air barrier abaa association of america

The Air Barrier Association of America

# Quality Assurance Program for Air Barrier Installation

## *A Risk Management Strategy*

AIA Continuing Education Provider

abaa EDUCATION

# Why do I need Quality for my Air Barrier Installation?

Qualified Labor

Failure of the Building Enclosure

# Why do I need Quality for my Air Barrier Installation?

- 650,000 construction workers needed today.
- In the next 10 years roughly 40% of the workforce retiring.

# Why do I need Quality for my Air Barrier Installation?

- Exterior Building envelope failures continue to climb – multi billion-dollar issue yearly

# Why do I need Quality for my Air Barrier Installation?

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# Why do I need Quality for my Air Barrier Installation?

- Approximately 75% of Construction Defect Claims involve Water [1]

- Estimated only about **5%-10%** of Construction Managers have a formal quality program [1]

- Air Barriers Perform the Water Resistive Barrier Function, along with airtightness layer to stop moisture transport

[1] = Zurich Insurance "Construction quality management programs: Keys to successful project delivery" - 2017

# Why do I need Quality for my Air Barrier Installation?

# Why do I need Quality for my Air Barrier Installation?

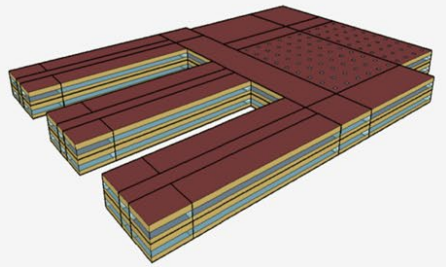
*What keeps us up at night ?*

# Moisture

- Liquid water entry
- Moisture transport through air leakage

## Infiltration Calculator Results

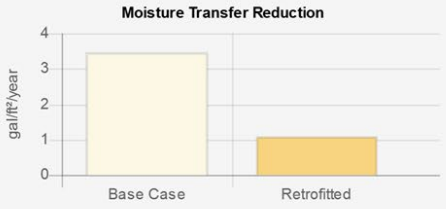
| | |
|---|---|
| **Building Type** | School Secondary |
| **Location** | Boston MA USA |
| **Floor Area** | 210900 ft² |
| **Energy Price** | Electricity 0.11$ /kWh, Natural Gas 11.03$ /1000 ft³ |



| Leakage Rate | | Equivalent Leakage Area | |
|---|---|---|---|
| **Base Case** | **Retrofitted Building** | **Base Case** | **Retrofitted Building** |
| 1.07 CFM/ft² at 75 Pa | 0.25 CFM/ft² at 75 Pa | 100.63 ft² | 23.49 ft² |

| Predicted Savings | Electricity | Natural Gas |
|---|---|---|
| **Energy** | 31,869 kWh | 2,550,773 ft³ |
| **Cost** | $ 3,505.56 | $ 28,135.02 |
| **Total Cost Savings** | $ 31,640.58 | |


| Moisture Transfer through the Wall Assembly due to Air Leakage | |
|---|---|
| **Base Case** | **Retrofitted Building** |
| 3.48 gal/ft²/year | 1.10 gal/ft²/year |
| 734,385.29 gal/year | 231,656.27 gal/year |



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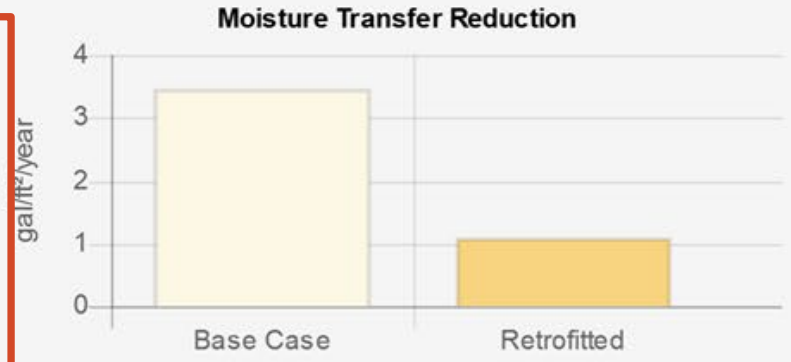
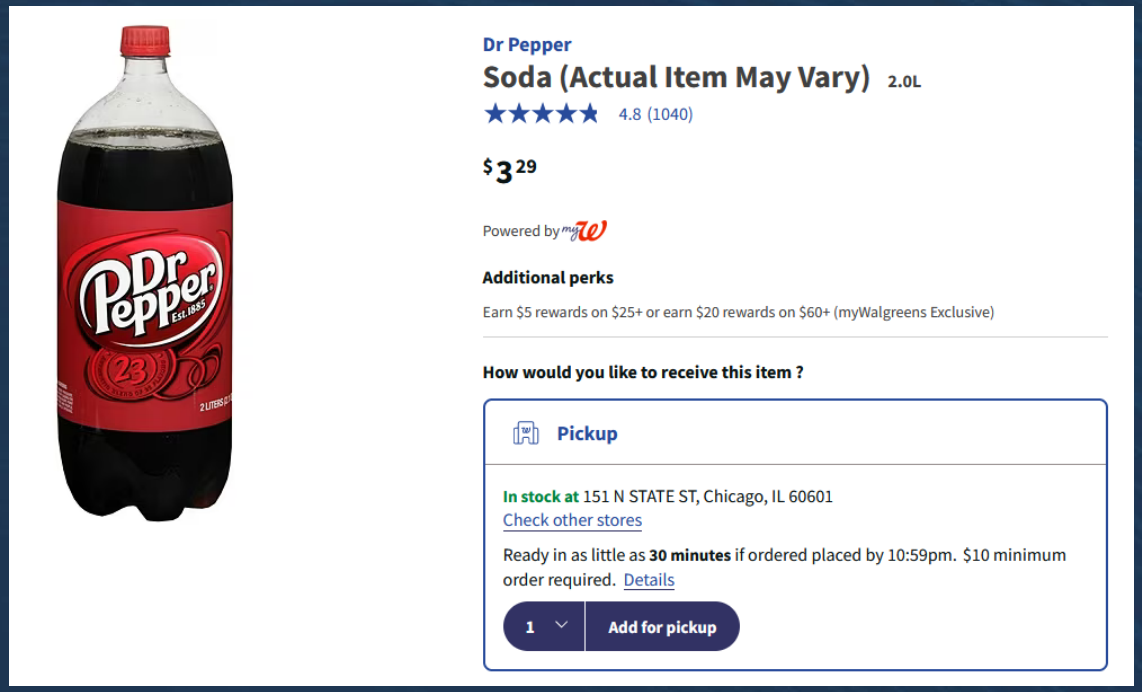





