2ND QUARTER 2020 NEWSLETTER
GOLD EDITION

air barrier
abaa
association of america

THE GOLD STANDARD OF AIR BARRIER KNOWLEDGE

AFTER SEVERAL YEARS OF DEVELOPMENT, THE CERTIFIED AIR BARRIER SPECIALIST (CABS) PROGRAM AND STUDY GUIDE WILL BE LAUNCHED IN SEPTEMBER 2020.

The Certified Air Barrier Specialist program is to ensure that a professional has the knowledge and skills to give building stakeholders a consistent message on the requirements for air barrier systems. These systems include the selection of air barrier materials and accessories for a specific application, the proper installation instructions for those materials, and any drawings or specifications related to an air barrier system.

CABS
Certified Air Barrier Specialist

WHO SHOULD BECOME CABS CERTIFIED?

Anyone who advises architects, owners, installers, inspectors/auditors, and other building stakeholders in the use, design, and installation of air barriers.

TYPICALLY, THESE INDIVIDUALS WOULD BE:

- Building Envelope Consultants
- Manufacturer Representatives
- Technical Field Representatives
- Architects
- Sales Professionals
- Technical Directors

WHY SHOULD I GET CERTIFIED?

Certification from an accredited organization, like the Air Barrier Association of America, demonstrates your expert knowledge of air barriers across five primary air barrier types. The types are board stock, fluid-applied, mechanically attached, self-adhered, and spray foam. By having this Certification, the holder has proven their knowledge across all the air barrier fields and can be a trusted advisor to the construction community.

GREETINGS FROM THE CHAIR

BY BRIAN STROIK

These last three months have truly been monumental, and I, along with everyone at the ABAA, hope you and your families are staying safe and healthy. CoVid-19 really is changing the “normal” for a lot of industries, including construction, and will likely continue to. As we start to come out of quarantine and projects begin to gain momentum, we hope all of you are able to get back to working 100%.

ABAA has been busy during this historic time. We have been working within industry by assisting the State of Washington with their Whole Building Testing Requirements, finalizing Technical Notes (which are now published on the airbarrier.org website), providing weekly webinars from industries top enclosure experts (http://www.airbarrier.org/events/category/webinars/), assembling a training manual for our Certified Air Barrier Specialist (CABS) Certification (available mid-September 2020), seeing more and more of our white papers being published nationally, and working on the annual ABAA conference.

The association also held its Annual General Meeting during this time. During the meeting, our membership re-elected to the Board of Directors: Andre Desjarlais (ORNL), Clarke Berdan (Owens Corning), Craig Wetmore (York Manufacturing), Brian Stroik (Tremco CPG), Dave Pennington (Prosoco), Matt Giambrone (OCP Contractors), Mike Bingley (Curtainwall Design & Consulting), Peter Barrett (Dörken Systems) and Roy Schauffele (Division 7 Solutions). The membership also elected new Board of Director Julie Szabo (WJE). I would like to thank these individuals for agreeing to volunteer their time and continuing to be leaders in the enclosure industry. I look forward to working with all of them.

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On a high note. The ABAA continues to gain momentum in specifications and the QAP program is being adopted on more and more projects even through this down time in construction. We are near our record-breaking numbers in both areas and we will continue to promote our Trained and Certified Installers, evaluated materials, and provide education, as requested and through our weekly webinars as move through this CoVid-19 era.

I wish everyone the best during these times.

Brian Stroik
Chair: Air Barrier Association of America

PULL ADHESION – THE ABAA TEST METHOD FOR THE AIR AND WATER RESISTIVE BARRIER INDUSTRY

BY MR. LAVERNE DALGLEISH

The Air Barrier Association of America (ABAA) QAP requires that the installer tests the adhesion of the installed air and water resistive barrier (AWB) material daily. When an ABAA audit is conducted, an adhesion test is performed to confirm that the installer is conducting the test properly and that the results of the tests meet the installation requirements. If the installer is not onsite at the time of the audit, then the auditor would conduct the test themselves.

ABAA has established minimum pull-off value of 16 psi for air and water resistive barrier materials and as a part of the material evaluation process, the manufacturer provides a pull adhesion laboratory test report for reference. However, on the jobsite, if a project specification calls for a higher value, then the installer must meet the higher value in the project specification.

