



Building Envelope Consultants and Scientists, LLC.



## Inverness North

### Façade Condition Assessment Report

**The Management Group Associations, Inc.**  
c/o Mr. Michael Rickman, Property Manager  
20440 Century Boulevard, Suite 100  
Germantown, MD 20874

**Building Envelope Consultants and Scientists, LLC**  
Nicholas J Palumbo, Sr. Project Manager  
1103 North Washington Street | Third Floor  
Baltimore, MD 21213



Building Envelope Consultants and Scientists, LLC.

July 25, 2023

**ATTENTION:** **The Management Group Associations, Inc.**  
c/o Mr. Michael Rickman, Property Manager  
20440 Century Boulevard, Suite 100  
Germantown, MD 20874

**SUBJECT:** **Façade Condition Assessment Report – Rev. 1**  
Inverness North  
Potomac, MD 20854  
BECS #20230013

Dear Mr. Rickman:

Building Envelope Consultants and Scientists, LLC (BECS) is pleased to submit the following report detailing our condition survey of the cladding systems and underlying conditions at the Inverness North Community, which includes T1-11 plywood panel siding, stucco, and cedar shingled facades.

## Background

The Inverness North property consists of 19 residential buildings, with a total of 124 residential townhouse units, constructed circa 1977 to 1979. The buildings are constructed as wood framed structures. The roofs are sloped, with cedar and asphalt shingles. The building exterior façade varies between adjacent townhouse units, and includes T1-11 plywood panel siding, stucco, and cedar shingled facades. There are painted wooden trim elements at windows, roof rakes, frieze boards, soffits and fascia.

BECS was requested to perform a visual condition assessment of the façades and underlying conditions. In general, the stucco and cedar shingle facades appeared to be in visually acceptable condition. As such, our field observations were limited to the T1-11 siding panels, where deterioration was clearly visible. With assistance from Gardeners Construction, we removed the T1-11 siding at one location for an intrusive exam. The following is a summary of our observations, and recommendations for repairs.

## Findings and Comments

On May 30, 2023, Nicholas Palumbo, P.E. of BECS, visited the property at Inverness North to observe and assess the nature and extent of deterioration to both the T1-11 wood façade siding and the underlying structural sheathing and framing. During our visit, we removed a portion of the wood paneling at 7831 Muirfield Court to allow visual observation of the structural wall system. The following is a summary of our observations.

### Construction:

The buildings are constructed with wood-framing, with facades varying between T1-11 plywood panel siding, stucco, and cedar shingles. Behind the siding is a black fiberboard sheathing, fastened to the wood stud framing. The T1-11 panels appear to be treated for exterior use and are painted to help prevent deterioration. The fiberboard sheathing appears to be asphalt-impregnated which helps provide water resistance but is not installed as a weathertight barrier. There was no building wrap weather barrier covering the sheathing at the location observed.

### T1-11 Siding Panels:

A *significant* percentage of the exterior T1-11 wood panels around the buildings are visibly decayed, to varying degrees. Although the deteriorated areas are often covered with paint, it is apparent the “wavy” or “bubbled” areas of the panels are rotted through. We were able to penetrate with a screwdriver through the T1-11 panels with little resistance at these locations. Near the base, the bottom edge of the T1-11 panels wick water upward, accelerating deterioration where the water doesn’t simply shed off the edge.

We performed a walkthrough around the property to observe the T1-11 paneling on each townhome and assess the level of deterioration. Although the paint obscures and conceals much of this deterioration from view, we graded each unit on a scale relative to other units. This is intended to identify those units with the most severe visible surface deterioration and help provide the Association with guidance regarding the overall condition of the property. It is expected the units with the most severe conditions when viewed from the exterior will have the greatest probability of deterioration within the hidden structural framing. (See Appendix)



