

## Part 3: GROUND MOVEMENT ANALYSIS

This section of the report comprises an analysis of the ground movements arising from the proposed basement and foundation scheme discussed in Part 2 and the information obtained from the investigation, presented in Part 1 of the report.

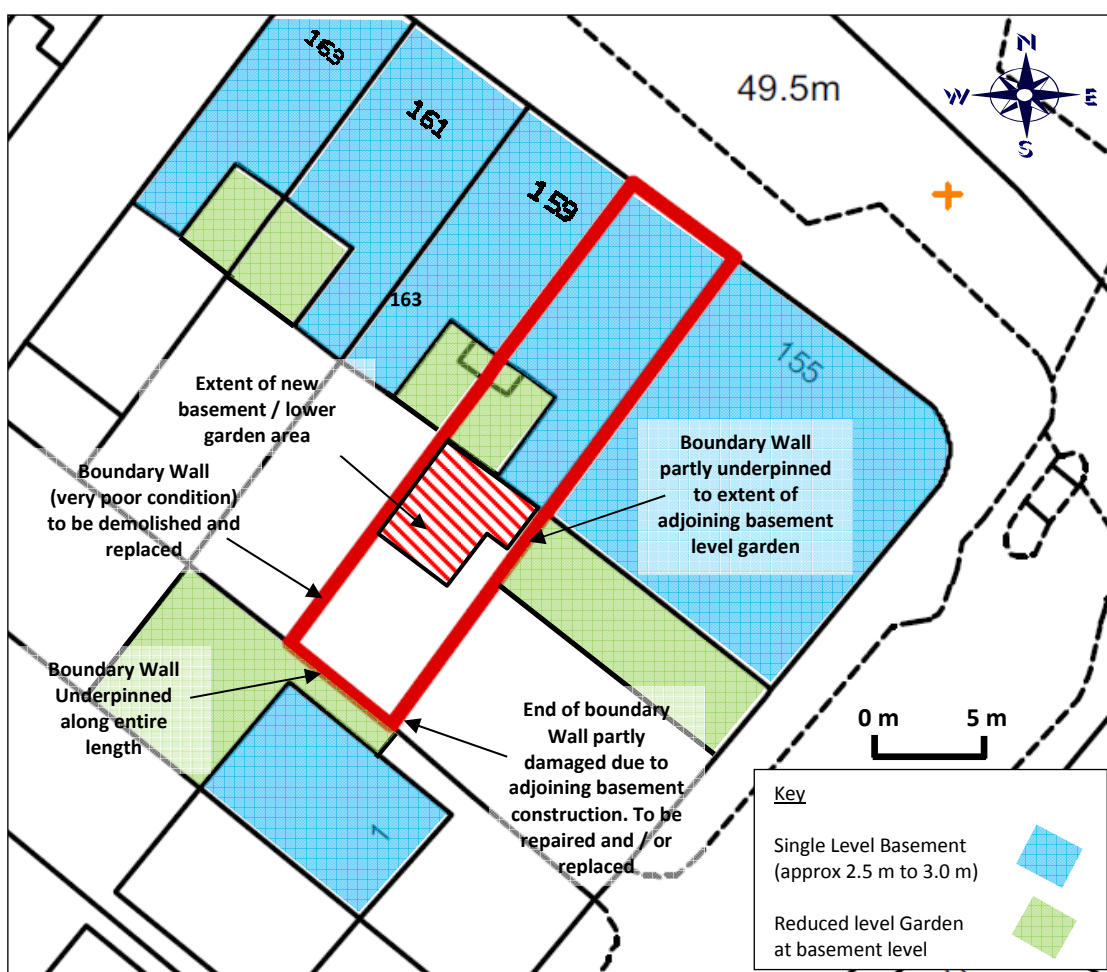
### 10.0 INTRODUCTION

The sides of an excavation will move to some extent regardless of how they are supported. The movement will typically be both horizontal and vertical and will be influenced by the engineering properties of the ground, groundwater level and flow, the efficiency of the various support systems employed during underpinning and the efficiency or stiffness of any support structures used.

An analysis has been carried out of the likely movements arising from the proposed excavation and the results of this analysis have been used to predict the effect of these movements on surrounding structures.

#### 10.1 Basis of Ground Movement Assessment

A plan showing the nearby sensitive structures is shown below.



Sensitive structures relevant to this assessment include Nos 155, 159 and 161 York Way and the nearby property of No 1 Cliff Road to the south / southwest of the site. The drawing shows that all the adjoining properties have basement structures, extending to a depth of at least 2.5 m below existing garden level, such that the proposed development will not result in an increase in foundation depth relative to these structures. These structures will not therefore be affected by any potential ground movements due to installation and / excavation effects on the proposed retaining walls and, as a result, a detailed analysis of these movements is not included in this assessment. However, unloading of the London Clay at proposed basement level due to the removal of the soils to form the new basement extension will result in potential heave movements that could affect the nearby sensitive structures and an assessment of these movements and potential impact on the adjoining properties has duly been undertaken.

The adjoining boundary wall with No 159 York Way is noted to be in extremely poor condition, with some parts of this structure near to collapse. This wall will be repaired and / or replaced as part of the proposed development and is not therefore considered a sensitive structure in the following assessment.

The boundary wall with No 155 York Way presently comprises two separate panels, each of approximately 5.0 m in length, which are further described as follows.

The first of these panels, comprising the closest section to the existing property (and therefore the proposed basement extension) is partly underpinned to a depth of between 2.5 m to 3.0 m, following construction of the lower level garden area to the rear of No 155 York Way, whilst Trial Pit No 3 shows that the foundations of the remaining 1.0 m to 1.5 m of this panel comprise a concrete strip extending to a depth of 1.0 m. Prior to construction of the proposed basement extension, it recommended that the remainder of this panel is underpinned to ensure that it is not affected by potential ground movements related to construction of the proposed basement extension.

The second panel, which extends from the mid-point of the rear garden to the boundary with No 1 Cliff Road, appeared to be of a slightly older construction and at its far end was shown by Trial Pit No 2 to have a much shallower brick foundation, extending to a depth of 0.15 m. This may, however, be partly the result of the basement extension to No 1 Cliff Road, which may have resulted in the loss of part of the original foundation during construction works for the adjoining retaining wall, which may also explain the localised damage to the base of this wall. It is similarly recommended that this part of the boundary wall is either repaired and / or replaced as part of the development and is not therefore considered as a sensitive structure in the analysis.

## 10.2 Construction Sequence

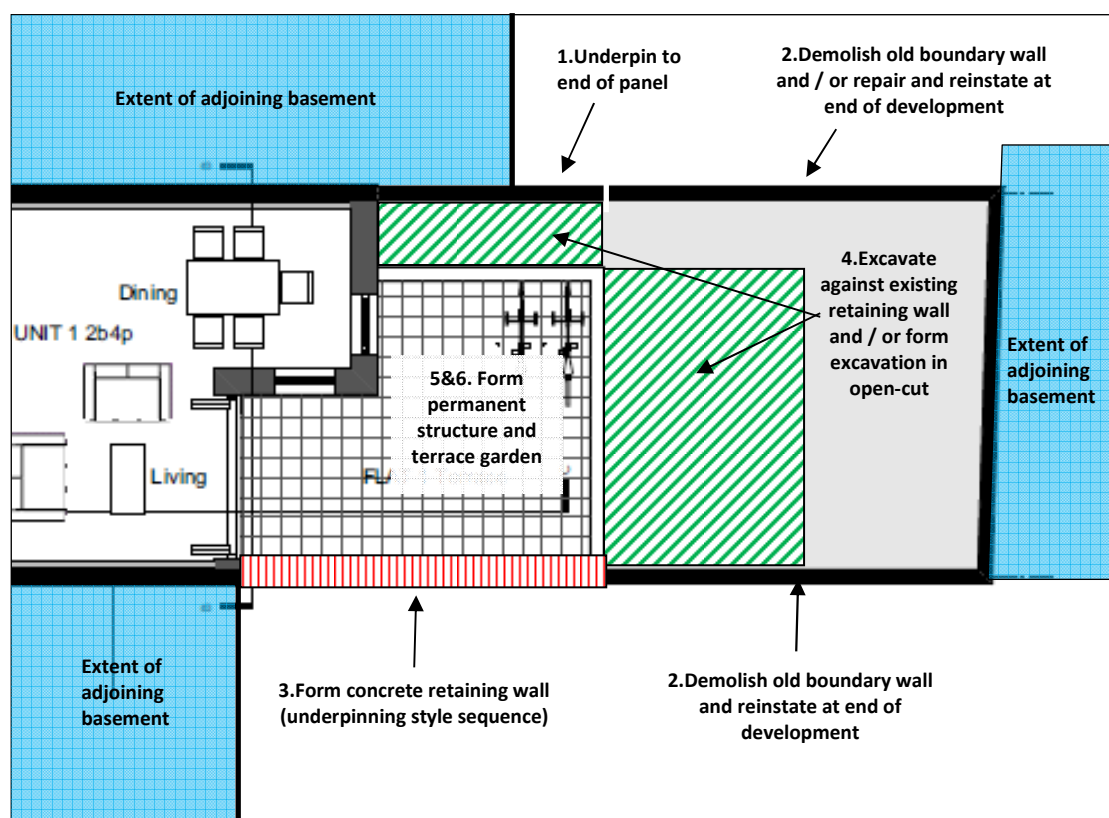
It is understood that it is proposed to extend the existing 2.5 m deep basement beneath part of the existing rear garden in order to allow an enlargement of the existing rear extension and to form a lower level or sunken garden for the proposed basement flat.

Detailed information regarding the proposed construction method and sequencing are not available at the present time, but it is understood that it is proposed to form at least part of the proposed extension, such as the side along the boundary with the garden of No 159 York Way, by casting reinforced concrete retaining walls by the same methodology as traditional underpinning.

Due to the presence of an adjoining basement structure along the boundary with No 155 York Way and the space available within the remainder of the garden, it is anticipated that the rest of the new basement structure will be formed in an open cut excavation. This should be feasible provided that localised slipping can be tolerated and that the excavations are managed to ensure that they do not have an adverse effect on the stability of the site. In situ retaining walls will then be constructed in front of the excavation and the area behind the walls backfilled on completion.

In general, the sequence of works for excavation and construction, will comprise the following stages, which are also summarised in the drawing below.

1. Underpin the remainder of the boundary wall with No 155 York Way
2. demolish the boundary wall with No 159 York Way / demolish and / or repair remainder of boundary wall with No 155 York Way;
3. install concrete retaining walls to form section of new basement along boundary with No 159 York Way;
4. excavate ground to basement level against existing retaining wall below the boundary wall with No 155 York Way and in an open-cut on remaining side;
5. construct basement floor slab and in-situ retaining walls and backfill surrounding excavation; and
6. form new terrace garden and construct ground floor slab to proposed ground level extension.



Suitable angles for the battered sides of the excavation are expected to be approximately 45° for the London Clay. However, as any excavation will not extend below the depth of the adjoining retaining structures, steeper angles may be feasible, particularly where there is limited space between the adjoining structures and proposed new basement extension.

Care should be taken to protect the sides during periods of rainfall and any run-off from construction operations until the retaining walls have been installed. Movement of plant at the top of any open cut should be prevented and daily inspections of the cut faces should be carried out to check stability.

