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Observation Report

November 18, 2019

Matt Debus
Vail Management Company

Re: Meadow Creek Condominiums, Vail, CO
(Building M)
Project No. 0307-19 M

On October 16, 2019, at Matt Debus' request, I visited the property referenced above to observe the general condition of the exterior decks along the east side of the condominium building and to provide you with my observations. The opinions expressed in this report are based only on visual observation of the condition of the structure on this date, without disturbing any integrity of the decks or the residence. These opinions do not represent overall property review, structural analysis, or compliance with applicable building code. The original construction documents dated 01-02-1981 for the building were present at the time of my visit.

PURPOSE AND SCOPE:

The purpose of this report is to evaluate the structural integrity of the existing decks along the east side of the condominium for building M, and to provide recommendations of the remedial work that should be done in areas where structural problems and or damage is observed.

BACKGROUND:

The condominium complex is a cluster of buildings that are spread out over the property and appear to have some similarities in a common repetitive layout. According to limited Town of Vail Planning documents, the condominiums appear to be built in the late 1970s or early 1980s. Building M consists of 6 units (M1-M6), built on a moderate sloping lot from the east to the west. Also according to some of the older documents from the town, it appears that the exterior decks for building M have been modified from the plans dated 01-02-1981. The exterior decks for the units in concern are located on the east side of building M. There were no construction documents for the modified decks at the time of my visit.

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OBSERVATIONS:

Building M consists of six units that stagger two units at a time from the northwest towards the southeast approximately 8 feet starting with units M1 and M2. The decks appear to have been remodeled at some point in time. The exterior decks are located on the east side of the building and are approximately 10'-0" above the finished grade. They extend approximately 9'-10" from the building and span the length of the M building. There is a framed partition wall located between the two units that divides the decks in half. The decks are accessed by an exterior door located on the west side of each individual unit and an exterior set of stairs for units M2, M3 and M6. The exterior decks appear to be framed with 2x wood decking on a combination of 2x8 dimensional lumber joists, glulam beams, timber beams and timber posts. (See Image A, B, C, and attached layouts)

(Image A, Unit 1 & 2)

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(Image B, Unit 3 & 4)

(Image C, Unit 5 & 6)

