CHAMBERLIN

Roofing & Waterproofing

NEWSLETTER

Waterproofing Details Can Make All The Difference



INTEGRIS Baptist Medical Center in Oklahoma City, Oklahoma

SPRING 2016

INTEGRIS Baptist Medical Center in Oklahoma City, OK, opened Easter Sunday 1959 as a 200-bed hospital and was known as the "hospital on the hill." Now it boasts 511 beds and offers a full range of surgical, diagnostic, therapeutic and rehabilitative services.

Fall 2015 kicked off a renovation of the hospital's entryway. This re-design by HKS included a new canopy and curtainwall to bring more light and life to the hospital entrance. General Contractor Flintco Constructive Solutions selected Chamberlin Roofing & Waterproofing to install the hot fluid-applied waterproofing for this project.

The waterproofing scope played a major role in this particular project, as a basement housing highly sensitive medical equipment was located directly

below the hospital's entrance. Keeping this area watertight was pertinent to the hospital functioning and their patients receiving the care they need.

The Right System

An environmentally friendly hot rubberized asphalt waterproofing system was chosen for this project. This system was a great choice for the facility because it conforms to surface irregularities and fully adheres to the deck, restricting lateral water movement.

To begin, the failing waterproofing system was removed. After the concrete was demolished, the Chamberlin crew got to work removing the old waterproofing with scrapers and grinders. The desired effect of this removal process was a rough substrate to which the new waterproofing system could easily adhere. Next, Flintco installed new curbs and mortar

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GUEST COLUMN: By Jeff Poe, Jr, El, RRO Terracon



Air Barrier Testing: Reveals Cost Reduction Solutions for School District

Ever notice a breeze in older buildings, even when it is not windy? Many buildings are leaking air, which means the owners are losing money. Charlotte-Mecklenburg Schools (CMS), the 19th largest school district in the U.S. with a \$1.3 billion operating budget, recently decided to take action to identify buildings in the school district that might be exhibiting air leakage.

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patching on deficient areas, and the hospital entrance was ready to receive the new waterproofing.

It's All About the Details

Chamberlin started with the details. The crew applied flashing on the inside and outside corners of the curbs and around the drains. Cracks in the substrate were sealed. The details are imperative in these areas where cold joints are used to connect the concrete slab to the curb or drain. Areas that have to be connected with joints are more susceptible to leaks and substrate cracking. The flashing details reinforce the seal, adding an extra layer of waterproofing protection.

Next, the hot fluid-applied waterproofing was prepped for installation. This system requires blocks of the material to be melted in a kettle and reach 450 degrees before installation. Once melted, the liquid is transported in buckets from the kettle to the installation area, where it is poured out and applied evenly.

The Perfect Balance

Applying this liquid waterproofing at the correct millage, or thickness, is crucial. Incorrect millage can affect warranty coverage and the material's performance. As the substrate expands and contracts over time, the waterproofing must be able to move with it. If it is applied too thick or too thin, its movement will be compromised and the system could leak.

Chamberlin crew members diligently applied the first layer of waterproofing. Then a mesh reinforcing fabric was installed to give rigidity to the waterproofing system. Next, a second layer of hot fluid-applied waterproofing was installed. Chamberlin and the waterproofing material manufacturer conducted millage testing throughout the project for quality control.

Once the entire waterproofing system was installed, Chamberlin performed a water test. The waterproofed area was filled with water. The amount of water was measured when it was filled and then again 24 hours later. If any water was lost, it could indicate a leak in the system. However, the system proved watertight, so Chamberlin proceeded with installing the cap sheet and drainage mat. To complete the process, the insulation was installed and the top level of concrete was poured.

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(AIR BARRIER TESTING Continued from pg. 1)



Charlotte-Mecklenburg Schools incorporated air barrier testing for all new buildings, major renovations and additions.

In early 2014, CMS approved an architectural and engineering guideline change proposal to incorporate air barrier testing for all new buildings, additions, and major renovations. Using this guideline, CMS's plan was to decrease the air leakage from 0.25 cfm per square foot of exterior enclosure for buildings built in 2014, to 0.15 cfm per square foot of building enclosure for buildings built in and after 2018.

To help the school district determine sources of air leakage in a school built in 2015, Terracon performed air barrier testing in general accordance with the US Army Corps of Engineers (USACE) Engineering Research and Development Center (ERDC), Air Leakage Test Protocol for Measuring Air Leakage in Buildings, with a proprietary (Retro-Tec) Blower Door Testing system.

IDENTIFYING CHALLENGES

For effective use of test equipment, the building had to be split into five areas to be tested separately. Splitting up the building into separate areas proved to be a challenge due to the amount of ducts and air transfers which cross the firewalls. Each of these had to be sealed for the testing. All doors and mechanical ducts that connected with other portions of the building outside of the testing area were sealed to prevent extraneous air leakage, which can disproportionately alter the results of the test.

