m	Made Ground	Grey brown to orange brown, clayey, fine to coarse, SAND/sandy CLAY, with occasional fragments of brick, concrete, slate, brick, glass
0.8-3.0+m	London Clay	Firm to stiff, high to very high strength, brown to orange brown, CLAY, with occasional selenite crystals.

Table 1: Summary of Borehole Logs

6. Site Hydrology

6.1. Site Specific Groundwater Conditions

During the course of the investigation perched water was encountered in three of the four shallow inspection pits within the cellar area (TP1, TP2 & TP4) and also within window sample hole (WS2) formed from the base of TP1. However, while site works were in progress no other groundwater entries were noted in the other trial pits and window sample holes. The noted entries in TP1/WS2, TP2 and TP4 are perched water as a result of surface water soaking through the perimeter hardstanding at ground floor level.

The standing water levels from the monitoring visits to date are shown in the table below.

Data		
Aquifer Designation	Superficial Deposits	There are no superficial deposits mapped
	Bedrock	London Clay-Unproductive Strata. Deposits with low permeability that have negligible significance for water supply or river base flow.
Source Protection Zones		The site is not located with a Source Protection Zone
Surface Water Features		The "Risk of Flooding from Surface Water" mapping on the Environment Agency website January 2015) shows the site to be within an area of Very Low Risk. Very Low Risk means that each year, this area has a chance of flooding of less than 1 in 1000 (0.1%).
Fluvial & Reservoir Flood Risk		On the basis of the information given on the EA website (February 2015) the site is not located within an area of potential risk of flooding from reservoirs or fluvial sources.
Watercourses, well (used/disused) or potential spring lines		The nearest water course shown on the Camden Plan of Watercourses (Source Lost Rivers of London) shows the River Fleet approximately 1.1km to the west. Given the geology of the area (London Clay) the potential presence of spring lines are negligible.

Table 2: Summary of Geology and Hydrology

The proposed basement will not result in any specific issues relating to land or slope stability. Whilst a proposed sequence of construction is outlined in Section 9, the contractor will be expected to work up his own sequence, outlining the temporary works involved and when in the construction process these will be installed.

7. Proposed Works

7.1. Introduction

Drawings **14286-PR-01, 14826-PR-02, 14286-PR-03** and **14286-PR-04** within Appendix C show the proposed structural arrangement of the building.

As part of the new works, part of the existing basement will be lowered by approximately 1000mm to a total depth of 3.0m below ground level. The existing perimeter walls will be underpinned using a hit and miss sequence with a maximum pin width of 1m to allow existing masonry to arch over. Underpins will be formed in mass concrete, the width of these will match the existing wall above. A reinforced concrete (RC) retaining wall will be placed in board of this. The head of this wall will be restrained by the new ground floor.

The basement is categorised as Type 3, in line with the requirements of BS 8102. This defines the space as a dry environment, with no water penetration. In order to comply with this, a drained cavity will be placed in front of the retaining walls. This will pick up any perched water within the made ground ingressing through the wall.

The retaining wall will be designed to resist earth and water pressures, together with surcharge load from the roadway on the west, north and south sides, and surcharge load from the adjacent building on the east side. Although the water table has been shown to be located below the level of the new basement, the design of the new perimeter basement walls will be designed for a head of water equivalent to 1m below ground level.

The new basement is being formed within the clay strata. This will heave as a result of the unloading from the excavation of the soil, required to form the basement. A layer of heave protection will therefore be placed to the underside of the basement slab to accommodate this movement.

The ground floor above the lowered basement is proposed to be formed using an arrangement of steel beams with metal deck and concrete slabs spanning between. The contractor may decide to install some of the steelwork early in order to utilise this in the temporary condition and eliminate the need for temporary props.

All of the existing buildings will be extended upwards as part of the works. It is proposed to form a lightweight mansard extension to the 3 storey building. The extensions to the other two buildings will be formed in loadbearing masonry/blockwork which will be built off of the top of the existing. As this construction will increase the loads on the existing walls and hence at foundation level, the perimeter walls to these will be underpinned in order to extend the pins into the clay strata which has a higher bearing capacity.

Pins will be formed in mass concrete, and extend a minimum of 150mm into the clay layer.

Within each of the buildings, upper level alterations are proposed which involve the removal of some internal loadbearing walls and relocation of existing staircases. New steelwork within the depth of the floor will replace loadbearing walls and will support new/existing timber joist floors throughout the upper floors. Steel internal columns are proposed within the two storey building to support the new roof structure, and within the single storey link structure to support new walls which do not extend down to ground floor level. Columns will typically be hidden within internal walls in order to minimise their intrusion internally. The columns that extend down to ground floor level outside of the footprint of the new basement will be supported on new mass concrete pad foundations, formed within the clay layer.

The mansard extension to the existing three storey building will be formed as a lightweight structure using cranked steelwork framed out in timberwork. which springs off of the 3rd floor.

7.2. Proposed Method of Analysis

The overall construction sequence and temporary/permanent propping regime will require detailed design to ensure that potential lateral and vertical movements are kept within acceptable levels.

For the purpose of analysing the basement walls and foundations, appropriate parameters will be used for the design associated with changes in loadings on the London Clay.

A heave/settlement analysis will be carried out using commercial software packages such as RSA or VDisp to assess any possible movements.

Condition surveys of the subject building will also be undertaken prior to the commencement and at the end of the site works.

The party wall process may also require that targets are installed on this building and monitored on a regular basis throughout the duration of the works to ensure that any movements are kept within acceptable and pre-agreed levels, as described within Section 8.

8. Protection of Adjacent Structures

8.1. Party Wall Matters

The proposed development falls within the scope of the Party Wall Act 1996. Procedures under the Act will be dealt with by the Employer's Party Wall Surveyor. The Party Wall Surveyor will prepare necessary notices under the provisions of the Act and agree Party Wall Awards in the event of any disputes.

The Contractor will be required to provide the Party Wall Surveyor with appropriate drawings, method statements and all other relevant information covering the works that are notifiable under the Act, which will necessitate confirmation of existing footing profiles for each condition. The resolution of matters under the Act and provision of the Party Wall Awards will protect the interests of all owners.

The proposed works to form the basement will be designed and detailed so that any movement of the existing structure is no worse than "Category 2", defined as Very Slight within the BRE Digest 251 Table 1 and CIRIA 580 (Burland et al).

The example calculation within Appendix F shows how this category is achieved using the anticipated movements of the retaining walls. This exact levels will be agreed as part of the party wall process, and the movement of the existing building will be monitored twice weekly during the formation of the basement using targets placed to the face of the walls. Monitoring is discussed in more detail in Section 8.3.

Condition surveys of the adjoining properties will be undertaken prior to commencement of the site works. Data from monitoring stations will be regularly analysed during construction to ensure that there is no unexpected movement that may affect the adjoining properties on either side.

8.2. Temporary Works

The design of the temporary works and the temporary stability of any existing structure to be retained as part of the permanent works is entirely the responsibility of the contractor.

The temporary works discussed below and shown indicatively on the drawings within Appendix C outline the expected temporary works required. All of this information will be firmed up by the contractor following their appointment. The contractor is to submit an overall Method Statement a minimum of 4 weeks prior to a site start and detailed drawings and calculations a minimum of 4 weeks, which are to include an assessment of the anticipated ground movement due to; temporary works and underpinning, and is also to cover each stage of construction, initial excavation, propping, full excavation etc.

The contractor will also be required to appoint a Temporary Works Co-ordinator for the duration of the contract in accordance with the specification.

The temporary works that are thought to be required are for the propping of the piled retaining walls prior to the installation of the main ground floor slab.

