

Unit L4: The deck for this unit appears to have been remodeled at some point in time. This unit deck is connected to unit L3 and is separated in the middle by a framed partition wall. The section of deck located to the north of the cantilevered floor above appears to have been added on at some point in time. This section of deck is framed with 2x8 deck joists spaced at 16" on center with 2x6 decking. The remainder of the deck is framed with 2x8 deck joists spaced at 20" on center with 2x6 decking. The joists bear on mechanical steel hangers on the east end and cantilever approximately 1'-2" on the west except for the southerly three joists, which are (2)-2x8's at 20" o.c. and they cantilever approximately 4'-0". These southerly cantilevered joists support the top of the stair stringers and the landing. (Refer to layout) The east end hangers are nailed to either a 2x8 ledger that is perpendicular with the deck joists or to a (2)-2x8 beam that is on an approximate 45 degree angle to the deck joists. The ledgers appear to be nailed to the side of the building. The cantilevered ends of the joists bear on two separate dropped 3 1/8 x 12 glulam beams. Some of the nails appear to be weathered and show signs of rust. Some of the deck joists are cracking and appear to be taking on a blackish/gray weathered look. The glulam beam to the south also supports some of the deck for unit L3. The glulam beam to the north only supports the deck for unit L4. The glulam beam to the south spans continuously over three separate 6x6 posts as described in unit L3. The glulam beam to the north spans continuously over two separate 6x6 posts that are spaced out 12'-4" and cantilever to the north approximately 2'-3". The top of the posts appear to have a notch at the top where the glulam beam bears. There appears to be one lag connecting the two members together on the southerly post and two lags connecting the two members together on the northerly post. The post to the north appears to have a vertical crack along the length of the post. The posts bear on concrete circular piers and do not appear to have a mechanical steel base plate. (See Image K, L, and M) This unit has a set of stairs that lead to the grade below. The stairs appear to be framed with three separate stair stringers with 2x6 decking for treads. The two stringers on the outsides of the stairs appear to be (2)-2x12 stringers with a 2x6 nailed to the inside face, and one located in the middle appears to be (1)-2x12 with a 2x6 nailed to one side. The stair stringers are supported on the cantilevered deck joist at the top and there does not appear to be any mechanical steel hangers and only nailing from the back side of the deck joist into the end grain of the stringer. (See Image N) The stair landing at the top is approximately 4'-0" x 5'-0" in size and appears to be sagging to the west. (See Image O) All of the stringers appear to bear on a cast in place concrete slab landing at the bottom. At the bottom of the two outside stair stringers, there were 6x6 newel posts that are bolted or lagged to them. These newel posts appear to be the support for the open steel railing of each side of the stairs. The stairs also move significantly upon putting any force on them.



(Image K)



(Image L)

Meadow Creek Condominiums (Building L), Vail, CO

#0307-19 L



(Image M)



(Image N)



(Image O)

Unit L5 & L6: These decks appear to be of the original design. The decks are connected to each other and are separated in the middle by a framed partition wall. The decks are framed with 2x8 deck joists spaced at 20" on center with 2x6 decking. Most of the joists bear on mechanical steel hangers or are toe-nailed on the east end and cantilever approximately 1'-2" on the west. The east end hangers are nailed to either a 2x8 ledger that is perpendicular with the deck joists or toe-nailed to a 2x8 ledger that is on an approximate 45 degree angle to the deck joists. The ledgers appear to be nailed to the side of the building. The cantilevered ends of the joists bear on a dropped 3 1/8 x 12 glulam beam. Some of the nails appear to be weathered and show signs of rust. Some of the deck joists are cracking and appear to be rotting on the top in areas and they also appear to be taking on a blackish/gray weathered look. The 3 1/8 x 12 glulam beam spans continuously over two separate 6x6 posts that are spaced apart approximately 10'-4" and cantilevers to the north and south approximately 2'-6". The top of the posts appear to have a notch at the top where the glulam beam bears. There does not appear to be a mechanical steel cap or any type of bolts connecting the two members together. The posts bear on concrete circular piers and do not appear to have a mechanical steel base plate. (See Image P, Q, and R)



(Image P)



(Image Q)



(Image R)

CONCLUSIONS:

At this time, I do not believe that the exterior decks on the west side of Building L will fail structurally but they should be attended to with some remedial work. Besides the deck being weathered and some signs of rot in areas, I do not believe they will fail in the near future. Although I do not believe the decks will fail, I do feel that the existing decks are not constructed to today's building codes. I feel that the 2x8 deck joists at 20" on center spacing and some of the supporting beams are not adequate to support the current Town of Vail design load criteria. I feel that the cracked deck joists that show signs of rot on the top are losing their structural integrity to support their imposed loads. I feel that the nails that are showing signs of rust may eventually become too corroded to support their imposed loads.

The stairs for unit L2 appear to be unsafe and should not be used and should be removed and replaced. The stairs and stair railings L4 do show signs of structural instability and should be attended to as soon as possible. I feel that the cantilevered (2)-2x8 deck joist that is supporting the top of the stair stringers is not structurally adequate and should have some remedial work completed on it per our recommendations.

Other concerns that I feel will shorten the workability of the decks is the supporting posts and all other non-treated wood members should bear on a concrete

pier that is a minimum of 8" above the grade and a minimum 48" below grade. These wood members should also have the correct steel mechanical connections. All 2x8 ledgers should be connected to a solid rim-board with a fastener that can withstand withdraw loading and not just nailing.

RECOMMENDATIONS:

I do recommend the following items have immediate remedial work completed on them:

1. Provide Simpson ABU66Z base plates to all 6x6 posts.
2. Add (3)-4" x 3/16" diameter Timber-Lok screws at 16" on center to all existing 2x8 ledgers that are attached to the building rim-board.
3. Replace all deck joists that are showing sign of rot along the top with new ones.
4. Add (2)-1/2" diameter through bolts to the glulam and the top of the 6x6 posts spaced six inches apart from the center of the beam.
5. For unit L2, these stairs should be removed and replaced with new stairs that can be designed by our office if requested.
6. For unit L4, add a new 6x6 post under the west cantilevered end of the existing (2)-2x8's and provide a new concrete pier and footing to support it. All of the joists that support the landing should be doubled up. The landing should not be larger than a 4'-0" cantilever. Lastly, replace any of the 2x8 deck joists that show signs of rot.
7. For unit L4, replace the 6x6 post that has the vertical crack in it and provide a base plate and bolts as described above.
8. For unit L4, provide a Simpson LSC to the middle stair stringer at the top and provide (2)-Simpson LSC to each side of the outside stringers. Provide one more 2x12 stringer to each outside stringer for a total of (3)-2x12 stringers. Verify that existing stairs meet current building code requirements.
9. For unit L1, L2, L3 and L4, I feel that the 3 1/8 x 12 glulam beams are undersized and should be replaced with 5 1/8 x 12 glulam beams.

The following items are recommended to help prolong the workability of the existing exterior decks:

1. Install Simpson LS70 or Simpson LUS26 hangers on all deck joists that are missing them.
2. Replace all dropped beams that are undersized to meet current building code load criteria. This can be determined by our office on unit to unit basis.
4. Add one more 2x8 deck joist to the existing 2x8 deck joists to meet current building code load criteria or replace all deck joists with 2x10's spaced at 16" on center.
5. Maintain decks by regularly monitoring them, clearing them of snow and ice, and by resealing them with the proper stain/sealer and or paint.

If you would like to discuss this report, or if we can be of further service to you, please do not hesitate to contact us.

Sincerely,
Structural Design Solutions, Inc.



Jeffrey P. Leonardo, P.E.
President

