



Wiss, Janney, Elstner Associates, Inc.
745 Fort Street, Suite 2200
Honolulu, Hawaii 96813
808.591.2728 tel
www.wje.com

September 19, 2025

Larry Warner
Board President
KBV AOA
4330 Kauai Beach Drive
Lihue, Hawaii 96766

Interim Assessment of Kauai Beach Villas

WJE No. 2024.2062.1

Dear Mr. Warner,

Wiss, Janney, Elstner Associates Inc. (WJE) was requested by the Hardy Group on behalf of the Kauai Beach Villas Association of Apartment Owners (AOAO), to complete a visual condition assessment of the exterior facade at the Wyndham Kauai Beach Villas (KBV), located at 4330 Kauai Beach Drive in Lihue, Kauai for the continuation of the interim assessments program described in our approved proposal dated April 1, 2024. The intent of the program is to identify structural safety concerns that are visually evident from the exterior and provide recommendations for mitigation. We specifically looked for conditions that could pose a falling debris hazard, loss of structural integrity at lanai railings, loss of structural integrity at the floor slabs, and deterioration of installed shoring at the lanais.

This letter summarizes our findings and recommendations from our visit to the property on September 4, 2025. The findings are limited to buildings A through F. Buildings G and H were not included in the survey because Building G is currently under construction and Building H is not occupied.

BACKGROUND

KBV consists of eight three story primary structures, identified as Buildings A through H, two pool houses and a maintenance building. The complex was developed in the 1980s for vacation occupancy and was constructed with lift slab construction method using 5-inch thick post-tensioned slabs supported by steel columns. The exterior perimeter walls are wood framed and clad with plywood sheathing, covered with ½" thick gypsum wall board with weather barrier and cement board siding. Interior partition walls are either framed with light gauge metal or wood framed and clad with gypsum wall board. Some areas of the structures have concrete masonry walls.

Since 2017, WJE has completed numerous assessments and identified deterioration to the concrete slabs due to corrosion of the embedded reinforcement, corrosion of the steel columns due to leaks in the building envelope, corrosion of the aluminum railings, and corrosion of the fasteners supporting the roof soffits. To address the observed distress, WJE has prepared repair drawing sets to address deterioration of the buildings concrete slabs, steel columns, lanai railings and roof soffits. Due to delays in completing the repairs, WJE has also completed periodic interim visual inspections which are summarized in our letter reports. A detailed history of our involvement prior to 2022 is outlined in our June 28, 2022 interim report and will not be repeated here. Since the June 28, 2022 report, WJE has completed four interim

assessments in 2023 and two assessments in 2024. The latest interim assessment was completed in February 2025 with the report dated April 10, 2025. Findings and recommendations from these assessments have been provided to the AOA in letter reports.

Some items identified in our previous reports have been previously addressed. These include installation of wood shores at the lanai floor slabs at corroded steel columns, slab edge repairs at building F in 2022 completed by Seal Masters Hawai'i (SMH), numerous rounds of concrete removal to prevent falling debris hazards, most recently in June 2023 also by SMH, installation of retrofit metal brackets at handrails in September 2023 by the property's maintenance crew and replacement of the wood soffits at Buildings F, G and H with vinyl soffits in 2024. Currently, SMH is in the process of completing repairs at building G to address concrete deterioration at the floor slabs and replace the lanai railings. The repairs are being completed per the drawings developed by WJE dated August 2024 and titled *Kauai Beach Villas Building G*. We understand that Building H will undergo similar repairs following the repairs to Building G per the drawings provided by WJE also dated August 2024, but this work is not yet underway.

OBSERVATIONS

Mr. Jarkko Simonen of WJE visited the project site on September 4, 2025, to perform a visual condition assessment of the exterior facade of Buildings A through F. The assessment was completed from the ground level along the perimeter of each of the six buildings and did not include entering the units or removing any finishes to inspect concealed conditions.

The conditions observed at each of the buildings are similar and consistent with the observations from our previous assessments and include the following:

- **Cracked, delaminated, or spalled concrete** – Concrete deterioration in the form of cracks, delaminations and spalls is ongoing and additional distress was observed during this survey. Areas that appear to be loose or that could fall in the near term were found at most of the buildings (Figure 1 and Figure 2). Falling concrete presents a potential hazard to pedestrians below and should be removed immediately. Locations of loose spalls are listed below and are identified with red triangles in Appendix A with areas that present highest safety hazard further highlighted with a text annotation.
 - Building A – Makai Stairwell, Units A12, A16 and A18 on Wailua Elevation and unit A17 on Lihue elevation.
 - Building B – Units B12 and B18 Makai Elevation and Unit B12 on Mauka Elevation.
 - Building C – N/A
 - Building D – Unit D21 Mauka Elevation, Units D15 and D16 on Lihue Elevation and units D6 and D15 on Wailua Elevation.
 - Building E – Unit E3 on Mauka Elevation, Unit E16 and stairwell on Makai Elevation, Units E11, E16 and E18 on Lihue Elevation and Units E4, E6, E9, E10 and E12 on Wailua Elevation.
 - Building F – Units F7 and F18 on Makai Elevation.

In addition to loose concrete identified above, new concrete deterioration, such as cracks or growth of existing concrete delaminations or spalls, were found throughout all the buildings. These areas are denoted by red revision clouds in Appendix A. Unit D9 was also noted to have two delaminations

consistent with possible post-tension cable breaks, identified with text annotations in Appendix A (Figure 3).



Figure 1. Overhead Falling Debris Hazard, Unit A17.



Figure 2. Overhead falling debris hazard unit E16

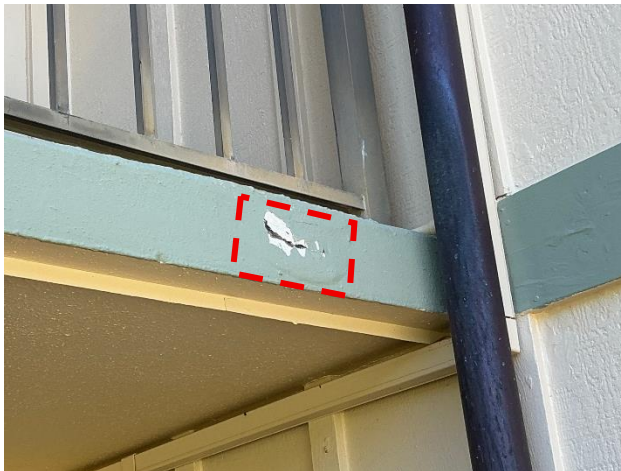


Figure 3. Delamination as a Result from PT Distress

- Railings** – Railings that have reduced structural integrity due to concrete spalls at the railing posts or due to visible corrosion of the railing elements are present at all buildings observed (Figure 4, Figure 5 and Figure 6). Full depth section loss in the railing pickets is widespread in all buildings. Some isolated areas of full-depth section loss are also present at the railing posts. Based on observations, the section loss appears to be progressing from the inside out suggesting that internal corrosion of the railing is occurring. The observed section loss, evidenced by through-depth holes, has reduced the structural capacity of the affected elements. Some elements have either lost full or most of their cross-sectional area or have already dislodged and therefore have no effective structural capacity remaining (Figure 7).

Some of the railing pickets have been retrofitted with metal angles and some of the top rails have been secured to walls, columns or previously installed shoring posts with metal straps or screws. Many of these retrofits are corroded or the fasteners between the strap and connected elements have failed (Figure 8 and Figure 9). Strap type retrofits with advanced deterioration have been identified with text annotations in Appendix A. Corroded picket retrofits are not specifically identified and are included in the picket distress annotation, purple rectangle in Appendix A.

Railings that visually appear to be most affected by loss of support at post connections or have lost significant cross-sectional area at the pickets or posts are highlighted with yellow in Appendix A. Railing or sections railings highlighted in yellow may not have sufficient capacity to resist the required design loads. This issue is widespread, affecting more than 50% of the railings at each building.

