

Byron K. Anderson, M.S.C.E., P.E. 60987, S.I. 7017423, C.G.C. 1525393, June 13, 2023



Summary of Findings

**Coachman Creek Condominium Association, Inc.
Buildings 1 through 28
2625 State Road 590
Clearwater, FL 33759
Claim Number: 4160072**



**16105 N. FLORIDA AVE., SUITE B, LUTZ, FL 33549
PH: (813) 849-5769 FAX: (813) 849-5770
FL EB NO. 9196**

STRUCTURAL ENGINEERING AND INSPECTIONS, INC.

SEI

June 13, 2023

Erin Dunnavant, Esq.
Danahy & Dunnavant
901 W Swann Avenue
Tampa, FL 33606

Regarding: Summary of Findings Buildings 1 through 28
Coachman Creek Condominium Association, Inc.
2625 State Road 590
Clearwater, FL 33759
Claim Number: 4160072

1.0 Introduction

Structural Engineering and Inspections, Inc. (SEI) has completed several inspections at the subject property and issued various reports documenting our findings and recommendations at the request of Danahy & Dunnavant, who is representing the Coachman Creek Condominium Association. The intent of this letter is to provide a summary of SEI's involvement at the subject property and a summary of our findings and recommendations. See our previous reports issued for individual buildings and previous reports issued for the temporary shoring effort and *dangerous* conditions for additional information. The following is a summary and timeline of relevant events:

1. SEI initially was contacted to inspect Building 5, evaluate *dangerous* and *unsafe* conditions, and provide shoring recommendations. SEI initially inspected Building 5 on August 4, 2020. At this time, the City of Clearwater was aware of *dangerous* and *unsafe* conditions present at Building 5. SEI concurred that *dangerous* and *unsafe* conditions were present at Building 5 and provided shoring recommendations. SEI also stated at that time that, "*Given the similar type of construction of Building 5 relative to the rest of the buildings in the community, SEI recommends that all buildings be surveyed for potential dangerous and/or unsafe conditions...*"
2. An initial shoring effort began circa 2020 following our inspection in August 2020. The initial shoring effort was completed by Handyworks Property Services, Inc. (HWPS).
3. An inspection of the HWPS shoring effort was completed by SEI on February 22, 2022. At the time of our inspection, it was apparent that our 2020 recommendations were not implemented. Additional *dangerous* conditions were also observed given that the aluminum soffit and fascia were removed to expose the underlying framing.
4. A supplemental shoring effort for Building 5 began on March 31, 2022, by G.A. Nichols Company. HWPS rejoined the supplemental shoring effort at Building 5 on April 29, 2022. SEI completed periodic inspections of the shoring effort on an approximate weekly basis until the shoring effort was near complete on or around May 2022.
5. SEI began completing inspections of the remaining buildings on February 22, 2022. The initial intent of the inspections was to determine if *Structural Damage* as defined by Florida Statute §627.706 (SB 408) was present at the buildings.
6. It became readily apparent during our initial inspections that widespread, systemic *dangerous* and *unsafe* conditions were present at several of the buildings within the community similar to Building 5.

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Accordingly, temporary shoring recommendations were issued by SEI and implemented by HWPS throughout SEI's inspections.

7. Prior inspections and evaluations of some buildings were completed by various other engineers, contractors, and the City of Clearwater prior to SEI's involvement at the subject property. These documents were provided for our review as part of our evaluation.

2.0 General Information

1. The Coachman Creek Condominium Association, Inc. community consists of a clubhouse, two pools, and 28 residential buildings, which are a combination of two-story and three-story structures with eight (8) and twelve (12) units, respectively.
2. The roof is constructed with pre-engineered wood trusses in a gable configuration and is covered with shingles.
3. The main exterior walls are constructed with masonry and covered with stucco. The gable ends of the roof are wood framed and also covered with stucco.
4. Each unit has its own private porch (lower units) or balcony (upper units).
5. The interior elevated floors are conventionally framed with 2x8's at 16 inches on center and bear on a framed wall at the center of the unit and common party walls. The balconies are framed primarily with 2x6's at 16 to 24 inches on center. All framed floors are topped with approximately 1.5 to 3 inches of lightweight concrete. The 2x6's typically bear on a single 2x8 ledger at the masonry wall or are notched into the masonry. A 2-ply 2x10 beam carries the 2x6's at all other areas.
6. The first floor is concrete slab on grade.
7. There are two sets of concrete and metal pan stairs with concrete and metal deck landings.

3.0 Investigation Methods

1. The following steps were performed as part of our assessment, not necessarily in this order:
 - a. A review of available historical aerial imagery was completed.
 - b. A review of available prior art was completed.
 - c. An inspection was performed where visible and accessible, primarily at the exterior of the building and bottom floor units. In some instances, SEI may have inspected a portion of the upper floor units as requested or as deemed necessary based on the results of ground floor or exterior inspections.
 - d. Interviews with homeowner(s), tenant(s), and/or representatives of the Condominium Association were conducted.
 - e. A review of applicable building codes and standards was completed.