951,517 less 2L bottles of water going into your enclosure

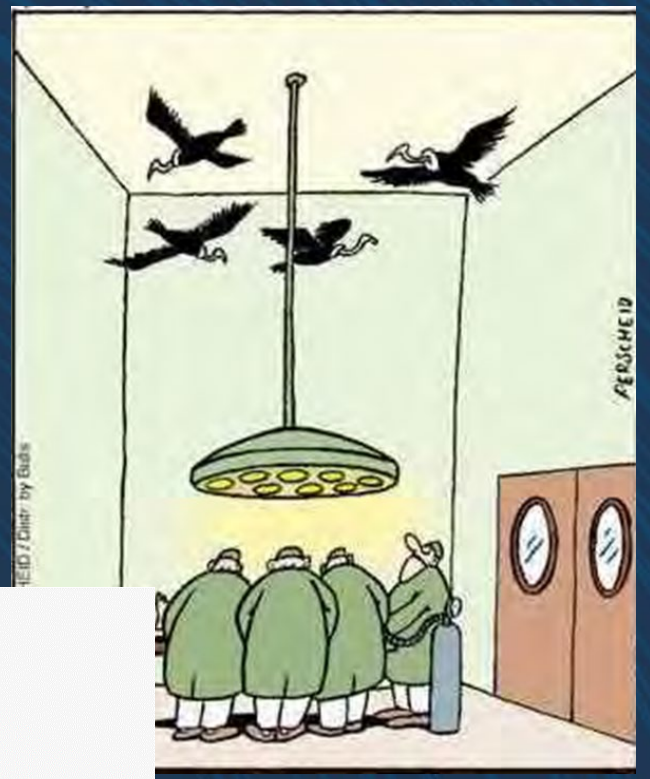
Close to 1 less Olympic sized swimming pool of water not going into your enclosure

# Risk Management Strategy:

## Implement Quality Assurance Process

# What is the ABAA Quality Assurance Program (QAP)?

- A holistic approach that does not focus on one single action to improve quality of the air barrier installation
- Focus on quality assurance vs quality control
- Focus on process, establishing standards, training for competency, corrective/preventative actions and continuous improvement



# What is Quality Control?

Definition:
*Inspection, Audit and Site Observation*

## What is the ABAA Quality Assurance Program (QAP)?

# Owner:

# So, what do I get with the ABAA QAP?

# ABAA Accredited Contractors

## Building Quality, Reducing Risk, and Mitigating Moisture:

QAP is a job site program that ensures proper materials, installation and inspection of the air and moisture barrier system.

# ABAA Certified Installers

Training with Industry Experts

3,000 hours Minimum Installation Experience

Written Exam Confirming Knowledge

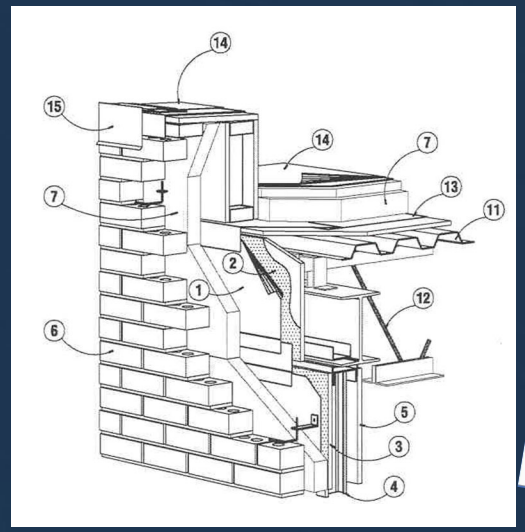
On-going Auditing of
Quality Installations to Maintain
Credential

# ABAA Evaluated Materials

Testing above code requirements

3rd Party Accredited Laboratories

3rd Party Review and Verification





Generico
Technical Data Sheet
AIR & VAPOR BARRIER
Generastick-705 LT
Description
Features and Benefits
Installation
Limitations

Mandatory Supporting Documentation such as construction, details, installation instructions and key information to support product application

