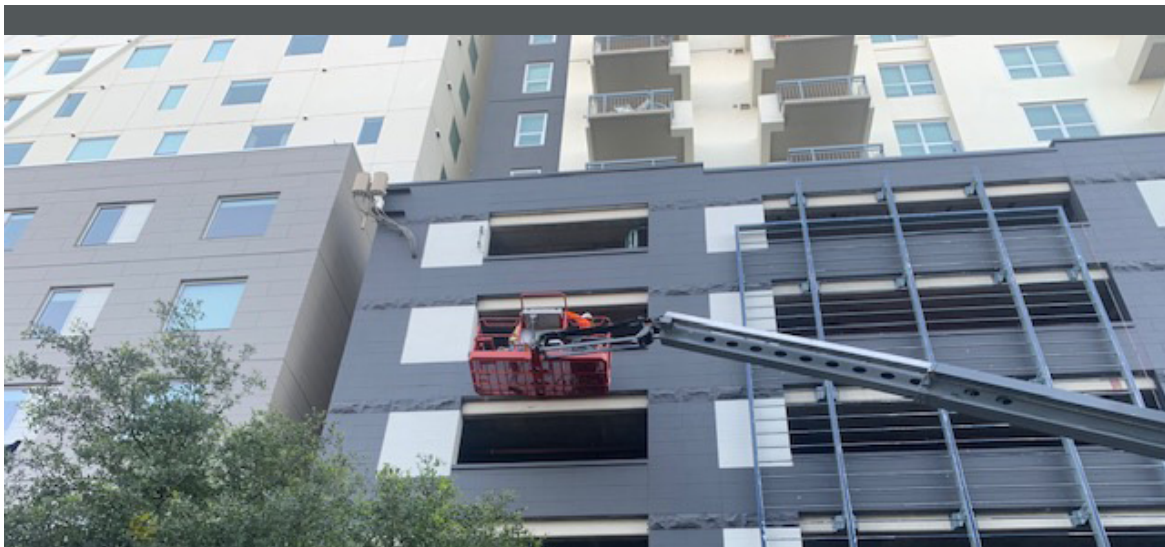


21 Rio Gets a Face Lift



Chamberlin restored 21 Rio, a vibrant University of Texas at Austin student apartment complex.

21 Rio, a high-rise apartment complex with parking garage and retail storefront below, exemplifies a college lifestyle like no other. Situated in Austin's central West Campus neighborhood, 21 Rio offers luxurious and pet-friendly student apartments near The University of Texas at Austin. It offers exceptional amenities, including a pool deck with one-of-a-kind views and state-of-the-art fitness center. With a great location to campus, ample amenities to offer students and a vision for green living at the community, 21 Rio puts a unique spin on apartment living.

Originally constructed in 2009, time and weather had taken their toll on the building. 21 Rio was struggling with water intrusion and was in need of rejuvenation. Chamberlin Roofing & Waterproofing was selected as the prime contractor to restore the skin of the building by face-sealing the envelope. The restoration

crew began by pressure washing the building to prepare the substrate for the new MasterProtect EL 750 elastomeric wall coating they installed by hand rolling and spraying. High performance hybrid sealant was installed at control joints and perimeters of the stucco prior to the coating, and aging and compromised horizontal and vertical joint sealant was also replaced across the stucco and masonry facades. A cut out and re-caulk was performed on the window perimeters, which began with the removal of existing sealant from the metal frame to stucco condition and preparation of the joints for installation of new sealant.

Chamberlin's skilled craftsmen then installed new backing material where needed to the manufacturer's specified depth-to-width ratio, filled the joints with high performance silicone sealant and

(Continued pg. 2...see 21 RIO)



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CONSULTANT'S CORNER



Greg Neiderer, PE,
Director of
Restoration
Walker Consultants



Katheryn Stairs, PE,
Director of
Operations
Walker Consultants

Plaza Slab Systems Demand Proper Design

PLAZA DURABILITY IMPACTS OF NEW ENERGY CODES

Every three years, the International Code Council (ICC) releases a new edition of their suite of codes and standards for constructing the built environment. Each issue seeks to increase the safety and energy efficiency of everything we as designers, contractors, and manufacturers build. However, these changes often create a

(Continued pg. 2...see PLAZA)

(21 RIO continued from pg. 1)

hand tooled the sealant for proper joint configuration, adhesion and a watertight seal. The crew cleaned the entire building envelope and covered the compromised existing stucco with a new elastomeric wall coating for water intrusion protection. The MasterProtect EL 750 elastomeric coating is a water-based, high-build, elastomeric, 100% acrylic waterproof coating for above-grade concrete, masonry, stucco and EIFS.

