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BY E-MAIL

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30 August 2023

Dear Mr S Bond

11 Wood Street, Skelmanthorpe - Defective Retaining Wall

Further to our report dated 12 May 2023, I understand that an application to replace the defective retaining wall has been refused by the Local Authority. From a structural perspective the following comments from the Tree officer have been made in the consultation response stating:-

> *'Please can we also have clarification as to why the wall can't continue to be repaired/patched as it seems to have been up to now'*
>
> *`Trees are not convinced that the proposal is necessary and that there are not other options available to repair/maintain the wall'*

To address the above, we have summarised below the options considered before recommending a full rebuild of the wall and why these are unlikely to be suitable.

1. Option 1 - Patch repairs

Patch repairs typically involve repairing small areas with like for like construction. However, for larger areas this is not sustainable as any underlying problems may not be resolved and the same defects will re-occur. The wall has had numerous patch repairs undertaken over the years, this, combined with the defects now present, are indicative of a structure that has reached the end of its useful life. Due to the extent of the defects and the likelihood of ongoing deterioration and maintenance, it is my opinion that patch repairs are not a suitable long-term solution.

The existing form of construction would not meet current design standards, and the defects viewed indicate that there is an underlying flaw in the wall construction. Simply patching the wall does not resolve the issue and may only mask the problem. This could potentially lead to a catastrophic failure in future.

2. Option 2 - Localised Rebuilding.

Localised rebuilding will require the careful removal of the affected areas of the wall and replacement with a new wall designed to current design codes and highway standards giving a design life of more than 100 years. Following removal of the affected section of the wall, the earth behind would need to be excavated to allow construction of new foundations, the wall could then be constructed from this base and backfilled. There are several risks associated with this approach which are as follows: -

- It is likely adjacent sections of wall could become unstable during the works requiring the extent of the replacement to be increased.
- Excavation sides would need to be battered back appropriately to make safe for construction operatives.
- The excavation works and associated battering back will encroach into the root zone potentially destabilising the trees and likely causing terminal decline of the tree (due to root damage).
- It is possible that the tree roots are contributing to the stability of the soil mass alleviating pressures on the wall. The loss of roots may impact upon this and result in an increase in pressures on areas of the wall left as existing, thus contributing to further deterioration.

Irrespective of the impact on the trees, any areas not rebuilt would likely continue to deteriorate and eventually need replacing.

3. Option 3 - Construct a new retaining wall in front of the Existing Wall.

This option would involve the construction of a new wall in front of the existing wall. The existing wall effectively becomes an infill. As the existing wall forms the edge of the highway, this cannot be undertaken without permanently encroaching onto an already narrow highway. In addition to this, the base would need to extend several metres below the highway requiring a closure of the road. As this wall would be wholly within the highway, it would become the responsibility of the Local Authority to maintain.

Following our appraisal of the above options we have arrived at the following conclusions.

Option 1 is not considered to be a suitable long-term solution as it does not resolve underlying problems with the existing construction and poses an ongoing maintenance issue.

Options 2 would put construction workers at unnecessary risk. Overcoming this would increase the risk of destabilising the trees or cause terminal decline. Any sections of the wall left in place would continue to deteriorate and will require replacement in future.

Options 3 is not feasible due to the width of the carriageway which would be permanently lost, and the disruption to the highway/any services due to construction of the base below the highway.

Based on the above, it is our opinion that the only sustainable long-term solution is to rebuild the wall in its entirety to current design condes using modern construction methods.

In relation to our comments on instability to the trees and terminal decline, we have consulted with the Arboriculturist who will advise in detail on the risk to the trees.

We trust the above is of assistance, however, should you like to discuss further please don't hesitate to contact us.

Yours sincerely

M Askew (CEng MICE)