

Sealing Sooners' Residential



Oklahoma University Cross Village houses more than 1,200 students at the new mixed-use complex in Norman, Oklahoma.

Cross Village is a new on-campus living option for Oklahoma University students. The 500,000-square-foot, mixed-use community comprises 413 student housing units and 40,000 square feet of retail, dining and entertainment space in Norman, Oklahoma.

Chamberlin's working history with the general contractor and extensive experience led to them being selected to waterproof the residential complex. A peel-and-stick system was selected for the below-grade waterproofing. The skin of all four buildings received a spray-applied air barrier, firestopping, acoustical sealants and joint sealants. In the parking garage, Chamberlin installed traffic coating, spray-applied water repellents, joint sealants and expansion joints.

SOONER THAN LATER

This was an extremely fast-paced project, as all four buildings and the parking garage were built in one year. With the compressed schedule, Chamberlin executed multiple scopes simultaneously. Once the air barrier application was completed on one building, crews would begin joint sealants on that building while other crews moved to the next building to continue air barrier application. The firestopping scope was on-going throughout the project. Each day, Chamberlin's project supervisors provided the crews with a clear understanding of their tasks, properly inspected equipment and the necessary tools to maximize each crew member's time on the jobsite.

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CONSULTANT'S CORNER:



By Tony Casagrande, PE
 President and Principal
 Campos Engineering

What to Expect When Commissioning the Building Enclosure

A project-based retrospect on lessons learned from implementing successful commissioning of building enclosures.

Back in the third quarter edition of this publication from earlier this year, my friend Gary Williams did a fantastic job describing the Building Enclosure Commissioning (BECx) process and its benefits. I want to dovetail into his detailed process description to drive home

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Before job start up, the project team held an initial planning meeting to determine milestone dates with the general contractor and subcontractors working on the project. Throughout the project, weekly update sessions were held to proactively assess progress and determine plans to make up any potential weather delays. Chamberlin's site superintendent attended these meetings, and each subcontractor discussed their time lines so everyone achieved one master plan together.

ONE TIME

Chamberlin crew members take pride in doing a high-quality job one time, the first time. Project superintendents were on site observing and mentoring the crews for appropriate preparation, installation techniques, proper adhesion and desirable aesthetics.

Crew members installing the air barrier inspected the material before use to make sure it was in proper condition for application and confirmed the sheathing seams were properly sealed for a watertight system. As the material was spray-applied, crew members tested for proper millage periodically each day striving for a smooth finish and optimal performance.

Prior to joint sealant installation, Chamberlin conducted an adhesion test mock-up to ensure the product and substrate worked together to create an optimal bond. The installation began with cleaning each joint, so the substrate was prepared for proper sealant adherence. The crews carefully installed the backer rod utilizing the proper width-to-depth ratio and finished by installing the sealant resulting in smooth, concave joints. Chamberlin conducted routine adhesion checks throughout the project.

The general contractor used BIM 360 to send out daily punch-list items, and Chamberlin cleared out their punch list weekly. Chamberlin's attention to detail and expertise gained from decades of waterproofing experience helped them deliver high-quality installations for this college campus.

FILLING THE GAPS

In the parking garage, the block outs for the expansion joints were wider than the specified product to be installed. One possible solution would be embedding a plate to close in the joint, but that would require drilling into the concrete. The concern with this approach was disrupting the post-tension cables, which could affect the structural integrity of the garage.



Chamberlin crews sealed the sheathing seams and covered the countersunk screw heads to prevent water from penetrating the building.



Air barrier installed on one of the residential buildings.

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(BUILDING ENCLOSURE Continued from pg. 1)

the value of BECx, tell the story of a few projects and our experience implementing BECx, and also share some lessons learned we think are helpful for owners, consultants, and providers of BECx to understand. Gary's article might be a good precursory read prior to diving into the information below. You can find it at www.chamberlintd.com by searching "BECx Gary Williams".