8.3. Monitoring Strategy

All items of temporary works and surrounding structures are to be monitored in a manner and frequency commensurate with the construction activity taking place. As a minimum the monitoring should include a daily full visual survey of all temporary works and surrounding structures, and a twice weekly measured survey of the existing structure using fixed survey points to be agreed with the Party Wall Surveyors.

The limits of any movement may be set against the colours green, amber and red:

Green:	- Settlement recorded within predicted movements.
Amber:	- Settlement recorded is approaching the predicted movements.
Red:	- Settlement recorded is above the predicted movements.

8.4. Remediation Measures should levels be exceeded

If the amber levels are exceeded, the contractor is to notify the Engineer and review the construction sequence.

If the red levels are exceeded at any point during the piling works, the contractor is to immediately cease the construction works and install temporary props/reinstall excavated material such as required to the face of the wall in order to prevent any further movement. These measures are to be kept in place until such time as the engineer deems them suitable to be removed.

The contractor is to ensure he has either have adequate provision in terms of props on site during the works, or be able to obtain temporary props required at short notice in order to install these in the event of the amber levels being exceeded.

8.5. Outline Monitoring Specification

Target locations for monitoring are to be agreed with the adjoining owners Party Wall Surveyors for inclusion on the Party Wall Award. The frequency of monitoring is to be agreed prior to execution of the works. A recommended frequency for monitoring is outlined below:

Prior to the commencement of the works:	- Baseline readings are to be taken
During the installation of the underpins	- Weekly readings
At the completion of each phase of the work:	- Single readings taken
End of the construction stage:	- Final readings taken

A stable datum must be maintained and the observed monitoring points must be an integral part of the structure. Targets are to be surveyed to an accuracy of ±1mm and read in three dimensions, i.e. the X, Y and Z axes.

Recordings should demonstrate the vertical and horizontal movements that have occurred since the previous measurements were taken.

Lateral and vertical movement limits are to be set against Green, Amber and Red limits. These limits are to be agreed by the Party Wall Engineer and the Pile Designer during the party wall process.

9. Impact Assessment (Stage 4)

9.1. Conclusion

It has been shown within this document that the proposed basement will not impact on the existing geological or hydrogeological conditions, and as the ground is flat, slope stability will not be an issue.

Whilst perched groundwater within the made ground has been identified, the proposed basement design has included measures to accommodate this.

Provided the works are undertaken in a logical and safe manner the works will not have a detrimental effect on either the existing building. An assumed construction sequence is included within the report, which it is expected that the appointed contractor will use to inform his sequencing for undertaking the works.

10. Proposed Sequence of Construction

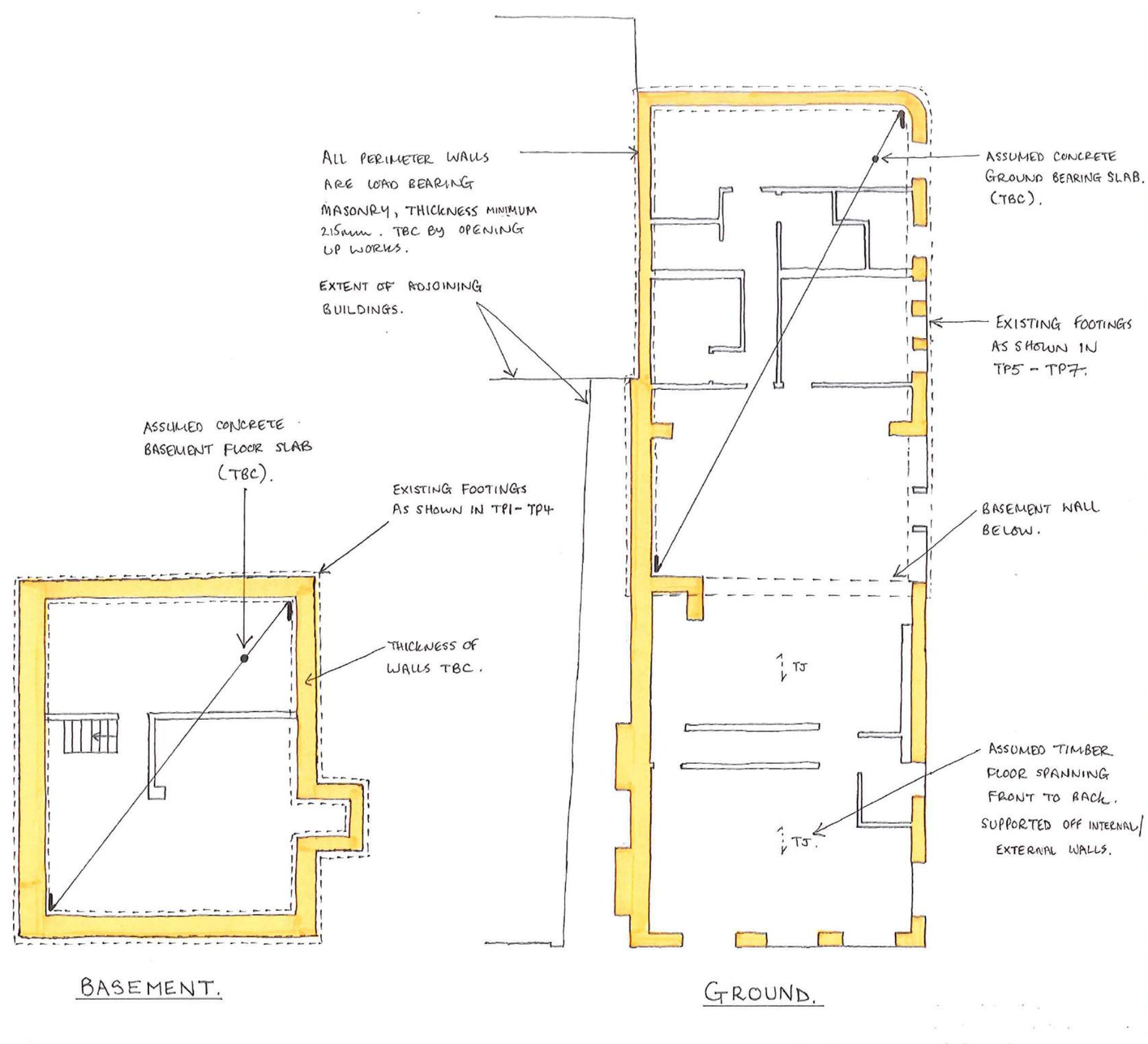
An assumed sequence of construction is described below. This summarises our initial thinking as to how the proposed works will be undertaken. It does not relieve the contractor from undertaking his own construction sequence in order to demonstrate that he has understood all of the challenges involved.