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- f. A review of the design concept was completed.
- g. A floor elevation survey (FES) was performed to document the relative elevation differences of the floors within each bottom floor unit of the buildings. The FES was conducted with the Zip Level Pro-2000 Elevation Measurement System.
- h. A structure scan of the exterior walls was completed to identify the locations of concrete and rebar-filled cells in the exterior walls of each building. The structure scan was conducted with the Geophysical Survey Systems, Inc. (GSSI) Structure Scan Mini HR.
- i. A structural analysis of the exterior masonry walls was completed.
- j. A review of the permit history of the buildings was completed.
- k. Where necessary, temporary shoring measures were designed and inspected.
- l. Where requested, a report of findings was completed.

4.0 Relevant Florida Building Code Information

- 1. The following excerpts were obtained from the Florida Building Code, Existing Building, 7th Edition (2020) (FBCE).¹
 - **[BS] DANGEROUS.** *Any building, structure or portion thereof that meets any of the conditions described below shall be deemed dangerous:*
 - 1. *The building or structure has collapsed, has partially collapsed, has moved off its foundation or lacks the necessary support of the ground.*
 - 2. *There exists a significant risk of collapse, detachment or dislodgment of any portion, member, appurtenance or ornamentation of the building or structure under service load.*
 - **UNSAFE.** *Buildings, structures or equipment that are unsanitary, or that are deficient due to inadequate means of egress facilities, inadequate light and ventilation, or that constitute a fire hazard, or in which the structure or individual structural members meet the definition of "Dangerous," or that are otherwise dangerous to human life or the public welfare, or that involve illegal or improper occupancy or inadequate maintenance shall be deemed unsafe. A vacant structure that is not secured against entry shall be deemed unsafe.*

¹ The Florida Building Code, Existing Building, 7th Edition (2020) (FBCE) Retrieved from <https://codes.iccsafe.org/content/FLEBC2020P1> (Accessed January 2021).

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5.0 Relevant Florida Statutes²

1. **F.S. 627.706(2)(i):** *“Sinkhole activity” means settlement or systematic weakening of the earth supporting the covered building only if the settlement or systematic weakening results from contemporaneous movement or raveling of soils, sediments, or rock materials into subterranean voids created by the effect of water on a limestone or similar rock formation.*
2. **F.S. 627.706(2)(j):** *“Sinkhole loss” means structural damage to the covered building, including the foundation, caused by sinkhole activity. Contents coverage and additional living expenses apply only if there is structural damage to the covered building caused by sinkhole activity.*
3. **F.S. 627.706(2)(k):** *“Structural damage” means a covered building, regardless of the date of its construction, has experienced the following:*
 1. *Interior floor displacement or deflection in excess of acceptable variances as defined in ACI 117-90 or the Florida Building Code, which results in settlement-related damage to the interior such that the interior building structure or members become unfit for service or represents a safety hazard as defined within the Florida Building Code;*
 2. *Foundation displacement or deflection in excess of acceptable variances as defined in ACI 318-95 or the Florida Building Code, which results in settlement-related damage to the primary structural members or primary structural systems that prevents those members or systems from supporting the loads and forces they were designed to support to the extent that stresses in those primary structural members or primary structural systems exceeds one and one-third the nominal strength allowed under the Florida Building Code for new buildings of similar structure, purpose, or location;*
 3. *Damage that results in listing, leaning, or buckling of the exterior load-bearing walls or other vertical primary structural members to such an extent that a plumb line passing through the center of gravity does not fall inside the middle one-third of the base as defined within the Florida Building Code;*
 4. *Damage that results in the building, or any portion of the building containing primary structural members or primary structural systems, being significantly likely to imminently collapse because of the movement or instability of the ground within the influence zone of the supporting ground within the sheer plane necessary for the purpose of supporting such building as defined within the Florida Building Code; or*
 5. *Damage occurring on or after October 15, 2005, that qualifies as “substantial structural damage” as defined in the Florida Building Code.*

²Relevant Excerpts from Florida Statutes. Retrieved from <https://flsenate.gov/Laws/Statutes/2021/627.706> (Accessed May 30, 2023)

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6.0 Historical Aerial Research

