NORTH CAROLINA STATE HISTORIC PRESERVATION OFFICE
Office of Archives and History
Department of Cultural Resources

NATIONAL REGISTER OF HISTORIC PLACES

Church of Saint Lawrence – additional documentation

Asheville, Buncombe County, BN0007, Approved 5/11/2010
Nomination by John Toms
Photographs by John Toms, August 2009

Overall view

Side and rear view

NPS Form 10-900
(Oct. 1990)

OMB No. 10024-0018

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in *How to Complete the National Register of Historic Places registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name Church of Saint Lawrence – additional documentation

other names/site number Basilica of Saint Lawrence

2. Location

street & number 97 Haywood Street ☐ not for publication N/A

city or town Asheville ☐ vicinity N/A

state North Carolina code NC county Buncombe code 021 zip code 28801

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this ☒ nomination ☐ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set for in 36 CFR Part 60. In my opinion, the property ☒ meets ☐ does not meet the National Register criteria. I recommend that this property be considered significant ☒ nationally ☐ statewide ☐ locally. (See continuation sheet for additional comments.)

Signature of certifying official/Title Date

North Carolina Department of Cultural Resources
State or Federal agency and bureau

In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. (☐ See Continuation sheet for additional comments.)

Signature of certifying official/Title Date

State or Federal agency and bureau

4. National Park Service Certification

I hereby certify that the property is:

	Signature of the Keeper	Date of Action
☐ entered in the National Register. ☐ See continuation sheet		
☐ determined eligible for the National Register. ☐ See continuation sheet		
☐ determined not eligible for the National Register		
☐ removed from the National Register.		
☐ other, explain		

Church of Saint Lawrence
Name of Property

Buncombe County, North Carolina
County and State

5. Classification

Ownership of Property
(Check as many boxes as apply)

- ☒ private
- ☐ public-local
- ☐ public-State
- ☐ public-Federal

Category of Property
(Check only one box)

- ☒ building(s)
- ☐ district
- ☐ site
- ☐ structure
- ☐ object

Number of Resources within Property
(Do not include previously listed resources in count)

Contributing	Noncontributing	
0	0	buildings
0	0	sites
0	0	structures
0	0	objects
0	0	Total

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing.)

N/A

Number of Contributing resources previously listed in the National Register

2

6. Function or Use

Historic Functions
(Enter categories from instructions)

RELIGION / Religious facility

Current Functions
(Enter categories from instructions)

RELIGION / Religious facility

7. Description

Architectural Classification
(Enter categories from instructions)

Late 19th and 20th Century Revivals
Other: Spanish Baroque Revival

Materials
(Enter categories from instructions)

foundation STONE / Granite
walls BRICK
TERRA COTTA
roof METAL / Copper
other STONE / Limestone

Narrative Description
(Describe the historic and current condition of the property on one or more continuation sheets.)

8. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

☐ **A** Property is associated with events that have made a significant contribution to the broad patterns of our history.

☐ **B** Property is associated with the lives of persons significant in our past

☒ **C** Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity who's components lack individual distinction.

☐ **D** Property has yielded, or is likely to yield, information important in prehistory or history.

Areas of Significance
(Enter categories from instructions)

Architecture
Engineering

Period of Significance
1909

Criteria Considerations
(Mark "x" in all boxes that apply.)

Property is:

☒ **A** owned by a religious institution or used for religious purposes.

☐ **B** removed from its original location.

☐ **C** moved from its original location.

☐ **D** a cemetery.

☐ **E** a reconstructed building, object, or structure.

☐ **F** a commemorative property

☐ **G** less than 50 years of age or achieved significance within the past 50 years.

Significant Dates
December 17, 1909

Significant Person
(complete if Criterion B is marked)
N/A

Cultural Affiliation
N/A

Architect/Builder
Guastavino, Sr., Rafael
Guastavino, Jr., Rafael

Narrative Statement of Significance
(Explain the significance of the property on one or more continuation sheets.)

9. Major Bibliographical References

Bibliography
(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS):

☐ preliminary determination of individual listing (36 CFR 67) has been requested
☒ previously listed in the National Register
☐ Previously determined eligible by the National Register
☐ designated a National Historic Landmark
☐ recorded by Historic American Buildings Survey # _____
☐ recorded by Historic American Engineering Record # _____

Primary location of additional data:

☐ State Historic Preservation Office
☐ Other State Agency
☐ Federal Agency
☐ Local Government
☐ University
☒ Other
Name of repository:
Basilica of Saint Lawrence, Archives

10. Geographical Data

Acreage of Property Approx. 1 acre – no boundary change

UTM References
(place additional UTM references on a continuation sheet.)

	Zone	Easting	Northing		Zone	Easting	Northing
1				3			
2				4			

☐ See continuation sheet

Verbal Boundary Description
(Describe the boundaries of the property on a continuation sheet.)

Boundary Justification
(Explain why the boundaries were selected on a continuation sheet.)

11. Form Prepared By

name/title John F. Toms, Archivist
organization Basilica of Saint Lawrence date April 5, 2010
street & number 115 Wild Cherry Road telephone (828) 252-9329
city or town Asheville state N. C. Zipcode 28804

Additional Documentation

submit the following items with the completed form:

Continuation Sheets

Maps

A **USGS map** (7.5 0r 15 minute series) indicating the property's location

A **Sketch map** for historic districts and properties having large acreage or numerous resources.

Photographs

Representative **black and white photographs** of the property.

