FORENSIC
BUILDING CONSULTANTS

Oswego Ridge Homeowners Association

Date: **March 4th, 2016**

Subject: **Oswego Ridge Condominiums Homeowners Association**
Targeted Building Envelope Rehabilitation
Design Brief – NOT FOR CONSTRUCTION

Project Overview:

Oswego Ridge Condominiums are a community of nine (9) buildings lettered "A" through "I" and were reportedly constructed in 1985. The buildings are arranged into two (2) basic model types predominantly varied by deck and entry types. There are multiple stand-alone carport structures and a clubhouse that are also a part of the community. Both building types share similar cladding materials and building envelope components, which include but are not limited to the following:

1. *Cedar bevel lap siding and cedar wood trim*
2. *Aluminum flange-mounted windows and sliding glass doors (appear to be original fenestrations)*
3. *Polyvinyl Chloride (vinyl) windows (appear to be replacement windows)*
4. *Steep-sloped roofs with concrete tile roofing over a felt underlayment and lead flashing (at some locations)*
5. *Metal flashing at roof-to-wall and roof-to-roof transitions*
6. *Crickets at some roof-to-chimney locations*

7. *Sloped metal caps atop chimneys*
8. *Metal gutters and downspouts*
9. *Elevated deck and landing assemblies (some possessed a waterproof membrane atop the plywood deck)*
10. *Wood railings*
11. *Swing doors at privacy decks and entries*
12. *Ground level concrete patios and sidewalks on grade*

Investigation Summary:

Forensic conducted visual and limited invasive investigations of the project's building envelope assemblies. Investigations occurred on February 16th and 17th, 2016.

Forensics' observations on site and photographic documentation of this investigation form the basis of the project team's assumptions regarding the as-built conditions on site since architectural plans and maintenance records were not available.

The typical exterior cladding systems consist of cedar bevel lap siding, pre-painted galvanized metal flashings, and cedar wood trims over 30# felt building paper water-resistive barrier (WRB). Although some locations possessed a Type 1, Grade D asphalt impregnated paper WRB. In some instances, a WRB was missing altogether. Exterior sheathing was plywood or gypsum or a combination of both. Forensics' investigations revealed areas of localized moisture entry that has affected underlying wall components. Decay ranged from severe to minimal.

Each building type has similar configurations of wood-framed plywood sheathed decks with a traffic coating and landings with outdoor carpeting (waterproofing was missing altogether). Both are located over partially enclosed ground floor concrete patios and entries. Structural elements at multiple of these locations are in need of repair. This includes the second level deck and landing attachment points to the structure and adjacent exterior walls, sheathing and framing that comprise the partial enclosures and railing assemblies. All locations have incurred water intrusion and decay of sheathing and framing elements.

The original windows and sliding glass doors are single-pane aluminum, flange-mounted units. Installation of the window and sliding glass door assemblies is concerning since all lack rough opening flashing and the WRB is not integrated with the window flange properly. Replacement windows and sliding glass doors are vinyl-flanged assemblies. Unfortunately, the perimeter nail flange was removed during installation, which poses a potential life-safety hazard. A few fasteners were detected, but they were not positioned to engage any framing elements. To make matters worse, some fasteners were placed through the horizontal portion of the frame and leakage has occurred. Those conditions not only void the warranty of the window, but makes it impossible to properly flash fasten or integrate the assembly to the existing structure and building envelope system. Furthermore, installation of the surrounding cedar trims was also improper. Sealant at the trim-to-window junction was either missing or installed improperly. As a result, water intrusion was evident at all invasive investigations at windows.

At the roof area forensic observed moisture intrusion and subsequent damage at many locations. Problematic roof conditions include, but are not necessarily limited to the following:

1. Insufficient crickets
2. Improper diverter ("kick-out ") flashing
3. Missing and broken clay roof tiles
4. Missing transition flashing
5. Failed lead flashings
6. Roof-to-wall step and apron flashing terminations are improperly integrated at envelope assemblies
7. The underlayment was observed to be severely deteriorated and improperly integrated in multiple locations.

In general, there is a distinct lack of necessary sheet metal, WRB, and flexible flashings that is required to properly shed water away from moisture-sensitive materials and out of the wall assemblies. Penetrations, terminations, and material transitions throughout the property, on all buildings, are fundamentally not properly constructed to

adequately protect the building from water intrusion over its intended service life. Many building envelope assemblies require replacement.

Design Brief Purpose:

The purpose of this Design Brief is to develop a narrative document describing the Project's repair requirements for only the exterior building envelope components and assemblies. It does not provide direction for correction to any elements not specifically described in the document.

