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EVALUATION REPORT

REPORT #: 001 DATE: October 30, 2023

PROJECT TITLE: Augusta Municipal Building Leak Investigation JOB #: 3042.2306

OVERVIEW:

Maria Rivera-Rivera, Augusta Richmond County (ARC) Deputy Director of Facilities, Central Services Department, contacted Johnson Laschober & Associates, P.C. (JLA) regarding water which was leaking into the Augusta Richmond County Municipal Building (Municipal Building) located at 535 Telfair St, Augusta, GA 30901. JLA Architectural personnel met a city representative at the facility on August 7, 2023, to perform an observation of the structure. The building was occupied and in use at the time of the observation.

The primary stated concerns were visible water leaks inside the building at the third-floor level at the expansion joints where the three-story wings attached to the 9-story center tower. However, during this site visit JLA personnel noted a potential structural issue with the marble façade panels separating and pulling away from the façade. JLA Structural and Architectural Personnel returned to perform an observation on October 11, 2023, from the roof of the center tower and again on October 18, 2023, to observe the façade panels and their attachments from a bucket lift after the identified suspect panel had been removed from the building.

ARC subsequently contracted with JLA to perform a structural assessment/evaluation of the marble façade on the building. Reference ARC Purchase Order P460291.

OBSERVATION:

The center tower of the building's structure is a concrete frame, with brick and/or terra cotta block infill. An expansion joint exists between the center tower and each of the two three-story wings to the East and West of the tower. JLA understands that this portion of the structure was constructed in the mid 1950's. A more recent addition was built on the South side including a new nine-story elevator tower with an expansion joint between it and the original building.

There are indications of water infiltration inside the building primarily at the third story level at the expansion joints of the building and at exterior wall window headers.

The façade of the original tower and wings consist of marble cladding made of approximately four-foot square, three-inch-thick marble panels. JLA observed, from the removed panel, that these marble panels are supported on the bottom side of the panel by a steel angle bolted to the building structure. The panels appear to be held in place by four steel clips, one on each side near the bottom and two on the top near the corners. Each clip was bolted to the structure and then inserted into slots in the marble panel. No other method of attachment was evident although inconsistent brick layup and periodic mortar intrusion left a small inconsistent gap between the panel and brick. It is presumed that all the marble panels are similarly attached to the structure.

There was a layer of metal flashing between the parapet wall panel and the marble parapet cap. The flashing directed water towards the roof. The exterior joints between the panels were originally sealed with a flexible caulk. At the time of the observation the caulk maintained some flexibility but had lost its bond and separated from the sides of the panels.

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JLA observed that the top clips of the removed panel were corroded and had failed and did not restrain the panel. The side clips and the horizontal flange of the support angle were also corroded but provided some restraint.

DISCUSSION:

The clips were corroded by water, which was apparently infiltrating behind the marble facade, likely at the joints between panels where the caulk was no longer effective. There did not appear to be a mechanism such as through wall flashing or weep holes which would allow the water to escape to the exterior. The cap flashing installed beneath the parapet cap was not installed properly and as a result allowed water to infiltrate the mortar joints at the top of the wall and rest between the top of the marble panel and the brick parapet wall allowing water to be in direct contact with the upper panel supports. Because of this the water would filter down through the gap behind the marble and rest on the horizontal surfaces, including the clips and angles holding the panels. This retained water then corroded these panel supports. Additionally, the water would have been stopped by items such as window headers and building expansion joints. With the lack of any mechanism to expel this water to the exterior, it leaked to the inside.

Except for several areas where the caulk had been replaced as part of the recent addition, the panel caulk appeared to be compromised across the entire façade. Accordingly, water was likely infiltrating at every building façade panel compromising each panel's support and restraint clips.

JLA's ability to observe the building's concrete structural frame was limited. However, there was no apparent indication that the frame itself was significantly compromised by this water. This could be typified by falling pieces of concrete or dirty/streaked stains on the façade or where the water was expelled inside. However, if not addressed, water can find its way into cracks in the concrete frame. It would then rust and corrode the steel reinforcing. Most damage of this type occurs when the rusting reinforcing steel expands and cracks off (spalls) the concrete covering the reinforcing. This further exposes it to the damaging water.

CONCLUSIONS AND RECOMMENDATIONS:

In JLA's professional opinion, this building is currently structurally safe to occupy and use. There are structural items that need to be addressed before they potentially become a compromising issue. However, they have not yet progressed to the point where they present a threat to the health and safety of the occupants inside the building (except as noted below.)

The larger threat is to members of the public outside the building since a reasonable scenario exists where a marble façade panel could fall from the structure and hit a person or vehicle. A panel could also hit the ground and shatter with the resulting fragments hitting a person, vehicle or breaking through a lower-level window. A façade panel from the Upper East and West sides could also potentially fall and crash through the roof of the two side wings.

JLA recommends the following be implemented as soon as possible:

1. Restrict all access to and from the building to just the main entry in the new front addition to the building.
2. Restrict access around the perimeter of the building until the panels can be tested.
3. Use a bucket lift or other means to check each of the façade panels. Identify and mark any panel which is loose or appears to be shifted or rotated.

JLA recommends the following be implemented as soon as practical:

1. Examine the attachments of the panels, starting at the areas of known water intrusion and those identified as suspect. Potential means of examination include:

a. Use an imaging (x-ray or other) process to examine the attachment clips. This will likely identify the presence and location of the attachment clips but has limited ability to determine their condition.
b. Use an imaging borescope to examine the attachment clips either through the exterior caulk joints or through holes drilled from the interior.
c. Selectively cut through and remove suspect panels. This would be more difficult to repair and/or replace.

