

abaa2024 building enclosure conference

Glazing Systems:
I have been doing it this way for
30 years, it's gotta be right?

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NACC Glazing Certifications

AIA
Continuing
Education
Provider



Glazing Systems: I have been doing it this way for 30 years, it's gotta be right?



Learning Objectives

1. Describe the risks that can be created by failed or faulty commercial glazing installations and review the lack of quality control construction procedures that are needed industry wide to elevate installer performance.
2. Explain how a systems approach that utilizes industry best practices when executed with process controls for glazing contractor shop and field operations can greatly improve glazing project outcomes.
3. Discuss the connection of installation practices to the overall performance of building enclosure to provide manufacturers intended system aesthetics, safety, and performance.
4. Summarize the NACC and AGMT certifications and collaboration opportunities with ABAA



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CPHC**

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Enclosures*
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*Program Development
Director*
North American
Contractor Certification



Whole Building Enclosure Process Control

- Holistic approach = better building enclosure
- Air, water, and vapor can enter from anywhere
 - Membrane
 - Flashing
 - **INTERFACES**
 - **PERIMETER JOINTS**
 - glazing system
- Installers need to understand **INTERRELATIONS OF SYSTEMS**

Can glazing installations be improved through process controls?

What does process control mean?

Quality control in glazing, substrates, interfaces, and air barriers

Why is this important for whole building enclosure?

Common challenges we see in glazing

- Current **SPECIFICATIONS** do not adequately address **INSTALLER QUALIFICATIONS**
- The glazing industry does not have **CONSISTENT STANDARDS FOR GLAZIER KNOWLEDGE**
- Systems and their applications have become more complicated requiring **TECHNICAL EXPERTISE** and adequate **PROCESS CONTROL** to create consistent outcomes
- **ROOT CAUSES OF ISSUES ARE CARRIED FORWARD**

- Design Flaws
- **CONSTRUCTION DEFECTS**
- Poor **WORKMANSHIP**
- **INSTALLATION ERRORS**
- System/Product Failures
- Maintenance After Installation



COMMON REASONS WHY BUILDING ENCLOSURES FAIL

Doug is on this project

—
Been here 30 years!!!

Q: How do you know the frame is being assembled correctly?

A: Doug is the foreman on this job. He makes sure it is right.

Industry reliance on:
“the people are the process”
This is not process-control!



How informed is Doug?

- Project kick-off meetings
- Estimator to PM handoff
- Submittals for shop drawings
- Product Submittals
- The list goes on
- One competent mechanic can not make up for lack of processes

Installer insufficiencies

- Need defined **standard to train workers**
- Lack of access in some regions to **formal training**
- Lack of uniform **licensing** or adoption of **certification**
- Contract labor brokers
- Lack of **continuing education requirements**
- Qualified workers reaching retirement age
- Not using or not understanding how to use **shop drawings and manufacturer installation instructions.**



A photograph of a modern building under construction. The building has a glass facade and concrete structure. A large crane is visible on the left, and a concrete pump truck with a long white boom is on the right. The scene is set on a city street with trees and a clear blue sky. The text "REPAIR AFTER INSTALLATION" is overlaid in yellow on the left side of the image.