The Design Brief explores scope alternates regarding materials and targeted repairs in order to identify general budgetary parameters, and to assist the develop the ultimate design intent. It can be used to facilitate communication and to obtain conceptual repair costs from qualified contractors. It should not be used for competitive bidding or construction purposes because it does not contain drawings or written specifications. However, upon execution of a subsequent agreement, Forensic can provide formal Construction Documents (a detailed set of drawings and specifications) that contain the information necessary for construction purposes at a later date.

Design Brief Outline:

- Building Wall Rehabilitation:
    - At all locations, remove and legally dispose of all cedar lap siding, wood trim, weather resistive barrier (WRB), and all related flashings
    - **Alternate #1:** Leave existing cedar siding in place at weather protected recessed areas highlighted on the elevation pages
    - Upon removal of exterior cladding, trim, and WRB, inspect all sheathing and framing for water damage. Chase and remediate all damage to extinction. See Contingency Allowances section for bidding assumptions
    - Install new metal flashing, WRB and membrane flashings as necessary to integrate new weather barrier components and complete building envelope system
        - Base of Design (BOD) Product: One layer of Tyvek House Wrap weather resistant barrier, Tyvek flashing tape, plastic caps, and all associated accessories
        - Metal flashing is to have a 4" up-leg and a 1" down-leg with a 1/2" hemmed drip edge. Terminate metal flashing with 1/2" upturned end dams
        - 5/4" thick cedar wood trim is to be installed at all window and door perimeters and to integrate the rain screen system
        - **Alternate #2:** 5/4" thick HardieTrim by James Hardie
        - Replace cedar bevel lap siding to ensure 1/2" minimum clearance above flashing, 2" above concrete, roof, and deck surface, and 6" at soil grade. Fasten siding using stainless steel ring-shanked fasteners
    - Install new bevel lap siding and cedar wood trim placed onto 1/2" thick x 2" wide PT furring spaced 16" on center, secured to framing members with corrosion-resistant fasteners
    - Install corrosion-resistant insect screens at all horizontal terminations including wall termination below eaves

- Exhaust vents:
    - Remove and legally dispose of all dryer exhaust vent covers

- Install new cedar trim block onto furring and top with metal flashing with upturned end dams.
- Extend ductwork as required to accommodate thickness of mounting blocks and new batten rain-screen.
- Install new prefabricated metal vent hood penetration with perimeter mounting flanges. Tight-line to existing ductwork. Seal flanges and integrate with WRB in accordance with project documents

- Utility Penetrations:
  - Remove and store (if feasible) all utilities such as; light blocks, electrical outlets, and hose bibs
  - Install Quickflash flashing panel components at all pipe penetrations
  - Extend all utilities as required to accommodate thickness of mounting blocks and new batten rain-screen.
  - Install new cedar trim block onto furring and top with metal flashing with upturned end dams

- Base-of-Wall at Ground Level Concrete Patio and Entry Assemblies:
  - Where siding terminates at concrete flatwork, install a kerf-cut into concrete and embed 24-gage stainless steel metal base-of wall flashing
    - Provide a 3/4" vertical bottom leg on base-of-wall flashing. Kerf-cut concrete and embed leg in a continuous bead of sealant as indicated by design documents
  - Provide a total cost and a per-lineal foot unit cost for this work

- Exterior Trim (Typical):
  - Remove and dispose of existing wood trims
  - Install new 5/4" finger-jointed fully primed cedar trim members using stainless steel ring-shanked fasteners (including swing door brick mold locations)
  - Install new cedar wood blocks at utility penetrations
  - **Alternate: #3:** Install fiber cement blocks by James Hardie
  - Install new cedar wood blocks at guardrail mounting locations to the building wall
  - Install new 24-gage, pre-painted galvanized sheet metal flashings over all projecting horizontal trim surfaces.
    - Properly integrate all new sheet metal flashings with adjacent WRB and wall assembly components to shed water away from the building
    - Install fasteners through vertical surfaces only

- Window Rehabilitation:
  - Remove and replace all aluminum windows, damaged vinyl windows, and vinyl windows where the nail flange has been removed:
    - BOD: Tuscany Series Vinyl windows by Milgard (Specified by Oswego Ridge HOA)
  - Install new flashing around all windows per AAMA 2400-10, Method B
    - BOD Product: StaighFlash by Tyvek, Great stuff foam insulation at window perimeter, and Masterseal 150 sealant as bedding joint

- Re-seal interior perimeters
- Install new trim around all window perimeters and a ½" wide dynamic sealant joint using Masterseal 150 and a 5/8" Diameter soft, non-gassing backer rod by Nomaco. Metal flashing with upturned end dams shall top all projecting wood trim and window assemblies

