



MORRISON HERSHFIELD

August 25, 2022

River View Vista Estates  
Eagle Crest Management  
c/o MARRISSA RAINEY  
PO Box 1215  
Redmond, OR 97755

**Re: Structural Assessment – Hot Tub Support Framing**

Dear MARRISSA,

This letter is to summarize the results of our structural assessment of the structural support framing for the hot tubs of selected decks located at the River View Vista Estates. The review encompassed assessment of original construction for in-set hot tubs, and for a recent renovation for hot tub recesses that were filled in to allow for hot tubs to sit on top of the decking. As our assessment was based on a sampling of the units chosen by Eagle Crest Management and/or the HOA, our findings are generalized to the overall conditions seen, and do not necessarily address individual units.

Executive Summary

Morrison Hershfield performed a visual assessment of 12 units located along Redtail Hawk Drive and Snow Goose Drive. For units with hot tubs, for both the original construction and new renovations, there was a clear lack of lateral bracing, which is installed to resist seismic and wind loads, and to provide stability to the hot tub platform framing. Additionally, there were clear signs of decay and defect in the structural members, and the framing and foundations installed appeared to be inadequately designed and constructed. It is our opinion that the structural support framing for the hot tubs be replaced right away, regardless of its age. While we did observe damaged framing members, and inadequate hot tub supports, we did not see any obvious framing that appeared to be failing or impending collapse. However, it should be noted that hot tubs are heavy, and impose significant loads on the supporting framing, and this item does bear some urgency. At the time of our visit we did not see any immediate life safety concerns, provided the decks don't undergo atypical loading, such as earthquakes, excessively large gatherings or large accumulations of snow.

Summary of Assessment

On August 3, 2022, Shawn Stevenson, P.E., S.E. and RJ Nueske, P.E. of Morrison Hershfield visited the site to perform a visual structural assessment of 12 units (7, 11, 12, 22, 24, 26, 39, 41, 43, 51, 53 and 55). Accompanying us on the site visit was Paul Fujimoto, a retired engineer and representative of the HOA. A member of maintenance staff assisted with access to the interior of Unit 7 and with removing siding elements for access to the underside of the deck on Unit 22. The temperature was in the mid-90s throughout the day, and the weather was sunny.

Framing for the original construction varied by location, but mainly consisted of 2x joists running perpendicular to the decking above. The joists were attached with nails or connectors to a 2x or 4x beam that rested on 4x posts. The posts were set into the ground onto a small concrete foundation or on a precast concrete block. On top of the joists was typically a piece of wood sheathing, such as plywood or OSB. See Figures 1 and 2 for typical arrangements.



*Figure 1 – Typical Original Framing*



*Figure 2 – Typical Original Framing and Sheathing*

In all observed cases, there was no lateral system, such as a sheathing-encased wall or diagonal braces. While the framing in some cases attached to the outer skirting of the decks, the siding of the decks was not designed to resist lateral loads and does not have the capacity or detailing to resist such loads. See Figure 3 for an example of a hot tub framing connected to the outer siding.



*Figure 3 – No Lateral Bracing*

For framing hot tub support with the hot tub located on top of the decks, the framing mainly consisted of filling in the existing inset space with decking matching the size of the current composite (Trex®) decking. Beneath the hot tubs was a combination of unsheathed and unbraced 2x cripple walls supporting new 2x joists. The cripple wall was placed on top of the original elevated platform. In some cases, the joists were attached to an end beam that was inadequately supported by a single floor joist. In some cases, new posts had been placed in the center of the hot tub area resting on pre-cast concrete blocks. The connection hardware and wood for these renovations appeared to be in good condition and showed no signs of damage or defect, but stacking unbraced framing on top of unbraced framing is a stability concern. See Figures 4 through 7 for examples.



*Figure 4 – Typical Unbraced Renovation Framing*



*Figure 5 – Typical Renovation Post*



*Figure 6 – Inadequate Support of New Framing*



*Figure 7 – Cedar Planking In-Fill*

At one location (Unit 7), there was an additional sheathed wall underneath the elevated platform and diagonal bracing from the platform level to the ground; presumably to provide some makeshift lateral bracing. However, the braces were not properly embedded or attached to a foundation and appeared to be inadequate. Additionally, Paul Fujimoto stated that the sheathing and braces had been added since the issue of framing adequacy had been raised by the Board, and showed pictures dated several weeks prior that verified that the bracing had only recently been installed. See Figure 8 for the bracing noted.



*Figure 8 – Bracing and Sheathed Wall*

### Recommendation

Our recommendations for the hot tub supports are based on our observations and upon our recommendations for the structural framing of the decking (see MH's letter regarding decking condition assessment). It is our opinion that the original hot tub support framing is at the end of its useful service life and that all the hot tub supports should be replaced right away as part of the complete deck replacement recommendations in our letter regarding the condition of the decks. In our opinion, it is impractical to repair, or retrofit, the inadequate hot tub support framing independent of replacing the deck framing for both the recessed and "on top" hot tub conditions, given the many structural concerns with the original design, the condition of the deck framing and hot tub support framing, and the recently installed inadequate hot tub support repairs. We recommend that the new deck and hot tub support framing be designed by a structural engineer, licensed in the State of Oregon, and that the design include an analysis of code required wind and seismic loading, and that the design include the necessary detailing for an adequate lateral load resisting system, such as diagonal bracing or shear panels. This recommendation applies to all the hot tub supports at the property, regardless of location (river side versus golf course side).

are advising against replacing the hot tub supports for tubs recessed into the deck independent of replacing the deck framing

We hope our recommendations address your concerns about the structural adequacy of the decks, as well as outline what should be done to address our concerns. Since the hot tubs are heavy and the support framing appeared to be inadequate, we recommend this issue be treated with some urgency. Thank you for the opportunity to work with you on this project and please reach out with any questions and we will be happy to assist you.

Sincerely,  
Morrison Hershfield Corporation



RJ Nueske, P.E.  
Structural Project Engineer

Reviewed by:



Shawn Stevenson, P.E., S.E.  
Principal, Senior Structural Engineer

