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Camden Council Planning Department
Camden Town Hall Extension
Argyle Street
London
WC1H 8EQ

24th May 2024

Our Ref: 31530 - Chester Terrace Gardens, NW1 4ND
Camden Planning Ref: 2023/0282/P

Dear Mr Hodgson,

Chester Terrace Gardens - retaining wall repair and reconstruction proposals

I write on behalf of the Chester Terrace Residents Association (CTRA), who have asked Price & Myers to review the current proposals, submitted by the Crown Estates Paving Commission (CEPC), for the repair and reconstruction of the existing retaining walls and balustrade to the eastern side of Chester Terrace Gardens and give our expert opinion, as consulting structural engineers with over 45 years' experience of working in Central London, on the extent of proposed work generally and also the proposed construction methodology.

We have reviewed the relevant documents submitted on Camden's Planning portal (reference above) along with Hurst Peirce + Malcolm's (HPM) drawing reference 24509-1000 rev T1, dated 19th April 2024 and as sent via email to CTRA on 26th April. Furthermore, I visited site on 20th May and met Michael Webber and John Beighton of CTRA to walk the length of the wall both at pavement level and from within the gardens.

Our commentary is as follows and covers several aspects of the proposed work.

The HPM plan drawing 24509-1000 rev 1 that has recently been provided to CTRA by CEPC shows that only three of the seven sections of wall, namely "Walls 2 to 4" inclusive, are proposed to be entirely rebuilt, as noted by the statement "new piled retaining wall, new balustrade over". The other four sections of wall have the following works noted: "Existing balustrade and foundation works to have cosmetic remedial works". This is different to the documentation on the Planning portal, which suggest that the wall in its entirety will be rebuilt.

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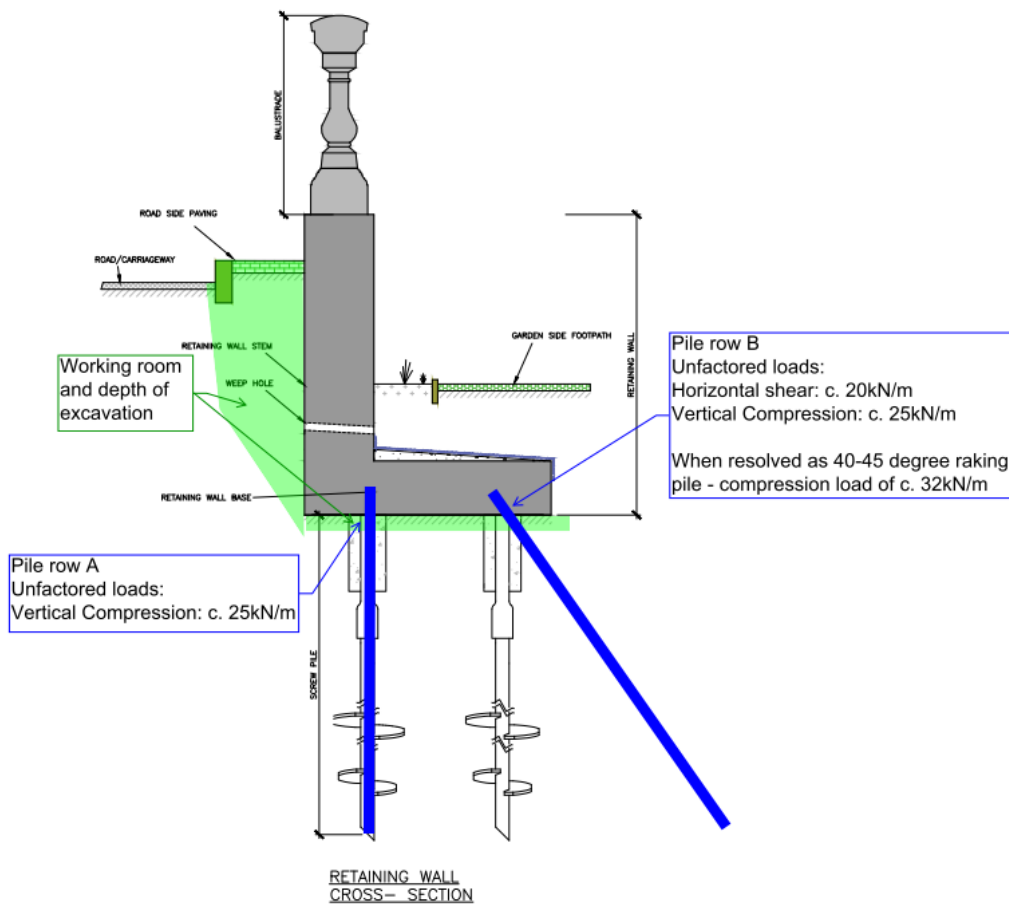
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The nature of the "cosmetic remedial works" to the foundation (ie. retaining wall) and balustrade should be clarified for the avoidance of doubt. However, it appears that the wall and balustrade is generally in a reasonable state of repair for its age, and we assume that repairs to the balustrade will address general wear and tear and, for example, include localised repair of bottles and handrails where concrete has spalled off and exposed small areas reinforcement. It does not appear necessary or proportionate to replace larger sections of the balustrade. Furthermore, given that where the necessary repair works to wall and balustrade are only cosmetic in nature, it is not clear why "Heras" style fencing remains in place adjacent to it.