**REPAIR AFTER
INSTALLATION**

COSTLY and DISRUPTIVE



Consensus built Quality Management Systems for Glazing

*Procedures, processes, and
systems*

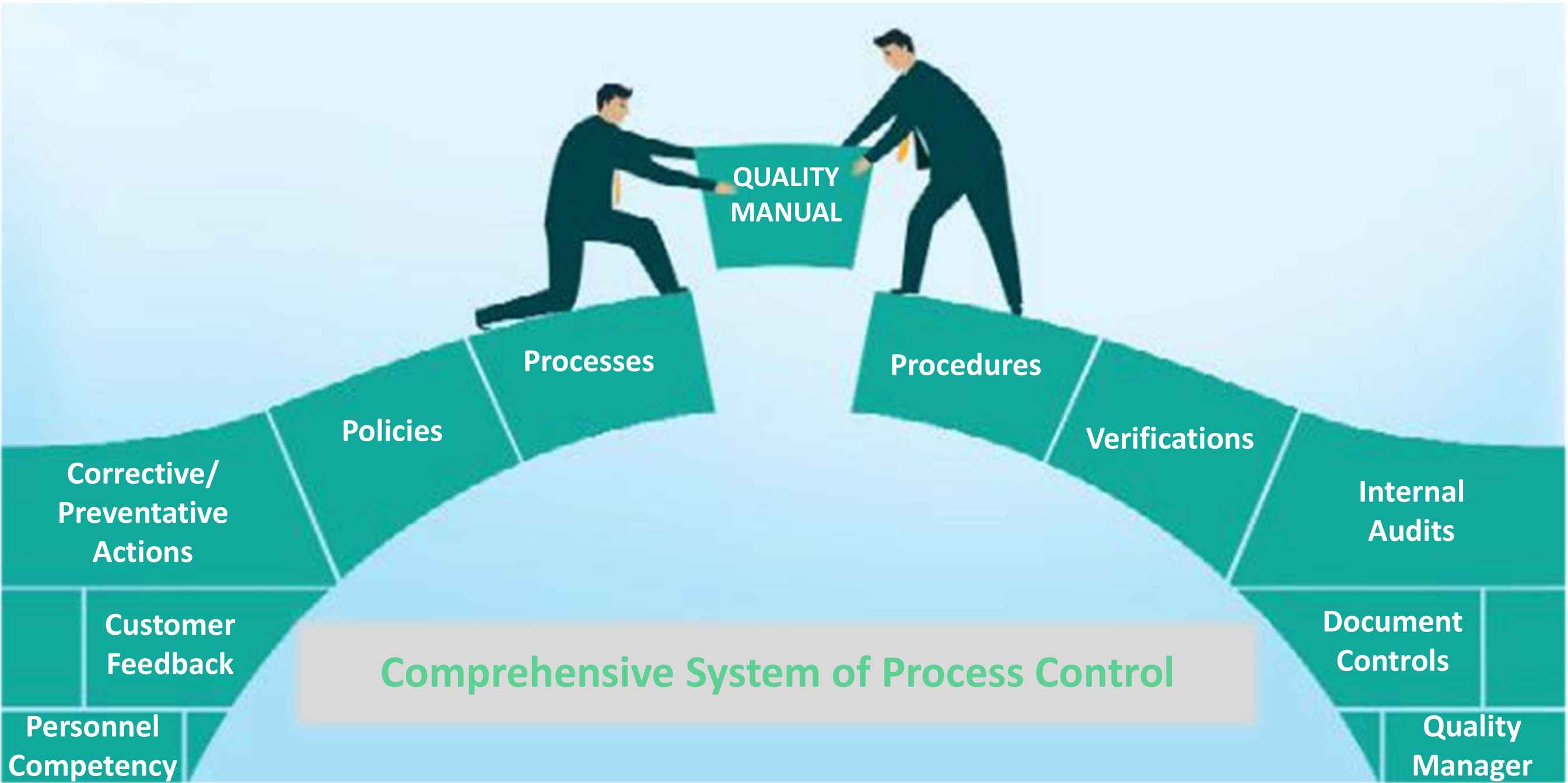
- Industry best practices
- Manufacturer instructions
- Management consensus of procedures

Certification driven

*QUALITY
MANAGEMENT
SYSTEMS*

- A collection of **BUSINESS PROCESSES** focused on consistently meeting customer requirements and enhancing satisfaction through **HIGHER QUALITY STANDARDS**.
- Consensus driven and aligned with an organization's **PURPOSE AND STRATEGIC DIRECTION**.





Procedures Set expectations

OPERATIONAL PROCEDURE

Document Name: Assembly Procedure
Document No.: 3.3
Created by: John Smith
Approved by: John Adams
Date: 5/05/20

Objective: To assure that proper processes are followed, manufacturer's work is maintained, and systems will perform as designed when installed

Responsibility: Project Managers, Shop Foreman, Assembly personnel

Procedure:

- Shop foreman is to review manufacturer's fabrication and assembly instructions with all necessary personnel before beginning work.
- Manufacturer's fabrication and assembly instructions are to be available for reference at point of use. (Shop Foreman)
- Project folder with shop drawings and fabrication instructions to be sent to shop foreman by PM
- Shop foreman assigns personnel, and reviews assembly instructions with designated and applicable personnel
- Assembly personnel to assemble frames per manufacturer's instructions and shop drawings (e.g. internal seals, gaskets, assembly, etc.)
- All materials are to be handled in a manner that prevents damage to the ends or face of extrusions, and edges and surface of glass
- Use specified fasteners at all connections
- All joints are to be tight
- Frame is to be assembled square
- Gaskets are to be fully seated and properly sized to prevent excessive shrinkage
- Use only unexpired sealant
- All internal seals are to be properly located and tooled
- Assembled frames to be stored in a manner to prevent damage, protect finish, and prevent injury

