

# Breckenridge Condominium Association Gaithersburg, Maryland



*Prepared for:*

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*By:*

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## Facades and General Grounds Condition Survey

### FINAL Report Phase I and Phase II

## **Background and Overview**

The Breckenridge Condominium community includes a total of fourteen (14) buildings, each between three and four stories tall, located in Gaithersburg, Maryland near the corner of Montgomery Village Avenue and Christopher Avenue. Phase I consists of nine (9) buildings on the North side of Christopher Avenue, constructed in 1989, and Phase II consists of five (5) buildings on the South side of Christopher Avenue, constructed in 2000. There are also a total of six (6) open-air carports and three (3) enclosed garages on the property. Breckenridge Condominium includes 230 garden style condominium units in Phase I, and 68 condominium units in Phase II.

Some of the following issues have been reported to Building Envelope Consultants and Scientists, LLC, (BECS), although this may not be a complete list.

- Leaks have been reported on the interior of various units,
- Exterior wood trim has been observed to be deteriorated,
- Structural steel stairwell framing is corroded,
- Gutters are missing,
- Soil erosion has exposed foundations, and
- Retaining walls were reported to be leaning.

This report provides a visual condition survey of all buildings on the property, with a focus on these reported issues. BECS has identified visible existing deterioration, discussed the potential source(s) of the noted deterioration, provided recommended repair and maintenance strategies to address these conditions, and have included opinions of the costs to make recommended maintenance and repairs.

## **Figures and Photographs**

We have included captioned figures and photographs within the report. Also, there are photographs included in the attached appendices. These figures and photographs help to describe/locate certain observations for the project.

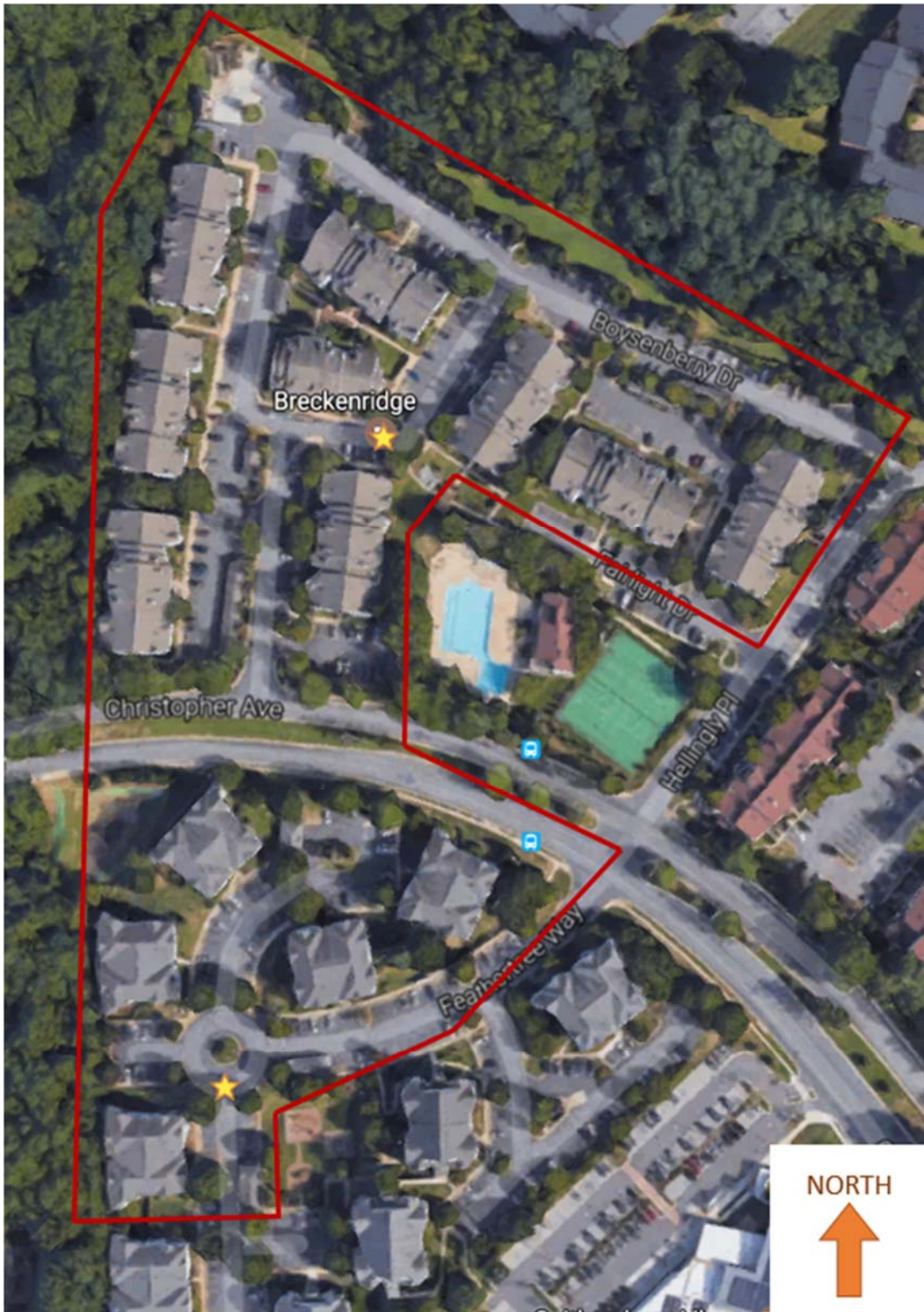


Figure 1 – Breckenridge Condominiums Key Plan and Arial Image (Google Maps).



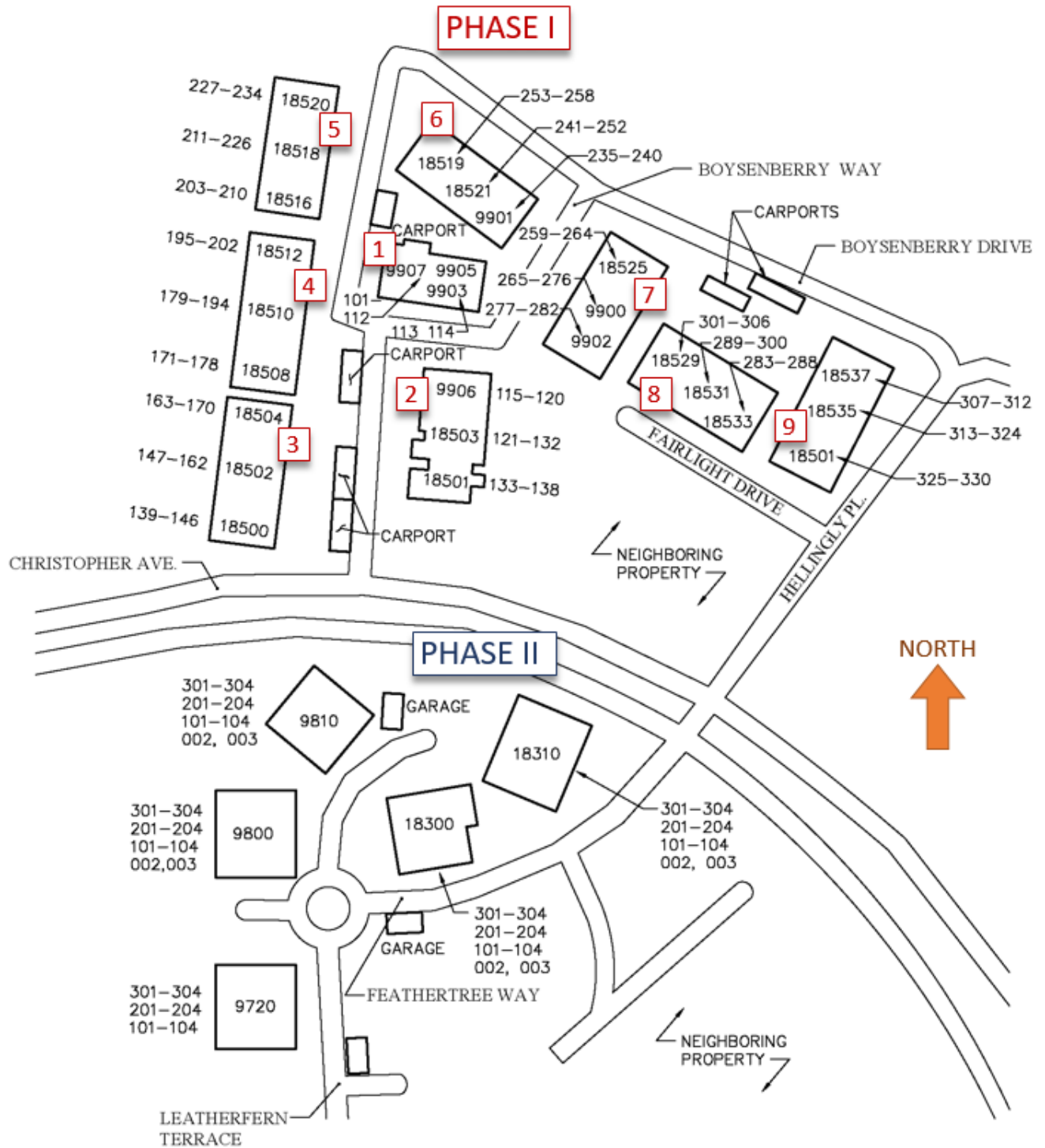


Figure 2 – Phase I Building Groups have been numbered by BECS for reference within this report.