Lesson #1: Inspect the mock-up for low hanging fruit. Most of us are used to looking at section views of plans and have learned how

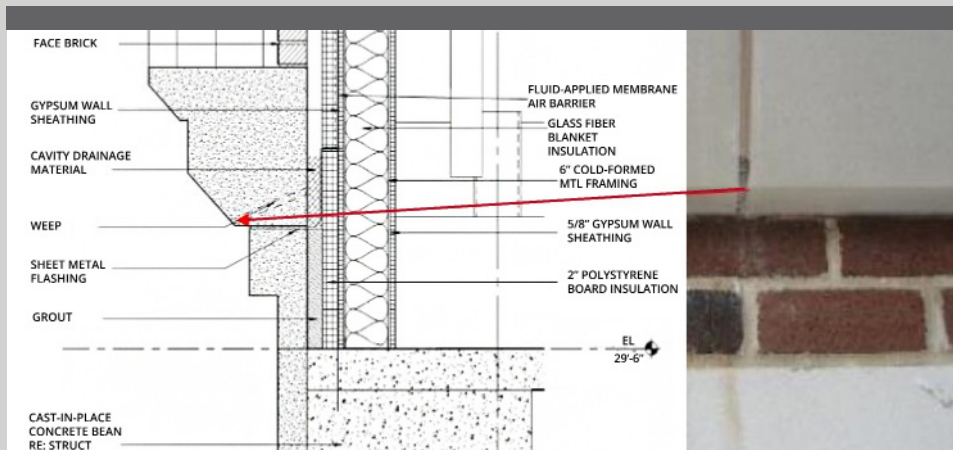


Figure 1: Plan section view versus actual installation

to recognize the detail in the section view as it translates into a completed system. Rarely do we get the opportunity to see a real section view in construction, except when the construction team is required to provide mock-ups of the building enclosure system. Mock-ups give the BECx provider a great head start reviewing how the contractors are actually going to install the enclosure system and also how that system will likely perform when completed. In figure 1, we see discoloration on the face of the stone due to the actual position of the weep being shallower than the designed position. Moisture was running down the brick face and onto the stone instead of dripping

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A 3/4-inch gap reducer installed on the wall of the joint with an epoxy adhesive.

Chamberlin did their research and found one manufacturer who produces a joint gap reducer that is installed on the wall of the joint with an epoxy adhesive. A 3/4-inch gap reducer combined with a larger expansion joint was the solution. However, this discovery was made three weeks from project finish, so a great deal had to be done in a short time. Chamberlin started by getting the new manufacturer approved by the project team. They then worked with the manufacturer to release the materials they currently had in stock so crews could start installing immediately as they waited for the remainder to arrive. Chamberlin increased manpower to accommodate for the short time frame, as well as the added step of installing a gap reducer in each joint, and completed the installation on time.

ALL SYSTEMS GO

Being proactive was vital to productivity on this project. When planning the schedule, a certain percentage of lost time was predicted due to weather during the cold months, as some of the waterproofing products could only be installed at certain minimum temperatures. With this in mind, Chamberlin boosted manpower early to meet schedule needs before weather restrictions arose.

Chamberlin crews installed over 240,000 square feet of air barrier in only four months with up to three spray rigs being utilized at the same time. In the parking garage, 320,000 square feet of water repellent was applied in just two weeks. Despite the large scale of work and challenges faced, Chamberlin successfully completed all of their work on or ahead of schedule with high-quality installations and zero safety incidents. ■



Expansion joint installed in the parking garage.

(BUILDING ENCLOSURE Continued from pg. 2)

past the brick and falling to the ground. Correcting the installation mistake during mock-up was much less costly to the contractor and saved the owner years of operational headaches cleaning stone.

Lesson #2: Expect the unexpected; the design may need to change to accommodate reality. Variations in product dimensions due to availability, substitutions, or mistakes are common in construction and affect every trade. Where there is some flexibility in dimensions with HVAC, electrical, or plumbing systems that are covered up in walls, there is little flexibility with the building enclosure, because so much of the waterproofing's effectiveness relies on dimensions. Case in point is a project where we encountered a potential waterproofing issue with the windows. Due to a product substitution approved by the designer, the windows in a large K-12 project were no longer going to be flush to the brick. This required a field alteration to the design of the sill and wall-applied