1. A review was conducted of publicly available material including current and historical aerial imagery from 1943 to 2021, sourced from the Florida Collection of the University of Florida Digital Collection (UFDC) Map and Imagery Library,³ the Florida Department of Transportation (FDOT) Aerial Photo Lookup System,⁴ and Google Earth.⁵ The historical aerial imagery for the subject property is retained digitally and available upon request. Pertinent observations from the review of historical aerial images are discussed below.
 - a. Circa 1943, the subject community appeared to have been primarily undeveloped and part of an agricultural area with circular and irregular shaped closed depressional / wetland features in the surrounding area. Particularly, a circular depressional feature reminiscent of a paleokarst feature was located adjacent to Building 1, Building 2, and Building 23. Additionally, the north portion of Building 1 and Building 2 appeared to be overlying the paleokarst feature, as shown in the 1952 historical aerial photograph below in **Figure 1**.
 - b. In the 1952 aerial, as shown in **Figure 1**, it appears that a man-made pond was created at the southeast portion of the property.
 - c. In 1962, it appears that most of the vegetation was removed in the northern section of the property in preparation for residential development.
 - d. By 1976, the site had been fully developed with buildings surrounding the north and west portions of the aforementioned pond and low-lying areas filled in. A relatively current aerial photograph circa 2021 is included in **Figure 2** below for reference.

³ University of Florida Map & Imagery Library. Retrieved from: <https://cms.uflib.ufl.edu/maps/Index.aspx>. (Accessed on August 17, 2020).

⁴ Florida Department of Transportation Aerial Photo Lookup System. Retrieved from: <https://fdotewp1.dot.state.fl.us/-AerialPhotoLookupSystem>. (Accessed on August 17, 2020).

⁵ Google Earth. Retrieved From: <https://www.google.com/earth/>. (Accessed on July 15, 2021).

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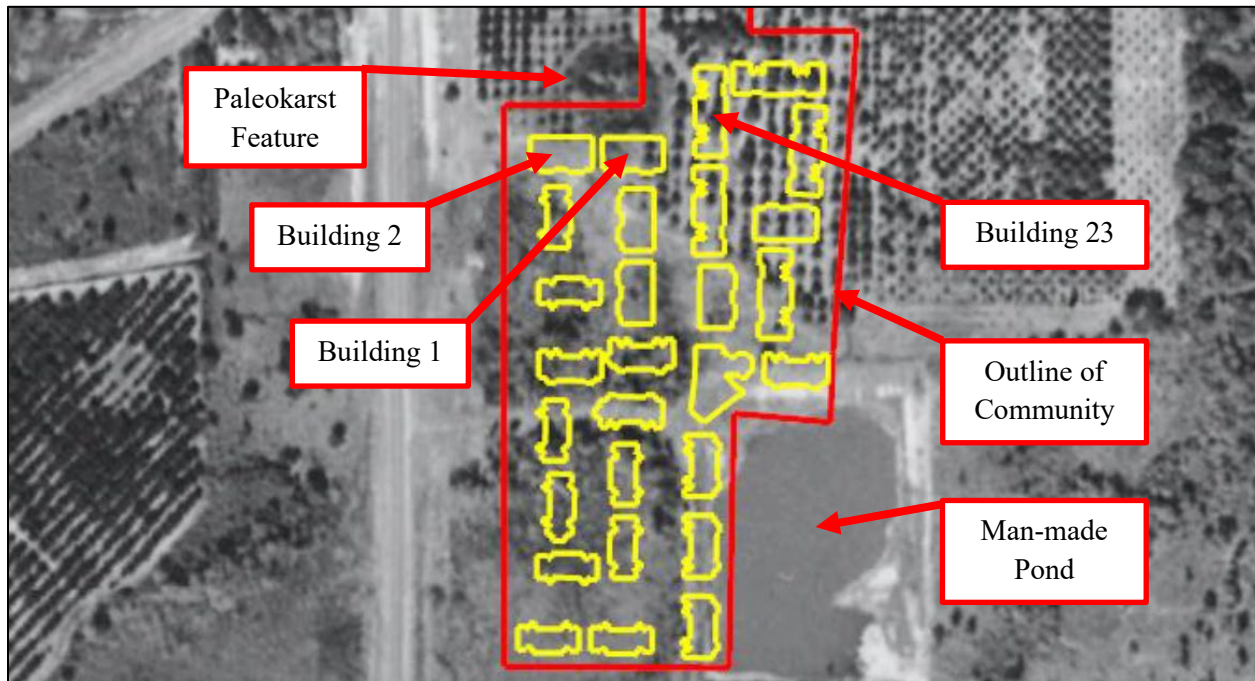


Figure 1 – 1952 Historical Aerial Photograph



Figure 2 - 2021 Aerial Photograph

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7.0 FEMA Flood Zones

A review of the current FEMA flood map indicates that several of the buildings on the south end of the property are located in a FEMA special flood hazard area AE (blue area) or flood zone X (orange area). Buildings 9, 10, 11, 12, and 15 appear to be located in zone AE. Buildings 7, 8, 14, and 16 appear to be located in zone X.