**BENEFITS of
VERIFICATION**

Tells supervision what to look for

**Tells everyone that quality is
important**

**Workers more apt to elevate
their performance**

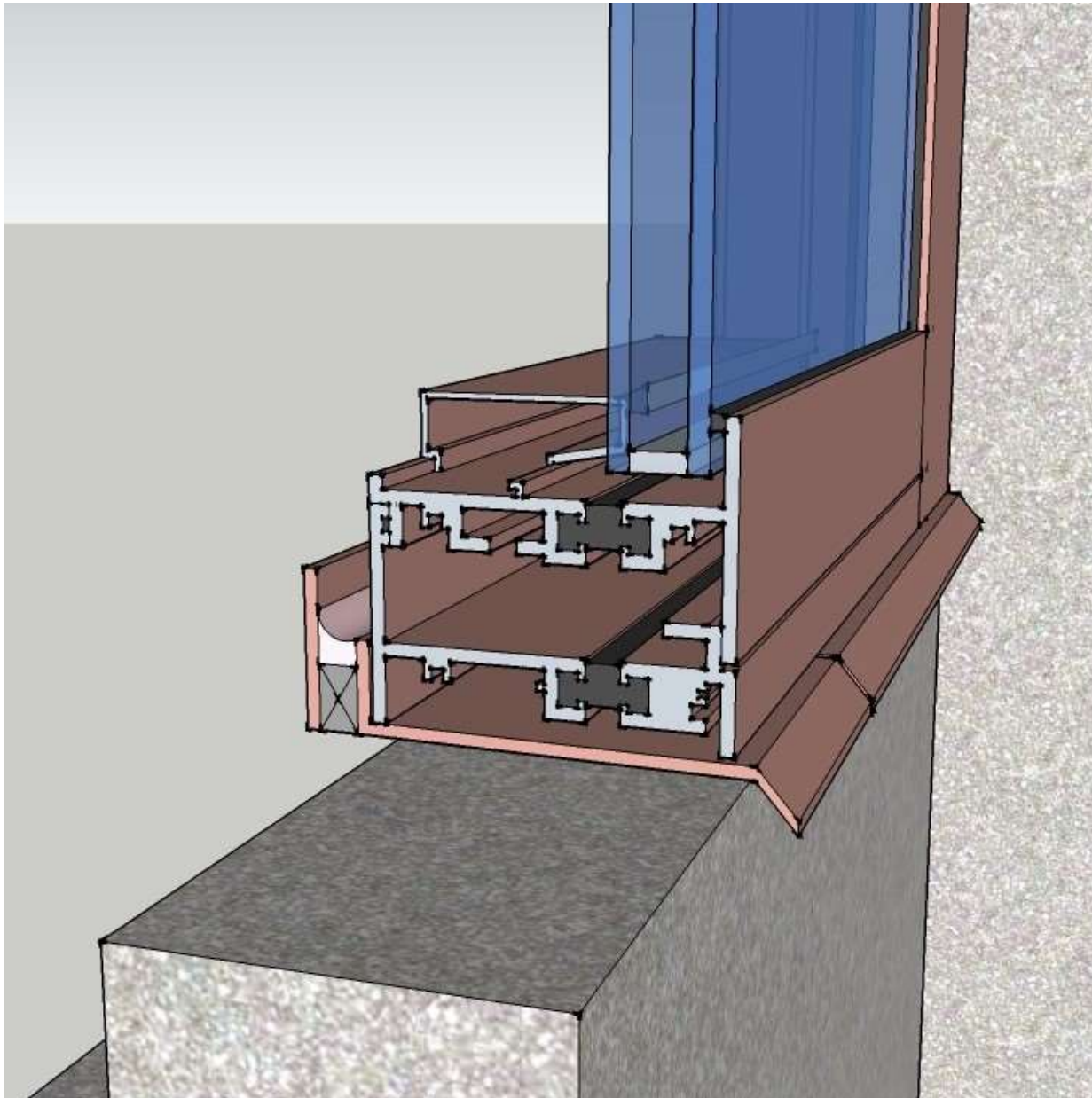
Identifies trouble spots



Checklists

Four generations after the first aviation checklist was put into use a lesson is emerging: checklists seem to defend anyone, even the experienced, against failure in many more tasks than we realized. **THEY PROVIDE A KIND OF COGNITIVE NET. THEY CATCH MENTAL FLAWS** inherent to all of us – flaws in memory and **ATTENTION TO THOROUGHNESS**. And because they do, they raise wide, unexpected possibilities.

