SEALANT, WATERPROOFING & RESTORATION INSTITUTE • FALL 2021 • 43.4

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PERSISTENCY + PERSEVERANCE = PRESERVATION

The support structure was based on a latticed bridge girder design supported on full height scaffold towers.

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PERSISTENCY + FORMULA PERSISTENCY + <t

BY JED DANIEL P.E.

he First Baptist Church is on the Historic Registry in downtown Winston-Salem, NC. For those who do not know, the City of Winston-Salem is part of the Triad which is comprised of Greensboro, Winston-Salem, and High Point in the center of North Carolina. Winston-Salem is known as being a part of "Tobacco Road "and some think this is from the historical significance that tobacco had for North Carolina, when it is actually due to the basketball competition between Wake Forest, Chapel Hill, Duke and NCSU. EXISTING 6 x 6 PAIN STL. TUBE CROSS EXISTING COPPER

NEW STANDING SEAM COPPER ROO

EXISTING GFRG PEN EAVE CORNICE EXISTING TERRACOT WINDOW SURROUN

TOWER LEV 13 EXISTING ALUMINIM GRILLS & BIRD SCREENS

XISTING GFRG COLUMNS

-EXISTING TERRACOT FINIAL

TERRACOTTA BASE EXISTING GFRC PEN CORNICE & FACIA V DENTIL MOUNDINGS TOWER LEV

TOWER LE 1 —EXISTING TERRACO WINDOW SURROUM & COLUMNS

- EXISTING ALUMINIM GRILLS & BIRD SCREENS

ROOF STRUCTURE W FACIA, PILASTERS & SCROLLS

XISTING ALUMINIM GRILLS & BIRD SCREI <u>TOW</u>ER LEV 8

EXISTING GFRC SIL BAND & CORNICE

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It is amazing to reflect on how far Winston-Salem's infrastructure has come in the past 150 years. Historically, most of Winston-Salem was built from 1890-1931. It was known mostly as the home to RJR Tobacco Company. Today, if you scan the current skyline, it is better known for its financial and technology significance. Wells Fargo and BB&T towers are visible and many of the older downtown tobacco buildings were repurposed into state-of-theart technology centers. Trivia Question: What do New York City and Winston-Salem have in common? Answer: The Empire State Building. Winston-Salem is home to the upper portion of the Empire State Building constructed and completed for RJR Tobacco Headquarters two years prior to completion of the iconic structure in Manhattan.

Turn of the century city growth resulted in the presence of various religious affiliations. The historic First Baptist Church began in 1871 when Alfred Holland ran an advertisement for Baptists and a congregation was established with five residents. In 1877 the membership grew to 105 residents and the church bought a lot for \$250. Fast forward to 1922, Dr. John Jester was asked to become the pastor and agreed on the condition that they find a new location and

The Historic First Baptist Church began in 1871 when Alfred Holland ran an advertisement for Baptists and a congregation was established with five residents.

create plans for a new building. His request was honored and the current Sanctuary and Spire were built for \$650,000

PHOTO 1: Cracks in the corner of the sanctuary exterior wall.

in 1924; by that time the congregation had grown to 675 parishioners. In 1954 the First Baptist Church expanded further with the construction of their Children's Building and in 1961 the Educational Building. Forty years after its original construction, the Sanctuary was re-dedicated and the Church underwent a \$225,000 restoration. In 2018, over 50 years later, the Church was showing problems from deferred maintenance.

As it stands, First Baptist Church consists of four main structures: Bell Tower, Sanctuary, Children's Building, and

the Education Building (*Diagram 1*). The Bell Tower was constructed with structural steel, composite brick masonry walls, and decorative terra cotta accents. The Sanctuary was constructed using lowerlevel stone masonry walls, full height-stained glass windows, upper-level composite brick masonry walls, decorative terra cotta balustrades, and a copper dome. The Children/Education wings were built similarly using composite brick masonry walls, punch windows, and decorative terra cotta accents. Over time, interior renovations, roof replacements, and façade repairs all became a necessity and part of the major fundraising campaign.