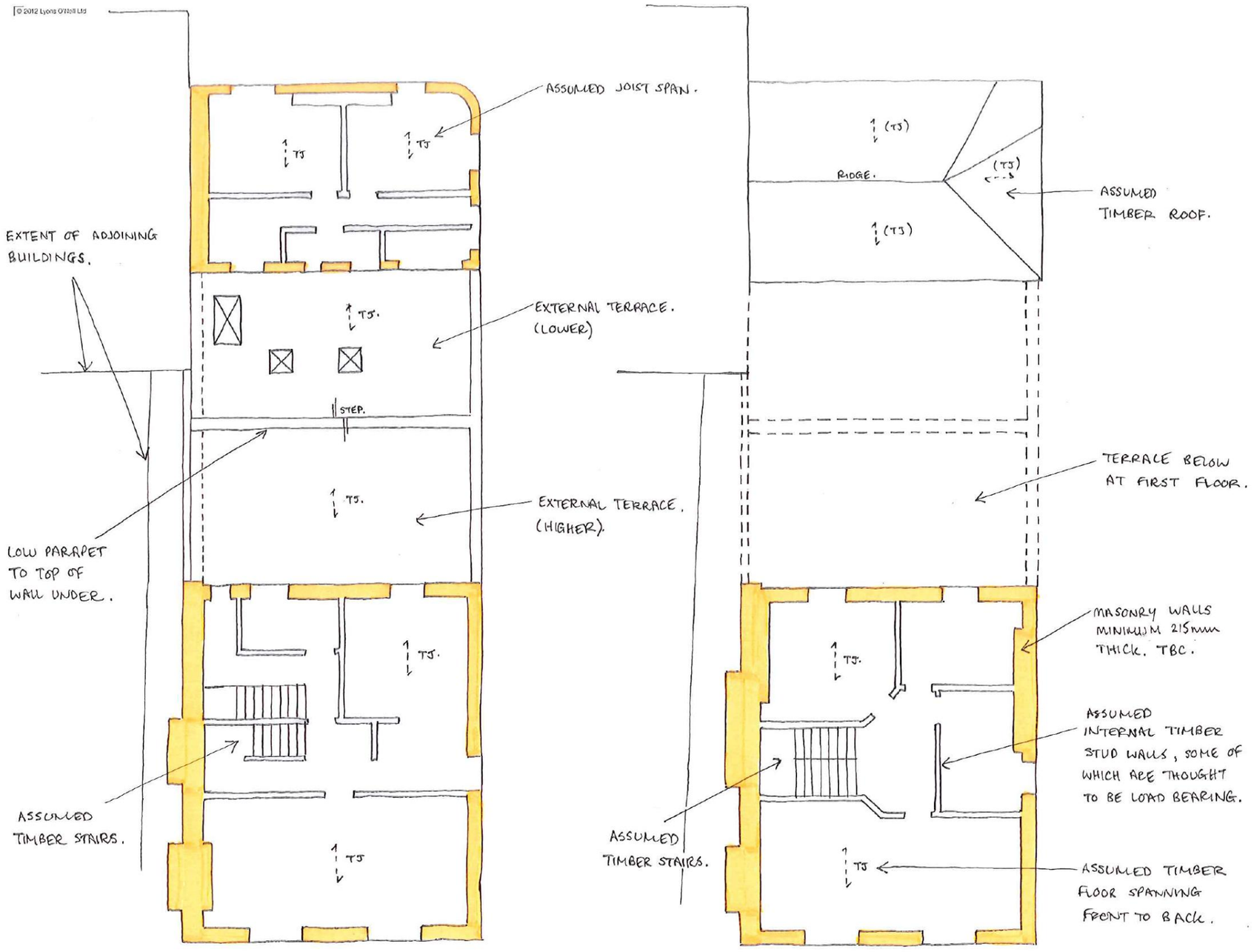
The proposed construction sequence for the new basement works and superstructure works are outlined below:

- Mobilise and set up site welfare
- Determine route of all services and cap these off as required.
- Remove the existing basement slab in area to be lowered.
- Demolish existing ground floor slab above area of basement to be lowered.
- Commence underpinning of existing masonry walls around the existing basement in hit and miss sequence.
- For each excavation, cast a mass concrete underpin below existing masonry walls and cast an RC retaining wall in board of this spanning between proposed basement slab level and ground floor level.
- Install heave protection to the underside of the basement slab.
- Place basement slab reinforcement and cast basement slab.
- Install steelwork at ground floor level.
- Install metal decking and cast the ground floor slab.
- Remove temporary props.
- Commence underpinning of existing masonry perimeter walls in hit and miss sequence to a depth great enough to achieve minimum 150mm depth into the clay layer.
- Commence superstructure works.

Appendix A

Existing Drawings





KEY

LOAD BEARING MASONRY WALL.

TJ ASSUMED TIMBER FLOOR SPAN.

STRUCTURE BELOW.

REV COMMENTS DATE CHK

STATUS

Lyons | O'Neill
Structural Engineers
45 Great Guildford Street
London
SE1 0ES
+44 (0)20 7223 7222
info@lyonsoneill.co.uk
lyonsoneill.co.uk

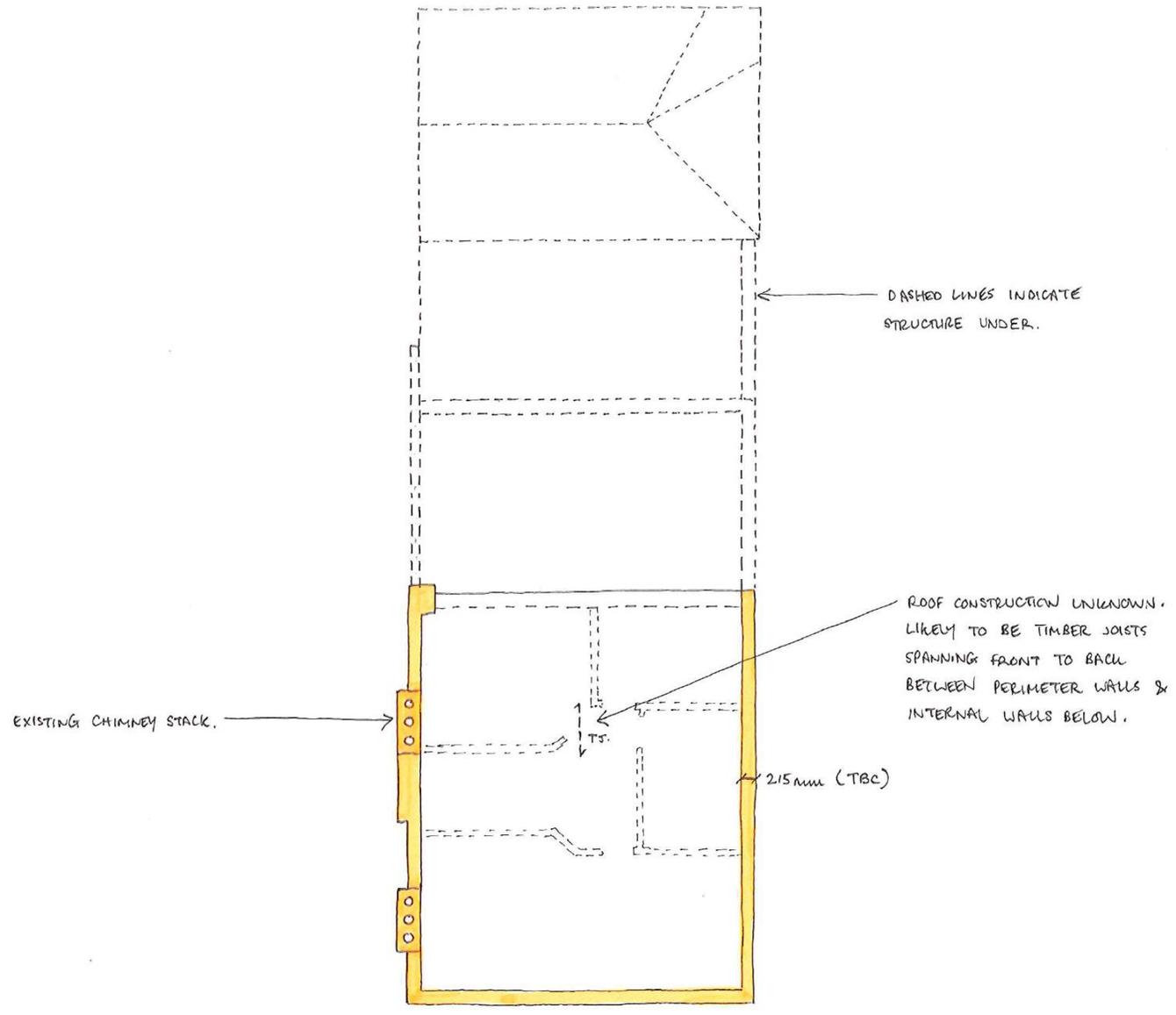
PROJECT
14286 - ADMIRAL MANN.