# ABAA 3rd Party Auditor


Extensive Training in all Air Barriers

Written Exam Confirming Knowledge

Building Enclosure Experience

3rd Party Unbiased Reporting

On-going Support and Oversight by 3rd party

# ABAA Trade Quality Control

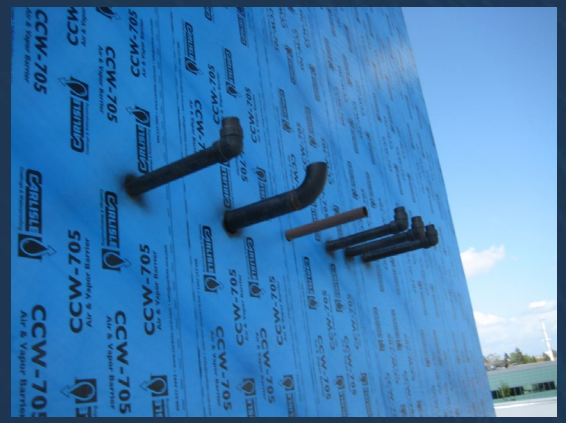

Substrate Testing

Substrate Inspection

Adhesion Testing

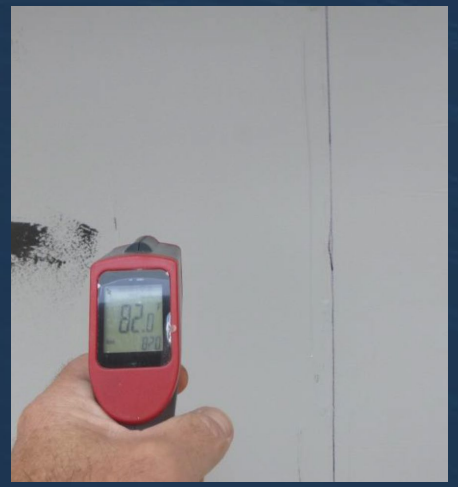
Thickness Testing

Density Testing



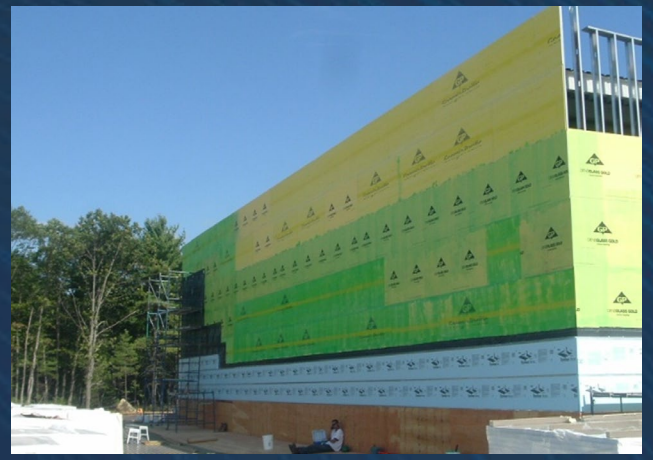

Visual Inspection of Air Barrier

# ABAA Installer Daily Job Site Reports

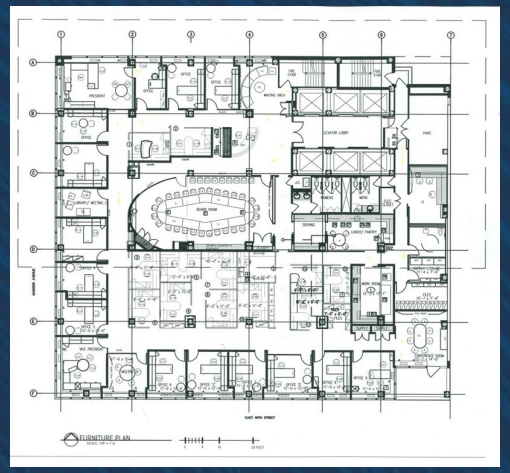


Environmental Conditions

Material Information



Substrate Conditions and Preparation done

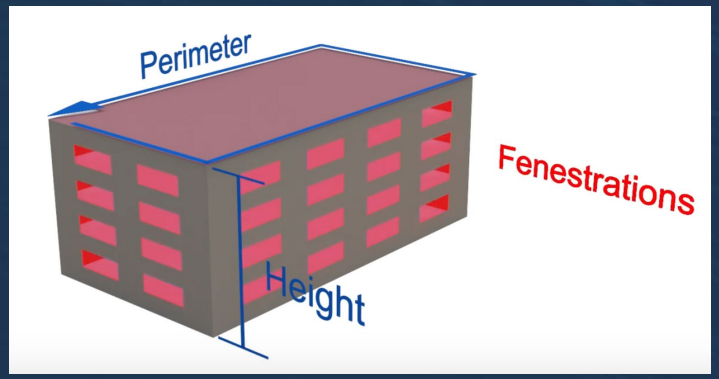


Location of Installation

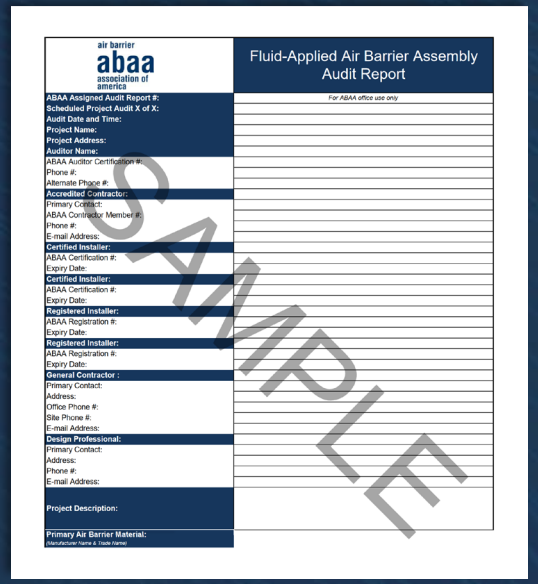
Visual Inspection

Testing Results

# ABAA Quality Control Audits




Amount based on project size



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Fluid-Applied Air Barrier Assembly Audit Report

