A Team's Fine Finish

Case Study in Brick:
Phi Mu Fraternity
University of Arkansas, Fayetteville

Red Handcraft
Modular Brick
Heritage Texture
Sacked Finish

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Historical Authenticity Finds Acme Brick Harmony

The exterior design of Phi Mu is rooted in the work of Palladio, a standard reference for many of the antebellum estates across the South. Architects sought to bring historical authenticity through close attention to classical details and façade proportions, particularly as influenced by the work of Lutyens. These were harmonized with aspects of American antebellum architecture, as well as more local precedents including the nearby Carnall Hall on the University of Arkansas campus.

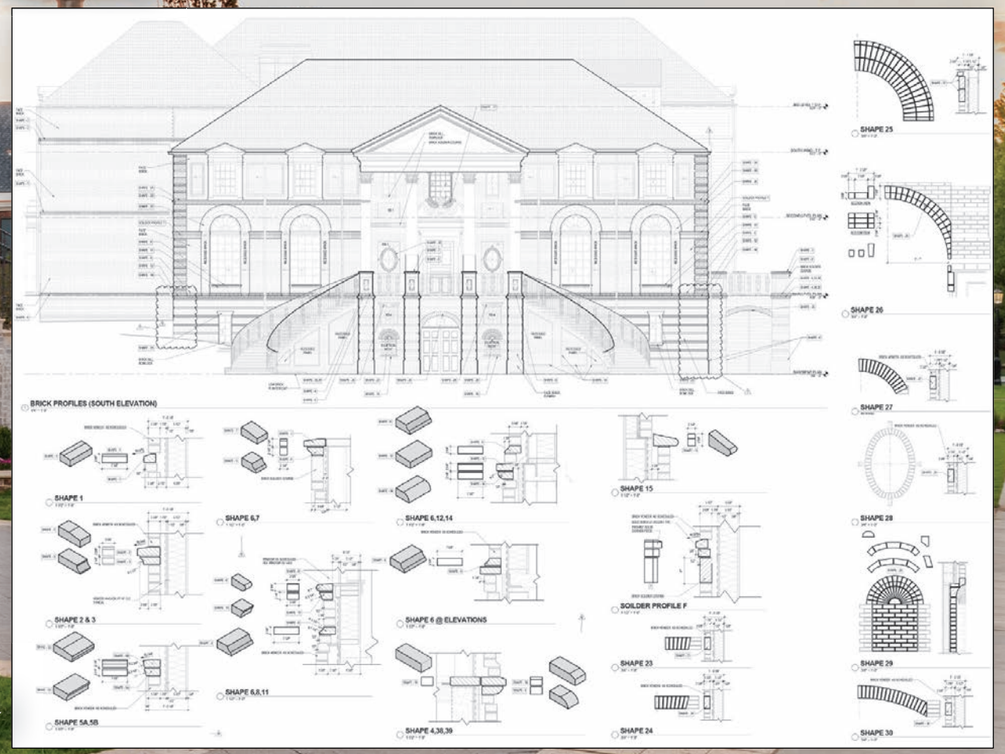
The brick entry loggia and staircase to the main level were important to the design from its conception. The loggia's triumphal vaulted passage, flanked by elliptical brick niches, dates to ancient Rome. The exterior staircase will allow the sorority to photograph its members annually in front of their house gracefully. The loggia and staircase create a strong presence and provide a transition for the site's 20-foot slope. The "piano nobile" main level, one floor above, meets the side street entrance at grade.

The Phi Mu exterior features a variety of special brick shapes and traditional details, including a rusticated base, horizontal banding and soldier courses, quoining, layered arches, jack arches, niches, recessed paneling, and even a raised quatrefoil motif (Phi Mu's symbol) at the entry loggia. The design and execution of these details in brick elevate and define the building's unique architectural character.

– Michael G. Imber Architects

Phi Mu Fraternity, University of Arkansas Fayetteville
architects Michael G. Imber, San Antonio, with Core Architects, Rogers AR, and Cunningham+Associates, Columbia MO
general contractor CDI Contractors, Little Rock / Fayetteville AR
masonry contractor Tri-Point, Bentonville AR