## 11.0 GROUND MOVEMENTS

An assessment of ground movements within and surrounding the excavations has been undertaken using the P-Disp computer programme licensed from the OASYS suite of geotechnical modelling software from Arup. This programme is commonly used within the ground engineering industry and is considered an appropriate tool for this analysis.

For the purpose of these analyses, the corners have been defined by x and y coordinates, with the x-direction approximately parallel with the orientation east-west, whilst the y-direction is approximately parallel with the orientation of north-south. Vertical movement is in the z-direction.

The full outputs of all the analyses are included within the appendix.

### 11.1 Ground Movements – Resulting from Excavation

#### 11.1.1 Model Used

Unloading of the underlying soils, particularly the clay soils of the London Clay, will take place as a result of the excavation of the proposed basement and the reduction in vertical stress will cause heave to take place. Undrained soil parameters have been used to estimate the potential short-term movements, which include the “immediate” or elastic movements as a result of the basement excavation. Drained parameters have been used to provide an estimate of the total long-term movement.

The elastic analysis requires values of soil stiffness at various levels to calculate displacements. Values of stiffness for the soils at this site are readily available from published data and we have used a well-established method to provide our estimates. This relates values of  $E_u$  and  $E'$ , the undrained and drained stiffness respectively, to values of undrained cohesion ( $C_u$ ), as described by Padfield and Sharrock<sup>18</sup> and Butler<sup>19</sup> and more recently by O'Brien and Sharp<sup>20</sup>. Relationships of  $E_u = 500 C_u$  and  $E' = 300 C_u$  for the cohesive soils have been used to obtain values of Young's modulus.

More recent published data<sup>21</sup> indicates stiffness values of  $750 \times C_u$  for the London Clay and a ratio of  $E'$  to  $C_u$  of 0.75, but it is considered that the use of the more conservative values provides a sensible approach for this stage in the design.

<sup>18</sup> Padfield CJ and Sharrock MJ (1983) *Settlement of structures on clay soils*. CIRIA Special Publication 27

<sup>19</sup> Butler FG (1974) *Heavily overconsolidated clays: a state of the art review*. Proc Conf Settlement of Structures, Cambridge, 531-578, Pentech Press, Lond

<sup>20</sup> O'Brien AS and Sharp P (2001) *Settlement and heave of overconsolidated clays - a simplified non-linear method*. Part Two, Ground Engineering, Nov 2001, 48-53

<sup>21</sup> Burland JB, Standing, JR, and Jardine, FM (2001) Building response to tunnelling, case studies from construction of the Jubilee Line Extension. CIRIA Special Publication 200

The excavation of an approximately 3.0 m thickness of soil for the proposed 2.5 m deep basement structure will result in a net unloading of around 55 kN/m<sup>2</sup>, assuming a unit weight of 17 kN/m<sup>3</sup> for the made ground and 19.5 kN/m<sup>3</sup> for the London Clay.

The soil parameters used in this analysis are tabulated below.

| Stratum     | Depth Range (m) | Eu (MPa)       | E'(MPa)        |
|-------------|-----------------|----------------|----------------|
| Made Ground | GL – 1.0        | 12.50          | 7.50           |
| London Clay | 1.0 – 20.0      | 25.00 to 96.25 | 15.00 to 57.75 |

The proposed cut slopes that will be used to form the basement excavation have been subdivided into a series of steps to reflect the variation in stress relief that will occur as the depth of these excavations increase from ground level to proposed formation level. For the purpose of the analysis, the final stage of the excavations, when the cut slopes have reached their maximum extent, has been chosen as the most critical stage and the results of this analysis are presented below.

A rigid boundary for the analysis has been set within the London Clay at a depth of 20.0 m below ground level.

### 11.1.2 Results

The predicted movements are summarised in the table below; the results are presented below and in subsequent tables to the degree of accuracy required to allow predicted variations in ground movements around the structure(s) to be illustrated, but may not reflect the anticipated accuracy of the predictions.

| Location                        | Movement (mm)                          |                                        |             |
|---------------------------------|----------------------------------------|----------------------------------------|-------------|
|                                 | Short-term Heave<br>(Excavation Phase) | Long-term Heave<br>(post construction) | Total Heave |
| Centre of excavations           | 6.0                                    | 5.0                                    | 11.0        |
| Edge of excavations             | 3.0                                    | 3.0                                    | 6.0         |
| At 5 m from edge of excavations | <1                                     | <1                                     | ≤1          |

The P-Disp analysis indicates that, by the time the basement construction is complete, up to 6 mm of heave is likely to have taken place at the centre of the proposed excavations, reducing to 2 mm to 3 mm at the edges. In the long term, following completion of the basement construction, a further 5 mm of heave is estimated as a result of long term swelling of the underlying London Clay.

If a compressible material is used beneath the slab, it will need to be designed to be able to resist the potential uplift forces generated by the ground movements. In this respect, potential heave pressures are typically taken to equate to around 40% of the total unloading pressure.

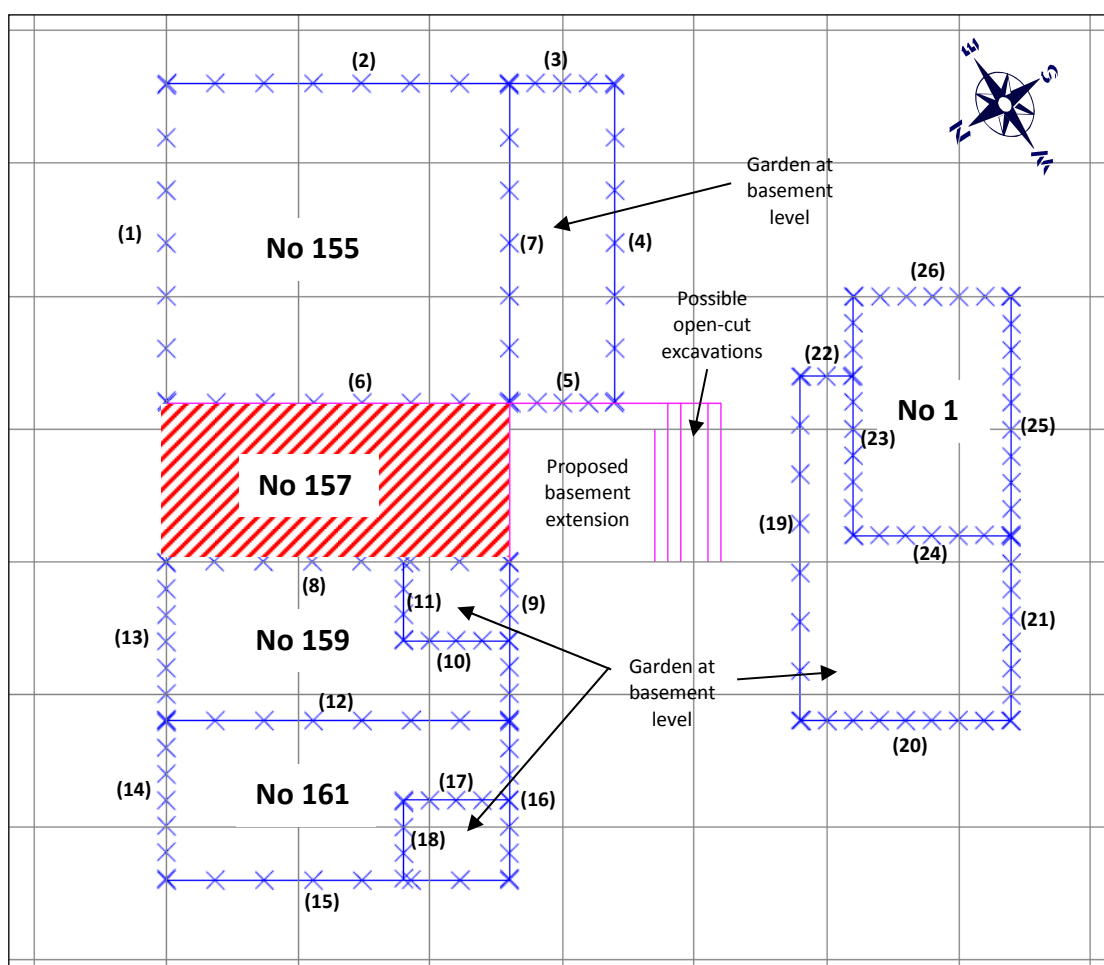
## 12.0 DAMAGE ASSESSMENT

In addition to the above assessment of the likely movements that will result from the proposed development, any neighbouring buildings within the zone of influence of the excavations are considered to be sensitive structures, requiring Building Damage Assessments, on the basis of the classification given in Table 6.4 of CIRIA report C760<sup>22</sup>.

The sensitive structures outlined below have been modelled as displacement lines in the analysis along which the damage assessment has been undertaken. For clarity, these critical lines are shown on the plan below.

- ❑ No 155 York Way and associated garden to southeast;
- ❑ No 157 and No 161 to the northwest; and
- ❑ No 1 Cliff Road and associated garden to the south / southwest.

For the analyses, a foundation depth of approximately 3.0 m below existing garden level has been assumed, based on the observed depth of the adjoining basement structures and information on the likely foundation construction from the trial pits completed from basement level within the existing property.



<sup>22</sup> Gaba, A, Hardy, S, Powrie, W, Doughty, L and Selemetas, D (2017) *Embedded retaining walls – guidance for economic design* CIRIA Report C760

## 12.1 Damage to Neighbouring Structures

The ground movements calculated using the P-Disp modelling software have been imported into X-Disp to carry out an assessment of the likely damage to adjacent properties, whereby the vertical heave movements along each sensitive structure have been used to estimate the deflection ratio of the nearby sensitive structures.

The building damage reports for sensitive structures highlighted above are included in the appendix and indicate that the damage to the adjoining and nearby structures due to short and total movements would not exceed Category 0 (negligible).

It is important to note that in the above assessment, X-Disp has only been used as a platform to undertake the damage assessment, which is based on ground movements imported from P-Dips, ie the X-Disp software has not been used to calculate any ground movements.

## 12.2 Monitoring of Ground Movements

The predictions of ground movement based on the ground movement analysis should be checked by monitoring of the adjacent properties and structures. The structures to be monitored during the construction stages should include the existing property and the neighbouring structure assessed above. Condition surveys of the above existing structures should be carried out before and after the proposed works.

The precise monitoring strategy will be developed at a later stage and it will be subject to discussions and agreements with the owners of the adjacent properties and structures. Contingency measures will be implemented if movements of the adjacent structures exceed predefined trigger levels. Both contingency measures and trigger levels will need to be developed within a future monitoring specification for the works.

## 13.0 GMA CONCLUSIONS

The analysis has concluded that the proposed open-cut excavations will remain stable during the period of construction and that the predicted damage to the neighbouring properties from the construction of the basement retaining walls and excavation would be 'Negligible'.

On this basis, the damage that has been predicted to occur as a result of the construction the proposed basement falls within the acceptable limits, although careful construction, including the careful control of the proposed open-cut excavations, and monitoring will be required to ensure that no excessive movements occur that would lead to damage in excess of these limits.