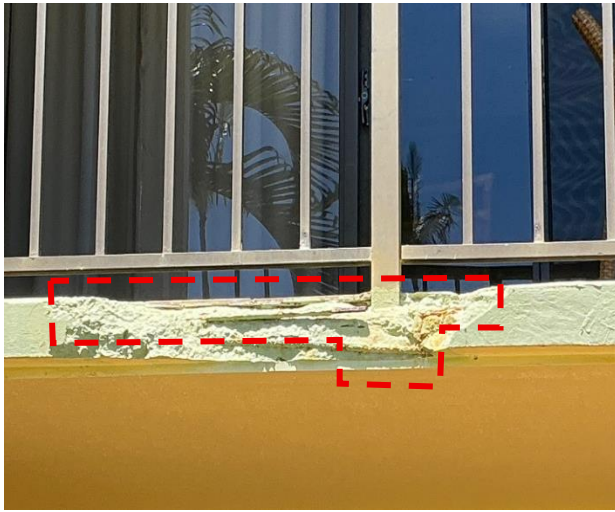


Figure 4. Exposed Post Base Unit C16



Figure 5. Typical Lanai Corrosion with full depth holes. Unit E10 shown.



Figure 6. Hole at post unit E10 lanai



Figure 7. Missing picket at unit F12



Figure 8. Corroded angle retrofits installed at railing pickets at Lihue elevation of Building D.



Figure 9. Corroded retrofit and full depth Holes due to Corrosion on Unit F3 Lanai

- **Roof Rakes** – Corrosion of the dowel-type ferrous fasteners at the roof rake overhangs is present at most of the roof tiles at the roof rake returns (Figure 10). Corroded fasteners have already caused roof tiles to fall. While most of the rakes have evidence of corrosion staining at the nail heads, given the concealed nature of the fasteners, failure of the fasteners due to corrosion may occur without visual evidence from the exterior.



Figure 10. Typical corroded nails at the roof rake returns. Lihue elevation at Building D shown.

- **Soffit Panel Decay/Displacement** – Decay or displacement of the soffit panels is present in building D along the Lihue Elevation (Figure 11). The decayed locations are identified in Appendix A with text annotations. Decay of soffit panels suggests the areas are getting wetted, which may affect the

connection of the panels to the structural framing. Soffit panels with similar conditions have previously fallen from building G. Falling panels are a safety hazard to pedestrians below.



Figure 11. Decay of soffit panel at Lihue elevation of building D.

- Missing Vent Covers** – Three vent covers are missing from the soffits at Building A and one from Building E. While these conditions do not currently pose an immediate operational concern, falling vent covers suggests that the fasteners used to secure them have failed, likely from corrosion, allowing the vent cover to fall. Falling vent covers can present an overhead debris hazard to pedestrians. In addition, vent covers limit pest ingress into the attics and, therefore, should be replaced. Missing vents are indicated in Appendix A with text annotations.



Figure 12. Missing vent covers at Building A. Condition is similar at other locations.

RECOMMENDATIONS

The observed conditions observed in the current survey are similar in nature to the observations made previously. The cause and potential impact of the observed deterioration have been covered in our past report and will not be repeated here. Thus, our recommendations below are similar, albeit not identical, to the recommendations made in our previous surveys.

Due to the extent of deterioration of the buildings and the increase in distress observed between each survey, we strongly recommend proceeding with repairs as soon as practical to restore the structural integrity and safety of the buildings and help mitigate the rate of deterioration.

We recommend immediate action on the following measures.

- **Cracked, delaminated, or spalled concrete** - Due to the falling debris hazard posed by incipient spalling, the loose concrete pieces noted to require mitigation in the observations section of the report should be removed immediately. Access to the areas below should be restricted until the material is removed. Where possible, we recommend that other incipient spalls not noted as a falling hazards are also removed as they will become a hazard in the near term.

Previous removal of delaminations have been successful in reducing the number of overhead debris hazards, as noted in previous reports. However, opening the existing spalls and exposing post-tensioning anchors has shown to cause additional deterioration to the post-tensioning system which increased future repair costs. Therefore, we strongly recommend that the deteriorated areas be repaired during the removal process, especially along slab edges. We also recommend that waterproof coatings be installed on all the lanais to prevent further ingress of chlorides and moisture.

Further, if repairs cannot be completed within 3 months, we strongly recommend coating all spalled areas with exposed reinforcement. The latex paint used previously has had limited success in slowing corrosion; therefore, we recommend using a more robust corrosion inhibiting coating such as Sikadur 32 or Armatec 110 Epocem manufactured by Sika. These products may slow down the corrosion until repairs can be made.

- **Lanai Railing** - The guardrails are exhibiting systemic and widespread section loss due to corrosion and should be replaced as soon as possible. For guardrails containing through-depth and advanced corrosion or posts embedded in spalling or delaminated concrete, the affected lanais should be further evaluated for adequacy of the railing system by load testing or restricted from occupancy until retrofit repairs or railing replacements are implemented.

Railings with spalls at the rail posts or through depth holes at the posts may suddenly break or dislodge under applied lateral loads. We recommend load testing all affected railing posts with observed corrosion or spalled concrete at their base. Alternatively, retrofit connections can be installed to tie the top rail to the structure if the spall or corrosion occurs within one rail segment of the structure. Strap type retrofits used to secure the railing to the building should follow details provided in our letter report titled *Interim Assessment of Kauai Beach Villas* dated September 26, 2023.

Corrosion of the railing pickets has advanced and the integrity of the pickets is unknown where staining or full depth section loss is observed. Deteriorated pickets may dislodge or break suddenly

under normal service loads. Dislodged or broken pickets can allow pets or children to fall through the rails. Therefore, we recommend load testing at least two units with through depth corrosion at the pickets to determine their current capacity. Alternatively, retrofits can be installed at the pickets. Retrofits for the pickets will need to be designed by a licensed structural engineer and can be load-tested for proof of concept.

Although retrofits can be effective in restoring capacity at the lanais noted in this report, they should not be relied on to provide a long-term solution. The short-term effectiveness of retrofits is demonstrated by the advanced corrosion observed at most installed retrofits. This is largely due to the use of mild steel angles and straps for the currently installed retrofits which corrode rapidly in the marine air. Even with proper material selection for the retrofit, aluminum or stainless steel, the fastener holes in the aluminum will corrode rapidly due to galvanic corrosion because readily available fasteners are generally stainless steel which cause accelerated corrosion of aluminum. Due to softness of aluminum, aluminum screws likely will not provide sufficient capacity to adequately secure retrofits to the railing.

Railings highlighted in this report should be closed to occupancy until load tested or repairs are made.

- **Roof Rake Tiles** - We recommend replacement of the existing fasteners with 316 stainless steel fasteners.

The repairs to Buildings G are ongoing and we understand that repairs to Building H will be started after the repairs to Building G are completed. While the repairs to Building G and H are ongoing, we recommend that the immediate concrete deterioration identified in this report be also addressed, which may be easier to coordinate and reduce mobilization costs while the contractor is on site.

Given the poor condition of the railings at all buildings, railing replacement should be started immediately at the most critical rails. These include rails that have exposed post bases, through-depth corrosion at the vertical posts or frequent through-depth holes at adjacent pickets.

Further, the deterioration to the steel columns is ongoing and based on observations of exposed steel columns at Building G, the slab-to-column connection is more deteriorated than anticipated. While not directly observed at Building A through F, it is likely occurring. We recommend that the posts be included in the repair scope as soon as possible. We also recommend that interior surveys of all buildings be completed in the next 6 months. The purpose of the surveys is to inspect the slab for evidence of cracks or spalls near the column connections.

CONCLUSION

At your request, WJE has conducted a reassessment of the residential buildings at Kauai Beach Villas to identify structural safety concerns for which mitigation is recommended. Based on the reassessment we have recommended your immediate action on several mitigation measures. Additional recommendations have been made regarding further assessment and repairs. We strongly recommend that you proceed with urgency with work required to implement repairs. Another reassessment is recommended in six months. We would be happy to discuss these recommendations and the next steps with you.



Sincerely,

WISS, JANNEY, ELSTNER ASSOCIATES, INC.

