Garland/DBS, Inc.
3800 E. 91st Street • Cleveland, OH 44105
Phone: (866) 327-0306 • Fax: (216) 883-2055

May 2, 2024

Luis F. Flores, CFM, LEED AP BD+C
Property and Procurement Officer
City of Jacksonville Beach
1460A Shetter Avenue
Jacksonville Beach, Florida 32250

RE: Building Enclosure Assessment
Lifeguard Headquarters
Jacksonville Beach, Florida

Dear Mr. Flores**,**

Garland/DBS Inc. (GDI) has performed a limited building enclosure assessment to review the existing condition of the exterior stucco cladding and windows, concrete overhangs, and embedded beams supporting an internal spiral staircase of the Lifeguard Headquarters located at 2 Ocean Front North in Jacksonville Beach, Florida. This letter includes a description of our understanding of the project, summarizes our visual observations, and provides discussion and conceptual recommendations for review and consideration by the City of Jacksonville Beach.

Project Background

The Jacksonville Beach Lifeguard Headquarters is a two-story concrete framed structure with a five-story watch tower (Figure 1). The original building was built in the 1920s; however, a one-story addition was constructed around approximately 10 years ago on the northwest of the original building. The exterior walls of the building consist of concrete or masonry covered with stucco painted white with red accents. The original windows have been replaced with residential style vinyl casement windows.


Figure 1. Overall view from southeast of the Lifeguard HQ.

The steep-sloped roofing consists of asphalt shingles with a white sheet membrane on the low-sloped portion above the steep-sloped area. The addition roofing is low sloped and covered with a granulated modified bitumen roofing assembly.

It is our understanding based on discussions with the City of Jacksonville Beach and lifeguard personnel that widespread cracking and isolated delamination of the existing stucco exists. Previous assessment reports indicated concern over the concrete overhangs as well as support for the internal spiral staircase that provides access to the upper floors of the watch tower. As such, the City of Jacksonville Beach retained GDI to perform an assessment of the building enclosure to address these reported issues.

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Field Investigation

On April 16 and 17, 2024, Mr. Finley of GDI was on-site to perform a visual assessment of existing conditions as well as review inspection openings created by SBC. Access to the roofs, exterior, and interior areas were provided. The following summarizes our observations:

Visual Observations

- The stucco is generally well adhered based on visual observation and sounding with a hammer. A few locations exhibited evidence of delamination which also corresponded to cracked and distressed areas (Figures 2 and 3).
  - At the southeast corner, a piece of loose stucco was removed below the soffit (Figure 4). The lath within the stucco was heavily corroded (Figure 5).

Figure 2. The coating on the stucco is peeling. The underlying stucco is cracked and delaminated.

Figure 3. A sizeable crack with discernable displacement exists at the southeast corner.

Figure 4. A small piece of ornamental stucco was loose and removed at the southeast corner.

Figure 5. The removed pieces exhibit heavily corroded lath.

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- Most cracking exists on the watch tower. The cracks either exhibit a radial (horizontal) pattern at the rounded corners of the tower or diagonal/stepped that originate at the window heads (Figures 6 and 7).
  - The rounded corners are laid with header units (Figure 8).
  - Previous concrete repair work is evident within the watch tower (Figure 9).

Figure 6. Radial cracks (yellow arrows) and diagonal cracks (black arrow) emanate from the window openings.

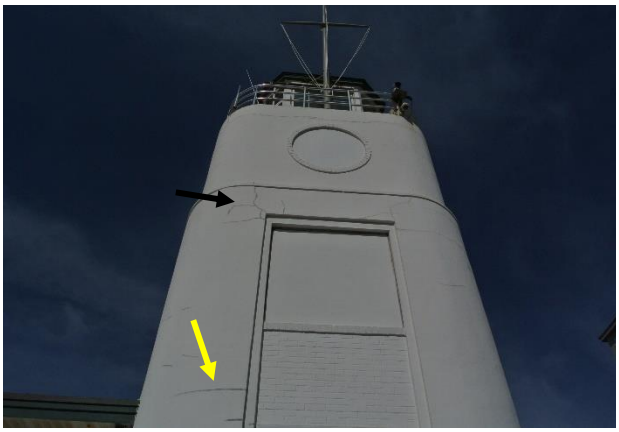

Figure 7. Radial cracks (yellow arrow) and diagonal cracks (black arrow) emanate from the window openings.