## Part 4: BASEMENT IMPACT ASSESSMENT

This section of the report evaluates the direct and indirect implications of the proposed project, based on the findings of the previous screening and scoping, site investigation and ground movement assessment.

### 14.0 INTRODUCTION

The screening identified a number of potential impacts. The desk study and ground investigation information has been used below to review the potential impacts, to assess the likelihood of them occurring and the scope for reasonable engineering mitigation.

#### 14.1 Potential Impacts

The table below summarises the previously identified potential impacts and the additional information that is now available from the ground investigation in consideration of each impact.

| Potential Impact                                                       | Site Investigation Conclusions                                                                                                                                  |
|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| London Clay is the shallowest stratum at the site.                     | The London Clay is prone to seasonal shrink-swell (subsidence and heave).                                                                                       |
| Seasonal shrink-swell can result in foundation movements.              | The London Clay is prone to seasonal shrink-swell and can cause structural damage. Desiccation was not noted during the fieldwork.                              |
| The site is located within 5 m of a highway or pedestrian right of way | The site fronts onto York Way. However, the proposed basement extension is set back on the rear part of the site at a distance more than 10 m from the highway. |

The results of the site investigation have therefore been used below to review the remaining potential impacts, to assess the likelihood of them occurring and the scope for reasonable engineering mitigation.

##### *London Clay is the shallowest stratum / Seasonal Shrink-Swell*

The proposed basement will extend to a depth such that new foundations will be expected to bypass any desiccated soils.

Subject to inspection of foundation excavations in the normal way to ensure that there is not significant unexpectedly deep root growth, it is not considered that the occurrence of shrink-swell issues in the local area has any bearing on the proposed development.

##### *Location of public highway*

The proposed excavations for the proposed basement extension are restricted to the existing garden on the rear part of the site at a distance greater than 5.0 m from any nearby highway or pedestrian right of way.

There is nothing unusual or exceptional in the proposed development or the findings of the investigation that give rise to any concerns with regard to stability over and above any development of this nature.

## 14.2 BIA Conclusion

A Basement Impact Assessment has been carried out following the information and guidance published by the London Borough of Camden.

It is concluded that the proposed development is unlikely to result in any specific land or slope stability issues.

## 14.3 Non-Technical Summary of Evidence

This section provides a short summary of the evidence acquired and used to form the conclusions made within the BIA.

### 14.3.1 Screening

The following table provides the evidence used to answer the surface water flow and flooding screening questions.

| Question                                                                                                                                                                                                                                                                     | Evidence                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Is the site within the catchment of the pond chains on Hampstead Heath?                                                                                                                                                                                                   | Topographical maps acquired as part of the desk study and Figures 12, 13 and 14 of the Arup report.                                                                                     |
| 2. 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?                                                                                                                 | A site walkover and existing plans of the site have confirmed that the proposed basement scheme will not increase the amount of hardstanding.                                           |
| 3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?                                                                                                                                                               |                                                                                                                                                                                         |
| 4. Will the proposed basement development result in changes to the profile of the inflows (instantaneous and long term) of surface water being received by adjacent properties or downstream watercourses?                                                                   | As above.                                                                                                                                                                               |
| 5. Will the proposed basement result in changes to the quantity of surface water being received by adjacent properties or downstream watercourses?                                                                                                                           |                                                                                                                                                                                         |
| 6. Is the site in an area known to be at risk from surface water flooding such as South Hampstead, West Hampstead, Gospel Oak and Kings Cross, or is it at risk of flooding because the proposed basement is below the static water level of a nearby surface water feature? | Flood risk maps acquired from the Environment Agency as part of the desk study, Figure 15 of the Arup report, the Camden Flood Risk Management Strategy dated 2013 and SFRA dated 2014. |

The following table provides the evidence used to answer the subterranean (groundwater flow) screening questions.

| Question                                                                                    | Evidence                                                                                                                                       |
|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 1a. Is the site located directly above an aquifer?                                          | Aquifer designation maps acquired from the Environment Agency as part of the desk study and Figures 3 and 8 of the Arup report.                |
| 1b. Will the proposed basement extend beneath the water table surface?                      | Previous nearby GEA investigations and BGS archive borehole records.                                                                           |
| 2. Is the site within 100 m of a watercourse, well (used/disused) or potential spring line? | Topographical and historical maps acquired as part of the desk study, Figures 11 and 12 of the Arup report and the Lost Rivers of London book. |
| 3. Is the site within the catchment of the pond chains on Hampstead Heath?                  | Topographical maps acquired as part of the desk study and Figures 12, 13 and 14 of the Arup report.                                            |

| Question                                                                                                                                                                                                   | Evidence                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| 4. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?                                                                                             | A site walkover and existing plans of the site have confirmed that the basement development will only replace existing hardstanding areas. |
| 5. As part of the site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?                                         | The details of the proposed development do not indicate the use soakaway drainage.                                                         |
| 6. Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to or lower than, the mean water level in any local pond or spring line? | Topographical maps acquired as part of the desk study and Figures 11 and 12 of the Arup report.                                            |

The following table provides the evidence used to answer the slope stability screening questions.

| Question                                                                                                                                                         | Evidence                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Does the existing site include slopes, natural or manmade, greater than 7°?                                                                                   | Topographical maps and Figures 16 and 17 of the Arup report and confirmed during a site walkover.                                                                                                                  |
| 2. Will the proposed re-profiling of landscaping at the site change slopes at the property boundary to more than 7°?                                             | The details of the proposed development provided do not include the re-profiling of the site to create new slopes.                                                                                                 |
| 3. Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°?                                                   | Topographical maps and Figures 16 and 17 of the Arup report and confirmed during a site walkover.                                                                                                                  |
| 4. Is the site within a wider hillside setting in which the general slope is greater than 7°?                                                                    |                                                                                                                                                                                                                    |
| 5. Is the London Clay the shallowest strata at the site?                                                                                                         | Geological maps and Figures 3 and 8 of the Arup report.                                                                                                                                                            |
| 6. 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? | Absence of trees confirmed during the site walkover.                                                                                                                                                               |
| 7. Is there a history of seasonal shrink-swell subsidence in the local area and / or evidence of such effects at the site?                                       | Knowledge on the ground conditions of the area and reference to NHBC guidelines were used to make an assessment of this, in addition to a visual inspection of the buildings carried out during the site walkover. |
| 8. Is the site within 100 m of a watercourse or potential spring line?                                                                                           | Topographical maps acquired as part of the desk study, Figures 11 and 12 of the Arup report and the Lost Rivers of London book.                                                                                    |
| 9. Is the site within an area of previously worked ground?                                                                                                       | Geological maps and Figures 3 and 8 of the Arup report.                                                                                                                                                            |
| 10. Is the site within an aquifer?                                                                                                                               | Aquifer designation maps acquired from the Environment Agency as part of the desk study and Figures 3 and 8 of the Arup report.                                                                                    |
| 11. Is the site within 50 m of Hampstead Heath ponds?                                                                                                            | Topographical maps acquired as part of the desk study and Figures 12, 13 and 14 of the Arup report.                                                                                                                |
| 12. Is the site within 5 m of a highway or pedestrian right of way?                                                                                              | Site plans and the site walkover.                                                                                                                                                                                  |
| 13. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?                                 | Camden planning portal and the site walkover confirmed the position of the proposed basement relative the neighbouring properties.                                                                                 |
| 14. Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?                                                                          | Maps and plans of infrastructure tunnels were reviewed.                                                                                                                                                            |

### 14.3.2 Scoping and Site Investigation

The questions in the screening stage that there were answered 'yes', were taken forward to a scoping stage and the potential impacts discussed in Section 4.0 of this report, with reference to the possible impacts outlined in the Arup report.

A ground investigation has been carried out, which has allowed an assessment of the potential impacts of the basement development on the various receptors identified from the screening and scoping stages. Principally the investigation aimed to establish the ground conditions, including the groundwater level and the engineering properties of the underlying soils to enable suitable design of the basement development.

The findings of the investigation are discussed in Part 2 of this report and summarised in the Executive Summary.

### 14.3.3 Impact Assessment

Section 14.0 of this report summarises whether, on the basis of the findings of the investigation, the potential impacts still need to be given consideration and identifies ongoing risks that will require suitable engineering mitigation. Section 9.0 of this report also provides recommendations for the design of the proposed development.

A ground movement analysis and building damage assessment has been carried out and its findings are presented in Part 3.

## 15.0 OUTSTANDING RISKS AND ISSUES

This section of the report aims to highlight areas where further work is required as a result of limitations on the scope of this investigation, or where issues have been identified by this investigation that warrant further consideration. The scope of risks and issues discussed in this section is by no means exhaustive but covers the main areas where additional work may be required.

The ground is a heterogeneous natural material and variations will inevitably arise between the locations at which it is investigated. This report provides an assessment of the ground conditions based on the discrete points at which the ground was sampled, but the ground conditions should be subject to review as the work proceeds to ensure that any variations from the Ground Model are properly assessed by a suitably qualified person.

As discussed throughout the report, perched water is likely to be encountered during the basement excavation, although the findings of the investigation indicate that potential inflows are unlikely to be significant and should be adequately dealt with through sump pumping. However, groundwater monitoring should be continued, and trial excavations should be considered to assess the extent of inflows to be expected within the proposed basement excavations.

The investigation has not identified the presence of any significant contamination and as the majority of the made ground will be removed from this site through the excavation of the proposed basement, remedial measures should not be required, other than where areas of soft landscaping are to be formed. However, as with any site there is a potential for further areas of contamination to be present within the made ground beneath parts of the site not covered by the investigation it is recommended that a watching brief is maintained during any groundworks for the proposed new foundations and that if any suspicious soils are encountered that they are inspected by a geoenvironmental engineer and further assessment may be required.

The findings of the ground movement analysis and damage assessment should be reviewed once the design proposals have been finalised, particularly if any changes are made to the proposed basement construction.

These items should be drawn to the attention of prospective contractors and further investigation will be required or sufficient contingency should be provided to cover the outstanding risk.