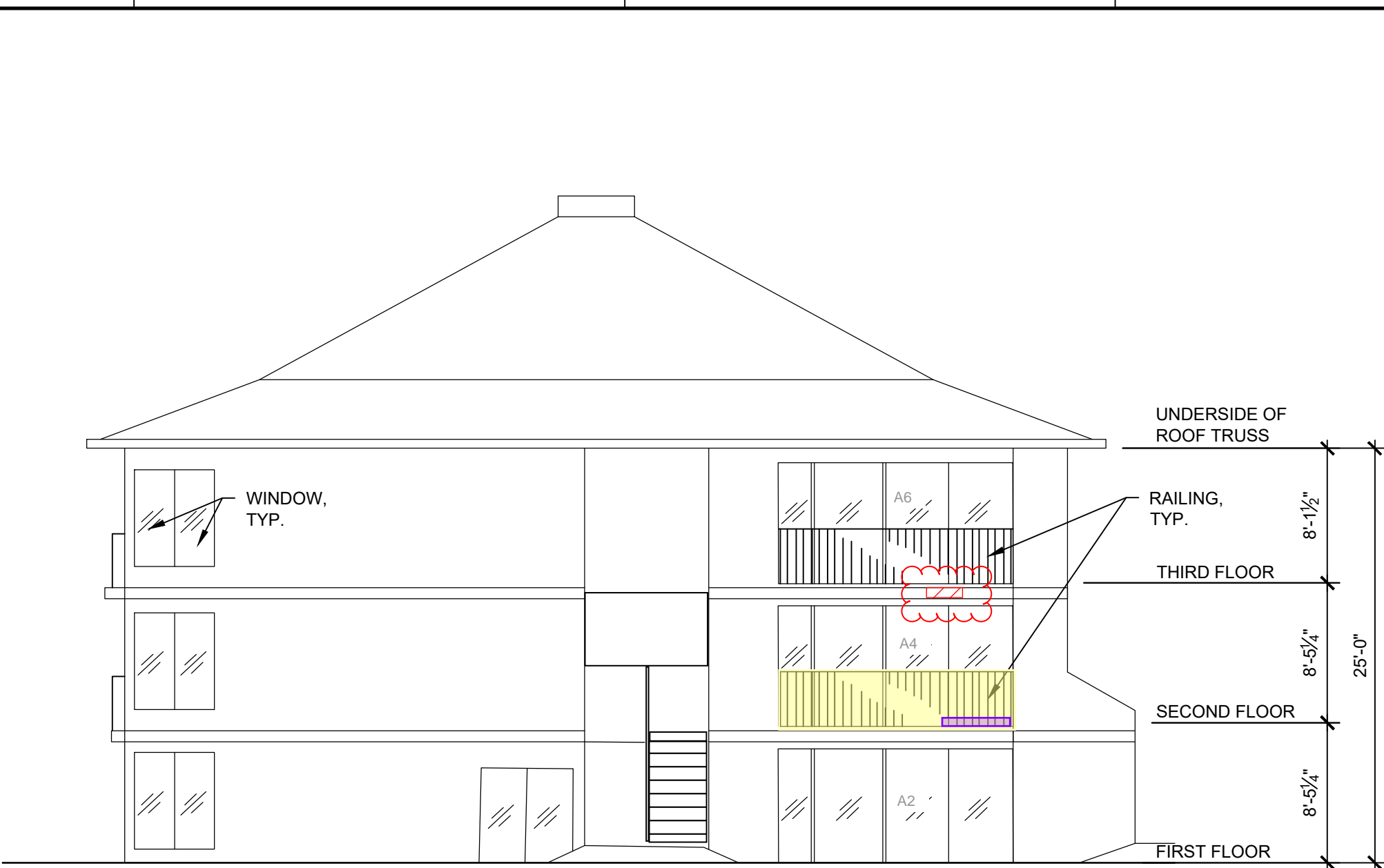
A handwritten signature in blue ink, reading 'Jarkko Simonen'.

Jarkko Simonen, PE (OR, WA, TX, HI)
Senior Associate and Project Manager

A handwritten signature in blue ink, reading 'Mike A. Greer'.

Mike A. Greer, PE/SE
Associate Principal and Unit Manager

APPENDIX A. ANNOTATED BUILDING ELEVATIONS




2 MAUKA ELEVATION - BLDG. A
S202A SCALE: 1/8" = 1'-0"



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Interim Visual
Assessment
September 2024
Buildings A through H

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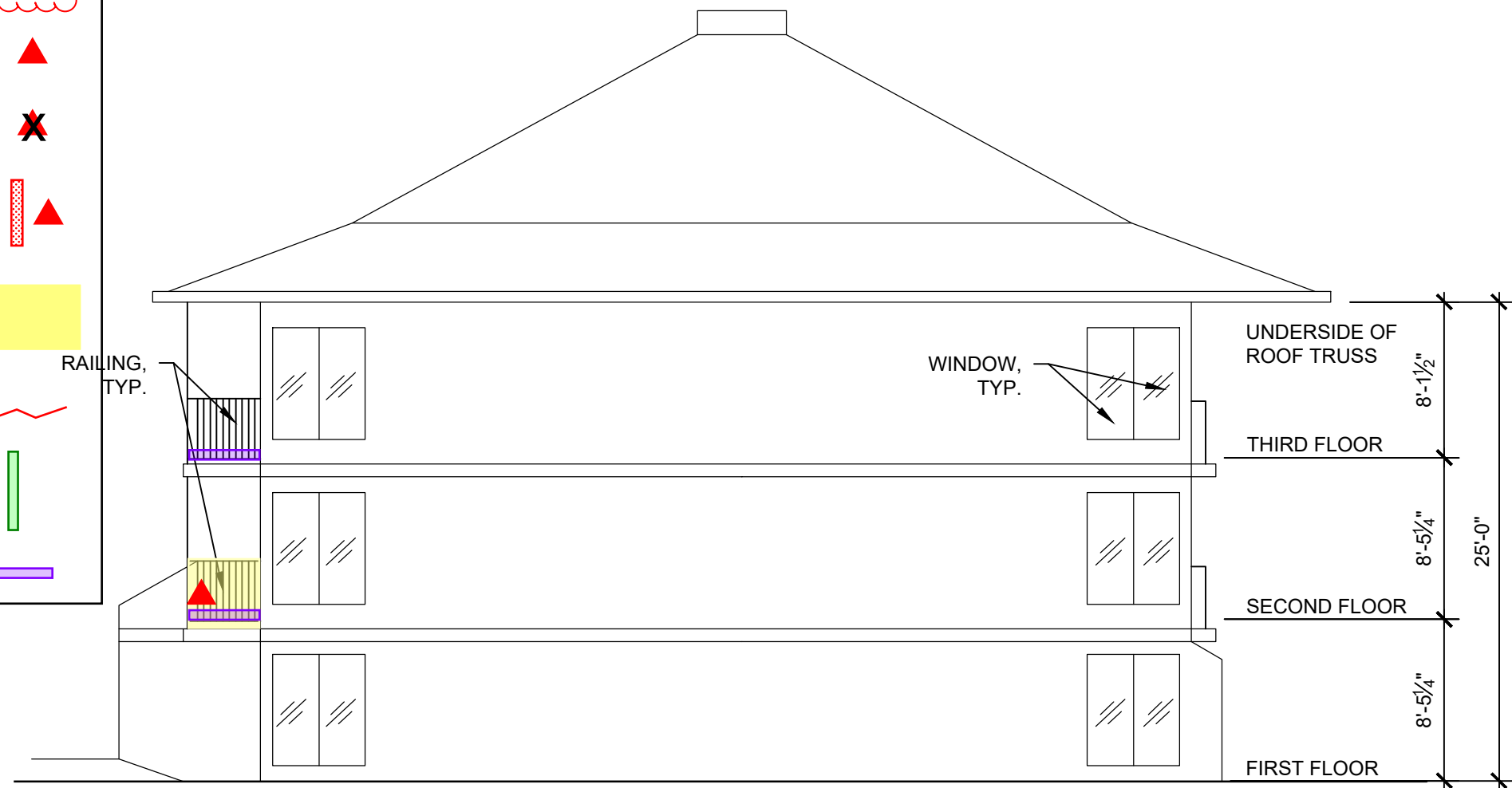
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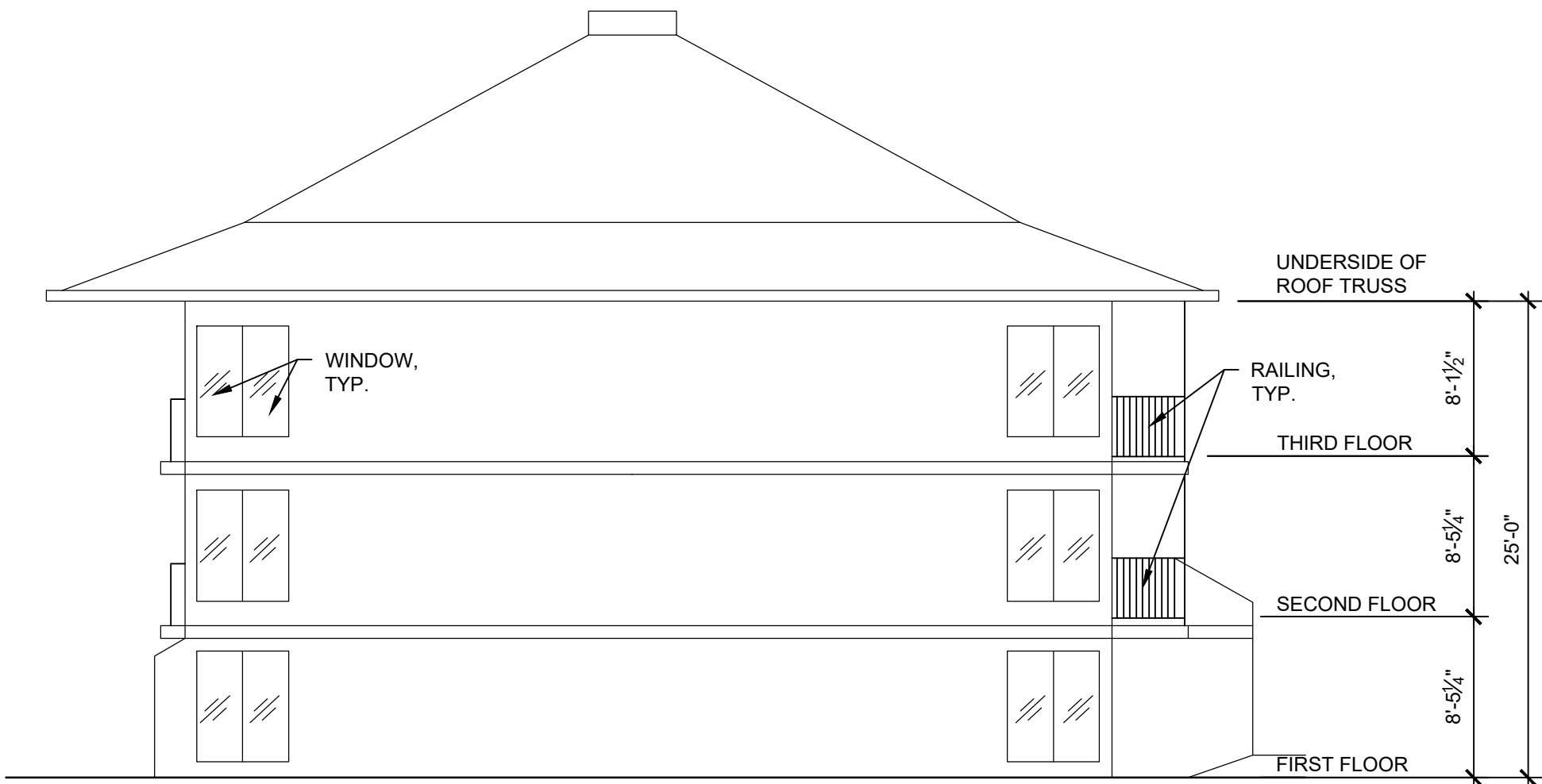
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LEGEND