Additional items
(Check with the SHPO) or FPO for any additional items

Property Owner

(Complete this item at the request of SHPO or FPO.)

name Roman Catholic Diocese of Charlotte
street & number 1123 South Church Street telephone 704-370-3333
city or town Charlotte state N. C. zip code 28203

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listing. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C. 470 *et seq.*)

Estimated Burden Statement: Public reporting burden for this form is estimated to average 18.1 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, P. O. Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Projects (1024-0018), Washington, DC 20303.

NARRATIVE DESCRIPTION

The original 1976 National Register Nomination for the Church of Saint Lawrence provided a full exterior description of the building. However, some interior areas and elements were not discussed, and are described in this amendment. These areas are the basement of the church, the sacristy, the northeast tower stair leading from the basement up to the main floor and second floor sacristy areas, and the front corner towers' staircases. All of these areas exhibit what Guastavino termed "cohesive construction," also known as timbrel or Catalan construction.

The design of Saint Lawrence employs cohesive construction in every horizontal surface of the building. The 1976 text refers to the dispersal of gravitational forces across the surface of a dome or vault using this technique. With cohesive construction, vaulting or domes are employed in supporting floors, ceilings, and stairs; the vaulting can be steep or shallow, depending upon its function. The masonry material consists of terra cotta tiles, generally about 12" long and 1" thick. The tiles are embedded in mortar, in layers, in such a way as to stagger the joints. An essential component of this construction is its curvature, based on parabolic and catenary configurations. Although usually only two to three tiles thick in the majority of applications, the resulting vaults are exceptionally strong. Further details of this process are provided in Section 8.

The basement, a large meeting space, is entirely timbrel construction. The space is finished, except for a small area below the vestibule. Partially excavated, this smaller space is walled off from the rest of the basement space, from the south façade foundation wall approximately twenty five feet inward, with a dirt floor about four feet above the finished floor of the main basement. Throughout the excavated and unexcavated basement space, the flooring of the nave above is supported by shallow ceiling vaults with cross tile ribs, resting on stone piers. The piers were later faced with tiles and brick during basement renovations in the 1930s, described in further detail under "Alterations, Preservation, and Usage." The massive stone foundation walls are visible on both the exterior and interior. With no plastering placed over the structural tiles, or finish tiles similar to those covering the various surfaces of the main floor and dome above, the structure of the uncovered cohesive construction arches, ribs and vaults can clearly be seen.

The main sacristy, located at the north end of the building behind the apse, has a rib vaulted timbrel ceiling, similar to the vestibule, supporting the floor of the second-floor sacristy space above. This second-floor sacristy space also contains a similar rib vaulted ceiling. Cabinetry changes and other alterations were made to the sacristy in 1969, further described under "Alterations, Preservation, and Usage."

In his article, "The Transfer of Thin Vaulting from Spain to America,"[1] George Collins describes variants of cohesive construction stair vaulting, which is used to support stair treads. Where each vault contacts the inner wall of its stair tower, it traces a parabolic (or catenary) arc. The supporting vault itself moves up and out from that curving line of contact, as a curving surface, where it simply terminates with no further support, as if ending in mid-air. Collins depicts the method by which the treads were placed on the thin vaults, which generally consisted of two to three tile layers in staircases. In squared Guastavino stair wells, at the turns, each succeeding flight seems to spring from the unsupported edge of the one below. In a variant of this, at the turns, pendentive corners extend the parabolic vault downward at the soffits into the corners, similar to a

[1] Collins, George R. "The Transfer of Thin Vaulting from Spain to America," *Journal of The Society of Architectural Historians*, XXVII No.3, October, 1968, pp. 176-201.

pendentive supporting a dome; the space that is thus created is filled to support the treads laid above. In circular stair wells, the "spiral," "elliptical," or "helical" stair ascended in a strikingly thin, continuous, flowing arc. In this same article Collins also describes how the elder Guastavino conducted and published various tests of these stair vaults, which demonstrated their great strength and reliability.

The northeast stair rises in two main sections, from the basement to a landing at the sacristy on the main floor, and from there to the second floor sacristy space. In each section, the first flight of the stair, with steeply-arched supporting vaulting, curves upward, attached to the curving surface of the wall, with its finished brick treads positioned in an ascending "half-helix" pattern. This curving flight terminates with its top edge resting on the bottom edge of a second flight. The second flight, also supported with timbrel vaulting, is attached against an adjoining straight wall. This distinctive configuration is repeated at the second level. Remnants of an original temporary wooden form and bracing can be seen in this stairway. The bracing is at the base of a vault where it leaves the wall, consisting of a simple wooden board held in place by three small mounds of plaster. Once the mortar had set, cohesive construction stairs were self-supporting, independent of the walls. At Saint Lawrence, this self-supporting characteristic is demonstrated in short portions of the stair towers, where the vaulting continues past window openings with no attachment on either side. After a short curing time, normally the wood bracing would have been removed, along with the remaining form located at the ceiling at the top of the second flight.

The stairs in the two square stair towers flanking the facade rise through three levels, each level containing three flights: from the main floor to the level of the choir; from the choir to the level of the exterior main roof aprons below the dome (with access to those aprons through adjacent low windows); and from that level reaching beyond the tower base into the space inside the round-arched openings at the second tier of the upper tower. Each flight is supported on the curving vaults, most of which have shallow pendentive corners. In the western tower the vaulting, varying two to three tiles thick, carries treads constructed of brick and tile. The vaulting adapts to variations in landings and doorways, where the length and connections of the flights of stairs change as they ascend. The exposed soffits are configured to these flights, tracing the associated catenary curves where they attach to the outer walls, and forming differing pendentive angles where they meet the corners. A robust example of the cohesive construction stair with its tile work exposed, it has served as the only operative access to the choir and other balconies.