Architect's Watercolor



Construction details, incorporating Acme Brick engineering drawings

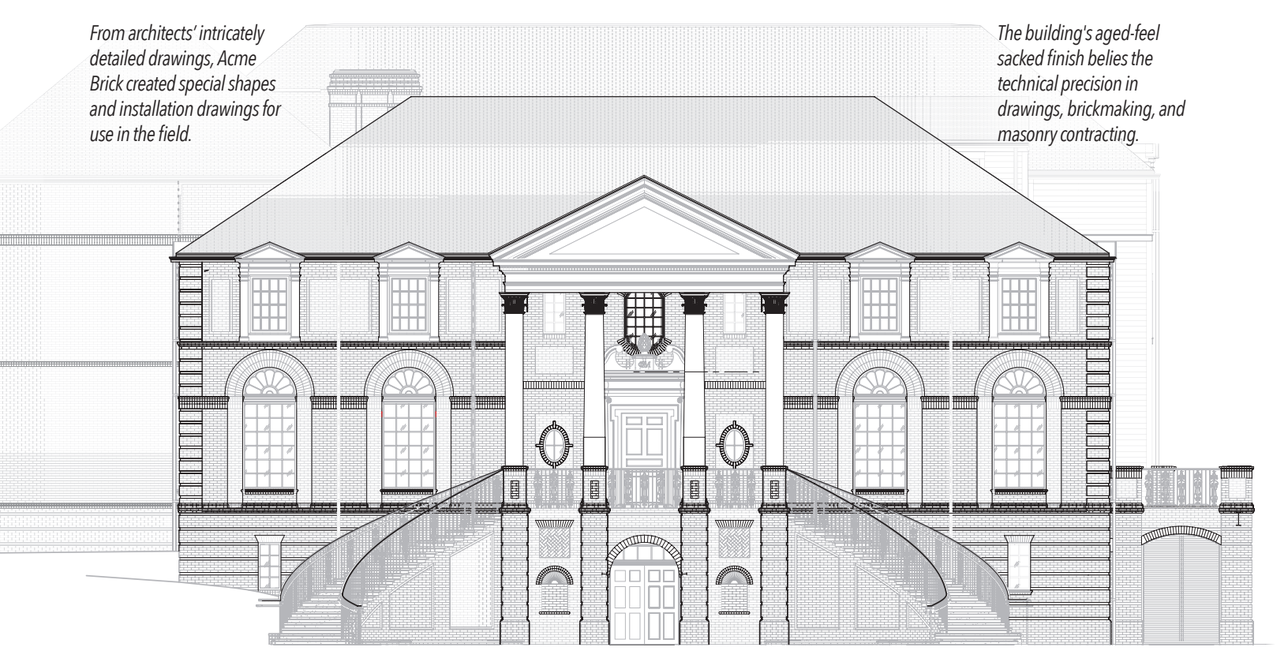
An Extra Layer of Coordination in Design Breeds Quality Commitment in the Field

This design was pretty unusual, and something of a new project type for us, even though we have an on-call contract with the University of Arkansas that often pairs our firm with another design architect with particular skills or specialty. We help execute the intent from the design architect, and usually have a hand-off in which we begin the process of creating construction documents. The highly detailed and complex masonry design, though, was unique and required an extra layer of coordination with the design architect through construction. Brick was an integral part to the depth and expression of the design, and a nod to craftsmanship of an earlier time.

On a job like this for a public university, we do not sole-source anything, so potential vendors and contractors who help in design are at most hoping to get a bidding advantage through familiarity with the design when we get bids. We made a lot of mockups of different brick through the design process, and looked at the desired mortar wash–a red brick with the patina of time, almost like painted brick that had washed off over the years. Acme Brick's base cost was good, and then the willingness of Acme and the masons to lend their expertise during design, helped us well before any contract documents went out for bidding.

From architects' intricately detailed drawings, Acme Brick created special shapes and installation drawings for use in the field.

The building's aged-feel sacked finish belies the technical precision in drawings, brickmaking, and masonry contracting.



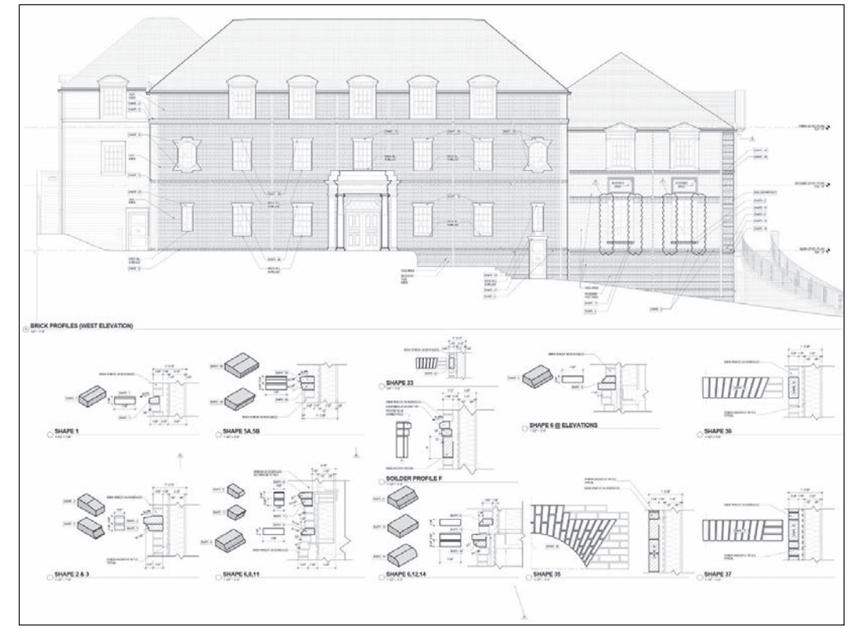
We do have many projects that are brick, and we do work with Acme quite a bit, so that level of trust means they know what to expect from us. Local Acme Brick is a really solid product, too.