If the higher value (project specification or ABAA) is met, then automatically both requirements will have been met. ABAA’s requirements do not undermine project specification requirements if they are more stringent. In other words, if the project specifications require a higher value than 16 psi, the installer must meet the higher value. When ABAA’s

QAP was introduced, the closest test method that was published by a standards development organization was ASTM D4541 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers. ABAA adopted this method for evaluating pull adhesion, but through the audit process, became aware that results may not be repeatable or reproducible due to the various modifications incorporated by different installers, namely, the size of disks, variations in the rate of the pull and whether scoring around the disk occurred. For example, a simple thing like the rate of pull can produce a different pull-off value. If you use the rate of pull suggested in ASTM D4541, you will get a different number than when using a hand crank and turning it very slowly.

With air and water resistive barrier materials, it is also important to determine where the failure occurred. The installer needs to prove that the material installed stuck to the substrate or if a failure within the substrate occurred. If there was a substrate failure, for example the facing releasing from a gypsum board, that needs to be recorded, but it is not considered to be a failure of the installation of the air and water resistive barrier material.

As the industry evolved, it was apparent that there was a need to develop a test method that was specific for the air and water resistive barrier industry. The ABAA Research Committee worked on the development of a pull adhesion test method, which documented the current practice in the industry and standardized the process. Careful consideration was given to develop a test method that could be used both in the laboratory and in the field so that the manufacturer's test results could be compared to field results.

The test method was vetted by the ABAA Research Committee and approved. The document was then submitted to the ABAA Board for final approval as an ABAA document. The result of this work is the published document ABAA T0002-2019 Standard Test Method for Pull-Off Strength of Adhered Air and Water Resistive Barriers Using an Adhesion Tester. The document can be found at; http://www.airbarrier.org/technical-information/abaa-standards/#1541192074772-602d1ab1-1604

THE DIFFERENCES BETWEEN THE ABAA T0002 TEST METHOD AND THE ASTM D4541 AND THE ASTM D7234 TEST METHODS INCLUDE:

- **a.** Cutting the material – ABAA's requirement is to separate the material under the disk from the balance of the material so that the value obtained is for the size of the disk – other test methods, you do not separate the material. The values are completely different
- **b.** Load rate – ABAA's requirement is one revolution per ten seconds (58 psi/m) – other materials require 150 psi/s or 30 psi/s. A quick sharp loading will produce very high results whereas a low loading rate will produce low results
- **c.** Test duration - ABAA's requirement is test until failure – other test methods are 100 or 30 seconds
- **d.** Termination of test - ABAA's requirement is to continue the test until there is a rupture in the layers. Other test methods are to a specific load
- **e.** Number of pulls - ABAA's requirement is for three pulls in a 39 inch by 39 inch area to be considered one test – other test methods requires three pulls in a representative area
- **f.** Size of disk - ABAA's requirement is for a 2.25 inch diameter disk – other test methods allows
- **g.** ABAA's requires a digital gauge whereas other test methods allow analog gauges

ABAA requires that the installers and the auditors use ABAA T0002.

This test method is a step forward in the evolution of the air and water resistive barrier industry. As the test method reflects what is already being done on the construction site, there are not a lot of changes that need to be made.

FEATURE ARTICLE:
RECENT RESEARCH ON WATER PENETRATION DETECTION TECHNIQUES

BY ANDREW DUNLAP AND SARAH FLOCK

To meet current commercial energy codes Air Barriers and the use of exterior insulation have become commonplace in exterior wall designs. Many of these air barriers also function as the code required Water-Resistive Barriers (WRB) which lead the research committee to further evaluate the performance of these components. When a material provides both functions they can be referred to as an Air Water Barrier (AWB). However, given the current focus of this study is about watertightness, the material will be referred to as a WRB throughout this article.

In effort to maintain continuity/efficiency of the exterior insulation, many different cladding attachment solutions have also been developed. Most cladding attachment solutions introduce penetrations through the WRB in some form; though, these are often considered to have limited impact on the overall watertightness given their small size. However, the potential effect of the number and frequency can often be overlooked (Figure 1). Installation practices, field conditions, and requirements by manufacturers are also not consistent and can further influence the performance. To better understand possible performance impacts of fastener penetrations at the WRBs, ABAA's Research Committee undertook a study that included a review of current code provisions, available test methods, and laboratory analysis to evaluate various water detection methods that could be employed to validate the watertightness of these penetrations. The airtightnesss of these penetrations are intended to be evaluated in a separate study.