The eastern tower is a mirror of the western one, with the stair vaulting rising to the second tier of the upper tower, identical except that it lacks stair treads through all of its flights past the choir level. The resulting exposed timbrel construction on both surfaces of the plain vault constitutes a valuable study of Guastavino technique. Other evidence of incomplete construction is exposed in the same tower, such as shallow wall mortises formerly used to position workers' platforms.

Stair rails consist of simple metal piping along the flights of the western and northeast towers. Portions of the western and eastern towers, respectively, from the main floor up to their landings at the level of the choir, are enclosed with tile paneling along the inner side of each flight, to the height of a railing. The eastern tower, incomplete and lacking treads above the choir landing, has likewise never had railings.

Alterations, Preservation and Usage

Section 7 and Section 8 of the 1976 National Register nomination state that the building had been "renovated," referring particularly to 1968 changes near the main altar. In actuality, the building has never been renovated. Alterations to the

building, including those of 1968, have been minor. The following chronology of the building's alterations discusses this in further detail.

Though the north portion of the basement and the stone foundation is above ground level, and was always excavated on the interior, the central and south portion of the space was only partially excavated until the 1930s. Limited earth removal and further finishing of the tiled floor, from the center southward, was completed at that time, as described above. In the large central space at the north end below the sacristy, positioned against the prominent rockwork of the foundation walls, there are now kitchen fixtures serving the main meeting area, which replace other fixtures dating from the 1940s when the basement was being used as a USO facility. There has been no alteration of the stone, or the original wood window and door framing. Adjacent to the building's past and current furnace area (northwest), restrooms with light wooden (reversible) partition walls were placed within the foundation areas below the Marian chapel. As stated, it was at this time that the stone piers received a brick and tile finish. [2]

Also in the 1930s, two doorways were created on the west side of the main floor of the church: one entering into the southern portion of the nave, and the second entering near the door to the Guastavino tomb at the southern end of the Marian chapel. The door which enters the nave pierced a small semicircular floor area which had contained the confessional since the construction of the church. The baptistery had been located in the opposite semicircular area, on the eastern side of the nave, until that time. To accommodate the door, the confessional was moved to the former location of the baptistery, and the baptistery was relocated to the vestibule, with the addition of the ironwork enclosure described in the 1976 text.[3] The confessional structure itself, as it was moved, is unaltered. Beginning in 1990, due to liturgical changes, the baptismal font was placed at the front of the church near the Marian chapel, with no specific baptistery area; the original font remains, however, in that new position. The door created to open into the Marian chapel never required any associated rearrangements or alterations.

Reversible changes made in 1968, namely, two carpeted ambo (pulpit) areas with wrought-iron railings, placed on either side of the apse, and carpeted wooden flooring placed over the original marble steps leading up to the altar, were entirely removed about 1988. The original marble altar steps and flooring are now again uncovered. The original celebrant's chair, seen in the earliest available photographs of the building, was located. Returned to its original position, it retains a removable finial displaying the crest of the bishop at the time of construction, Bishop Leo Haid, who was a seminal figure in the history of Catholicism in North Carolina. The original pulpit could not be relocated, but one which is similar in size and outline to the original is now in the original position.

Changes in 1968 pertaining to the position of the main altar table were minimal. As a conscientious and compatible accommodation to the historical design of the building, and to liturgical needs, neither the altar paneling nor the composition of the surrounding area was disturbed. The main altar table was moved forward about ten feet, and lowered about two feet, in

---

[2] Basilica of Saint Lawrence. Parish archives. Series D1. Drawing showing grade line of earth removed, and finish details, n.d.

[3] Basilica of Saint Lawrence. Parish archives. Recorded interview, Lucille Lamy, February 25, 2005 (parishioner continuously, 1924 – present).

a visually-balanced position at the edge of the altar steps. A marble slab was positioned above it, without alteration of the original altar itself, to bring the top of the new slab to a height appropriate for the celebration of Mass. All other original components of the area, the reredos, the tabernacle, the seventeenth-century crucifixion figures, retables, etc., remain in their original positions.

In the 1970s, furnishings for vestments and for storage of liturgical objects were added to the sacristy. Two large cabinets stand independently against side walls, with another set of cabinets placed along a sink and above it, attached with thin masonry screws; no original masonry was otherwise affected. The original glazing of the two sacristy windows was transparent double-sash, but shortly after 1976 this was replaced by an arrangement of irregular multicolor glass pieces, positioned within a thick cement mortaring. The framing was not affected, and this is reversible.

The small domes described in the 1976 text which cap the facade towers, originally surfaced with colored tiling, were sheathed with copper about 1991. For many years, water and ice penetration had affected the tiling. The sheathing solved this moisture problem, and it is reversible when better treatment can be implemented in the future, to open the caps to the elements again. Of particular importance, the original tiling underneath this sheathing was left intact. The underlying colored tile pattern is specifically related to Guastavino's broader design of the building, and is discussed in Section 8. The current copper caps are visually compatible with the original copper of the main dome. The large arched openings near the top of the towers, described in the original nomination, were glazed with fixed panes at the time the tower caps were installed. This has provided further protection for the interior masonry of the uppermost portion of the towers, which had previously been left open to all types of weather.

In the early 1990s the original main entrance double-leaf door was removed rather than restored, due to weathering and some deterioration due to age. The replacement was unsuitable historically and structurally, and was removed within a few years. The present replacement, installed in 2003, is more compatible with the building and the original doors. Constructed of oak, its panel designs are patterned after the original panels.

