INTRODUCTION

This short document from Willow Cottages residents [date 19 March 2018] is a measured and considered response to the recently submitted GEA authored BIA Audit Response document dated 24 January 2018.

The GEA BIA Audit Response is a formal reply to the additional queries raised in Campbell Reith's BIA Audit Report dated December 2017. It should be noted that to date the applicant under planning application 2016/7146/P [Proposed Basement works at 31 Willoughby Road NW3] has been afforded three opportunities to respond appropriately to the numerous and legitimate queries relating to the proposed works and their impacts on Listed Willow Cottages [LWC] and Listed Willow Cottages rear retaining boundary wall [LRRBW].

EXECUTIVE SUMMARY

The Residents of Willow Cottages have identified and list the following concerns pertaining to both the proposed works at 31 Willoughby Road [planning application 2016/7146/P] and their impacts on Willow Cottages i.e.

1. The BIA report underscores that all data provided by third parties [including necessary experts] is accepted de facto and that it is neither appropriately assessed nor tested for being suitable and correct for the BIA modelling. Such disregard is counter intuitive to proper methodology making the study results suspect and potentially invalid as the correctness and scope of BIA parameters have not been properly and adequately determined.
2. The combined summary drawings, including drawing 4186-SM02E and summary groundwater tables which all show their relationships to Listed Willow Cottages, ominously underplay and even ignore the real relationships and obvious impacts of

- Close proximity in that the closest distance between new 440mm thick basement RC wall to the listed Willow Cottages rear boundary retaining wall is approximately ONLY 250mm. This gap is impossible to achieve by basement construction methods without destroying the listed retaining wall. This risk location has not been identified.
- Greater excavation depths of circa 4.5m to level 81.0 which is 2.26m below the Lower Ground Floor level of Willow Cottages and 2.07m lower than the listed Willow Cottages rear boundary retaining wall at patio ground level,
- Groundwater levels in the 'Made Ground' layer [83.26] are seen to be higher than the Willow Cottages rear patio ground level of 83.07m and a marginal 170mm below the Lower Ground Floor level of 83.43m of Listed Willow Cottages. This is important because the top 'Made Ground' layer of 3m depth [85.5m to 82.5m] is the aquifer layer where the ground water flows through and downhill down Willow Road towards South End. Also, almost 65% of the groundwater readings taken are above the 82.5m level and within the problematic aquifer 'Made Ground' layer. See Dr Michael De Freitas summary article 'Ground Response to basement development in Camden' of 23 May 2013 which confirms that it is the shallow 'Made Ground' layer that causes very real problems to neighbours abutting basement works in Hampstead as this layer is where the ground water predominantly flows.
- Separated Main Contractor responsibility for temporary works including excavations, correct and safe shoring and shuttering merely deflects the real difficulty of actual execution of a theoretical design

3. The Revised BIA Audit Response document neither correctly identifies nor investigates the very obvious areas of major risk and potential damage to Listed Willow Cottages. This continued omission is either cynically wilful or a glaring oversight, which in either case merely makes not only the 24 January 2018 BIA Audit Response but also the BIA document glaringly inadequate and invalid.
4. Whilst the BIA Audit Response document relates solely to the CR December 2017 BIA Audit, the applicants do continue to omit any response to other Willow Cottages scheduled concerns which have been previously issued to LBC [e.g. overlooking]

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SKETCHES

See

- Extract Section 2.1.2 Conceptual Model / Proposed Section CC with comments
- Extract Section 2.1.1 Table of Groundwater Monitoring
- Extract Drawing 4186-SM02E / Suggested Method of Works 1 - Stage 4 Plan with comments
- Sketch 17032018_001 Section CC Corrected – showing real proximity relationship with rear 37/38/39 Willow Cottages and retaining wall

1. **BIA AUDIT RESPONSE 24012018 DOCUMENT - Stated limitations of information used within the response document**

   COMMENT ON DOCUMENT PAGE 1 Item 1.0 INTRODUCTION 1.1. LIMITATIONS - The GEA document states '*Any comments made on the basis of information obtained from the client or other third party parties are given in good faith on the assumption that the information is accurate, no independent validation of such information has been made by GEA'*.