## **APPENDIX – PART 1A**

### **Desk Study**

#### **Site Location Plan**

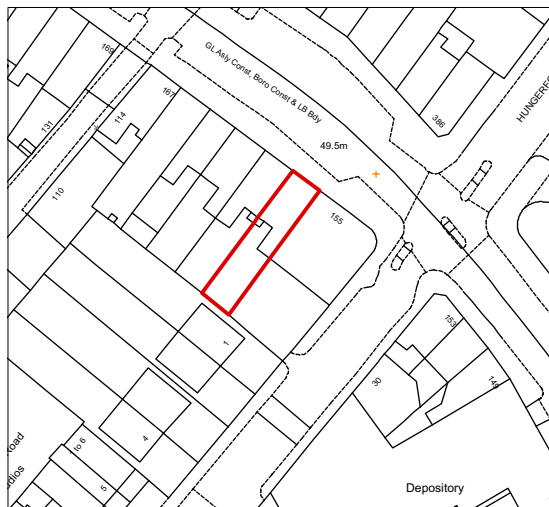
#### **Existing and Proposed Plans and Elevations**

#### **Service Information**

#### **Envirocheck Report Summary**

#### **Historical Maps**

#### **Preliminary UXO Assessment**



**PLANNING**



**YURKY CROSS**  
CHARTERED ARCHITECTS

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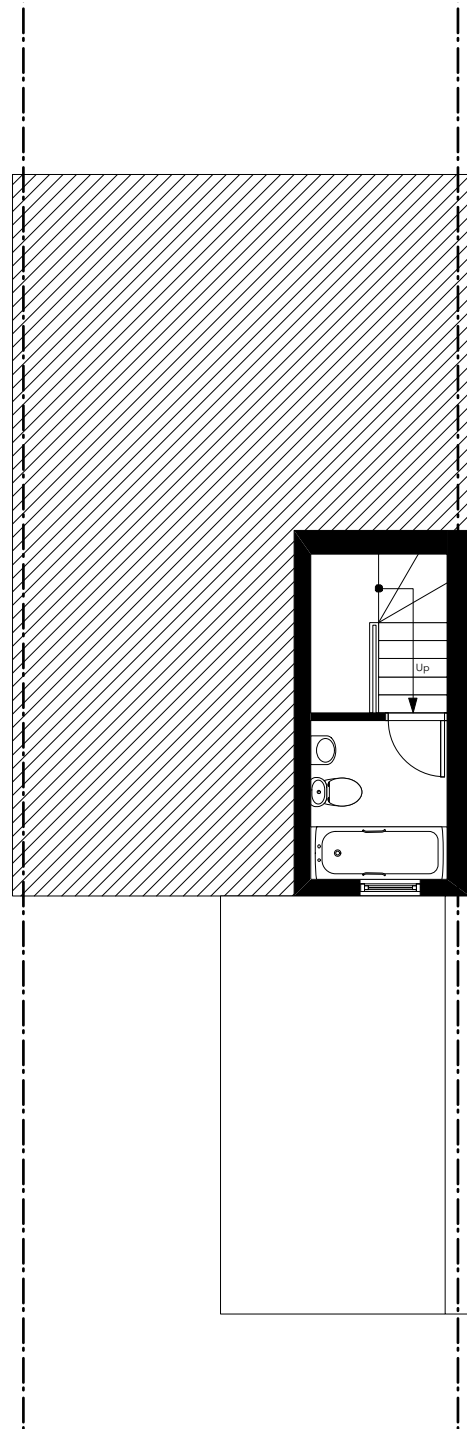
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157 York Way  
London  
N7 9LN

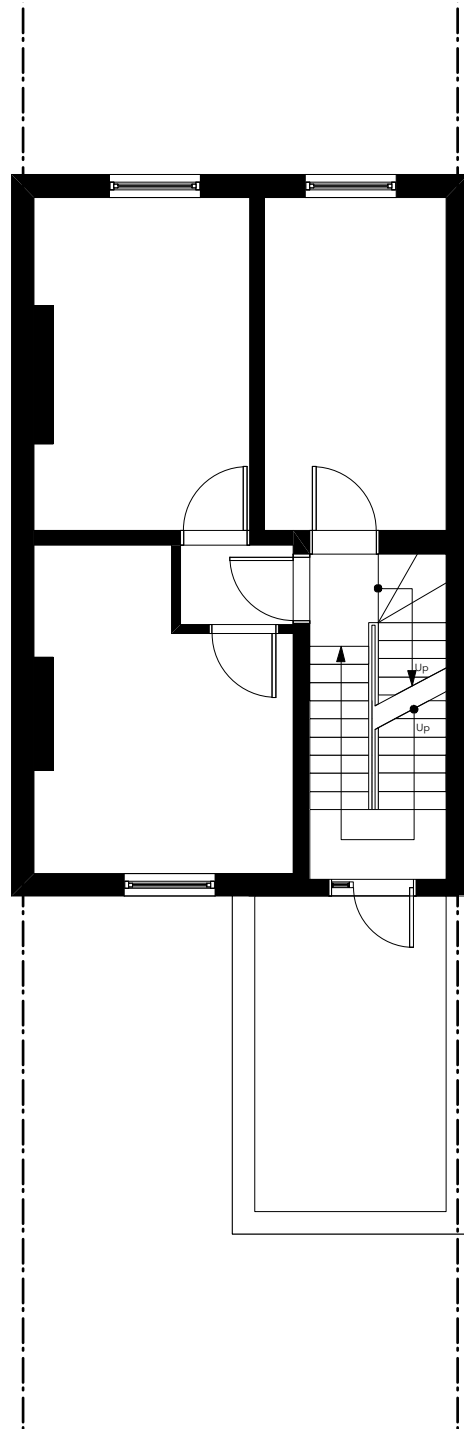
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Site Location Plan

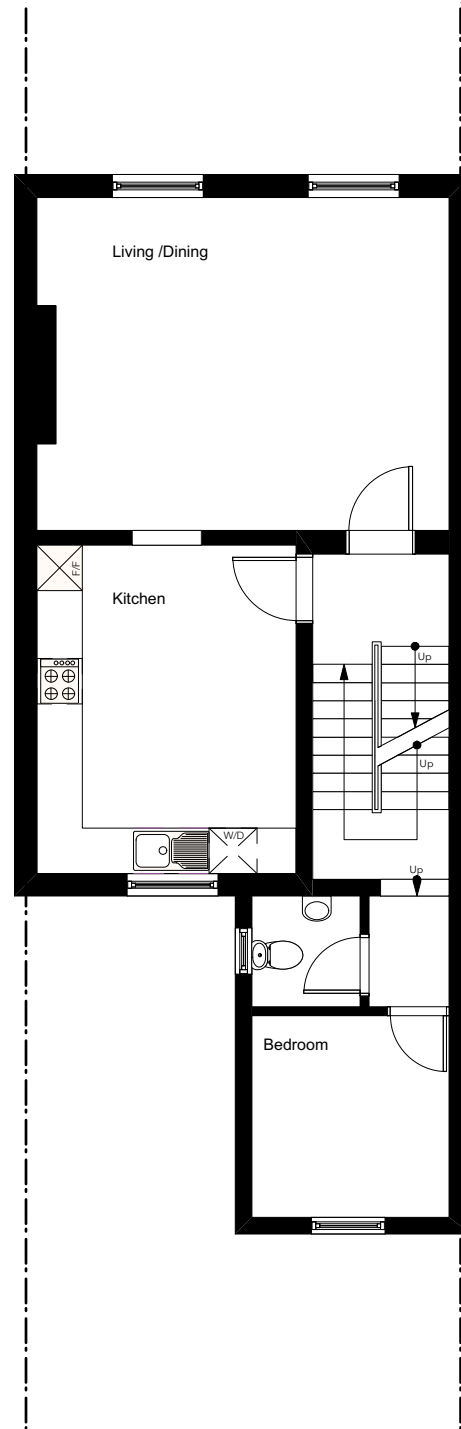
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| MC         | 16913       | <b>PA01</b> |     |