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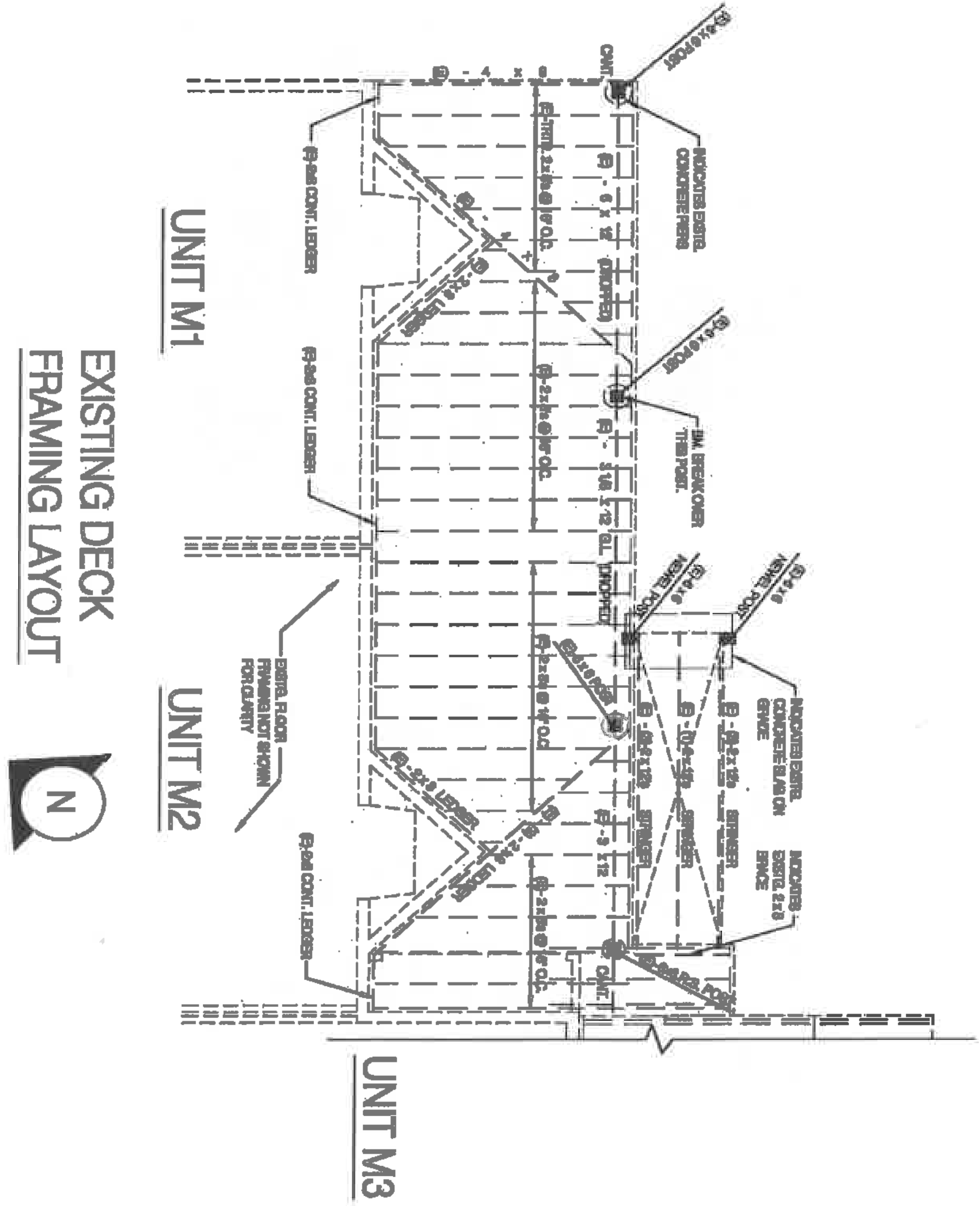