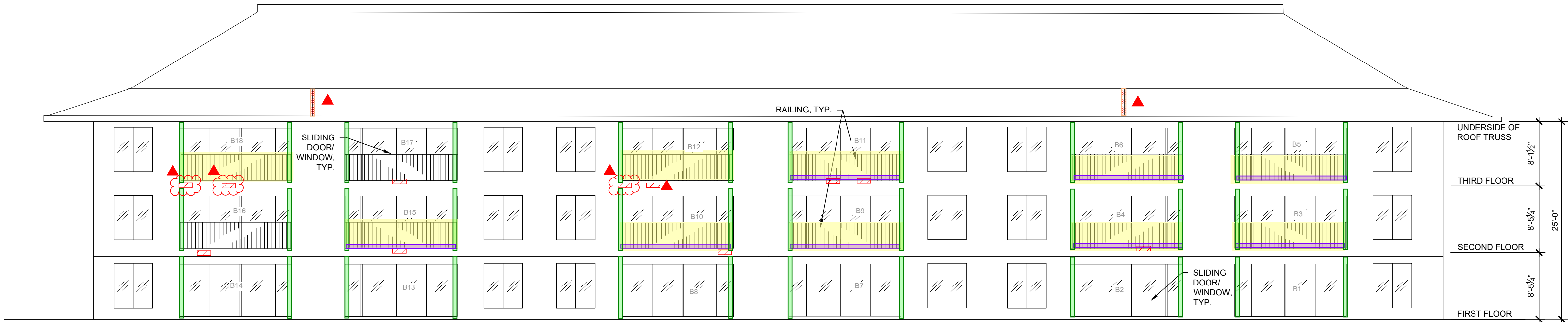
- Concrete Spall or Delamination
- New or growth of existing concrete spall or Delamination observed in 9/2025
- Safety Hazard - Loose concrete spall/fall hazard
- No longer a safety hazard
- Safety Hazard - Corroded fastener at roof rake. Clay tile fall hazard
- Safety Hazard - Structural integrity of railing or railing connection reduced
- Concrete crack in slab leading edge
- Shoring post installed
- Corrosion of the railing pickets



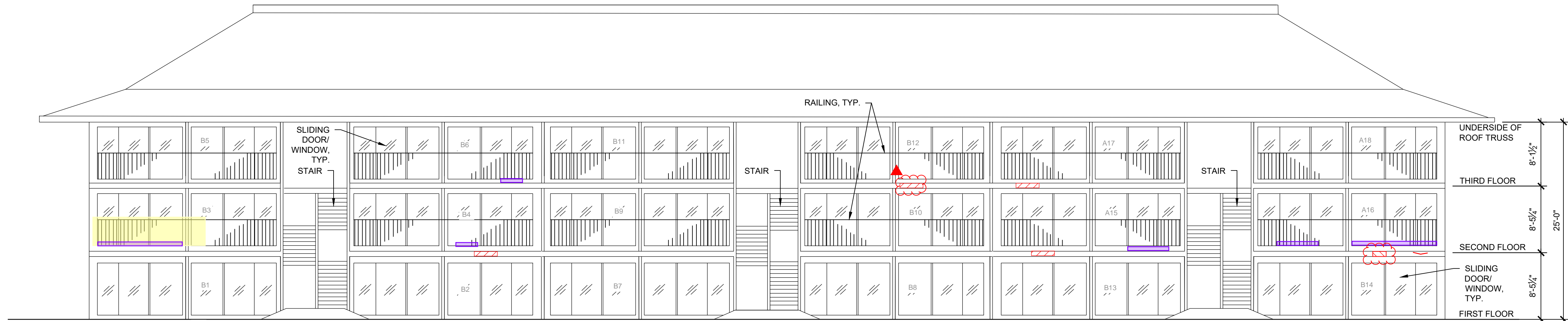
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S203B SCALE: 1/8" = 1'-0"



2 WAILUA ELEVATION - BLDG. B
S203B SCALE: 1/8" = 1'-0"



3 MAKAI ELEVATION - BLDG. B
S203B SCALE: 1/8" = 1'-0"



4 MAUKA ELEVATION - BLDG. B
S203B SCALE: 1/8" = 1'-0"

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September 2024
Buildings A through H