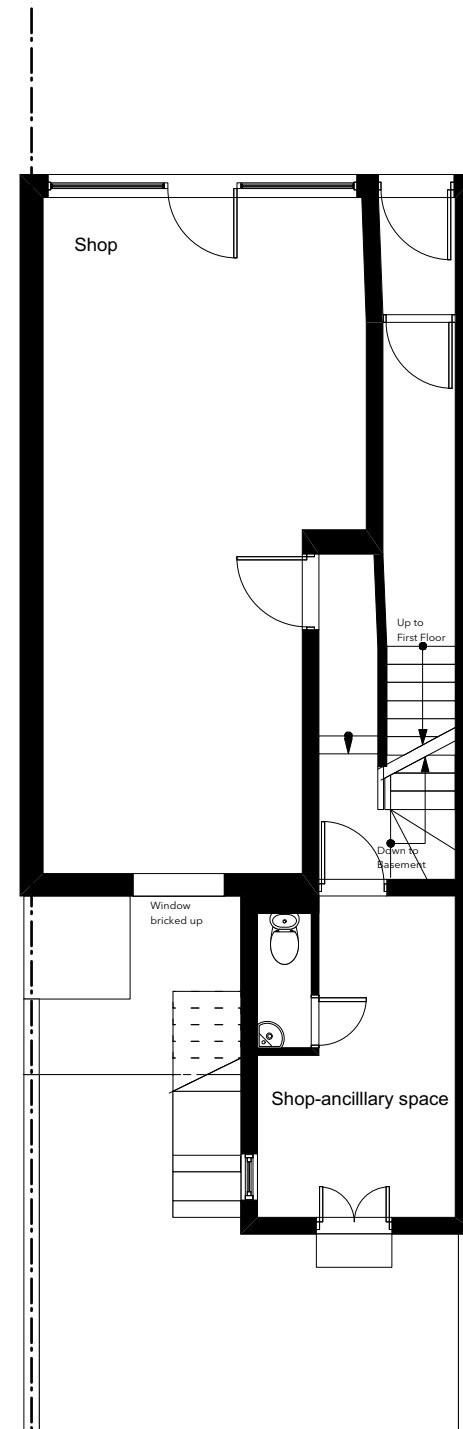
THIRD FLOOR PLAN



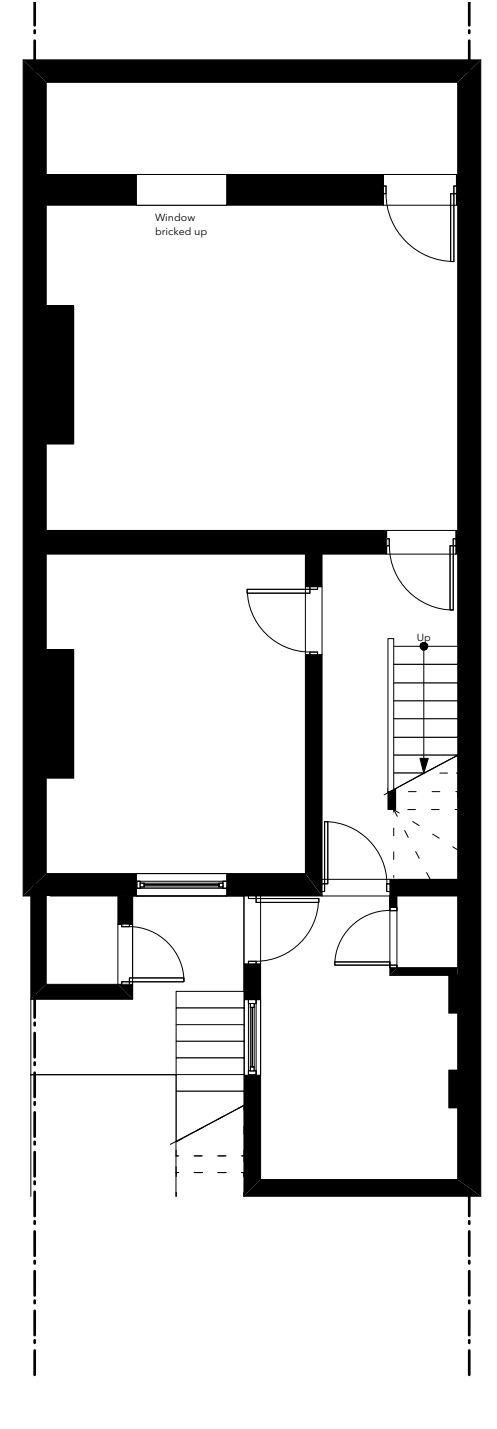
SECOND FLOOR PLAN



FIRST FLOOR PLAN



GROUND FLOOR PLAN



BASEMENT FLOOR PLAN



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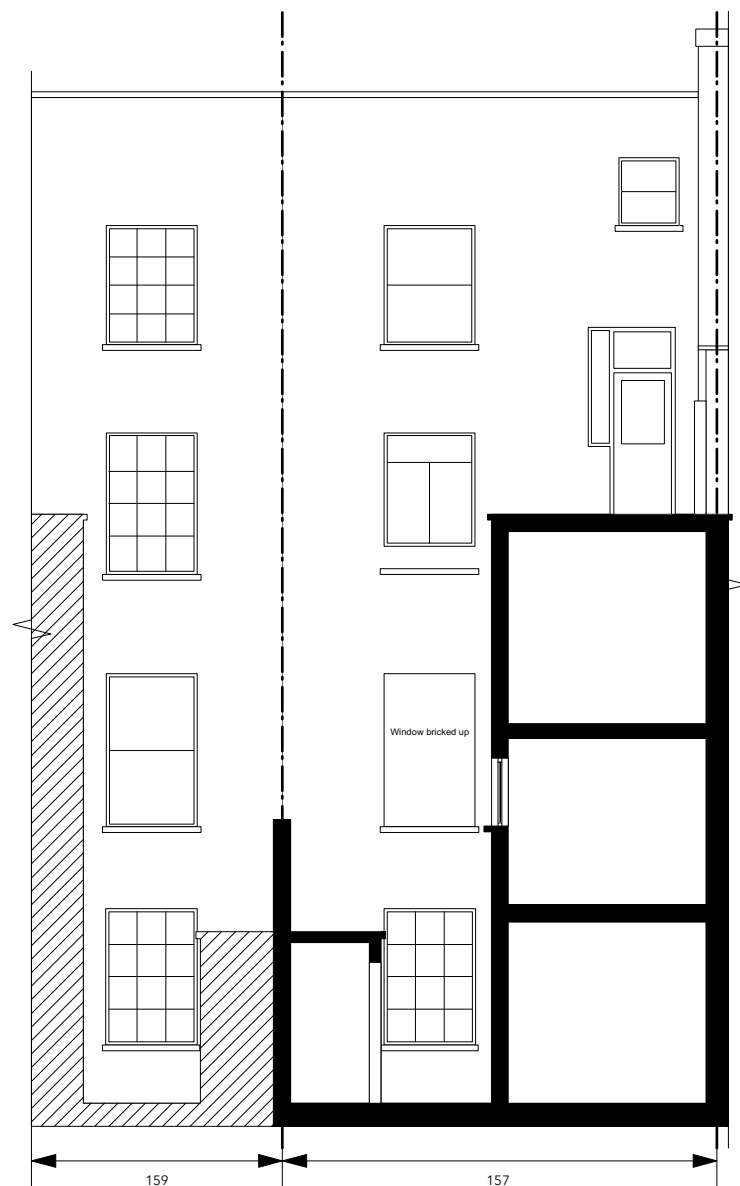


**YURKY CROSS**  
CHARTERED ARCHITECTS

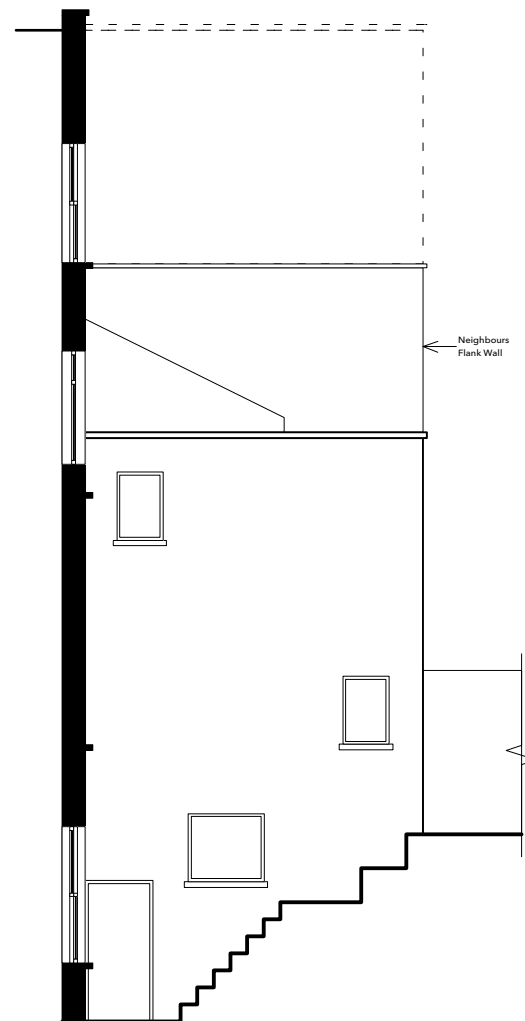
167 York Way LONDON N7 9LN  
T 020 7267 0481 F 020 7267 1248 E info@yurkycross.co.uk

| P R O J E C T                    |  | D R A W I N G   T I T L E |  | D R A W I N G   N U M B E R |           |                 |
|----------------------------------|--|---------------------------|--|-----------------------------|-----------|-----------------|
| 157 York Way<br>London<br>N7 9LN |  | Existing Plans            |  | PA-02                       |           |                 |
|                                  |  |                           |  | S C A L E                   | D A T E   | R E V I S I O N |
|                                  |  |                           |  | 1:100@A3                    | June 2017 |                 |

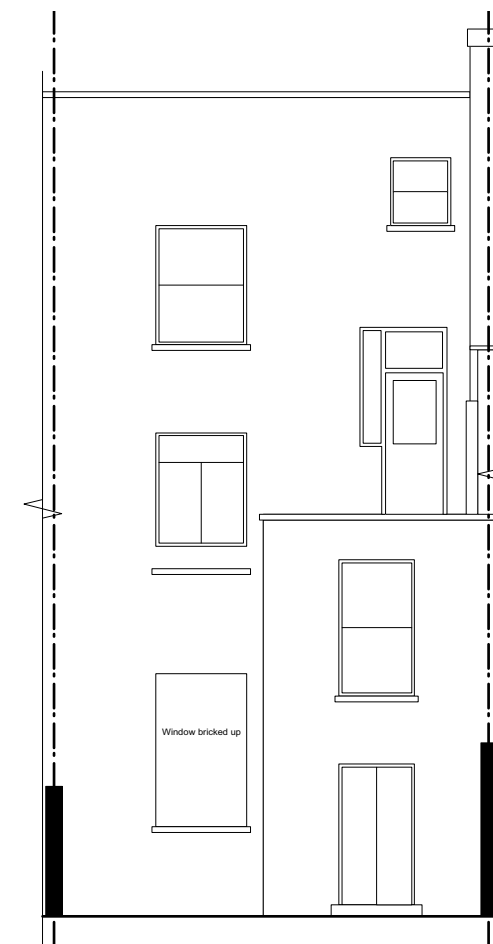
**PLANNING APPLICATION**



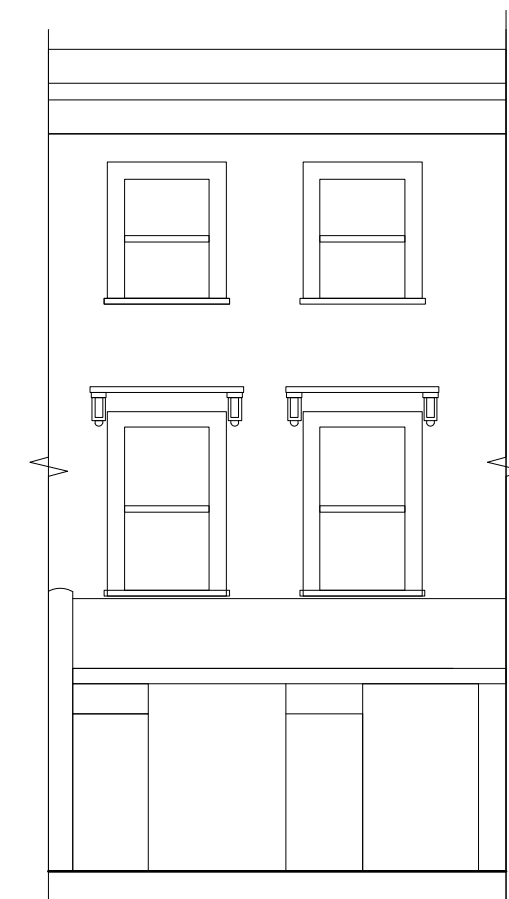
EXISTING BACK ADDITION-  
SECTION



EXISTING BACK ADDITION-  
FLANK ELEVATION



EXISTING REAR ELEVATION



EXISTING FRONT ELEVATION

## PLANNING APPLICATION

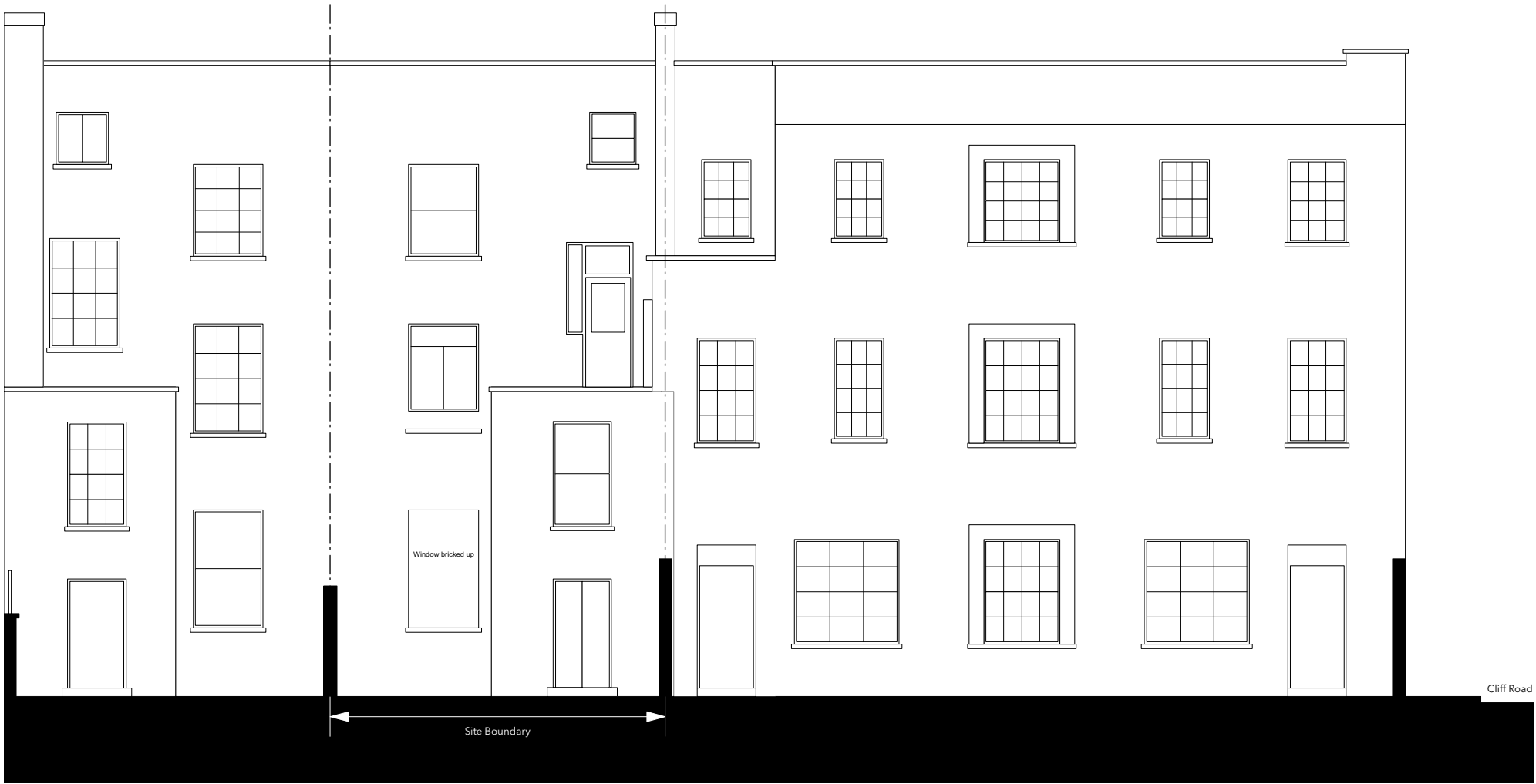


**YURKY CROSS**  
CHARTERED ARCHITECTS

167 York Way LONDON N7 9LN  
T 020 7267 0481 F 020 7267 1248 E info@yurkycross.co.uk

THIS DRAWING MUST NOT BE SCALED.