2. Remove the parapet cap around the perimeter of the 9th floor roof in its entirety and physically examine the steel panel anchors located at the top of the panel. This would allow for the removal and replacement of the cap flashing and allow it to be properly installed.

3. Retrofit the attachments of the panels. The extent of this would be dependent on the results of the examination. The worst-case scenario would be to remove and reinstall all the top panel clips with stainless-steel attachments or supplement the carbon steel fasteners with additional stainless-steel fasteners. Other possibilities include securing the existing panels to the frame without removing them, utilizing new anchors drilled through the panels, countersunk and then the holes plugged with marble plugs.

4. Evaluate further the lack of through wall flashing at the intersection of the 3rd floor roof and the 9 story tower to determine the best approach for removing the lower panel or a section of the lower panel and install through wall flashing and weeps to allow for water and water vapor that accumulates in the wall cavity to have a means to be expelled to the exterior of the building rather than seeping into the interior.

5. Remove all the existing sealant that is located between the panels and replace it with new flexible sealant to eliminate water intrusion through the multiple gaps in the exterior façade that have been caused by this material failure. In this same process install weeps and drainage holes above window heads to properly expel water from the wall cavity. Sealant in the design of this building is being used as a mechanism to prevent water intrusion and allow for the marble panels to expand and contract with temperature changes. Sealant replacement is a deferred maintenance item and has a limited lifespan. Plans should be made and funds allocated to repair and/or replace exterior sealant every 10-15 years in ensure a continued watertight envelop on the building.

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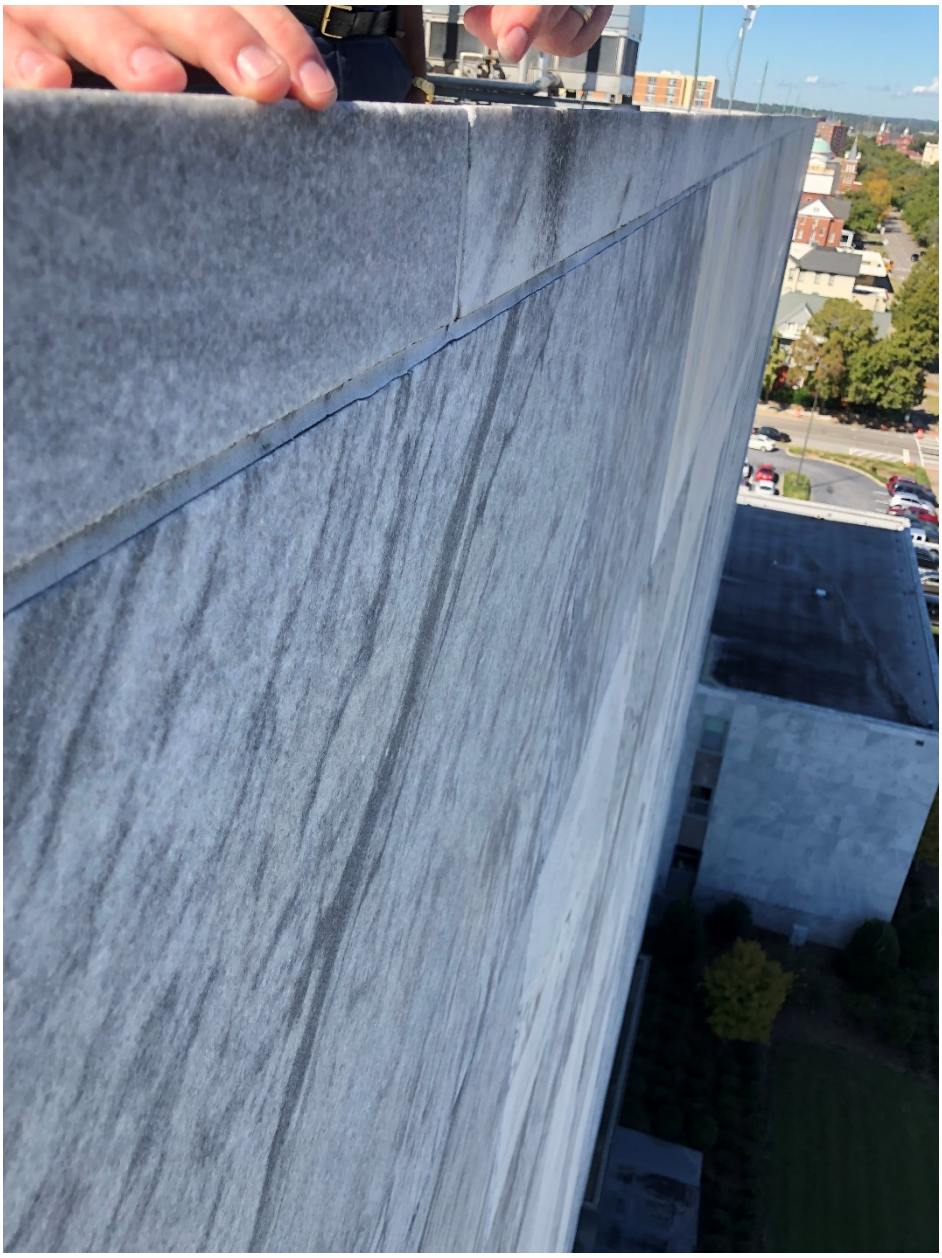

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