PROACTIVE SAFETY

21 Rio was fully occupied for the duration of the project, so keeping the residents of the apartment complex and the crew members safe was a primary focus. Chamberlin developed a complex, site-specific safety plan for the project, and the superintendent communicated the plan to all crew members and the project team.

A Job Hazard Analysis (JHA) was also developed for this project that covered each task on the job, potential hazards associated with those tasks and how to prevent those hazards from causing an accident. The superintendent reviewed it with crew members each day before work began.

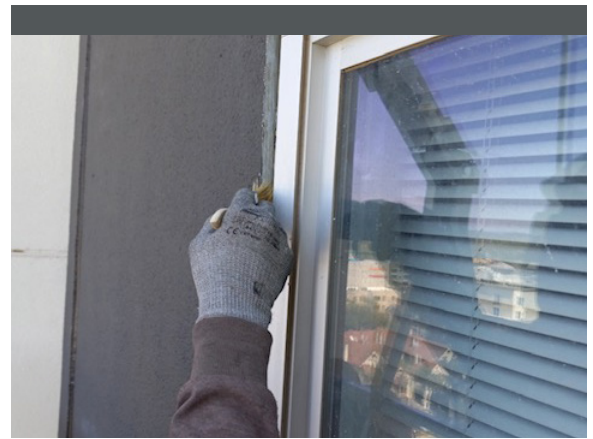
Warning and directional signage as well as designated pathways were in

place for foot traffic. All equipment was inspected daily by a competent person before use. Personal protective equipment was worn at all times, and Chamberlin's zero tolerance fall protection policy was in place. Weekly toolbox talks were held for all crews covering pertinent safety topics and reinforcing Chamberlin's safety policies and procedures.

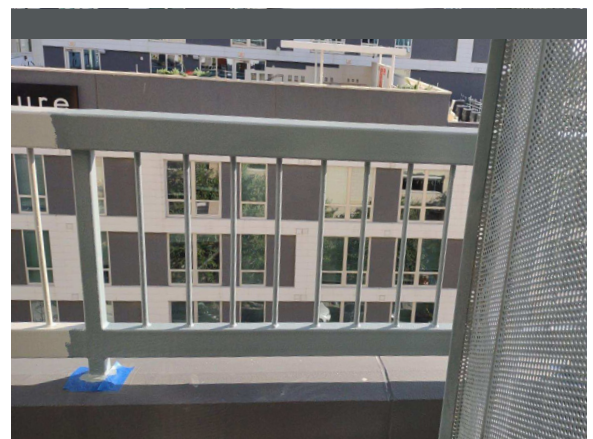
During installation of the elastomeric wall coating, care was taken to protect pedestrians and objects below as well as in surrounding areas from coating that could drip or get caught in the wind. During the cut out and re-caulk of the window perimeters, an overhead protection system was constructed out of lumber and scaffolding to act as a shield for potential falling debris.

FINDING SOLUTIONS

The original plan for the crew was to work on scaffolding, but Chamberlin found a cost and time saving solution. The entire apartment portion of the building envelope scope was completed concurrently from several swing stages across multiple drops, and from boom lifts on the lower levels where the parking garage is located, saving the owner thousands of dollars. To expedite work and



All windows and balcony doors were resealed.



Balcony rails and coping were freshly painted.

(Continued pg. 3...see 21 RIO)

(PLAZA continued from pg. 1)

TABLE 1						
	2006	2009	2012	2015	2018	Increase
Zone 1	15	15 → 20	20	20	20	5
Zone 2	15	15 → 20	20	20 → 25	25	10
Zone 3	15	15 → 20	20	20 → 25	25	10
Zone 4	15	15 → 20	20 → 25	25 → 30	30	15
Zone 5	20	20	20 → 25	25 → 30	30	10
Zone 6	20	20	20 → 30	30	30	10
Zone 7	25	25	25 → 35	35	35	10
Zone 8	25	25	25 → 35	35	35	10

need to adjust the way we build, even if our previous methods have been working well for decades. One area where there is evidence that detailing and installation methods need to be updated due to increasing energy code requirements is in the design and construction of plaza slab systems.