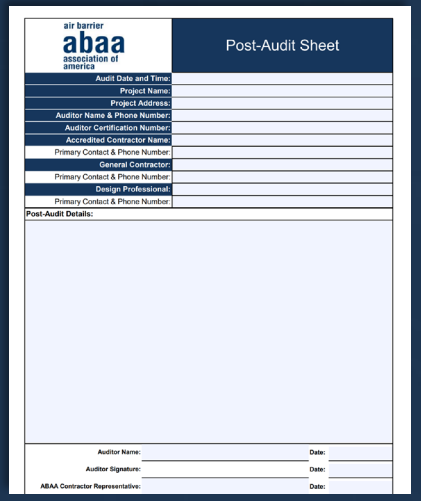
For ABAA office use only

| | |
|---|---|
| **ABAA Assigned Audit Report #:** | |
| **Scheduled Project Audit X of X:** | |
| **Audit Date and Time:** | |
| **Project Name:** | |
| **Project Address:** | |
| **Auditor Name:** | |
| ABAA Auditor Certification #: | |
| Phone #: | |
| Alternate Phone #: | |
| **Accredited Contractor:** | |
| Primary Contact: | |
| ABAA Contractor Member #: | |
| Phone #: | |
| E-mail Address: | |
| **Certified Installer:** | |
| ABAA Certification #: | |
| Expiry Date: | |
| **Certified Installer:** | |
| ABAA Certification #: | |
| Expiry Date: | |
| **Registered Installer:** | |
| ABAA Registration #: | |
| Expiry Date: | |
| **Registered Installer:** | |
| ABAA Registration #: | |
| Expiry Date: | |
| **General Contractor :** | |
| Primary Contact: | |
| Address: | |
| Office Phone #: | |
| Site Phone #: | |
| E-mail Address: | |
| **Design Professional:** | |
| Primary Contact: | |
| Address: | |
| Phone #: | |
| E-mail Address: | |
| **Project Description:** | |
| **Primary Air Barrier Material:** (Manufacturer Name & Trade Name) | |

SAMPLE

Extensive and Standardized Audit report


Photo log documenting installation



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Post-Audit Sheet

| | |
|---|---|
| **Audit Date and Time:** | |
| **Project Name:** | |
| **Project Address:** | |
| **Auditor Name & Phone Number:** | |
| **Auditor Certification Number:** | |
| **Accredited Contractor Name:** | |
| Primary Contact & Phone Number | |
| **General Contractor:** | |
| Primary Contact & Phone Number | |
| **Design Professional:** | |
| Primary Contact & Phone Number | |

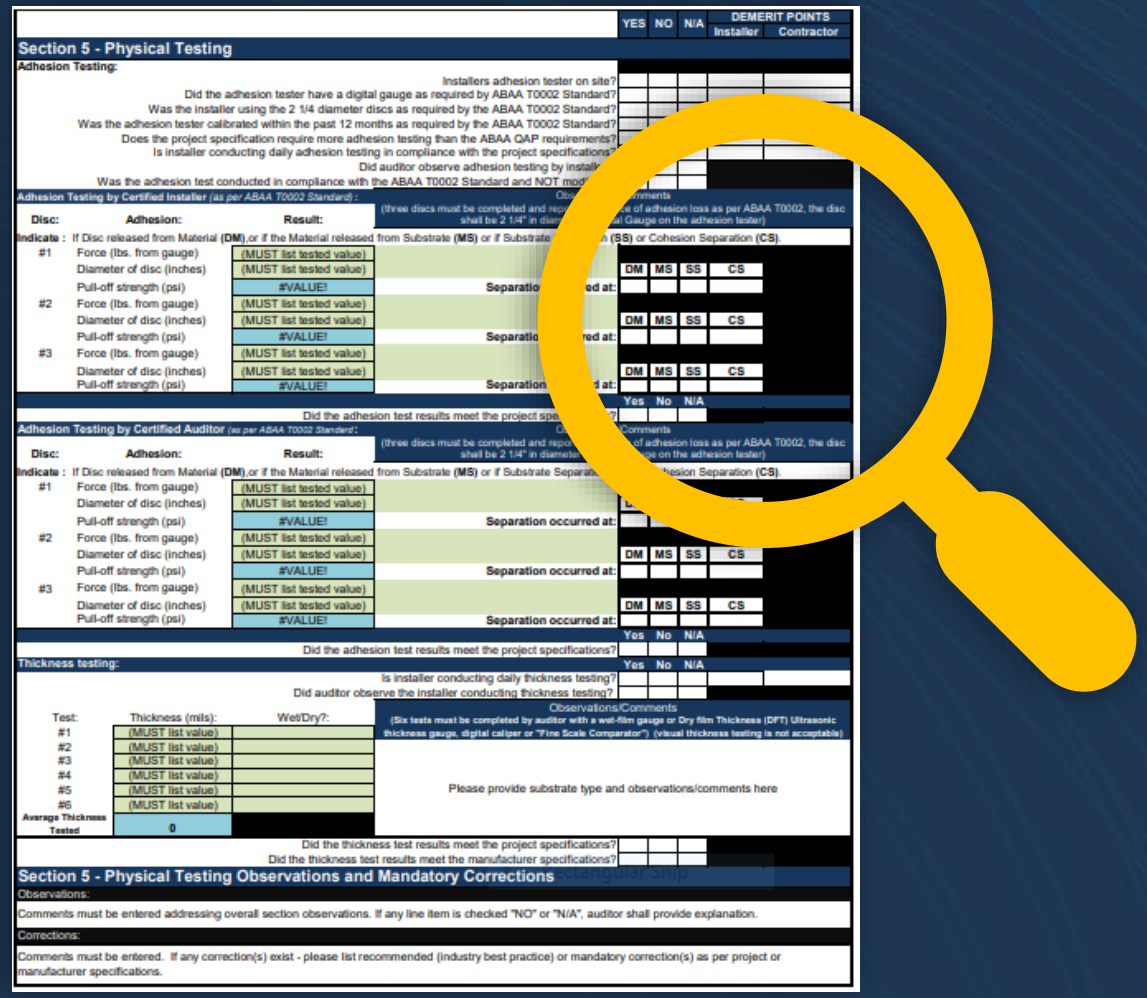
**Post-Audit Details:**

| | | | |
|---|---|---|---|
| **Auditor Name:** | | **Date:** | |
| **Auditor Signature:** | | **Date:** | |
| **ABAA Contractor Representative:** | | **Date:** | |