Given that HPM drawing 24509-1000 rev 1 is the far more recent document, it therefore more accurately reflects the current proposals. As such, we assume that no major items of plant or machinery will need to go near to the four sections of wall that are to have only cosmetic remedial works. Therefore, with the possible exception of some smaller or less mature elements of vegetation being removed for access, the existing flora, including all trees and mature bushes, in these areas can remain intact.

Where the three sections of wall are still noted as being replaced, we assume that the methodology shown in the HPM method statement and drawing 24509-201 rev P1 still applies, albeit for a reduced length of the wall. These sections of wall have come to the end of their useful life and will be replaced with a more robust form of construction, using more modern construction techniques. The balustrades that sit on top of these sections of retaining wall have suffered damage as a direct result of the historic movement of the wall and in any case need to be replaced because it is not practical to reconstruct the wall with the balustrade remaining in place.

Notably, the method statement suggests that a "21 tonne excavator" is required to install the steel screw piles that will support the new L-shaped reinforced concrete (RC) retaining wall. This would presumably necessitate the destruction of all the mature trees and shrubs in the vicinity. HPM's drawings do not note the required capacities for the piles, however our own calculations show that (all loads here are unfactored) vertical compression loads of around 25kN/m, to each of the two rows of piles, and horizontal shear loads of around 20kN/m, to the outer pile row, are needed to resist the applied forces. If the outer pile row is installed at a 40-45 degree rake from vertical, resolving the forces removes the shear load and it puts the pile essentially in pure compression (and so leaves a far more structurally efficient arrangement), with a load capacity of around 32kN/m required. This arrangement is as shown in the sketch below, with proposed pile rows shown in blue.

