Maintaining Seattle’s Aging Building Exteriors

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Today’s Agenda

• Curtainwall Maintenance
  o Loose Mullion Caps and Glazing Stops, Some Photos Modified to Protect Privacy
  o Repair Methodology: Gaskets, Sealants, Clips, Fasteners
  o Statute of Limitations for Defective Components

• Planter and Plaza Renovations
  o Planter Waterproofing, Detail Considerations, Transitions with Storefronts
  o Plaza Waterproofing, Detail Considerations, Adding Drains, Trapped Moisture, Traffic Coating

• Code Requirements
  o When does Washington State Law Require Hazardous Materials Testing
  o New HIGH IMPACT OSHA Rules for Crystalline Silica

• New Innovative Products
  o New Split Slab Waterproofing Technology, Low Impact, High Performance
  o Translucent Elastomeric Waterproof Coating
Curtainwall Maintenance and Repairs: Some Curtainwall Terminology

- Insulated Glass/Glazing Unit (IGU): Window component consisting of multiple panes of glass sealed together and separated by gas.

- Mullion: A vertical member providing structural support and a division between IGUs, doors, or panels.

- Mullion Cap: A decorative cover piece that is attached over a structural mullion.

- Glazing Stop: A component of the window system that butts-up against IGUs to hold them in place.

- Curtainwall: Light weight cladding components, typically aluminum framed, non-structural, attached to the building exterior (hung). Drainage vs Barrier

- Window Wall: Light weight cladding components, typically aluminum framed, non-structural, attached to the building between floor slabs (built-in).

- Storefront: Decorative commercial grade window system, typically at street level.
Curtainwall Maintenance and Repairs: Loose Caps and Glazing Stops
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SECUREMENT:

Mullion Caps and Glazing Stops are Installed and Secured in Place in a Variety of Different Ways.

- Compression Gaskets
- Thermal Isolator Clips
- Fasteners
- Adhesives

Over Time Some of These Attachment Methods Can Fail.

We will Review Three Different Repairs, Each Unique and Each Using One or Many of These Methods.
Curtainwall Maintenance and Repairs:

Loose Caps and Glazing Stops

Removable Aesthetic Mullion

- Original Design Used Gasket for Securement
- Pros of Gasket Design
  - Ease of Use
  - Aesthetically Consistent with Original Design
Curtainwall Maintenance and Repairs:

Loose Caps and Glazing Stops

Removable Aesthetic Mullion

- Gasket Dependent
- Pros of Gasket Design
  - Ease of Use
  - Aesthetically Consistent with Original Design
Curtainwall Maintenance and Repairs: Loose Caps and Glazing Stops

Removable Aesthetic Mullion

- Gasket Dependent
- Cons of Gasket Design
  - Warranty
  - Performance
  - Life Expectancy
Curtainwall Maintenance and Repairs:

Loose Caps and Glazing Stops

Removable Aesthetic Mullion

• Gasket Dependent
• Cons of Gasket Design
  • Long Term Performance
Curtainwall Maintenance and Repairs: 
Loose Caps and Glazing Stops

Removable Aesthetic Mullion

• New Design Uses Structural Silicone for Securement
• Pros of Structural Sealant Design
  • Warranty
  • Performance
  • Life Expectancy
Mullion Cap

- New Design Uses Structural Silicone for Securement
- Cons of Structural Sealant Design
  - Removal and Re-Set of Mullions
  - Change of Appearance

Pros Outweighed Cons, Long Term Life Safety
Curtainwall Maintenance and Repairs:

Loose Caps and Glazing Stops

Mullion Caps

- Original securement design relies on plastic thermal isolator clips.
- These are only installed on one side of the split mullion. This allows movement from thermal expansion and contraction.

Plastic Thermal Isolator Clips
Mullion Cap

- The clip shown on the bottom here is able to rotate.
- The stop shown in the drawing is not present on the extrusion.

Curtainwall Maintenance and Repairs:
Loose Caps and Glazing Stops
Curtainwall Maintenance and Repairs:
Loose Caps and Glazing Stops

Missing Stop Allows Clip to Rotate
Curtainwall Maintenance and Repairs:

Loose Caps and Glazing Stops

Mullion Cap

- New design uses support structure
- Testing required
  - If testing passes new clip will be used.
Curtainwall Maintenance and Repairs:

Loose Caps and Glazing Stops

Mullion Cap

- Alternative repair concept
  - Structural sealant is being tested as a back-up to the new clip

Structural Sealant Installed on Both Sides
Curtainwall Maintenance and Repairs: 

Loose Caps and Glazing Stops

Glazing Stop

- Old securement design relies on compression gasket.
- The gasket pushes against the glass and secures the extrusion against the frame.
Curtainwall Maintenance and Repairs:

Loose Caps and Glazing Stops

Glazing Stop

- The front edge of the glazing stop has an aluminum to aluminum slotted connection, again relying on the gasket for compression.
Curtainwall Maintenance and Repairs:
Loose Caps and Glazing Stops

Structural Sealant to Secure Backside to Glass
Curtainwall Maintenance and Repairs:
Loose Caps and Glazing Stops

Gasket Remains In-Tact to Hold Glazing Stop During Curing
Curtainwall Maintenance and Repairs:
Loose Caps and Glazing Stops

Bumper Stop with Stainless Steel Fastener to Secure Front Portion of Glazing Stop.
Curtainwall Maintenance and Repairs:

Statute of Limitations

Washington State provides a statute of limitations that can protect buyers from construction defect.