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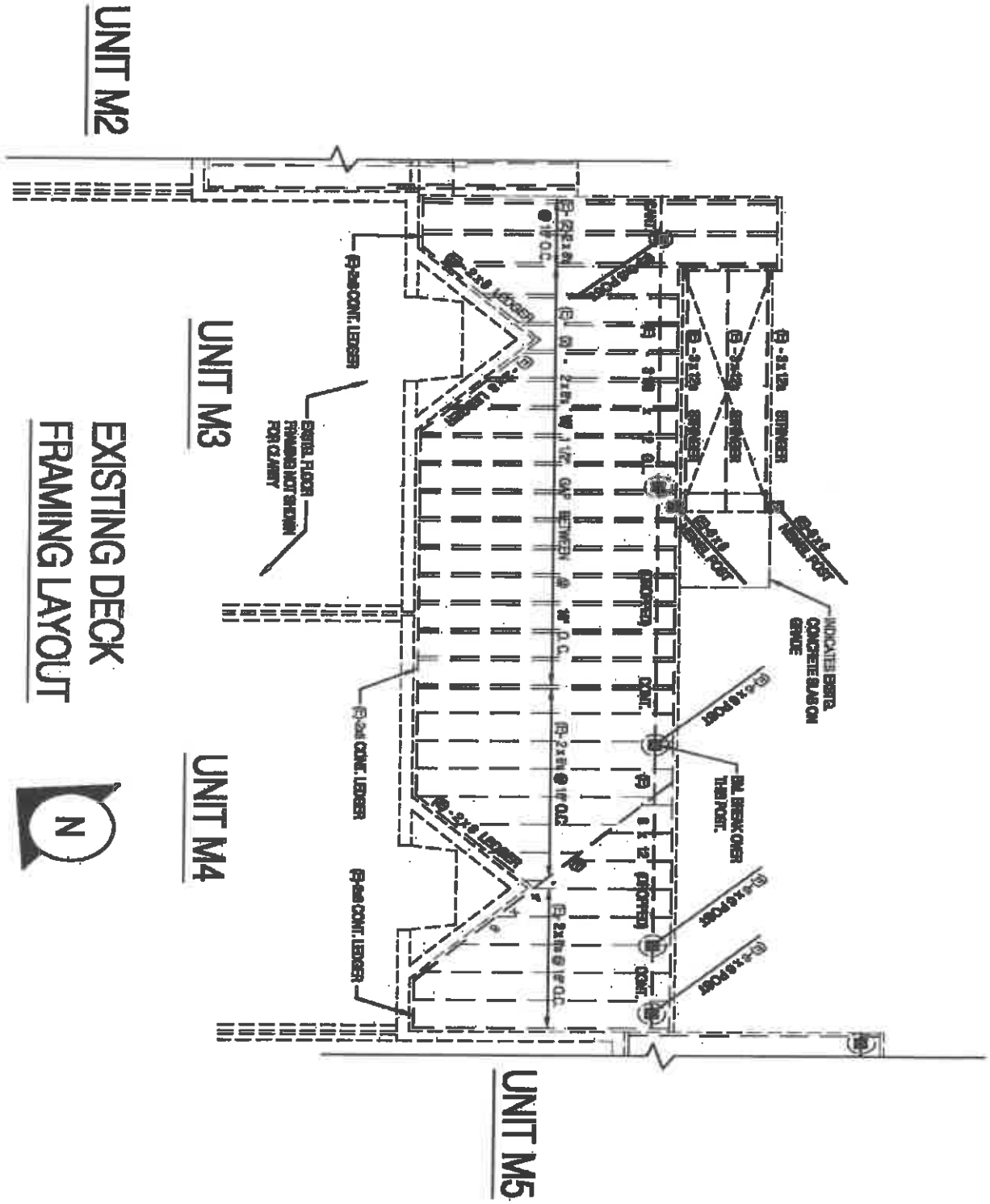