The first paragraph of Section 7 in the 1976 text states that gypsum is used for the "brick mortar" in the building, "rather than … Portland cement." Standard mortars are, in fact, used for the vertical brick elements of the building. The mortars for the cohesive construction arches and vaulting supporting the building's horizontal surfaces were comprised of quick-drying gypsum plastering for the first tile layer, which then supported subsequent tile layers using Portland cement mortar. [4] This is described further in Section 8 in this amendment, along with the fact that a primary motive for Guastavino's move to the United States was the more consistent quality of Portland cement available in the country. [5]

---

[4] Collins, p. 177-178

[5] Austin, Peter. "The Work of Rafael Guastavino in Western North Carolina," *May We All Remember Well: A Journal of the History and Cultures of Western North Carolina*, Volume I. Asheville, N.C.: Robert S. Brunk Auction Services, Inc., 1997, p. 67. Guastavino, Rafael. *Essay on the Theory and History of Cohesive Construction Applied Especially to the Timbrel Vault*. Boston: Ticknor and Company, 1892, p. 14-17. (Hereinafter cited as "Guastavino, *Cohesive Construction* … .")

The church retains a large collection of duplicate tiles. These consist of both utilitarian, unglazed "structural," tiles (although technically, nearly all Guastavino tiling has structural functions) as well as glazed Guastavino finish tiles, for both structural and decorative functions. Among the finish tiles are duplicates of the various custom decorative tiles used in the Marian chapel and borders described in Section 8. Access at the present time makes an estimate difficult, but there are as many as 450 rough structural tiles, many of them larger sizes; possibly 400 rectangular glazed finish and structural tiles; about 150 small decorative tiles pertaining to the altar and chapel areas; and other small tiles and fragments. They are at present in secure storage.

Studies conducted in 2005 disclosed breaches in the copper sheathing of the flat areas of roofing, and other damage, all related to weather and age. At that time there were no areas of water damage found in the main dome. The weathering and other problems were not found to be severe yet, but preservation activities in the parish have recognized that prevention of future degradation is paramount. The preservation work required, including long-term stabilization along with repair of past damage, will be costly. At this time, the primary concerns are spalling of tile and brick corbelling, efflorescence, and damage to the exterior decorative elements. The many large windows will require stabilization of their wood and metal frameworks, leading, and exterior protective glazing. [6] Sensors placed in several masonry cracks have shown no movement over six years.

[6] Basilica of Saint Lawrence. Studies conducted by Wiss, Janney, Elsner, Inc., and Preservation Trades Company, September, 2005. Copy available through the Saint Lawrence parish archives.

STATEMENT OF SIGNIFICANCE

Summary of the National Significance of the Church of Saint Lawrence

This amendment to the original 1976 nomination documents the national significance of the Church of Saint Lawrence, and pertains only to the main Guastavino church building. For clarity in the following text, the proper name usage is simply, "Saint Lawrence." The Church of Saint Lawrence received the Vatican designation of Minor Basilica in1993. [7]

In addressing National Register Criteria Consideration A, religious properties, the national significance of Saint Lawrence is derived from its architectural and engineering distinctions, rather than its religious importance. The basis for the national significance of Saint Lawrence, under Criterion C, is its design and engineering by Spaniard Rafael Guastavino Sr., as primary architect and supervisor of construction, where every horizontal surface of the building utilizes Guastavino's cohesive construction (synonymously, "timbrel" or "Catalan" design and construction). Rafael Guastavino Sr., and Rafael Guastavino Jr., and their works through the Guastavino Company, are now seen to hold a preeminent and unique position in the history of American and European architecture and engineering. [8] They functioned as contractors rather than architects in their other projects in North America, with the exception of Saint Lawrence, Saint Mary Church in Wilmington, North Carolina, and a very few early buildings in New York City which are now demolished. [9] In Spain, before moving to

[7] The ecclesiastical designation as a Minor Basilica (all basilicas outside the city of Rome are termed 'Minor' Basilicas) was due to several factors, which include its Guastavino architecture and engineering, along with works of art which comprise the fixtures and furnishings of the building (e.g., the unusual seventeenth-century Spanish reredos, the windows, tiling, etc.). Saint Lawrence's founding as the first parish west of the Blue Ridge in North Carolina, from which other parishes and schools were established, along with its social history within the immediate community, are particularly significant in the history of the Roman Catholic Church.

[8] The architect conventionally named Rafael Guastavino Sr., in the United States, is in fact Rafael Guastavino II (or, Rafael Guastavino y Moreno), with a father, Rafael Guastavino. Rafael Guastavino Jr., as usually stated, is Rafael Guastavino III (or, Rafael Guastavino y Esposito). The same usage of "Sr." and "Jr." applies to the use of "elder" and younger" in generally distinguishing the two architects. Further complicating this, the elder, as Rafael Guastavino II, at times published his name using "Jr.," while the younger Guastavino published and signed his name without the use of "Jr." This can be seen, for example, in the series of patent applications published in *Journal of Preservation Technology*, Volume 30, No. 4. Albany, N. Y.: Association for Preservation Technology, 1999, in facsimile items (n.p.) following page 59, showing the legal name used in the applications by the elder, prior to his death, and the younger, after 1910. See also: Rafael Guastavino, IV. *An Architect and His Son; the Immigrant Journey of Rafael Guastavino II and Rafael Guastavino, III*. Westminster, Maryland: Heritage Books, 2006.