- Sliding Glass Door Rehabilitation:
  - Remove and replace all aluminum SGDs, damaged vinyl SGDs, and vinyl SGDs where the nail flange has been removed:
    - Tuscany Series Vinyl Sliding Patio Doors by Milgard (Specified by Oswego Ridge HOA)
  - Install flashing around all windows per AAMA 2400-10, Method B
    - BOD Product: StaightFlash by Tyvek, Great stuff foam insulation at window perimeter, and Masterseal 150 sealant as bedding joint
  - Install new trim around all SGD perimeters and a ½" wide dynamic sealant joint using Masterseal 150 and a 5/8" Diameter soft, non-gassing backer rod by Nomaco. Metal flashing with upturned end dams shall top all projecting wood trim and SGD assemblies

- Swing Door and Rehabilitation:
  - Remove and store for reinstallation (if feasible) all entranceway and privacy deck storage doors. Factor replacing damaged doors using Thermatru S-2000 or 2001. See allowances section
  - **Alternate #4:** Marathon series door system by VPI Quality Windows
  - Install 26-gage bonderized metal sill pan underneath all doors and install new Straightflash flashing around all doors per ASTM E2112. Lap flashing at jamb and head over onto frame of new doors
  - Install new trim around all door perimeters on interior and exterior and seal using Masterseal 150. Metal flashing with upturned end dams shall top all projecting wood trim

- Elevated Deck and Landing Assembly Rehabilitation:
  - Remove dispose of all deck and landing plywood and railings in compliance with applicable codes
  - Provide temporary access to units (scaffolding, temporary stairs, etc.) as determined during reconstruction of the landing at first selected building
    - Obtain approval of any temporary access provisions by building official having jurisdiction
    - Conform to all code requirements for temporary access and fire egress provisions.
  - Remove and safely dispose of all existing flashing components at deck/landing edges and deck/landing-to-wall locations
  - Temporarily shore non-cantilevered deck and landing assembly to remove ledger board and necessary deck components to install continuous WRB and adequate flashing provisions behind ledger and to and integrate flashing at exterior wall assemblies and swing door locations.
  - Remove and legally dispose of any damaged framing and replace with new in accordance with design documents. New connectors shall be Z-max by Simpson Strongtie. See allowances section
  - Remove and replace interior trim around SGD assembly
  - Remove and safely store existing non-damaged vinyl sliding glass doors for reinstallation

- Remove and legally dispose of and replace all aluminum sliding glass door assemblies
- Install new solid wood shims atop framing members to achieve adequate slope (2% minimum) away from the building. Install crickets where necessary
- Install new 26-gage bonderized metal deck-to-wall flashing, sill pan with back and side end dams, and saddle flashing and diverters at deck corners
- Install cedar wood blocks at guardrail attachment points and top with metal flashing with upturned end dams
- Reinstall non-damaged vinyl SGD or new vinyl SGD per AAMA 2400-10, method B.
- Install new ALX waterproofing system by Westcoat
- **Alternate #5:** Install new 360NF/951NF waterproofing system by TREMCO.
- Install new deck fascia, coping, fiber cement cladding and finger-jointed fully primed cedar trim to match existing wall assembly and trim configuration
- Install new cedar wood fascia-mounted railing
- **Alternate #6**: Install new fascia mounted metal guardrails in lieu of wood rails

- Roof Assemblies Rehabilitation: The design intent for the project is to phase the full remediation of the roof assembly. Immediate areas of concern to be targeted as follows:
  - Roof tiles
    - Survey all roof tiles for damage and replace all affected tiles with new
    - Substitution of carport tiles may be considered if onsite supply of new tiles is exhausted
  - Kick-out and Diverter Flashing:
    - Remove legally dispose of existing diverter flashings
    - Install metal kick-out diverter flashing constructed and dimensioned in accordance with project documents and code requirements. Integrate flashing below roof-to-wall step flashings and WRB above
  - Roof-to-wall flashing:
    - Remove and safely store gutters at all locations
    - Upon removal of exterior cladding, trim, and WRB, inspect all sheathing and framing for water damage. Chase and remediate all damage to extinction. See allowances section

      Reinstall gutters as required
  - Roof-to-Wall Transitions:
    - Integrate flashing and roofing assemblies with WRB and flashing components at rehabilitated exterior walls
    - Install new flashing assemblies at shed roof off-set termination transitions to create an overhang over the vertical trim terminations
  - Downspouts:
    - Remove and safely store existing downspouts. Replace after exterior wall Work is complete
    - Provide temporary downspouts as necessary to protect new and existing wall assembly components during construction
  - Lead flashings