   It should be noted that no responsibility is taken by the authors of this document for the accuracy of statements made by the client or third parties or for the suitability of methods suggested. This seriously undermines confidence in the findings, the scope and the proposed methodology put forward in this document.

   The authors as experts, have been asked numerous times to respond to specific concerns previously identified that clearly and obviously impact on the Listed Willow Cottages terrace and the Listed rear retaining boundary wall belonging to Willow Cottages. The response continues to be lacking.

2. **BIA AUDIT RESPONSE 24012018 DOCUMENT – GROUND WATER : Selective information, omissions and errors**

   COMMENT ON DOCUMENT PAGE 2 Item 2.1.1 GROUNDWATER MONITORING - The GEA document on page 2 includes both a table showing varying groundwater depths up to 19 December 2017 and a proposed section C-C drawing showing proposed works relative to soil types and relationship to Willow Cottages.

   These two items warrant further scrutiny.

   It is seen that the groundwater reading depths taken at Borehole 1 are the highest. If one extends groundwater depth level BH01 19122017 of 83.26m to Listed Willow Cottages one will see the groundwater level would equate to being [1] approximately **190mm higher** than the rear Willow Cottages courtyard level of 83.07, and [2] a mere approximate **170mm below** the interior Lower Ground Floor Level of Listed Willow Cottages [83.43m]. The table also shows that 17 of 26 groundwater readings [almost 65%] are above the 82.5m level confirming the constant high levels of ground water in the porous higher 'Made Ground' level at 31 Willoughby Road and about and under Listed Willow Cottages et al. It should be noted that the surrounding topography to Willow Cottages is a valley with existing and historic evidence of wells and underground water [see 1866 Ordinance Survey map and our previous objection submission].

   These readings confirm that there is permanent flowing groundwater at the shallow bearing foundation levels of Listed Willow Cottages and the Listed rear boundary retaining wall. As mentioned in our earlier submitted critiques, Listed Willow Cottages and the listed retaining wall have shallow Victorian footings on currently stable memory-based load bearing and compacted ground. The proposed works will cause serious long term destabilisation to the now stable and well-established loadbearing soil profile to both listed constructions [achieved over 150 years]. Furthermore, the measured ground water profile shows

there to be substantial water within the 'Made Ground' zone that will obviously be re-directed by the proposed basement works onto the fragile listed retaining wall and the listed Willow Cottage terrace. This will remove the fines within the soil, reduce bearing capacity and cause disparate movement and damage to Willow Cottages.

The rear Listed Boundary Retaining wall only has simple shallow stone flags as footings where both original wall and footings were not designed to take additional loads from the newer badly constructed abutting higher wall formed to retain the Made Ground soil at finish level 85.5m – hence the temporary steel structure at 39 Willow Road which braces the dangerous boundary construction. The listed rear boundary retaining wall also is not able to deal with the excessive hydrostatic pressure from the now higher and deeper aquifer 'Made Ground' [3m deep] layer as the original rear garden ground level of 31 Willoughby Road was at the top of the old Listed Retaining Wall at 84.6m level and not at the higher 85.5m level.

Proposed Section C-C [shown on Page 2] is graphically incorrect and shows the relationship with Listed Willow Cottages and listed rear retaining wall in a more 'optimistic' manner that is dangerously misleading. The new proposed basement retaining wall, some 440mm thick, is not shown and the section position forming the drawing is located inappropriately at the widest part of the works from Willow Cottages. Section CC does not show the true and much closer works proximity to Listed Willow Cottages and the listed retaining wall as it makes the distance between Willow Cottages and Willoughby Road works far wider. Drawing 4186-SM02E shows the footprint proximity of the new proposed basement works relative to the listed Willow Cottages rear boundary retaining wall i.e. shows the closest distance of approximately 250mm. This unidentified risk location is impossible to construct whilst maintaining the structural integrity of the listed retaining wall!

This same Section C C also excludes levels relative to Willow Cottages which would help identify these concerns and areas of risk raised by Willow Cottages residents.

This selective graphic underplays the real complexity of the proposed works impact on Willow Cottages and the listed retaining wall which the BIA neither acknowledges nor analyses.