[9] Parks, Janet, and Neumann, Alan G. *The Old World Builds the New: the Guastavino Company and the Technology of the Catalan Vault, 1885-1962*. New York: Avery Architectural and Fine Arts Library and Ira D. Wallach Art Gallery, Columbia University in the City of New York, 1996, p. 14. (Hereinafter cited as "Parks, 1996".) Collins, p. 192. Collins' 1968 article makes observations in a note concerning possible façade remnants, in New York City, of Guastavino's ca. 1884 design of a building for Bernard Levy, whereas Parks, in 1996, refers to Guastavino's drawings of this building, in Columbia University's Avery Library, but states that the early buildings are demolished.

America in 1881, Guastavino Sr. had been held in high regard at the School of Architecture in Barcelona. His influence had been important as both the architect and engineer of prominent structures in that city, and in other parts of Spain, using timbrel construction. He had received international recognition in Europe and the United States before emigrating. A brief history of the Guastavino Company in America will further describe the contracting function of the company, a role which has been documented in the literature on the Guastavinos since the publication of the 1968 George Collins article mentioned above. Their design of components of buildings thereby evolved as their means for further implementation of timbrel architecture, collaborating with many of the leading architects of the time. The company's contracting role provides a point of comparison, to the effect that Rafael Guastavino Sr.'s design of Saint Lawrence as primary architect, his use of cohesive construction throughout, and the direct supervision he provided for the construction of the entire building, is singular in the context of the company's work in America. Guastavino comprehensively demonstrated the technical and creative principles, and possibilities, of timbrel construction at Saint Lawrence, which has been described by today's most recognized Guastavino scholar as his "crowning achievement in American building arts." [10] It is also, in a literal sense, an indigenously Spanish expression, where Guastavino's native interpretations included explicit references honoring the Renaissance timbrel architecture of Valencia, rigorous baroque design with prominent exterior corbelling, and the incorporation of the church's imposing Spanish seventeenth-century altarpiece. The prominence of Saint Lawrence in his professional life is further emphasized through various efforts he made relating to its appointments and its completion, including his largess toward the funding of the building. Guastavino died in 1908, with his son completing interior finishes, and was entombed within the building in 1909. At Saint Mary, by contrast, the elder Guastavino's design contribution is known to have been incomplete, and the degree to which this unfinished design was implemented is also unclear; Saint Mary was started after the elder Guastavino's death and was constructed without his supervision; and, at Saint Mary, there are no specific Spanish architectural precedents found in the elder Guastavino's writings which are incorporated into the building, as there are at Saint Lawrence.

Guastavino Architectural Designs and Contracting: Spain and the United States

Guastavino's "Cohesive Construction," is also interchangeably termed "timbrel" construction, and "Catalan" construction, from Catalonia, the region in Spain of its most extended development before Guastavino's work. This method of masonry construction uses various sizes of terra cotta tiles, generally rectangular, 10" to 15" long and about 1" thick, to form arches, vaults and domes. A first soffit course of tiles was set in quick-drying gypsum plaster mortar. Subsequent layers of tiles (usually two to three, sometimes more, depending on the overall size of the dome or vault), using Portland cement, were placed so as to cover or "break" the joints of the first and each subsequent layer. An equally critical aspect of the system was the carefully-calculated curvature of the vaulting, which provided its rigidity, in conjunction with the extensive surface bonding created within the mortar and tile. [11]

[10] Ochsendorf, John A. Letter dated July 15, 2009, to John F. Toms, Archivist, Basilica of Saint Lawrence, concerning the significance of Saint Lawrence. Basilica of Saint Lawrence. Parish Archives. Series MF. Ochsendorf, Associate Professor of Architecture, Department of Architecture, Massachusetts Institute of Technology (MIT), specializes in the history of masonry architecture. His remarks in the letter summarize the results of his ongoing seminal research on Guastavino. Appreciation is expressed for his information and guidance.

[11] Collins, p. 176-178.

The resulting vaults and domes were exceptionally strong, due to the 'cohesion,' or attachment, of the mortar within the tile. They were able to span greater distances than traditional stone voussoir arches and vaults, were fireproof, and unlike traditional vaults, they could withstand architectural penetrations without compromising structural integrity. The vaults were very light in weight compared to stone or brick vaulting; they exerted very little lateral thrust, and they could be used to create very low-rise floor vaults and domes (1 foot in 20 feet). No heavy wooden centering was required, with forms being needed only to indicate the shape of the vault while being built. [12] In his 1892 book, *Essay on the Theory and History of Cohesive Construction Applied Especially to the Timbrel Vault*, using the arch as an example, Guastavino describes additional advantages of timbrel construction, where problems inevitably associated with voussoir systems were avoided, such as the voussoir mortar curing time of several days duration, pressures between the voussoirs and the centering, and pressures exerted on mortar which affected the curing. Similarly, with timbrel domes, time was also immediately saved since there was no need to erect centering. Tile positioning moved inward from the perimeter, concentrically, using the system's more quickly-drying mortars, with the lightweight movable forms progressively guiding the correct curvature. As each new row of the staggered tiles was mortared into position, the highly-skilled workers were able to stand on the previous row in safety, usually in less than a day. There was almost no deflection as the mortar cured. [13]