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LEGEND

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No longer a safety hazard

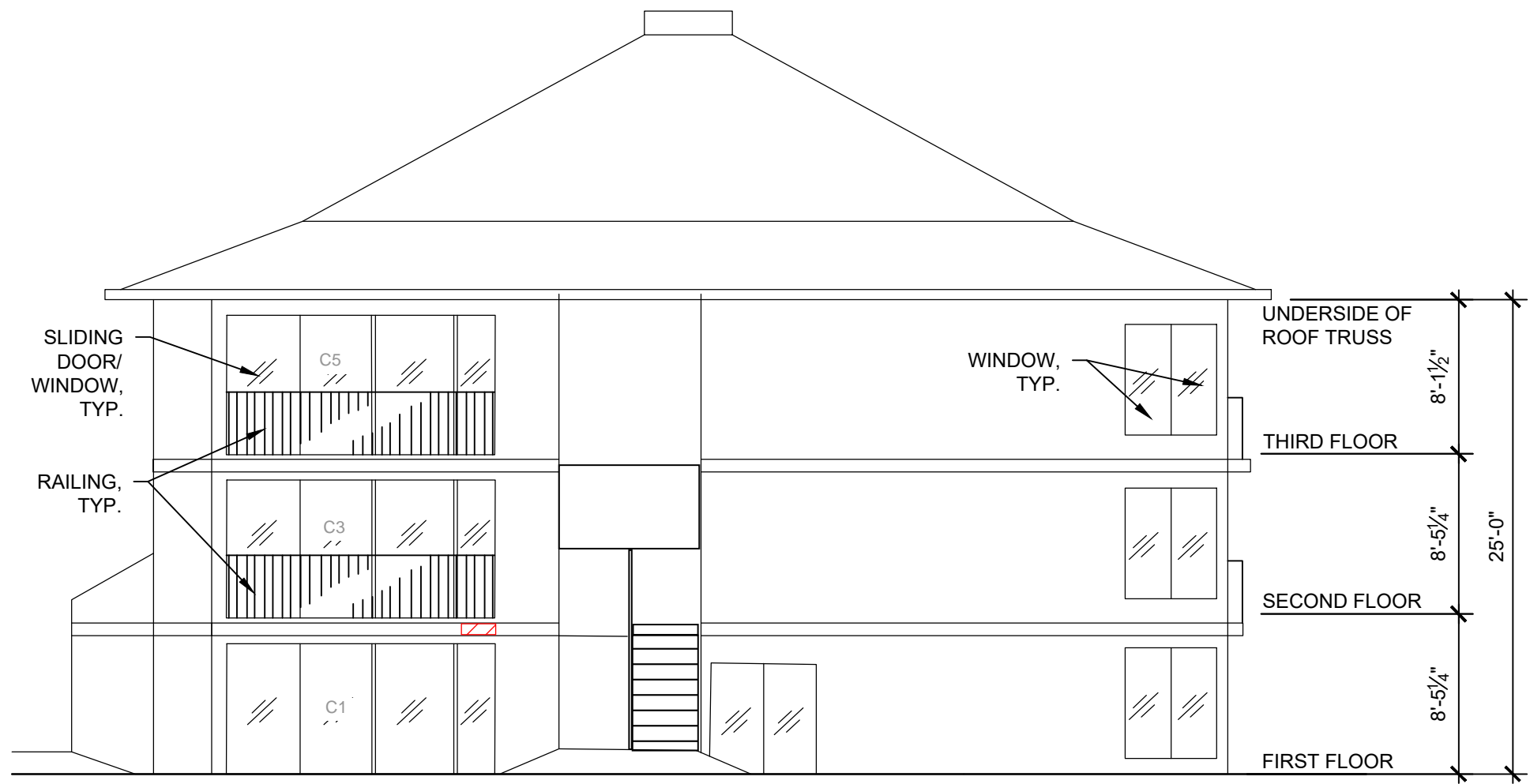
Safety Hazard - Corroded fastener at roof rake. Clay tile fall hazard

Safety Hazard - Structural integrity of railing or railing connection reduced

Concrete crack in slab leading edge

Shoring post installed

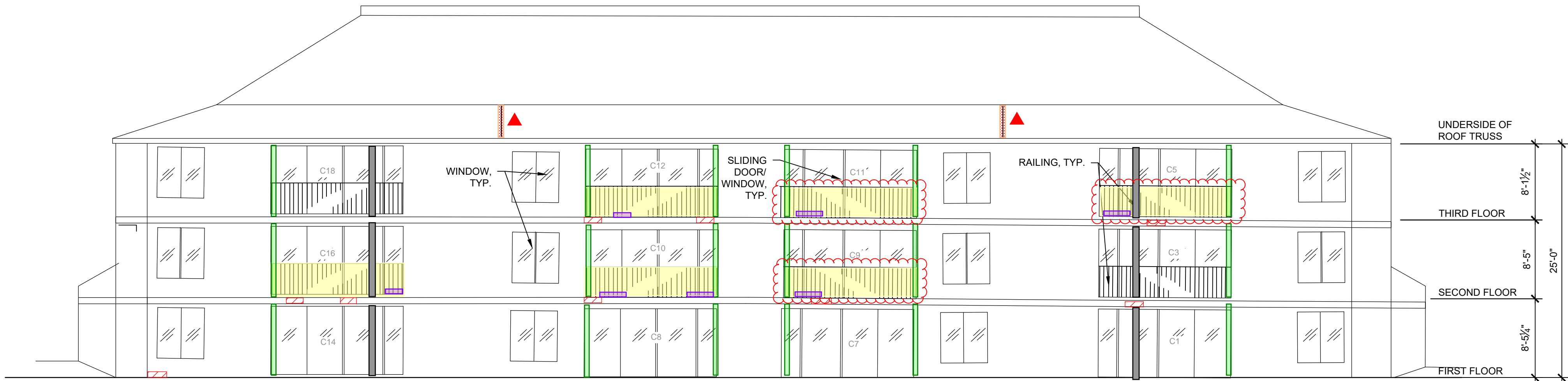
Corrosion of the railing pickets



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2 MAKAI ELEVATION - BLDG. C
S202C SCALE: 1/8" = 1'-0"