CODE CHANGES BETWEEN 2006 AND 2018

The International Energy Conservation Code (IECC) identifies the energy efficiency requirements for envelope design among other building systems. It recommends three methods of evaluating building components for their energy efficiency, including the R-Value method. The code divides the United States into eight different zones, and then identifies the required R-Value that each system needs to meet. Designers are then tasked with layering materials to achieve the R-Value for their component and zone.

Table 1 illustrates the change in required R-Values since 2006 for the category 'Insulation over Roof Deck,' which is how plaza slabs are typically classified. On average, R-Values for the majority of the United States have increased 10 units, with Zone 4 rising 15. For this particular case, required R-Values have doubled in five code cycles.

PLAZA BASICS

Plaza systems are typically used in the boundary between exterior supported space and an interior occupied space. Examples include between a parking garage and occupied space below, an on-grade plaza with below-grade space, or a rooftop patio and

(Continued pg. 3...see PLAZA)

(21 RIO continued from pg. 2)

minimize disturbances from accessing each resident's unit, Chamberlin devised special means of direct access to balconies across unique conditions to carry out the exterior work. Working from these stages and lifts required the crew to go through fall protection training and be swing stage and boom lift certified.

Chamberlin provides craft and safety training throughout the year with Chamberlin University, including swing stage classroom training at Chamberlin's office shared with the Engineer of Record, Building Diagnostics, for this project. Educating our team members on safety and technical skills empowers them to deliver quality, cost-effective projects that are completed safely and productively. For each project, and 21 Rio was no exception, Chamberlin works to provide our technicians the proper knowledge, tools and equipment they need to complete their scopes.

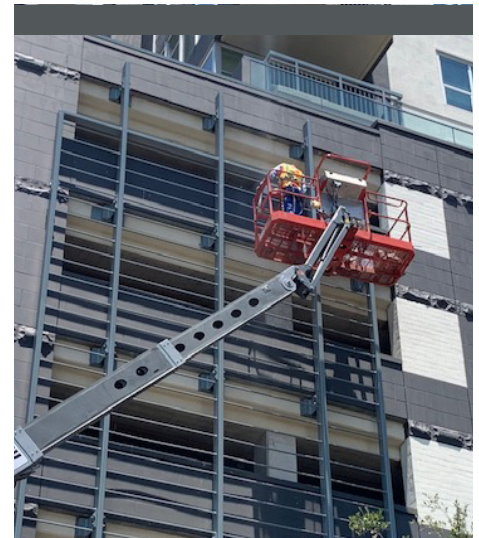
With the large square footage, multiple balconies and windows plus the building being fully occupied for the year-long project, the crew had to overcome long work hours and work some weekends to stay on schedule. An additional struggle Chamberlin had to overcome was weather delays. For curing purposes, the elastomeric wall coating and traffic membrane could not be installed if there was rain or even a chance of rain. The crew worked long hours to make up

for lost time and completed the job on schedule with zero safety incidents.

SUCCESSFULLY RESTORED

The apartment complex was also in need of having exposed brick and stone masonry on the garage coated as well as the decorative metal elements and metal coping freshly painted all the way from the ground level retail storefront up to the roof. The Chamberlin crew also executed targeted repairs, including sealant replacement at dryer and exhaust fan louvers, windows and balcony doors and perimeters, traffic membrane application, and sheet metal installation, to make the building effectively sealed for a watertight complex for all residents.

Working as a team was key to successfully stay within schedule, under budget and perform quality work for 21 Rio. Chamberlin's attention to detail and expertise gained from decades of roofing and waterproofing experience helped them deliver high-quality installations for this student living apartment complex. 21 Rio revitalization was completed with quality craftsmanship, cost and time saving solutions and with a spirit of cooperation. Building Diagnostics stated, "Chamberlin was one of the first contractors we worked with when we started our consulting engineering firm in Houston 28 years ago. Chamberlin has continued to serve our clients well as we



The lower portion of the building's elastomeric coating was performed from boom lifts.

grew and opened offices in Austin, DFW, Kansas City, and Mexico City."

