Jensen Yorba Lott Inc.

MEMORANDUM

Serving Alaska Since 1935

Date: **September 22, 2017**

To: **Amber Al-Haddad**

From: **Tony Yorba**

RE: **Wrangell Public Safety Space Envelope**

CC:

Summary: Significant rot, fungi and carpenter ants was discovered in the exterior west facing wall of the Wrangell Public Safety Building. The condition renders the court clerks office unusable. At the request of Wrangell Borough staff, Tony Yorba and Dan Fabrello conducted an investigation of the exterior wall assemblies, and to a lesser extend the roof assemblies, of the entire building in order to determine if other similar conditions exist in the building, what the prognosis is, likely corrective work and cost s for such work. The building had been previously documented in a report by JYL accomplished in 2004. Later, the south elevation cladding was replaced primarily due to failure of the integral gutter system. It was understood that the exterior wall assembly was at the end of its useful life, so wall cladding replacement for the north, west and east walls was included in a set of documents accomplished by JYL dated June 2017. That work has not yet proceeded. In addition, replacement for the membrane roof portions of the building was included in a set of drawings also dated June 2017. That work has not yet proceeded. Yorba and Fabrello conducted the on site evaluation of the exterior space assembly, using the previous documentation as a guide. The following is a summary of their findings:

1. The North wall is capped by a concealed gutter assembly identical to that replaced on the south wall in 2008. The assembly, which creates an overhang that projects out approximately 24 inches, is structurally failing, with noticeable deformation. The temporary steel straps installed as a measure to resist the deformation are failing. The condition is a life safety threat and should be corrected as soon as possible.
2. There appears to be extensive dryrot in the plywood sheathing of the walls below the gutters on the north side.
3. Virtually all the siding on the building is dryrotted and well beyond its useful life.

4. The parapets at the perimeter of the membrane roofs leak water into the wall assembly below. This includes the angled wall areas between the large sloped roof areas facing the street, and the court clerks offices at the rear of the building. It can be assumed that extensive rot has occurred in these areas. We did not observe critical structural damage, but the plywood sheathing is virtually destroyed in these areas and the dimensional lumber will follow suit.
5. The south elevation work was not done in compliance with the 2008 construction drawings, specifically, the PVC membrane used to seal the old gutter system was not welded to the new metal flashing. It does not appear to have been adhered at all to the flashing. As a result , the membrane has oxidized and peeled up and curled around itself, leaving the plywood sheathing exposed. The gutters were not connected to the building with mechanical fasteners and sleeves as shown on the drawings, but rather with metal strips and rivets. Most of these have failed. The gutter sections were riveted together with no provisions for sleeves or sealant pockets. The gutters leak at every joint.
6. Sealant between window frames and siding has cracked and is no longer an effective seal. There is no secondary flashing under the siding other than the 15 lb building paper, so there is little to resist water intrusion. There is visible failure in mullion trims between the mulled window units.
7. The metal roof assembly is largely intact, although paint is eroding and rust is present in many flashings where the coating fissured during fabrication.
8. The membrane roof assembly appears to be largely intact, except for the failure at the parapets.

The following are our recommendations:

1. Remove the failing North wall concealed gutter assembly, or replace it with a structurally competent replacement. This is a life safety issue and should be addressed as soon as possible.
2. Reconfigure the parapet wraps at membrane roof area. This includes removing the metal parapet coping, wrapping the existing wood parapet with roofing membrane, and then re-installing the metal coping. This will eliminate the active leaks sourced from the parapets This should be done immediately.
3. At the south wall, remove defective materials and replace them with materials as originally shown in the 2008 drawings. This should be done as soon as possible to prevent water intrusion from again damaging the south side offices.
4. Remove and replace exterior wall cladding down to bare studs and window assemblies under the membrane roof area. In particular, the west wall area must be addressed in order to remove the immediate life-safety threat posed by mold. Windows should be replaced at the same time so that a complete, modern water shedding configuration can be accomplished. The windows must be removed to adequately replace the dryrotted materials, and since they are at the end of their useful life they should not be re-installed.

5. Remove all wood siding, which can be assumed to be significantly dryrotted virtually everywhere. The wood siding could be replaced with wood siding, but we recommend a metal siding similar to that replaced at the south elevation. Replacement siding should be installed in a rain screen wall assembly configuration to better protect the building from wind driven rain. Plywood substrate and gypsum sheathing should be replaced where rot is present.

Background:

The Wrangell Public Safety Building was built in two phases, the second phase completed from drawings prepared by Ackley Jensen Architects (Now Jensen Yorba Lott, Inc). It is a complex building due to the very challenging mix of occupancies. It requires significant fire rated assemblies, and complex mechanical systems, sound attenuation and security measures to successfully combine the public safety functions as well as provide public access to important community service functions. Walls consist of 6 inch wood studs with ½" plywood shear panels and ½" gypsum sheathing required to accomplish the code required 1 hour rated wall assembly. The exterior gypsum sheathing was covered with 15 lb felt underlayment (commonly called 'tarpaper") and 1x8 t&g cedar siding in both vertical and horizontal orientations. Sloped roofs are 24 gage metal "Klip Rib" roofing with concealed fasteners installed over 15 lb felt and secured to ¾" plywood roof sheathing. Roof structure varies from pre-manufactured wood trusses, glued laminated beams and dimensional lumber joists. Low slope roofs are the original Inverted Roof Membrane Assemblies (IRMA) consisting of EPDM rubber membrane loose laid over the plywood roof deck with loose laid rigid insulation held in place with concrete ballast boards and pavers. The scope of this report is limited to an evaluation of the exterior space envelope, consisting of roof, walls, window and door openings.