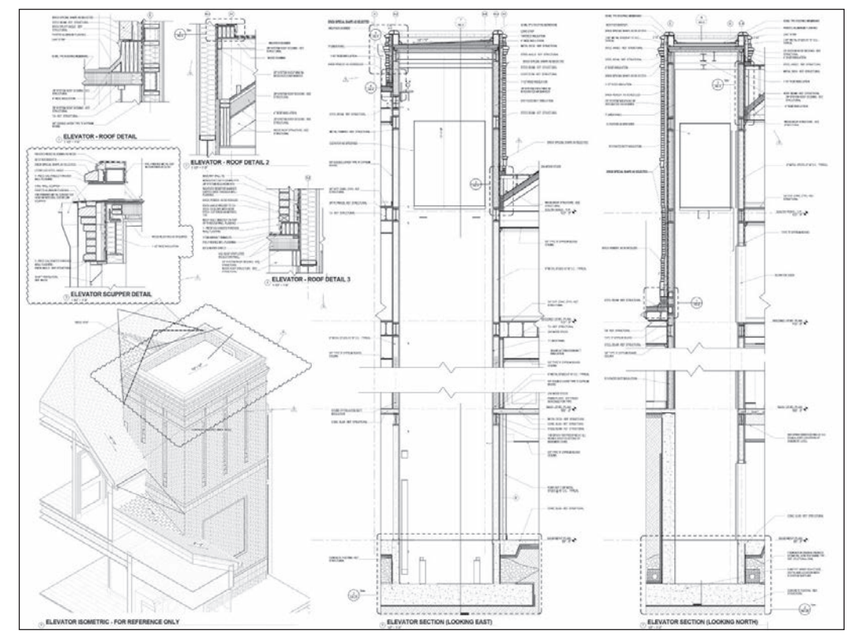
Acme went as far as providing shop drawings in the construction documents phase, before bidding. They gave us their interpretation of what we were showing. We often joke that architects are "masters of none," while brick masons and manufacturers are very good at their specific material and can resolve conflicts and unintended consequences before construction. Many pressures on this job, however, were not from brick, but from other areas, like framing or window profiles, which were amplified on this project due to the sheer number of unique situations.

We had little margin for error, which led to important and necessary compromises during design and construction. We had to resolve between sticking with what's drawn and accommodating what can be done in field. Quite a bit of my time was spent on-site, because this was a unique design, with not just the typical two or three shapes, but 60–water tables, arches, sill profiles, brick piers for raised patios, elliptical niches, stairs on a curve, and more. The sheer complexity of the project could not be edited and simplified.

The budget and schedule also left zero margin for error. The building was finished the day before students moved in. Had anything been really wrong during the process, someone would have to eat costs. We really gained a high level of trust and had a great rapport with the mason, because he really cared about the end product, and getting it right.

For architects on a project this demanding, it's important to enlist a skilled mason and brick maker to help direct the design process to be efficient and economical without compromising the design. Acme has the resources to do that, and allows us to do a better job for our clients.





Architects incorporated Acme shop drawings directly into working drawings (top) for clarity and consistency.

Extensive wall sections (bottom) covered undulations in the finish wall surface and on elements such as the elevator tower.

This was the most challenging project of my career so far, and that made it such a great project. I have never heard from so many people who are noticing and understanding the work that went into the detail in the project. Working with a design architect who was remote required response and guidance with an extraordinary level of communication. They cared deeply about design and were committed to the very end, which was good for everyone and for the project.

– Michael Baldwin, AIA, Project Architect, Core Architects

Sequencing for the Art in Brick

Communication was a major factor on the project, beginning in design with the architects, who worked in direct contact with Acme engineers, while drawings were still in progress. Designs submitted to the plant included 60 different special shapes and a total of 57,000 shape units, compared to 230,000 rectangular brick.

First, the engineer reviewed the shapes with me to see if we could manufacture everything as drawn. Several shapes were significantly larger than what we could produce. The architects were good to agree to redraw these as two shapes. That way, aesthetics remained the same, and we could make the two separate shapes instead.

The scale of the building was pretty overwhelming for our particular plant, and took six months to complete manufacturing. To maintain consistency across that timespan, we focused on making similar shapes together.