After Chamberlin's hard work and dedication, 21 Rio in the West Campus by The University of Texas at Austin is fully revamped and refreshed to offer their student residents a watertight home that is built to last. Chamberlin is proud to contribute to the college community and the city of Austin. ■

(PLAZA continued from pg. 2)

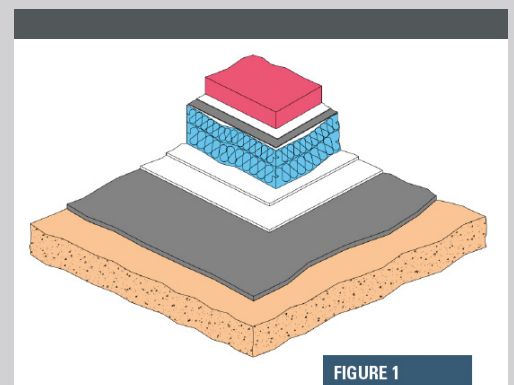
the building below. Plaza systems are sometimes referred to as sandwich slabs because of the layers of materials shown in Figure 1. The waterproofing (light grey), waterproofing accessories (white), and insulation (blue) are sandwiched between the structural slab below (dark grey) and the wear surface above (red). While the concrete and waterproofing options have not changed significantly since 2006, the increasing R-Values have resulted in increasing thickness of insulation. As the insulation has historically represented approximately 30% of the cost of a plaza system (excluding the structural slab), the 'meat' in this sandwich has gotten much more expensive.

PRIMER ON INSULATION

When we convert the 2018 R-Values into insulation thicknesses, as illustrated in Table 2, there are significant impacts on depth. Since the insulation is a large financial component of a plaza system and it would take considerable effort to remove and replace the wear slab to fix any issues, it deserves to be given the same level of thought and detailing usually reserved for the waterproofing system.

There are two types of insulation commonly used in plaza systems: EPS (white 'bead board') and XPS (blue or pink 'foam board'). Table 3 compares the design characteristics important to consider when selecting which material is better suited for this type of installation.

The published characteristics of insulation each play an important role and should be considered in the long-term performance of the system. Having already covered the importance R-Value and relative price play, next to consider is compressive strength. The manufacturer publishes compressive strength values which are based on either 10% deformation or the yield strength.



(Continued pg. 4...see PLAZA)

(PLAZA continued from pg.3)

Taking a typical insulation depth of 6" per Table 2, 10% deformation would result in nearly 5/8" of deformation. This magnitude of elastic settlement in the insulation layers is significant, usually occurs in a differential manner as loading is often inconsistent, and therefore must be accounted for in design. Designers should select materials only after having considered the anticipated dead and live loads and wear slab tolerance for settlement. Often, after breaking down the point loads of items such as tires and planters, designers select a compressive strength which is higher than originally thought necessary.

The next characteristic to consider is the water absorption and water vapor permeance of insulation, which indicates how much water is likely to be trapped in the material and how water will move through the system. All plaza systems,

by design, anticipate water passing through the wear slab and insulation layers on its way to drainage. In colder climates, this inevitably means the insulation layers will be wet and experience freeze-thaw cycles. Manufacturers unfortunately do not correlate the published values to a corresponding measure of freeze-thaw resistance. This is an important consideration, as our case studies have shown the ability to withstand these destructive forces varies greatly between the two types of insulation.

CASE STUDIES

EPS Insulation

Test pits into existing plaza systems insulated with EPS 'bead board' insulation have shown favorable short-term (~two years) performance in colder climates, as seen in Photo 1. However, long-term (20+ years) exposure to freeze-thaw cycling has resulted in deterioration of the board into individual beads as seen in Photo 2.

This breakdown of the insulation as a cohesive material causes the loss of its insulating and compressive strength characteristics. In most cases, this leads to cracking of the wear slab, damage to the waterproofing membrane, and even condensation on the underside of the structural slab below, prompting replacement of the entire plaza system.

XPS Insulation

Similar test pits were also conducted on plaza slabs insulated with XPS insulation. The short-term and long-term inspections of the insulation itself were both favorable, likely due to the physical characteristics of the board, as previously discussed and as illustrated in Photo 3. However, the success of the insulation board is sometimes accompanied by a failure in the wear slab. Because of the low absorption of the material, moisture remains on the insulation board, and freeze-thaw damage was observed

on the bottom of the concrete wear slab, as shown in Photo 4. This creates a new need to ensure drainage paths are designed to handle water at multiple layers of the plaza system.