None of the BIA documents including January 2018 revision acknowledges or identifies or analyses any of these obvious and important aspects of the abutting contiguous conditions that relate to the proposed development works at 31 Willoughby Road and Listed neighbouring constructions. None of these very real risk scenarios have been described nor investigated by the applicant's consultants. This makes the revised January document a persistent gross oversight with selective risk scenarios and remains fundamentally invalid as it continues **not** to show the real impact of the proposed application works on Listed Willow Cottages.

3. BIA AUDIT RESPONSE 24012018 DOCUMENT – ENGINEERING & TEMPORARY WORKS: Selective information, omissions and errors

COMMENT ON DOCUMENT ENGINEERING SECTION [RICHARD TANT ASSOCIATES] - The GEA document includes a structural engineering section submitted by Richard Tant Associates. There are a number of obvious shortcomings which are listed once again below i.e.

BRIEF & RELEGATION OF RESPONSIBILITY – In this section under 'Brief', the Engineers state '*as is standard for works of this type, the main contractor will be fully responsible for the design and erection of all temporary works*'. The relegation of responsibility for how the proposed works [e.g. excavations, shoring and stabilisation, forming of reinforced concrete 440mm thick retaining walls with associated foundations] are to be safely and correctly carried out while potential damage to contiguous neighbouring properties is mitigated, is simply unacceptable. These matters should be clearly defined within the BIA document so that the actual formation tasks can be understood in the full context of the proposed construction works. It is not acceptable to either pass the responsibility of this critical phase to another party and it is not

acceptable to separate the necessary temporary installation works from the structural engineering solution within the proposed works. This separation incorrectly implies that the two are not fundamentally interlinked. As Dr de Freitas states in his seminal article 'Ground response to basement development in Camden' dated 23 May 2013 quote '*…. It is not appropriate for matters to be left to 'good industrial practice' once planning permission is given – predicting ground response and responding so as to mitigate its effects is, in many parts of Hampstead beyond what 'good industrial practice' is able to guarantee'* unquote. Separating and excluding proper temporary works methodology within the BIA document makes a nonsense of the BIA conclusions as the parameters of analysis are purposefully blinkered.

EXCAVATION DEPTHS - The engineering solution cannot be constructed without safe temporary works. The needed excavations are to a deeper level at approximately the 81.0m level [nominal 4.5m deep] and **not** to the document stated *'approximately 4.1m below existing ground level'* as this does not realistically allow for necessary well compacted hardcore layers plus possible insulation and waterproofing layers which will all in turn require more excavation depths. The proposed excavation is [1] to be over 2.07 m below the Patio Level of the listed rear boundary retaining wall [83.07m], and [2] some 2.43m below the Lower Ground inside Floor Level of Listed Willow Cottages [at 83.43m].

FOOTPRINT PROXIMITY - Not only are these depths damaging to the Listed Willow Cottages structures but are even more troubling when scrutinising Stage 3 and Stage 4 of associated Ungar Architects Drawing 'Suggested Method of Works 1' Drawing Number 4186-SM02E. This drawing clearly shows the footprint proximity of new concrete 440mm thick basement retaining walls to the Listed Willow Cottages rear boundary retaining wall as at worst approximately 250mm and at best approximately 1m. With constraints of both distance between structures and the fragile listed wall with flag footing, makes it impossible to build without substantial damage.

Combining footprint proximity with excavation depth below both Listed Willow Cottages rear boundary retaining wall and Listed Willow Cottages lower floor level, the spectre of real damage becomes obvious. This risk is made even worse when one adds the fact that although the excavations will go through the higher 3m deep 'Made Ground' level into a further approximately 1.5 m depth within the lower 'London Clay' layer, the ground water layer within the aquifer 'Made Ground' layer coupled with the hill slope places more hydrostatic pressure on the existing shallow and limited footings of listed Willow Cottages and rear listed retaining wall.