## **Limitations**

Evaluations of existing buildings and their components require that certain assumptions be made regarding existing conditions. Some assumptions cannot be verified without performing intrusive investigations, which can prove costly and may damage existing features of the building. We did not make intrusive observations, take samples, or perform tests. Our evaluations do not consider conditions that may become or cause structural deficiencies, settlement conditions, or other defects if not addressed and are limited to the visually apparent conditions at the time of our site visit. We are not responsible for other portions of the property that are not a part of this investigation or for components unrelated to those reported such as heating, AC, electrical, and plumbing. We did not investigate for the presence or absence of any hazardous substances including but not limited to toxins, carcinogens, mold, noise, and or contaminants in soil, water, and air. We did not perform calculations to determine the adequacy of the structure.

We performed these services in a manner consistent with the level of skill and care ordinarily exercised by professional engineers and consultants practicing in this region under similar conditions. No other representation, warranty or guarantee is given. Our opinions are based on our engineering judgment. We will not be responsible for latent defects that may appear in the future or for differing opinions of others that may arise. The intent of our investigation was not to perform an exhaustive study to locate every existing defect, but rather focuses on the condition of the components being observed. Should additional information become available that we were not aware of, did not see, or which was unknown at the time of our investigation, we reserve the right to revise our report as needed.

This report is to be read in its entirety; thus no portions of this report may be used outside the context of the entire report. This report is not a construction document and is not intended to be used for construction or actual repairs based on this report alone. This report is intended solely for the use of the Client or Owner; any third party use, third party reliance, or third party decisions made on the basis of this report shall be the sole responsibility of such third parties.

## **Observations**

Between December 2016 and February 2017, Nicholas J. Palumbo, P.E. of BECS visited Breckenridge Condominiums to make visual observations of the current conditions. These observations included the following elements of the building:

- Exterior facades, staircases, retaining walls, and other exposed elements of the buildings and property from the ground level.
- Interior of several units, following the review of leak survey responses from residents.
- Underside of the roof decking and structural roof trusses via attic access.
- Roof, roof trim, chimneys, and gutter systems via ladder access.

### **Phase I Buildings**

The nine (9) residential buildings in Phase I were constructed circa 1989. These buildings have between three and four stories above grade, with open-air stairwells exposed to the exterior. Each building appears to be constructed with wood framing, including the exterior balcony decks. Some of the buildings also have operating wood fire places with chimneys. The exposed stairs are steel framed with precast concrete steps, and have wood framed landings. The buildings have vinyl siding and wood trim on the exterior, with Thermo-ply insulative sheathing observed behind the siding. Asphalt shingles were replaced in 2008.

Problems within Phase I include, but are not limited to, deteriorated wood trim, water intrusion, corroded stairs, missing gutters, soil erosion, and excessive settlement at balcony foundations. Flashings above windows were typically observed sealed, trapping water and contributing to accelerated wood trim deterioration. Likewise, wood roof fascia and rakes were covered with sheet metal fascia, which can trap moisture and accelerate deterioration. Many of the roof fascia and rakes were observed with insect borings, such as carpenter bees.

Penetrations through the exterior walls were observed unsealed, including typical HVAC lines. Siding at the lowest level was typically “chopped”, or cracked, in a manner which appears to be a result of landscaping.

Gypsum walls in the attics were commonly found with large openings, and in some locations the walls appeared to be completely missing or removed. BECS is not aware if these walls are required as fire walls.

Many dryer vents were observed to be clogged with lint, due to screen covers, causing a potential fire hazard. Current codes do not permit screens at dryer duct terminations. These should be cleaned and removed.

Buildings within Phase I appeared to have similar conditions, with specific observations identified below.

*Building Group #1 – 9903, 9905, and 9907 Boysenberry Way (Units 101-114):*

- The building footprint is approximately 65 ft. by 100 ft., and three stories tall. This building includes the management office, as well as a protrusion at one end for an additional stairwell, which extends approximately 15 ft. beyond the primary section of the building.
- The bottom section of the stairs at 9903 Boysenberry Way was found to be severely corroded and failing. Shoring has already been installed below the lowest steps.
- Wood trim was deteriorated and painted over. This did not appear to be the most extensive damage in comparison to other buildings in Phase I. Some trim also has peeling paint.
- One small piece of siding was missing at the top corner of the wall, beneath the eave.
- One exterior lighting fixture was loose from the wall, and one exterior light fixture was missing the cover over the light bulb. This appears to be a safety hazard.
- A significant amount of wires were observed extending out from the electrical closet. It is not known what these wires are for, or if they are active. Siding was missing at this location as well.
- The attic space in this building was difficult to access, including above the management office. Where accessible, the following was observed:
  - Limited locations of water staining and/or water damage were observed on the underside of the roof sheathing.
  - At locations where vents protrude through the side of the building, the wall sheathing had approximately 2 ft. x 1 ft. openings, with the siding visible.
  - Gypsum was missing on the side of one dormer. It appears to have been ripped out, or may have fallen down.

*Building Group #2 – 9906 Boysenberry Way, 18503 and 18501 Boysenberry Drive (Units 115-138):*

- The building footprint is approximately 65 ft. by 140 ft., and three stories tall.
- The bottom section of the stairs at 18503 Boysenberry Drive was found to be recently replaced with galvanized steel.
- Wood trim was deteriorated and painted over. Some trim also has peeling paint.
- In at least one location, a hole through the wall was found at the stair railing anchorage. This hole appeared to extend directly through the siding, the wall sheathing, and with insulation visible within the wall cavity.
- The pump room, located below the exterior stairwell, was observed to have water damage on the interior gypsum walls. We were informed by Management that this was a result of a plumbing leak in addition to a clogged floor drain, which has since been repaired. It is our understanding that this is no longer a problem, beyond the damage that has occurred.
- The attic space in this building was difficult to access, due to lofts within the units. Where accessible, the following was observed:
  - Limited locations of water staining and/or water damage staining were observed on the underside of the roof sheathing.
- Unit 121, located on the first floor, reported water infiltration at windows during heavy rains. On the interior, the following was observed:

- Organic growth was observed near the base and side of the sliding door frame. It appears that air may be infiltrating through the sweep and/or gaskets at the base of the door.
- In the bedroom, tape was observed around the window frame. We felt a small amount of air infiltrating through the window frame gaskets. It is assumed the tape was applied by the resident to prevent air infiltration.
- The wood trim on the exterior of this window was observed to be in acceptable condition.