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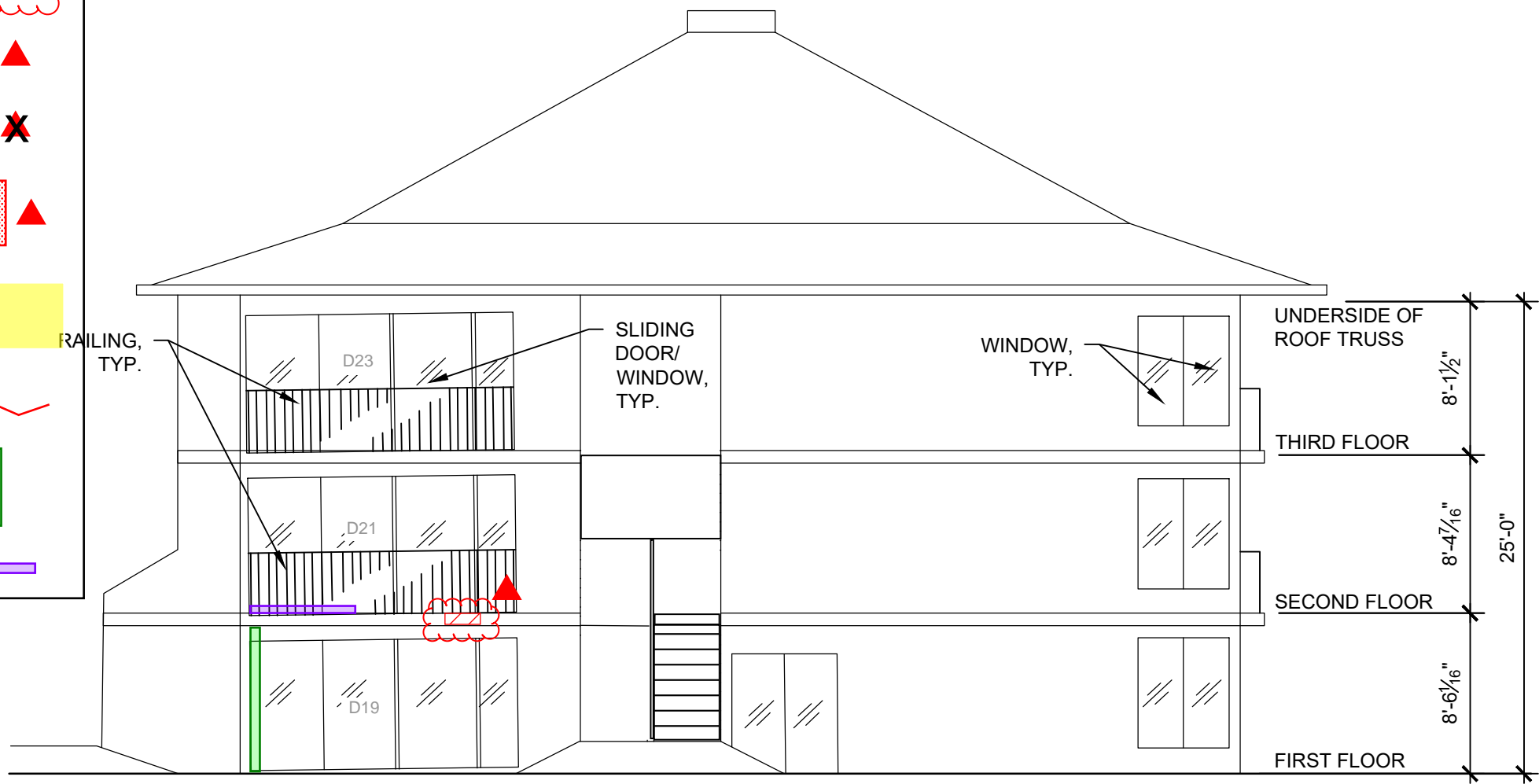
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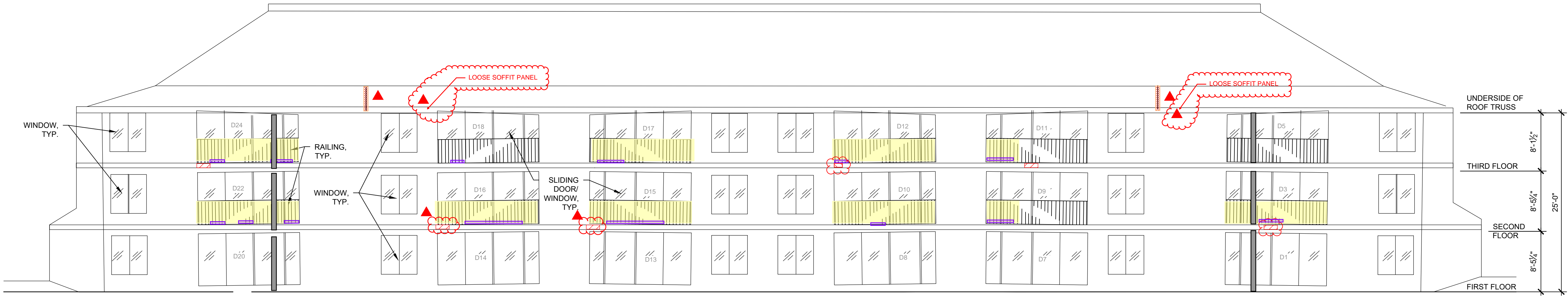
Corrosion of the railing pickets



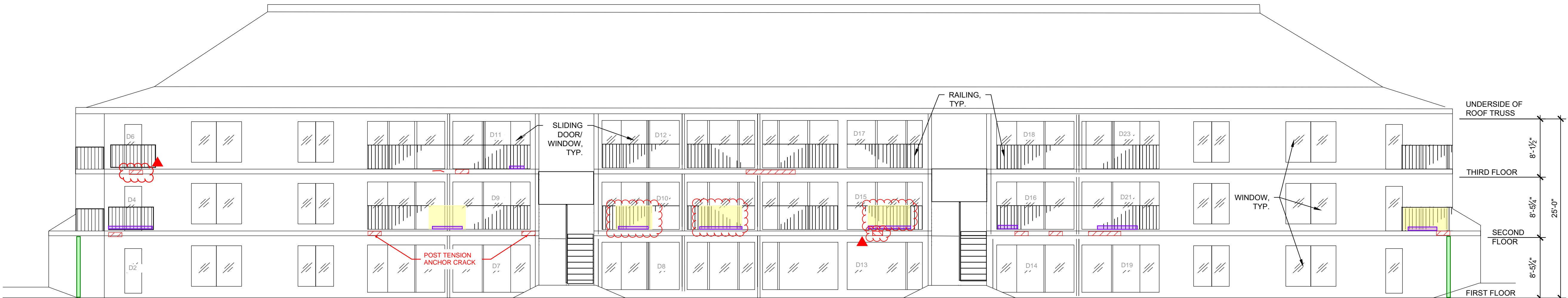
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S203D SCALE: 1/8" = 1'-0"