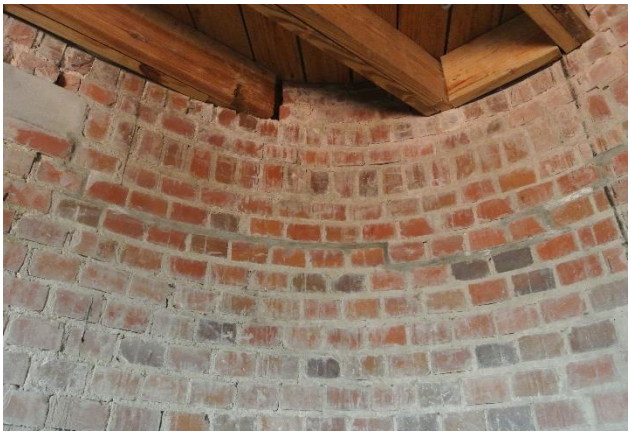

Figure 8. The interior brick wythe is exposed showing header units exclusively at the radiused corners.

Figure 9. Previous repairs to the concrete floor slab and window headers were noted (yellow arrows).

- Some windows have broken glass (Figure 10).
  - An insulated glass unit at the top observation deck of the watch tower exhibits condensation within the unit (Figure 11).
- The wood trim around the windows is deteriorated in most locations (Figures 12 and 13).
  - Corrosion of window frames and door hardware is apparent in several locations (Figures 14 and 15).

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Figure 10. A few windows are broken.

Figure 11. An IGU in the observation deck enclosure has failed. Note the condensation within the unit (yellow arrow).

Figure 12. The wood trim around the windows is deteriorated.

Figure 13. The wood trim around the windows is deteriorated. Corrosion staining from fasteners (yellow arrows) is also apparent.

Figure 14. Window fasteners are exhibiting surface corrosion (yellow arrow).

Figure 15. Door hardware throughout the facility is showing varying degrees of corrosion (yellow arrow).

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- A gutter has been installed over a door (Figure 16) leading to an existing stairwell that is now flanked by the addition.
- The soffit around the two-story portion of the building is vented; however, minimal ridge venting is provided (Figures 17 and 18).
- Control joint sealant at the addition exhibits varying degrees of cohesive and adhesive failures (Figure 19).
- Biological growth, corrosion staining, and cracks are present on the north facade of the addition (Figure 20).
- The main concrete overhang on the east facade has drains through its thickness; however, corrosion staining from the drain insert is evident (Figure x 3081).

Figure 16. A gutter has been installed above a second-floor door at the watch tower (yellow arrows).

Figure 17. The eave soffit is vented around the perimeter of the two-story structure.

Figure 18. Two box vents (only one is truly near the ridge) exist at the steep-sloped roof (yellow arrows).

Figure 19. Sealant is experiencing adhesive and cohesive failures (yellow arrows).

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Figure 20. Biological growth, cracking, corrosion staining (yellow arrow) is present along the north facade of the addition.

Figure 21. The drain inserts through the concrete overhang are exhibiting corrosion (yellow arrow).

Inspection Openings

NBC under the direction of GDI made three inspection openings: (1) interior spiral staircase beam connection, (2) exterior spiral staircase beam pocket, (3) watch tower window head lintel. The following observations were made:

Interior Beam Connection

The interior gypsum ceiling board was removed near the exterior wall to review the interior condition of the beam supporting the spiral staircase.

- The wood floor joists also exhibit some water staining and deterioration neat the exterior wall (Figure 22).
- A new beam has been installed below the existing beam. The new beam is in good condition with no visual distress or displacement.
  - The new beam is welded to a steel plate via clip angles. The plate is welded to two (2) plates that are anchored into the existing concrete wall (Figure 23).
  - The existing beam is severely corroded near the exterior wall (Figure 24).

