

# **CITY OF KEY WEST FIRE STATION #3 Structural Condition Assessment**

**1525 Kennedy Drive  
Key West, Florida**



## **Prepared By**

**Perez Engineering and Development, Inc.  
1010 Kennedy Drive, Suite 202, Key West, FL.**

**And**

**Reynolds Engineering Services, Inc.  
24478 Overseas Hwy, Summerland Key, FL. 33042**



**September 25, 2024**

James C. Reynolds, PE  
Fl. Lic. No. 46685



# Reynolds Engineering Services, Inc.

September 25, 2024

Mr. Eric Augst, Senior Construction Manager  
City of Key West  
1300 White Street  
Key West, Fl. 33040

Re: Fire Station #3 - 1525 Kennedy Drive, Key West  
Building Structural Assessment

Dear Mr. Augst,

On August 28, 2024 I conducted a structural inspection of the building to determine its overall structural condition and prepare an opinion of probable construction costs for repairs.

Fire Station #3 consists of the original building that had been remodeled in the past to convert it from a 2-story building to a single story structure. The area of this structure is shown shaded on the attached floor plan. It consists of a concrete foundation with steel reinforced concrete frame, concrete masonry block walls, and pre-cast double tee beam concrete roof.

Building additions were constructed on the north, south, and east sides of the building. These additions were also built with concrete walls and floors. The classroom addition has a wood-framed truss roof, the kitchen/living and dorm addition has a steel bar joist roof support structure and the addition on the east for the laundry, EMS, and offices has a poured concrete slab roof.

The additions to the building are in very good condition with little structural damage noted. The roofs, walls, and floors were all in good condition. The original building, however, is suffering from concrete spalling in many areas.

Concrete spalling is damage to concrete structural members that occurs when the steel reinforcement expands due to corrosion. When the steel reinforcement corrodes, the oxidized steel expands exerting enough force that it exceeds the tensile strength of the concrete causing the concrete to crack and break away from the reinforcement. Once the concrete is cracked the steel reinforcement is directly exposed to the environment causing the corrosion to accelerate. Concrete spalling is primarily occurring on the original building structure.

Concrete spalling is a common problem with older concrete structures that contain aggregate high in chlorides mined from local sources. Repairing spalled concrete is a relative straightforward process, however a building with a concrete spalling problem will likely need to be repaired repeatedly over the life of the building.

The following pages contain photographs of these areas that can be referenced on the floor plan at the end of this report.

The building is safe to occupy with the exception of the loose spalling concrete on the garage door headers; especially the middle bay. This concrete should be stabilized or repaired as soon as practical to prevent injury from falling concrete.

### Photographic Documentation



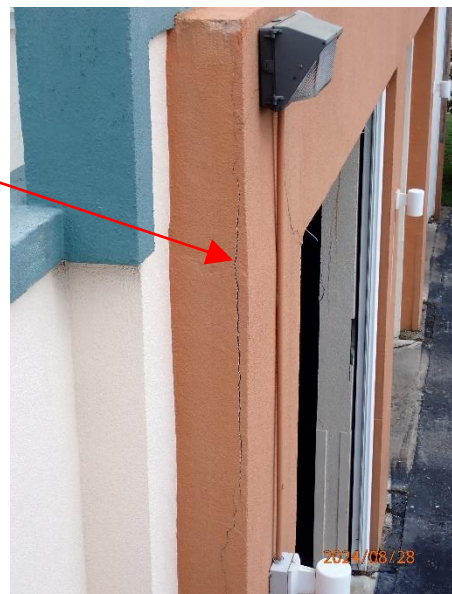
**Picture #1**



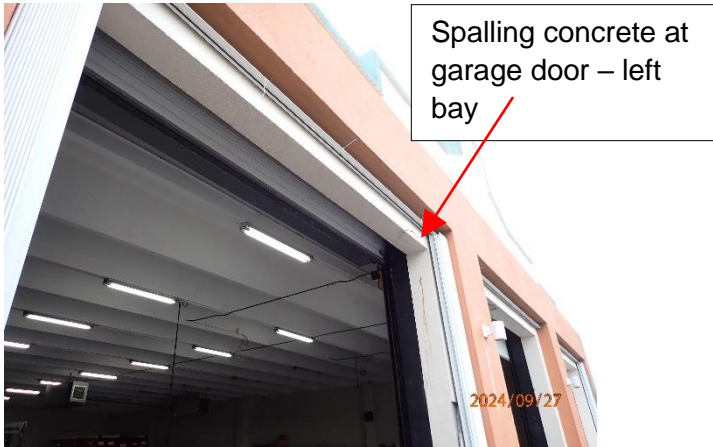
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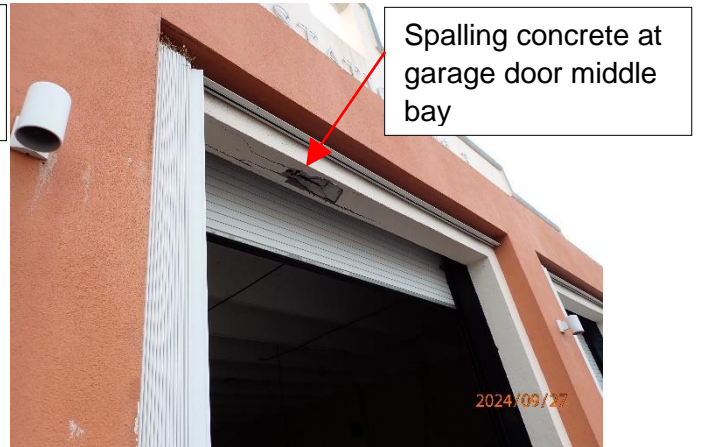
**Picture #3**