**Photos 1 & 2: Wood T1-11 siding, visually bubbled/wavy where deteriorated.**





**Photo 3 & 4: Wood T1-11 siding stained on back side. Severe deterioration at chimney**

**Fiberboard Sheathing:**

The T1-11 panels are not intended to be a weather barrier for the building, and with a lack of WRB, this assembly is heavily reliant on the integrity of the exterior T1-11 panels to act as a water barrier. A Weather Resistant Barrier (WRB), such as Tyvek, is commonly used in wood-framed structures as a barrier to prevent water infiltration, while being vapor permeable to allow water vapor to pass out and keep the wood framing dry. WRB materials must be installed as a system with proper taping at seams, and proper flashing around windows, doors, and other penetrations. Without a proper weather barrier, air and moisture can enter the building structure and lead to decay and structural deterioration.

Despite having an inherent water-resistant quality, the black asphaltic fiberboard sheathing is not intended to provide a waterproof barrier for the structure. The fiberboard sheathing is not continuous between floor lines and is not taped or flashed at seams or windows. Additionally, the sheathing is not continuous across floor lines, and leaves the wood structural framing directly exposed to the rear face of the T1-11 siding.



**Photos 5 & 6: Wood framing exposed at floor line. Deteriorated fiberboard sheathing.**

**Structural Wood Framing:**

Proper and functional detailing of the flashing around windows, doors, wall penetrations, and seams, is critical to prevent water infiltration at these points. Where observed, the window flanges are not sealed and flashed, but are simply fastened against the face of the fiberboard sheathing. The absence of flashing allows water to pass behind the window frame into the exterior wall structural wood framing.

It is evident that water has been penetrating through the top and bottom edges of the window frames, and along the sides, causing staining and some deterioration of the structural wood framing. Some of the wood is rotted at the base of the wall, and around the perimeter of the window frame where there is no flashing. At a minimum, the deteriorated elements should be replaced or reinforced with new framing elements, including studs, plates, and headers. Removing the existing T1-11 siding panels will provide the opportunity to assess the condition of the underlying fiberboard sheathing, and the structural elements.

**By removing the paneling at each townhouse we would be able to assess the condition of the existing fiberboard and structural framing at each location, and ensure structural repairs are completed where necessary.**



**Photos 7 & 8: Deteriorated wood framing at base of wall, below window.**

## Recommendations

Our survey was not exhaustive in nature and there may be hidden structural deficiencies of which we are not aware, did not see, or had not yet manifested into visible conditions at the time of our field observations. Recommendations for repair, attention, or replacement are listed below.

Based on both our visual and intrusive survey, it is evident that the T1-11 façade panels require replacement at many units around the property. This is necessary to reduce or eliminate the potential for continued deterioration of the structural wood framing, including studs, plates, and headers. Wood deterioration is ongoing, and as the project is delayed concealed damages will continue to grow, corresponding to greater repair costs and structural concerns.

***BECS recommends fully re-siding townhomes which have signs of deterioration. This work can be phased so that costs and disruption to the community are more manageable. Based on our visual survey, the siding at units identified with severe deterioration are recommended to be replaced within the next 1-2 years, and townhomes which have limited deterioration within the next 2-5 years. Remaining units should be monitored for degradation over time.***

Re-siding of each townhouse will require removal of exterior wood T1-11 siding panels, and associated wood trim, and replacement with new siding materials which will not deteriorate in the same manner. This will ensure an extended lifespan without the need for ongoing replacement and maintenance of the panels.

An alternate wood product that may be installed in place of the T1-11 is called SmartSide. This is fabricated with impregnated resins and waxes to be moisture and insect resistant and is already primed for painting. This product is also available in various colors that may be acceptable to the community. Additionally, synthetic materials may include PVC paneling (such as Azek), vinyl siding, or fiber cement siding (such as Hardie Board). These are different materials than the existing T1-11 siding and, although they may have a similar appearance, cannot be expected to match exactly the color and texture.