WxProofing LLC (WxP) was asked to get involved early in the project. Although WxP had a relationship with the Church, the project was awarded to a local general contractor due to the complexity and need for multiple trades. The preliminary design was in process, but exterior repairs were not very well defined. To that end, WxP was asked to visit the site to survey the façade, and develop a design-build repair scope. Visual observations identified aged mortar joints and vertical stress cracking at Bell Tower corners leading to underlying interior finish damage (*Photos 1-3*). Ultimately, WxP's proposed scope was broken down between costs associated with the Bell Tower, masonry at the roofline, and exterior masonry







(28) MTL. ROOF - PIPE PENETRATION ROOF DETAIL

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-DOUBLE LAYER OF 55# FELT UNDERLAYMENT

COPPER STANDING SEAM ROOF



elevations. The cost breakdown was approximately 70%/20%/10%, respectively. The scope as determined included a large amount of pointing, cleaning by hand and replacing 150 cracked terra cotta units (TCU). Sealants would be used on any skyward-facing joints. As with most design-build proposals, one generally has a lengthy list of qualifications/clarifications. Of particular interest were the

terra cotta lead time (six to seven months) and the superimposed scaffolding load imposed on the Bell Tower backside.

Since pricing came in higher than anticipated, the general contractor decided to pursue a design bid assist cost analysis. This process involves identifying all items of cost and determining whether a fee will apply or not. In addition, standard labor rates are provided for all staff ranging from management to laborer. The thought was that this process would offer a savings when in fact this was not the case. During this process, the imposed scaffold roof load became a greater concern and was further reviewed.

WxP was asked to prepare an estimation of probable cost to provide a support structure which clear spanned the Bell Tower roof backside. This approach would eliminate any structural concern and the need for possible shoring down through the main Church entry. This cost would be applied to an allowance sum carried by the general contractor. The support structure concept was based on a latticed bridge girder design supported on full height scaffold towers. The cost was exorbitant but considering the need for street lane closures and a crane for erection and dismantling, it was justified.

Approximately 18 months later, plans, as prepared by a local architectural firm with input from their preservationist, were made available. Due to cost concerns, the thought was to competitively bid the project. Unfortunately, the scope was amended reducing the number of replacement TCUs but adding a significant amount of architectural patching, thus driving up the price. WxP collaborated with the general contractor to identify added items and derive an equitable solution. After all was said and done, the contract was issued and ready to roll.

In many instances, contract verbiage is "cut and paste" but in today's environment, one needs to pay particular attention to the fine print. The first item of concern had to do with North Carolina sales tax. Approximately three years ago, the state of North Carolina imposed a revenue tax on construction projects. From a tax standpoint, projects can be classified by the owner as either Capital Expenditure (Cap X) or Repair and Maintenance (R&M). The responsible party (owner or contractor) for this tax depends on the classification. The contract stated WxP included North Carolina sales tax, which was not the case. Ultimately an affidavit was issued confirming Cap X status thus eliminating this potential added cost to WxP. Another item of concern was that the contract stated that WxP was

The scope as determined included a large amount of pointing, cleaning by hand and replacing 150 cracked terra cotta units (TCU). responsible for all access equipment, when in fact the general contractor pulled that cost from the contract to save mark-up. Other items in contention included working seven days a week and one parking space per firm. My point is to red line any clause which was not the original basis of your bid because one only has leverage before the contract is signed. In addition, make sure that allowances, unit prices and alternates, Schedule of Values, your proposal, and

any schedule input presented by your firm are referenced in the contract. After these negotiations, the project was finally awarded and ready to turn over to operations.

- APPLICATOR -

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DIAGRAM 2: North elevation showing terra cotta unit pieces.