Sequencing was a big challenge, too. We worked with the mason to deliver the shapes that were needed first, as his crew worked around the building. But we also worked with the architects to accommodate late changes to areas of the building where the brick had not yet been manufactured. Our overall average shrinkage for our kilns is consistent due to firing temperature and the consistency of our base body material.

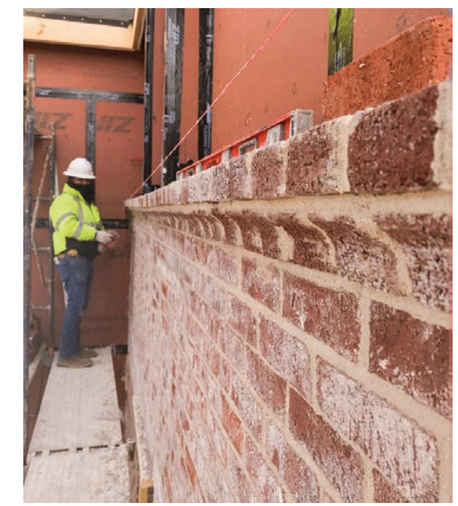
The mason was very patient with Acme, especially in the necessary delay to manufacture larger pieces without cracks in the face of the brick. Having completed this project and others before it, we encourage architects to think about details and the number of shapes placed on a building. Great detail requires longer deadlines.

Brick is an art when manufacturing shapes. Sometimes art takes a little time to be done well. We had to be creative ourselves, but communication among architects, Acme engineers, and the mason made the timeline possible.

– Lynn Ramsey, Acme Brick Plant Manager

Acme Brick coordinated manufacturing with the masonry contractor so that brick arrived on-site in the sequence of construction, from back to front, across dozens of special shapes.

An initial sack finish was applied by masons as the wall went up, and then a second pass near completion brought the unique appearance to the character approved by architects on-site.



Team Up with Acme

Teamwork began with the architect's initial elevations (1) when the project began.

Acme engineers created shape approval drawings (2, 3) matching the architect's details with the Acme plant's capabilities to produce desired shapes.

The architect chose to include Acme engineers' approval drawings directly in the contract drawings (4).

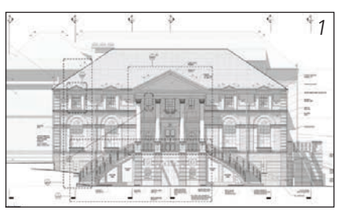
Acme engineers worked with the masonry contractor to identify where particular shapes were to be installed, complete with an itemized schedule of quantities (5).

Acme engineers provided additional detail (6) in locations where the masonry contractor required guidance to explain how and where the shapes would be laid in the wall.

After approvals, Acme engineering provided plant team members (7) with "green" drawings of shapes to be extruded and cut.

These drawings of the respective cut and fired material dimensions (8) were used to make a cardboard template (9) to produce a frame (10).

This frame and many more allowed for cutting (11) the extensive collection of special shapes (12) that makes this unique project so distinctive and aesthetically appealing.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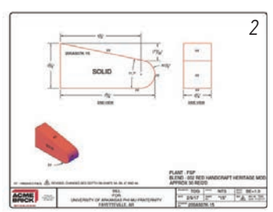

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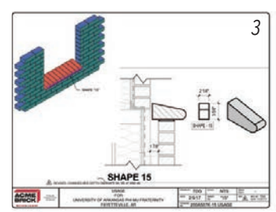

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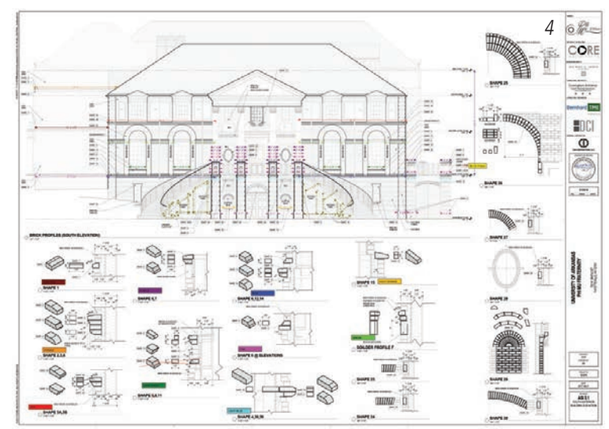
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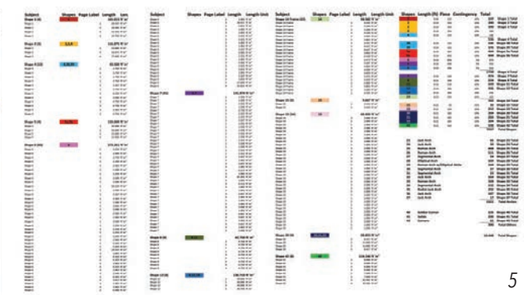
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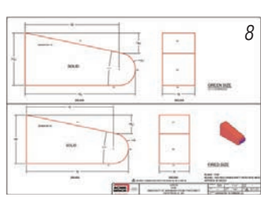
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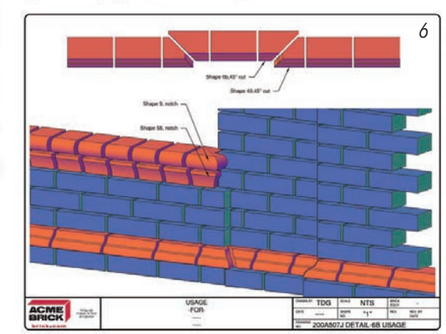