To continue reading this article including all tables, figures and photos, go to <https://www.chamberlinltd.com/articles/plaza-slab-systems-demand-proper-design>. ■



TABLE 2

Zone	R-3.1 (EPS)			R-5 (XPS)		
	Inches Req'd 2006 IECC	Inches Req'd 2018 IECC	Increase	Inches Req'd 2006 IECC	Inches Req'd 2018 IECC	Increase
1	5"	7"	2"	3"	4"	1"
2	5"	9"	4"	3"	5"	2"
3	5"	9"	4"	3"	5"	2"
4	5"	10"	5"	3"	6"	3"
5	7"	10"	3"	4"	6"	2"
6	7"	10"	3"	4"	6"	2"
7	9"	12"	3"	5"	7"	2"
8	9"	12"	3"	5"	7"	2"

This article was originally printed in SWR Institute's Spring 2020 Applicator.

Gregory J. Neiderer, PE, is the Director of Restoration and has 35 years in engineering and over 29 years with Walker Consultant's Philadelphia office. Kathryn Stairs, PE, is Director of Operations with 20 years of engineering and 18 years with Walker Consultants at their Philadelphia office. For more information, Greg can be reached at 610.995.0260 or gneiderer@walkerconsultants.com and Kate can be reached at 610.995.0260 or kstairs@walkerconsultants.com.

Developing Our Workforce



Chamberlin attended ABC's 2022 Leadership Forum

Proper training and continuing education are key components in working safely and productively on our projects. Through professional development and mentoring, we elevate our team to deliver successful projects at the best possible price.

Associated Builders and Contractors (ABC) Greater Houston's 2022 Leadership Forum commenced in January of this year. Consisting of 11 interactive learning sessions, this course guides A/E/C professionals to reach their highest leadership potential. The comprehensive program helps attendees polish their leadership skills and communicate effectively. Congratulations to the four Chamberlin employees who graduated from ABC's 2022 Leadership Forum on Friday, May 20, 2022.

Jorge Hermosillo, Safety Manager

Wayne Ferguson, Roofing & Sheet Metal Operations Manager

Jonathan Harper, Roofing & Sheet Metal Senior Project Estimator

Jared Britton, Roof Maintenance & Leak Repair Project Manager

Construction Career Collaborative (C3) is an alliance of construction companies dedicated to positively impacting the future of the construction industry by strengthening the workforce pipeline. These companies work to advance the well-being of craft workers, support best safety practices and deliver continuous skills training.

C3 recently offered a construction workforce development course developed by The National Center for Construction Education and Research (NCCER). The curriculum is designed to prepare

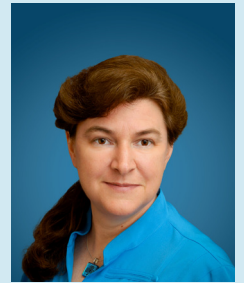


Bradley Rowan receiving Construction Workforce Development Certification

individuals to run a training department or launch a training organization. The intensive 10-month program covers 11 relevant topics and includes a series of individual assignments and networking activities. Chamberlin's Quality and Training Manager Bradley Rowan received a Construction Workforce Development Professional Certification upon completion of this course in May 2022. ■

Employee Profile

Amy Haynes
Senior CAD Specialist
Dallas, Texas



Career Experience:

Before Chamberlin, Amy was a CAD specialist for her brother, who was a roofing consultant at the time. She continued in architectural drafting for 15 years, mainly in the commercial, historical preservation, master plans, government and schools sectors.

Notable Project:

When reviewing the laser scans for the Irving Convention Center pool deck project, Amy caught an issue before the job started which ended up saving time and money on material. She identified the adjustable pedestals for the deck pavers only heighten to 21 inches, but the original form of the patio was deeper than 21 inches in some areas. This allowed the project team to order additional insulation for those areas beforehand, and the project was completed successfully and on time.

Great personal accomplishment:

Amy fulfilled her goal of gaining a Construction Documents Technology (CDT) Certification through Construction Specification Institute (CSI). The CDT provides foundational training in construction process, roles and responsibilities, and construction documentation. Amy passed a comprehensive test on all aspects of the architectural coordination of a project and maintains her certification with 24 hours of professional development every three years.

Outside the office:

As an active member of her church, Amy plays the guitar and sings vocals for music ministry. An avid, self-taught musician, she also joined TIMES, the Traditional Irish Music Education Society, and participates in Irish jam sessions with them.

