List of Options

TASK: 01

PROJECT NAME:	Waterside Balcony Repair	**PROJECT NUMBER:**	240703
CLIENT:	Waterside HOA	**DATE:**	2024-07-18
CONTRACTOR:	H&C		

Task 1 is intended to develop ideas and further understand the expectations of the HOA, HOA board and WMPM. The following list, is comprised of all options Jackola considered. Discussion or listing of these various options shall not be construed as recommendations by Jackola. Member/beam sizing and design approach are subject to change and have not been fully designed.

Task 1 is separated into 2 primary repairs, water management & structural repair. The water management options are alphabetical and the structural repair are numerical. The structural repairs are also grouped into numerical groups that have similar structural characteristics. They are split into two repair groups as many of the water strategies can be used with multiple structural designs.

As discussed in the observation report the edge of the existing columns is approximately at the edge of the sewer easement. The edge of the balconies protrude into the easement 42”-60”. It is possible to have structural elements in the easement with approval from Lakeside County Sewer & Water District. However, if the sewer line needs to be serviced/replaced and a new column must be removed the cost to remove the column, brace the balconies, and reinstall the column would be at the cost of the HOA.

Based on the assembling of these options and the different factors that influence these options Jackola is recommending all soffits be removed prior to repair design. Many options change the loading on the existing deck joists. These joists appear to be compliant with the codes at the time of construction. However, compared to current codes they appear to be overstressed by 33%. Removal of the soffit is recommended based on the changing of supports and loading, possible issues with the membrane, drains & sheathing, and confirmation of a repeatable solution.

A major concern regardless of the option chosen is the rotted deck sheathing. Exposing the decking by removing the soffit will expose the breadth of the damage. This rotted sheathing may required the decks to be shortened, partial concrete removal & membrane repair, or another repair method.

Balcony Structural Repair	Water Management Strategies
Group 1 – Maintain Original Design	Option A – Repair of existing & heat tape
Option 1.1 – Repair back to existing	Option B – Replace drains with trough/trench drain
Option 1.2 – Architects option (steel)	Option C – Sheet flow with additive concrete
Option 1.3 – Repair with Alaskan Yellow Cedar	Option D – Sheet flow with demolished concrete
Group 2 – Add bearing line along existing columns	Option E – Add roof on 3rd floor to cover decks
Option 2.1 – New drop beam aligned with columns	Option F – Replace deck, use traditional decking (Trex)
Option 2.2 – New beam & center column	Option G – Add liquid applied sealant to concrete
Option 2.3 – New beam & shortened cantilever	Option H – Add vinyl deck covering over concrete
Group 3 – Demolish deck/deck beam & restart	
Option 3.1 – Concrete plank between outriggers	
Group 4 – Add bearing line along deck beams	
Option 4.1 – Add columns along deck beams	
Option 4.2 – Add full height pipe columns with cables	
Option 4.3 – Add pipe columns with cables	

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Balcony Structural Repair

Group 1 – Maintain Original Structural Design

Option 1.1 Repair Back to Existing Condition

- Repair
  - Repair back to existing
  - Replace glulam beams
  - Updated flashing details - replacement beams do not appear to be treated or naturally resistant and must be protected from the elements with proper flashing
- Pros
  - Definite scope
- Cons
  - Non-resistant beams will decay/begin to fail if water mitigation strategies fail, are not maintained or are installed incorrectly.
  - Outrigger beams may be rotted at their ends (in the saddles). New saddles may be required, beams may need to be replaced or cut back (decks shortened).
  - Depending on design, further deflection issues.

Option 1.2 Architects Option (Steel Beams & Columns)

- Repair
  - Replace/reinforce wood members with steel
  - See arch proposal
- Pros
  - Connections are easier to make water tight
  - Steel can be shallower than wood
  - Easier to water proof
- Cons
  - Expensive
  - Excessive demo

Option 1.3 Repair with Alaskan Yellow Cedar Glulams

- Repair
  - Repair back to existing
  - Replace glulam deck beams with Alaskan Yellow Cedar Glulams
  - Updated flashing details - replacement beams do not appear to be treated or naturally resistant and must be protected from the elements with proper flashing
- Pros
  - Definite scope
  - Naturally resistant lumber
- Cons
  - Alaskan Yellow Cedar is not as strong and would need to be deeper/wider than the existing beams.
  - Outrigger beams may be rotted at their ends (in the saddles). New saddles may be required, beams may need to be replaced or cut back (decks shortened).