To run the test, all mechanical louvers, vents, and any other engineered transfer through the air barrier system to the exterior, had to be covered and sealed to prevent air leakage. All exterior doors were shut and any operable windows closed and locked. Three fans were

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BOMA

CEPP



Chamberlin removed the old waterproofing at the hospital entrance to prepare for the new system.



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Solutions: It's What We Do

This project was scheduled in two phases. The first phase ran October to November 2015, and the second phase is slated to start in April 2016. Ideally, the entire entrance to the hospital would have been renovated at once, but since the project was divided into two phases, that was not possible and created a challenge. Once the new waterproofing system was installed, it was watertight. However, leaks from the old, failing waterproofing system could possibly infiltrate the new system. If they weren't fully separated, water leaking from the old waterproofing system could seep under the membrane of the newly installed waterproofing and ruin it from the underside. If that happened, the first phase of waterproofing would no longer be functional.

Chamberlin had an idea. Based on previous jobs where they had faced similar circumstances, they created a detail that could isolate the first phase from the second phase. The project team agreed with the solution, and Chamberlin implemented the detail.

The concrete poured to cover the new waterproofing system was

stopped two feet short of where the old and new waterproofing systems met. This created a block out, which allowed room to apply the waterproofing detail that would isolate the two systems. In this two-foot block out, Chamberlin tied the new hot waterproofing into the old system as best as possible. However, they knew that would not be sufficient to keep the two systems fully separated, since they could not access enough of the old waterproofing system to properly tie the two systems together. For further protection, they turned the waterproofing up the vertical face of the new concrete slab, stopping one inch from the top. The crew then installed an expansion board with a zip strip against the waterproofing on the vertical face, essentially forming an expansion joint and protecting the vertical waterproofing. Concrete was then poured to fill the block out. Finally, Chamberlin removed the zip strip and filled that area with joint sealant for additional protection from water penetration at the slab. This waterproofing detail will keep the new system watertight until the second phase of the project is completed.

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R



A water test was performed to check for leaks.



The completed hot fluid-applied waterproofing system before concrete is poured.

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TEXO

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set in a plastic frame which was placed in an exterior door frame. The three fans were connected to controllers which adjust the fan speed based on the pressure in the building. A computer records the flow through the fans and dictates to the controllers what the required pressures shall be throughout the test.

The flow through the building enclosure was recorded at 10 different pressure points. These points were placed on a graph which created a straight line that was then used to calculate the flow through the building enclosure at 75 Pascals, a unit of pressure in metric units.

Smoke pens, devices that emit a constant stream of smoke that can be used to show air movement, were used on the interior of the building to focus in on the source of leaks during the pressurization phase of the test. A stream of smoke was moved across different surfaces that had potential for air loss, such as windows, doors, electrical outlets, roof and wall

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IREM



Fans were placed in exterior door frames to conduct the air barrier test.



A computer records the flow through the fans and dictates to the controllers what the required pressures shall be throughout the test.

intersections, and other areas that may penetrate the air barrier. Terracon also used infrared cameras to help detect air leaks. By repeating this process, Terracon was able to identify significant sources of air leakage. For this facility, the exterior doors and the intersections of the exterior walls at the roof deck were the major offenders. At the doors, large gaps were exposed at the door locks and at the thresholds.

IDENTIFYING COST SAVINGS

In this case, the allowable leakage rate equated to 0.25 cfm per square foot of exterior enclosure area which met the target standard provided by the CMS. To illustrate the amount of leakage, this result equates to a single opening of approximately 36.7 square feet or roughly 6 feet by 6 feet of equivalent leakage area.

Other areas were identified which could be easily repaired, allowing the client additional savings in energy consumption. For an idea of how much these repairs could save, The National Institute of Standards and Technology issued a report stating that an office building with a total floor area of 24,200 square feet (approximately 30% of the floor area of the school building tested by Terracon) in the same climate zone saved more than \$3,000 annually when air infiltration into the building was eliminated by 83 percent from its baseline. Equating this to the floor area of the entire school building, the annual savings is approximately \$10,000.

By identifying the most efficient way to conduct air barrier testing for this type of school building, Terracon, in partnership with CMS, was able to show results and recommend cost-savings as well as energy conservation solutions, setting a baseline for future energy performance reviews within the District's buildings.

Jeff Poe, Jr., El, RRO, is an engineer at Terracon in the Charlotte, North Carolina office. He has experience in building enclosure testing, roofing design, above and below-grade waterproofing, and contract administration. Jeff can be reached at (704) 594-8939 or Jeff.Poe@terracon.com.