Rafael Guastavino, Sr., was born in Valencia, Spain, in 1842. In 1861 he enrolled in Barcelona's Escola Especial de Mestres d'Obres, which had been established in 1850, and offered degrees in architecture and building. This was one of several institutions providing formal education in the profession known as "master builders" which the Spanish government had founded during the 1850s and 1860s. Generally, architects in Barcelona during this period graduated from a master builder curriculum prior to receiving their architecture degree either in Barcelona or Madrid. Before receiving his 1864 architecture diploma from the Escola, Guastavino worked as an engineer's assistant and attended classes at the Academia Provincial. In the 1870s the Escola became a polytechnic school and subsequently the School of Architecture (currently named Collegi d'Arquitectes de Catalunya). [14] During the 1860s and 70s, rapid industrialization in Catalonia and elsewhere demanded the use of new methods and building materials, particularly brick, cement, and iron. Fulfilling the emerging demands for new construction in Barcelona thus became the task of the graduating classes of architects and master builders of the era who had been educated at the Escola. [15] Guastavino's tradition was such that, from the beginning, he practiced his profession in its two aspects: functions which were more architectural in nature, such as commissions for architectural design and preparing projects for competitions; and construction projects derived through bidding which had been designed either by himself, or by others. [16] Guastavino's first building, in which he exercised both roles, was his 1866 private residence in Barcelona: "I

[12] Collins, p. 176-189.

[13] Guastavino, *Cohesive Construction* …, p. 51-56. [See note 5.]

[14] Rossell, Jaume. "Rafael Guastavino I Moreno: Inventiveness in 19th century architecture," in Tarrago, Salvador, ed. *Guastavino Company, (1885-1962), Catalogue of Works in Catalonia and America*. Barcelona, Spain: Collegi d'Arquitectes de Catalunya, 2002, p. 45-46; 48.

[15] Rossell, p. 48-49. Guastavino, *Cohesive Construction* …, p. 41.

[16] Rossell, p. 48.

tried the first experiment on myself, as a physician tries his own medicine … building a construction four stories in height, practically with no beams, using clay and cement." [17]

After this success and others, his 1869 design of the Batllo Brothers textile factory in Barcelona (and later additions in 1875) implemented cohesive construction for improved air circulation and light, as well as using the vaults to open the space for machinery. In his factory designs, the architectural planning of functions involving worker health and safety was a principal concern. At Batllo, he and the owners perceived the need for an integrated, efficient interconnection among the water supply, drainage, gas fittings, lighting and other mechanical fittings, along with pioneer improvements in the work environment. Guastavino's architecture supported the owner's services offered to the employees, which were remarkable for that time, including a child care center, dining rooms with adjoining kitchens, spacious changing rooms, a school and summer camp for workers' children, the highest wages in the city, sick pay, and safety measures to minimize accidents. [18]

As Guastavino continued to succeed in these earlier projects, he was concerned about the scientific testing and description of his system. In 1893, writing about his designs of this early period, he observed, "all these works were almost empirical. The thickness of the arches was determined by intuition and practice." He considered it necessary to "satisfy the sciences with these [projects]. … Can we have any guarantee [of the system] by these alone?" [19] In 1871 Guastavino visited a natural cavern carved by the Jalon River in Spain, describing it as an "immense room … where this colossal space was covered by a single piece, forming a solid mass of walls, foundation and roof, and was constructed with no centres or scaffolding and especially without the necessity of carrying pieces of heavy stone and heavy girders or heavy centres; all being made of particles set one over the other, as nature had lain them. … This grotto is really a colossal specimen of cohesive construction. … Why have we not built in this system?" [20]

As he continued to design buildings and develop timbrel architecture, he gained a certain renown for his work, in Spain and internationally. Major expositions of his work were held in Barcelona in 1871, 1872, and 1876, and architectural publications of the time included residences which he designed and constructed. His work was displayed at the 1873 World Exposition of Vienna. In the United States, he received a bronze medal *in absentia* for architectural designs he had submitted for the 1876 Philadelphia Exposition. [21] Later recognition, in 1893 after his move to America, included his design, commissioned by the Spanish government, for the Spanish Pavilion at the World's Columbian Exposition in Chicago; the

---

[17] Guastavino, Rafael, *Cohesive Construction.…*, p. 15.

[18] Tarrago, Salvador. "Consideracions [sic]on Guastavino's work in Catalonia," in Tarrago, Salvador, ed. *Guastavino Company, (1885-1962), Catalogue of Works in Catalonia and America*. Barcelona, Spain: Collegi d'Arquitectes de Catalunyaa, 2002, p. 7. Other mill owners resented these innovations, culminating in political unrest and an 1889 bomb explosion at an entrance to the Batllo complex; after then, the building was never used again as a factory, but was used for other functions.

[19] Guastavino, *Cohesive Construction* …, p. 16.

[20] Guastavino, *Cohesive Construction* …, p. 12-13.

[21] Rossell, p. 47, 50. Collins, p. 190-192.

project was also published in *American Architect and Building News*. [22] At that same exposition, he addressed the Fourth International Congress of Architects, and later provided a written presentation for the Sixth International Congress of Architects in Madrid in 1904. In Barcelona, students and faculty at the School of Architecture had been visiting his projects as early as the construction of the Batllo factory. [23] The famous Antonio Gaudi (1852-1926) and other architects who studied at the school in the 1870s received much of their inspiration and engineering knowledge from Guastavino's oeuvre. [24] The Batllo factory addition of 1875 and Barcelona's Julia House of 1874 were precedents for Gaudi and the early twentieth-century *modernisme* movement in Catalonia. [25] Before he had left Barcelona in 1881, Guastavino had designed and built approximately twenty-five structures in Catalonia, including factories, warehouses, apartments, residences and theaters. [26]