3 LIHUE ELEVATION - BLDG. D
S203D SCALE: 1/8" = 1'-0"



4 WAILUA ELEVATION - BLDG. D
S203D SCALE: 1/8" = 1'-0"

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ELEVATIONS - BLDG. D

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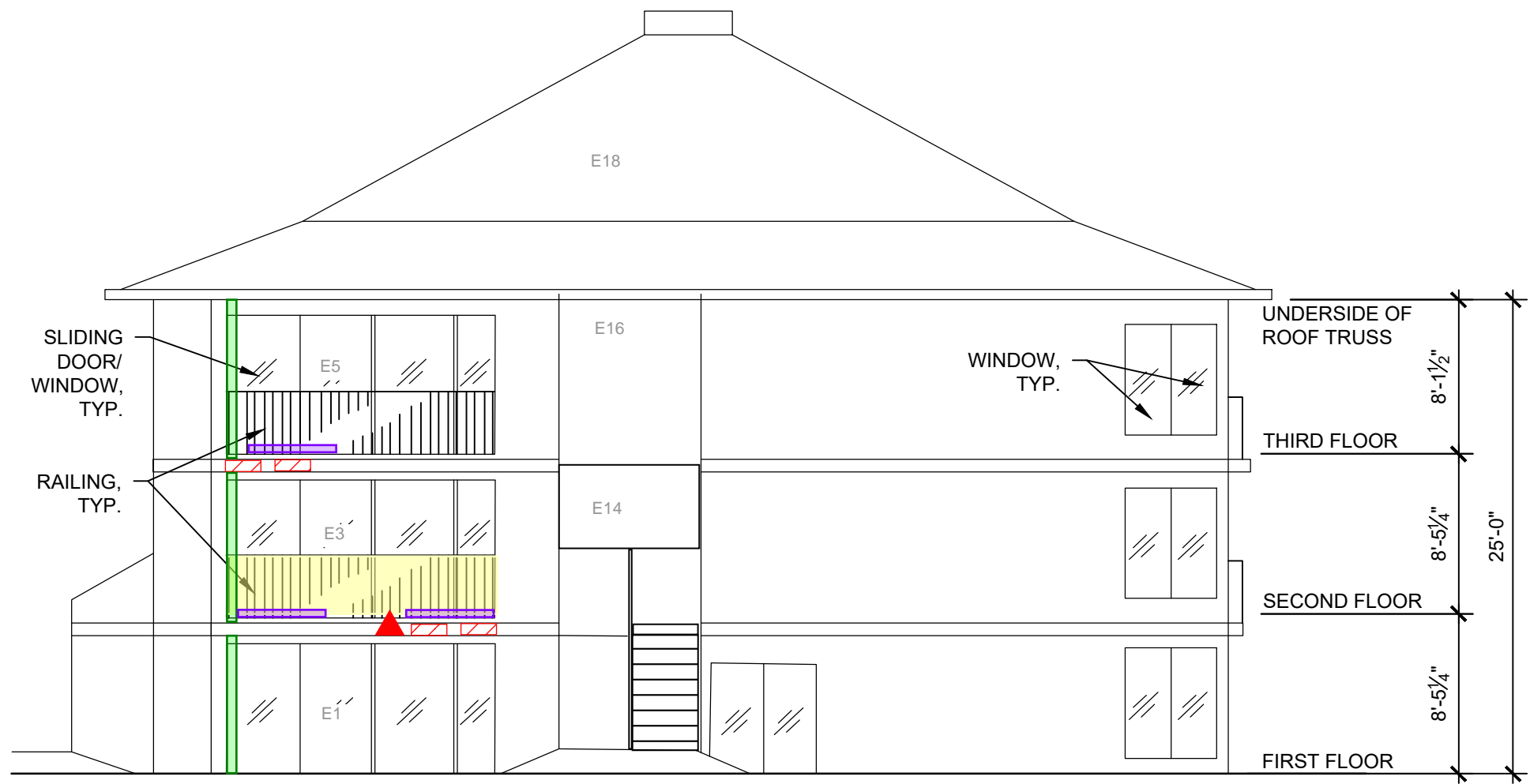
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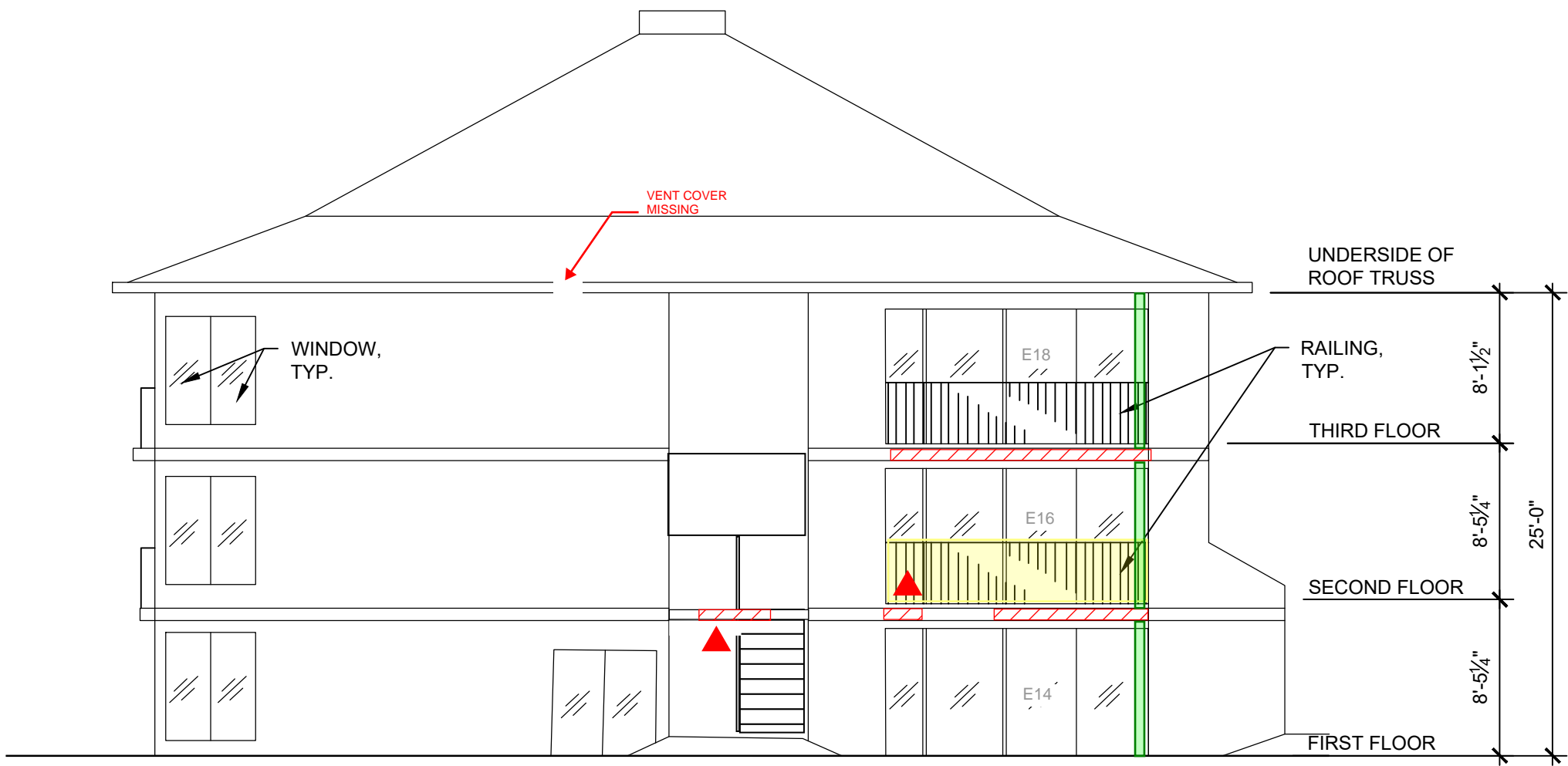
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Shoring post installed

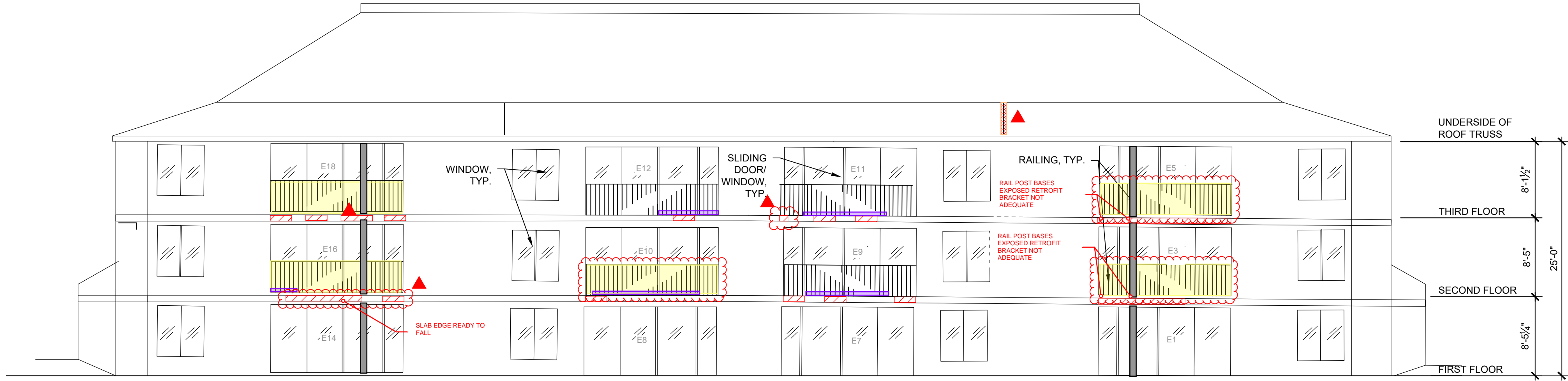
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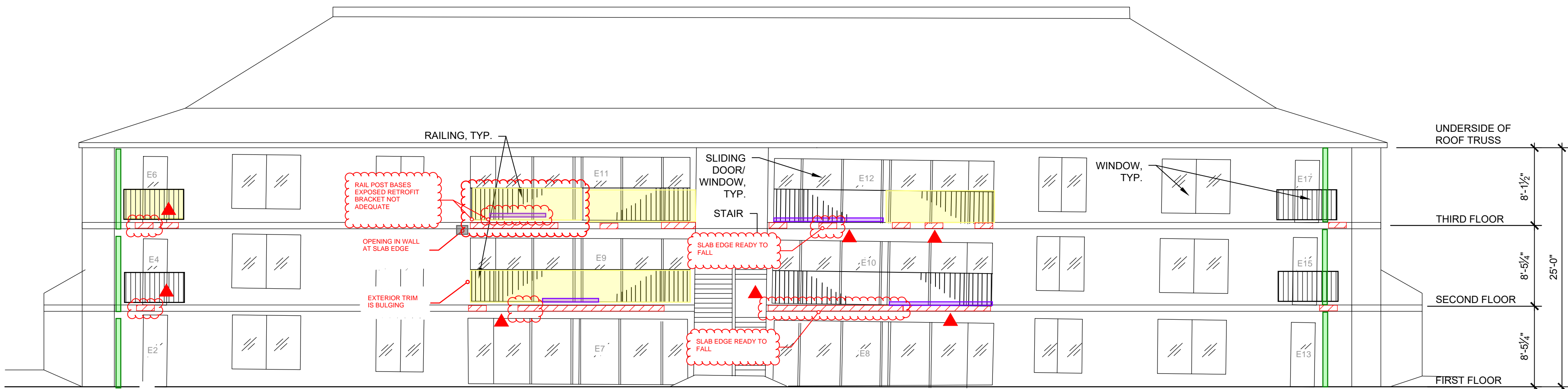
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2 MAKAI ELEVATION - BLDG. E
S202E SCALE: 1/8" = 1'-0"