*Building Group #3 – 18500, 18502, and 18504 Boysenberry Drive (Units 139-170):*

- The building footprint is approximately 65 ft. by 140 ft., and four stories tall.
- The bottom section of the stairs at 18502 Boysenberry Drive was found to be severely corroded and failing.
- Wood trim was deteriorated and painted over. Some trim also has peeling paint.
- Gutters in the rear of the building were missing, allowing water to fall adjacent to exterior walls and building foundations. Water that is not properly managed away from foundations can cause soil erosion and differential settlement conditions.
- Settlement was observed at the rear central balconies. The concrete beneath one of the column posts was cracked, with evidence of vertical displacement. This is located a short distance from the top of a retaining wall, which is currently leaning outward a limited amount, and may be influencing the settlement. (See Retaining Walls)
- Within the attic space, the following was observed.
  - Limited locations of water staining and/or water damage were observed on the underside of the roof sheathing.
  - One 4 in. diameter PVC vent line was found cut short, and left open just above the ceiling. The open end of the line was covered with insulation. This appeared to be trapping humidity, with moisture observed within the pipe and water damaged gypsum adjacent to the line.
  - Gypsum was missing at the end stairwells. It is not known if this gypsum wall is required.
  - One location was observed with Thermo-ply sheathing missing, and the back of siding visible. This was at a transition in roof elevation.
  - On the west end, two trusses located above the stairwell appeared to have been repaired with plywood gussets fastened to the truss panel point. **This may be improperly designed and fastened, creating a potential structural concern.**

*Building Group #4 – 18508, 18510, and 18512 Boysenberry Drive (Units 171-202):*

- The building footprint is approximately 65 ft. by 140 ft., and four stories tall.
- The bottom section of the stairs at 18510 Boysenberry Drive was found to be recently replaced with galvanized steel.
- A significant amount of wood trim was deteriorated and painted over. Some trim also has peeling paint.



- Gutters in the rear of the building were missing, allowing water to fall adjacent to exterior walls and building foundations. Water that is not properly managed away from foundations can cause soil erosion and differential settlement conditions.
- The pump room, located below the exterior stairwell, was observed to have water damage on the interior gypsum walls. We were informed by Management that this was a result of plumbing leak in addition to a clogged floor drain, which has since been repaired. It is our understanding that this is no longer a problem, beyond the damage that has occurred.
- Within the attic space, the following was observed:
  - Limited locations of water staining and/or damage were observed on the underside of the roof sheathing. One large area of water staining was observed on the roof sheathing directly over the central stairwell.
  - Exhaust vents and exhaust lines were observed to be disconnected and/or crushed at multiple locations.
  - One small opening was observed at a vertical wall to roof transition. Daylight was visible through this opening.
  - A bird's nest was found. This may indicate at least one opening in the roof and/or soffit.
  - Trusses over the central staircase were loose on the bottom heel, below the roof ridge. This appears to be a bearing point, although the structural function of the truss was not exactly clear to visual observation. Other similar trusses are tight at the base.
  - One truss was found with a disconnected metal plate connection. It appears to be repaired with a supplemental diagonal 2x4 fastened to the truss members near the connection point, which appears to be holding the members together. **This may be improperly designed and fastened, creating a potential structural concern.**
  - One broken vertical member was found at the central gable truss. **This is a structural concern, and must be repaired with a properly engineered detail to restore the member's structural integrity.**
- Unit 171, located on the first floor, was unoccupied upon our initial visit. On the interior and exterior of the unit, the following was observed:
  - Water staining and cracked plaster was observed around the perimeter of the window frame.
  - BECS observed significant wood trim deterioration on the exterior of the window.
  - The interior finishes were repaired in January.

*Building Group #5 – 18516, 18518, and 18520 Boysenberry Drive (Units 203-234):*

- The building footprint is approximately 65 ft. by 140 ft., and four stories tall.
- The bottom section of the stairs at 18518 Boysenberry Drive was found to be recently replaced with galvanized steel. The second floor stairs appeared to be corroded, most significantly at tread supports.
- A significant amount of wood trim was deteriorated and painted over. Some trim also has peeling paint.

- Gutters in the rear of the building were missing, allowing water to fall adjacent to exterior walls and building foundations. Water that is not properly managed away from foundations can cause soil erosion and differential settlement conditions.
- Near the end of the wall, the building foundation was observed to be exposed, although the building foundation did not appear to be settling or cracking. This erosion appeared to be partially attributed to water runoff from the roof.
- Balcony railings at upper levels of the 18520 stairwell were found to be flexible to the touch. (It is possible that railings were flexible at other locations as well, where not directly observed by BECS). This is a safety concern, and establishing rigid connections per current code should be considered a high priority.
- Within the attic space, the following was observed:
  - Numerous locations of water staining and/or water damage were observed on the underside of the roof sheathing.
  - One location of plywood sheathing appeared to be relatively new, or replaced, due to apparent water damage. This section was approximately 4 ft. x 4 ft., and appears to remain free of additional water staining or water damage.
  - The back of siding was observed on one vertical elevation transition. It was evident that wall sheathing was missing at this location.
  - Daylight was observed through the sheathing and siding at one vertical elevation transition.
  - Exposed electrical wiring was found, which appeared to be connected to an electrical element (such as a light fixture) extending through the ceiling below.
- Unit 211, located on the first floor, reported water infiltration, or signs of excessive humidity, at the exterior walls. On the interior and exterior of the unit, the following was observed:
  - There did not appear to be signs of moisture damage or staining on the interior of the walls, or in the closet adjacent to the window.
  - The resident installed a corrugated pipe on the exterior of the unit, extending from the base of the downspout and away from the exterior wall. It appeared that the top of soil was below the interior slab-on-grade floor line.
  - The resident stated that the gutters were overflowing, while Management informed BECS that the gutters were recently cleared.

*Building Group #6 – 18519 and 18521 Boysenberry Drive, 9901 Boysenberry Way (Units 235-258):*

- The building footprint is approximately 65 ft. by 140 ft., and three stories tall.
- The bottom section of the stairs at 18521 Boysenberry Drive was found to be recently replaced with galvanized steel.
- Wood trim was deteriorated and painted over. Some trim also had peeling paint.
- One window was found with a unique flashing on top of the trim. This appeared to be relatively new, and wrapped down the front of the lintel trim.
- One section of siding at the lowest level was found displaced, with Thermo-ply sheathing visible behind.

- One downspout was observed which did not extend to the ground. It appeared that a corrugated pipe was removed, allowing the water to fall to the base of the wall. Water that is not properly managed away from foundations can cause erosion and differential settlement conditions.
- The attic space in this building was difficult to access, due to lofts within the units. Where accessible, the following was observed:
  - Limited locations of water staining and/or water damage were observed on the underside of the roof sheathing
  - One area of Thermo-ply sheathing was observed to be broken, with a daylight apparent through a hole.
  - Daylight was also apparent near the peak at a vertical elevation transition.

*Building Group #7 – 18525 Boysenberry Drive, 9900 and 9902 Boysenberry Way (Units 259-282):*

- The building footprint is approximately 65 ft. by 140 ft., and three stories tall.
- The bottom section of the stairs at 9900 Boysenberry Way was found to be recently replaced with galvanized steel.
- The concrete slab at the center patio appeared to be significantly cracked and spalling. This included partial concrete patches. This may become a trip hazard, as it continues to deteriorate.
- A significant amount of wood trim was deteriorated and painted over. Some trim also has peeling paint.
- A length of siding below one window was found peeling away from the wall. The Thermo-ply sheathing was visible behind the siding.
- Approximately 4 ft. section of the soffit vent was found missing. This can allow birds and rodent infestation.
- The attic space in this building was difficult to access, due to lofts within the units. Where accessible, the following was observed:
  - Limited locations of water staining and/or water damage were observed on the underside of the roof sheathing.
- Unit 271, located on the second floor, reported water infiltration within the room adjacent to the balcony and at the balcony door. On the interior of the unit, the following was observed:
  - A water stain was observed on the ceiling of the room adjacent to the balcony. BECS was informed that this stain has shown for a “long time”. There is a tall ceiling in this room, which is located directly below a transition between a low roof and a wall above.
  - The resident installed plastic over one of the windows. It appeared that this window was not fully closed, and may have been allowing air infiltration.
  - The resident informed BECS that water enters around the perimeter of the patio door during heavy rain events. Water stains were not observed. On the exterior, the flashing above the door was observed to be unsealed, which would allow water to weep out.
  - A vent adjacent to the patio door was open through the wall. This opening did not appear to be closed tight around the perimeter.
- Unit 282, located on the third floor, reported water infiltration at one skylight. On the interior of the unit, the following was observed:

- Below the skylight, near the exterior wall, very minimal signs of water damage and/or peeling plaster were observed. BECS was informed that this area was resurfaced and painted when the new management took over. The area appeared dry to the touch.