- Breach of contract – 6 Years (brand new buildings)

Depending on the language in the contract it can protect buyers from such issues as:

- Water intrusion
- Defective components
- Poor workmanship

For More Info Visit:

Curtainwall Maintenance and Repairs:

General Information

Gaskets vs Wet Seal

• Gaskets form a weathertight seal and accommodate movement to cushion the glass from wind, seismic and thermal loads.
  • No leaks doesn’t mean no repairs needed.

• Wet Seal usually recommended in weatherproofing applications, more reliable and longer lasting.
  • Draw back, IGU replacement

• If gaskets selected, consider higher grade material such as silicone.
Planter and Plaza Renovation and Repairs

Planter and Plaza Waterproofing

- Flaws in original design
- New design overview
- Detailing, devil’s in the details
Planter and Plaza Renovation and Repairs

Planter and Plaza Waterproofing

- Original Design
  - Asphaltic waterproofing with protection course
  - Sealant dependent storefront

What is Our Weak Point?
Planter and Plaza Renovation and Repairs

Planter and Plaza Waterproofing

- Smelled Like Moisture in the Space
- Carpet Adhesive Signs of Moisture
Planter and Plaza Renovation and Repairs

Planter and Plaza Waterproofing

- Core cut revealed trapped moisture under interior slab.
Planter and Plaza Waterproofing

- Solution:
  - Wrap waterproofing completely over curb.
  - Install pan under storefront.
  - Install vapor barrier on interior slab.
Planter and Plaza Renovation and Repairs

Planter and Plaza Waterproofing

• Ponding identified
  • Scanning
  • New drains
Planter and Plaza Renovation and Repairs

Planter and Plaza Waterproofing

- Traffic coating required on curb to remain
  - Trapped moisture
    - Moisture mitigation primer
  - Transition between systems
Planter and Plaza Renovation and Repairs

Planter and Plaza Waterproofing

- New Liquid Flashing UV Stable
- New Waterproofing
- New Pan
- New Vapor Barrier
Planter and Plaza Waterproofing: Devil’s in the details.
Planter and Plaza Waterproofing Devil’s in the details.
Planter and Plaza Renovation and Repairs
Planter and Plaza Renovation and Repairs

Concrete Pan Decking Products

• Topical Application
  • Polyurethane (Exposed or Covered)
  • PMMA-Poly Methyl Methacrylate (Exposed or Covered)
  • Modified Asphaltic (Covered)

• Dealing with trapped moisture
  • Mitigation primer, testing
  • Moisture friendly products
Planter and Plaza Renovation and Repairs

Split Slab Waterproofing Products

- Coating over split slab not recommended
- Demo and install new waterproofing or for targeted repairs inject low viscosity acrylate
  - Modified Asphalctic (Covered, Pavers or New Concrete)
Code Requirements

New and Existing:

• Asbestos Containing Materials (ACM) Testing
  • Reminder: When is it required?

• OSHA’s New Crystalline Silica Rule for Construction
  • What you need to know.
Asbestos Containing Materials (ACM) Testing

• When is it required?
  • Washington State Law* requires that prior to any work being performed on existing structures, regardless of age, ACM (asbestos containing materials) testing be performed on any materials being disturbed.
  • Owners have an obligation to provide documentation of a good faith survey.
  • If a good faith survey is not available the contractor has the right to perform a survey at the owner’s expense.

*WAC 296-155-160 - Construction regulations which refer to WAC 296-62-077; WAC 296-62-077 Part I-1 Occupational Health-Asbestos; RCW 49.26 – Asbestos Safety Act
OSHA’s New Crystalline Silica Rule for Construction

- Who does this impact? All repair projects that include preparation or cutting of concrete or mortar.
- When? June 23, 2017
- Basic Requirements:
  - Written Exposure Plan
  - Designate Competent Person
  - Restricted housekeeping, create alternative methods to limit exposure
  - Provide medical exams including chest X-rays
  - Worker training
  - Record keeping
- Properly following existing dust control measures limits further requirements. However, we anticipate many contractors will follow requirements to limit liability.
Innovative Repair Products

• Low viscosity injection grade acrylate
  • Uses
  • Impacts
  • Cost
• Translucent elastomeric waterproof coating
  • Uses
  • Advantages
Low Viscosity Injection Grade Acrylate

• How would you normally waterproof this split slab area?
• New sealants? Short term at best
• Topical coating? Short term and problematic
• Demo, waterproof, re-pour?
  • Normally our recommendation, however, expensive and had been done before.
Innovative Repair Products

Low viscosity injection grade acrylate
• Difficult transitions and interfaces
Innovative Repair Products

Low viscosity injection grade acrylate

- Long term degradation
- Water intrusion continued after new waterproofing application
Innovative Repair Products

Low viscosity injection grade acrylate

- Ports installed at all transitions, acrylate injected
- Completely waterproof immediately
- Fraction of the cost compared to traditional methods
- Low impact
Innovative Repair Products

Translucent Elastomeric Coating

• Difficult masonry projects
Innovative Repair Products

Translucent Elastomeric Coating

• Difficult masonry projects
Innovative Repair Products

Translucent Elastomeric Coating

• Difficult masonry projects
Some Waterproofing Product Terminology:

- Sealant: A waterproofing filler used to seal building components ("Caulk").
- Sealer (Film Building): Spray or roller applied weatherproofing for masonry (Translucent slight change in appearance).
  - Bridges hairline cracks.
- Sealer (Penetrating): Spray or roller applied weatherproofing for masonry (Intended to have no change in appearance).
  - Does not bridge cracks.
- Coating: Film building elastomeric waterproof covering. (Walls, Decks, Parking).
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