Post-Audit Punch List

Circulation to entire project team

# ABAA Internal 3rd Party Review of Audit



## Section 5 - Physical Testing

| | YES | NO | N/A | DEMERIT POINTS Installer | DEMERIT POINTS Contractor |
|---|---|---|---|---|---|
| **Adhesion Testing:** | | | | | |
| Installers adhesion tester on site? | | | | | |
| Did the adhesion tester have a digital gauge as required by ABAA T0002 Standard? | | | | | |
| Was the installer using the 2 1/4 diameter discs as required by the ABAA T0002 Standard? | | | | | |
| Was the adhesion tester calibrated within the past 12 months as required by the ABAA T0002 Standard? | | | | | |
| Does the project specification require more adhesion testing than the ABAA QAP requirements? | | | | | |
| Is installer conducting daily adhesion testing in compliance with the project specifications? | | | | | |
| Did auditor observe adhesion testing by installer? | | | | | |
| Was the adhesion test conducted in compliance with the ABAA T0002 Standard and NOT mod | | | | | |

**Adhesion Testing by Certified Installer** *(as per ABAA T0002 Standard)* :

| Disc: | Adhesion: | Result: | Observations/Comments |
|---|---|---|---|
| | | | (three discs must be completed and repo… shall be 2 1/4" in diam… …ce of adhesion loss as per ABAA T0002, the disc …al Gauge on the adhesion tester) |
| **Indicate :** | If Disc released from Material (**DM**),or if the Material released from Substrate (**MS**) or if Substrate … (**SS**) or Cohesion Separation (**CS**). | | |
| #1 | Force (lbs. from gauge) | (MUST list tested value) | |
| | Diameter of disc (inches) | (MUST list tested value) | DM MS SS CS |
| | Pull-off strength (psi) | #VALUE! | **Separatio… …ed at:** |
| #2 | Force (lbs. from gauge) | (MUST list tested value) | |
| | Diameter of disc (inches) | (MUST list tested value) | DM MS SS CS |
| | Pull-off strength (psi) | #VALUE! | **Separatio… …ed at:** |
| #3 | Force (lbs. from gauge) | (MUST list tested value) | |
| | Diameter of disc (inches) | (MUST list tested value) | DM MS SS CS |
| | Pull-off strength (psi) | #VALUE! | **Separation… …d at:** |

| | Yes | No | N/A |
|---|---|---|---|
| Did the adhesion test results meet the project spe… …? | | | |

**Adhesion Testing by Certified Auditor** *(as per ABAA T0002 Standard)* :

| Disc: | Adhesion: | Result: | Observations/Comments |
|---|---|---|---|
| | | | (three discs must be completed and repo… shall be 2 1/4" in diameter) … of adhesion loss as per ABAA T0002, the disc …ge on the adhesion tester) |
| **Indicate :** | If Disc released from Material (**DM**),or if the Material released from Substrate Separa… | | …hesion Separation (**CS**). |
| #1 | Force (lbs. from gauge) | (MUST list tested value) | |
| | Diameter of disc (inches) | (MUST list tested value) | |
| | Pull-off strength (psi) | #VALUE! | **Separation occurred at:** |
| #2 | Force (lbs. from gauge) | (MUST list tested value) | |
| | Diameter of disc (inches) | (MUST list tested value) | DM MS SS CS |
| | Pull-off strength (psi) | #VALUE! | **Separation occurred at:** |
| #3 | Force (lbs. from gauge) | (MUST list tested value) | |
| | Diameter of disc (inches) | (MUST list tested value) | DM MS SS CS |
| | Pull-off strength (psi) | #VALUE! | **Separation occurred at:** |

| | Yes | No | N/A |
|---|---|---|---|
| Did the adhesion test results meet the project specifications? | | | |

**Thickness testing:**

| | Yes | No | N/A |
|---|---|---|---|
| Is installer conducting daily thickness testing? | | | |
| Did auditor observe the installer conducting thickness testing? | | | |

| Test: | Thickness (mils): | Wet/Dry?: | Observations/Comments (Six tests must be completed by auditor with a wet-film gauge or Dry film Thickness (DFT) Ultrasonic thickness gauge, digital caliper or "Fine Scale Comparator") (visual thickness testing is not acceptable) |
|---|---|---|---|
| #1 | (MUST list value) | | |
| #2 | (MUST list value) | | |
| #3 | (MUST list value) | | |
| #4 | (MUST list value) | | Please provide substrate type and observations/comments here |
| #5 | (MUST list value) | | |
| #6 | (MUST list value) | | |
| **Average Thickness Tested** | 0 | | |

| | | | |
|---|---|---|---|
| Did the thickness test results meet the project specifications? | | | |
| Did the thickness test results meet the manufacturer specifications? | | | |

## Section 5 - Physical Testing Observations and Mandatory Corrections

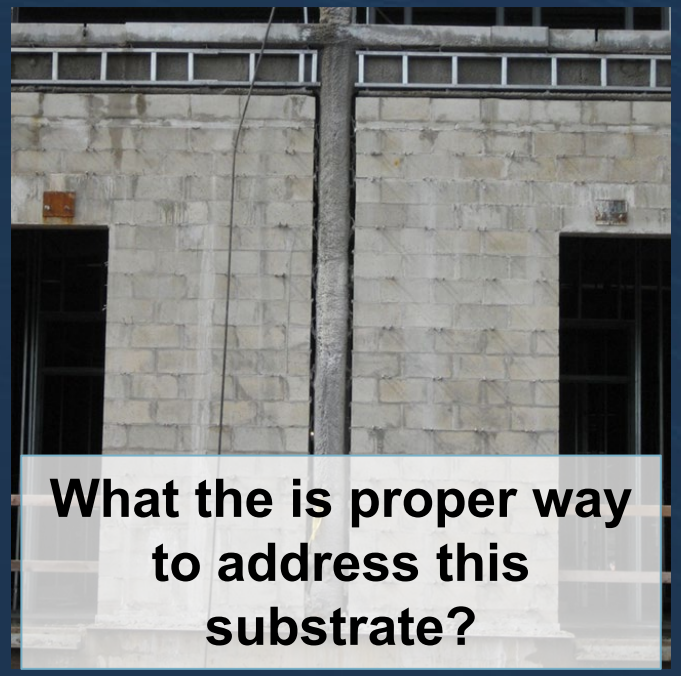
**Observations:**

Comments must be entered addressing overall section observations. If any line item is checked "NO" or "N/A", auditor shall provide explanation.