| PROJECT                          |  | DRAWING TITLE       |  | DRAWING NUMBER |           |          |
|----------------------------------|--|---------------------|--|----------------|-----------|----------|
| 157 York Way<br>London<br>N7 9LN |  | Existing Elevations |  | PA-03          |           |          |
|                                  |  |                     |  | SCALE          | DATE      | REVISION |
|                                  |  |                     |  | 1:100@A3       | June 2017 |          |

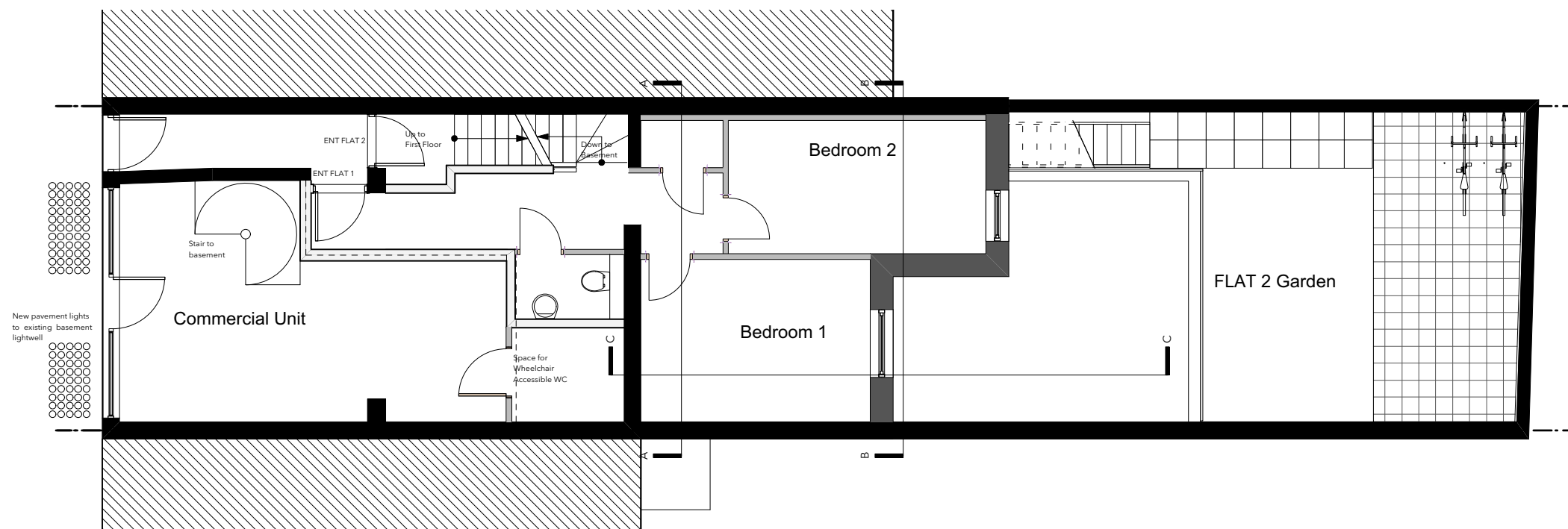


REAR CONTEXT ELEVATION

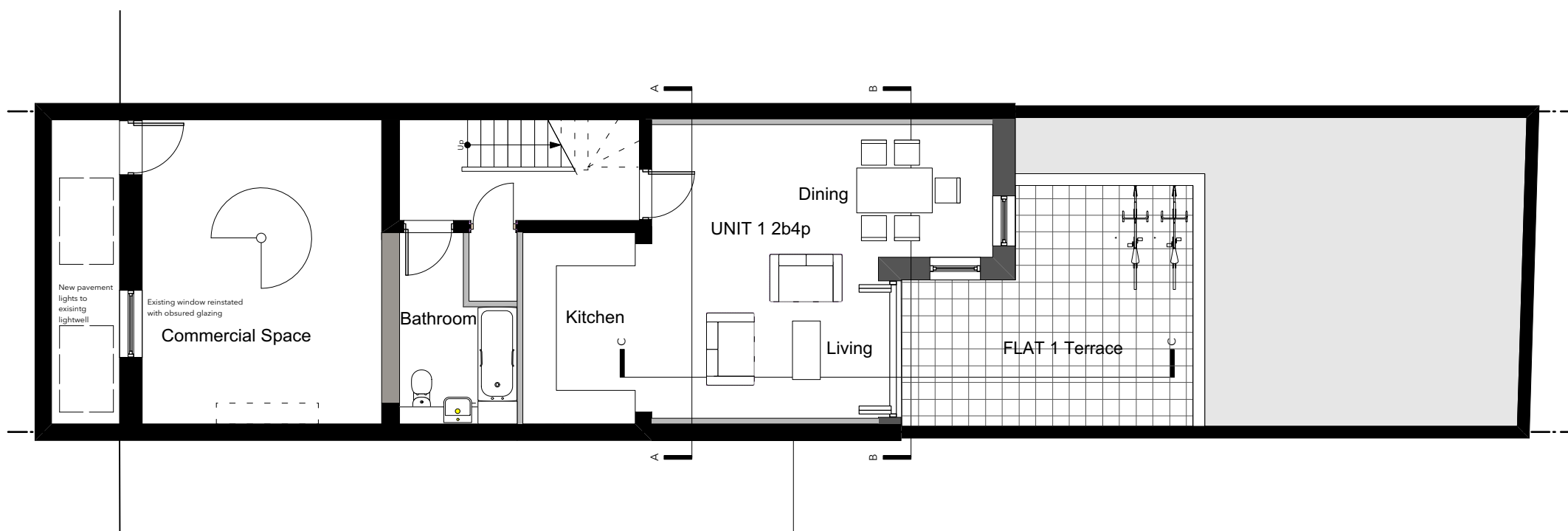
PLANNING APPLICATION

THIS DRAWING MUST NOT BE SCALED.

|                                                                                                                                                                                                                                  |                                             |                                             |                         |           |          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------|-------------------------|-----------|----------|
|  <div>YURKY CROSS<br/>CHARTERED ARCHITECTS<br/>167 York Way LONDON N7 9LN<br/>T 020 7267 0481 F 020 7267 1248 E info@yurkycross.co.uk</div> | PROJECT<br>157 York Way<br>London<br>N7 9LN | DRAWING TITLE<br>Existing Context Elevation | DRAWING NUMBER<br>PA-04 |           |          |
|                                                                                                                                                                                                                                  |                                             |                                             | SCALE                   | DATE      | REVISION |
|                                                                                                                                                                                                                                  |                                             |                                             | 1:100@A3                | June 2017 |          |



GROUND FLOOR PLAN



BASEMENT FLOOR PLAN

## PLANNING APPLICATION



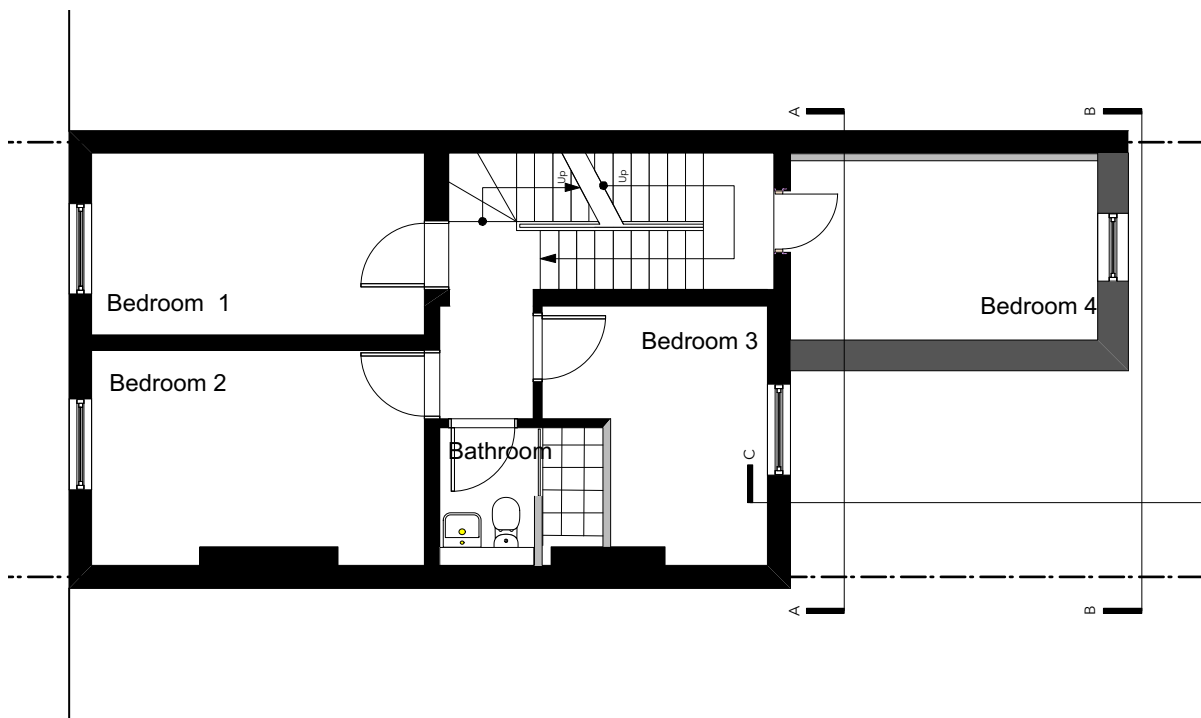
THIS DRAWING MUST NOT BE SCALED.