Figure 3 - Excerpt from FEMA Flood Map

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8.0 Prior Art Review

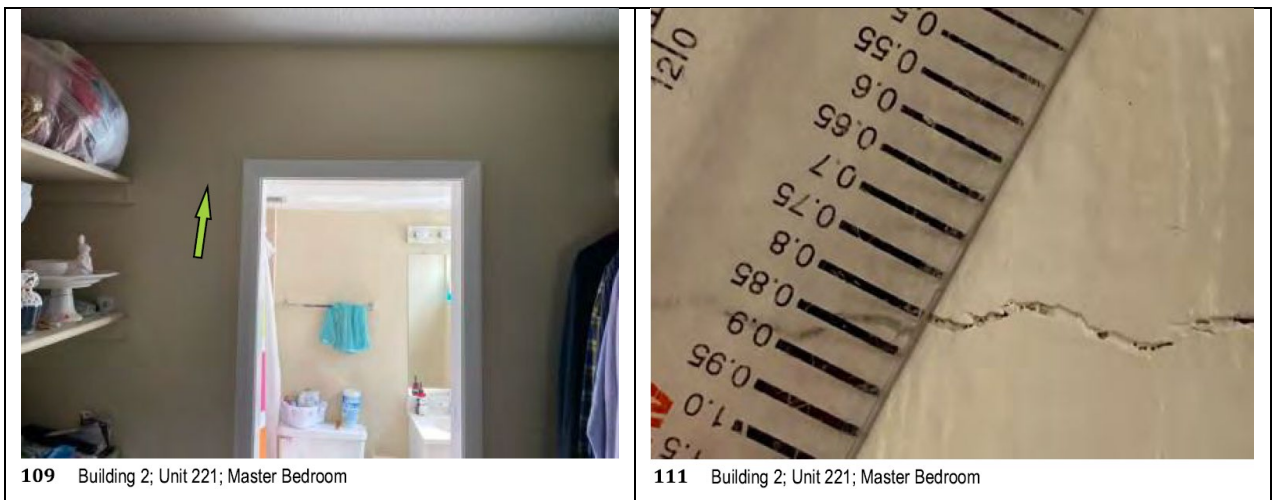
1. The following documents were provided that are relevant to Building 2, 21, and 23. Pertinent information obtained from the documents is provided as an excerpt or shown in italics below. Our comments are not italicized.
 - a. Sinkhole Loss Investigation Buildings 2, 21, and 23, prepared by Grindley Williams Engineering (GWE), dated August 11, 2020.
 - i. Page 10 – *Given that no conditions causing concern of imminent collapse were observed on the buildings, the criteria for structural damage under Item #4 are not satisfied.*

The intent of Item #4 is to evaluate whether the building or any structural portion of the building is significantly likely to imminently collapse because of movement or instability of the soils supporting the building. GWE did not complete at least 30 ft. standard penetration test (SPT) borings to rule out the presence of Item #4 of *Structural Damage* in accordance with industry standards. This is particularly concerning given the presence of a large paleokarst feature located adjacent to Building 1, Building 2, and Building 23 and the fact that this paleokarst feature was not considered in GWE’s assessment of the building.

- ii. Page 11 – *The binding of the front doors at Building 21, Units 2122 and Unit 2123, and Building 23, Unit 2324 were due to deferred maintenance and hardware in need of adjustment, unrelated to differential settlement/movement based on the lack of associated issues.*

SEI notes that GWE reported door frames were out-of-square and documented cracking in the drywall around door frames. No documentation was provided regarding deferred maintenance or hardware in need of adjustment.

- iii. Page 55/56 –





Photograph 135 Building 21; Unit 2123; Walk-In Closet

Negligible to very slight crack in wall surface originating at door opening



Photograph 136 Building 21; Unit 2123; Walk-In Closet

Alternate view of previous photograph

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v. Appendix C – Page 2 –

| Penetrometer Log (Building 21) | | | | | | | | | | | | | | |
|--------------------------------|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Depth (inches) | Q _c (kg/cm ²) | | | | | | | | | | | | | |
| | P15 | P16 | P17 | P18 | P19 | P20 | P21 | P22 | P23 | P24 | P25 | P26 | P27 | P28 |
| 0 to 6 | 5 | 5 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | OB | 10 | 10 | 10 |
| 6 to 12 | 5 | 5 | 10 | OB | 10 | 20 | OB | OB | R | 25 | | R | R | R |
| 12 to 18 | 5 | 5 | 10 | | OB | 35 | | | | R | | | | |
| 18 to 24 | 10 | 10 | 10 | | | R | | | | | | | | |
| 24 to 30 | 10 | 10 | 10 | | | | | | | | | | | |
| 30 to 36 | 15 | 10 | 10 | | | | | | | | | | | |
| 36 to 42 | 25 | 10 | R | | | | | | | | | | | |
| 42 to 48 | 25 | 10 | | | | | | | | | | | | |

R: Refusal (Dial reading ≥ 40)
OB: Obstruction (Dial reading ≥ 40)

GWE encountered very loose soils to the extent of CPT P16 and loose soils to the extent of CPT P15. Soil testing should have been completed to at least medium dense material.