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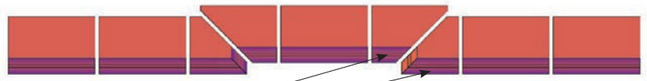
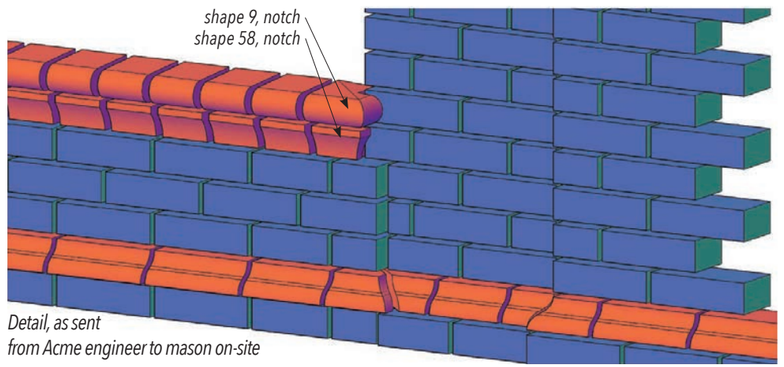
Figuring It Out from Brick to Digital and Back

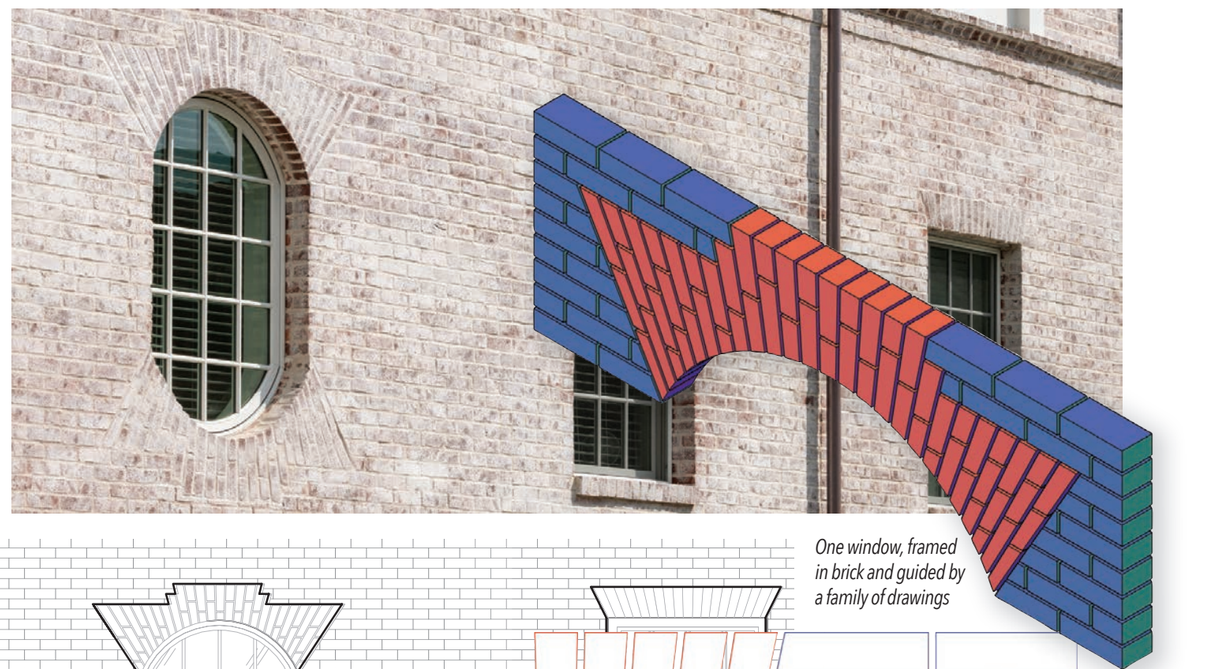
Not even the best set of construction documents can anticipate every challenge in the field. Each day, according to the mason, was a puzzle to solve, sometimes unusually difficult. One particular day included a troublesome wall condition with shapes laying up to make a one-inch setback under a window. The mason was momentarily stumped. Acme's engineer asked for a little time and created a drawing showing how to achieve the intended design. The nudge of explanation worked, and saved the day. This project featured daily back-and-forth, which led not to frustration, but to working friendships. Despite never meeting in person, mason and engineer can pick up today where they left off, many months ago, and recall specific details and discussions in critical teamwork to complete the project.