        - Survey all plumbing boot flashings for damage due to tile abrasion.
        - Remove, legally dispose of, and replace all affected existing lead flashings
    - Chimney and Caps:
        - Replace existing chimney caps and siding and flashing
        - Construct crickets at roof to chimney transitions integrating framing and sheathing with new roof sheathing
    - Eave and Rake Fascia:
        - Contractor shall inventory existing fascia and replace damaged sections

- **Alternates in Rehabilitation:** Provide an add or deduct for the following:
    - **Alternate #1:** Leave existing cedar siding in place at weather protected recessed areas highlighted on the elevation pages
    - **Alternate #2:** 5/4" thick HardieTrim by James Hardie in lieu of cedar wood trims
    - **Alternate #3:** Install fiber cement blocks by James Hardie at all utility penetrations
    - **Alternate #4:** Marathon series door system by VPI Quality Windows
    - **Alternate #5:** Install new 360NF/951NF waterproofing system by TREMCO
    - **Alternate #6**: Install new fascia mounted metal guardrails in lieu of wood
    - **Alternate #7**: Parking Structures - Provide a unit cost to shore roof structure and replace damage posts. Install proper footing to elevate the post off the asphalt

General Considerations and Additional Contingency Allowances:

- Exterior Sheathing, Insulation and Framing Member Replacement
    - The design intent is to remove and replace sheathing, framing, or insulation only where damaged unless explicitly described for replacement, and as determined by consultant. All repairs to the building's structural elements are to be as directed or approved by a licensed Structural Engineer and Building Official
    - Plywood sheathing:
        - Remove and legally dispose of any damaged existing plywood sheathing. Replace with new plywood
        - Assume that approximately 5% of existing plywood, of total exterior wall assembly of each building, will need to be replaced and provide an allowance for replacement costs
    - Gypsum sheathing:
        - Remove and legally dispose of any damaged existing plywood sheathing. Replace with new plywood
        - Assume that approximately 50% of existing gypsum, of total exterior wall assembly of each building, will need to be replaced and provide an allowance for replacement costs
        - Assume 50% of all gypsum sheathing seams will possess gaps that require filling in order to maintain fire resistance
    - Insulation:
        - Remove and legally dispose of any damaged and/or contaminated wall insulation

        - Replace insulation in "like-kind" and in conformance with applicable codes
        - Assume that approximately 5% of all existing exterior wall insulation, of total exterior wall assembly, will need to be replaced and provide an allowance to replace
    - Framing Members:
        - Remove and dispose of any damaged framing members that cannot be treated in place as determined by a licensed Structural Engineer. Replace with new framing members in accordance with the design documents
        - Assume that 5% of all framing members, of total exterior wall assembly, will need to be replaced and provide an allowance to replace
        - Treat all microbial growth in accordance with EPA GUIDELINES
- Interior Finishes
    - The design intent is to return interior finishes to a paint-ready state at areas where remediation work is performed
    - R&R on exterior walls and around windows and doors:
        - For interior work that is required due to window reinstallation or replacement, contractor is to provide a per unit cost for restoring the interior components to a paint-ready state Contractors shall factor using a PVA primer first and then an interior paint
        - Provide a $2000 per building contingency allowance for interior repairs
    - Nail Pops
        - Contractor is to provide a per unit cost (per square foot) for repairing incidental and cosmetic “nail pops” resulting from the exterior repair
- General Contingency:
    - Provide a 10% General Contingency for the Project

Site Work:

The design intent is to permit landscaping to remain in place during construction and tie back or otherwise restrain landscaping elements as necessary to perform work. It is likely that some landscaping elements will have to be removed. Landscaping will be assumed to be the responsibility of the Association or the individual homeowner, and will not be included in the Contract. Assume that this work is to be by others, or is to be performed as a Change Order issued to individual homeowners or the Association

Remediate the existing site work where needed to achieve the appropriate clearances between grade, flatwork, and moisture-sensitive building materials

- Site grading:
    - Contractor to survey site and identify locations where siding or wood framing is located less than 6” from grade, remove soil out 48” parallel to adjacent structure, and down as necessary to achieve 6" of clearance.
    - Where not practical, remove a 12" strip of soil and replace with drain rock to achieve a minimum of 2" clearance. The resulting trough is to be directed away from the building to an approved location
- Landscaping:
    - The design intent is to remove landscaping as needed where adjacent to building exterior walls and to salvage plants (where practical) for reinstallation
    - Base Bid:

- Landscaping shall be the responsibility of the Owner

Conclusion

Forensics' Design Brief is presented to the Association for preliminary pricing.

Please contact Toby White, toby@forensicbuilding.com or Rob LoPiccolo, rob@forensicbuilding.com with any questions, concerns.

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