**Corrections:**

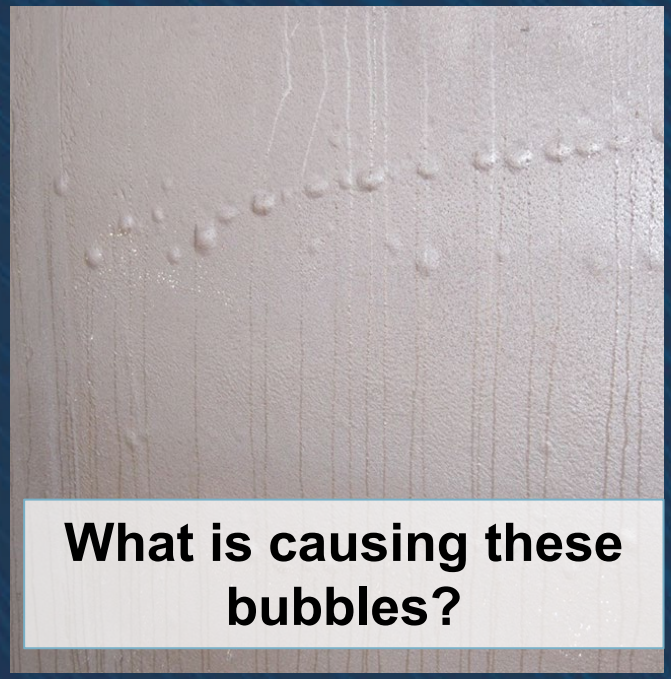
Comments must be entered. If any correction(s) exist - please list recommended (industry best practice) or mandatory correction(s) as per project or manufacturer specifications.

# ABAA 3rd Party Technical Support



What the is proper way to address this substrate?

Can this be fixed? Do I need to remove it?



What is causing these bubbles?

Does this cell structure look right?

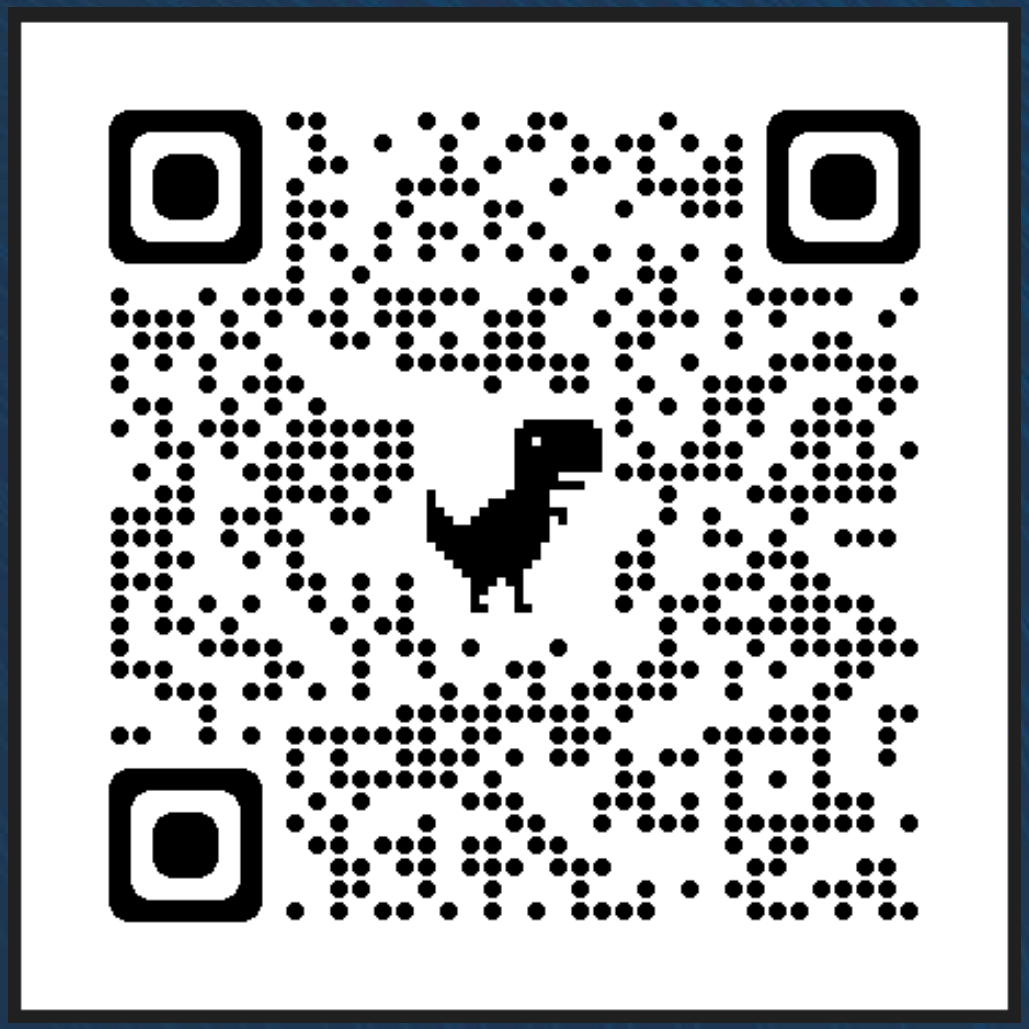
Are these adhesion values OK?

# Owner:

What’s the expected **COST** of the ABAA QAP?

# Owner:

Where can I determine how much it will cost for my project?



# Owner:

Where can I determine how much it will cost for my project?