SUBJECT
EXISTING FIRST & SECOND FLOOR PLANS.

SCALE @ A3 1:100 @ A3. DATE

BY EMK. CHECKED

DRAWING No. 14286-EX-02. REV



KEY

LOAD BEARING MASONRY WALL.

TJ ASSUMED TIMBER SPAN.

STRUCTURE BELOW.

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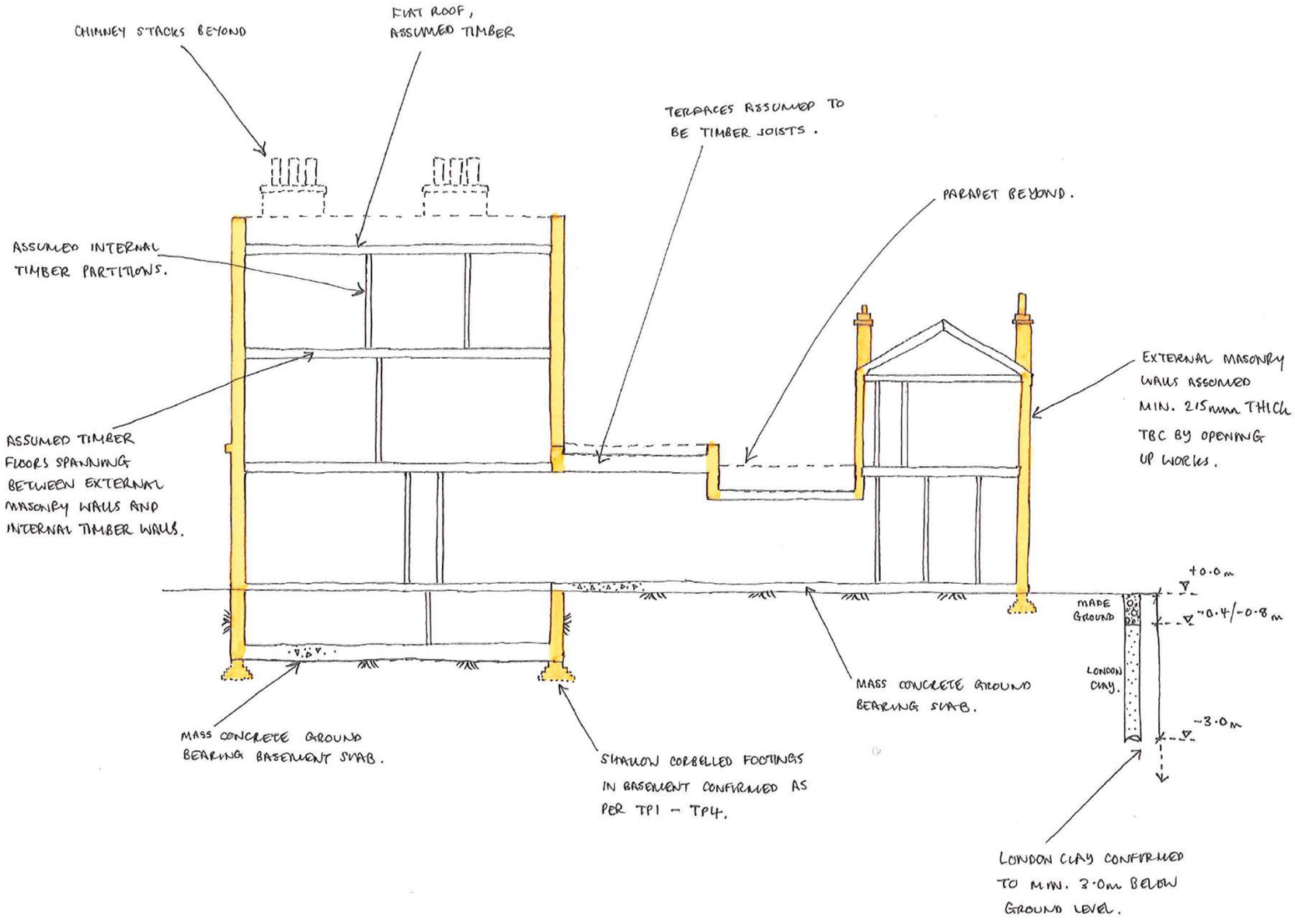
PROJECT
14286 - ADMIRAL MANN.

SUBJECT
EXISTING ROOF PLAN.

SCALE @ A1 1:100 @ A3
DATE JAN '15.
BY EMK.
CHECKED
DRAWING NO. 14286-Ex-03
REV



KEY

LOAD BEARING MASONRY WALL.

EXISTING MASS CONCRETE.

REV COMMENTS DATE CHK

STATUS

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PROJECT
14286 - ADMIRAL MANN PH

SUBJECT
EXISTING SECTION.