**Picture #4**



**Picture #5**



**Picture #6**



**Picture #7**



**Picture #8**

Spalling concrete tie beam in garage bay



**Picture #9**



**Picture #10**

Spalling concrete tie beam in garage bay



**Picture #11**

Loose, cracked mortar between roof tee-beams



**Picture #12**

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Fire Station #3 Condition Assessment  
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Spalling concrete tie beam outside garage bay



**Picture #13**

Deteriorated wood-framed patio roof



**Picture #14**

Deteriorated wood-framed patio roof cracked roof joists



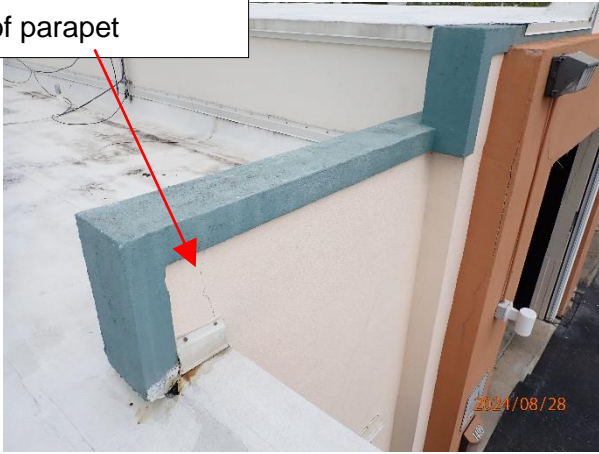
**Picture #15**

Cracked concrete roof parapet



**Picture #16**

Cracked concrete  
roof parapet



**Picture #17**

Cracked stucco on  
roof parapet



**Picture #18**

Cracked stucco on  
roof parapet



**Picture #19**



**Picture #20**



**Picture #21**

Severely corroded generator base.  
NOTE: Not part of building structure.