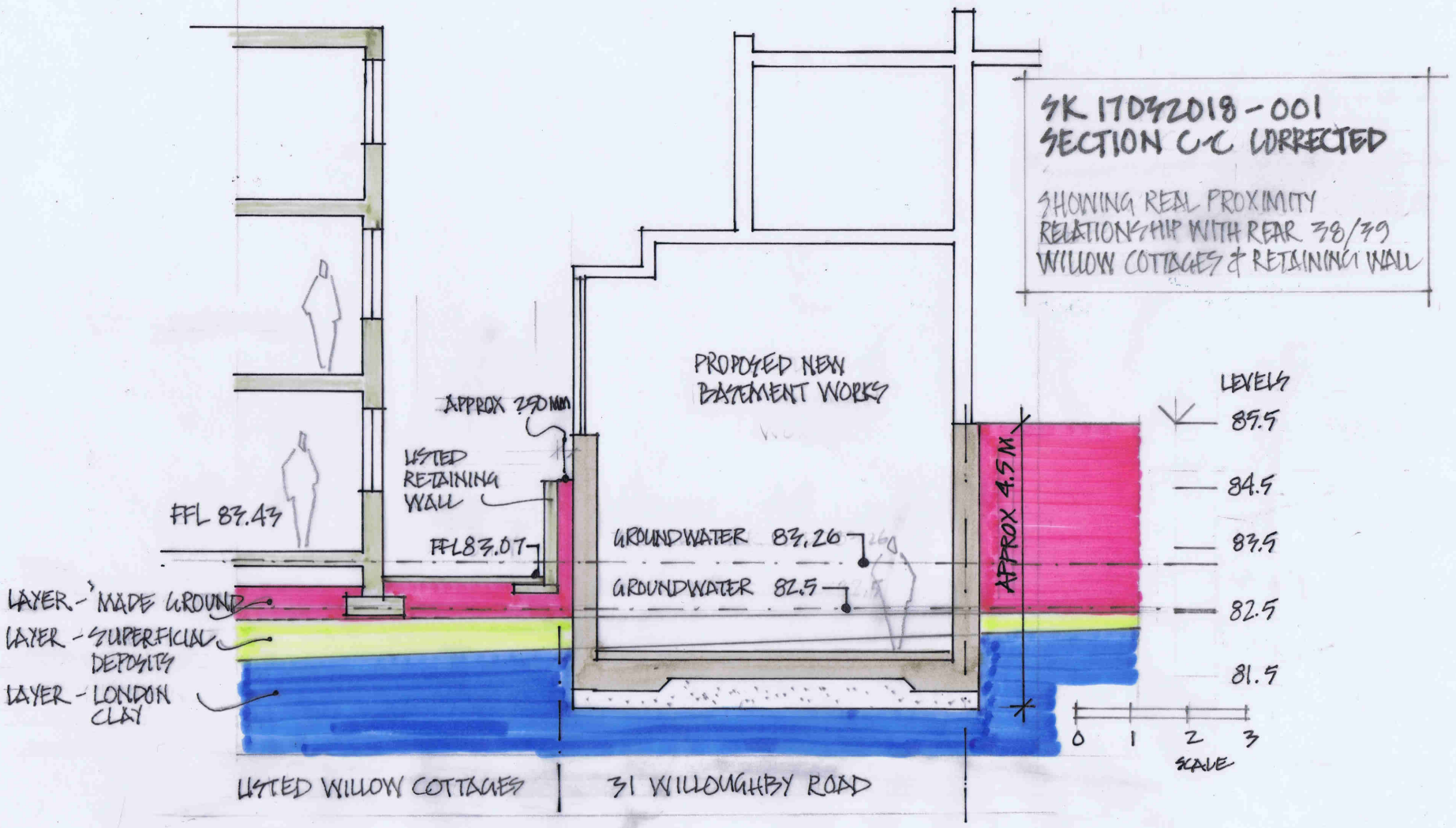
None of these aspects nor scenarios have been acknowledged nor identified in any part of this BIA revision document. These concerns have been raised by Willow Cottages residents before and the applicant has chosen to ignore these very real areas of high risk and potential damage to these heritage buildings.

It must also be noted that the Section AA position considers the party wall relationships of 31/33 Willoughby Road and 31/29 Willoughby Road. These are important relationships. However, another equally important relationship has been omitted from the documentation which is 31 Willoughby Road / Listed Willow Cottages and Listed rear retaining wall. Such an ongoing omission makes the BIA and associated revisions inaccurate in its scope of analysed parameters, concerns and impacts, and wanting in areas of defined risk and assessed damage, making the study results once again totally invalid.