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Group 2 – Add Bearing Line Along Existing Columns

Option 2.1 New Drop Beam Aligned With Columns

- Repair
  - Add a new glulam beam between the existing glulam columns
  - Joists appear to pass cantilevered, would need to be checked
- Pros
  - Remove support beams from weather exposure
- Cons
  - Wood beams are large 8.75"x27.5" and would significantly restrict view and head room
    - Steel beams may be able to get in the range of 8"x16"

Option 2.2 New Beam & Center Column

- Repair
  - Add a new glulam beam between the existing glulam columns
  - Add a new column centered on glulam
  - Joists appear to pass cantilevered, would need to be checked
- Pros
  - Remove support beams from weather exposure
  - Higher head, view height
    - Wood beams are 8.75"x10.5"
    - Steel beams are 4"x8"
- Cons
  - Restrict view with vertical element
  - Column installation would require excavation

Option 2.3 New Beam & Shortened Cantilever

- Repair
  - Add a new glulam beam between the existing glulam columns
  - Joists appear to pass cantilevered, would need to be checked
- Pros
  - Remove support beams from weather exposure
  - Remove amount of 3rd floor roof exposed to weather
  - Reduce load on structure
  - Increased view compared to other options
    - Wood beams are 8.75"x21"
    - Steel beams are 8"x12"
- Cons
  - Deck is shortened by 2ft or more
  - View limited compared to other options

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Group 3 – Demolish Decks & Restart

Option 3.1 Concrete Plank Between Outriggers

- Repair
  - Demo
  - Span with hollow core concrete panels from outrigger to outrigger
- Pros
  - Near complete control of water drainage
  - Confirmation that there is no internal damage to water management
  - Limit amount of wood
- Cons
  - Expensive
  - Longer Construction

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Group 4 – Add Bearing Line Along Deck Beams

Option 4.1 Add Columns Along Deck Beams

- Repair
  - Add columns at the end of the outrigger beams
  - Add columns at the middle of the deck beams
  - Replace deck beams
- Pros
  - Defined wood solution
  - No cantilevers
  - Flexibility in material choices, Alaskan Yellow Cedar
  - Smaller deck beams (remove curb without hindering view)
- Cons
  - Sewer easement
  - Change of appearance
  - Possible reduced view from condo
  - Excavation and additional concrete

Option 4.2 Add Full Height Pipe Columns with Cables to Support Deck Beams

- Repair
  - Add 5" pipe columns at the end of the outrigger beams
  - Brace to deck beam and outrigger beams
  - Cables from the columns to support the deck beams
    - Similar to support cables/columns for the garages
  - Replace deck beams
- Pros
  - Defined wood solution
  - No cantilevers
  - Flexibility in material choices, Alaskan Yellow Cedar
  - Smaller deck beams (remove curb without hindering
  - Unlikely but possible to reuse existing beams
- Cons
  - Sewer easement
  - Change of appearance
  - Possible reduced view from condo
  - Excavation and additional concrete

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Option 4.3 Add Pipe Columns with Cables to Support Deck Beams

- Repair
  - Add 5" pipe columns at the end of the outrigger beams, supported off outriggers
  - Brace to deck beam and outrigger beams
  - Cut outriggers back
  - Cables from the columns to support the deck beams
    - Similar to support cables/columns for the garages
  - Replace deck beams
- Pros
  - Defined wood solution
  - Flexibility in material choices, Alaskan Yellow Cedar
  - Smaller deck beams (remove curb without hindering
  - No in sewer easement
- Cons
  - Maintains cantilevers but they are reduced
  - Change of appearance
  - Possible reduced view from condo

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Water Management Strategies

Option A Repair of Existing, Add Heat Tape To Drains

- Repair
  - Repair damaged piping
  - Possible discharge into existing downspout
  - Possible to replace the pipe with a gutter instead to prevent cracking (this has its own issues though)
  - Add electric heat tape into the drain line
- Pros
  - Definite scope
- Cons
  - Heat trace maintenance
  - Depending on methods, no guarantee that this will not be an issue in the future.