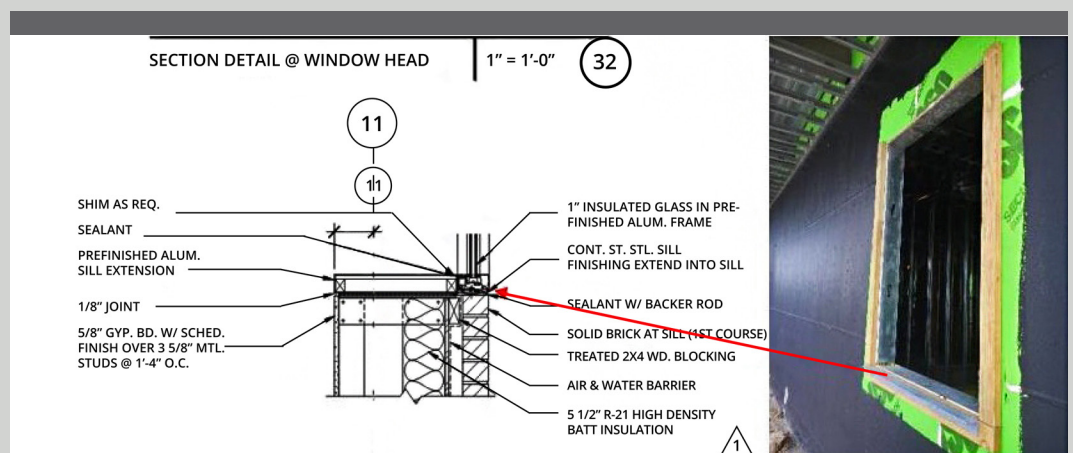


Figure 2: Plan section view versus actual installation

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air and water barrier detail. In figure 2, we can see a galvanized sill installed at the base of the window opening that interferes with the designed continuous air and water barrier. At this point in the project, the substituted windows were ordered and the field alteration had occurred at all of the more than 50 window locations. Sticking with the original design would have been costly and time consuming. The contractor, designer, owner, and BECx provider worked together to come up with a solution and revised the design to incorporate the air and water barrier wrapping over the sill. This correction was incorporated into the project with no lost time or add in cost because the team understood sometimes the design needs to change to accommodate reality.

Lesson #3: Scheduling is critical because BECx can get messy.

I think the best lesson we ever learned implementing BECx is how important advocating for sequence and duration in project scheduling is for the project wellbeing and sanity of the team. BECx is becoming more popular in the industry, but is still less understood than general building commissioning. Construction teams, owners, and consultants need help from the BECx provider to get the right sequence of events and durations into the project schedule but, they themselves may not understand the process well enough to get it right. For example, AAMA 501.2 testing of finished window enclosures requires the BECx provider to shoot pressurized water at the windows while being able to detect small leaks inside of

the enclosure. Figure 3 shows an intrepid BECx provider hoisted above a window enclosure for water intrusion testing. The coordination effort to ensure the exterior of the window was installed well in advance of the interior finish-out was imperative so the water intrusion testing could occur without damaging finishes. Coordination with the landscaping contractor was also important so the scaffolding and water didn't damage finished landscaping. This coordination occurred during pre-testing meetings well in advance of actual testing and included all of the project stakeholders involved to make sure the goals and consequences of the water intrusion testing were understood and precautions were incorporated to minimize damage to finished surfaces and project delays due to repair.

To get the most bang for your BECx buck, make sure to include inspection of the enclosure mock-ups to find and correct issues early in the project, be prepared to make changes to the design to accommodate reality, and insist on tight sequence and duration scheduling involving all of the project stakeholders. If you can focus your time into these three lessons learned, you will help maximize some of the benefits of BECx which are better quality of the installed product, finding and correcting issues before they become a large impact on cost or time, and helping the team work together to turn over a finished project to the owner. ■



Figure 3: AAMA 501.2 Testing

Tony Casagrande, PE, is president and a principal of Campos Engineering, a consulting engineering firm specializing in field and design engineering services. As a Registered Engineer and also NEBB certified TAB and BSC professional, Tony developed the firm's technical process for commissioning and testing, adjusting, and balancing services. Now, as president of the firm, Tony focuses on the advancement of Campos' services, growing into key markets, developing corporate strategies and leading the firm's management training programs. Tony can be reached at tcasagrande@camposengineering.com or 214-696-6291.

Want to share your building envelope expertise?