(26) TOWER NORTH ELEVATION

LEGEND

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REPLACE IN-KIND

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Overall, the project was forecasted to take approximately eight months to complete. The first step on any project is to navigate through the submittal phase. Specifications were very explicit on means, methods and materials proposed for use. Unfortunately, there were many conflicts between what was bid and these subsequently added documents. Submittals were issued comprised of technical data and safety data sheets for all products. In addition, details of each specification section were required to be issued. In other words, every specification had to have materials, manager/worker qualifications, quality control program, mock-ups, samples, warranties, all outlined. The Level of detail resulted in a significant challenge. Submittal manuals were issued, rejected, and reissued multiple times before acceptance. Formatting, wording, and logic were all conditions of acceptance. It took approximately four months to navigate through this formal paperwork process.

As stated, TCU replication required approximately a sixto-seven-month lead time. The first step was to do a site survey (tap and map) to confirm if what is on the drawings is accurate (*Diagram* 2). Since a crane was not employed to confirm existing conditions, binoculars were used by the preservationist. For the most part, TCU replacement units were located at the lower corners of the Bell Tower, and the quantity was close to the allowance. Replication can be accomplished in multiple ways: extraction, photogrammetry, or simply field measurements. Accuracy is critical but decreases from option to option. In this case, WxP was instructed that absolutely no TCU would be removed from the site. As such, WxP relied completely on their field measurements and CAD drawings. Fortunately, most units needing to be replaced were corner ashlars not possessing ornate profiles. TCU phases included research and development (shop drawings, color match, lab test); molds and modeling; extraction; and replacement using appropriate anchorage. Final cost was determined based on number of molds (12 each) and replacement units (41 each). In the end, final TCU cost was close to budget.

1st Baptist Church - Terra Cotta Summary						Separate Price - Owner Stock (one of each mold type)
Molds (12 each)	North	South	East	West	Total	
A	7	7	0	0	14	1
В	3	2	0	0	5	1
CL(eft)	3	0	1	1	5	1
CR(ight)	3	1	0	0	4	1
DL(eft)	0	0	1	0	1	1
DR(ight)	0	0	1	0	1	1
E	1	0	1	0	2	1
FL(eft)	1	1	0	0	2	1
FR(ight)	1	1	0	0	2	1
G	0	0	1	1	2	1
Н	1	0	0	0	1	1
I	0	0	1	1	2	1
		PIECES NEEDED FOR REPLACEMENT			41	12
					41	

DIAGRAM 2: North elevation showing terra cotta unit pieces (continued)

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During the manufacturing of TCUs, WxP proceeded to complete all other work. However, prior to performance of any work, a series of mock-ups had to be completed with the approved products and mechanics. Mock-ups included cleaning, paint stripping, pointing (Photo 4), patching, glaze touch-up (Photo 5), lead tees for skyward facing joints (Photo 6), and sealant. Once released, scope was managed intensely since the final contracted work excluded many items perceived necessary from the initial design-build assessment. Items such as patching credits were applied to additional pointing needs; and adds were issued for paint stripping, TCU glaze touch-ups, in-wall corroded steel prep, and concrete repairs to the Bell Tower intermediate slab (Photo 7). Unforeseen(s) included having to replace a TCU urn damaged during construction and remove graffiti made from trespassers. All items resulted in a net add to the contract of less than 10%. Façade repairs were completed within the allotted timeframe.

Overall, the work possessed greater administrative versus construction challenges. In the end, the owner received a quality product preserving this historic structure for years to come (*Photo 8*). Our firm wishes to acknowledge the dedication and commitment of our Triad Regional Manager, Robert McDowell, who was instrumental in achieving these results.



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About the Author

Jed Daniel P.E. has a Bachelor of

Science degree in **Civil Engineering** from North Carolina State University and is a licensed general contractor plus a professional engineer (PE). His 42 years of experience encompasses structural steel design, general contracting sales management and executive positions in the waterproofing/ restoration industry. Jed is currently General Manager for

WxProofing LLC (contractor) and in charge of overall operations for three offices in two states. He is very active in both charitable and professional organizations. Jed is a long time and active member of Sealant, Restoration and Waterproofing Institute including serving as its president. He was instrumental in the creation of the SWRI Foundation and the Trinity Award program. You can reach Jed at jdaniel@wxproofing.com.

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PHOTO 8: Completed project.