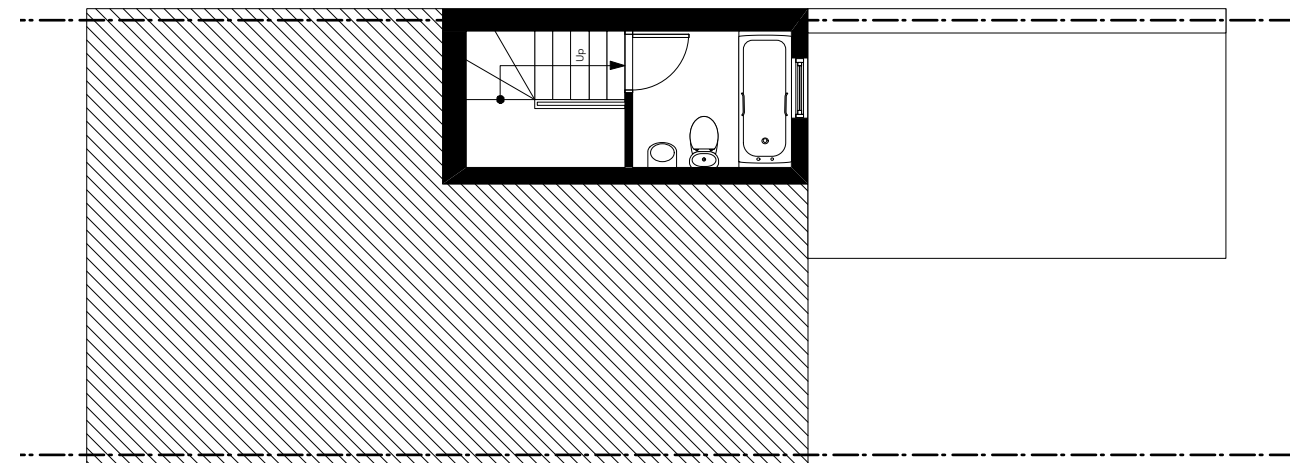
**YURKY CROSS**  
CHARTERED ARCHITECTS

167 York Way LONDON N7 9LN  
T 020 7267 0481 F 020 7267 1248 E info@yurkycross.co.uk

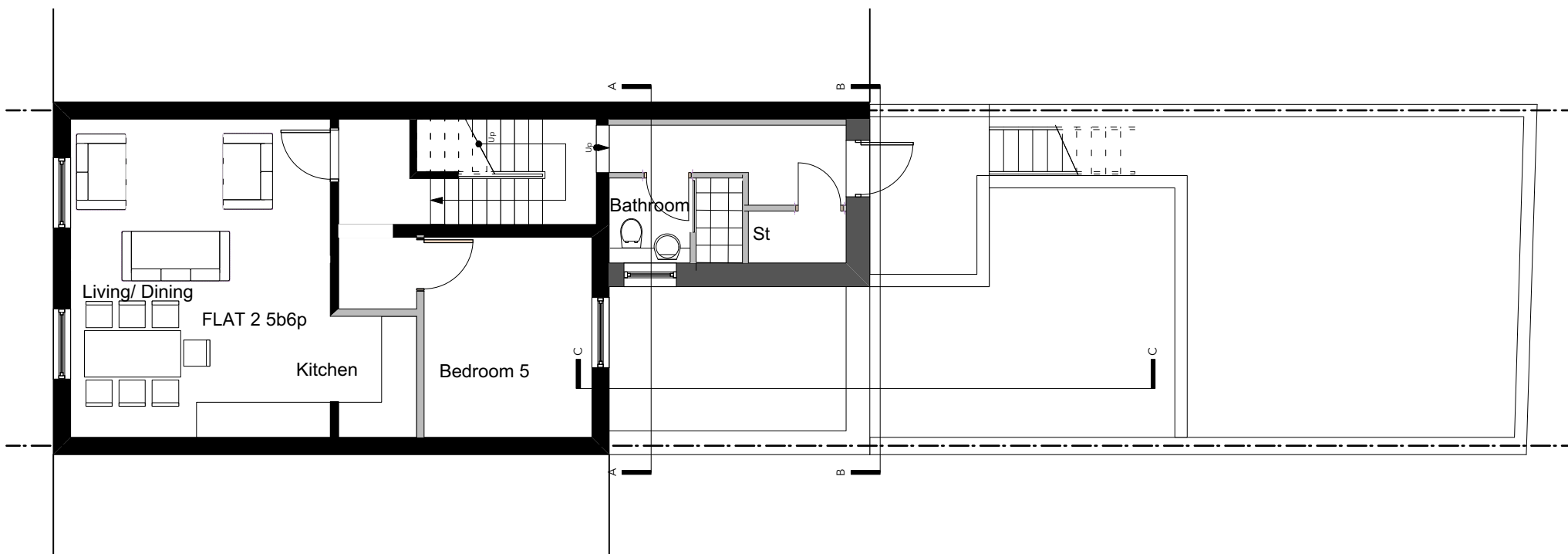
| P R O J E C T                    | D R A W I N G   T I T L E | D R A W I N G N U M B E R |           |          |
|----------------------------------|---------------------------|---------------------------|-----------|----------|
| 157 York Way<br>London<br>N7 9LN | Floor Plans<br>PROPOSED   | PA-05                     |           |          |
|                                  |                           | SCALE                     | DATE      | REVISION |
|                                  |                           | 1:100@A3                  | June 2017 |          |



SECOND FLOOR PLAN



THIRD FLOOR PLAN



FIRST FLOOR PLAN

## PLANNING APPLICATION



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**YURKY CROSS**  
CHARTERED ARCHITECTS

167 York Way LONDON N7 9LN  
T 020 7267 0481 F 020 7267 1248 E info@yurkycross.co.uk

| PROJECT                          |           | DRAWING TITLE           |  | DRAWING NUMBER |  |
|----------------------------------|-----------|-------------------------|--|----------------|--|
| 157 York Way<br>London<br>N7 9LN |           | Floor Plans<br>PROPOSED |  | PA-06          |  |
| SCALE                            | DATE      | REVISION                |  |                |  |
| 1:100@A3                         | June 2017 |                         |  |                |  |



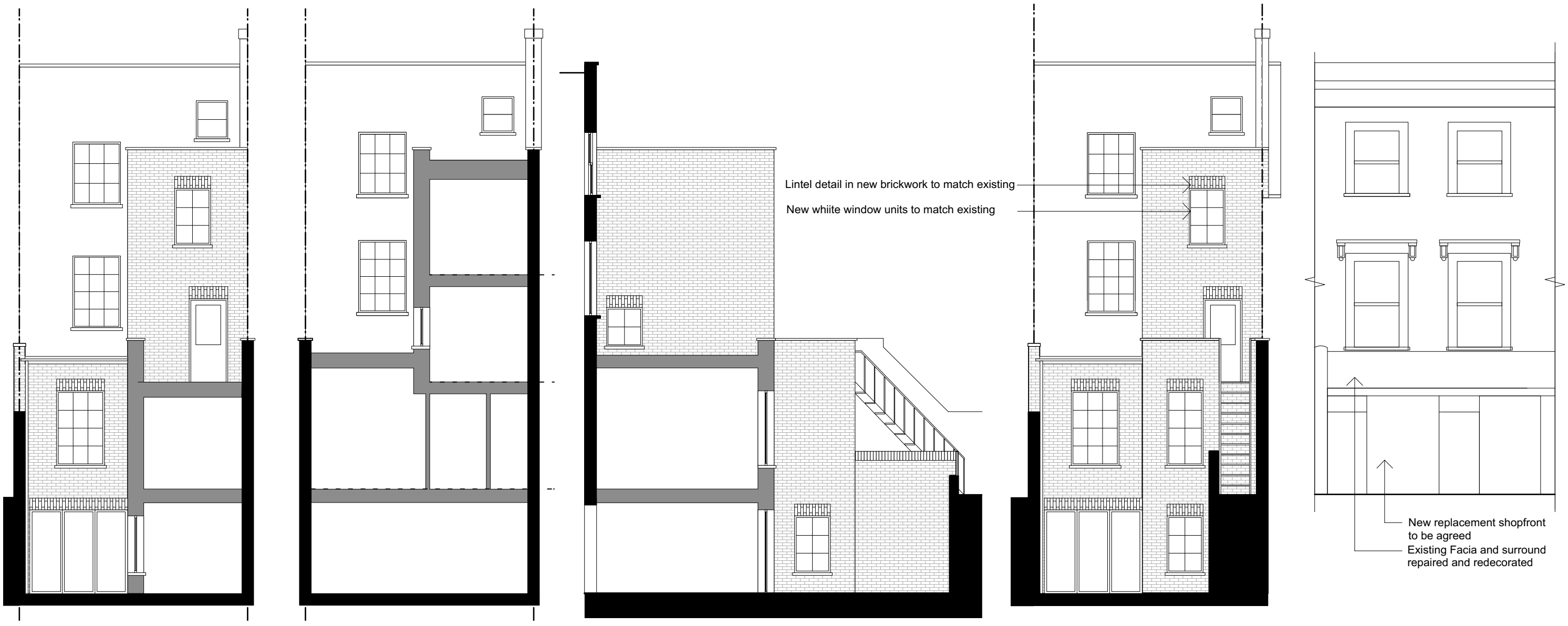
New stock brickwork to match existing



Existing



Proposed extension



PROPOSED BACK ADDITION-SECTION A

PROPOSED BACK ADDITION-SECTION B

PROPOSED BACK ADDITION-FLANK ELEVATION/SECTION C

PROPOSED REAR ELEVATION

EXISTING FRONT ELEVATION

PLANNING APPLICATION

|                                                                                                                                                                                                                                  |                                             |                                                     |                         |           |          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-----------------------------------------------------|-------------------------|-----------|----------|
|  <div>YURKY CROSS<br/>CHARTERED ARCHITECTS<br/>167 York Way LONDON N7 9LN<br/>T 020 7267 0481 F 020 7267 1248 E info@yurkycross.co.uk</div> | PROJECT<br>157 York Way<br>London<br>N7 9LN | DRAWING TITLE<br>Proposed Elevations<br>and Section | DRAWING NUMBER<br>PA-07 |           |          |
|                                                                                                                                                                                                                                  |                                             |                                                     | SCALE                   | DATE      | REVISION |
|                                                                                                                                                                                                                                  |                                             |                                                     | 1:100@A3                | June 2017 |          |

THIS DRAWING MUST NOT BE SCALED.



REAR CONTEXT ELEVATION

PLANNING APPLICATION

THIS DRAWING MUST NOT BE SCALED.

|                                                                                                                                                                                                                                         |                                             |                                             |                         |           |          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------|-------------------------|-----------|----------|
|  <div>YURKY CROSS<br/>CHARTERED ARCHITECTS</div> <div>167 York Way LONDON N7 9LN<br/>T 020 7267 0481 F 020 7267 1248 E info@yurkycross.co.uk</div> | PROJECT<br>157 York Way<br>London<br>N7 9LN | DRAWING TITLE<br>Proposed Context Elevation | DRAWING NUMBER<br>PA-08 |           |          |
|                                                                                                                                                                                                                                         |                                             |                                             | SCALE                   | DATE      | REVISION |
|                                                                                                                                                                                                                                         |                                             |                                             | 1:100@A3                | June 2017 |          |

Our Ref: 12412468      Your Ref: J18052 - 157 York Way

Tuesday, 13 March 2018

Su Connor  
Widbury Barn Widbury Hill  
Ware  
Hertfordshire  
SG12 7QE

Dear Su Connor

Thank you for contacting us regarding UK Power Networks equipment at the above site. I have enclosed a copy of our records which show the electrical lines and/or electrical plant. I hope you find the information useful.

