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October 16, 2017

Little Whale Cove HOA
c/o Mr. Dave Maguire
PO Box 49
Depoe Bay, Oregon 97341

Subject: **Recreation Center Condition Assessment Report**
Singing Tree, Depoe Bay, Oregon
MCE Project Number: 171142

Dear Mr. Maguire:

As you have requested, Kevin M McCormick, P.E., S.E. of Miller Consulting Engineers, Inc. (MCE) met with you and some of the members of the HOA board at the above-noted building to perform a structural site observation on September 12, 2017. The purpose of this site observation was to identify structural deficiencies present. The scope of this report includes visual observations of the interior and exterior of the structure.

This is a condition assessment report and is limited to visual observations only; no other means of testing or evaluation was performed to reach the conclusions in this letter. The professional opinions expressed in this report are based solely on the observed conditions at the time of the site observation and information supplied. Evaluation of waterproofing, flashing, and related moisture protection is beyond the scope of this report.

BACKGROUND

Based on a review of a drawing, it appears that the enclosed tennis building, new entry, and stairs to the second and observation floors were added circa 1977. As per our discussions, the HOA board is interested in upgrading and/or expanding the Recreation Center. One of the main concerns is the possible performance of the structure in the event of a moderate earthquake. For the purposes of this report, it will be assumed that the enclosed tennis courts are on the east side of the clubhouse and the existing pool is located on the west side.

OBSERVATIONS

Enclosed Tennis Courts:

The enclosed tennis courts were constructed with the use of a pre-engineered metal building which is designed to clearspan long distances and eliminate the need for interior columns. Typically these buildings are covered with metal roofing and corrugated metal side wall panels. These buildings are generally lightweight and move significantly in a wind or seismic event. However, this structure is unique. The roof and side walls are formed out of wood and covered with plywood. This makes the building more rigid and able to sustain loading without moving very much.

A quick review was performed using the old building codes under which this structure should have been designed. It was found that the old wind load forces were still higher than the current code seismic forces by about a factor of two. This means that the tennis court building should still have capacity to resist earthquake forces. Based on this review, it still appears that this is a good anchor structure for the recreation center complex.

This building does have a deficiency in that the west gable end wall that attaches to the existing east clubhouse wall does not have the plywood sheathing or framing on it. It appears that they depended on the existing building to help support this end.

Existing Pool Building:

The existing pool building is a single story wood framed structure that covers about 1260 square feet over the pool. The walls are about 12 feet tall and are sheathed with plywood. The interior walls are covered with diagonal wood boards or wood paneling. The east and west walls have a large percentage of openings. However this is a relatively small structure and with some minor modifications should be able to perform adequately during a seismic event. Based on the old code (which would have been used to design this structure) the design wind loads are still about one and one-half times greater than the new design seismic forces. The windows and opening do cause some deficiencies in the structure.

Front Entry

The front entry is one of the additions that was constructed circa 1977. It ties the existing clubhouse to the pool area. It is wood framed, has a three-story stair tower that leads to the exercise room on the second floor, and the old viewing platform area on the third floor at the top of the stairs. The stairs are steep and do not appear to conform to the current building code. There was an exception under the old building code that allowed private stairs to be constructed with an 8" rise and a 9" tread. This may have been the exception that they used, since the drawings do not show an access to the second floor exercise room, but have it labeled as an attic.

The front entry area has a lot of windows and very little wall area, making this area vulnerable to earthquake damage. The roofs over this area are all at different levels and are most likely not well tied together. This portion of the structure relies on the pool and clubhouse for lateral stability.

Clubhouse

As discussed, the clubhouse was originally part of an existing structure. When the clubhouse was built, they tried to integrate it in with the existing structure. Based on the sagging of the second floor near the bearing wall line on the south, it appears that the old roof structure support may have been modified to create the second floor space. While the floor is sagging at the wall line, it does not appear to be recent movement.

This building also as a lot of windows and doors and there is not a lot of wood framed wall remaining on the west and south sides, which makes this corner of the building susceptible to earthquake damage. It is unclear how the loads from the roof or second floor will transfer down to the foundation using the interior walls.

ADDITIONAL DISCUSSION ITEMS

During our meeting we talked about a variety of options and possible revisions that could be done to improve the structural performance as well as the usability of the recreation center. We will try to briefly cover those topics and possible ramifications or impact on the structure. Some of these items are beyond our field of structural expertise. They fall under the expertise of an Architect. We will review the sections of the current building code to the best of our ability to provide the answers. In general, the vertical or gravity framing for the structure appears to be adequate. Most of the connections are bearing. All of the post to beam connections observed had a positive connection between the post and the beam.

The addition of an elevator to second floor will help increase the usability of the fitness center. However, the jurisdiction may require a structural review of all of the framing members for this new load. The plan page from 1977 calls this space an attic. This only would have required a design load of about 20 lbs. per square foot (psf). The fitness room will now require a design load of 100 psf. It might be possible to limit this load, but it will take a discussion with the building department. It most likely will require limiting the occupant load to less than 50 people and providing another exit way. If the fitness room was moved down to the main floor due to expansion, there would be no need to change the stairs or put in an elevator.

The moving of the mechanical and electrical equipment room up to the second floor is possible. There is not a lot of load with this equipment and could be accommodated with the existing framing. This should not require the modification of the stairs, since this would not be a public space. The removal of the existing mechanical room walls may require the installation of support beams and posts since it does appear that these walls are helping support the attic space above.

The removal of the tower would help make the roof lines of the building more consistent, but would require construction of a new roof and wall framing. The removal of this element does not significantly improve the seismic capability of the building.

Expansion to the north and/or south of the existing clubhouse would help strengthen the building and would better tie the existing structure into the covered tennis courts. Based on the slope of the roof, the roof pitch would most likely need to be changed in order to provide for an eight foot plate height at the new exterior wall.

CONCLUSIONS/RECOMMENDATIONS

After reviewing the structure, it was found to be in better condition than expected. The tennis court structure is significantly stronger and can be used as an anchor structure for future expansion or remodel. The seismic improvements to the whole recreation center will be dependent on what type or size of expansion/remodel is selected. If no expansion is selected, then it might be beneficial to provide a better tie between the clubhouse and

the tennis court structure. This would help keep them from pulling apart during a seismic event. Installing additional framing and sheathing at the west gable end of the tennis structure (where it meets the existing clubhouse) and then sheathing the inside of the wall would help provide increased capacity for this structure in the event of a failure of the clubhouse.

The pool house could have a window removed from the southwest corner and then the wall could be strapped together to provide for better performance and stiffness. The windows on the east side could be strapped together and then the interior of the structure could be sheathed with new plywood sheathing and then the finishes could be reinstalled.

The existing clubhouse could be seismically improved by strapping around the windows and adding some new plywood sheathing to the interior side of the existing structure. The interior walls could be better tied into the second floor and roof to provide for a better load path from the roof down to the concrete slab foundation.

There are a lot of good options available for the board for improving the usability and seismic performance of this entire structure. We anticipate that this report will generate some more specific questions about possibilities for design changes and we are willing to discuss those questions with you and hopefully provide answers which will help you decide what options work the best for your needs.

If you have any questions or concerns in this matter, please feel free to contact me.

Respectfully,

Miller Consulting Engineers, Inc.

Kevin M. McCormick, P.E., S.E.
Managing Principal