FIGURE 1: View of numerous penetrations through the WRB to facilitate cladding attachment.

Per the IBC, the WRB is defined as "a material behind an exterior wall covering that is intended to resist liquid water that has penetrated behind the exterior covering from further intruding into the exterior wall assembly." Figure 2 provides a representation of this provision for use and reference in this article (IBC 2018). The IBC offers various compliance options for WRBs including through direct reference, agreement with a referenced standard or by alternate material approval.

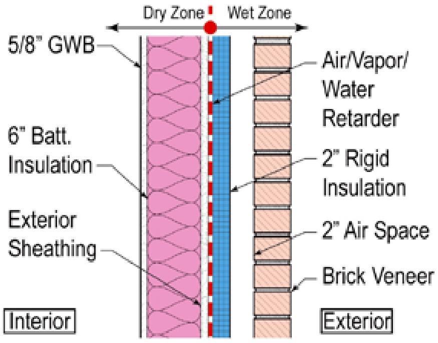

FIGURE 2: Illustration indicating the line of watertightness in which the code requires no further intrusion into the Dry Zone of the wall assembly.

The various test methods for WRBs referenced by the code and the alternate material approvals were reviewed as a part of the evaluation. A detailed review of these methods is included in a paper published and presented at the 2019 ASHRAE Buildings XIV conference titled "Affecting Water-Resistive Barrier Effectiveness: Fixing the Facade Fasteners?". In summary, the available test methods were found to have many limitations including, but not limited to, reliance on visual assessment only, originated for evaluation of materials other than WRBs, failure to consider installed conditions such as cladding attachments, inconsistent test pressures and/or durations, as well as inability to monitor and quantify water penetration at substrate conditions. Additionally, the standardized tests that are used today are subjective and are utilized inconsistently among manufacturers and products types.n Further, the available tests only capture visible water intrusion. Water penetration and accumulation into the sheathing which may not travel all the way to the backside is not consistently monitored or documented following the existing standards.

These findings identified a need for a new test method that could provide quantitative results for comparing installed performance. In response, the Air Barrier Association of American (ABAA) Research Committee began development on a material water penetration resistance test and an assembly water penetration resistance test with the intent to combine provisions in ASTM E2357 Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies and E331 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference. However, while drafting this approach, project participants questioned if improvements regarding detection methods for water penetration should and could be evaluated. This resulted in a water penetration detection study to evaluate and compare available methods and processes for incorporation in the assembly water test.

WATER PENETRATION DETECTION STUDY

In partnership with Oak Ridge National Laboratory (ORNL) and Tremco, ABAA Research Committee undertook a study which included multiple 39.37-inches by 39.37 inches (1-meter by 1-meter) wall assembly mockups composed of exterior gypsum sheathing (sheathing) attached to cold formed metal stud framework. A fluid applied and a self-adhered sheet WRB were evaluated and self-taping fasteners were installed penetrating the WRB in multiple manners (flush, overdriven, underdriven, angled and missing the stud) with the intent to cause water penetration in order to evaluate the various detection options (Figure 3). This project did not test the efficacy of the different AWBs, rather, fasteners were purposely installed in various ways to foster water penetration and activate the different methods of detection.

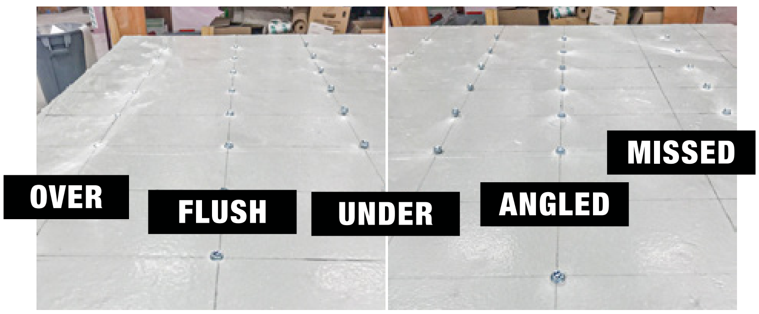

FIGURE 3: Photograph of a sampling of the fasteners that were purposely installed incorrectly.