*Building Group #8 – 18529, 18531, and 18533 Boysenberry Drive (Units 283-306):*

- The building footprint is approximately 65 ft. by 140 ft., and three stories tall.
- The bottom section of the stairs at 18531 Boysenberry Drive was found to be severely corroded and failing. This also includes the railings. **Failing stairs are a safety hazard, and repairs should be considered a high priority.**
- Wood trim is deteriorated and painted over. Some trim has significant peeling paint.
- Paint on at least one downspout was observed peeling.
- Two windows, in addition to the roof fascia, appeared to have the wood trim covered with a sheet metal fascia. Along one fascia, the sheet metal appeared to be missing, allowing observation of wood fascia with significantly worn paint.
- One section of siding was found to be falling down at the eave, and one section below a window.
- The attic space in this building was difficult to access, due to lofts within the units. Where accessible, the following was observed:
  - Limited locations of water staining and/or water damage were observed on the underside of the roof sheathing
  - One 2x4 truss web member was found with a 5 ft. long split. This was located above the central stairwell. **This is a structural concern, and must be repaired with a properly engineered detail to restore the member's structural integrity.**
- Unit 287 reported water infiltration at the skylight. On the interior of the unit, the following was observed:
  - Signs of organic growth were observed around the skylight frame. This did not appear to continue beyond the window frame, or down the wall or ceiling.
  - Most of the growth was localized at the bottom of the skylight.
  - The source of growth, or potential source of moisture, was not directly evident by visual observation.

*Building Group #9 – 18501 Fairlight Drive, 18535 and 18537 Boysenberry Drive (Units 307-330):*

- The building footprint is approximately 65 ft. by 140 ft., and three stories tall.
- The bottom section of the stairs at 18535 Boysenberry Drive was found to be recently replaced with galvanized steel.
- A significant amount of wood trim was observed deteriorated and painted over. Some trim has significant peeling paint. Deteriorated wood with faded paint was observed directly behind a downspout.
- Trim around one window appeared to be covered with sheet metal fascia, which is inconsistent with the rest of the windows. Covered trim can trap water and moisture, increasing the rate of deterioration.
- Siding was observed detached below a window, exposing the wall sheathing.

- The attic space in this building was difficult to access, due to lofts within the units. Where accessible, the following was observed:
  - Limited locations of water staining and/or water damage were observed on the underside of the roof sheathing.
  - One opening was observed with metal flashing behind. It is not known when this flashing was installed, but it's possible that it was installed over the damaged sheathing while repairing the roof.
- Unit 308, located on the first floor, reported water damage on the ceiling. On the interior of the unit, the following was observed:
  - Staining was observed on the ceiling near the center of the living room. This stain continued for a length of approximately 5 ft, and was located approximately 10 ft from the nearest exterior wall.
  - The source of staining was not evident. From limited observation, and based on the fact that the staining was not adjacent to an exterior wall or roof, it appears this was not a result of water infiltration. It is our understanding that there is no bathroom or sink above this location.



## Phase II Buildings

The five (5) residential buildings in Phase II were constructed circa 2000. These buildings each have a footprint of approximately 75 ft. by 75 ft., and are three stories above grade with one additional level located downhill from the main entrance. Each building appears to be constructed with wood framing, including the exterior balcony decks. The buildings have vinyl siding and wood trim on the exterior, with Tyvek building paper observed exposed at several locations. Asphalt shingles are original to the buildings.

Conditions within Phase II include, but are not limited to, deteriorated wood trim, water intrusion and condensation, and frequent repairs to the roof as a result of leaks. It is our understanding that deteriorated wood trim was replaced and painted approximately six years prior to our observations, and is already showing significant deterioration.

Flashings on the exterior façade were typically observed sealed, preventing water from exiting from behind the siding/trim. Also, many exhaust and dryer vents in the attic were observed to be disconnected, resulting in significant amounts of lint within the attic space. This may cause a potential fire hazard.

Buildings within Phase II appeared to have similar conditions, with specific observations identified below.

### 9720 Leatherfern Terrace:

- A relatively limited amount of wood trim deterioration was observed.
- A majority of the second floor band board trim was observe to be deteriorated and/or degraded.
- Within the attic space, the following was observed:
  - Water stained and/or water damaged OSB and truss rafters were observed at multiple locations near the eaves.
  - Water damaged OSB was observed at one roof vent penetration, adjacent to a vent duct which was detached from the exhaust. The area of deterioration was approximately 3 ft. x 2 ft.
  - One truss appeared to have been repaired with an OSB gusset fastened to the truss panel point. **This may be improperly designed and fastened, creating a potential structural concern.**
  - A large volume of bird remnants and nests were found within the attic. Also, one live bird was found. BECS was informed that the attic was smoked out approximately 5 or 6 months prior to our visit.

### 9800 Leatherfern Terrace:

- A significant amount of wood trim deterioration was observed.
- A majority of the second floor band board trim was observe to be deteriorated. This was stripped apart at one corner, and appeared to be constructed with plywood.
- At least one section of siding was observed missing, with building paper exposed.

- From the exterior, condensation was observed on the interior of one first floor window. This condensation appeared to be located on the interior of the unit, and between the double panes of glass. Organic growth appeared to be visible on the interior window frame.
- Within the attic space, the following was observed:
  - Water stained and/or water damaged OSB and truss rafters were observed at multiple locations near the eaves, one observed location at the ridge, and one observed location at a roof vent penetration.
  - One truss appeared to have been repaired with an OSB gusset fastened to the truss panel point. **This may be improperly designed and fastened, creating a potential structural concern.**

#### 9810 Leatherfern Terrace:

- A relatively limited amount of wood trim deterioration was observed.
- A section of siding was observed at the second floor of the building. Tyvek moisture barrier appeared to be loose, with a small area of wall sheathing visible.
- One loose soffit vent was observed on the rear side of the building.
- Within the attic space, the following was observed:
  - Water stained and/or water damaged OSB and truss rafters were observed at multiple locations near the eaves.
  - The OSB sheathing appeared to be water damaged at one loose vent line, located directly beneath the sheathing. The damage appears to be from humid air exiting the vent line.
  - One truss metal-plate connection was observed to be dismantled, with the members directly nailed back together on each end. **This may be improperly designed and fastened, creating a potential structural concern.**
  - The “fire door” hatch was found on the floor. **Fire walls must extend floor to ceiling, and breeches such as these create bridges.** Assuming the gypsum wall in the center of the attic is intended to be a fire wall, this hatch should be set within the wall opening.
  - Evidence of bird infestation was observed, in addition to insect poisoning.
- Unit 101, located on the first floor, reported water infiltration at windows during heavy rains. On the interior and exterior of the unit, the following was observed:
  - The resident informed us that the windows began leaking after the windows were replaced, and that it only occurs during heavy and/or wind driven rains.
  - There was minimal signs of staining around the window frames. Paper towels located on the window sills had limited signs of staining.
  - One window, which had some staining at the top of the window, also had cracks between the window frame and the window jamb. A crack at the head jamb also extended up the face of the wall for approximately 3 inches.
  - The exterior trim around these windows appeared to be covered with a sheet metal fascia. This was not observed at other units in Phase II. Sheet metal may trap moisture and accelerate deterioration.

18300 Feathertree Way:

- A significant amount of wood trim deterioration was observed.
- A large piece of siding was observed hanging and partially fallen. This was located near a downspout, and below a piece of deteriorated wood trim.
- A small gap was observed at the soffit vent in one location.
- Within the attic space, the following was observed:
  - Water stained and/or water damaged OSB and truss rafters were observed at multiple locations near the eaves, and one observed location at the ridge
  - A small section of OSB was observed missing at the intersection between a dormer sidewall and the primary sloped roof. Flashing at this intersection was observed to be covering the section of missing OSB, and signs of water stains or water damage were not found.
  - One disconnected truss metal plate connector was found. **This is a structural concern, and must be repaired with a properly engineered detail to restore the member's structural integrity.**
  - Observations were limited due to discovery of a live bird within half of the attic space. This may indicate at least one opening in the roof and/or soffit.

18310 Feathertree Way:

- A significant amount of wood trim deterioration was observed. This appears to be the most severely deteriorated building within Phase II.
- One of the electrical rooms was observed with significant wood deterioration on the interior, including the OSB sheathing and the wood framing. A section of side-wall sheathing was missing as a result of this deterioration. **Loss of structural integrity is a safety hazard, and repairs should be considered a high priority.** From the ground, it appeared that water may be infiltrating at an intersection between the electrical room sidewall and the second floor balcony, although this was not confirmed.
- From the exterior, condensation was observed inside one first-floor window. This appeared to be focused along the middle rail between the top and bottom sash.
- Within the attic space, the following was observed:
  - Water stained and/or water damaged OSB and truss rafters were observed at multiple locations near the eaves.
  - At one dormer, the transition between each sidewalls and the primary sloped roof was open to the exterior. Also, it was apparent that the flashing was incorrectly installed. The OSB sheathing was observed to be water damaged at this location, with the opening allowing water entry, and potential for birds.
  - One disconnected truss metal plate connector was found. **This is a structural concern, and must be repaired with a properly engineered detail to restore the member's structural integrity.**

- One significantly bowed truss web member was found. **This is a structural concern, and must be repaired with a properly engineered detail to restore the member's structural integrity.**
- Bird remnants were found within the attic.