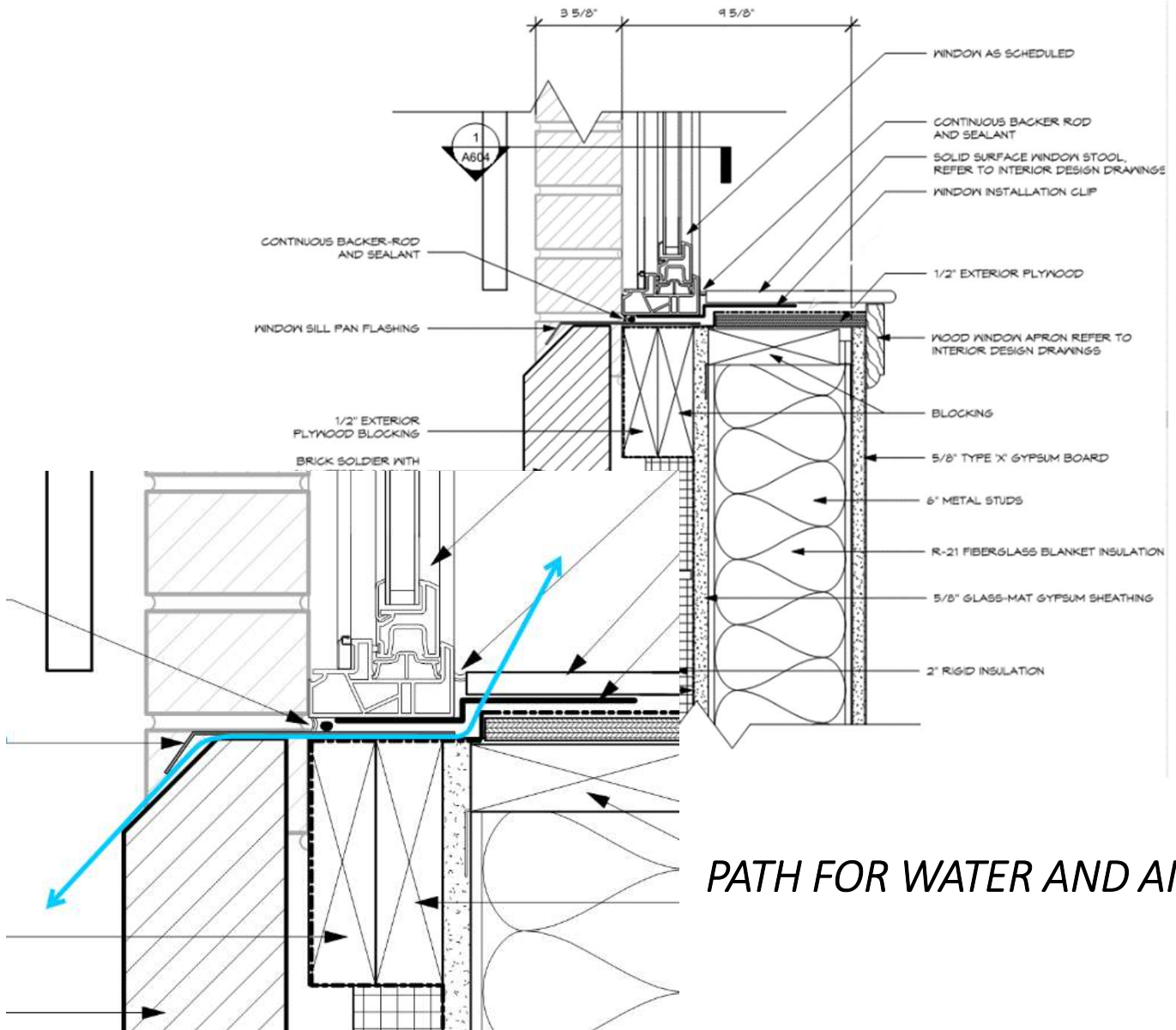
Atul Gawande – General Endocrine Surgeon –
Brigham and Women’s Hospital, Boston



Adjacent construction