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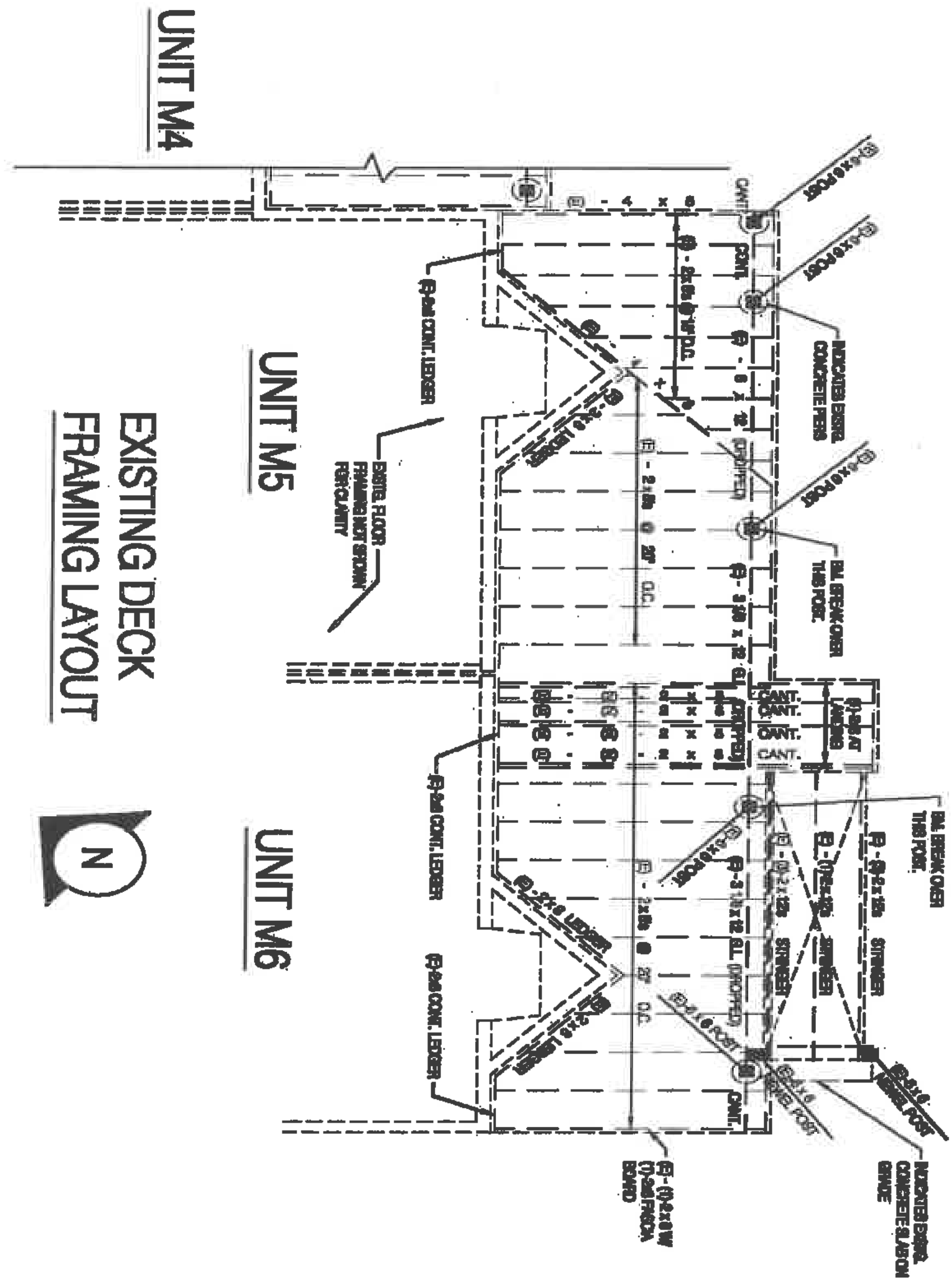

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Unit M1: A section of this deck appears to have been remodeled at some point in time. The deck is connected to unit M2 and is separated in the middle by a framed partition wall. A small section of this deck located to the north of the cantilevered floor above appears newer then the remainder of the deck. The newer section appears to be framed with treated 2x8 deck joists spaced at 16" on center with 2x6 decking. Most of the joists bear on mechanical steel hangers on the west end and cantilever approximately 8" on the east. The west end hangers are nailed to a 2x8 ledger that is perpendicular with the deck joists or a 4x8 that is on an approximate 45 degree angle to the deck joists that appears to be lagged to an older 2x8 rim board. (See attached layout) The cantilevered ends of the joists bear on a dropped 6x12 beam. The 6x12 beam spans continuously over two separate 6x6 posts that are spaced out approximately 13'-0" and cantilevers to the north 6". Starting from the north, located at the top of the first 6x6 post there appears to be a steel mechanical cap on one side where the 6x12 bears. The next 6x6 post located to the south supports the end of the 6x12 and a 3 1/8 x 12 glulam beam. (See Image D) The beams appear to be lapped over the 6x6 post and connected together with two lag bolts. The 6x6 post also appears to have numerous vertical cracks along the length of the post. (See Image E) Both of the 6x6 posts bear on concrete circular piers and only the northerly one appears to have a mechanical steel base plate. The remainder of the deck for unit M1 appears to be 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. Most of the joists bear on mechanical steel hangers or are toe-nailed on the west end and cantilever approximately 8" 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 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 that supports some of the deck for unit M2. 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. One of the deck joists appears to have a couple of 2x6 members nailed to the side along the top and bottom of the joist. (See Image F) The 3 1/8 x 12 glulam beam spans continuously over two separate 6x6 posts that are spaced apart approximately 14'-1". The paint that was applied to the glulam beam has become weathered and is peeling away in areas. The glulam beam bears on the 6x6 post to the south that is described in unit M2.