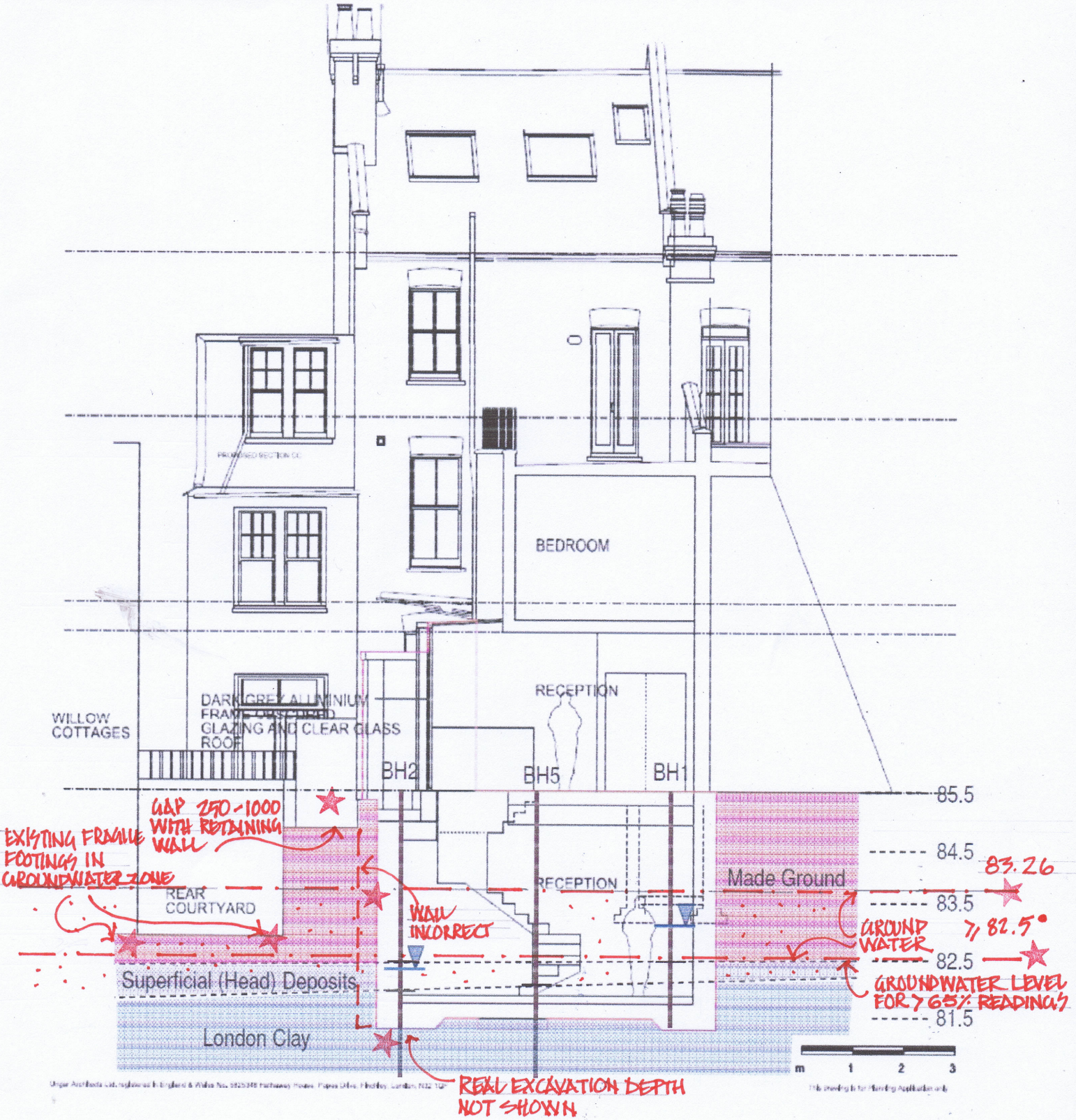
4. OTHER CONCERNS - Other planning concerns raised but not acknowledged

The BIA Response document dated 24 January 2018 does not acknowledge, address nor mention the other raised concerns that the application would have on Willow Cottages. Please see our original objection document dated 22012017.