Submit an article to
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Industry Honors for Safety and Construction Excellence

Chamberlin Roofing & Waterproofing has been recognized by established A/E/C industry organizations for their team's commitment to safety, quality and teamwork on their projects and their dedication to delivering more to their clients.

American Subcontractors Association (ASA) Houston Chapter awarded Chamberlin with Gold-Level Commitment to Safety (CTS) status. The CTS program was developed to increase the number of specialty contractors who uphold effective safety programs and training for management and employees. ASA recognizes companies with exemplary safety and health programs, site-specific safety and health processes as well as continuous progress in the area of employee safety.

Additionally, Chamberlin was honored to receive the Associated General Contractors (AGC) San Antonio Safe Specialty Contractor of the Year award at the AGC Safety Fair and Cook-Off. A panel of safety professionals determined the winning companies based on their safety program, policies and records for projects executed within the San Antonio AGC Jurisdiction.

Engineering News-Record (ENR) Texas & Louisiana credited Chamberlin with a Best Project Merit award for their roofing and waterproofing work on the Rolex building in Dallas, Texas. A team of industry experts selects 42 projects across five states as the region's best. Among the criteria



Chamberlin's work on the new Rolex building in Dallas, Texas, earned them an ENR TX & LA Best Project Merit Award.

judged is teamwork, project challenges and solutions, safety programs and construction craftsmanship.

Associated General Contractors (AGC) also recognized Chamberlin for their Oklahoma University (OU) Cross Village project with a 2018 AGC Build Oklahoma Award. This award acknowledges the "Best of the Best" commercial construction projects in the state of Oklahoma.

Lastly, the Associated Builders and Contractors (ABC) Excellence in Construction (EIC) Awards celebration

honors the nation's most innovative and high-quality construction projects, safety programs and diversity programs. Chamberlin's work on OU Cross Village, The Querencia, The Buckingham, Methodist TNI Parking Garage and the Rolex building placed first or second at their local chapter competition which qualifies them to compete in the 2018 National ABC EIC Awards program. ■



Chamberlin is proud to have achieved American Subcontractors Association (ASA) Houston Chapter Gold-Level Commitment to Safety (CTS) status.

LOCATIONS:

Call the nearest local office or 1-800-749-1432

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PIONEER NATURAL RESOURCES - IRVING, TX

New Construction Waterproofing
Contract Amount: \$2,000,000 (approx.)
Owner: HR Horseshoe Venture, LLC
Architect: HKS, Inc.
General Contractor: Austin Commercial
Scope of Work: Installation of hot-applied waterproofing, sheet waterproofing, traffic coatings, thermal insulation, air barrier, sheet metal flashing and trim, pavers, firestopping, joint sealants, site pavers and expansion joints
Project Description: One-million-square-foot campus

HEIGHTS HIGH SCHOOL WATER INFILTRATION PROJECT - HOUSTON, TX

Remedial Waterproofing
Contract Amount: \$1,700,000 (approx.)
Owner: Houston Independent School District (HISD)
Architect: Rice & Gardner Consultants, Inc.
General Contractor: Chamberlin Roofing & Waterproofing
Scope of Work: Concrete repair and replacement of below-grade sheet waterproofing plus installation of French drain, fluid-applied waterproofing, curtain grout injection, mechanical interior catch basins and sump pumps, exterior storm sewer lift station, electrical work, interior finishes, dewatering system, flashing and sheet metal
Project Description: Reserve Officer Training Corps (ROTC) classrooms

HILTON CANOPY RIVERWALK - AUSTIN, TX

New Construction Roofing
Contract Amount: \$250,000 (approx.)
Owner: Hilton
Architect: Gensler
General Contractor: Sundt Construction
Scope of Work: Installation of roof panels, wood blocking, TPO roofing system, coping, counterflashing, cleat and metal roof panels
Project Description: Upscale downtown hotel with rooftop pool

USAA PARKING GARAGE REPAIRS PHASE 1 - SAN ANTONIO, TX

Remedial Waterproofing
Contract Amount: \$750,000 (approx.)
Owner: USAA
Consultant: Campbell & Associates
General Contractor: Byrne Construction Services
Scope of Work: Concrete repair and replacement of barrier cable and pedestrian cable
Project Description: USAA headquarters parking garage