2. The following pertinent information was obtained from Sinkhole Loss Investigation, prepared by Grindley Williams Engineering for Building 5, dated September 14, 2020.
 - a. GWE stated that *Structural Damage* is present at the building, however, the damage is not the result of *Sinkhole Activity*, therefore there is no *Sinkhole Loss*.
 - b. GWE stated that adverse differential settlement is related to highly plastic clayey soils, buried debris, and decomposition of organic-laden soils. GWE also attributed inadequate compaction as well as erosion and percolation of water around footings as additional contributing factors.

3. The following documents were provided that are relevant to Building 22 and/or Building 25. Pertinent information obtained from the documents is shown in italics or summarized below.
 - a. Report of Settlement Investigation and Structural Damage Evaluation, prepared by Florida Testing & Environmental, Inc. (FTE) for Building 22, dated January 7, 2019.
 - i. FTE concluded that *Sinkhole Activity*, *Structural Damage*, and *Sinkhole Loss* were present at the subject building.
 - ii. FTE recommended a program of compaction and chemical grouting.
 - b. Sinkhole Loss Investigation Building 22 and 25, prepared by Grindley Williams Engineering (GWE), dated August 5, 2019.
 - i. GWE disagreed with FTE’s findings and concluded that *Structural Damage*, *Sinkhole Activity*, and a *Sinkhole Loss* were not present at Building 22 or Building 25.

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- ii. Notable sinkhole indicators were not present in any of the GWE borings completed for buildings 22 and 25.
4. The following documents were provided that are relevant to Building 28. Pertinent information obtained from the documents is shown in italics or summarized below.
 - a. Coachman Creek Condominium Building 28 Limited Structural Investigation, prepared by McCarthy and Associates, Inc. Consulting Engineers for Building 28, dated September 1, 2002.
 - i. The report summarizes a limited non-destructive inspection of Building 28. The report states that there may be major structural issues in the building, and it was recommended that a structural and geotechnical engineer be contacted to evaluate the cause and origin of differential settlement and design repairs. The report also recommended that destructive investigation of framing connections be completed at the east wall to evaluate potential compromise due to observed settlement and outward rotation of the east wall.
 - b. Results of Settlement Investigation, prepared by Driggers Engineering Services, Inc. (Driggers) for Building 28, dated December 13, 2002.
 - i. Driggers reported the foundation to be embedded 10 inches below grade.
 - ii. Driggers completed six hand auger borings up to 10 feet below grade and determined that the cause of differential settlement was highly plastic clays and organic soils.
 - iii. Driggers noted that other causes of differential settlement may be present such as *Sinkhole Activity*, but standard penetration test (SPT) borings and ground penetrating radar (GPR) would be necessary to determine.
 - c. Coachman Creek Condominium Building 28, prepared by McCarthy and Associates, Inc. Consulting Engineers, dated December 11, 2003.
 - i. The letter states that based on a review of the building history and testing completed by Driggers Engineering Services, the structural integrity of the building was not compromised, and that underpinning should be performed.
 - d. Coachman Creek Condominium Building 28, prepared by McCarthy and Associates, Inc. Consulting Engineers, dated March 29, 2004.
 - i. The letter summarizes various observations and concerns including a progression of damage, notable slopes to floors (3/4-inch in 4 feet), out-of-plumb exterior walls (1 inch in 4 feet), corrosion, wood rot, stucco damage, handrail issues, and concrete spalling.
 - ii. The letter stated that in addition to underpinning, structural repairs are necessary and that a settlement monitoring program, deeper SPT borings, and verification of foundation depth versus original soils and fill areas is recommended.
 - iii. The letter reiterated that floor/roof connections should be exposed and evaluated.

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- iv. The letter stated that additional repair solutions may be necessary depending on the results of the testing recommendations.
- e. Retrofit Foundation Repair, prepared by Silcox, Kidwell, & Associates, Inc. for Structural Solutions, LLC. for Building 28, dated August 14, 2006.
 - i. Page 1 – *The retrofit foundation repair was completed in accordance with the directive furnished by this office and as reflected in the repair plan for this particular project.*
 - ii. The letter did not comment on the location or depth of underpins used for repair.
- f. Invoices and agreement, prepared by Structural Solutions, LLC. – Florida for Building 28, dated on or around May 26, 2006.
 - i. The invoices and agreement indicate that 43 underpins were installed for a fee of \$40,802.00.
- g. Housing Inspectors Report, prepared by the City of Clearwater Planning and Development Department for Building 28, dated February 22, 2013.
 - i. The letter summarized several “major” conditions including *unsecured guardrails...stairway handrails...balcony walkways and supports failing...cracks in sidewalks and balcony walks in means of egress paths...cracks in exterior plaster walls...Violations are throughout condominium complex.*
- h. Peer Review and Floor Elevation Surveys – Building 28, prepared by Universal Engineering Services, dated May 25, 2017.
 - i. UES reported overall elevation differentials on the order of 8.8 inches.
 - ii. UES found organics, debris, and clay in hand augers.
 - iii. UES stated that the existing underpin depths are unknown.
- i. Sinkhole Loss Investigation, prepared by Grindley Williams Engineering for Building 28, dated February 13, 2020.
 - i. GWE stated item #1 was only partially satisfied because there were no *dangerous* or *unsafe* conditions observed at the interior. SEI strongly disagrees with this statement.
 - ii. GWE stated that criterion #2 of *Structural Damage* was identified.
 - iii. GWE stated that *Sinkhole Activity* and *Sinkhole Loss* were not identified.
 - iv. GWE recommended structural repairs to masonry.