**Vinyl siding is the least expensive option at approximately \$9.50 per SF installed, without needing to be painted. T1-11, Smartside, and Hardie siding are similar cost, approximately \$23.00 to \$25.00 per SF installed and painted. T1-11 is not primed, and would require multiple coats of paint and primer. PVC (Azek) panels are much more expensive, at approximately \$25.00 to \$27.00 per SF installed and painted.**

**Costs may also vary significantly depending upon the various repairs performed, means and methods, materials selected, and hidden conditions that might be discovered upon removal of the existing siding.** Our opinion of costs is provided for initial budgeting purposes only. More accurate costs would be obtained from qualified contractors in a bidding scenario using engineered repair construction documents. These costs are based upon current dollars and do not consider optional work, annual inflation or the costs associated with fees for bonds, engineering, construction monitoring or other administrative services. Costs are based upon estimated quantities derived from our survey and our experience of the actual costs received for work on similar projects.



During the re-siding process, the condition of the sheathing and structural framing can be assessed to identify locations where structural repairs may be required. The following repair options should be considered:

1. Remove existing T1-11 siding panels and install new synthetic façade over existing wall system. *This is not recommended, as the existing system does not include an Air and Weather Barrier, and is not water-tight or air-tight.*
2. Remove existing T1-11 siding panels and install a new Air and Weather Barrier on top of existing fiberboard sheathing. This will keep water and moisture from penetrating the wood framing and prevent ongoing deterioration. A new synthetic façade would be installed to cover the AWB. *New windows and doors with full-perimeter flanges are recommended for full weather protection.*
3. Remove existing T1-11 siding panels and remove existing fiberboard sheathing. Install new plywood or OSB sheathing and a new Air and Weather Barrier. *Existing windows and doors must be replaced or removed and re-set to allow for proper installation of wood sheathing, and proper installation of a new weather barrier with flashing around windows.*

The recommended repair and maintenance program will bring the exterior wall systems and their associated components back to a particular level of performance and service life expectancy for the buildings.

This report is not a specification, does not provide a detailed scope of work or repair drawings, and should not be relied upon in any format as a guideline for needed repairs, see Limitations section below for further information. Upon request, BECS may provide repair drawings showing new framing, repair details, and general notes as required for permitting. We appreciate the opportunity to be of service. If you have questions regarding this report or require additional assistance, please contact our office at your convenience.

Sincerely,

**Building Envelope Consultants and Scientists, LLC**



Nicholas J. Palumbo, P.E.  
Sr. Project Manager



William J. Hasselman  
Sr. Project Manager

**Attachment:**

Facade Condition Assessment Summary

## Limitations

Evaluations of existing buildings and their components require that certain assumptions be made regarding existing conditions. Some assumptions cannot be verified without performing intrusive investigations, which can prove costly and may damage existing features of the building. We did not remove additional finishes, take samples, or perform tests. Our evaluations do not consider conditions that may become, or cause, structural deficiencies or defects and are limited to the visually apparent condition of the components at the locations observed and at the time of the investigation. We are not responsible for other portions of the property that are not a part of this investigation or for components unrelated to those reported such as heating, AC, electrical, and plumbing. We did not investigate for the presence or absence of any hazardous substances including but not limited to toxins, carcinogens, mold, noise, and or contaminants in soil, water, and air.

We performed these services in a manner consistent with the level of skill and care ordinarily exercised by professional engineers and consultants practicing in this region under similar conditions. No other representation, warranty or guarantee is given. Our opinions are based on our engineering judgment. We will not be responsible for latent defects that may appear in the future or for differing opinions of others that may arise. The intent of our investigation was not to perform an exhaustive study to locate every existing defect, but rather focuses on overall condition of the elements of concern, and specific conditions brought to our attention by the Client. Should additional information become available that we were not aware of, did not see, or which was unknown at the time of our investigation, we reserve the right to revise our report as needed.

This report is to be read in its entirety; thus no portions of this report may be used outside the context of the entire report. This report is not a construction document and is not intended to be used for construction or actual repairs based on this report alone. This report is intended solely for the use of the Client or Owner; any third party use, third party reliance, or third party decisions made on the basis of this report shall be the sole responsibility of such third parties.