Fenestration systems may not perform as intended

Adjacent Construction: METAL FLASHING

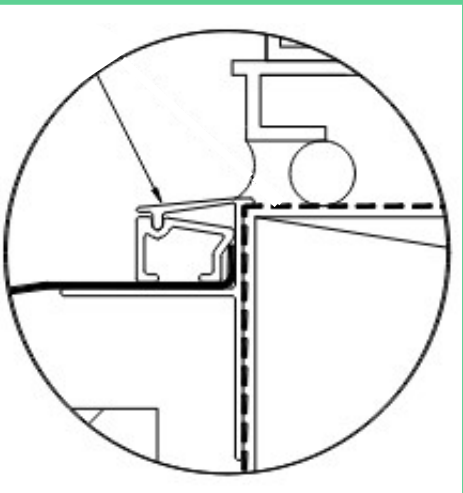
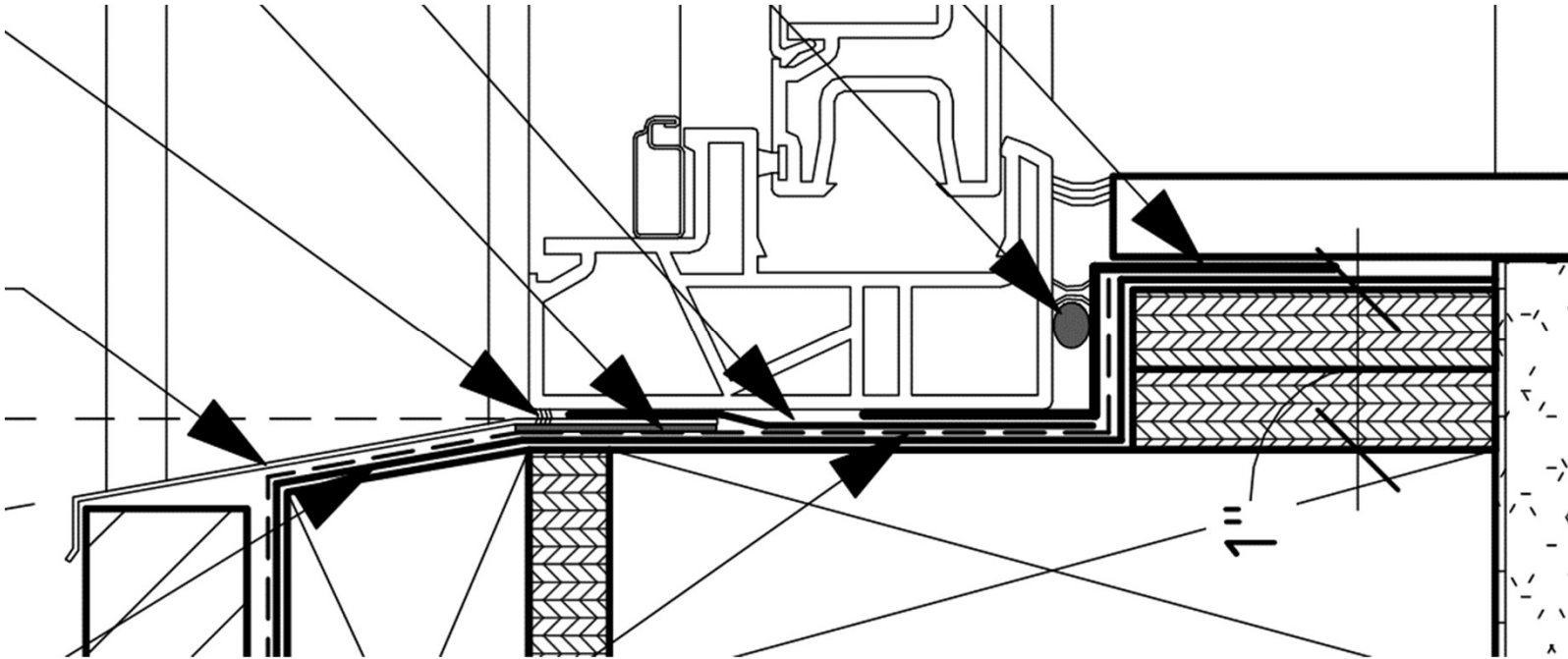