## Retaining Walls

Numerous retaining walls are located around the property. Most of the walls in Phase I are constructed of timber, with one location appearing to be relatively new. Most of the walls in Phase II are constructed of concrete, with at least one Mechanically Stabilized Earth (MSE) retaining wall including modular blocks on the face.

A majority of these walls appear to be in acceptable condition. However, one wall in Phase I was observed to be leaning, with potential of failing. Also, a couple of walls in Phase II were observed to have some reasons for concern. These walls were visually observed by BECS to help provide some understanding of the failures.

Specific observations at walls containing observed deficiencies are identified below.

### Retaining Wall at Phase I – Building Group #3:

- The retaining wall behind Building Group #3 is approximately 6 ft tall and 115 ft. long, with an additional 18 ft. length on the side of the building. Half of the retaining wall behind the building was observed to be leaning outward. At the nearest point, the top of the wall is approximately 10 ft. away from the concrete pads in the rear of the building below the balconies, and within 4 ft of a building protrusion.
- The half of the wall that does not appear to be leaning was found with regularly spaced deadman anchors, while the half of the wall that was found leaning appears to have irregularly spaced deadman anchors. It appears that some anchors are missing.
- Some of the timbers were found to be deteriorating. This appeared to be somewhat randomly located, although many of the timbers were found to be holding moisture when observed following rain events.
- Soil erosion was evident at the top along the length of the wall, as well as the north side where the wall turns back to meet the building. The building foundations have been exposed at this point due to excessive erosion.
- A railing was not found at the top of the wall, and is required by code when the vertical drop is greater than 30 inches.

### Retaining Wall at Phase I – Building Group #5:

- The retaining wall in the behind Building Group #5 is approximately 4 ft tall and 50 ft long. This wall appears to be in acceptable condition.
- Near the end of the wall, the building foundation was observed to be exposed, although the building foundation did not appear to be settling or cracking. This erosion appeared to be partially attributed to water flow along the top of the wall, and then away from the building at this point.
- A continuation of this wall would assist with soil retention, and help to prevent excessive erosion.
- A railing was not found at the top of the wall, and is required by code when the vertical drop is greater than 30 inches.



Retaining Walls at Phase I – Group #7:

- One 18-inch tall timber landscaping wall was observed leaning. These timbers did not appear to be tied back to resist overturning.

Retaining Walls at Phase I – Group #8:

- A significant length of this timber retaining wall appeared to be newly constructed, while part of the wall appeared to be previously existing. The “older” section of wall still appears to be in acceptable condition, with limited displacement and limited deterioration. This wall is approximately 3 to 4 ft. tall.
- Corrugated drain lines were observed extending from the bottom of downspouts and through the bottom of the new retaining wall in an appropriate manner.
- There were no visually apparent defects in this wall.

Retaining Wall at Phase II - 9800 Leatherfern Drive:

- A concrete retaining wall behind this building is approximately 4 to 5 ft tall, and approximately 75 ft long. The soil appears to be approximately the same elevation on both sides of the wall, with a steep downward grade on the lower side of the wall.
- A large diameter wall opening appeared to be cut through the wall after initial construction, allowing water drainage from behind the wall. This resulted in significant soil erosion on the lower side of the wall, exposing the foundation. There was no visual evidence of undermining the footing.
- Holes spaced along the length of the wall were set above the soil elevation. These did not appear to be functional as weeps.

Retaining Wall at Phase II - 9810 Leatherfern Terrace:

- A concrete masonry unit (CMU) retaining wall, approximately 3 ft. tall, appears to be constructed with Mechanically Stabilized Earth (MSE).
- Soil erosion was observed at the top and bottom of the wall, at the intersection between the retaining wall and the building foundation wall. Soil was undermined beneath a concrete A/C pad.
- Several cap blocks were displaced at the top of the wall. It appears they were never affixed to the wall.

Retaining Walls at Phase I – Group #9:

- One timber retaining wall was observed to be deteriorated along the top course, although it does not appear to be leaning or failing otherwise. This wall is approximately 2 to 3 ft. tall.

## Carports

Six (6) open-air carports are located within Phase I, and provide cover for a limited number of parking spaces. The frames are constructed of painted steel, with steel roof joists. The steel posts are wrapped in wood, while the roof has OSB sheathing fastened to the steel joists, asphalt shingles, and wood trim around the perimeter fascia. The steel posts were set into concrete piers at the base.

Most carports appear to be in visibly acceptable condition. Specifically observed problems are identified below:

### Carport at 18502 Boysenberry Drive:

- One front beam was visibly damaged, which may reduce the capacity of the member. This should be addressed to restore the structural integrity of the member.

## Garages

Three (3) enclosed garages are located within Phase II, and provide cover for three to four vehicles each. Each garage appears to be constructed with wood framing, with vinyl siding and wood trim on the exterior.

Most garages appear to be in visibly acceptable condition. Specifically observed problems are identified below:

### Garage at 18300 Feathertree Way:

- One gutter was observed to be damaged, with the corner bent out of place. It was not apparent if this gutter remained functional.
- One overhead door was visibly damaged. It was not known if the door remained functional.

## **Repair Recommendations and Budget Projections**

Our opinion of costs to perform the recommended repairs is identified for each following item, and depends upon the various repairs performed, means and methods, materials selected, and hidden conditions that might be discovered. Actual costs received from bidding contractors according to a detailed specification may vary significantly from the estimate provided. In addition, quantities used in preparing our estimate are based upon a limited, partial survey and will vary especially considering the hidden nature of the types of repairs being considered (i.e., building sheathing and waterproofing membranes). Access to the building facades may also require specialty staging, as determined by contractor's means and methods, which can inflate mobilization costs.

Our opinion of costs is provided for budgeting purposes only. These costs are based upon current dollars and do not consider optional work, annual inflation or the costs associated with fees for bonds, engineering, construction monitoring or other administrative services. Costs are based upon estimated quantities derived during our survey and our experience of the actual costs received for work on similar projects.

It should be noted that no material testing of building components was performed and no calculations were performed to determine the adequacy of the facility's original design. It was not the intent of this survey to perform an exhaustive study to locate every existing defect. Trained and licensed professionals made visual observations, however there may be defects at the facility that were not readily accessible, not visible, or which were inadvertently overlooked, or had not developed into visible defects at the time that the survey was performed. Please note that our condition survey did not include the recognition, detection or evaluation of hazardous substances such as mold, asbestos or lead paint. Our opinion of costs contained herein do not include abatement of these substances, if necessary, as part of the renovation.

## Phase I & Phase II - Common Repairs

Some common damaged elements were found at both Phases I and II. These observed damages and recommendations for repair include the following:

### 1. Roof Truss Damage.

There were 11 roof trusses observed that must be repaired or verified for integrity of previous repairs. This includes those unrepaired trusses at Building Groups #4 and #8, 18300 Feathertree, and 18310 Feathertree, and several previously repaired trusses at other locations. It is not known if the previous repairs were properly designed or implemented, but many of these repairs appeared to be installed in an improper manner.

BECS recommends addressing these truss failures and further inspecting the previously repaired trusses on a case-by-case basis. Repairs to each truss must be completed to restore structural integrity. **This is a safety concern, and repairs should be considered a high priority.**

**In our opinion, a true cost estimate cannot be provided by BECS until after further engineering inspection and structural design are prepared. Each truss repair may be unique. For budgetary purposes, a cost estimate for the inspections and repairs to all eleven trusses is approximately \$7,000.**

### 2. Attic Draftstop Wall Damage.

At Phase I, fire-rated gypsum walls in the attics had many large openings, and some gypsum walls were completely missing or removed. This was most notable at Building Groups #1 and 3. At Phase II, one hatch was not installed in the opening through a fire-rated gypsum wall in the attic.