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9.0 Observations

1. The following are examples of our visual observations during our inspections of the readily accessible areas. This is not meant to be an all-inclusive list.

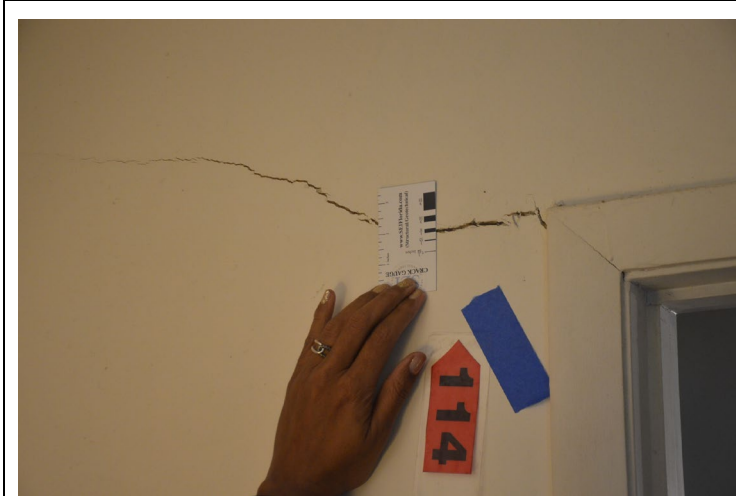


Vertically displaced concrete topping on second floor at Building 5



Vertically displaced concrete topping at Building 4

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Drywall cracking at Building 4



Binding and out-of-square door at Building 4



Deteriorated wood beam and
deteriorated/corroded metal hanger at Building 5

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Deteriorated framing at Building 22



Temporary repairs and shoring to deteriorated framing at Building 22



Corroded and distorted metal hangers at Building 19

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Broken handrail connection at Building 13



Distorted aluminum soffit at Building 4



Deteriorated wood beam at Building 12

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Apparent water intrusion/staining at aluminum soffit at Building 24



Underlying deteriorated framing at Building 24 after soffit was removed



Corroded metal stairs at Building 28

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Corrosion and minimal bearing of concrete and metal deck at the stairway landing of Building 11



Loose screw at metal stairs of Building 11



Exterior masonry cracking at Building 5

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Approximate 2-inch separation of interior concrete floor slab from baseboard at Building 28



Interior drywall cracking at Building 24 adjacent to cracking at exterior masonry wall



Exterior cracking at masonry wall of Building 24 adjacent to interior drywall cracking

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10.0 Summary of Findings

Based on our evaluation of the data discussed herein, SEI's testing, and visual observations of the building exteriors, ground floor units, and a portion of upper floor units, we conclude the following within a reasonable degree of professional probability:

1. Various *dangerous* and/or *unsafe* conditions were observed at several buildings. This includes, but may not be limited to, corroded stairwells and beam hangers, offset cracks in concrete, out-of-square and binding doors, loose handrails, insufficient bearing at metal pan landings, deteriorated framing, etc. Representatives of Coachman Creek were put on notice of these conditions as they were discovered.
2. Based on the results of our inspections from primarily the exterior and interior of bottom floor units, readily apparent *dangerous* and *unsafe* conditions were observed at buildings 2, 3, 4, 5, 7, 11, 12, 13, 14, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, and 28.
3. At this time, under the direction of SEI, HWPS has completed temporary shoring at buildings 2, 3, 4, 5, 7, 11, 13, 14, 16, 17, 18, 21, 22, 23, 24, 25, and 26. Additional shoring remains to be completed at buildings 12, 19, and 28. Final repairs shall be completed to eliminate the *dangerous* conditions.
4. The intent of the temporary shoring effort and design is to temporarily eliminate readily apparent *dangerous* structural conditions until final repairs can be implemented. The intent of the shoring effort is not to eliminate all *unsafe* conditions or to complete all necessary maintenance items on the building. Additionally, the shoring effort is not intended to address all *dangerous* conditions associated with overstressed members in a wind event or potential geological hazards. The shoring design and effort is only adequate under normal weather conditions. The shoring effort shall not be construed in part or whole as a final repair to the building. Once the shoring is completed and approved by SEI, the shoring shall be inspected by SEI or another Professional Engineer every 3 months until final repairs are completed. The findings of the inspection shall be submitted to SEI and the authority having jurisdiction.
5. No readily apparent *dangerous* conditions were observed at buildings 1, 6, 8, 9, 15, and 27.
6. Based on our experience with the community, the aluminum soffit and fascia have concealed latent defects in the underlying framing. Accordingly, additional *dangerous* and *unsafe* conditions may exist at upper floor units that were not inspected. To inspect the underlying building components, SEI recommends that the soffit and fascia be removed in areas where excessive differential movement or concrete cracking is observed, where water intrusion is apparent, where excessive corrosion is observed, or where framing damage or deflection is observed. It is likely that shoring or framing repairs would be required in these areas. **All interested parties including but not limited to unit owners, maintenance personnel, property managers, contractors, government officials, insurance professionals, etc. that observe this type of damage shall inform the association so further investigation of the area can be completed.**
7. At this time, SEI has determined that *Structural Damage* as defined by Florida Statute §627.706 (SB 408) is present at buildings 2, 4, 5, 7, 9 through 17, 19, and 22 through 28. Accordingly, further investigation is warranted at these buildings to determine if *Sinkhole Activity* is a contributing cause of this damage. Further investigative methods shall, at a minimum, include but may not be limited to geophysical testing such as ground penetrating radar (GPR) and/or Electrical Resistivity Imaging (ERI) and geotechnical testing such as standard penetration test (SPT) borings to the depth of competent limestone.