I have also enclosed a fact sheet which contains important information regarding the use of our plans and working around our equipment. Safety around our equipment is our number one priority so please ensure you have completed all workplace risk assessments before you begin any works.

Should your excavation affect our Extra High Voltage equipment (6.6 KV, 22 KV, 33 KV or 132 KV), please contact us to obtain a copy of the primary route drawings and associated cross sections.

If you have any further queries do not hesitate to contact us.

Plan Provision  
0800 056 5866



This information is made available to you on the terms set out below. If you do not accept the terms of use set out in this fact sheet please do not use the plans and return them to UK Power Networks.

1. UK Power Networks does not warrant that the information provided to you is correct. You rely upon it at your own risk.
2. UK Power Networks does not exclude or limit its liability if it causes the death of any person or causes personal injury to a person where such death or personal injury is caused by its negligence.
3. Subject to paragraph 2 UK Power Networks has no liability to you in contract, in tort (including negligence), for breach of statutory duty or otherwise how for any loss, damage, costs, claims, demands, or expenses that you or any third party may suffer or incur as a result of using the information provided whether for physical damage to property or for any economic loss (including without limitation loss of profit, loss of opportunity, loss of savings, loss of goodwill, loss of business, loss of use) or any special or consequential loss or damage whatsoever.
4. The information about UK Power Networks electrical plant and/or electric lines provided to you belongs to and remains the property of UK Power Networks. You must not alter it in any respect.
5. The information provided to you about the electrical plant and/or electric lines depicted on the plans may NOT be a complete record of such apparatus belonging to UK Power Networks. The information provided relates to electric lines and/or electrical plant belonging to UK Power Networks that it believes to be present but the plans are not definitive: other electric lines and/or electrical plant may be present and that may or may not belong to UK Power Networks.
6. Other apparatus not belonging to UK Power Networks is not shown on the plan. It is your responsibility to make your own enquiries elsewhere to discover whether apparatus belonging to others is present. It would be prudent to assume that other apparatus is present.
7. You are responsible for ensuring that the information made available to you is passed to those acting on your behalf and that all such persons are made aware of the contents of this letter.
8. Because the information provided to you may not be accurate, you are recommended to ascertain the presence of UK Power Networks electric lines and/or electrical plant by the digging of trial holes. Trial holes should be dug by hand only.

Excavations must be carried out in line with the Health and Safety Executive guidance document HSG 47. We will not undertake this work. A copy of HSG 47 can be obtained from the Health and Safety Executives website.

All electric lines discovered must be considered LIVE and DANGEROUS at all times and must not be cut, resited, suspended, bent or interfered with unless specially authorised by UK Power Networks.

The electric line and electrical plant belonging to UK Power Networks remains so even when made dead and abandoned and any such electric line and/or electrical plant exposed shall be reported to UK Power Networks.

Where your works are likely to affect our electric lines and/or electrical plant an estimate of the price of any protective /diversionary works can be prepared by UK Power Networks Branch at Metropolitan House, Darkes Lane, Potters Bar, Herts. , EN6 1AG, telephone no. 0845 2340040



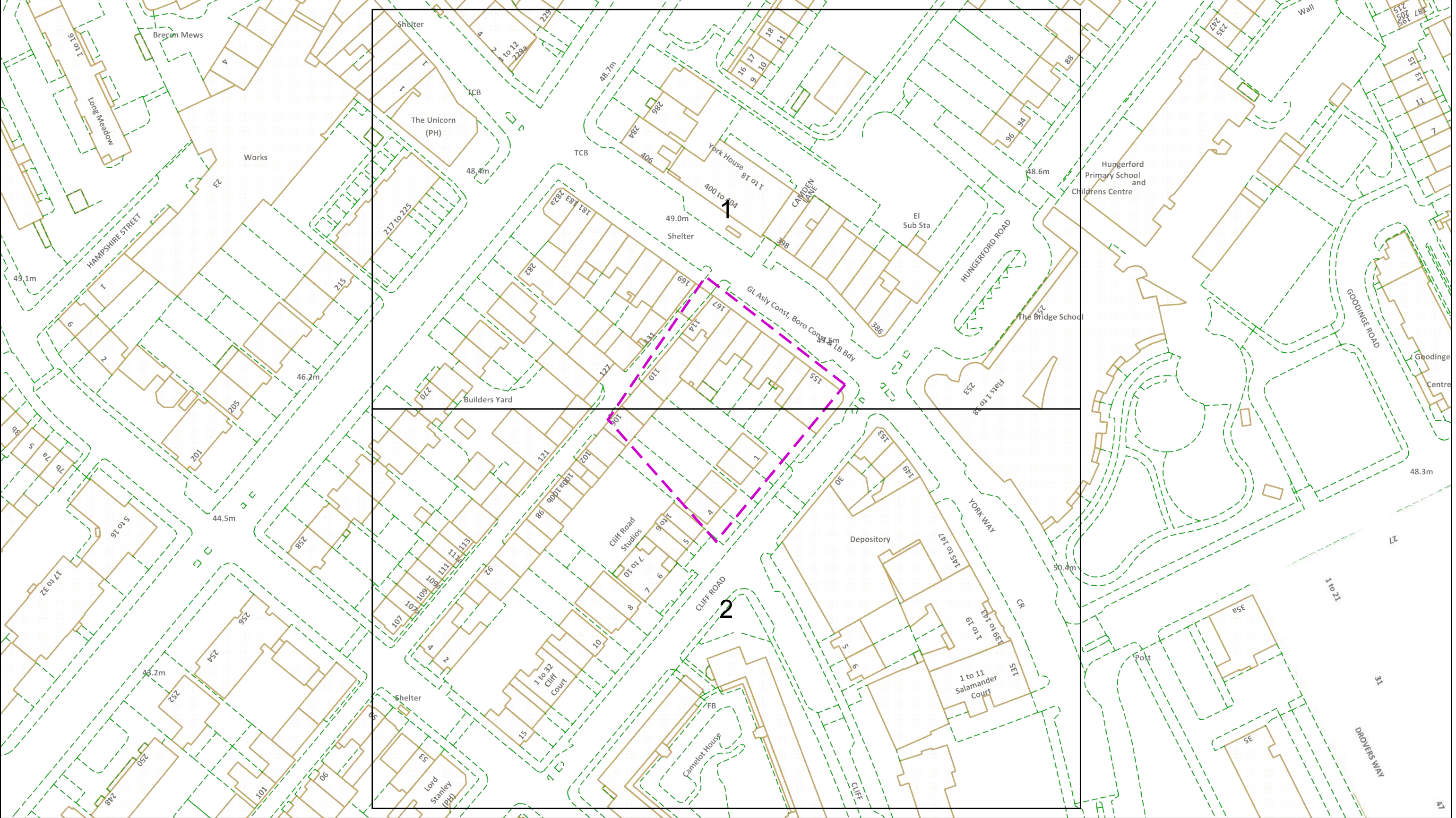
- 9 Any work near to any overhead electricity lines must be carried out by you in accordance with the Health and Safety Executive guidance document GS6 and the Electricity at Work Regulations.

The GS6 Recommendations may be purchased from HSE Books or downloaded from the Energy Networks Association's website.

If given a reasonable period of prior notice UK Power Networks will attend on site without charge to advise how and where "goal posts" should be erected. If you wish to use this service, in the first instance please telephone: 0845 6014516 between 08:30 and 17:00 Monday to Friday.

10. You are responsible for the security of the information provided to you. It must not be given, sold or made available upon payment of a fee to a third party.
11. If in carrying out work on land in, on, under or over which is installed an electric line and/or electrical plant that belongs to UK Power Networks you and/or anyone working on your behalf damages (however slightly) that apparatus you must inform immediately UK Power Networks by our emergency 24 hour three digit telephone number **105** providing;
- your name, address and telephone number;
  - the date, time and place at which such damage was caused;
  - a description of the electric line and/or electrical plant to which damage was caused;
  - the name of the person whom it appears to you is responsible for that damage;
  - the nature of the damage.
12. The expression "UK Power Networks" includes UK Power Networks (EPN) plc, UK Power Networks (LPN) plc, UK Power Networks (SEPN) plc, UK Power Networks and any of their successors and predecessors in title.





|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                       |  |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--|--|
| <div>Dig Sites    Area:     Line: </div> <div>The quality and accuracy of any print will depend on your printer, your computer and its print settings. Measurements scaled from this plan may not match measurements between the same points on the ground.</div>                                                                                                                                                                                                                                                                                                                                        |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |
| <div>This plan must be used with the attached ‘Symbols’ document.</div> <div>Date Requested: 13/03/2018<br/>Job Reference: 12412468<br/>Site Location: 529795 184850<br/>Requested by:<br/>Mrs Su Connor<br/>Your Scheme/Reference: J18052 - 157 York Way<br/>Scale: 1:1025 (When plotted at A3)</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  | <div>1. The position of the apparatus shown on this drawing is believed to be correct but the original landmarks may have been altered since the apparatus was installed.<br/>2. The exact position of the apparatus should be verified - use approved cable avoidance tools prior to excavation using suitable hand tools.<br/>3. It is essential that trial holes are carefully made avoiding the use of mechanical tools or picks until the exact location of all the cables have been determined.<br/>4. It must be assumed that there is a service cable into each property, lamp column and street sign, etc.<br/>5. All cables must be treated as being live unless proved otherwise by UK Power Networks.<br/>6. The information proved must be given to all people working near UK Power Networks plant and equipment. Do not use plans more than 3 months after the issue date for excavation purposes.<br/>7. Please be aware that electric cables/lines belonging to other owners of licensed electricity distribution systems may be present and it is your responsibility to identify their location.</div> |                                                                                       | <div>1. UK Power Networks does not warrant that the information provided to you is correct. You rely upon it at your own risk.<br/>2. UK Power Networks does not exclude or limit its liability if it causes the death of any persons or causes personal injury to a person.<br/>3. Subject to paragraph 2 UK Power Networks has no liability to you in contract, in tort (including negligence), for breach of statutory duty or otherwise for any loss, damage, cost, claims, demands, or expenses that you or any third party may suffer or incur as a result of using the information provided whether for physical damage to property or for any economic loss (including without limitation loss of profit, loss of opportunity, loss of savings, loss of goodwill, loss of business, loss of use) or any special or consequential loss or damage whatsoever.<br/>4. This plan has been provided to you on the basis of the terms of use set out in the covering letter that accompanies this plan. If you do not accept and/or do not understand the terms of use set out in the covering letter you must not use the plan and must return it to the sender of the letter.<br/>5. You are responsible for the security of the information provided to you. It must not be given, sold or made available upon payment of a fee to a third party.</div> |                                                                                       |  |  |
| <div>Maps produced at 1:2500 scale are Geo-Schematics which show LV mains cables and overhead lines (in some cases all voltages). Prior to carrying out excavations you must refer to the 1:500 records to determine the location of all known underground plant and equipment.</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                       |  |  |
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