We asked Amy to choose her favorites from this random list of things as a way to get to know her a little better:

AMY'S LIST:

Ham sandwich	Ice cream sandwich
Uber	Drive
Book	E-Reader
Sand	Snow
Science Fiction	Westerns

PROJECTS IN PROGRESS

CHAMBERLIN
Roofing & Waterproofing

LOCATIONS:

HOUSTON

4545 Langfield Road
Houston, TX 77040
Ph. (713) 880-1432
Fax (713) 880-8255

DALLAS/FT. WORTH

2170 Diplomat Drive
Farmers Branch, TX 75234
Ph. (214) 273-9110
Fax (214) 273-9120

AUSTIN

2755 Business Park Drive
Buda, TX 78610
Ph. (512) 275-1600
Fax (512) 523-9350

SAN ANTONIO

13111 Lookout Run
San Antonio, TX 78233
Ph. (210) 822-6536
Fax (210) 822-8211

OKLAHOMA CITY

912 Messenger Lane
Moore, OK 73160
Ph. (405) 680-0506
Fax (405) 680-0508

*Also licensed in Arkansas
and Louisiana*

NRHS ACC ABOVE GRADE PACKAGE - NORMAN, OK

New Construction Waterproofing

Contract Amount: \$1,800,000 (approx.)

Owner: Bremner Real Estate

Architect: HGA

General Contractor: JE Dunn Construction Co.

Scope of Work: Installation of air barrier, firestopping, joint sealants, expansion control, site and paving sealants

Project Description: Regional health clinic – ambulatory care center

LE MERIDIEN HOTEL RENOVATION - FORT WORTH, TX

Remedial Waterproofing

Contract Amount - \$700,000 (approx.)

Architect: Sandvick Architects

General Contractor: Muckleroy & Falls

Scope of Work: Concrete repair, below-grade waterproofing, elevator pit waterproofing, hot fluid-applied waterproofing, traffic coating, joint sealants, masonry cleaning and joint firestopping

Project Description: 189-room hotel

TFC-DPS BUILDING A & E - AUSTIN, TX

Remedial Roofing

Contract Amount: \$2,000,000 (approx.)

Owner: Texas Department of Public Safety & Texas

Facility's Commission

Architect: LAN

General Contractor: Teal Construction

Scope of Work: Removal of current roof and installation of wood blocking, hot modified roofing and counterflashing

Project Description: Central services building for Texas

Facilities Commission

ROUND ROCK PUBLIC LIBRARY - ROUND ROCK, TX

New Construction Waterproofing

Contract Amount: \$700,000 (approx.)

Owner: City of Round Rock

Architect: Ray Gill

General Contractor: Hensel Phelps

Scope of Work: Installation of hot-applied waterproofing, traffic coating, water repellents, thermal insulation, air barrier, firestopping, joint sealants, expansion control, site and paving sealants, sheet metal flashing and trim

Project Description: Multi-story public library

NEW MARY CARROLL HIGH SCHOOL - CORPUS CHRISTI, TX

New Construction Waterproofing

Contract Amount: \$450,000 (approx.)

Owner: Corpus Christi ISD

Architect: Gignac Architects

General Contractor: Fulton Coastcon

Scope of Work: Installation of joint sealants

Project Description: School building with 2,400 student capacity

(BEP) LEPE OFFSET ROOF - DALLAS, TX

Remedial Roofing

Contract Amount: \$2,000,000 (approx.)

Owner: United States Department of Treasury

Architect: Raymond-Pond Solutions

General Contractor: GC Works, Inc.

Scope of Work: Removal of existing modified bitumen roof system and installation of fleeceback PVC roofing system, counterflashings, downspouts and gutters

Project Description: Printing hub

2727 N LOOP BUILDING A - HOUSTON, TX

Remedial Roofing

Contract Amount: \$600,000 (approx.)

Owner: Quanta Services

Architect: Kendall/Heaton Associates, Inc.

General Contractor: O'Donnell/Snider Construction

Scope of Work: Removal of built-up roofing and installation of wood blocking, vapor barrier, hot modified roofing, flashing and sheet metal

Project Description: Office spacey

TMC3 COLLABORATIVE BUILDING - HOUSTON, TX

New Construction Roofing

Contract Amount: \$2,000,000 (approx.)

Owner: Texas Medical Center

Architect: Elkus Manfredi Architects

General Contractor: Vaughn Construction

Scope of Work: Installation of wood blocking, weather barrier, hot modified roofing, flashing and sheet metal

Project Description: Medical and health collaboration building

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