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(Image D)

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(Image E)

(Image F)

Unit M2: The deck for this unit appears to have been remodeled at some point in time. This unit deck is connected to unit M1 and is separated in the middle by a framed partition wall. The deck appears to be 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. Most of the joists bear on mechanical steel hangers or are toe-nailed on the west end and cantilever approximately 8" 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 (3)-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 dropped 3 1/8 x 12 glulam beam as described in unit M1 or a 3x12 dropped beam. Some of the deck joists are cracking in areas and they appear to be taking on a blackish/gray weathered look. The 3x12 beam to the south spans continuously over two 6x6 posts that are spaced apart approximately 9'-7" and cantilevers to the south 3'-0". The 6x6 post that supports the north end of the 3x12 beam also supports the south end of the 3 1/8 x 12 glulam beam described in unit M1. The top of this post appears to be notched where the two beams butt up against each other and it appears that there are two lag bolts that penetrate both of the beams. (See Image G) The 6x6 post that support the south of the 3x12 beam also has a notch at the top and appears to have two ¼" diameter through bolts that connect the members together. (See Image H) This post appears to have numerous vertical crack along the length of it.

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(Image G)

(Image H)

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The 6x6 posts bear on concrete circular piers and only the southerly one appear to have a mechanical steel base plate. (See Image I) This unit has a set of stairs that lead down to the grade below. They appear to be framed with three separated stair stringers. The two stringers on the outsides of the stairs appear to be (3)-2x12 stringers, and one located in the middle appears to be (1)-2x12, with 2x decking treads. None of the stringers appear to be attached to the cantilevered deck joist at the landing with a mechanical hanger. There also appears to be a 2x8 angled brace that is attached with a series of random nails to the southerly 6x6 post mentioned above and is sandwiched at the top between some of the cantilevered deck joist for the landing above. (See Image J & K) The stringers all appear to bear on a treated 2x plate at the bottom that does not appear to be anchored to a concrete slab on grade landing. 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 on each side of the stairs. The stair landing at the top is approximately 3'-0" x 4'-6" in size. The landing appears to be framed from 2x8's that have been nailed on to the cantilevered ends of the 2x8 deck joists mentioned above. The south end of this landing appears to be connected to the deck of unit M3. The stairs also move significantly when putting force on them. (See Image H & L)

(Image I)

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(Image J)

(Image K)

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(Image L)

Unit M3: The deck for this unit appears to have been remodeled at some point in time. This unit deck is connected to unit M4 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. The deck appears to be framed with (2)-2x8 deck joists spaced at 16" on center with 2x6 decking. Most of the joists bear on mechanical steel hangers or are toe-nailed on the west end and some cantilever approximately 4'-6" on the east end, where the landing for the stairs are located. The landing is approximately 4'-6" x 3'-6" in size and appears to be sagging to the east. The remainder of the joist in this location cantilever approximately 10" to the east. The remainder of the deck to the south of the cantilevered floor is built up (2)-2x8's with a 1 ½" gab between them spaced at 16" on center. (See Image M) Some of the original deck joists are cracking and appear to be taking on a blackish/gray weathered look. Most of these joists bear on mechanical steel hangers or are toe-nailed on the west end and cantilever approximately 10" to 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 ledgers appear to be