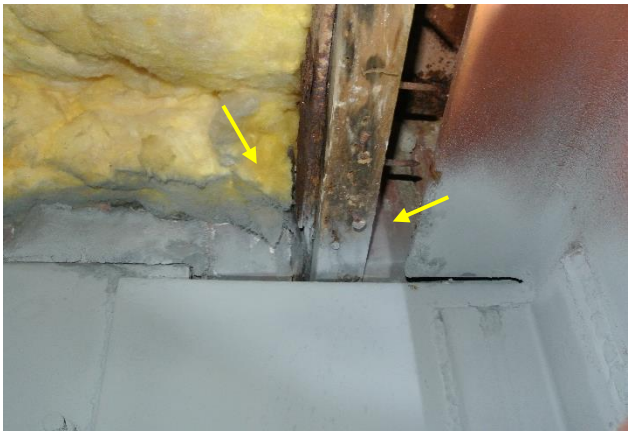

Figure 22. Water staining on and deterioration of the wood joists and floor boards was noted (yellow arrows) .

Figure 23. The new beam is welded to a plate that is welded to plates anchored into the wall.

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Exterior Beam Pocket

The brick masonry concealing the existing beam pocket was removed. The outboard edge of the existing beam seen in Figure 24, is thoroughly corroded (Figure 25). Most of the flange and web have been completely consumed.

Figure 24 The existing beam is severely corroded (yellow arrow) near the exterior wall.

Figure 25. The end of the existing beam is thoroughly corroded where it is embedded into the brick masonry.

Tower Window Head

A portion of a previous concrete repair was chipped out to expose the underlying construction (Figure 26). Concealed is a steel lintel that exhibits similar corrosion noted at the exterior beam pocket (Figure 27).

Figure 26 A small portion of the previous concrete repair was removed to expose the lintel.

Figure 27. The steel lintel is heavily corroded similar to the steel beam in Figure 25.

Discussion and Conclusions

All masonry wall assemblies, regardless of quality of construction and design, will absorb rainwater due to the inherent porosity of the masonry. The amount of water entering the exterior enclosure and the ultimate disposition of the water within the wall is influenced by the as-built configuration and condition of the wall system.

Preventing migration of water through a wall system to interior spaces can be achieved by either of three fundamental concepts: barrier walls, mass walls, and drainage walls. Barrier walls do not allow for

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rainwater to be absorbed by or enter the wall assembly. All rainwater is repelled at the exterior face of barrier walls. As such, barrier walls typically do not utilize flashings to evacuate water from within the wall system as water is not expected to enter the wall.

Mass walls resist water leakage to the interior by relying on the bulk of the wall system to absorb the water that does enter the outboard face. If the amount of water introduced into the mass wall is greater than the wall's absorptive capacity, then water leakage to the interior may occur. Mass walls are typically constructed of many wythes of masonry with solid collar joints and also do not utilize flashings.

Drainage walls are designed to allow moisture that enters the wall to drain down through a continuous and unobstructed cavity (i.e., an air space) within the wall assembly. A masonry drainage wall functions by preventing water leakage to the interior by establishing a continuous clear cavity or air space between the inboard face of the masonry veneer and the back-up framing system. Common back-up systems include CMU, concrete, light gage steel framing, and wood framing. Water that can migrate through the masonry veneer is ultimately able to reach the clear cavity at the inboard face of the masonry veneer. At this point, the only path of travel of the water should be down the inboard face of the masonry veneer. Continuous impermeable materials (flashings) installed across the cavity at all interruptions in the cavity are intended to collect and drain water from the wall assembly. For maximum effectiveness, flashings should extend outboard of the veneer face and be terminated with a drip edge, extend 8 inches vertically above the horizontal leg, include adequate provisions for drainage, and be free from unsealed laps and breaches. While not theoretically necessary, a water resistive barrier applied to the outboard face of the back-up system exposed to the cavity (i.e., exterior wythe of CMU or sheathing exposed to the cavity) provides a redundant means of directing water to the exterior in the event water is able to bridge the cavity width via mortar droppings, lateral ties, etc.

The original construction of the exterior brick masonry wall did not include, or intend for the use of flashing, or the accommodation for differential movement. This is not uncommon for the era in which this building was constructed. During this time, the transition between the philosophies of mass walls to drainage walls is evident in the design, detailing, and construction of this building. The exterior wall is load-bearing and supports the floor and stair framing, which is akin to mass wall systems; however, the wall is constructed with embedded steel for the stair framing and above window heads at the tower. In this case, in lieu of using a masonry arch for lintels which is common for mass walls, the introduction of steel begins the transition to more common drainage veneer type walls.