End

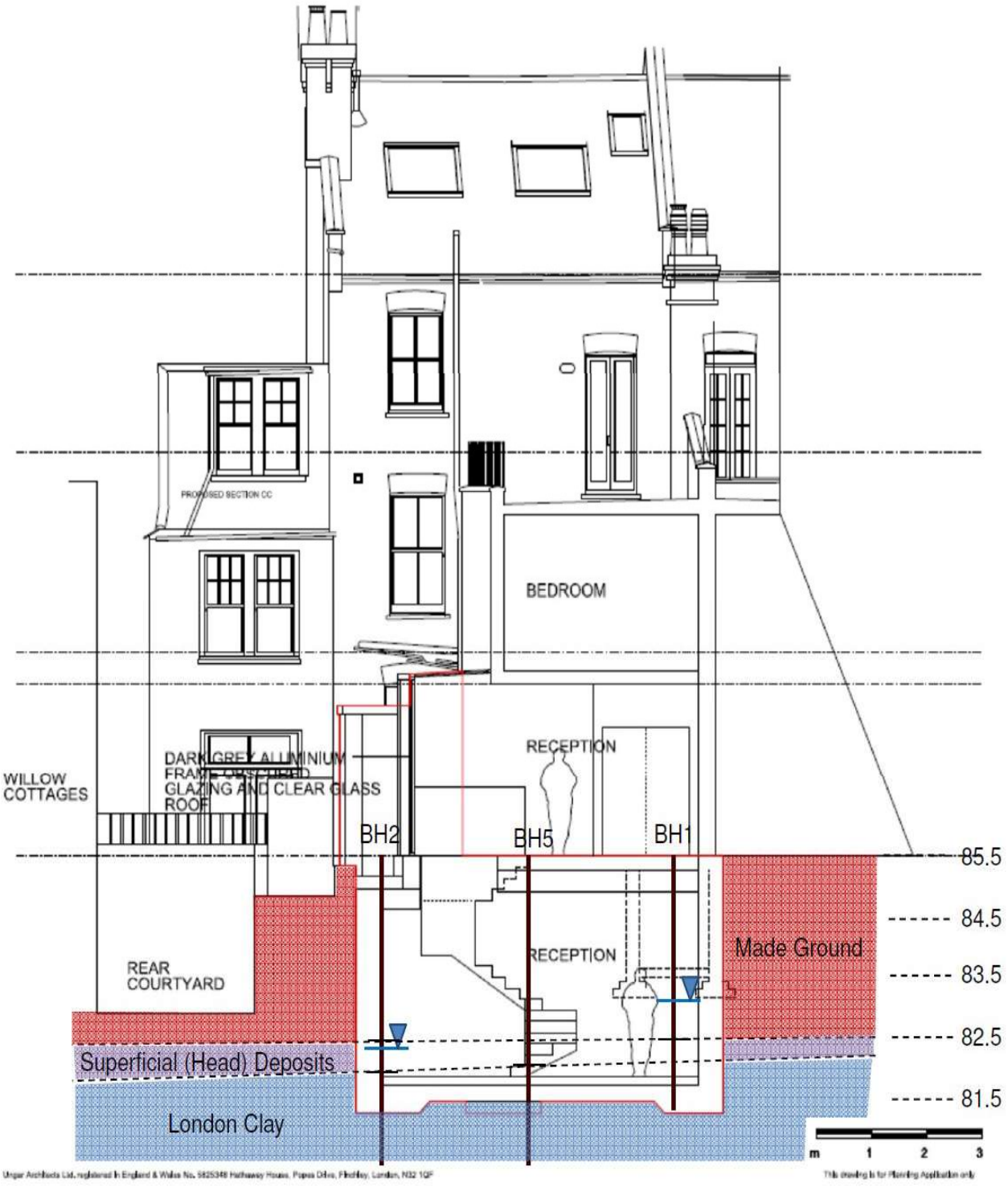

SK 17032018-001
SECTION C-C CORRECTED
SHOWING REAL PROXIMITY RELATIONSHIP WITH REAR 38/39 WILLOW COTTAGES & RETAINING WALL
PROPOSED NEW BASEMENT WORKS
APPROX 250 MM
LISTED RETAINING WALL
FFL 83.43
FFL 83.07
GROUNDWATER 83.26
GROUNDWATER 82.5
APPROX 4.5 M
LEVELS
85.5
84.5
83.5
82.5
81.5
LAYER - MADE GROUND
LAYER - SUPERFICIAL DEPOSITS
LAYER - LONDON CLAY
0 1 2 3
SCALE
LISTED WILLOW COTTAGES
31 WILLOUGHBY ROAD