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ELEVATIONS - BLDG. E

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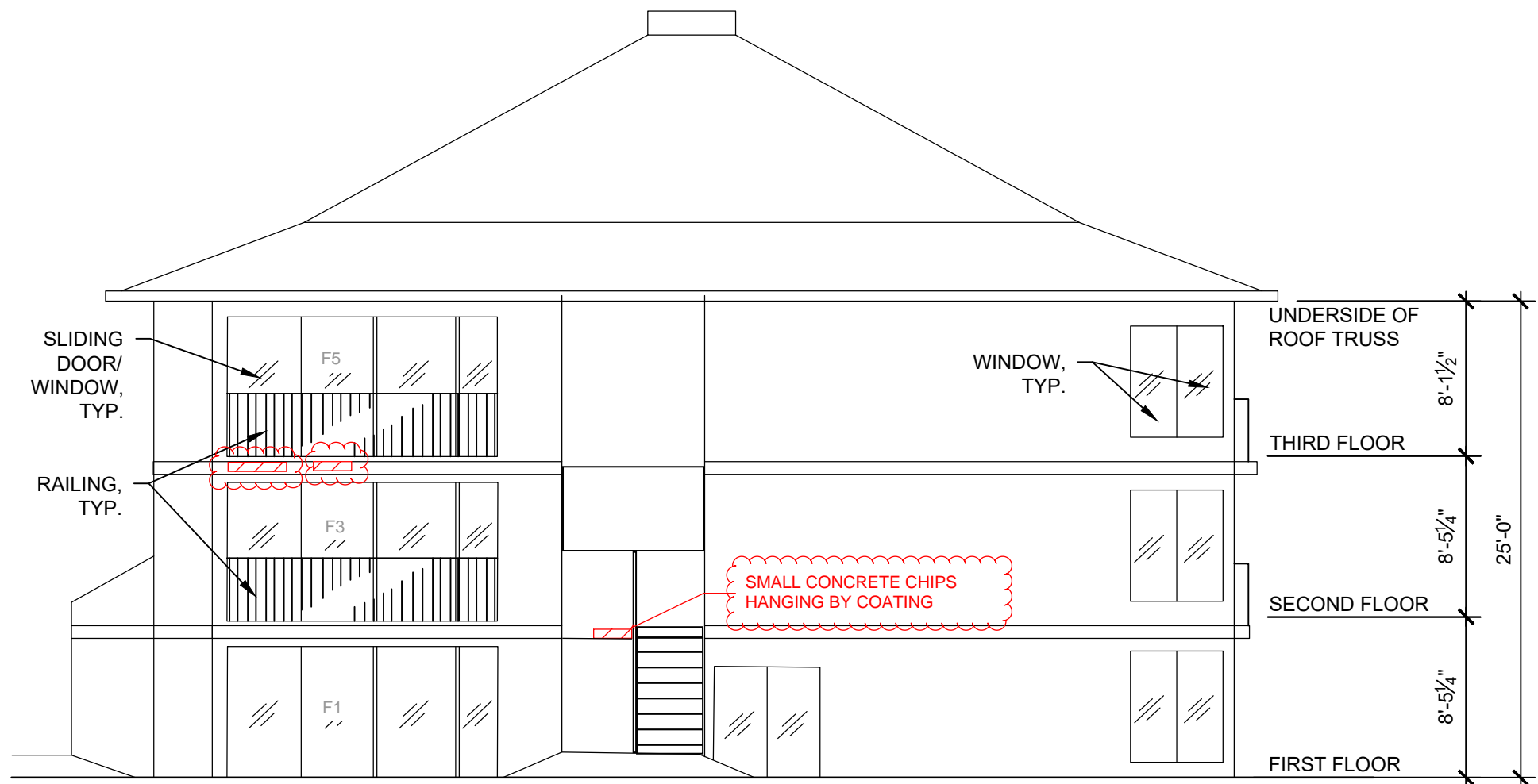
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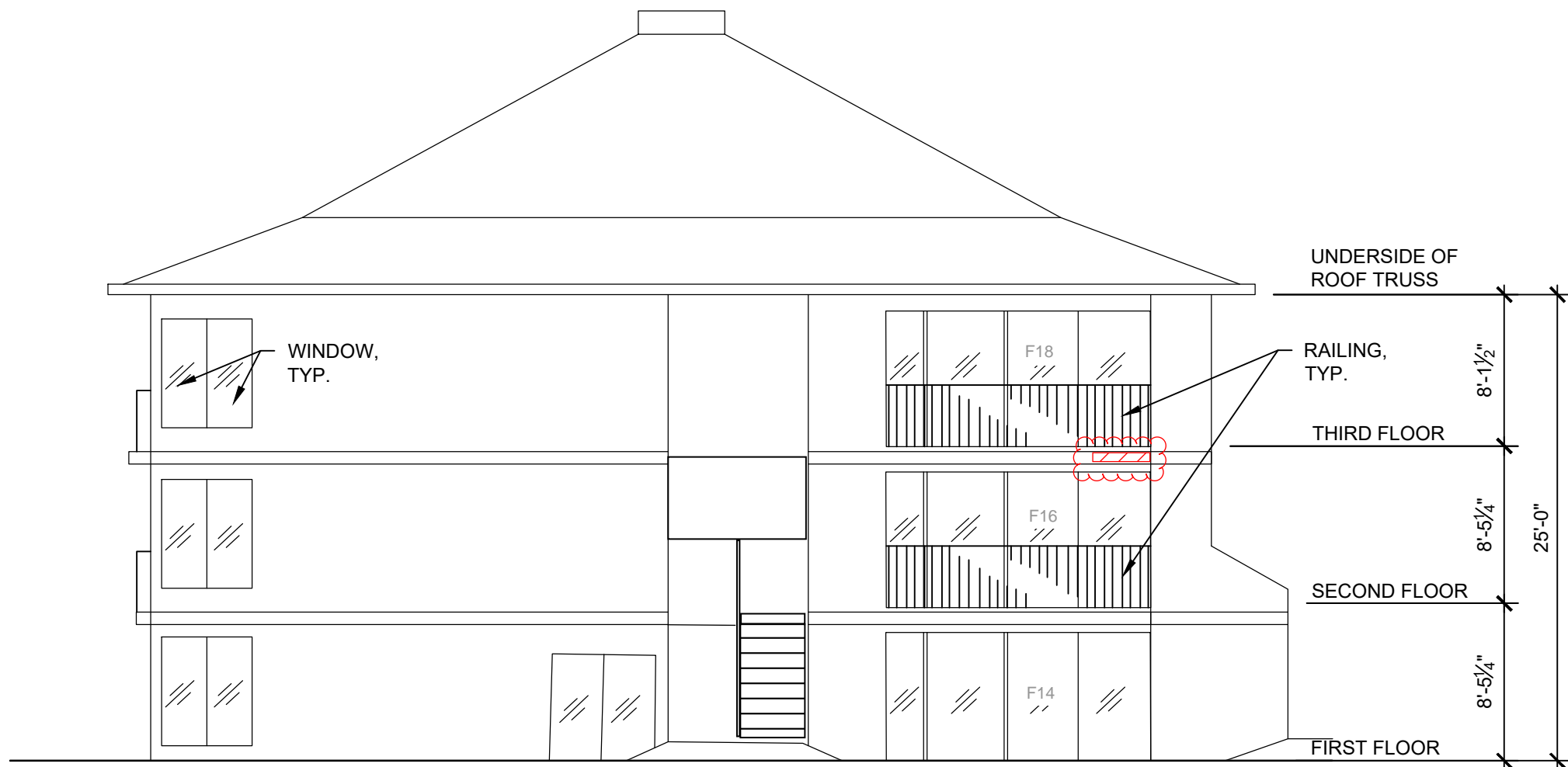
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Corrosion of the railing pickets



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