PATH FOR WATER AND AIR

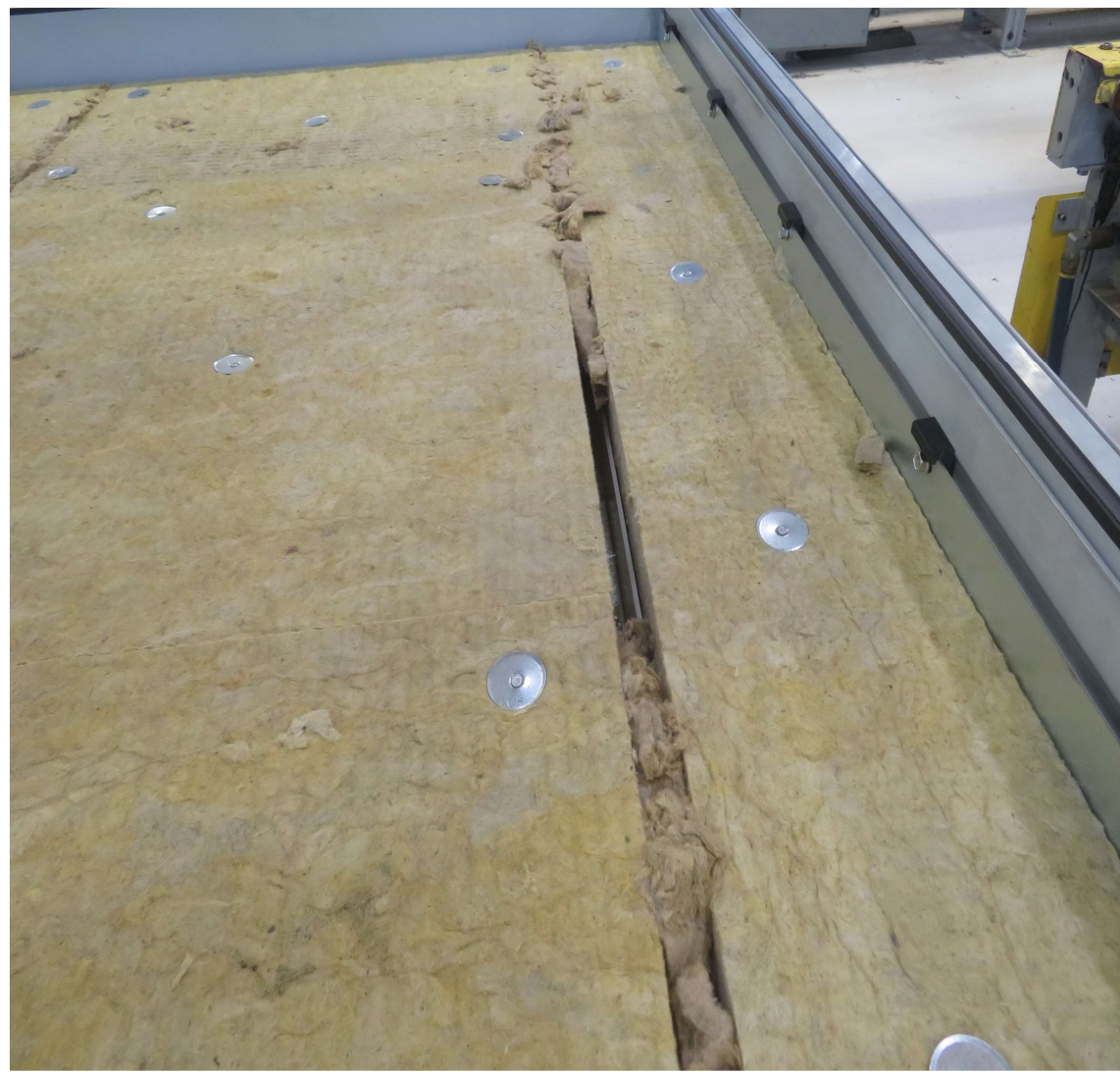
Adjacent Construction: METAL FLASHING



Adjacent Construction: METAL FLASHING



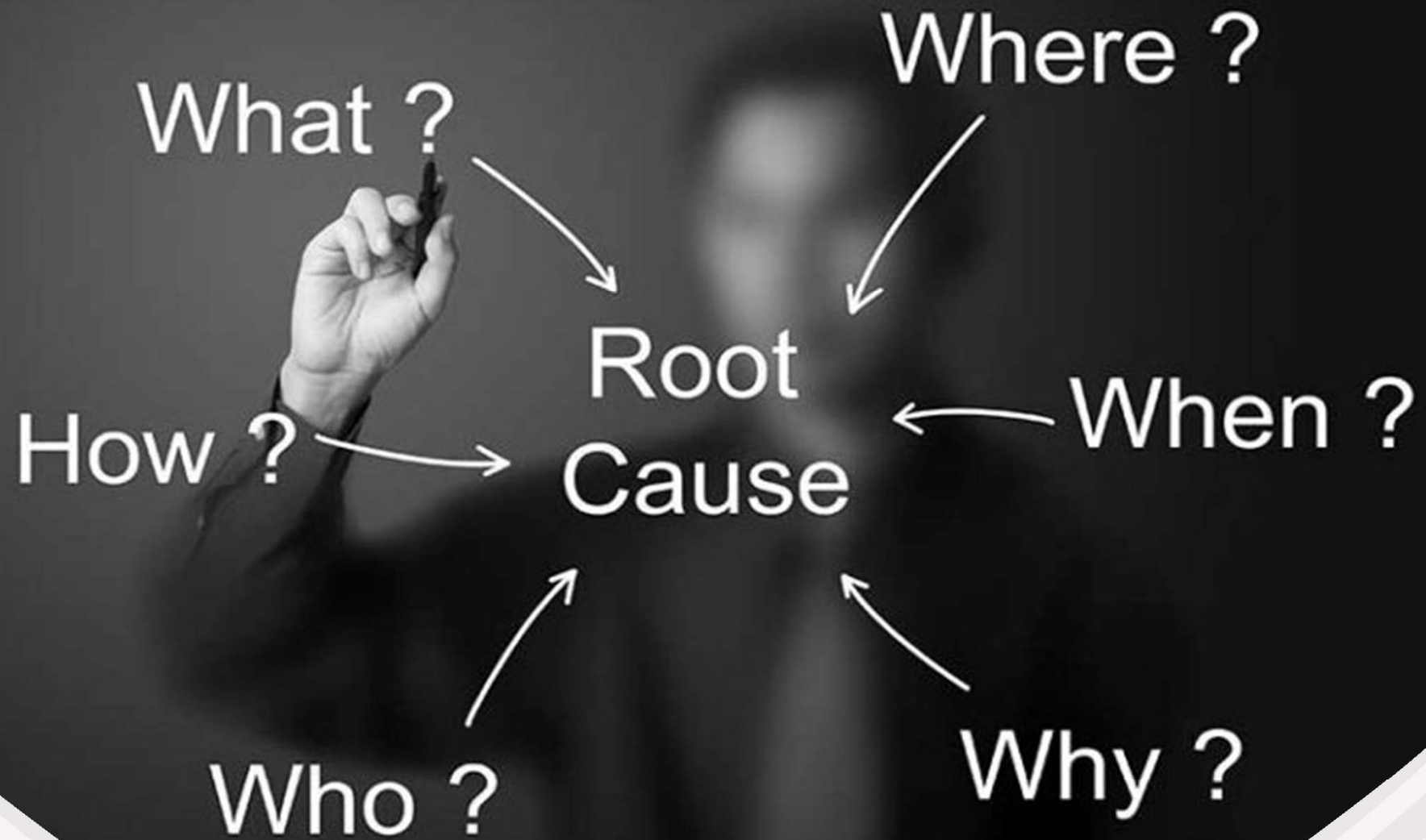
Components hidden after installation



CHECKLIST:

Is insulation installed continuously with no gaps?