He remained concerned at that time, as an architect, that scientific description and verification of the stability and strength of cohesive construction had not been achieved due to a lack of consistent quality of mortar, a problem which, as he perceived, had historically impeded the full development of timbrel architecture. The consistent quality of Portland cement which had by then become available in the United States was a means to continue the development of the system, to further its testing, and to demonstrate its reliability and considerable advantages. [27]

Guastavino moved to New York City in 1881 with his son, also named Rafael (1872-1950). At the time of his arrival, he found it difficult to establish an architecture practice, notwithstanding his reputation in Spain and Europe, his 1876 Philadelphia Exposition award, and his letters of introduction. In 1883 he won the competition for the design of the Progress Club in New York City, which he then carried out in collaboration with one of the members of the selection committee. The same year he designed and constructed two fireproof apartment buildings on lots he had purchased in the city, and in the following two to three years designed some private houses, apartments, and a synagogue on Madison Avenue. In 1886 Guastavino lost the competition for the design of the Arion Club in New York City, but received a contract for the design of its floor vaults. None of these structures are now standing. [28] One of his clients, Bernard Levy, assisted Guastavino in successfully applying for patents on various aspects of his construction processes in 1885, and in following years. From then onward, in the United States, the Guastavino Company collaborated with numerous architects constructing specific building components such as ceilings, stairs, domes, and supporting structures for flooring, which it alone could build, in many of the era's most important buildings.[29]

---

[22] Collins, p. 196.

[23] Parks, 1996, p. 14. (See note 9.)

[24] Collins, p. 191.

[25] Ochsendorf, p. 1-2.

[26] Rossell, p. 47.

[27] Guastavino, *Cohesive Construction* …, p. 42-44.

[28] Collins, p. 192. (See, in particular, note 47.) Parks, 1996, p. 14. Parks observes that these buildings are now demolished.

[29] Parks, 1996, p.14.

Guastavino wrote of this period, that the precaution of "Nearly five years … spent in studying American methods, materials and facilities" was "absolutely necessary." He described how "the cement is the essential part …" and that for reasons of worker safety, the time constraints in construction contracts, and other factors, "it was necessary to know exactly with what kind of material I was going to work, and in what condition." When he first arrived, he recounted, "explanations were given to interest prominent architects and builders, but some seemed to take the matter as a dream, or as if I was a visionary." He knew that the acceptance of the system depended on scientific testing, but he could not perform tests unless "we can depend upon the materials with mathematical regularity." After his early buildings and designs, the publication of some of his first projects in New York, and his ongoing study of the process, he wrote that he was then "in a position to begin … a series of tests and experiments." [30]

As Guastavino published the scientific testing and description of his structural system in the late 1880s and 1890s, it became widely accepted and his practice expanded. In 1889, his specifications for arches were published in *Engineering News*, and later testing was conducted on the reaction of the masonry to fire, its load-bearing capacities, and the properties of various tile processes. [31] That same year the business was reorganized, and the Guastavino Fireproof Construction Company was incorporated; it was later established as the R. Guastavino Company in 1897. [32] The company advertised in major architectural journals, where examples of their various projects and the information derived from the testing of their systems were made available. [33] Guastavino quickly gained the confidence of many of the best American architects of his time. His clients came to include Bertram Goodhue; Ralph Adams Cram; Warren and Wetmore; Richard Morris Hunt; Carrere and Hastings; McKim, Mead, and White, and many others. [34] His collaboration with the latter firm for the Boston Public Library, which included first floor structural vaulting and the building's broad vaulted ceilings (completed 1892), provided a considerable amount of publicity for the company, and firmly established his American reputation. Guastavino was invited to lecture in Boston, including the Society of Arts at the Massachusetts Institute of Technology, in 1889 and 1890. The lectures were published in *American Architect and Building News*, and were later incorporated into Guastavino's book, *Cohesive Construction* …, mentioned above, published in 1892 and 1893, the same year as his address to the Fourth International Congress of Architects and his architectural commission for the Spanish Pavilion at the Chicago World's Columbian Exposition. [35] Over several decades, in their role as collaborators, the influence of the Guastavinos on a great many of the period's important architectural spaces was thus as broad as that of the principal architects. As Collins characterized these contacts, the elder Guastavino "was more frequently consulted than advised by architects with whom he worked." [36]

---

[30] Guastavino, *Cohesive Construction.…*, p. 17-19; 43.

[31] Collins, p.193-94.

[32] Collins, p.194.

[33] Collins, p.196.

[34] Parks, 1996, p.11.

[35] Collins, p. 194. Guastavino, *Cohesive Constriction* ….

[36] Collins, p. 192-96.

Guastavino came to Asheville as a contractor under architect Richard Morris Hunt, for George Vanderbilt's Biltmore Estate (NHL, 1968), in 1894. In that same year he began development of what soon became his own thousand-acre estate, named Rhododendron (NR, Rafael Guastavino, Sr., Estate, 1986). It was located eighteen miles east of Asheville outside the town of Black Mountain and was his residence for fourteen years, until the time of his death.