Methodology:

Investigators used a hydraulic man lift to access the walls on the south, east , north and most of the west elevations. The southwest end of the building is blocked to motorized traffic so our investigation there was limited to access via a 20 ft extension ladder. We directly observed the wall assembly primarily by using a hole saw, cutting 1.5" holes through the wall assembly and examining the condition of the representative cores of each layer of materials. We cut cores in virtually every area of siding. We also removed sections of T&G siding in some locations, but the condition of the siding was so poor that it was difficult to remove the siding without it shredding apart. For roof observations, we removed the metal parapet caps to allow us to look directly into the wall assembly. We limited observation of other roof areas to what could be directly observed- no cutting of roof assemblies was attempted. Windows and Doors were investigated by direct observation, with cores cut and siding removed next to windows that appeared especially problematic. We used a moisture detector to identify moist areas prior to making cuts. We also tested most core samples to observe relative moisture content at each.

Observations:

General Observations:

1. The wood siding throughout the building is dryrotted, in some places the rot is complete through the entire board.
2. The membrane at the parapet did not completely wrap the top of the parapet wall. As a result water leaked through the parapet flashing at each seam in the metal, where it entered the wall assembly. Extensive rot has occurred in walls below the parapets.
3. The attached drawings are noted to indicate specific observations make at each test location.

South wall: free water is visible dripping from the gutter assembly and in certain places from the vent space. PVC membrane used to seal the old gutter system was not welded to the new metal flashing. It does not appear to have been adhered at all to the flashing. As a result , the membrane has oxidized and peeled up and curled around itself, leaving the plywood sheathing exposed. The gutters were not connected to the building with mechanical fasteners and sleeves as shown on the drawings, but rather with metal strips and rivets. Most of these have failed. The gutter sections were riveted together with no provisions for sleeves or sealant pockets. The gutters leak at every joint, and water can be observed leaking under the eave flashing.

East Wall: East walls below the sloped roof sections exhibited relatively little rot beyond the siding itself. However, walls below the low slope membrane roofs were extensively dryrotted with the rot observed completely through the plywood siding, and soft damp gypsum sheathing observed. We observed the rake overhangs and did not see rot present in them, other than the rot visible in the cedar siding.

North Wall: free water was observed running down the wall and soffits. It appears to be primarily from leaks in the gutter joints, but may be sourced from failures in other flashings as well. We also observed the structural failure of the concealed gutter assembly. Cores confirmed that the water has penetrated the wall assembly, with rot assumed to be present in most plywood areas.

West Wall: West walls below the sloped roof sections exhibited relatively little rot beyond the siding itself. We observed the rake overhangs and did not see rot present in them, other than the rot visible in the cedar siding. However, walls below the low slope membrane roofs were extensively dryrotted with the rot observed completely through the plywood siding, and soft damp gypsum sheathing observed. We observed free water dripping out of the siding near the overflow scupper in this area. This appears to be sourced from the leaking parapet and not from the membrane roof.

Metal roofs: the "Klip Rib" roof is in fair condition. It is popping out of place at the edge of the north gutter due to the failure there, and some seams were popping on the south side. Finish is eroding and will require maintenance to prevent extensive rusting within 5 years. We inspected the attic space over the apparatus bay and the police spaces and found no signs of leaks/

Membrane roofs: Parapets were not sealed completely in the original construction and are the source of much of the water damage in the building. We confirmed this by coring into walls below where leaks were observed in the parapet coping. In most area, extensive dryrot was observed. However, we cut into drywall ceilings in two areas and found no dryrot or wet materials. This suggests that the water damage is limited to the walls themselves and that no roof structure damage has occurred.

Doors: No significant deterioration was observed in any doors or frames and they can be assumed to be in good condition

Windows: Windows in generally protected areas (ie: under overhangs) can be generally assumed to be in fair to good condition and it may be possible to re-use them. However, all windows in areas lacking overhangs must be replaced.

Recommendations:

The following are the repair recommendations from the team:

1. Remove the failing North wall concealed gutter assembly, or replace it with a structurally competent replacement. This is a life safety issue and should be addressed as soon as possible.
2. Reconfigure the parapet wraps at membrane roof area. This includes removing the metal parapet coping, wrapping the existing wood parapet with roofing membrane, and then re-installing the metal coping. This will eliminate the active leaks sourced from the parapets This should be done immediately.
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We understand that funds are limited. We have identified the following areas of work that could be addressed as separate projects. However, a piecemeal approach should be considered carefully as leaks may still occur if a defective piece remains next to an area

that was repaired. They should be considered on a case by case basis. The following are individual projects with a budget assigned to each one. They are numbered in order of priority, considering both ease of repair, relative cost and life safety concerns

1. South Elevation Gutter Repair:
2. Parapet Repair
3. North Gutter Replacement:
4. West Wall Siding/Window
5. East Wall Siding/Windows
6. North Wall siding repair
7. All other Siding/Windows