– Todd Goodson, Acme Brick Engineer

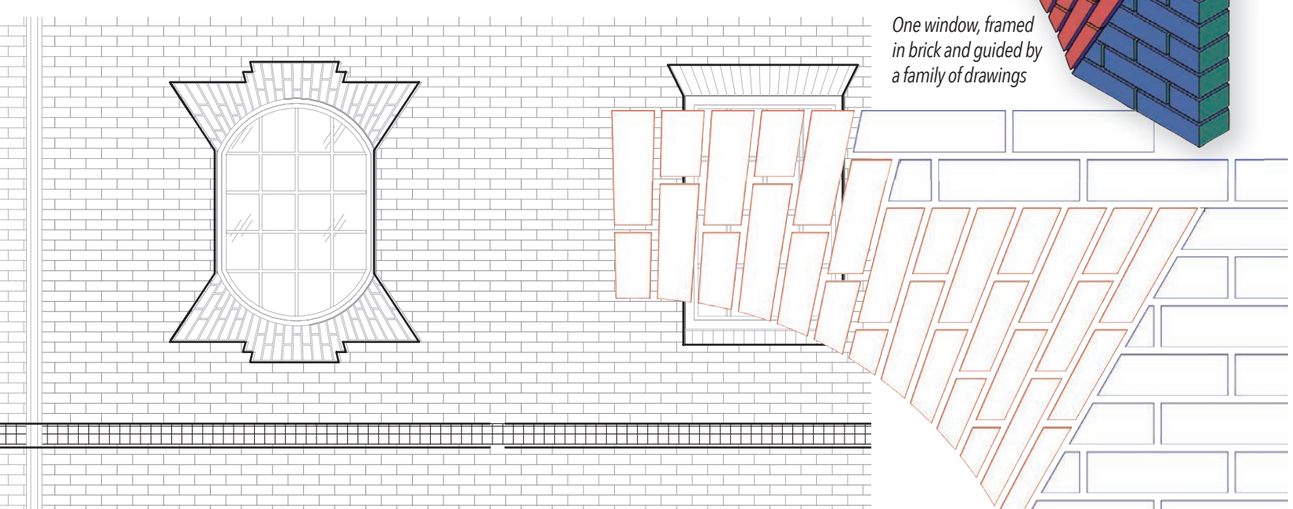




Detail, as sent from Acme engineer to mason on-site



One window, framed in brick and guided by a family of drawings



Against the Wall: A Mason Solves Daily Puzzles Building a Gem

We recommended Acme Brick to the architect and the owners, because they were going for an old-world-style building and cost was a big factor. We worked with Acme's engineers on shop drawings, and submitted and resubmitted eight or nine revisions, instead of usual two or three, to get things right.

This was a super difficult job, with a lot of intricate work, and so many different shapes in the building. Getting them to work together, and making all that work to maintain project cost and pricing required front-end paperwork that was three to four times the usual.

We sequenced the project to make it conducive to build, starting in the back and working our way to the front main façade. That way we could catch any problems on the back side and work them out, so that we were ready by the end for the front entryway that people see most. We want it consistent, to fit together perfectly like a puzzle, and the architects and Acme engineers made that work.

We exchanged shop drawings, back and forth, to reach a final set from architects. Given the size of the project and the number of brick, a revise-and-go, approved-as-noted approach would not have worked. We could not afford to have, say, a thousand shapes that don't get included.

Building the project included challenges that might not be obvious. The wall spacing, the insets and outsets, and the wall surfaces in different planes made it difficult. You can see how the lower portion sticks out, and shapes break it up. We started on the short north side, came around down that wall, adjusting for framing, windows, specialty trim-out, detail woodwork, arches, and more. On the side was a starburst window that was particularly tough to build.

We did get expert help from the architects' drawings and Acme engineers. They made it clear "in the box," with placement all figured out. In the field, however, every tiny difference between the size of the arch and the actual window provided meant trimming a sixteenth or an eighth of an inch, here and there, with the architects' consultation. In a perfect world, every component and trade is exactly right; in the real world, on site, we work to resolve everything away from the brick, yet achieve the desired appearance, shaving off a blade width, if needed.

Acme packed the window's many shapes in their precise positions to eliminate any confusion and support a steady construction pace.