At this building, the painted stucco covering on the concrete and masonry is meant to make the exterior walls a barrier wall where the paint or coating on the stucco is the main water control; however, as the coating ages, the roofing/waterproofing of the observation deck ages, and/or windows leak, water that gets behind this barrier is trapped. Therefore, this moisture in tandem with the combination of embedded steel and the lack of accommodations for movement within the wall assembly, has created a deleterious environment for the both the steel and masonry.

Over time and currently, the advanced state of distress observed in the stucco and brick masonry around window and door openings and within the field of the wall is generally caused by the expansive corrosion of embedded steel lintels and structural steel framing, respectively. Corrosion is an electrochemical process requiring an anode, cathode, and electrolyte. In this case, moisture absorbed by the masonry acts as the electrolyte with the embedded steel behaving as both the anode and cathode. When combined, the reaction results in a significant increase in the base metal volume as the ferrous component of the steel oxidizes into iron oxide, or rust which places pressure on the adjacent masonry leading to distress. When rust is present, the increased porosity of the steel surface tends to trap moisture and further accelerate corrosion. The rate of oxidation and deterioration of the steel lintels will accelerate if it is not arrested.

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The quantity of water entering the outer wythe of masonry is highly dependent on the condition and type of the stucco coating, stucco, masonry units and mortar joints, and concrete. Failed coatings, cracked and delaminated stucco, incompletely filled joints, failed sealant, and unsealed penetrations can dramatically increase the volume of water that infiltrates an exterior wall. With the lack of flashing, moisture trapped in the stucco and brick masonry is held in contact with the steel for extended periods of time leading to ongoing corrosion. Masonry, concrete, and stucco allow moisture to slowly evaporate from the exterior wall; however, when it is coated with paint or other coatings, the water migration out of the wall will be slowed or completely obstructed which can further exacerbate the corrosion process.

Further marine environments are highly corrosive due to the salt content of the water that near shore buildings experience. The introduction of salts and ferrous metals accelerates the corrosion procession. As such, the salinity of the water that wets this building only compounds the issue discussed above.

Windows

The wood trim has experienced a similar fate as the walls. It too was painted and as water permeates or leaks into the trim, drying outward is restricted. As such, the wood begins to rot and deteriorate as observed throughout the building. Similarly, the salinity of the water has corroded fasteners not only within the trim, but of the windows, doors, and hardware.

While some units are broken or the IGU seal is breached, the vinyl residential casement windows are likely not rated to handle the coastal environment routinely experienced at this building.

Roofing

While no reported or evidence of water leakage associated with the roofing was observed, the current configuration of the steep-sloped roofing could have a negative impact on the overall performance. In order for natural ventilation to work on steep-sloped roofs, there must be a clear air space between the eave and ridge with vents at both that provide the requisite air exchange. While the eave soffit maintains open ventilation, the ridge does not appear to provide the needed net free ventilation area, as only one vent is provided on the north. Without proper ventilation, the hygric buoyancy of warm, humid air (not uncommon for the location) can significantly increase the moisture content of wood framing and decking near the ridge which can lead to rot and/or mold.

Recommendations

Based on the findings of our limited evaluation and experience with similar projects, GDI offers the following recommendations to enhance the performance of the building enclosure and reduce the distress observed to date:

Facade Repairs

Most of the stucco repairs are isolated to the east facade and watch tower. Here, the stucco coating should be removed, stucco cracks routed and sealed, and delaminated stucco removed and replaced. At tower windows, the steel lintels should be removed where the window has been removed and infilled with masonry. Where a window remains, the lintels should be removed and replaced with a stainless steel lintel or a masonry lintel/arch.

At the southeast corner of the building, the stucco should be removed to fully review the underlying masonry. Upon this review, a rebuild or reinforcement repair will be necessary.

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Elsewhere, the stucco coating should be removed so that cracks can be routed and sealed and delaminated stucco removed and replaced.

Subsequent to these repairs as well as the window scope outlined next, the stucco should be recoated with a vapor permeable coating.

Windows

The use of a residential style, casement window in a coastal environment will not provide the requisite rain water penetration, air leakage, and projectile metrics for a life safety facility. Further, with some of the windows damaged, broken, or losing their seal, replacement of the windows is warranted.

Roofing

Further investigation into the ventilation of the steep-slope roof is warranted to ensure that wood framing at the ridge condition is not compromised by increased humidity and moisture levels.

