

Date:	September 3, 2019
To:	Mr. Andy Andrews, President Leilani Community Association (808) 965-6125 (h) (808) 796-1880 (d) andy@cruzio.com

EP JN:	18000-19-43
Re:	<b>Structural Assessment Report</b> Leilani Community Association Metal Building Pavilioin 13-3441 Moku St, Pāhoa, HI 96778
TMK:	(3) 1-3-036: 048

On August 15, 2019 Engineering Partners (EPI) performed a site investigation at 13-3441 Moku Street located in Leilani Estates, Puna, Hawaii. The purpose of the investigation is to evaluate the structural condition of the pre-engineered metal building pavilion structure on site. The following is a summary of the results of the assessment.



The subject building is a 7,500 square foot, single story, pre-engineered metal building originally permitted and built in 1989. Record structural plans were not made available for our review. The span of the rigid frames is 100 feet wide and there are four total frames spaced 25 feet apart. The foundation system consists of spread footings which measure approximately four feet square and a slab on grade over top. There are partial sidewalls near the top of the structure but otherwise it is considered an open structure. The wall and roof framing are light gauge metal purlins which support the metal roofing and siding. There is cable cross bracing in the roof and side walls.



Overall the pavilion is in fair structural condition. Although the structure was originally built on this site in 1989, it was relocated from a previous site. Pre-engineered metal buildings typically perform well during seismic events. They are typically light-weight flexible buildings so large forces are not developed during seismic events. Due to the open nature of the structure, lateral loads from hurricanes or other wind events are also minimized. There do not appear to be any damages due to seismic or wind events, but corrosion due to rain exposure is a concern that should be addressed to ensure continued occupancy of the structure.

There appear to be welded patch plates in the frames and the column steel exhibits pitting and corrosion, especially near the base plates. Some of the corrosion and pitting appears to be below the finish paint, so it was most likely in that condition when the building was relocated. Some of the anchor bolts exhibit advanced corrosion and material loss, but overall each base plate has no less than three effective anchor bolts. The cable cross bracing in the sidewalls is someone loose, most likely due to the corrosion in the column near the attachment. The corrosion is worst in the bottom three feet of the column webs.



There does not appear to be any significant settlement of the foundation system and the slab-on-grade floor exhibits minimal cracking.

Although record plans were not made available, it seems that the rafter-to-column connection was modified when the building was relocated. There is a gusset on the inside of the column that appears to be field welded to the column and rafter. It seems likely that the columns were set about one foot wider than the original construction, but this cannot be confirmed. That said, it appears that the welds

and connections are in good condition, and the overall dimensions of the connection appear to be consistent with engineered rigid frames of this size.



While the structure is in fair condition, we recommend the following repairs be performed in the time allotted as a means of addressing the minor deficiencies in the structure, and to ensure continued occupancy of the structure.

- 1) Tighten cable cross bracing, reinforce web near attachment with welded plate. (twelve months, estimated cost \$2,500)
- 2) Treat and replace corroded anchor bolts. Anticipate replacing or adding one anchor bolt per each of the eight columns. (twelve months, estimated cost \$20,000)
- 3) Grind corroded areas in bottom three feet of each column and weld patch plates to restore original section properties. (three to five years, estimated cost \$10,000)
- 4) Clean and blast paint from columns and rafters, then apply corrosion resistant paint system to the structural steel. (three to five years, estimated cost \$100,000)
- 5) While it is not required, it may be prudent to paint the roof purlins and wall girts while the rest of the structure is painted. The purlins and girts can be evaluated for corrosion closer to the time of the work. (three to five years, estimated cost \$100,000)

This report is presented as a Limited Condition Survey. Problem areas that were not observed during the survey may, in fact, exist due to many factors. Evaluation of the existing structure requires that certain assumptions be made regarding existing conditions. Some of these assumptions cannot be verified without destroying otherwise adequate or serviceable portions of the building. Therefore, the

scope of this report shall be limited to its contents with respect to the review of the exposed framing. No other inspections of the other structural members in the structure were checked or inspected. This report does not warranty any of the other structural systems of strength of any members due to seismic or wind loads. Please contact us if you have any questions.

Regards,  
Engineering Partners, Inc.



Yen Wen Fang, P.E.  
Principal

September 3, 2019

Date