HALL ARTS RESIDENCE & HOTEL - DALLAS, TX

New Construction Waterproofing
Contract Amount: \$1,700,000 (approx.)
Owner: Hall Arts Residences, LLC
Architect: HKS, Inc.
General Contractor: Austin Commercial
Scope of Work: Installation of dampproofing, hot-fluid rubberized asphalt waterproofing, sheet waterproofing, traffic coating, thermal insulation, air barrier, sheet metal flashing and trim, firestopping, joint sealants, site and paving sealants and expansion control
Project Description: Luxury apartment complex and hotel

CHRISTUS SANTA ROSA PAVILION - SAN ANTONIO, TX

Remedial Waterproofing
Contract Amount: \$500,000 (approx.)
Owner: AA Santa Rosa, LLC c/o Ackerman & Co.
General Contractor: Chamberlin Roofing & Waterproofing
Scope of Work: Installation of joint protection and replacement of wet glazing sealants, elastomeric coating, zipper gasket coating and window perimeters
Project Description: Twelve-story medical office building

MDACC THE WOODLANDS - WOODLANDS, TX

New Construction Roofing & Waterproofing
Contract Amount: \$1,200,000 (approx.)
Owner: MD Anderson Cancer Center
Architect: HDR Architects
General Contractor: Vaughn Construction
Scope of Work: Installation of air barrier, elevator pit waterproofing, elastomeric coating, TPO roofing, high-temp coping flashing, wood blocking, flashing and sheet metal, canopy sheet metal and joint sealants
Project Description: Outpatient clinic

AUSTIN-BERGSTROM INTERNATIONAL AIRPORT GARAGE - AUSTIN, TX

New Construction Roofing & Waterproofing
Contract Amount: \$1,600,000 (approx.)
Owner: City of Austin
Architect: PGAL
General Contractor: Austin Commercial
Scope of Work: Installation of thermal insulation, wood blocking, coverboard, base wall and curb flashing, SBS modified roofing, TPO roofing, sheet metal flashing and trim, pre-applied sheet waterproofing, water repellents, air barrier, hot modified roofing, flashing and sheet metal, flexible flashing, firestopping, joint sealants, site and paving sealants and expansion control
Project Description: Six-level parking garage

ROSS STERLING HOUSE - HOUSTON, TX

Remedial Roofing & Waterproofing
Contract Amount: \$350,000 (approx.)
Owner: Joe Swinbank
Architect: Eubanks Group Architects
General Contractor: Chamberlin Roofing & Waterproofing
Scope of Work: Removal of modified bitumen roofing system and installation of PVC membrane roofing and copper standing seam roofing, wood blocking, flashing and sheet metal, coping, counterflashing, metal roof panels, roof pavers and fluid-applied waterproofing plus masonry restoration, limestone repair and exterior cleaning
Project Description: Renovation of Governor Ross Sterling Mansion

OKLAHOMA CITY CONVENTION CENTER - OKLAHOMA CITY, OK

New Construction Waterproofing
Contract Amount: \$200,000 (approx.)
Owner: The City of Oklahoma City
Architect: Populous
General Contractor: Flintco, LLC
Scope of Work: Installation of sheet waterproofing, pre-applied sheet waterproofing, firestopping, joint sealants, expansion control and site and paving sealants
Project Description: Meeting rooms, exhibit space and a ballroom

For a complete list of specialty contracting services, visit www.chamberlinltd.com.

ROOFING/SHEET METAL

- Modified Bitumen/BUR
- Single ply
- Reflective coatings
- Vegetative roofing
- Metal standing seam
- Roof related sheet metal
- Tile

WATERPROOFING/CAULKING

- Joint sealants
- Membrane waterproofing
- Elastomeric wall coatings
- Traffic coatings
- Expansion joints
- Dampproofing/flashing
- Water repellents/metal flashing

BUILDING/GARAGE RESTORATION

- Concrete/masonry restoration
- Exterior cleaning & coating
- Epoxy & grout injection
- Bearing pad replacement
- Structural repair
- Paver repair & replacement

ROOF MAINTENANCE/LEAK REPAIR

- Roofing & waterproofing expertise
- Leak repair specialists
- Preventative roof maintenance plans
- Roof & building envelope surveys
- Proactive Roof Asset Management
- On-call service 24 hours/365 days a year
- Free estimates