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July 6, 2020

7th Tee HOA
Attention: Mr. Bruce Sneed

RE: Timber Retaining Wall Inspection

Address: 3585 Clubheights Dr.
Colorado Springs, CO 80906

Dear Mr. Sneed:

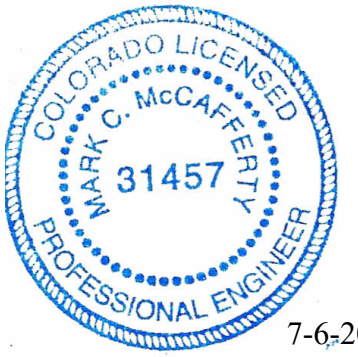
In accordance with your request we have performed a structural inspection of the vertical timber retaining walls on the 7th Tee HOA property at 3585 Clubheights Drive. in Colorado Springs, Colorado on July 2, 2020. The inspection was performed by and report written by Mark C. McCafferty, P.E. For your interest, a copy of Mr. McCafferty's resume is attached.

This inspection report is limited to observations made from visual evidence. No destructive or invasive testing was performed. The report is not to be considered a guarantee of condition and no warranty is implied.

This report has been prepared for your benefit and in strict confidence with you as our client. No reproduction or reuse of this report for the benefit of others is permitted without expressed written consent, except as may be required by Colorado real estate regulation. Further, except as required by real estate regulation, we will not release this report to anyone without your permission.

We thank you for the opportunity to serve you.

Sincerely,



7-6-20

Mark C. McCafferty, P.E.
Principal

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STRUCTURAL INSPECTION

Property owner: 7th Tee HOA
Address: 3585 Clubheights Dr.
Colorado Springs, CO 80906

DESCRIPTION

The subject structures are vertically driven timber soil retaining walls at several locations around the various buildings of the HOA. The largest timber retaining wall is at the rear/east side of the east multi-unit condominium building, adjacent to the Country Club of Colorado Golf Course.

OBSERVATIONS AND COMMENTS

The call to our office was with regard to a request for a structural inspection and opinion with regard to the condition of the timber retaining walls.

The following observations were made on the day of the inspection. Most observations are recorded on the attached photo-template:

Exterior

1. As noted in the attached photos, there are various timber retaining walls adjacent to various buildings around the property. All timber retaining walls are constructed with vertically driven, treated "railroad tie" piles. The largest retaining wall is along the rear/east side of the east building and is about 3.5 to about 4 feet in height. On this east wall, there is rot and deterioration of most timbers, tree growth between the timbers, and at least one missing timber with soil erosion through the wall (photos 1, 2, 3, 4, 5). Other retaining walls consist of similar timbers, are shorter and retain less soil (photos 6-12).

DISCUSSION

As we discussed, the east timber retaining wall is the largest wall on the property and retains the most soil and its performance is the most critical compared to the other retaining walls we observed on the property. The deterioration of this wall is more significant that the other walls. The wall is slowly deteriorating over time and the deterioration includes rot, missing timber, and tree growth between timbers. The wall was likely constructed around 1978 are part of the overall HOA development. A generally accepted "lifespan" for timber retaining walls is about 20 years and the age of this wall is over twice that expected life. Complete failure, if that were to happen, would likely affect the rear deck foundations of the east building, rather than the foundations of the building itself. The deterioration of this wall is more significant that the other walls. As we discussed, replacement of individual timbers may be possible, depending on finding a competent

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contractor to do this, however, it would likely be impractically costly on a “per timber” basis because of the heavy equipment required to remove and re-drive individual timbers. It is also possible to remove and replace a portion of the wall, but again the unit cost is increased by repeating the process on another portion of the wall.

The most cost-effective solution is to demolish and replace the existing timber retaining wall. A more cost-effective type of wall would be an engineered segmental block retaining wall. Such a wall is constructed with approximately 8x8x16” hollow block (filled with gravel during construction) with horizonal layers of “geogrid” fabric and engineered gravel backfill below the ground level on the uphill side of the wall. The block wall requires a “foundation” along its length consisting of compacted engineered gravel. There should be a gravity drain with “daylight” outlet well away from the property. All roof downspouts from the building should be extended underground to outlet at or beyond the face of the new block wall. Engineering and municipal permitting is required for the wall construction. In my professional opinion, all of the existing timber retaining wall should be removed, including the underground portions, as there is some risk that the timbers could rot and affect the new wall if left underground. Depending on the depth of the existing timbers, the design of the wall may be affected.

CONCLUSIONS

The east timber retaining wall should be prioritized for complete removal and replacement with a new engineered “segmental block” retaining wall.

The remaining timber retaining walls (photos 6-12) should be kept under observation for signs of additional movement, deterioration or soil erosion. Eventually, these should be replaced with similar segmental block retaining walls. In most cases, engineering would not be required for the remaining walls.