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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 original deck joists are cracking and appear to be taking on a blackish/gray weathered look. The 3 1/8 x 12 glulam beam spans continuously over three separate 6x6 posts that are spaced apart approximately 12'-4", 11'-10" and cantilevers to the north 3'-6". This beam also supports some of the deck for unit M4. The paint that was applied to the glulam beam has become weathered and is peeling away in areas. The bottom section of the cantilevered end of the glulam also appears to be showing signs of rot. The top of the 6x6 posts appear to have a notch at the top where the glulam beam bears. There appear to be two lag bolts connecting the two members together. (See Image N) The posts bear on concrete circular piers and do not appear to have a mechanical steel base plate. The most northerly concrete pier appears to flush with the finished grade. (See Image I) This unit also has a set of stairs that lead down to the grade below. The stairs appear to be framed with three separate stair stringers. The stringers appear to be 3x12's with 2x decking treads. The stringers appear to be attached to the timber with lag bolts into the end grain of the stringers. I was unable to determine how this timber was attached to the cantilevered deck joist at the landing mentioned above. (See Image O) The stringers all appear to bear on a concrete slab on grade 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 on each side of the stairs. The stairs also move significantly when putting force on them. (See Image P & Q)

(Image M)

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(Image N)

(Image O)

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(Image P)

(Image Q)

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Unit M4: A section of this deck appears to have been remodeled at some point in time. The deck is connected to unit M3 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 10" on the east. The west end hangers are nailed to either a 2x8 ledger that is perpendicular with the deck joists or to a 4x8 ledger that is on an approximate 45 degree angle to the deck joists. The ledgers appear to be lagged or bolted to the side of the building. (See Image R) The cantilevered ends of the joists bear on a dropped 6x12 beam that spans continuously over three separate 6x6 posts that are spaced apart approximately 9'-7", 3'-3" and cantilevers to the south approximately 10". At the top of the 6x6 posts to the south, there appears to be a steel mechanical cap on one side where the 6x12 bears. The remainder of the deck appears to be the original framing that had some remedial work done to it. The deck is framed with 2x8 deck joists spaced at 16" on center with 2x6 decking. Some of the joists have an additional 2x8 screwed to it with a 1 ½" gab between them as described on unit M3.The paint that was applied to the original deck joists and underside of this decking has peeled away in areas. Most of the joists bear on mechanical steel hangers or are toe-nailed on the west end and cantilever approximately 10" 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 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 as described above in unit M3. 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 6x6 post to the north supports both the glulam beam and the 6x12 beam. The beams appear to be lapped over the 6x6 post and connected together with two lag bolts. (See Image T)

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(Image R)

(Image S)

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(Image T)

Unit M5: A section of this deck appears to have been remodeled at some point in time. The deck is connected to unit M6 and is separated in the middle by a framed partition wall. A small section of this deck located to the north of the cantilevered floor above appears newer then the remainder of the deck. The newer section appears to be framed with 2x8 deck joists spaced at 16" on center with 2x6 decking. Most of the joists bear on mechanical steel hangers on the west end and cantilever approximately 10" on the east. The west end hangers are nailed to a 2x8 ledger that is perpendicular with the deck joists or a 4x8 that is on an approximate 45 degree angle to the deck joists that appears to be lagged to the side of the cantilever building from above. The cantilevered ends of the joists bear on dropped 6x12 beam. The 6x12 beam spans continuously over three separate 6x6 posts that are spaced out approximately 9'-0", 3'-6" and cantilevers to the north 6". Starting from the north, at the top of the first two 6x6 posts, there appears to be a steel mechanical cap on one side where the 6x12 bears. Both of these 6x6 posts bear on concrete circular piers and do appear to have a mechanical steel base plate. The third 6x6 post located to the south supports the end of the 6x12 and a 3 1/8 x 12 glulam beam. The beams appear to be lapped over the 6x6 post and connected together with two lag bolts. (See Image U) This 6x6 post bears on a concrete circular pier and does not appear to have a mechanical steel base plate. The remainder of the deck for unit M5 appears to be framed with 2x8 deck joists spaced at 20" on center with 2x6 decking. Some of the paint that was applied to the underside of this decking and joists has peeled away. Most of the joists bear on mechanical steel

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hangers or are toe-nailed on the west end and cantilever approximately 10" 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 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 that supports some of the deck for unit M6. 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 V) The 3 1/8 x 12 glulam beam spans continuously over two separate 6x6 posts that are spaced apart approximately 12'-1". The 6x6 post located to the south supports the end of the 3 1/8 x 12 glulam beam described above and a 3 1/8 x 12 glulam beam that support the deck for M6. The glulam beams appear to lab on top of each other where they bear on the 6x6 post to the south and are connected together with two lag bolts. (See Image W)