*– Need help on how to use it, watch this video. –*

$ Total project cost

ft² Total air barrier square footage

**0** Number of ABAA QAP Audits

**0** Total estimated ABAA QAP Project Costs

**0** Percentage of ABAA QAP costs to total project cost

# Owner:

What's the expected **COST** of the ABAA QAP?

Strip Mall

Building Cost: $6,390,000
ABAA Wall Area: 11,348 sf
QAP Investment: $4,964
Audits: 2

**% of Job Cost: .08%**

Small Hotel

Building Cost: $17,280,000
ABAA Wall Area: 17,280 sf
QAP Investment: $5,468
Audits: 2

**% of Job Cost: .03%**

Medium Office

Building Cost: $24,334,400
ABAA Wall Area: 10,975 sf
QAP Investment: $4,932
Audits: 2

**% of Job Cost: .02%**

Large Hotel

Building Cost: $65,594,884
ABAA Wall Area: 33,849 sf
QAP Investment: $6,877
Audits: 2

**% of Job Cost: .01%**


Secondary School

Building Cost: $51,037,800
ABAA Wall Area: 27,040 sf
QAP Investment: $6,298
Audits: 2

**% of Job Cost: .01%**

Large Office

Building Cost: $276,224,400
ABAA Wall Area: 64,480 sf
QAP Investment: $11,480
Audits: 3

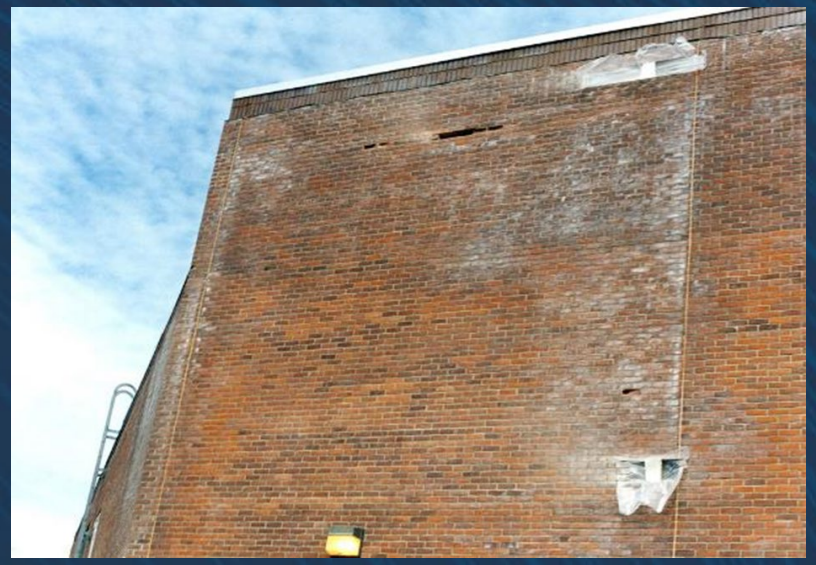
**% of Job Cost: .004%**

# Benefits of ABAA Quality Assurance Program (QAP)?

- QAP improves schedule, reduces rework, and reduces the potential for future litigation from poor installation

- Ensure the project meets the Project Specifications/Requirements

- ASHRAE Study 1478 showed Projects using a formal enclosure quality program met the owner's requirements 100% of the time, those without a formal program only 20% of the time



# How do I implement it for my project?

- It needs to be specified in the contract documents – short and sweet

B. Air Barrier Association of America (ABAA) Quality Assurance Program (QAP); www.airbarrier.org/sle:

1. Installer Qualification: Use accredited contractor, certified installers, evaluated materials, and third-party field quality control audit.
2. Manufacturer Qualification: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture. Use secondary materials approved in writing by primary material manufacturer.

# How do I implement it for my project?

- It needs to be specified in the contract documents – more detailed

## PART 1 - GENERAL

1.3 SUBMITTALS

A. Submittals: Submit in accordance with Division 1 requirements.

B. Quality Assurance Program: Submit evidence of current Contractor accreditation and Installer certification under the Air Barrier Association of America's (ABAA) Quality Assurance Program (QAP). Submit accreditation number of the Contractor and certification number(s) of the ABAA Certified Installer(s).

Air Barrier Subcontractor Qualifications: Air barrier Subcontractor(s) shall be accredited at the time of bidding and during the complete installation, period by the Air Barrier Association of America (ABAA) whose Installer(s) are certified in accordance with the site Quality Assurance Program used by ABAA.

# How do I implement it for my project?

- It needs to be specified in the contract documents – more detailed

## PART 1 - GENERAL

Field Quality Assurance: Implement the site Quality Assurance Program requirements used by ABAA. Cooperate with ABAA Auditors and any independent testing and inspection agencies engaged by the Owner. Do not cover the air barrier assembly until it has been inspected, tested and accepted.

## PART 2 - MATERIALS

Manufacturer: Obtain primary ABAA Evaluated Materials from a single ABAA Evaluated Manufacturer regularly engaged in manufacturing specified air barriers. Obtain secondary materials from a source acceptable to the primary material manufacturer.

# How do I implement it for my project?

- It needs to be specified in the contract documents – more detailed

## PART 3 - EXECUTION

Air Barrier Association of America Installer Audits: Cooperate with ABAA's testing agency. Allow access to work areas and staging. Notify ABAA in writing of schedule for Work of this Section to allow sufficient time for testing and inspection. Do not cover Work of this Section until testing and inspection is accepted. Arrange and pay for site inspections by ABAA to verify conformance with the material Manufacturer's instructions, the site Quality Assurance Program used by ABAA, and this section of the project specification.