PROPOSED SECTION C-C – WITH COMMENTS RELATIVE TO WILLOW COTTAGES



Borehole No	Standpipe depth (m bgl) [m OD]	Depth to groundwater (m bgl) [m OD]					
		02/02/2016	23/02/2016	14/12/2016	05/07/2017	11/07/2017*	19/12/2017
1	3.1 [82.45]	2.55 [83.00]	2.34 [83.21]	Not monitored	2.46 [83.09]	3.00 [82.55]	2.29 [83.26]
2	4.00 [81.50]	3.00 [82.50]	3.04 [82.46]	Not monitored	3.17 [82.33]	3.20 [82.30]	3.04 [82.46]
3	3.00 [82.40]	2.75 [82.65]	2.70 [82.70]	2.75 [82.65]	2.85 [82.55]	2.80 [82.60]	2.66 [82.74]
4	5.00 [80.40]	2.75 [82.65]	2.76 [82.64]	2.75 [82.65]	2.88 [82.52]	2.89 [82.51]	2.83 [82.57]

*Water levels within BH1 not fully recovered from rising head test undertaken on 5th July 2017.



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		02/02/2016	23/02/2016	14/12/2016	05/07/2017	11/07/2017*	19/12/2017
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3	3.00 [82.40]	2.75 [82.65]	2.70 [82.70]	2.75 [82.65]	2.85 [82.55]	2.80 [82.60]	2.66 [82.74]
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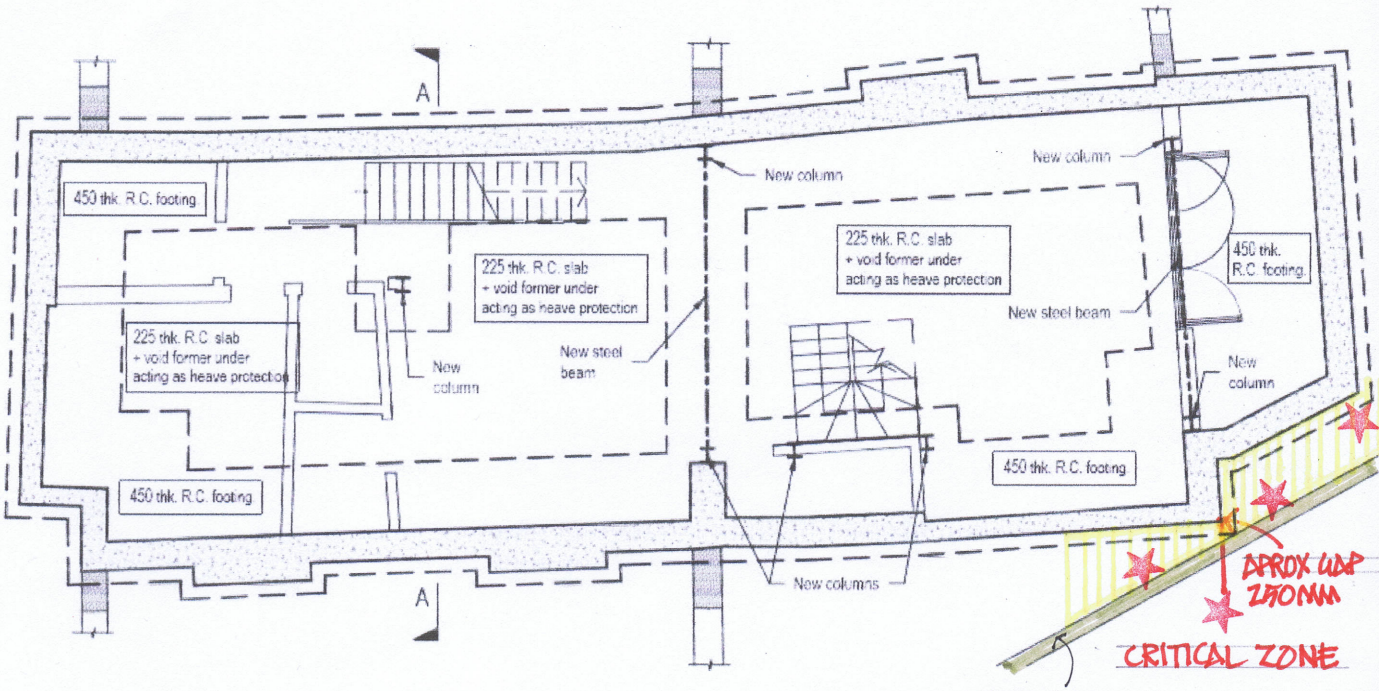
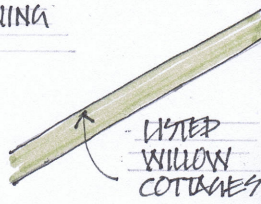
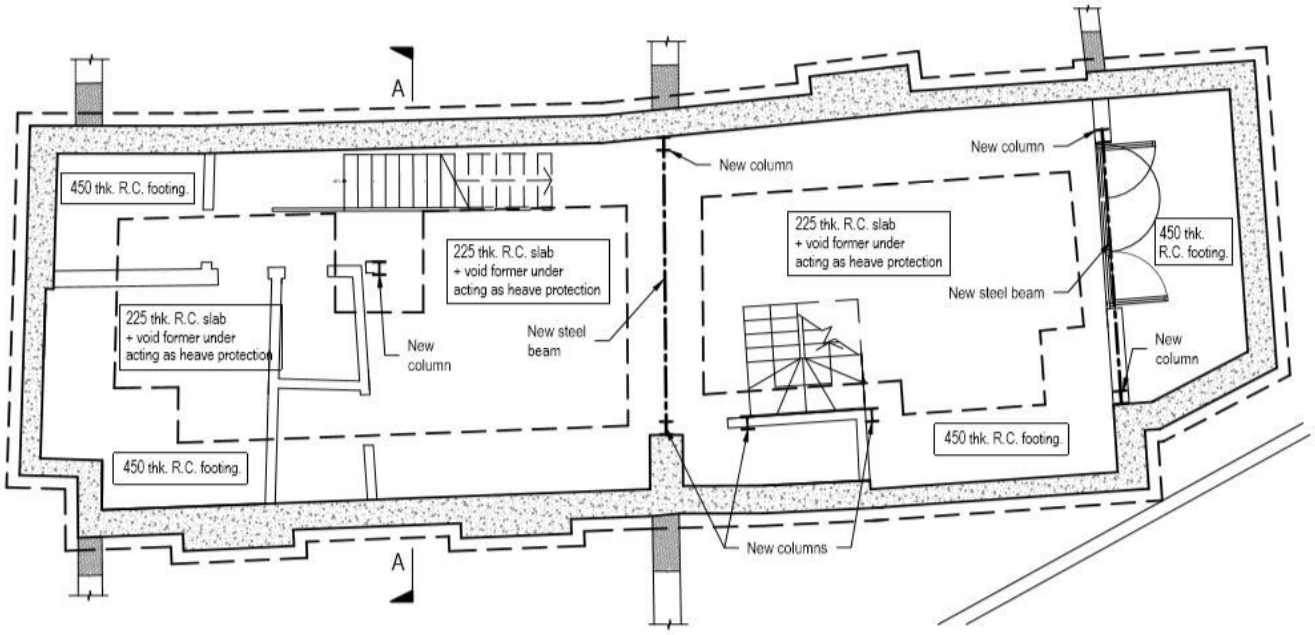
EXTRACT DRAWING 4186-SMOZE



Stage 4:

a. Pour pads / strips / fit steels / cast R.C. walls.
b. Remove sacrificial pins.
c. Cast slab.
d. After concrete has cured and achieved design strength carefully trim back projections & remove temporary works.
e. Install partition walls & finishes: insulation, waterproofing etc.- refer to Architects details.





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