(Image U)

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(Image V)

(Image W)

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Unit M6: The deck for this unit appears to have been remodeled at some point in time. This unit's deck is connected to unit M5 and is separated in the middle by a framed partition wall. The section of deck located to the south of the cantilevered floor above appears to have been added on at some point in time. The entire deck appears to be framed with 2x8 deck joists spaced at 20" on center with 2x6 decking. The paint that was applied to the deck joists and underside of this decking has peeled away in areas. Most of the joists bear on mechanical steel hangers or are toe nailed on the west end and cantilever approximately 10" on the east except for the northerly four joists, which cantilever approximately 4'-5" to the east where and landing for the stairs are located. 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 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 deck joists are cracking and appear to be taking on a blackish/gray weathered look. (See Image X) The glulam beam to the north spans continuously over two separate 6x6 posts as described in unit M5 and supports some of the deck for M5. The glulam beam to the south spans continuously over two separate 6x6 posts that are spaced out approximately 12'-6" and cantilevers to the south 2'-6". The top of the post to the north appear to have a notch at the top as described in unit M5. The post to the south appears to be notched where the glulam beam bears. There appear to be one lag bolt connecting the two members together. The posts bear on concrete circular piers and do not appear to have a mechanical steel base plate. The top of the concrete pier to the south appears to be flush with the finished grade. (See Image Y) 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. The two stringers on the outsides of the stairs appear to be (3)-2x12 stringers, and one located in the middle appears to be (1)-2x12, with 2x decking treads. The stringers do not appear to be attached to the (2)-2x8 cantilevered deck joist at the landing with a mechanical hanger. The stair landing at the top is approximately 4'-5" x 4'-0" in size and appears to be sagging to the east. The majority of the landing appears to be framed from 2x8's that have been nailed on to the cantilevered ends of the 2x8 deck joists. (See Image Z) The stringers all appear to bear on a treated 2x treated plate at the bottom that does not appear to be anchored to a concrete slab on grade landing. The 2x plate appears to overhang on the west side of the concrete slab on grade landing where one of the stringers bears. 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 on each side of the stairs. The stairs appear to be twisted and also move significantly when putting force on them. (See Image Y)

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(Image X)

(Image Y)

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(Image Z)

CONCLUSIONS:

At this time, I do not believe that the exterior decks on the east side of Building M 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. 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.

The stairs and stair railings of M2, M3 and M6 show signs of structural instability and should be attended to as soon as possible. I feel that the cantilevered deck joists that are supporting the top of the stair stringers are not structurally adequate and should have some remedial work completed on 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.

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RECOMMENDATIONS:

I 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. Where applicable, add (2)-1/2" diameter through bolts to all supporting beams and the top of the notched 6x6 posts spaced six inches apart from the center of the beam. If the 6x6 post is cut below the supporting member a Simpson PC6Z should be installed.

5. For unit M2, M3 and M6, 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 then a 4'-0" cantilever. Lastly, replace any of the 2x8 deck joists that show signs of rot.

6. For unit M2, M3 and M6 provide a Simpson LSC to the middle stair stringer at the top and provide (2)-Simpson LSC to each side of the outside stringers. Verify that existing stairs meet current building code requirements.

7. For unit M2, the 2x plate should be replaced with a treated 2x12 plate that is fully supported on a concrete slab or post. This plate should also be properly anchored to the concrete supporting member.

8. Replace all the 6x6 posts that have a vertical crack and provide a base plate and bolts as described above.

9. For unit M1 and M2, the 3 1/8 x 12 glulam beam is undersized and should be replaced with 5 1/8 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 a unit to unit basis.

4. Add one more 2x8 deck joist to the existing 2x8 deck joists spaced at 20" on center 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