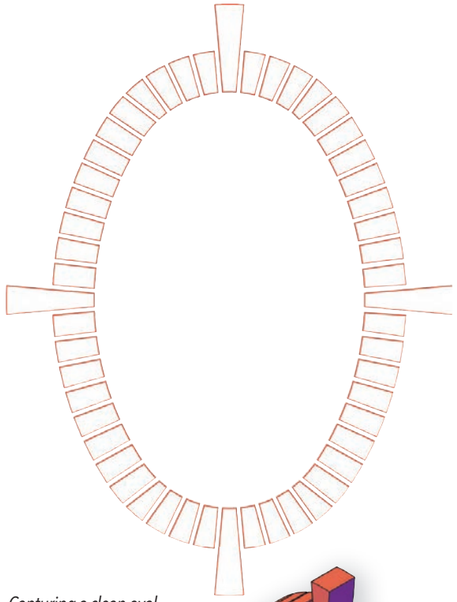
Acme's engineering drawings were perfect. We knew ahead what to expect: a high initial rate of absorption, soft brick, more "old world" in its character. We went to the plant and watched the process. We saw how Acme builds molds, pushes the clay mix through, and hand-cuts shapes. The Acme plant manager was all about the project, and made sure the brick was consistent overall. For us, the outcome was awesome, despite and really because of the challenges. My favorite thing, in fact, was a full day with another worker laying up a decorative elliptical niche. The quatrefoil pattern took literally a day to make, with the step-ins and step-outs, making a lot of crazy little adjustments to achieve the architects' ideas.

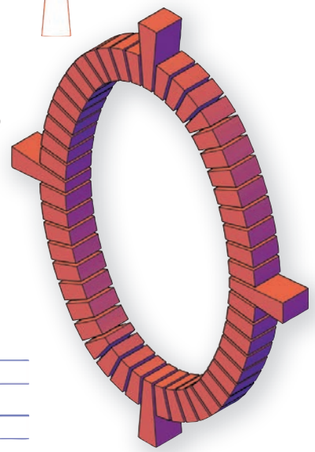
This project was only possible because the architects put trust in us, talked to us, and found out how to deal with real-world complications. Maybe most architects and masons don't want to deal with this kind of thing, but I really enjoy it. The key is to take your time, and make sure we get this right.

We like to have more input than most masons on a building. We like working with design professionals to get their details right, so they are not surprised when stuff they have drawn blows a budget. Time and labor is no joke in this kind of work. This is one of the most detailed jobs–the most intricate–we've ever done. Even the sacking on the face of the brick was tricky. We followed the sample panel, and then needed a second pass to achieve the architects' ultimate goal.

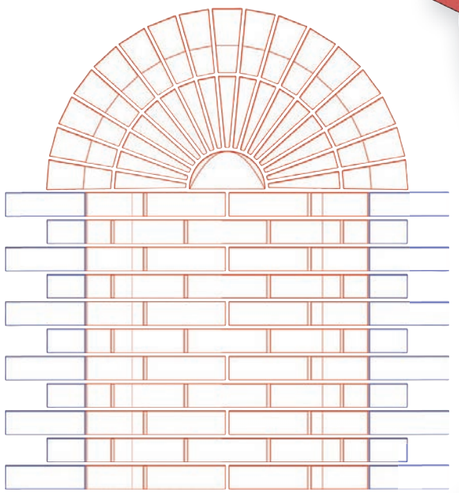
This is the kind of work, though, that wins awards. I hope we win.

– Terrance Reese, Tri-Point Masonry Contractor

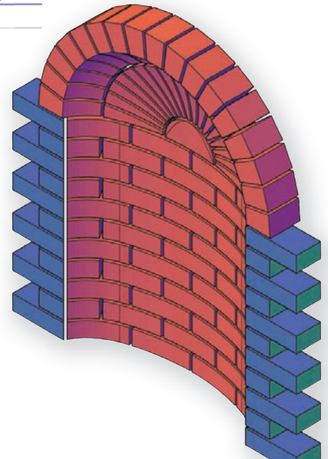


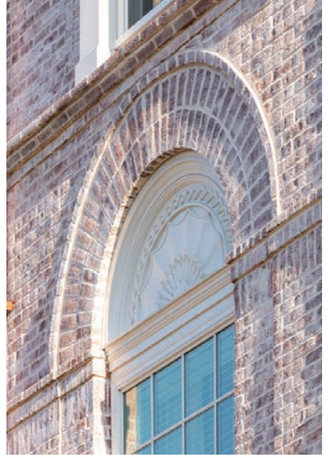


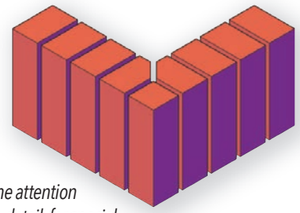
Capturing a clean oval design in construction took intermediate engineering drawings to make and lay the brick.