Twenty four (24) mockup panels were constructed in order to evaluate the following detection methods.

1. Water indicator paper placed between the WRB and the sheathing. Multiple types of paper were evaluated in attempt to identify a material that would work for the various WRB's.
2. Water indicator paper placed between the backside of the sheathing and the metal studs.
3. Water indicator paper in the fastener holes after the mockup was partially disassembled after testing.
4. Fluorescent dye in the water with UV light during and after testing.
5. RH sensors embedded in the sheathing to monitor the internal RH change during testing.
6. Embedded pin probes in the sheathing, placed directly inboard of the exterior face, to monitor moisture content during testing.
7. Electric sensor tape placed between the backside of the sheathing and the metal studs.
8. An experimental Sensor Plate that is under development as part of another Research Committee effort was embedded directly inboard of the exterior face of the sheathing.
9. The Sensor Plate was also installed in plane with the exterior surface of the sheathing and covered with the WRB.
10. Moisture meter pin probes performed after testing through the backside of the sheathing to a depth just behind the WRB.
11. Visual assessment during testing and after testing during the disassembly of the specimens.

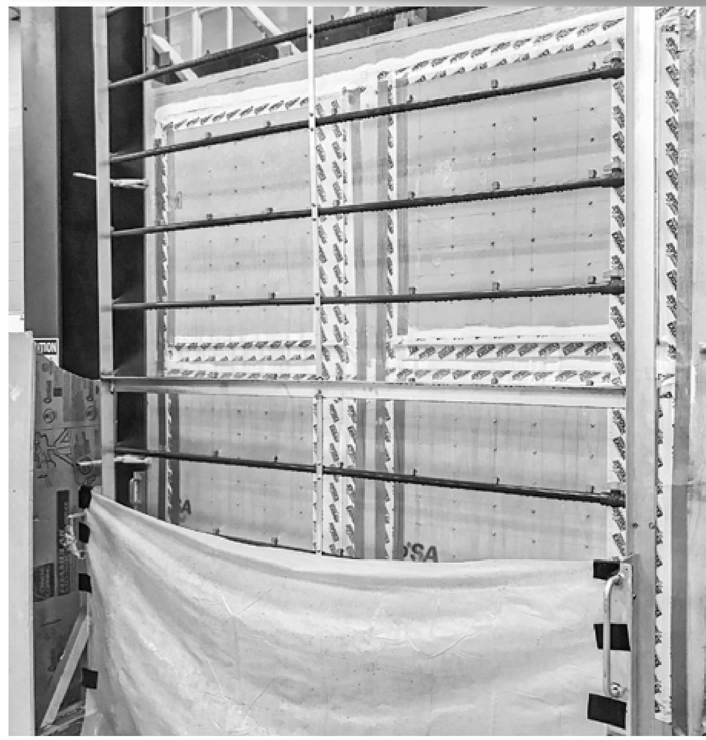

FIGURE 4: Water testing of four mockup panels.

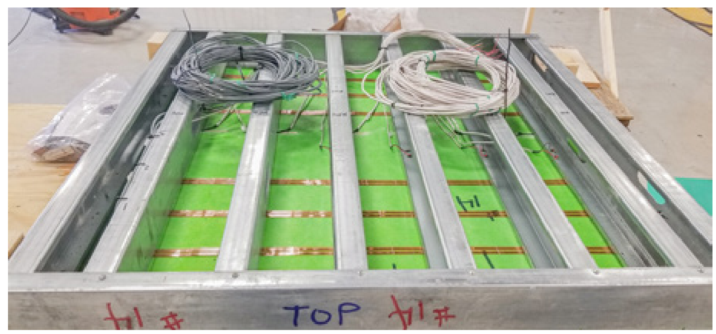

FIGURE 5: Backside view of installed sensors.