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8. At this time, SEI has not determined that *Structural Damage* as defined by Florida Statute §627.706 (SB 408) is present at buildings 1, 3, 6, 8, 18, 20, 21, and 23. However, *Structural Damage* cannot be ruled out. Specifically, the presence of Criterion #4 of *Structural Damage* cannot be ruled out. The intent of Criterion #4 is to evaluate whether the building or any structural portion of the building is significantly likely to imminently collapse because of movement or instability of the soil supporting the building. To investigate the presence of Criterion #4 of *Structural Damage*, at a minimum, a GPR and/or ERI survey is necessary, followed by SPT borings to a depth of at least 30 feet below ground surface.
9. Based on historical aerial research, it is apparent that a large paleokarst feature adjacent to buildings 1, 2, and 23 was filled in during development of the property. A paleokarst feature is a landform associated with *Sinkhole Activity*.
10. At Building 28, *Sinkhole Activity* as defined by Florida Statute S627.706(2)(i) cannot be ruled out as a contributing cause of *Structural Damage*. Therefore, a *Sinkhole Loss* as defined by Florida Statute S627.706(2)(j) cannot be eliminated. SEI recommends additional geophysical and geotechnical testing be completed at the property. At a minimum, SEI recommends an additional SPT boring at the center rear and front of Unit 2811.
11. At Building 28, the subsurface conditions encountered by GWE, and site conditions observed by SEI are quite deleterious. Specifically:
 - a. The borings completed at the rear (borings SPT-1, SPT-2, and SPT-3) encountered buried debris and organics to depths ranging from 10 feet to 18.5 feet below grade. SEI generally concurs with GWE that this is a contributing cause of damage due to consolidation and decomposition of the soils as well as migration of soils into nested voids within buried debris.
 - b. The borings completed at the front of the building (borings SPT-4, SPT-5, and SPT-6) encountered highly plastic near-surface clayey soils. SEI generally concurs with GWE that this is a contributing cause of damage due to volumetric expansion and shrinkage of these soils under fluctuating moisture conditions.
 - c. The building resides on a relatively steep slope at the rear. Given the pattern of elevation contours observed in the FES towards the rear slope, there may be slope stability issues, particularly given the deleterious backfill underlying the rear of the building.
12. At Building 28, given the deleterious subsurface conditions encountered including but not limited to buried organics and debris, highly plastic clayey soils, and possible *Sinkhole Activity* as well as the significant *Structural Damage* and approximately 10 inches of elevation differential observed in the FES, extensive measures are necessary to stabilize the land and building and repair the foundation. At a minimum, repairs may include but may not be limited to:
 - a. Compaction grouting to mitigate *Sinkhole Activity*.
 - b. Removal and replacement of the interior floor slab and foundations with a structural slab supported on piles. This will require shoring of the second and third level floor framing, as well as removal and replacement of interior walls and associated mechanical, electrical, and plumbing systems. Complete removal and replacement of the drywall in these units will also be necessary.
 - c. Repairs or retrofitting will likely be necessary at exposed undersized floor framing members.

