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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 5 1/8 x 12 glulam beam as described above in unit J1 and also supports some of the deck for that unit. 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. (See Image L) The 6x8 post to the north supports two separate glulam beams that is described in unit J1 and appears to have a custom steel T-shaped cap located on the outside and does not appear to have a base plate connection where it bears on a circular pier. (See Image G)

(Image K)

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(Image L)

Unit J3: The deck for this unit appears to have been remodeled at some point in time. This unit deck is connected to unit J4 and is separated in the middle by a framed partition wall. This deck also has a hot tub on it that is approximately 5'-6" x 6'-6" in size and appeared to have a slow leak which created a small puddle on the ground. (See layout for location) The section of deck located to the north of the cantilevered floor above appears to have been added on at some point in time. It is framed with 2x8 deck joists spaced at 16" on center with 2x6 decking. Some of the paint that was applied to the underside of this decking and joists has peeled away. The joists bear on mechanical steel hangers on the west end and cantilever approximately 12" on the east except for the northerly three joists, which cantilever approximately 5'-0". These northerly cantilevered joists support the top of the stair stringers and the landing. The west end hangers are nailed to either a 2x8 ledger that is perpendicular with the deck joists or to a 2x8 ledger that is on an approximate 45 degree angle to the deck joists. The ledger perpendicular to the joists appears to be lagged or bolted to the side of the building. The ledger that is on the 45 degree angle appears to be nailed to the side of the building. The cantilevered ends of the joists bear on a dropped 5 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 5 1/8 x 12 glulam beam spans continuously over two separate 6x8 posts that are spaced apart approximately 11'-0" and cantilevers to the north approximately 2'-3". The 6x8 posts appear to have a custom steel T-shaped cap located on the

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outside and do not appear to have a base plate connection where it bears on a circular pier. (See Image M) This unit has a set of stairs that lead down 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, and one located in the middle appears to be (1)-2x12. The stair stringers appear to have no visible connection to the (2)-2x8 cantilevered deck joist at the top. The (2)-2x8 cantilevered deck joist appear to have some rot at the top where they bear on the glulam beam. The stair landing at the top is approximately 3'-0" x 5'-0" in size and appears to be sagging to the east. (See Image N) 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. (See Image O) The remainder of the deck appears to be framed with 2x8 or (2)-2x8 deck joists spaced at 20" on center with 2x6 decking. The (2)-2x8 deck joists appear to be located below the hot tub. The paint that was applied to the underside of this decking and joists has mostly peeled away. Most of the joists bear on mechanical steel hangers or are toe-nailed on the west end and cantilever approximately 12" on the east. The west 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 ledger perpendicular to the joists appears to be lagged or bolted to the side of the building. The ledger that is on the 45 degree angle appears to be nailed to the side of the building. The cantilevered ends of the joists bear on a dropped 5 1/8 x 12 glulam beam that supports some of the deck for unit J4. 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. (See Image P) The 5 1/8 x 12 glulam beam spans continuously over two separate 6x8 posts that are spaced apart approximately 14'-4". Where the glulam beam bears on the 6x8 post to the north, it also supports the 5 1/8 x 12 glulam beam described above and appears to have a custom steel T-shaped cap. The 6x8 post to the south also supports a 6x12 timber beam that supports the remainder of the deck for unit J4. The 6x8 posts bear on concrete circular piers and do not appear to have a mechanical steel base plate. (See Image Q)

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(Image M)

(Image N)

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(Image O)

(Image P)

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(Image Q)

Unit J4: A section of this deck appears to have been remodeled at some point in time. The deck is connected to unit J3 and is separated in the middle by a framed partition wall. The section of this deck located to the south of the cantilevered floor above appears newer then the remainder of the deck. The newer section of deck is framed with 2x8 deck joists spaced at 16" on center with 2x6 decking. The joists bear on mechanical steel hangers on the west end and cantilever approximately 12" on the east. The west end hangers are nailed to either a 2x8 ledger that is perpendicular with the deck joists or 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. (See Image R) The cantilevered ends of the joists bear on a dropped 6x12 timber beam. The timber beam spans continuously over two separate 6x8 posts that are spaced apart approximately 10'-4" and cantilevers to the south approximately 2'-6". The 6x8 post to the south appears to not have a cap plate on it nor does it appear to have a base plate connection where it bears on a circular pier. The remainder of the deck appears to be framed with 2x8 deck joists spaced at 20" on center with 2x6 decking. The paint that was applied to the underside of this decking and joists has mostly peeled away. The joists bear on mechanical steel hangers on the west end and cantilever approximately 12" on the east. The west end hangers are nailed to either a 2x8 ledger that is perpendicular with the deck joists or are on an approximate 45 degree angle to the deck joists. The ledgers appear to be nailed to the side of the

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building. The cantilevered ends of the joists bear on a dropped 5 1/8 x 12 glulam beam as described above in unit J3 and also supports some of the deck for that unit. 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. (See Image S) The 6x8 post to the north supports the glulam beam described above for unit J3 and the 6x12 timber beam. It appears to have a metal strap and a piece of plywood on the inside and outside where the beams bear on it. The post does not appear to have a base plate connection where it bears on a circular pier. (See Image T)

(Image R)

(Image S)

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(Image T)

CONCLUSIONS:

At this time, I do not believe that the exterior decks on the east side of Building J 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 or the (2)-2x8 at 16" on center spacing below the hot tubs 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 and stair railings for unit J3 do show signs of structural instability and should be attended to as soon as possible. Some of the railings are not attached to the 6x6 newel post and may fall off if not attended to. 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

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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 and Simpson PC6Z cap 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. For unit J3, add a new 6x6 post under the east cantilevered end of the existing (2)-2x8's and provide a new concrete pier and footing to support it. All of the joists should be doubled up that support the landing. The landing should not be larger then a 4'-0" cantilever. Lastly replace any of the 2x8 deck joists that show signs of rot.

5. For unit J3, I feel that the (2)-2x8's spaced at 20" o.c. located under the hot tub are undersized and should be replaced with (2)-2x10's at 16" o.c. or (3)-2x8's at 16" o.c.

6. For unit J3, provide a Simpsons 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.

7. For unit J3, the leak should be repaired on the hot tub so that the supporting members are not exposed to constant moisture.

8. For unit J3 and J4, I feel that the 5 1/8 x 12 glulam beam is undersized and should be replaced with a 5 1/8 x 13 ½ or 6 ¾ x 12 glulam beam.

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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 bases.

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