For the concrete overhangs, consider a new waterproofing coating on the skyward face along with the removal of the ferrous drain insert. A new aluminum insert integrated into the new coating is recommended.

Closing

GDI appreciates the opportunity to assist you with this limited evaluation and to provide recommendations for your consideration to address the reported issues at the Jacksonville Beach Lifeguard Headquarters located in Jacksonville Beach, Florida. Should you have any questions or comments regarding this information, please contact me at your convenience.

Sincerely,
Garland/DBS Inc.

David S. Finley
Director of Building Science
Garland Envelope Services

Garland/DBS, Inc.
3800 East 91st Street
Cleveland, OH 44105
Phone: (800) 762-8225
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ROOFING MATERIAL AND SERVICES PROPOSAL

City of Jacksonville Beach
Ocean Rescue Headquarters
2 Ocean Front N
Jacksonville Beach, FL 32250

Date Submitted: 05/02/2025
Proposal #: 25-FL-250477
MICPA # PW1925
FL General Contractor #: CGC1533467

Purchase orders to be made out to: Garland/DBS, Inc.

Please Note: The following budget/estimate is being provided according to the pricing established under the Master Intergovernmental Cooperative Purchasing Agreement (MICPA) with Racine County, WI and OMNIA Partners, Public Sector (U.S. Communities). The line item pricing breakdown from Attachment C: Bid Form should be viewed as the maximum price an agency will be charged under the agreement. Garland/DBS, Inc. administered an informal competitive process for obtaining quotes for the project with the hopes of providing a lower market-adjusted price whenever possible.

Scope of Work: Exterior Wall Restoration and Window Replacement

1. Remove and replace windows.
2. Provide and install windows per field survey.
3. 74 total window openings with PGT impact windows with turtle glass tint
   Remove and dispose of old glass and installation of new
   Replacement of deteriorated / rotted wood in window openings
4. Steel lintels to be removed where the window has been removed and infilled with masonry at tower elevations, as per GES recommendation from on-site survey.
5. Replace existing lintels with stainless steel lintels where windows remain in tower.
6. Remove stucco at upper southeast corner elevation to expose underlying masonry substrate beneath stucco; perform reinforced repairs as required and install new smooth finish stucco to match adjacent surfaces
7. Remove and replace delaminated stucco; patch and repair cracks and other damage in stucco surfaces.
8. Replace all exterior wall sealant applications.
9. Install fluid applied roof systems at canopy roof sections, previously coated roof section at north elevation, and install traffic bearing waterproof coating at upper-level tower lookout roof area
10. Pressure wash exterior wall surfaces to remove dirt, algae, and other surface contaminants
11. Scrape to remove loose paint; lead based paint scrapings to be captured on reinforced polyethylene sheeting; all scrapings to be captured and removed daily
12. Apply high build primer to uneven painted surfaces

13. Install two coat application of an architectural emulsified acrylic dampproof and breathable wall coating
14. Prep and prime all wood trim and apply two coats of Sherwin Williams Duration premium exterior grade paint
15. Remove all tools, equipment, and debris from jobsite upon completion of project
16. All work performed in full accordance with OSHA safety regulations

Proposal Price Based Upon Market Experience:	**$**	**1,095,861**

Garland/DBS Price Based Upon Local Market Competition:

1 National Building Contractors	**$**	**1,095,861**

Potential issues that could arise during the construction phase of the project will be addressed via unit pricing for additional work beyond the scope of the specifications. This could range anywhere from wet insulation, to the replacement of deteriorated wood nailers.

Please Note – The construction industry is experiencing unprecedented global pricing and availability pressures for many key building components. Specifically, the roofing industry is currently experiencing long lead times and significant price increases with roofing insulation and roofing fasteners. Therefore, this proposal can only be held for 30 days. DBS greatly values your business, and we are working diligently with our long-term suppliers to minimize price increases and project delays which could effect your project. Thank you for your understanding and cooperation.

Clarifications/Exclusions:

1. Plumbing, Mechanical, Electrical work is excluded.
2. Masonry work is included to which it obtains to the scope of work.
3. Interior Temporary protection is excluded.
4. Any work not exclusively described in the above proposal scope of work is excluded.

If you have any questions regarding this proposal, please do not hesitate to call me at my number listed below.

Respectfully Submitted,

John Petersen

John Petersen
Garland/DBS, Inc.
(216) 302-3777