YES NO

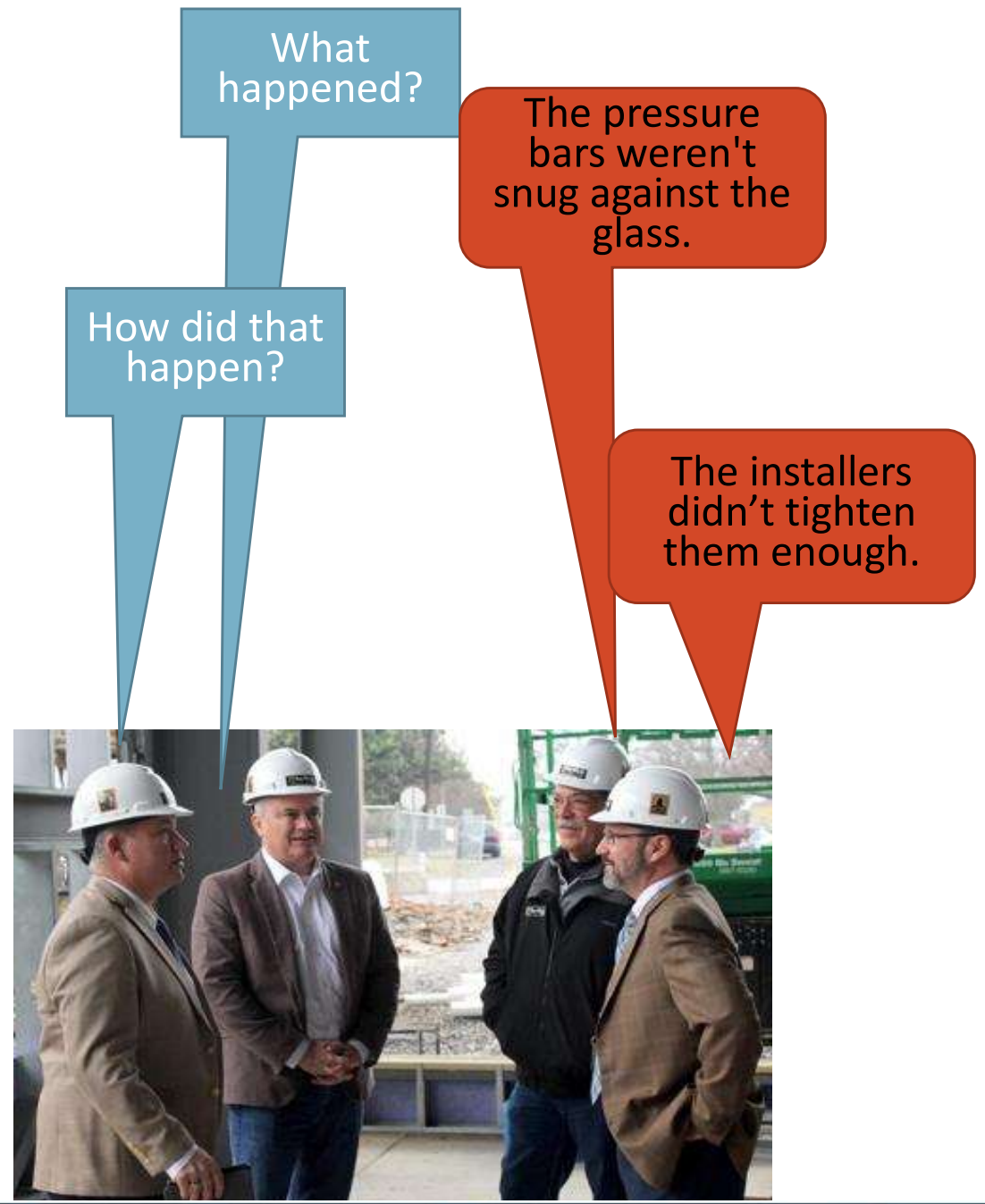


Determine Root Cause

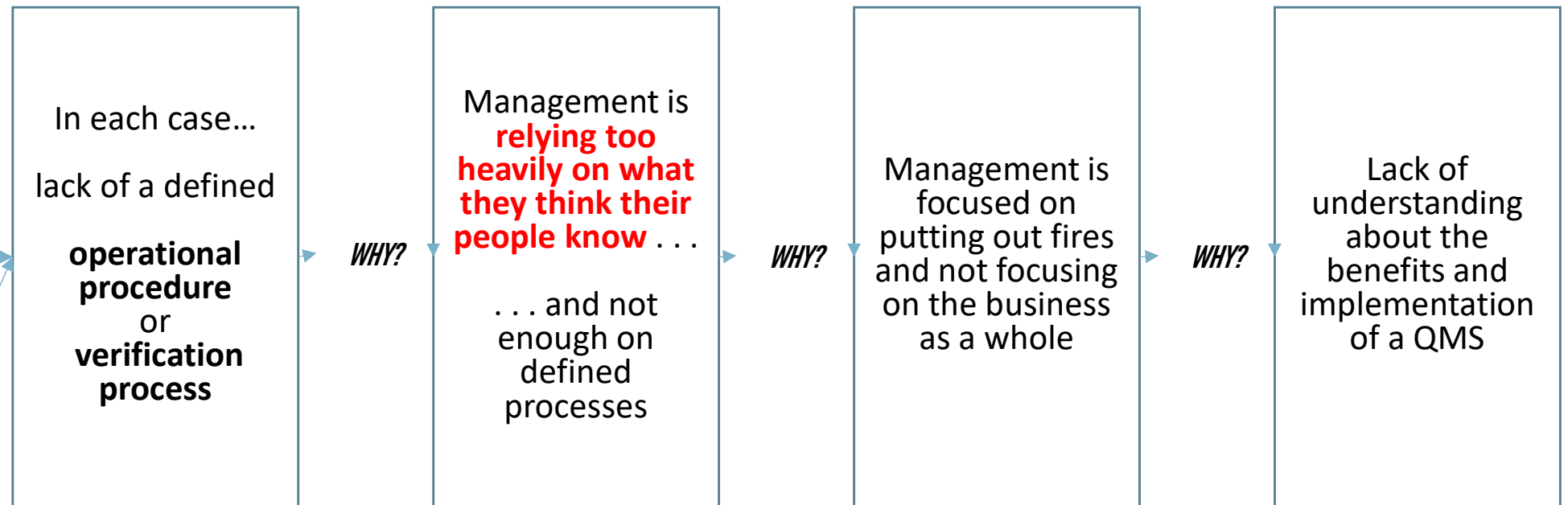
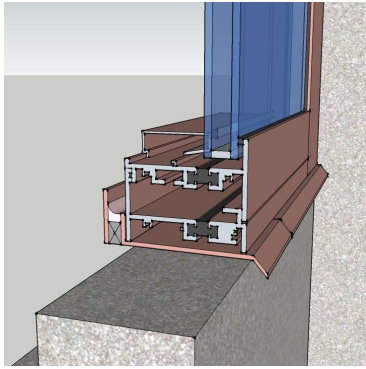


WHY did it happen;
not necessarily how
did it happen

Determine Root Cause



Determine Root Cause





Better Glazing Outcomes Rely on:

- Qualified glazing sub-contractors
- Quality Systems
- Competent Installers

INDEPENDENT THIRD-PARTY
ASSESSMENT

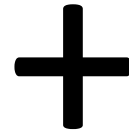
Glazing Contractor Certification



NACC

North American Contractor Certification

NACC CONCEPT



Industry identified **BEST PRACTICES** and **SYSTEMS**

combined with

COMPETENT management with fully **TRAINED / VERIFIED**
installers

Independent Third-Party Assessment

- Annual, multi-day, on-site audit of company's operations
- 32 page / 50 category checklist
- Primary facility / Jobsite
- Mandatory / Scored Items



5 Program Components



Business Practices



Safety



**Contract
Administrative
Processes**