Option B Replace Drains with Trough/Trench Drain

- Repair
  - Demolish drains & piping
  - Demo strip of existing concrete @ drains
  - Replace with shallow trench drain (MiFab T275) or concrete trough
  - Discharge
    - Trough/trench drain through top of beam (would need to be checked but is possible)
    - Discharge into existing downspout
    - Discharge down into a gutter attached to the outriggers.
- Pros
  - Heat trace may be limited or eliminated (if needed easy to add and maintain)
- Cons
  - There would likely be some standing water in the trough that would have to evaporate
  - Ideal location to discharge from the trench drain would be in the middle and not at the edges. This could be paired with a central column
  - Difficult to install

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Option C Sheet Flow with Additive Concrete

- Repair
  - Demolish drains & piping
  - Add concrete topping material to sheet flow over the patio edge
  - Add heat tape and gutter on 3rd floor
- Pros
  - Less heat trace
  - No interior drainage piping
- Cons
  - Water intrusion and icicles possible from level 2 balcony to level 1 patio
  - Heat trace maintenance
  - Concrete adds additional weight to the structure (extra joists required if original design retained)
  - Slope would be closer to 1% instead of the standard 2%
  - May have to add a finish or topping to the entire balcony where the new meets the old. This adds cost, weight, and may not be as resilient as a single slab.
  - Depending on deck repair option, the deck beam will be lower and will lower the clear height as well as restricting view from condos.
  - Membrane repair still required.

Option D Sheet Flow with Demolished Concrete

- Repair
  - Demolish drains & piping
  - Demo existing concrete to drain and repour to sheet flow over the patio edge
  - Add heat tape and gutter on 3rd floor
- Pros
  - Less heat trace
  - No interior drainage piping
  - Consistent 2% slope
  - Reduced structural load (3" of concrete at edge instead of 5")
  - Confirm membrane is intact
- Cons
  - Water intrusion and icicles possible from level 2 balcony to level 1 patio
  - Heat trace maintenance
  - Extensive demolition required
  - An expansion joint with sealant will be visible between the new and old portion of the deck.
  - Depending on deck repair option, the deck beam will be lower and will lower the clear height as well as restricting view from condos.

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Option E Add Roof on 3rd Floor to Cover Decks

- Repair
  - Repair deck drains and piping
  - Add new roof at level 3 to cover the balcony
  - Possible to add screening or vinyl roll up curtains
  - Encroachment
- Pros
  - Limit water/snow entry
  - Possible to reuse deck drains
- Cons
  - May be structurally infeasible, would need to verify
  - May still have freezing issues if deck drains reused

Option F Replace Deck, Resurface with Traditional Decking (Trex)

- Repair
  - Demolish the decks and rebuild with a Trex decking
- Pros
  - Water drains through deck instead of traveling to the exterior
- Cons
  - Significant demolition
  - Expensive
  - Water from deck to deck, and to the patio below

Option G Add Liquid-Applied Coating to Concrete

- Repair
  - Move moisture barrier to top of concrete
- Pros
  - Visible moisture barrier
  - Repair to membrane beneath concrete not required
- Cons
  - Maintain and replace every 5-10 years depending on cracking, moisture intrusion or freeze-thaw
  - Change appearance of decks

Option H Add Vinyl Sheets to Concrete

- Repair
  - Add walkable vinyl covering or non-walkable with raised platform
- Pros
  - Visible/accessible moisture barrier
  - Repair to membrane beneath concrete not required
  - 15-yr warranty
- Cons
  - Change appearance of decks