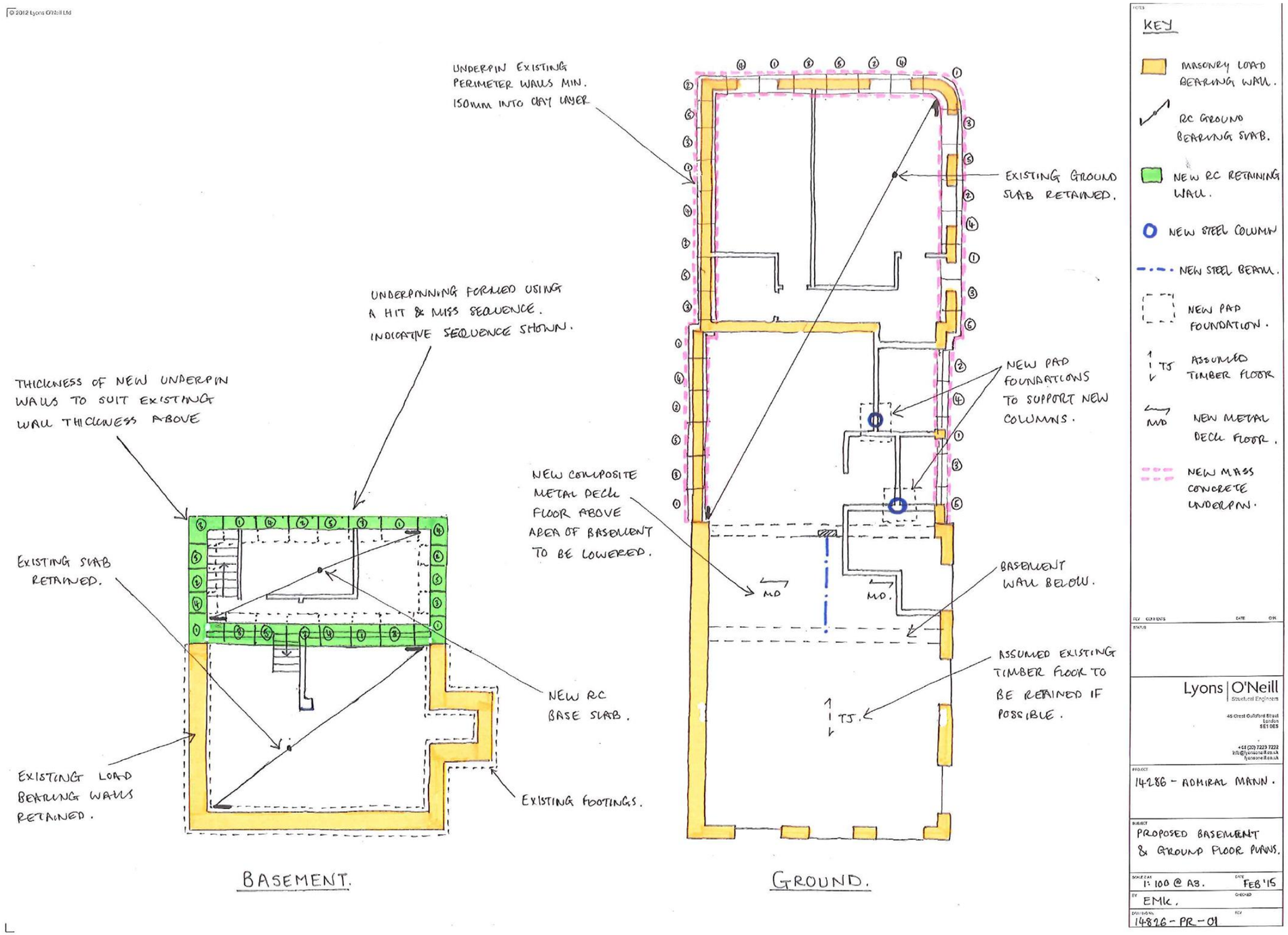
SCALE@A3 NTS. DATE FEB '15

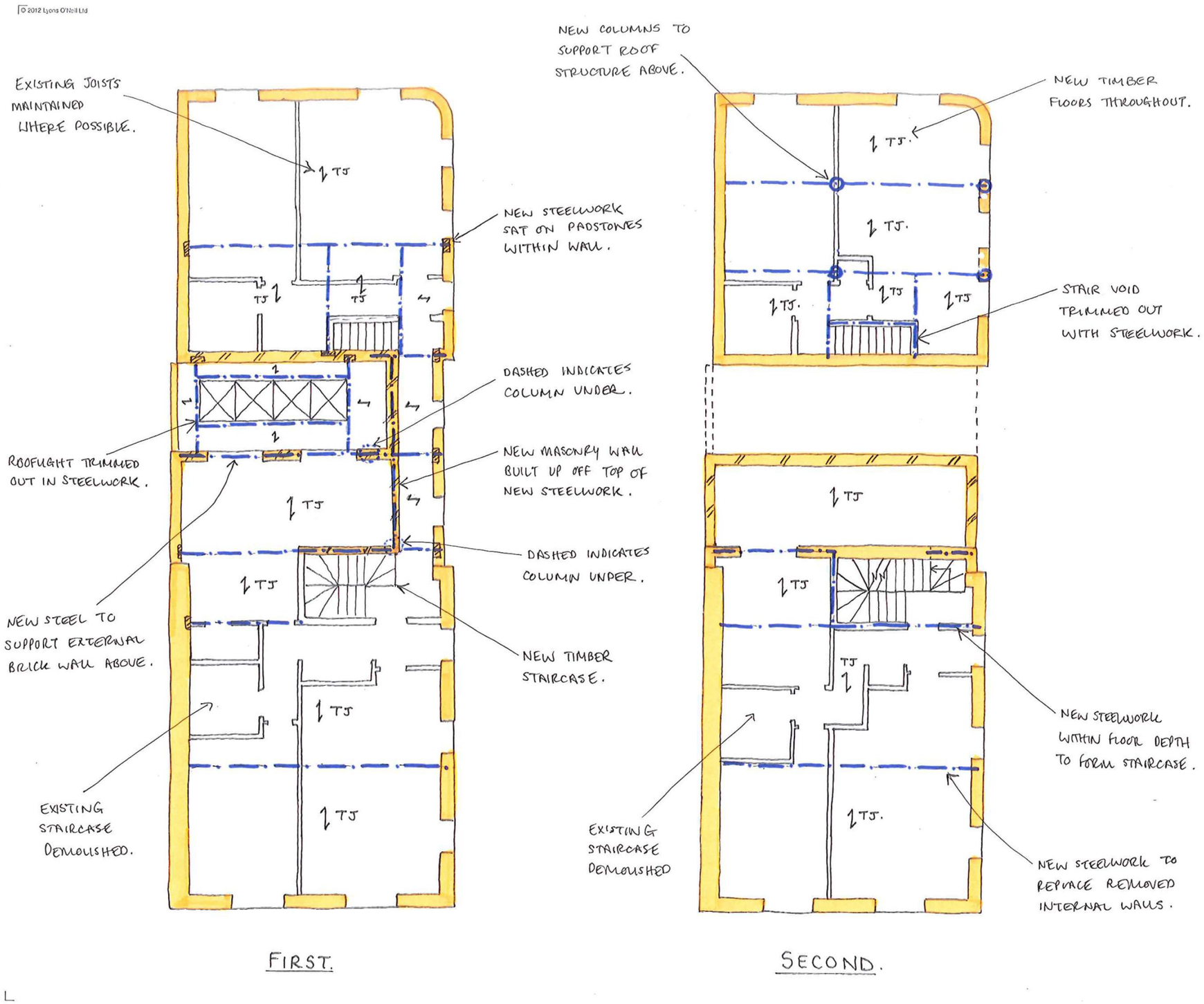
BY EMK CHECKED

DRAWING No. 14286 - EX - 04 REV

Appendix B

Proposed Drawings





KEY.

- EXISTING LOAD BEARING MASONRY WALL
- NEW LOAD BEARING MASONRY WALL.
- NEW STEEL BEAM
- NEW STEEL COLUMN
- STEEL COLUMN BELOW.
- TJ TIMBER FLOOR SPAN.

REV	COMMENTS	DATE	CHK

STATUS

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PROJECT
14286 - ADMIRAL MANN.

SUBJECT
PROPOSED FIRST & SECOND FLOOR PLANS.

SCALE @ A3
1:100 @ A3.