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- d. The foundation and pile system shall be designed to bypass buried organics and debris and highly plastic clays. The foundation and pile system shall also be designed to resist uplift forces generated from volumetric expansion of plastic clays. Underpins designed for both tension and compression or grouted micropiles are potential suitable alternatives for the piling system. Piles shall be located at the supporting elements of the structural slab as well as at all interior and exterior load bearing elements.
 - e. SEI generally concurs with GWE that structural repairs are required at the masonry walls. This shall include epoxy injection at masonry cracks, possible removal and replacement of masonry components, and/or retrofit filled cells.
 - f. All *dangerous* conditions shall be eliminated as part of the repair in accordance with Chapter 4 of the 2020 Florida Building Code, Existing Building, 7th Edition. Additionally, in accordance with Florida Statute S627.707, the building shall be stabilized as part of the repair. Therefore, all deteriorated framing shall be repaired, or removed and replaced.
 - g. SEI recommends that a cost-benefit analysis be completed when final repairs are designed to determine if demolishing and replacing the structure on a deep foundation with soil improvement would be a more cost-effective approach.
13. At Building 22 and Building 5, *Sinkhole Activity* as defined by Florida Statute S627.706(2)(i) cannot be ruled out as a contributing cause of *Structural Damage*. Therefore, a *Sinkhole Loss* as defined by Florida Statute S627.706(2)(j) cannot be eliminated.
14. In order to remediate *Sinkhole Activity* at Building 22, and stabilize the land and building and repair the foundation the following is necessary:
- a. This property should be grouted utilizing low mobility compaction grout to seal off the limestone surface, fill voids, and compact the soils from the depth of competent limestone to 15 feet below ground surface.
 - b. This property should also be grouted utilizing a program of expanding polyurethane chemical injection grouting in order to densify near-surface very loose to loose near-surface soils and provide for more uniformly compacted soils.
 - c. In accordance with Chapter 4 of the Florida Building Code, all *dangerous* conditions shall be eliminated as part of the repair. Additionally, in accordance with Florida Statute S627.707, the building shall be stabilized as part of the repair. Therefore, all deteriorated framing shall be repaired, or removed and replaced.
15. In order to remediate *Sinkhole Activity* at Building 5, and stabilize the land and building and repair the foundation the following is necessary:
- a. Compaction grouting to mitigate *Sinkhole Activity*.
 - b. Removal and replacement of the interior floor slab and foundations at all units with a structural slab supported on a deep foundation. This will require shoring of the second and third level floor framing, as well as removal and replacement of interior walls and associated mechanical, electrical,

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and plumbing systems. Complete removal and replacement of the drywall in these units will also be necessary.

- c. Repairs or retrofitting will likely be necessary at undersized floor framing members.
 - d. The foundation and pile system shall be designed to bypass buried organics and debris and highly plastic clays. The foundation and pile system shall also be designed to resist uplift forces generated from volumetric expansion of plastic clays. Underpins designed for both tension and compression or grouted micropiles are potentially suitable alternatives for the piling system. Piles shall be located at the supporting elements of the structural slab as well as at all interior and exterior load bearing elements.
 - e. SEI generally concurs with GWE that structural repairs are required at the masonry walls. This shall include epoxy injection at masonry cracks, possible removal and replacement of masonry components, and/or retrofit filled cells.
 - f. All dangerous conditions shall be eliminated as part of the repair in accordance with Chapter 4 of the 2020 Florida Building Code, Existing Building, 7th Edition. Additionally, in accordance with Florida Statute S627.707, the building shall be stabilized as part of the repair. Therefore, all deteriorated framing shall be repaired, or removed and replaced.
 - g. Various *unsafe* conditions as defined within the FEBC remain at the building. This includes but may not be limited to means of egress issues such as excessive sloping floor surfaces, tripping hazards (offset concrete cracks, for example), and binding doors. These items shall be addressed as part of final repairs. The occupants of the building should exercise caution in these areas until final repairs are completed.
 - h. Various maintenance items remain at the building. This includes but may not be limited to widespread roof leaks and leaks through stucco over frame. These items shall be addressed as part of final repairs.
 - i. SEI recommends that a cost-benefit analysis be completed when final repairs are designed to determine if demolishing and replacing the structure on a deep foundation with soil improvement would be a more cost-effective approach.
16. As at least a portion of the Coachman Creek property and several of the buildings are in a FEMA Special Flood Hazard Area, and the buildings were constructed pre-FIRM, current flood elevation certificates are required for any building prior to finalizing repair recommendations. The flood elevation certificates are necessary to determine if substantial damage / repair (50% rule) requirements have been triggered.

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11.0 Closure

1. All work shall be performed by a Florida Certified Contractor in accordance with applicable building codes and standard building practices. Our findings and conclusions are limited to the specific areas mentioned for the above-referenced project at the time of inspection and for the structural items contained herein only. If field conditions change or are different than indicated, it is the responsibility of all parties to contact Structural Engineering and Inspections, Inc. This inspection and our findings shall not be construed in part or whole as a list of all possible defects.
2. The sign and seal on this project indicate professional engineering responsibility for the structural and geotechnical portion only. General architecture, life safety, accessibility, electrical, mechanical, etc. are the responsibility of others.