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The Importance of Safety

Dealing with waterproofing material that is 450 degrees takes true attention to safety. If the material comes in contact with skin, it can cause high degree burns. Chamberlin's crew members donned leather gloves and long sleeve shirts in addition to standard PPE. Additional precautions were taken, such as taping the sleeves of their shirt to their gloves and tucking their pants into their boots so the hot product could not drip onto their skin.

Chamberlin had a dedicated crew member to man the kettle that melted the hot fluid-applied waterproofing. Starting two hours before the rest of the crew members, he got the kettle fired and the material melting. He worked diligently throughout the day to keep the waterproofing material at the correct temperature for application, as it has to be heated to an exact temperature to bond correctly. He also stayed after work was completed for the day to ensure the propane tanks were off and the material was cooling safely. Throughout the duration of the project, the kettle area was barricaded off for protection of those working around it.

A Real Team Effort

Chamberlin was on a fast-paced schedule from the get-go on this project. They proactively worked to complete their scope in just two weeks. In addition to creating a detail to solve the potential dual-phase issue, they added additional manpower and worked overtime to keep the project on schedule. Great communication and collaboration from Flintco was a tremendous asset. In the end, Chamberlin applied approximately 11,000 square feet of hot fluid-applied waterproofing to the split slab at the hospital entrance leaving the area watertight and the medical equipment protected in the basement below. Teamwork truly made this project a success.

Chamberlin Receives NRCA Awards



Curtis Purvis, Chamberlin Superintendent, accepts the NRCA's "Best of the Best" Award.

The National Roofing Contractors Association (NRCA) recognized Chamberlin Roofing & Waterproofing at the 129th Annual Convention held in Orlando, Florida for excellent workmanship and safety in several categories. Curtis Purvis, Chamberlin Superintendent, was chosen as a Roofing Industry Alliance for Progress' Most Valuable Player in leadership, safety and community service. This MVP awards program identifies outstanding roofing workers who are role models and demonstrate work-related and personal goals to which others aspire. In addition, Curtis was honored with Professional Roofing's Best of the Best Award. This prestigious award is given to only



Curtis Purvis and Deric Mount, Chamberlin Project Manager, accept the the NRCA Safety Award.

one professional in the country.

The Gold Circle Awards program recognizes NRCA members for exceptional contributions to the roofing industry and unique roofing-related jobs. Chamberlin was honored with two Gold Circle awards, both for their work on the **Dallas Love Field Modernization** project. They received an honorable mention in Outstanding Workmanship Low-Slope category and also the highly sought after Gold Circle Safety Award. This safety award recognizes companies for an accident-free project where public protection challenges were in the forefront of the job elements and dominated the scope of work.

Employee Profile

Andy Wharton

Vice President — Waterproofing & Caulking Dallas, TX

Experience:

An Aggie through and through, Andy graduated from Texas A&M with a degree in Architecture. In an effort to put his education to good use, he sought out a job in the A/E/C industry. On a road trip to Dallas after graduation, Andy discovered a job opening at Chamberlin, applied and was brought on as a project manager in the Waterproofing & Caulking Department.

Andy has gained extensive knowledge and experience in the waterproofing field over the past 11 years, working on notable projects like Baylor McLane Stadium and Parkland Hospital. He progressed to senior project manager and now oversees waterproofing and caulking operations for Chamberlin's North Texas and Oklahoma markets as a vice president.

A Day in the Life:

The one thing Andy can count on doing every day is problem solving. His work takes him from the office to jobsites to clients' offices to suppliers – you name it – but wherever he is, he is solving problems. Andy works hard to anticipate Chamberlin's clients' needs, communicate those needs clearly with his team and find a solution that is right for the client. Whether it be in person or over the phone, he works meticulously to ensure all work is being done safely, correctly and as productively as possible.

Andy appreciates the opportunities his job provides for continued learning and training. His door is always open to all of his employees, and he ensures they have the tools and knowledge they need to get their job done right. He is happiest when he and his team do their best and succeed in making a project easier for the client. He considers his greatest accomplishment at Chamberlin to be helping others succeed.

Outlook:

Andy knows that without a high level of customer service, we won't have customers. And without customers, we won't have work. Andy strives to develop a good, honest relationship with every client he encounters, listening to their needs and providing a team approach to executing their project successfully. He believes productivity is a product of being safe and doing a quality job as a team. But above all, safety is most important. Getting our employees - and the employees of the trades we work around – home safely every day is his top priority. He drives this mindset down through his team at Chamberlin, making sure everyone from project managers to installers understand the importance of safety on the jobsite.

Outside the office:

If you are looking for Andy outside the office, he is more than likely spending time with his baby boy. Asher is the Wharton's first child and an absolute joy. When he can squeeze it in, you might find Andy shooting hoops or playing golf. He also has a knack for fixing up antique cars and bicycles.