Quality



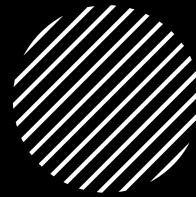
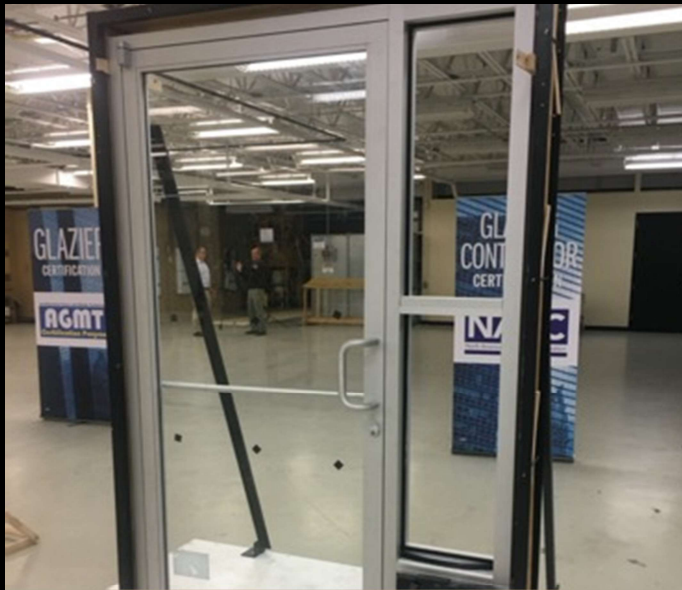
**Glazing
Processes**

Glazier Personnel Certification



**Architectural Glass
& Metal Technician**
CERTIFICATION PROGRAM

AGMT PERSONNEL ASSESSMENT



- Initial Certification:
- **Written Exam** - 125 question/2-hour
7500 Hours Glazing Experience
- **Physical tests**
 - Curtainwall
 - Harness
 - Layout
 - Storefront and Entrance
 - Sealant application
 - Weather sealing
 - Structural glazing

A Powerful Combination....



Quality Assurance Program

The features and benefits of our Site Quality Assurance Program



Architectural Glass
& Metal Technician
CERTIFICATION PROGRAM

NACC

North American Contractor Certification

air barrier

abaa

association of
america

By prioritizing the Whole Building Envelope with quality and collaboration, we can enhance energy efficiency, comfort, and durability in buildings.

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