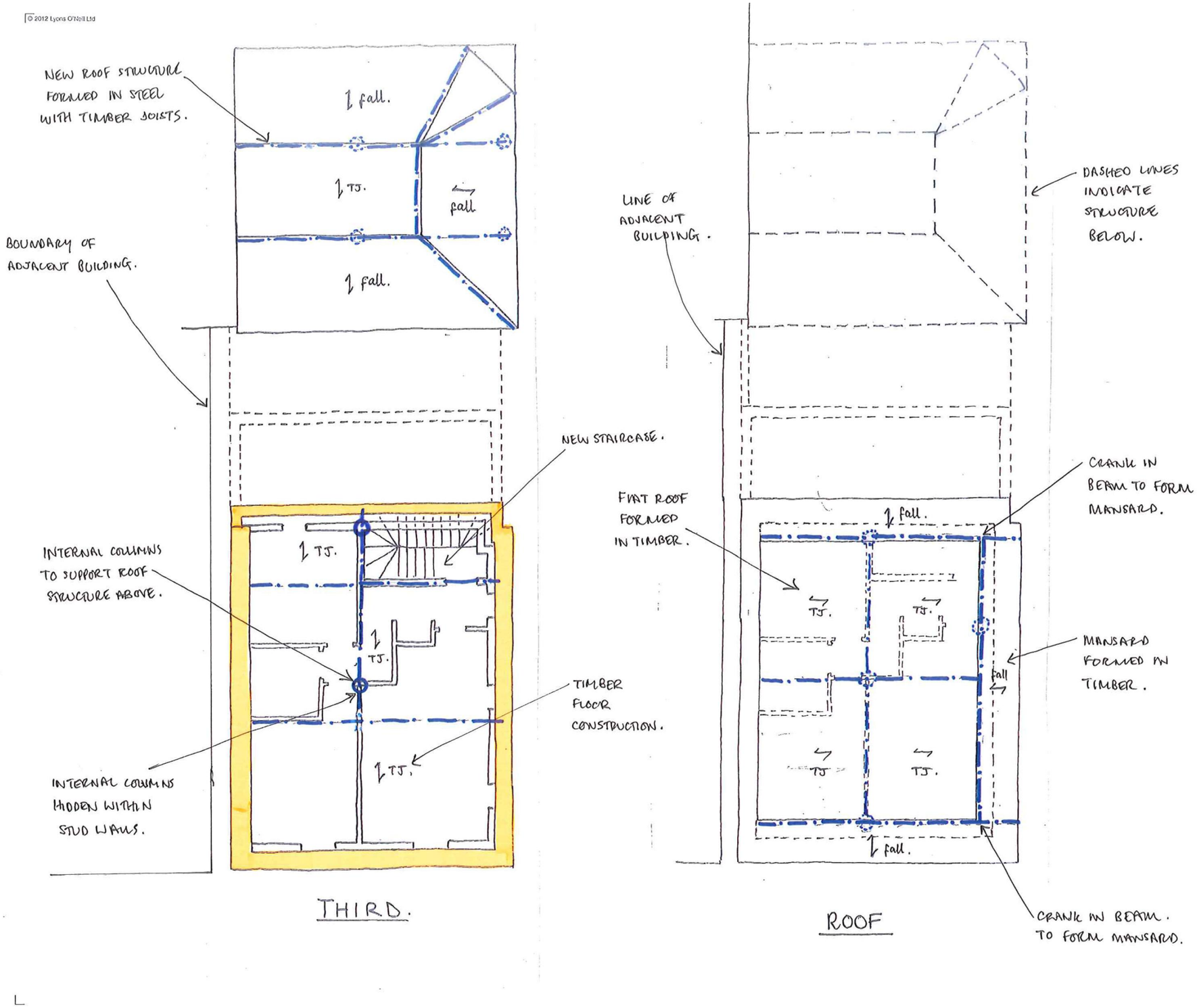
DATE
FEB '15.

BY
EMK.

CHECKED

DRAWING No.
14286-PR-02.

REV



NOTES

KEY

- LOAD BEARING MASONRY WALLS.
- STRUCTURE BELOW.
- NEW STEEL BEAM
- COLUMN BELOW.
- NEW STEEL COLUMN.

REV	COMMENTS	DATE	CHK

STATUS

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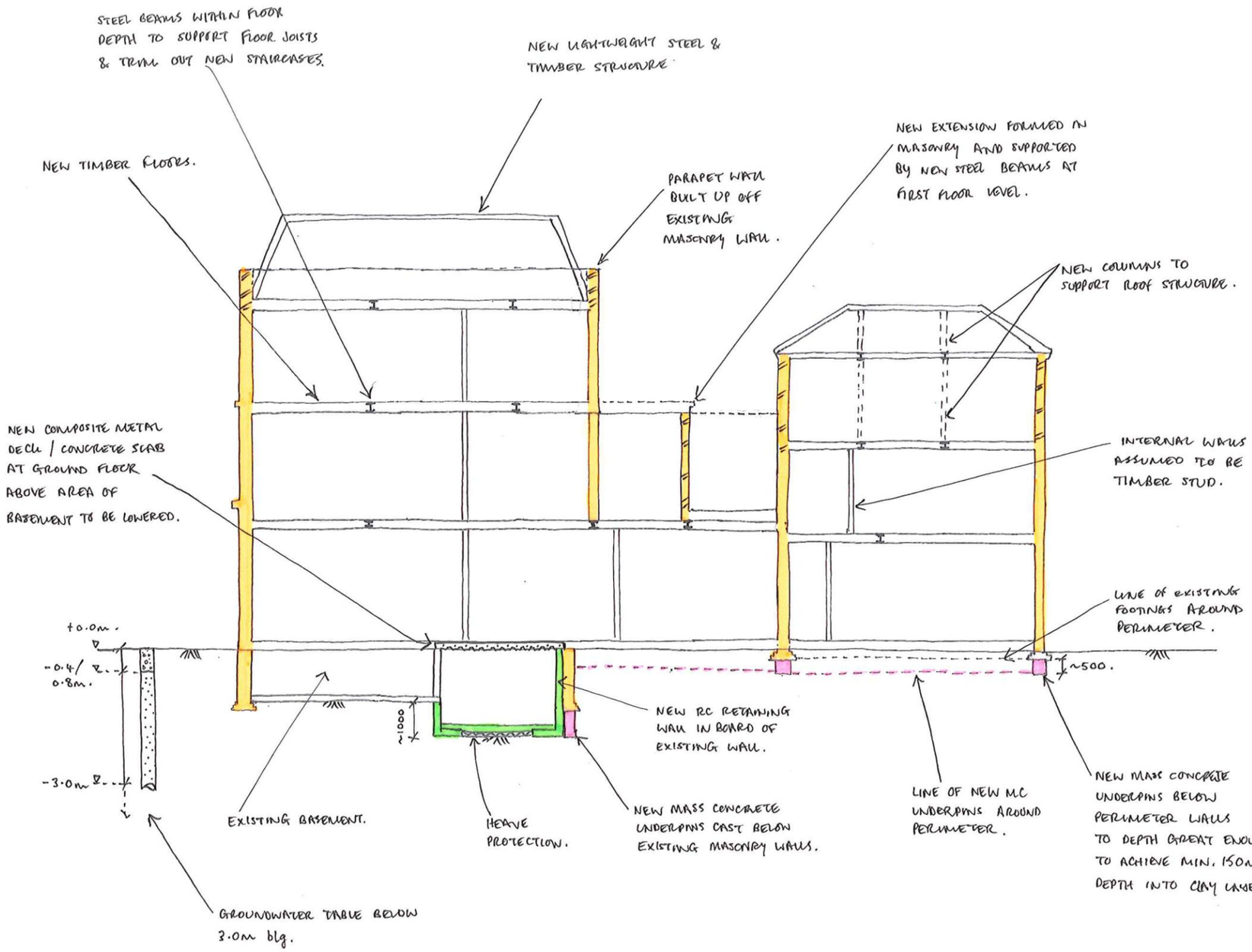
PROJECT
14286 - ADMIRAL MANN.

SUBJECT
PROPOSED THIRD & ROOF PLANS.

SCALE @ A3 — DATE
1:100 @ A3.

BY — CHECKED
EMH.

DRAWING No. — REV
14286-PR-03.



KEY.

- EXISTING LOAD BEARING MASONRY WALL.
- NEW LOAD BEARING MASONRY WALL.
- NEW REINFORCED CONCRETE.
- NEW MASS CONCRETE UNDERPINS.

REV COMMENTS DATE CHK

STATUS

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PROJECT
14286 - ADMIRAL MANN.

SUBJECT
PROPOSED SECTION.