We asked Andy to choose his favorites from this random list of things as a way to get to know him a little better:





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CHAMBERLIN Roofing & Waterproofing

LOCATIONS:

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AUSTIN PUBLIC LIBRARY – AUSTIN, TX

New Construction Roofing Contract Amount: \$1,100,000 (approx.) **Owner: City of Austin** Architect: Lake Flato/ Shepley Bulfinch- A Joint Venture General Contractor: Hensel Phelps Scope of Work: Single-ply roofing system, sheet metal and flashing Project Description: New library and community space

PROJECTS IN PROGR

TEXAS STATE UNIVERSITY SABINAL BUILDING – SAN MARCOS, TX

Remedial Roofing & Waterproofing Contract Amount: \$200,000 (approx.) **Owner: Board of Regents** Architect: Lym Architecture Consultant: Wiss, Janney, Elstner Associates, Inc. General Contractor: Vaughn Scope of Work: SBS modified roofing system and associated sheet metal flashings, dampproofing, cold fluid-applied waterproofing, joint sealants, weather barrier Project Description: Renovation of J.C. Mitte Art Building and Sabinal Buildina

MAIN METHODIST HOSPITAL - SAN ANTONIO, TX

New Construction Waterproofing Contract Amount: \$1,400,000 (approx.) Owner: Methodist Healthcare Architect/Consultant: ESa General Contractor: Skanska Scope of Work: Flashing, air barrier, joint sealants, expansion joints, cold fluid-applied waterproofing and below-grade waterproofing Project Description: New children's tower and central tower addition, and expansion of the NICU

HERMAN PARK RESIDENCE - HOUSTON, TX

New Construction Roofing & Waterproofing Contract Amount: \$1,500,000 (approx.) Owner: Tema Development Architect: Corgan Associates Inc General Contractor: Morganti Group Inc Scope of Work: Crystalline waterproofing, thermal coating, air barrier, flashing, joint sealants, caulking, traffic coating, expansion joints, single-ply roofing, sheet metal Project Description: New seven-story luxury apartments

HANOVER MONTROSE – HOUSTON, TX New Construction Waterproofing Contract Amount: \$950,000 (approx.) **Owner: The Hanover Company** Architect: Solomon Cordwell Buenz General Contractor: Hanover Construction Scope of Work: Cold fluid-applied waterproofing, elevator pit waterproofing, traffic coating, air barrier and flashing Project Description: New 30-story luxury apartments

499 SHERIDAN – OKLAHOMA CITY, OK New Construction Waterproofing Contract Amount: \$1,700,000 (approx.) Owner: BA Leasing BSC, LLC Architect: Kendall/Heaton Associates, Inc. General Contractor: JE Dunn Construction Company Scope of Work: Hot fluid-applied rubberized asphalt, vertical sheet waterproofing, pre-applied sheet waterproofing, cementitious and reactive waterproofing, traffic coating, vapor retarders, air barriers, joint sealants, expansion joints, mechanical floor coating and paving sealants Project Description: Twenty-seven story office tower

THE GATHERING PLACE – TULSA, OK New Construction Waterproofing

Contract Amount: \$1,300,000 (approx.) **Owner: Crossland Construction Company** Architect: Michael Van Valkenburgh Associates General Contractor: Manhattan Construction Company Scope of Work: Hot fluid-applied rubberized asphalt waterproofing, sheet waterproofing and tunnel waterproofing Project Description: Park and recreational area

THE ASCENT AT VICTORY PARK – DALLAS, TX

New Construction Roofing & Waterproofing Contract Amount: \$1,750,000 (approx.) **Owner: Greystar** Architect: Good Fulton & Farrell Architects **General Contractor: Hoar Construction** Scope of Work: Dampproofing, hot fluid-applied rubberized asphalt waterproofing, pre-applied sheet waterproofing, bentonite waterproofing, traffic coating, thermal insulation, fluid-applied waterproofing, air barriers, sheet metal flashing and firestopping Project Description: Two apartment and retail towers

GASTON MEDICAL OFFICE BUILDING - DALLAS, TX

New Construction Roofing Contract Amount: \$500,000 (approx.) Owner: Gaston Medical Office Building Architect: Corgan Associates, Inc. General Contractor: Turner Construction Company Scope of Work: TPO roofing system, formed sheet metal fabrications, counterflashing, coping, flashing and sheet metal, cap wall and curb flashing Project Description: Medical office and parking garage

DELL PEROT BUILDING - PLANO, TX

Remedial Roofing & Waterproofing Contract Amount: \$600,000 (approx.) Owner: Dell Marketing, LP Architect: Corgan Associates, Inc. General Contractor: Dell Scope of Work: Removal of EPDM roofing system and installation of new TPO roofing system, flashing and sheet metal, coping, joint sealants, crystalline waterproofing, exterior insulation, thermal and moisture protection, painting and coating Project Description: Business campus and parking garages

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

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