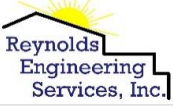
**Picture #22**

**END OF SECTION**

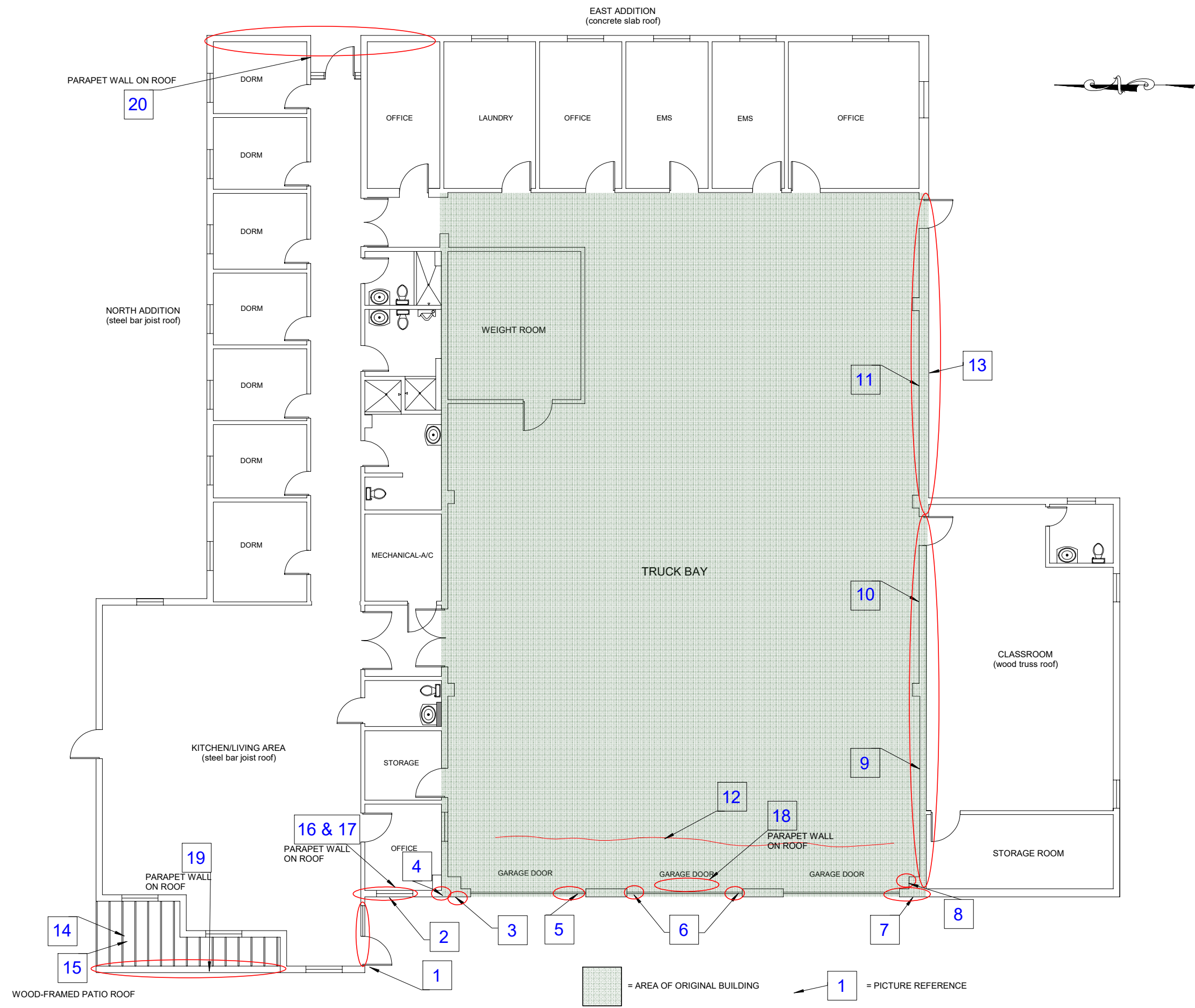


Mr. Eric Augst  
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**REPAIR COST OPINION**

|                                       |   |              |   |              |               |                 |              |              |
|---------------------------------------|---|--------------|---|--------------|---------------|-----------------|--------------|--------------|
| <b>Structural Repair Cost Opinion</b> |   |              | Prepared By: James C. Reynolds, PE  |              |               |                 |              |              |
| City of Key West                      |   |              | Reynolds Engineering Services, Inc.   |              |               |                 |              |              |
| Fire Station #3                       |   |              |  |              |               |                 |              |              |
| <b>Spalling Concrete Repair</b>       |   |              |   |              |               |                 |              |              |
| <u>No.</u>                            | <u>ITEM</u>                               | <u>UNITS</u> |   |              |               | <u>QUANTITY</u> | <u>PRICE</u> | <u>TOTAL</u> |
| 1                                     | Truck Bay Tie Beam                        | CF           |   |              |               | 70              | \$ 425.00    | \$ 29,750.00 |
| 2                                     | Garage Door Headers and Columns           | CF           | 40  | \$ 425.00    | \$ 17,000.00  |                 |              |              |
| 3                                     | Concrete Façade/Parapet Roof Wall Repairs | CF           | 20  | \$ 475.00    | \$ 9,500.00   |                 |              |              |
| 4                                     | Roof Repair for Concrete Restoration      | LS           | 1   | \$ 15,000.00 | \$ 15,000.00  |                 |              |              |
| 5                                     | Roof Replacement - Wood Frame over Patio  | LS           | 1   | \$ 20,000.00 | \$ 20,000.00  |                 |              |              |
| 6                                     | Entrance Door Concrete Repair             | CF           | 6   | \$ 425.00    | \$ 2,550.00   |                 |              |              |
| 7                                     | Tee-beam Roof Crack                       | LS           | 1   | \$ 5,500.00  | \$ 5,500.00   |                 |              |              |
|                                       |   |              | Sub total:  |              | \$ 99,300.00  |                 |              |              |
| Contingency (20%)                     |   |              |   |              | \$ 19,860.00  |                 |              |              |
|                                       |   |              | Total Estimated Cost:   |              | \$ 119,160.00 |                 |              |              |

**END OF REPORT**



**FLOOR PLAN**  
SCALE: 3/32"=1'

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**TITLE:**  
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1525 Kennedy Drive  
Key West, Fl.

Date:  
9/25/2024

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