SCALE @ A1 / DATE
1:100 @ A3

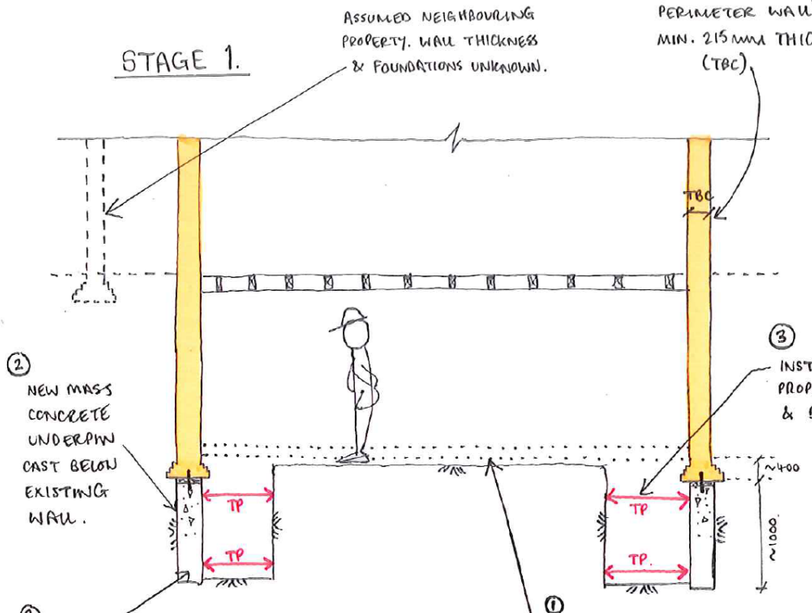
BY / CHECKED
EMK.

DRAWING No. / REV
14286-PR-04

Appendix C

Assumed Sequence of Construction Sketches

STAGE 1.



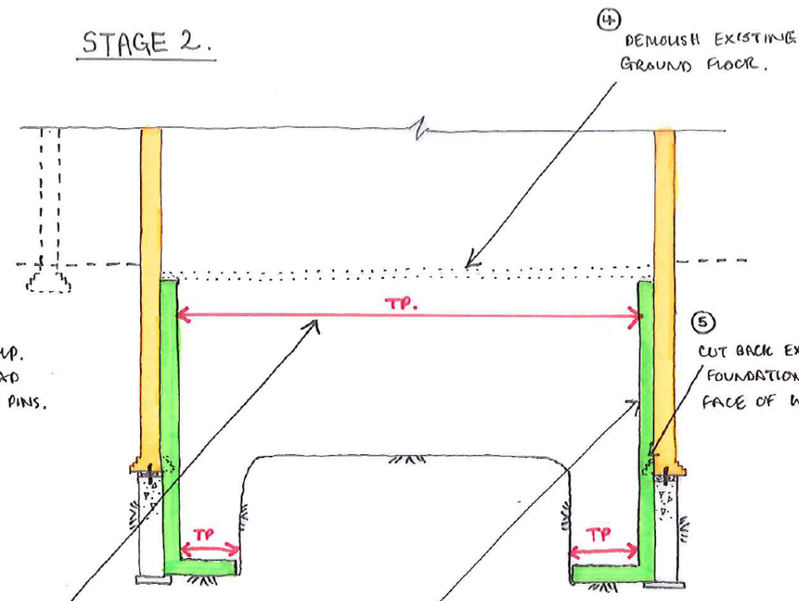
② NEW MASS CONCRETE UNDERPIN CAST BELOW EXISTING WALL.

③ INSTALL TEMP. PROPS TO HEAD & BASE OF PINS.

② UNDERPINS FORMED IN HIT & MISS SEQUENCE, MAXIMUM 1.0m EXCAVATION WIDTHS.

① DEMOLISH EXISTING BASEMENT SLAB.

STAGE 2.



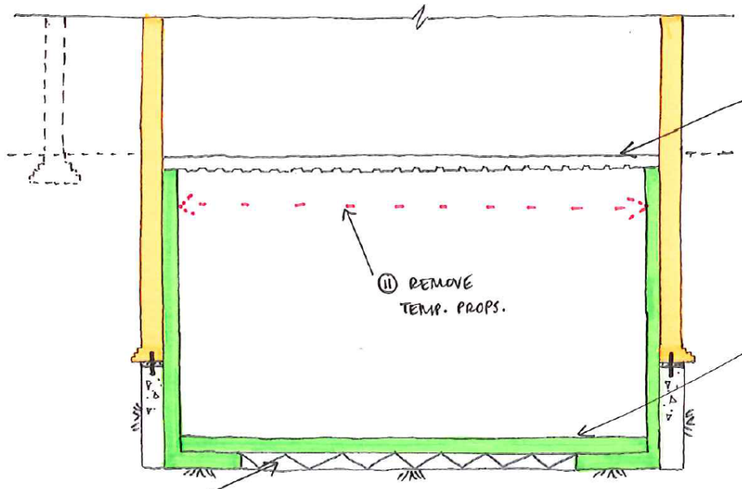
④ DEMOLISH EXISTING GROUND FLOOR.

⑤ CUT BACK EXISTING FOUNDATION TO FACE OF WALL.

⑦ INSTALL TEMPORARY PROPS AT HEAD & BASE OF RETAINING WALLS.

⑥ CAST NEW REINFORCED CONCRETE (RC) RETAINING WALLS IN BOARD OF MASS CONCRETE UNDERPINS & EXISTING WALL ABOVE.

STAGE 3



⑩ INSTALL METAL DECK & CAST CONCRETE GROUND FLOOR SLAB.

⑪ REMOVE TEMP. PROPS.

⑨ CAST RC BASEMENT SLAB.

⑧ LAY HEAVE PROTECTION LAYER ON TOP OF GROUND BETWEEN TOES OF RETAINING WALLS.

STAGE 4.

⑫ UNDERPIN PERIMETER WALLS AS SHOWN ON GROUND FLOOR ON DRAWING 14286-PR-01. UNDERPIN IN HIT & MISS SEQUENCE IN MASS CONCRETE TO A DEPTH MINIMUM 150mm INTO THE CLAY LAYER.

⑬ COMMENCE SUPERSTRUCTURE WORKS. UPPER LEVELS TO BE BUILT UP IN LOAD BEARING MASONRY WITH TIMBER FLOORS SPANNING BETWEEN PERIMETER WALLS & STEEL FLOOR BEAMS.