1. Audits and subsequent testing shall be carried out at the following rate:
   a. Up to 10,000 $ft^2$ of air barrier contract requires one (1) audit.
   b. 10,001 – 35,000 $ft^2$ of air barrier contract requires two (2) audits.
   c. 35,001 – 75,000 $ft^2$ of air barrier contract requires three (3) audits.
   d. 75,001 - 125,000 $ft^2$ of air barrier contract requires four (4) audits.
   e. 125,001 – 200,000 $ft^2$ of air barrier contract requires five (5) audits.
   f. 200,001 $ft^2$ and over of air barrier contract requires six (6) audits.

2. Forward written audit reports to the Architect within 10 working days of the inspection and test being performed.

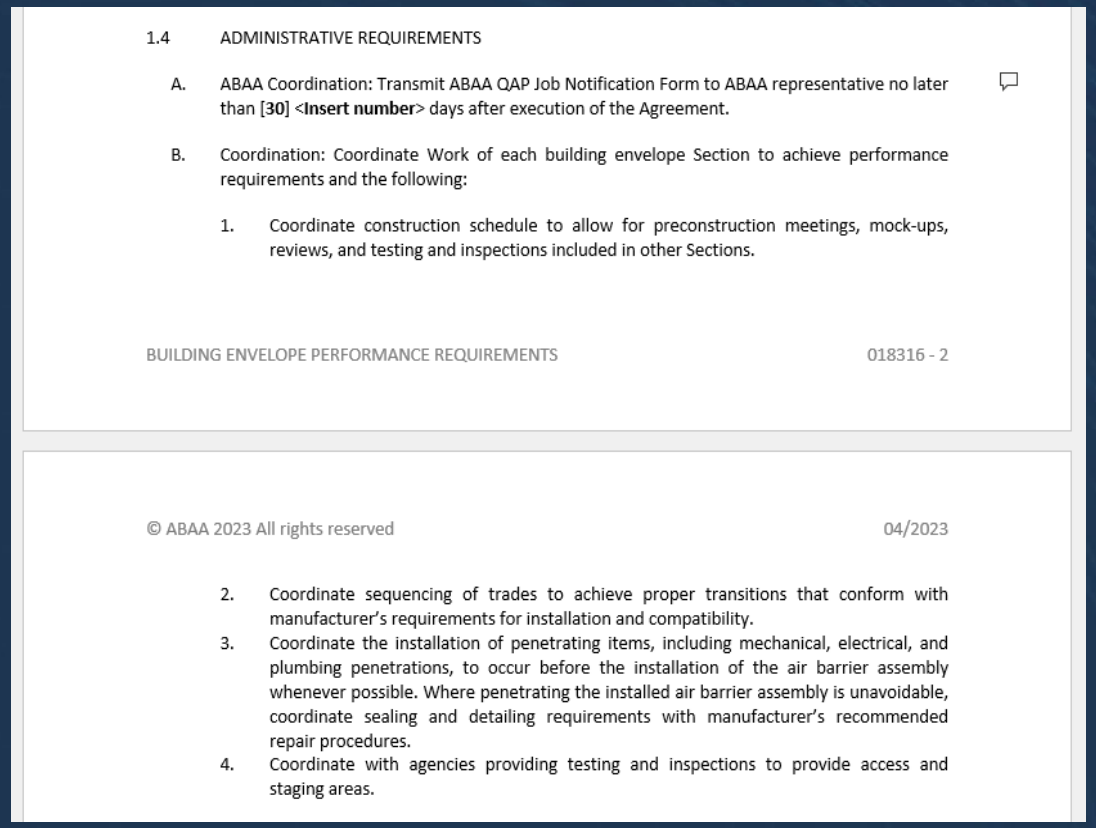
3. If the inspections reveal any defects, promptly remove and replace defective work at no additional cost to the Owner.

# How do I implement it for my project?

- It needs to be specified in the contract documents – more detailed

## DIVISION 1

Kickoff form to notify ABAA of a new project



1.4 ADMINISTRATIVE REQUIREMENTS

A. ABAA Coordination: Transmit ABAA QAP Job Notification Form to ABAA representative no later than [30] <**Insert number**> days after execution of the Agreement.

B. Coordination: Coordinate Work of each building envelope Section to achieve performance requirements and the following:

1. Coordinate construction schedule to allow for preconstruction meetings, mock-ups, reviews, and testing and inspections included in other Sections.

BUILDING ENVELOPE PERFORMANCE REQUIREMENTS 018316 - 2

 04/2023

2. Coordinate sequencing of trades to achieve proper transitions that conform with manufacturer's requirements for installation and compatibility.
3. Coordinate the installation of penetrating items, including mechanical, electrical, and plumbing penetrations, to occur before the installation of the air barrier assembly whenever possible. Where penetrating the installed air barrier assembly is unavoidable, coordinate sealing and detailing requirements with manufacturer's recommended repair procedures.
4. Coordinate with agencies providing testing and inspections to provide access and staging areas.

Preconstruction and Preinstallation Meetings

C. Preconstruction Meeting: In conformance with requirements specified in [**Section 013100**] [**Section 013000**] [**other Division 01 Sections describing Preconstruction Meeting requirements**], discuss items of significance that could affect the progress and performance of air barrier system installation, including:

1. ABAA Quality Assurance Program requirements and schedule.
2. Schedule and phasing.
3. Air barrier system boundaries and transitions.
4. Coordination and sequencing of Work with other Sections.
5. Mock-ups.
6. Testing and inspecting.

D. Preinstallation Meetings: Conduct at [**Project site**] <**Insert location**>.

1. Specific requirements are included in Air Barrier Sections.
2. Discuss where each trade's Work begins and ends and the responsibility and sequence of installation for all joints and transitions between systems and components.

# In Summary:

- In the history of the United States we have never seen this shortage of construction workers.
- It is EXTREMELY expensive and DIFFICULT to fix defect after construction and occupancy
- The ABAA Air Barrier QAP is an effective way to manage risk of moisture
- The cost is less than what you will probably spend on “chips and dips”[1] on Friday’s in the construction trailer

[1] = Quote from past General Contractor QA/QC individual and ABAA board member, Mr. Brian Stroik