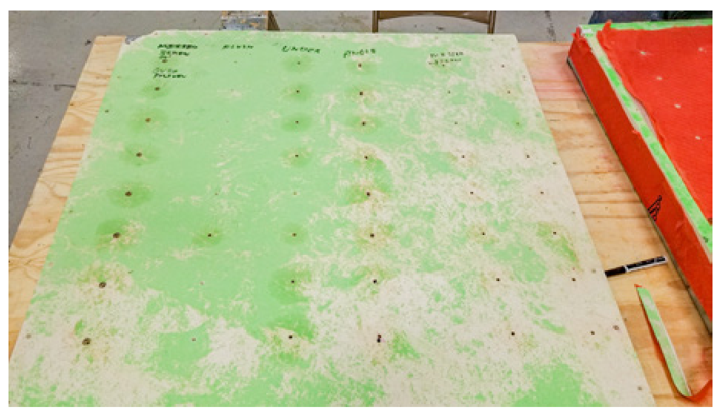

FIGURE 6: Water staining on sheathing behind WRB.

The mockup panels were then subjected to two separate rounds of ASTM E331 water testing, one at 0 psf (0 Pa) and the second 6.24 psf (300 Pa) for two hours each and the results were documented (Figure 4). Each specimen was observed and photographed during the testing. Several of the moisture detection protocols that used sensors required the use of computer systems to collect the data during the exposures. At the end of each test, the panels were disassembled, including the removal of the WRB in some instances, to record evidence of water intrusion by photography and documentation. Figure 5 illustrates some of the RH and Pin Probe sensors used, Figure 6 illustrates water staining of the sheathing directly behind the WRB, and Figure 7 demonstrates the results of one of the detection methods.

FIGURE 7: Results of water indicator paper after test.

An evaluation that includes specific results will be provided in the final report authored by ORNL, but a graphic evaluation summary of detection methods is provided in Figure 8. Each method was evaluated for five features including simplicity of use, cost, quantitative versus subjective, accuracy, and applicability. A scale of green/yellow/red was used to assess each feature where green was acceptable, yellow was borderline, and red was not to be further pursued at this time.

Based on these results, the Research Committee has narrowed the focus for additional development to the moisture meter, sensor tape, and RH sensors as possible detection methods that could be options for use in a new test method. Consideration has also been given that detection methods that may be used in a laboratory setting could be different than that is used in a field evaluation. Plans are underway for refinement testing to be completed with the moisture meter, RH sensors, and sensor tape with these thoughts in mind. Next steps also include:

- Issue Final ORNL Report.
- Refine detection method(s) for assembly test.
- Develop wall assembly and component sub-assembly test methods.
- Consider product classifications based on level of preconditioning, test duration, test pressure, and performance results.

In summary, initial studies indicate that the amount of water penetration associated with fastener penetrations through WRBs can vary greatly based on installation practices in the field which are not consistent from project to project. Test methods commonly used by manufacturers and industry professionals to evaluate WRBs prior to full-scale implementation are not representative of typical built conditions or long-term durability concerns, including, but not limited to penetrations for cladding attachments. Without a standardized method for evaluating these affects (both in the laboratory and field), designers and contractors are left without a means to assess and compare products and installation methods. The ABAA Research Committee endeavors to publish new test methods using the results of the detection method study and work with American Society of Testing Materials to provide consensus standards that would quantitively measure water intrusion and monitor penetration that may otherwise be concealed to address this concern.

Feature	Moisture Measurement Technique								
	Water Indicator Paper			Other Techniques					
	WRB /Sheath	Sheath / Stud	Holes	Moisture Meter	Pucks	Disk	Tape	Pins	RH
Simplicity	Green	Green	Green	Green	Yellow	Red	Red	Red	Red
Cost	Green	Green	Green	Green	Green	Red	Red	Red	Red
Quantitative	Yellow	Yellow	Red	Green	Red	Green	Green	Green	Green
Accuracy	Red	Yellow	Red	Yellow	Red	Yellow	Yellow	Yellow	Green
Applicability	Red	Green	Green	Green	Green	Green	Yellow	Green	Green

FIGURE 8: Evaluation of Detection Methods Graphic Summary.

TRAINING & EDUCATION UPCOMING EVENTS

AIR BARRIER EDUCATION FOR THE CONSTRUCTION INDUSTRY

DID YOU MISS THIS TRAINING?