NOTES

REV COMMENTS DATE CHK

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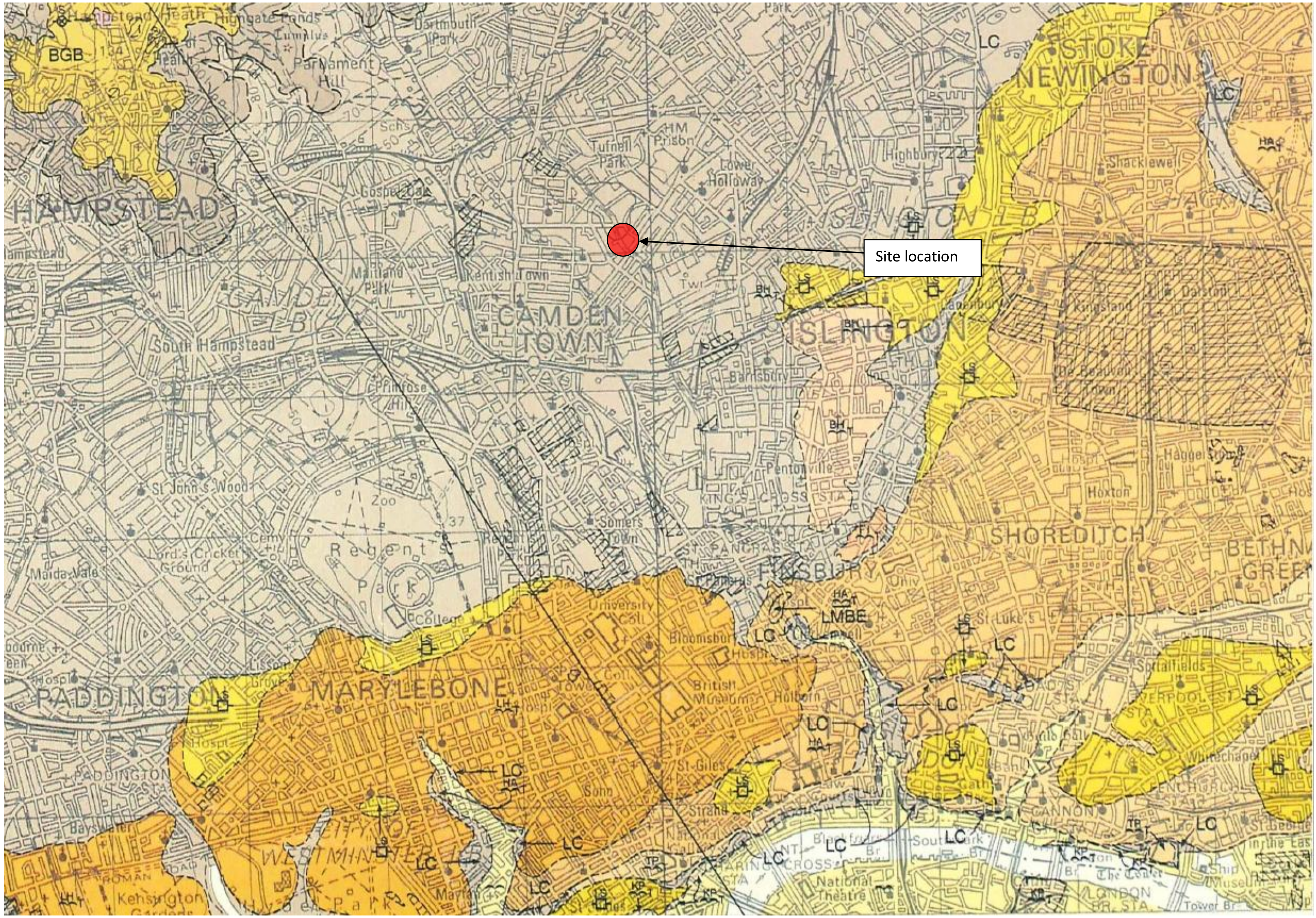
PROJECT
14286 - ADMIRAL MANN.

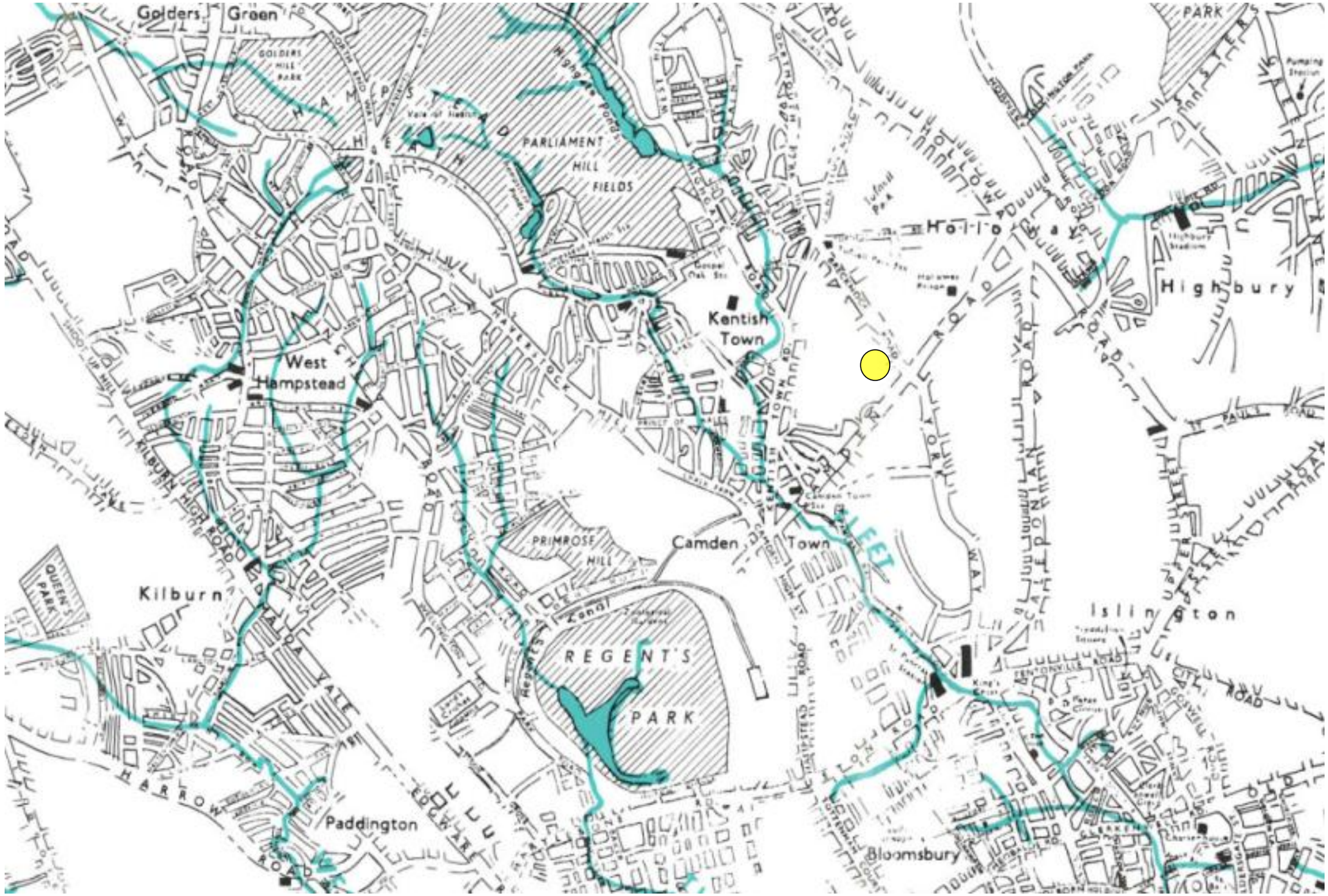
SUBJECT
PROPOSED SEQUENCE OF CONSTRUCTION.

SCALE @ A1 1:100 @ A3. DATE FEB '15.
BY EMK. CHECKED
DRAWING NO. 14286-CS-01. REV

Appendix D

Historical and Geological Maps


Site location
HAMPSTEAD
CAMDEN TOWN
STOKE NEWINGTON
ISLINGTON
SHOREDITCH
MARYLEBONE
PADDINGTON
FINSBURY
Tufnell Park
Lower Holloway
HM Prison
South Hampstead
Primrose Hill
St John's Wood
Maida Vale
Regent's Park
Kentish Town
Pentonville
Barnsbury
Hoxton
Haggerston
Spitalfields
Bloomsbury
British Museum
Holborn
Whitechapel
Kingsland
Dalston
Shacklewell
Highbury
Parliament Hill
Somers Town
Lord's Cricket Ground
BGB
LC
LMBE


Golders Green
GOLDERS HILL PARK
HAMPSTEAD
Highgate Ponds
PARLIAMENT HILL FIELDS
PARK
Holloway
Highbury
Kentish Town
West Hampstead
PRIMROSE HILL
Camden Town
FLEET
Kilburn
QUEEN'S PARK
REGENT'S PARK
Islington
Paddington
Bloomsbury


Leighton Road
Leighton Grove
Lady Margaret R
Hilldrop Crescent
Hilldrop Lane
Camden Road
Beacon Hill
Hartham Road
Surr Street
Islip Street
Caversham Road
Gaisford Street
Patshull Road
Lawford Road
A5200
York Way
North Villas
Cliff Villas
Carteloowes Gardens
Caledonian Park
North Road
Manger Road
Market Road
2
2
2
4
3
4
2
3