Following discussion with a fire safety engineer, these were determined to be draftstops. BECS recommends repairing the walls, and including self-closing doors for accessibility through the attic spaces. **This is a safety concern, and repairs should be considered a high priority.**

**In our opinion, a true cost estimate cannot be provided by BECS. For budgetary purposes repairs to all buildings is approximately \$18,000. (Approximately \$2,000 per building, primarily focused in Phase I)**

### 3. Attic Vent Line Displacement.

Many vent lines were damaged and/or disconnected from their exhaust.

BECS recommends inspecting all attics, and replacing or resetting all vent lines. These lines should be fastened to the exhausts to prevent future displacement. Lint found within the attic should also be

cleaned, and could pose a fire hazard. These repairs include one PVC vent line which appeared to cause water damage to gypsum and insulation at Building Group #3, and one loose vent line which appeared to cause water damage to the OSB sheathing at 9810 Leatherfern. **This is a fire safety concern, and repairs should be considered a high priority.**

**In our opinion, this would be a limited expense, as it may be performed by limited skill personnel or on-site property maintenance staff. For budgetary purposes, a cost estimate for repairs within all fourteen buildings is approximately \$7,000. (Approximately \$500 per building)**

#### 4. Wood Trim Deterioration.

A significant amount of wood trim was deteriorated on the buildings around the property, with Phase II appearing to have greater damage than Phase I. Some of this deterioration may not be visible where painted over with multiple coatings.

We recommend replacing wood trim with water-resistant colored PVC trim, or PVC trim painted to match existing. Additionally, new flashings should be properly installed to allow water to weep from behind the vinyl siding. Installation of new flashing will require sections of siding to be removed, and reset.

As one option in Phase I, BECS recommends replacing deteriorated trim, while repainting existing trim observed to be in acceptable condition. The following provides an estimate percent of deteriorated trim on each Building Group based on visible repairs necessary upon time of visit.

Building	No. Stories	Estimated Percent of Deteriorated Trim	Estimated Cost for Partial Repair	Estimated Cost for Full Repair	Priority
Group #1	3	20%	\$19,600	\$98,000	7
Group #2	3	20%	\$19,600	\$98,000	6
Group #3	4	30%	\$29,400	\$98,000	3
Group #4	4	40%	\$39,200	\$98,000	2
Group #5	4	50%	\$49,000	\$98,000	1
Group #6	3	10%	\$9,800	\$98,000	8
Group #7	3	25%	\$24,500	\$98,000	5
Group #8	3	10%	\$9,800	\$98,000	9
Group #9	3	30%	\$29,400	\$98,000	4

As an alternate option in Phase I, BECS recommends replacing 100% of the wood trim on each building to provide a long term solution. This will prevent continued deterioration of the trim, and allow access to inspect and repair improper flashings and sealants around the windows and doors.



In Phase II, the most significant deterioration was observed at 9800 Leatherfern, 18300 Feathertree, and 18310 Feathertree. Additional damage may be hidden by existing trim, including failure of building wrap, deteriorated wall sheathing, etc. On the relatively less severely deteriorated buildings, it is significant enough that BECS recommends replacing 100% of wood trim.

**In our opinion, costs to address 100% trim replacement in Phase I will be approximately \$882,000.**

**100% trim replacement in Phase II will be approximately \$230,000 per building, or \$1,150,000 total. The full extent of wood rot cannot be fully assessed until work is in progress, and additional carpentry for wood rot not included in the budget may result in additional costs, billed at an hourly Time & Materials basis. A typical carpentry rate can be approximately \$85 per man hour.**

#### **5. Siding and Soffit Displacement and Damage.**

Multiple sections of vinyl siding were either missing or displaced, and several siding sections were cracked or broken. This includes siding at Phase I, where commonly cracked siding at the base may be a result of landscaping tools (i.e. weed trimmer). Also, several sections of soffits were missing, including Building Group #7, 99800 Leatherfern, and 9810 Leatherfern, and 18300 Feathertree.

BECS recommends replacing and/or resetting siding and soffit vents where missing or loose. Landscapers should be notified to prevent further damage to the base siding.

**In our opinion, this would be a limited expense. This has been considered in a recent report provided by Shepard consulting, providing a cost estimate of \$5,000 per year.**

#### **6. Wall Sheathing and Weatherproofing Damage.**

During our investigation, most of the building sheathing and weatherproofing was not visible behind the siding. In Phase I, some of the Thermoply sheathing became exposed following a wind event, when several siding panels were displaced. It became evident that the Thermoply was reaching the end of its life span, which is recommended to be 30 years by the manufacturer. Taping was not observed at panel joints or nail/staple penetrations, and a number of openings were observed in the panels, which exposed the interior wall studs and insulation.

Larger openings in the attic walls were found at multiple locations, such as those observed at Building Groups #4, 5 and 6, and 18310 Feathertree. These openings may allow water and air infiltration, as well as birds or other animals. Also, special attention should be placed at Building Group #4, Unit 171, and 9810 Leatherfern Terrace, Unit 101, where water infiltration was reported at the first-floor windows.

New sheathing must be installed where panels have openings, where sheathing was missing and/or openings were observed in the attic spaces. During replacement of any trim and/or siding, BECS recommends inspecting and addressing additionally deficient wall panels, panel joints, window and door frame perimeters, and other readily apparent sheathing and weatherproofing details, to help ensure proper installation and detailing to prevent water intrusion. This would include the sheathing, taping, building paper, and appropriate flashing. All units should be inspected.

**Due to limited accessibility during our observations, BECS is unable to estimate potential repairs required behind the siding and trim facades. Also, many of the known locations require accessibility from the exterior, by removing and resetting any interfering vinyl siding and/or wood trim. For budgetary purposes, a cost estimate for repairs at all fourteen buildings is approximately \$14,000. (Approximately \$1,000 per building)**

## 7. Roofing Damage and Weathering.

At Phase I roofs, specific attention should be set to the low roof-to-wall intersection above Building Group #7, Unit 271, where the ceiling below was water damaged. Also, special attention should be set to the skylights at Building Group #7, Unit 282, and Building Group #8, Unit 287, which both had minimal signs of water infiltration and/or condensation.

At Phase I, BECS recommends immediately repairing any existing damages, including openings observed around the perimeter of the roof, and missing shingles. BECS also recommends replacing all the roofing shingles within the next 10-15.

All the Phase II, the roofs were observed to be of the same age, and had similar damage across the buildings. Limited observations included weathered shingles, some missing shingles, numerous popped nails, and improper drip edge at the gutters. It is assumed that the shingles were installed around 2000, when the buildings were originally constructed, with an original life expectancy of approximately 20 years. These visibly appeared to be reaching the end of their lifespan.

At Phase II, BECS recommends immediately repairing any existing damages, including openings observed around the perimeter of the roof, and missing shingles. BECS also recommends replacing all the roofing shingles within the next 5 years, as they are currently reaching the end of their life expectancy.

**In our opinion, costs to address immediate temporary repairs to the existing roofing in Phase II is approximately \$5,000. Costs to address full roof replacement will be approximately \$72,000 per building in Phase I, and approximately \$45,000 per building in Phase II. (Approximately \$10 per SF)**

## 8. Roof Sheathing Damage.

Typically, plywood and OSB roof sheathing was found with limited locations of water staining and/or water damage. In Phase I, most of the water stained plywood appeared to retain its structural integrity. The most significant damage observed was at Building Group #5. In Phase II, however, the damage appeared to be more significant than Phase I, with the OSB sheathing often deteriorated through to the underside of the roofing. This deterioration was typically located near the eaves, in addition to a few locations at the ridge and roof vent penetrations.

BECS recommends repairing the localized sections of plywood and OSB roof sheathing where necessary. This can be accomplished during roof replacement.

**In our opinion, sheathing repairs would be completed during replacement of the roofing shingles, with costs included within the full roof replacement.**

## Phase I - Building Repairs

Observed damage and recommendations for repair at Phase I include the following:

### 1. Foundation Settlement.

In the rear of Building Group #3, settlement was observed at the base of one column supporting the central balconies. Although the foundation does not appear to have settled more than an inch, and does not appear to require jacking, further settlement should be prevented. The adjacent footing, supporting a similar balcony column, should also be shored to prevent any potential settlement. Based on a previous report prepared by McKenzie Engineering Services, P.C. on August 21, 2016, the foundation extends only 16 inches below grade. Current Montgomery County code requires foundations to extend a minimum of 30 inches below grade, such that it bears below the frost line.