ONLINE HERE: https://bit.ly/36nbrtw

ABAA WEBINAR
Now Available Online!
1 AIA LU/HSW

TOPIC:
Trust, but Verify
QC for Your Air Barrier

UPCOMING SYMPOSIUMS AND PRESENTATIONS

DATE	ORGANIZATIONS	CITY/STATE
13-Aug-20	CSI Great Lakes Regional Conf.	Cincinnati, OH
21-Sep-20	Advancing Construction Quality 2020	Denver, CO
30-Sep-20	Construct Show 2020	Grapevine, TX
13-Oct-20	CSI/BEC Minnesota	Minneapolis, MN
14-Oct-20	BEC Iowa	Des Moines, IA
16-Nov-20	Spec. Writers of Independent Practice	Grapevine, TX
20-Nov-20	IIBEC	Houston, TX

UPCOMING INSTALLER TRAINING

SPRAYED POLYURETHANE FOAM INSTALLER TRAINING

Oct 20-22, 2020 in Reston, VA

FIELD AUDITOR TRAINING

Oct 20-22, 2020 in Reston, VA

SELF-ADHERED & FLUID APPLIED TRAINING

Jun 22-24, 2020 is Online Training, Worldwide
Aug 11-13, 2020 in Northbrook, IL
Oct 20-22, 2020 in Reston, VA

FOR INFORMATION ON PROGRAMS & REGISTRATION, PLEASE VISIT THE ABAA WEBSITE:

www.airbarrier.org/education/installer-courses/

ATTENDEES	# OF EVENTS	CEU'S
2,001	28	3,982

SUMMARY OF EDUCATION THIS YEAR

A number of face-to-face educational events have been postponed after health officials recommended the public avoid close social contact to slow the spread of COVID-19. However, ABAA has introduced a series of weekly webinars to substitute these missed opportunities. Above is a summary of training conducted so far this year. Until changes take place, we will continue to schedule more of these through the summer months and information and details on these are available on the ABAA website Events Tab.

If you are involved in a local organization and would like ABAA to present a future half or full day symposium or would like us to host a webinar for your members, please reach out to Tamara Foncerrada at the ABAA office via email: tamara@airbarrier.org or call the ABAA office at 866-956-5888.

For information on past and upcoming webinar details, please visit the ABAA website here: http://www.airbarrier.org/events/category/webinars/

FEATURED QAP PROJECT

ARCHITECT: The Collaborative
GENERAL CONTRACTOR: Rudolph Libbe
LOCATION: 1 LA-Z-BOY Dr, Monroe, MI 48162
TYPE: Commercial ***VALUE:*** $239,000
BUILDING AREA (sq. ft.): 100,000
TOTAL AIR BARRIER AREA (sq. ft.): 30,000

http://www.airbarrier.org/portfolios/lay-z-boy-hq/

The Air Barrier Association of America (ABAA) is proud of our accredited contractor members and want to better showcase the jobs they do, reinforcing why someone would want to use an ABAA accredited contractor.

ABAA has developed a 'virtual museum' section on the website where ones can review different projects in a photo gallery, at the same time having brief discussions of what was done. The intent is to show off our ABAA specified projects, completed by an ABAA accredited contractor. This has resulted in some great projects being showcased!

The next intake for QAP project is scheduled for September. Applications will be reviewed in October, with posting to the ABAA website in November. Keep this date in mind and any potential projects you can submit. ABAA would love to promote the QAP with projects such as these. All projects will be showcased using social media outlets.

VIRTUAL INSTALLER TRAINING [COVID-19 RESPONSE]

Adapting to the sudden change experienced worldwide with COVID-19, ABAA offered their first ever virtual installer training. During the month of April, all Self-Adhered and Fluid Applied (SA/FL) installer training program modules were recorded, with online courses scheduled in May. The program will be a combination of watching the recorded webinars, followed by live sessions with the instructor to answer questions, review the modules and provide support. This was the first time ABAA has ever done online installer training and can serve as a resource moving forward for individuals to take refresher courses in the future. The certification exam will be done online, and the installer training manual will be sent to the installer for study prior to the course, which will enable them to take notes and study ahead of the program. The next step will be to record the modules for the Spray Polyurethane Foam (SPF) course, followed by the Auditor course. Watch your emails and social media for further details and release dates.

HAVE AN INDUSTRY RELATED ARTICLE YOU WOULD LIKE TO SEE FEATURED IN OUR NEWSLETTER?

Submit it to us for review and you could see your work published in the next newsletter! Also, we would love to hear your feedback on our newsletters and any content you want to see more or less of?

Email it to us at: abaa@airbarrier.org