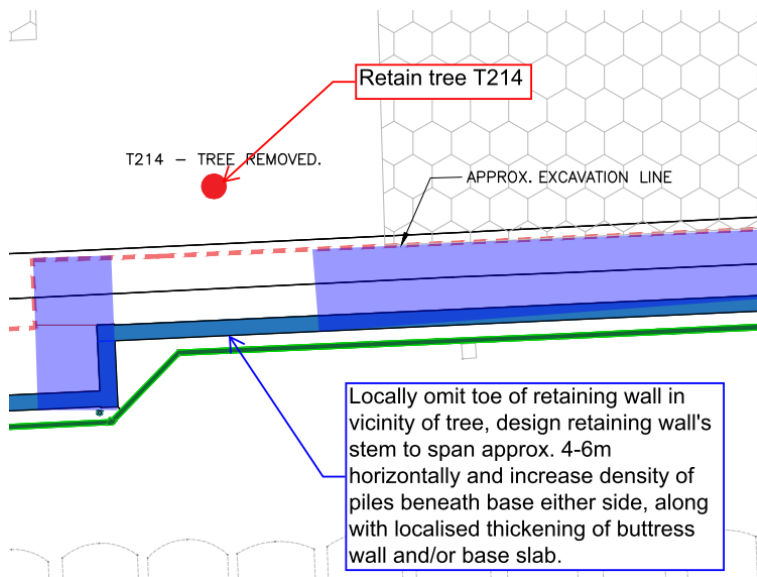


Proposed alternative piling arrangement, with approximate piles loads

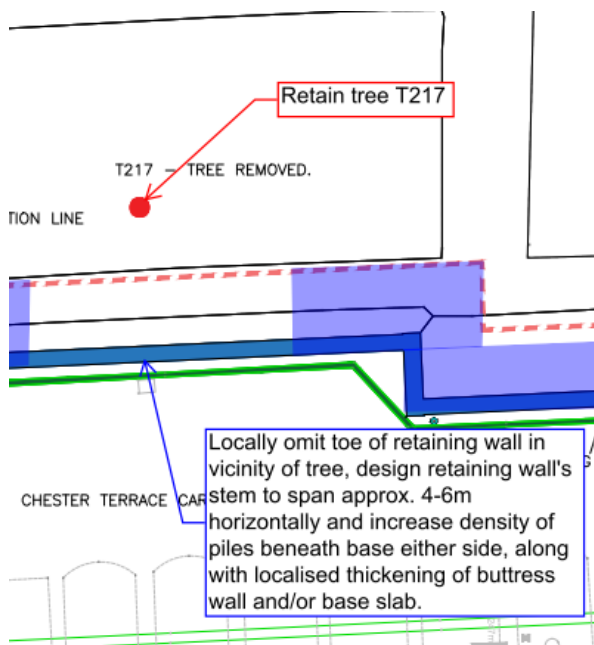
Given that screw piles can typically be installed at approximately 500mm centre spacing before adverse group action needs to be considered, it is certainly not unreasonable to assume that screw piles could be installed at 1m centre spacing along each row. This would result in piles needing to take unfactored compression loads in the order of 25-35kN. Having spoken to some screw pile specialists, including Target Fixings (website: <https://targetfixings.co.uk/products/heli-pile/>) it is clear that piles achieving such loads in the London Clay assumed to exist on the site can readily be installed using hand held equipment, for example a 63kg pneumatic driver, and at the 45 degree rake indicated in the sketch above given the available working room. Even if the piles needed to be installed using a 1.5 tonne mini-excavator to get the required torque to reach the necessary capacity, this would still likely be possible with minimal destruction of the local mature flora. The currently proposed use of a 21 tonne excavator to install the piles therefore seems needlessly excessive, destructive, and expensive, for such modest loads that are only, after all, generated from supporting what is a relatively low level retaining wall.

Whilst it is acknowledged that any flora immediately adjacent to where the sections of wall will be replaced will need to be removed, it does appear that an alternative structural arrangement could be pursued local to trees marked T214 and T217 and so not require their removal. Please refer to the two sketches below, which are mark ups of HPM drawing 24509-82 rev P1, showing

the basic principle. The sketches show the toe/base of the retaining wall locally being left out for a 4-6m length of wall in the vicinity of the trees, therefore meaning that the tree roots would remain relatively undisturbed. The new 450mm thick RC retaining wall stem appears to already be thick enough to span this distance horizontally, but it, or the buttressing wall and/or base at either end, could be increased in size if necessary. The density of piles beneath the toe of the retaining wall would also need to be increased at either end, but a detailed analysis of the arrangement and refinement of loads should prove it feasible.



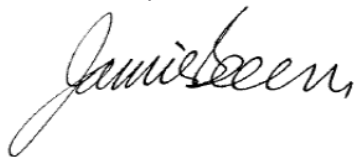
Tree T214 - near Wall 2 - proposed alternative retaining wall arrangement



Tree T214 - near Wall 2 - proposed alternative retaining wall arrangement

In summary, it appears that a far less intrusive approach to the replacement of the three sections of retaining wall can be taken, that would result in the preservation of the vast majority of the existing trees and mature shrubs in the gardens.

Yours sincerely,
for Price & Myers

A handwritten signature in black ink, reading "Jamie Beeson". The signature is written in a cursive style with a large, sweeping initial "J".

Jamie Beeson, MA, MEng, CEng, MIStructE
Partner