BECS recommends performing additional investigation prior to preparing a final design. With our current understanding of the foundation and soil system, it may be feasible to install a new footing below each post per code, or stabilizing the existing footings with helical piers. This will provide a deeper foundations extending below the frost line *and* beyond backfilled soils influenced by the retaining wall. **This is a safety concern, and repairs should be considered a high priority.**

**In our opinion, a cost estimate cannot be provided by BECS until after further engineering inspection and structural design are prepared. For budgetary purposes, a cost estimate for installation of shoring is approximately 40,000. The cost can be limited if shoring is installed simultaneously with reconstruction of the adjacent Retaining Wall.**

### 2. Exterior Stair Corrosion.

The lowest level of stairs at Buildings Groups #1, 3 and 8 are severely corroded, while others were recently replaced with galvanized steel members. Stairs at upper levels and at the building ends have greater cover from weather and did not appear to be significantly deteriorated.

To address public safety, BECS recommends replacing the remaining corroded stairs which have not yet been replaced. It is our understanding that the lowest level stairs are in the process of being replaced by Management. BECS recommends that the second level of all central stairs be refinished and repainted where corroded, and all stairs should be monitored for ongoing deterioration and structural integrity. **This is a safety concern, and repairs should be considered a high priority.**

**This is an ongoing project, for which Management has current proposals and costs. Breckenridge has provided the ongoing costs for these repairs.**

### 3. **Missing Gutters, Downspouts, and Corrugated Pipes.**

Building Groups #3, 4 and 5 had missing gutters and downspouts in the rear. Soil erosion at the base of downspouts was most significant at these buildings. Also, lack of corrugated pipelines extending from the base of the downspouts appeared to limit proper drainage of water away from the buildings. Both the missing gutters and lack of corrugated pipes appeared to contribute to excessive soil erosion at the building foundations.

BECS recommends installing properly sized gutters and downspouts to prevent water runoff down the facades and directly onto the soil adjacent to the building foundations. Also, BECS recommends installing corrugated pipes to lead water six to ten feet or more downhill and away from the buildings and foundations. Similarly, this should be applied at the top of retaining walls to prevent further soil erosion behind the walls. Ensure that *all* roofs and gutters are cleared of leaves and debris to allow proper water drainage.

**Breckenridge has provided costs for this work, as proposed by a contractor. This cost will be approximately \$21,800 for three buildings. Installation of downspouts and corrugated pipes would be included with the gutters.**

### 4. **Pump Room Damage.**

Pump rooms at Building Groups #2 and 4 had water damage resulting from prior failures of interior plumbing and drainage.

BECS recommends removing and replacing all water-damaged sheathing and insulation. It does not appear that the wood framing or wood trim requires replacement. This does not appear to be a structural frame.

**It is our understanding this is being addressed by Breckenridge, and that an estimated cost is not expected.**

### 5. **Railing Anchorage.**

Flexible balcony railings were observed at a couple of locations, and may be widespread. The railings are anchored at each end with a single screw into the structure at top and bottom rails, and a single screw at the center post base. It appears that the limited anchorage, and relatively small size of railing members, allows for the observed flexibility. Each 3 story building has approximately 16 balconies, while each 4-story building has approximately 22 balconies. This is a total of approximately 162 balconies in Phase I.

BECS recommends further engineering inspection of the current installation. New railings and/or proper anchorage may be required to meet current codes. **This is a safety concern by current standards, and further inspection should be considered a high priority.**

**In our opinion, additional engineering inspection and structural design are required. After an engineered design is prepared, the estimated cost to address this item may be assumed at approximately 5,000 per year.**

#### 6. Electrical Hazards.

Electrical wiring was exposed in the attic at Building Group #5, and outside an electrical closet at Building Group #1. Also, at least one light fixture was loose, and one more has a missing cover at Building Group #1. There may be other electrical elements which were not observed during our inspection.

BECS recommends removing and/or repairing exposed wiring to prevent electrical and safety hazards. Corresponding electrical elements and/or fixtures, including the observed light fixtures, must also be inspected and properly repaired as necessary. **This is a safety concern, and repairs should be considered a high priority.**

**In our opinion, this would be a limited expense, considering the limited number of exposed wires and/or hazardous electrical fixtures observed by BECS. For budgetary purposes, a cost estimate to address these items is approximately \$500.**

#### 7. Clogged Dryer Vents.

Numerous dryer vents were clogged with lint, due to screen covers, and could pose a potential fire hazard. Also, numerous vents were observed with flaps remaining partially opened while not in operation.

All clogged vents around the property must be cleaned. Also, BECS recommends removing the screen covers at dryer vents to prevent future clogging. Alternate vents may be installed with stronger flaps, to help remain closed when not in operation. **This is a safety concern, and repairs should be considered a high priority.**

**In our opinion, this would be a limited expense, although it would require ladder access to each dryer vent. For budgetary purposes, a cost estimate to address this item is approximately \$2,700. (Approximately \$300 per building).**

## 8. Minor Wall Penetrations.

Many wall penetrations through exterior walls were unsealed, including typical HVAC lines. Penetrations also occur at stair railing anchorages. This includes multiple locations of missing sheathing observed from within the attic. This exposes structural framing and interior finishes to the exterior environment. Sheathing with properly sealed penetrations and joints is required as a weather and air barrier, as well as providing structural shear resistance and wind load capacity.

BECS recommends all wall penetrations be properly sealed, and all missing and/or deteriorated sheathing be replaced with new sheathing. This would include the missing sheathing observed at Building Groups #3 and #5, and the overly sized wall penetrations observed at Building Group #1. All units should be inspected.

**In our opinion, this would be a limited expense, considering the currently limited number of missing sheathing panels observed, and relative costs of seals. For budgetary purposes, costs to address each building will be approximately \$200 per building, or approximately \$1800 total.**

## 9. Window Condensation.

Condensation was observed on the interior of window frames. Also, several units were found with tape around the edge of the window frames. The condensation is likely a result of air infiltration, in addition to thermal conduction directly through the metal frames. Condensation is prone during the winter, when the window frame is colder than the dew point of the warm interior air. It is our understanding that the windows are original, circa 1989, whereas typical metal frame window have a life expectancy of 15 to 20 years.

BECS recommends replacing all windows to improve thermal efficiency and help prevent water and air infiltration and condensation issues. Balcony doors should also be considered.

**It is our understanding that windows are the responsibility of each individual owner, and the expense is not the Association's responsibility.**

## 10. Concrete Walkway Deterioration.

The concrete walkway entrance at Building Group #7 was cracked and spalled, and included concrete patches which appeared to be insufficient and be prone to failure. BECS recommends removing damaged concrete, and replacing with new concrete to eliminate tripping hazards.

**This has been considered in a recent report provided by Shepard consulting, providing a cost estimate of \$5,000 per year.**



## Phase II - Building Repairs

Observed damage and recommendations for repair at Phase II include the following:

### 1. Electrical Room Damage.

One electrical room at 18310 Feathertree had water damaged sheathing and wood framing. It appears that water is entering from the roof-to-balcony intersection, where flashing and detailing may be insufficient.

BECS recommends inspecting, and water testing, the framing to understand the true point of water entry, and repairing properly to prevent further infiltration. The wood framing must be replaced where damaged to ensure structural integrity.

**In our opinion, a cost estimate cannot be provided by BECS until after further engineering inspection and structural design are prepared. For budgetary purposes, a cost estimate for inspection and design, demolition, reconstruction, and final water testing is approximately \$5,000.**

### 2. Animal Waste in Attic.

A live bird was found in both 9720 Leatherfern and 18300 Feathertree. A large volume of bird remnants and nests were found in the attics at 9720 Leatherfern and 18310 Feathertree. BECS recommends clearing the attics of live animals and any debris or remnants. Biological hazards should be taken into consideration. BECS also discovered an empty container of poison in one of the attics.

**In our opinion, this would be a limited expense, although it may require the attention of a specialist who can safely and effectively clean potential biological hazards. For budgetary purposes, a cost estimate for professional exterminators to fully clean the attics is approximately \$12,000.**

### 3. Window Condensation.

Condensation was observed on the interior of a first-floor window at 9800 Leatherfern. The apparent condensation between the panes implies that the damaged window has a broken seal. BECS recommends replacing this damaged window. Also, condensation was observed on the interior of a first-floor window at 18310 Feathertree. This did not appear to be within the panes, and may be a result of air infiltration at the middle rail. BECS recommends inspecting the window seals to ensure integrity, and replacing windows as necessary. Through our observations, only two windows were found with condensation.