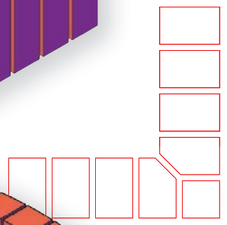
Acme engineering made each special shape and built each detail in software, especially this elliptical niche, before the plant made any actual brick.

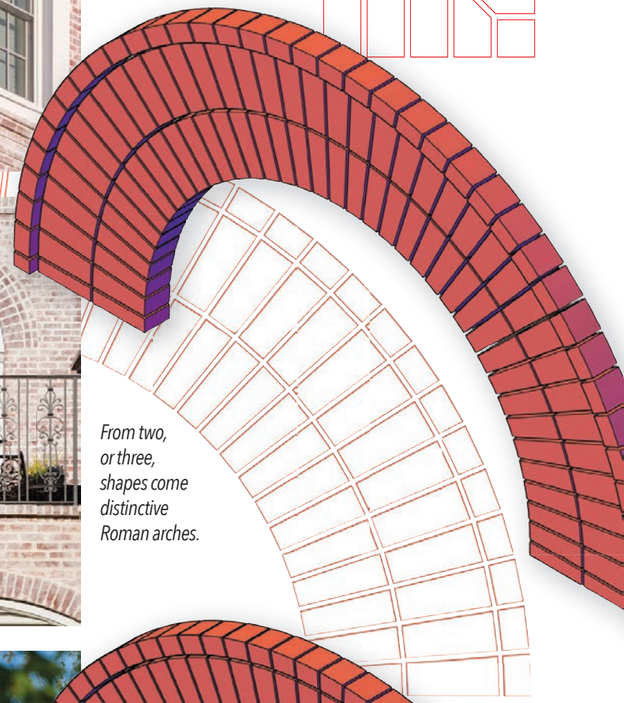






The attention to detail for special shapes guided field cuts, too.





From two, or three, shapes come distinctive Roman arches.

Special shapes in quantity add to a repeating balcony column design.

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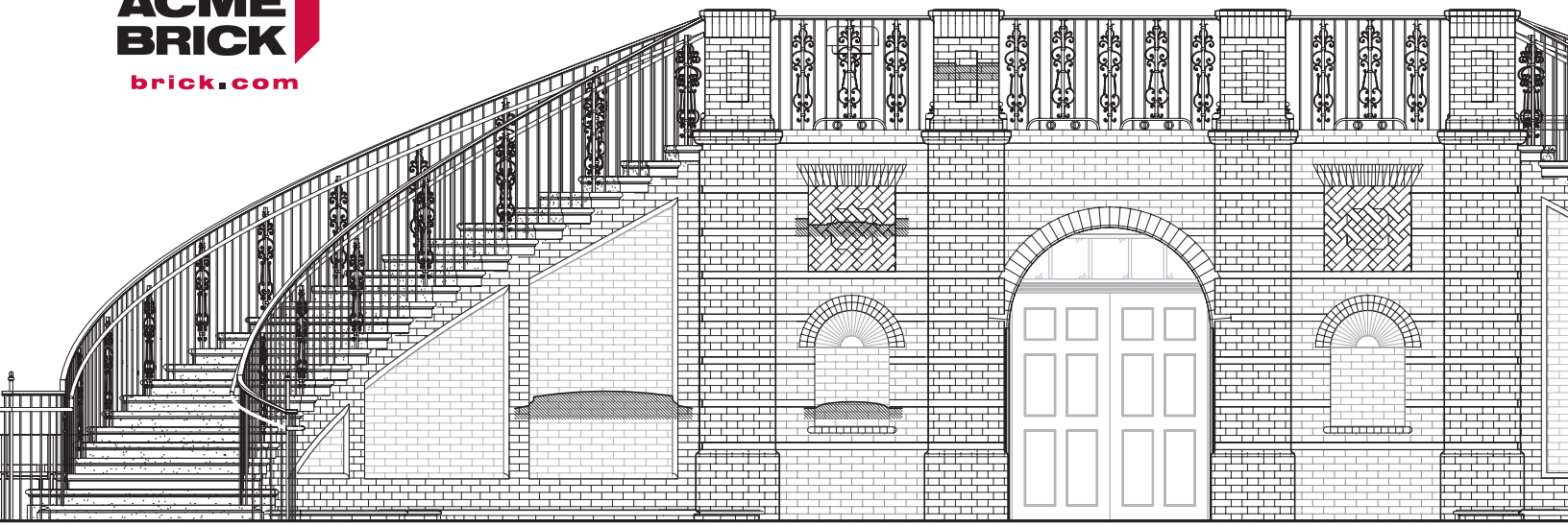
Every design should be photo-worthy. House group pictures helped drive a sweeping main elevation.



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