**In our opinion, the mode of failure must be further understood prior to replacing the windows with condensation. Replacement windows will cost approximately \$1,000 per window.**

## Retaining Wall Repairs

Retaining walls deficiencies observed around the property at Phase I and Phase II include safety hazards and potential for structural failures. Although the walls vary in severity, the identified retaining walls should all be considered for repairs and/or replacement.

### 1. Building Group #3.

The timber retaining wall behind Building Group #3, approximately 6 ft tall and 125 ft long, was observed to be the most significantly damaged and visibly failing wall on the property. Approximately half the length of this wall was observed leaning to some degree. At the leaning section, it was found that many of the regularly spaced deadman anchors were missing. Missing anchors would significantly reduce the stability and integrity of the wall, and cause reason for concern. Additionally, a number of timbers were found partially deteriorated, indicating that the wall may be approaching the end of its useful service life. The existing wall is within a short distance of Building Group #3, where one footing supporting the balcony has already been found to be settling.

To avoid potential failure, BECS recommends replacing the entire length of this existing retaining wall with a new, properly constructed wall. We recommend installing a modular MSE retaining wall. A new wall would also incorporate proper drainage with a drainage field and weeps behind the wall, and corrugated drain lines from downspouts continuing downhill beyond the wall. This will help prevent erosion and settlement of both the soils and the building behind the wall. **This is a safety concern, and repairs should be considered a high priority.**

**In our opinion, further engineering inspection and structural design are required. The impact of the adjacent building on the wall is currently not fully understood, and must be taken into consideration with the design and constructability. However, the estimated cost for engineering is approximately \$5,000, and the cost to install a typical Modular Retaining Wall of this length and height would be approximately \$65,000 to \$75,000. (Approximately \$500 to \$600 per LF)**

### 2. Building Group #5.

The timber retaining wall behind Building Group #5, approximately 4 ft tall and 40 ft long, was observed to have significant soil erosion was observed at one end of the wall. Erosion occurred where water is able to flow freely downhill, leaving the footing at the corner of the building exposed. Although the foundation does not appear to be cracking or settling, the footing is now considered to be above the frost line, with further erosion eventually likely to undermine the footing.

BECS recommends extending the retaining wall to a natural stopping point, and providing new compacted soils to cover the exposed footing. This may be approximately 15 ft of additional length. It is also an option to replace the wall with a modular MSE retaining wall, as the existing wall will likely reach the end of its lifespan within the next 5-10 years. Any new wall should also incorporate proper

drainage with a drainage layer and weeps behind the wall, and allow drain lines from the roof to continue downhill beyond the wall. This will help prevent erosion and settlement of the soils between the building and the wall.

**In our opinion, further engineering inspection and structural design are required. The impact of the adjacent building on the wall is currently not fully understood, and must be taken into consideration with the design and constructability. However, the estimated cost for engineering is approximately \$5,000, and the cost to install a typical Modular Retaining Wall of this entire length and height would be approximately \$22,000 to \$27,000. (Approximately \$400 to \$500 per LF)**

3. **Building Group #7.**

One short landscaping wall is leaning, and is less than a 2 ft. tall. This does not appear to be an immediate safety hazard.

BECS recommends removing the wall and replacing with a concrete curb, or small concrete wall set below frost depth.

**In our opinion, cost to address demolition and replacement the existing wall with a new concrete curb will be approximately \$2,000.**

4. **9800 Leatherfern Drive.**

Significant erosion has occurred at the end of the wall, behind the wall, and in front of the wall where water is allowed to escape through an opening. Despite the erosion, at the time of our observations the concrete wall behind 9800 Leatherfern Drive appeared to be in structurally stable condition.

BECS recommends assessing this wall further to consider various options for proper drainage. The excessive erosion should not be allowed to continue, considering the proximity to the building foundation and continued erosion and potential undermining of the existing retaining wall foundation. Appropriate drainage planes should be provided, along with re-establishing the original soil elevation in front of the wall.

**In our opinion, a cost estimate cannot be provided by BECS until after further engineering inspection and structural design are prepared. However, the estimated cost for engineering is approximately \$3,000, and the cost for construction to backfill, regrade, and provide adequate water management is approximately \$12,000. (Approximately \$150 per LF)**

5. **9810 Leatherfern Drive.**

Soil erosion has occurred at the intersection between a modular MSE retaining wall and the primary building foundation wall. This erosion has undermined a concrete A/C pad.

BECS recommends installing a drain at the top of the wall to feed water down, through the base of the wall, and continuing a significant distance down the hill and away from the building. This option should be considered at the opposite end of the retaining wall, where limited erosion was also observed near 9800 Leatherfern Drive. The eroded soils can then be backfilled.

**In our opinion, this would be a limited expense, considering the limited scope of work. For budgetary purposes, a cost estimate for providing backfill and adequate water management is approximately \$2,000.**

#### 6. **Building Group #9.**

Although not evidently failing, one section of a timber retaining wall at Building Group #9 appears to be deteriorating.

BECS recommends monitoring this wall for further deterioration or signs of failure. The top timber, which showed the greatest signs of deterioration, may be replaced.

**In our opinion, a cost estimate to replace this wall is approximately \$4,500. (Approximately \$150 per LF)**

### **Carports and Garages**

Most carports and garages were in visually acceptable condition. BECS did not have access to the interior of garages at Phase II.

#### 1. **18502 Boysenberry Drive.**

BECS recommends replacing or supplementing the visibly dented joist, to restore the structural integrity.

**In our opinion, a cost estimate to supplement this member is approximately \$1,500.**

#### 2. **18300 Feathertree Way.**

BECS recommends replacing the dented gutters, to ensure proper operation. Assuming the dented garage door is operational, this is likely a matter of appearance, and can be replaced at the discretion of the Association.

**In our opinion, a cost estimate to address this issue is approximately \$1,000.**

## **Prioritization Summary**

### **Phase I & Phase II - Common Repairs**

1. Roof Truss Damage.
2. Attic Draftstop Wall and Door Damage.
3. Attic Vent Line Displacement.
4. Wood Trim Deterioration – Phase II, Phase I.
5. Siding and Soffit Displacement and Damage.
6. Wall Sheathing and Weatherproofing Damage.
7. Roofing Damage and Weathering – Phase II, Phase I.
8. Roof Sheathing Damage – Phase II, Phase I.

### **Phase I - Building Repairs**

1. Foundation Settlement.
2. Exterior Stair Corrosion.
3. Missing Gutters, Downspouts, and Corrugated Pipes.
4. Pump Room Damage.
5. Railing Anchorage.
6. Electrical Hazards.
7. Clogged Dryer Vents.
8. Minor Wall Penetrations.
9. Window Condensation.
10. Concrete Walkway Deterioration.

### **Phase II - Building Repairs**

1. Electrical Room Damage.
2. Animal Waste in Attic.
3. Window Condensation.

### **Retaining Wall Repairs**

1. Building Group #3.
2. Building Group #5.
3. Building Group #7.
4. 9800 Leatherfern Drive.
5. 9810 Leatherfern Drive.
6. Building Group #9.

### **Carports and Garages**

1. 18502 Boysenberry Drive.
2. 18300 Feathertree Way.

## Closure

We appreciate the opportunity to be of service, and look forward to the opportunity to work with you to implement the recommendations of this report.

Very Truly Yours,

**Building Envelope Consultants and Scientists, LLC.**



Nicholas Palumbo, P.E.  
Project Manager



Steven C. Turner, P.E.  
Principal

Attachments:    **Appendix A: Building Group #1**  
                      **Appendix B: Building Group #2**  
                      **Appendix C: Building Group #3**  
                      **Appendix D: Building Group #4**  
                      **Appendix E: Building Group #5**  
                      **Appendix F: Building Group #6**  
                      **Appendix G: Building Group #7**  
                      **Appendix H: Building Group #8**  
                      **Appendix I: Building Group #9**  
                      **Appendix J: 9720 Leatherfern**  
                      **Appendix K: 9800 Leatherfern**  
                      **Appendix L: 9810 Leatherfern**  
                      **Appendix M: 18300 Feathertree**  
                      **Appendix N: 18310 Feathertree**  
                      **Appendix O: Carports and Garages**