Beginning in the early 1890s, the younger Guastavino was traveling extensively to supervise the company's construction projects and managing the offices in New York and Boston. He had attended private and public schools in his earlier years, and practiced drafting in his father's office beginning around age thirteen. Over several years, along with his other responsibilities in the office, he mastered the engineering system of graphic statics, the analytic science of masonry stresses. This classic vault theory was used by Guastavino Sr., Gaudi, and others, in their engineering of timbrel vaulting. The younger Guastavino's entry in the annual design competition of the Architecture League of New York won the first-place gold medal, in 1895. [37] After the establishment of the Rhododendron estate, the elder exercised general control of the company from there, and the younger was managing nearly all projects on-site. [38]

As it grew and the number of its projects increased, and as cohesive construction continued to evolve technically and aesthetically, the company experienced difficulty among suppliers in locating various types of tiles of consistent quality which were shipped on time. The problem was compounded when there was a need for glazed, colored tiles. As with mortars, the reliance on tile "materials with mathematical regularity" was equally important in advancing the system. By 1898, the younger Guastavino joined his father at Rhododendron to assist in establishing tile experimentation and development facilities, including production-sized kilns. [39] Work continued at Rhododendron until the company established a larger tile production facility in Woburn, Massachusetts, in 1900. [40]

After the death of the elder Guastavino in 1908, according to Collins, Rafael Jr. carried on the work so efficiently that some of their clients did not notice there had been two different individuals running the company - the change in management from father to son, in terms of its general effect, appeared effortless. [41] After the completion of Saint Lawrence and its extensive decorative tile elements, and as the result of working with projects designed by the firm of Cram, Goodhue, and Ferguson, the younger Guastavino began to develop acoustical tiles in collaboration with Harvard physicist Wallace C. Sabine. Sabine

---

[37] Guastavino, Rafael, IV. *An Architect and His Son; the Immigrant Journey of Rafael Guastavino II and Rafael Guastavino, III*. Westminster, Maryland: Heritage Books, 2006, p. 39. (Herinafter cited as "Guastavino, Rafael IV").
Collins, p. 192.

[38] Austin, p. 71.Collins, p. 195.

[39] Parks, p. 23. Guastavino, Rafael IV, p. 45.

[40] National Register Nomination. Rafael Guastavino, Sr., Estate, also known as Rhododendron, 1989, Section 8, p. 4.

[41] Collins, p. 199.
A Guide to the History, Art and Architecture of the Church of Saint Lawrence, Asheville, North Carolina. Asheville, N.C.: [Saint Lawrence Parish], 1923, p. 28. (Hereinafter cited as, *Guide to ... Saint Lawrence*.)

and Guastavino Jr. first patented an acoustical tile with the trade name, Rumford, in 1914, with a unique pore structure as its main feature, followed by a 1916 patent for an improved, financially successful, acoustical tile, trade-named Akoustolith. [42] Chronologically, the tile work at Saint Lawrence stands between the company's first production and experimentation at Rhododendron, and the younger Guastavino's pioneering efforts in his work with Sabine. The decorative tile of the church was one of the company's more ambitious projects at that time, where the figurative components are large and were difficult to execute. [43] This tile work is described in more detail in the subsequent specific discussion of Saint Lawrence.

The Guastavino Company was closed in 1962. The company's work had been incorporated into over 1,000 structures in North America. [44] In that year, its records were acquired for Columbia University in New York by the late Professor George Collins. An authority on Spanish architecture and the famed buildings of Gaudi, in 1968 Collins published the article cited above, titled "The Transfer of Thin Vaulting from Spain to America," in *The Journal of the Society of Architectural Historians*. He described visiting buildings listed in the company records, to photograph and inventory them.[45] In the years following their acquisition, the project records and other company documents were arranged and stored at Columbia University's Avery Architectural and Fine Arts Library. Janet Parks, the Avery Library Curator, published a 1999 article concerning the contents and arrangement of the Guastavino Company records and related holdings. In it, she details several problems concerning the collection's use as an inventory of all of the company's projects. As would be expected, it is the most vital single source of information, but its records are incomplete in several ways. [46]

Parks discusses the purging of significant portions of the records before the 1962 Collins acquisition, including components of the project files. As an inventory of company projects, the most complete source is the accumulation of factory order cards from the company's tile production at the Woburn factory, beginning in 1900. [47] These records document work at Saint Lawrence by listing tile shipments for its construction, from September, 1907, through December, 1908. There are no other items concerning the construction of Saint Lawrence, such as drawings or correspondence, in the collection. [48] In the

---

[42] Pounds, Richard; Raichel, Daniel; and Weaver, Martin. "The Unseen World of Guastavino Acoustical Tile Construction: History, Development, Production," *Journal of Preservation Technology*, Volume 30, No. 4. Albany, N. Y.: Association for Preservation Technology, 1999, p. 33-37.

[43] *Guide to ... Saint Lawrence*, p. 28, 31. This 1923 publication was compiled by parishioners who had known the Guastavino family over a period of time. The description, such as is, of the extensive firing and glazing processes would seem to be in the context of information given by them or the Company.

[44] Parks, 1996, p. 11.

[45] Collins, p. 200.

[46] Parks, Janet. "Documenting the Work of the R. Guastavino Company: Sources and Suggestions," *Journal of Preservation Technology*, Volume 30, No. 4. Albany, N. Y.: Association for Preservation Technology, 1999, p. 21-25. (Hereinafter cited as, Parks, 1999.)

[47] Parks, 1999, p. 21-22.

[48] Information provided by Professor John A. Ochsendorf, MIT School of Architecture, Guastavino Project, correspondence dated July 6, 2006, concerning the tile factory order records of the Guastavino Company archives at Columbia University.

same article Parks reiterates that the company "specialized in parts of buildings," describing their use in "interior spaces." [49] In another publication, she identified Saint Lawrence and Saint Mary Church in Wilmington, N. C. as Guastavino-designed architecture. [50]

The location, documentation, and publication of information concerning Guastavino vaulting has increased in more recent years in the United States and Spain. A prominent exhibition on Guastavino vaulting at Columbia University in 1996 brought together much of this interest, including the publication of an annotated exhibition catalog by Janet Parks and Alan Neumann titled, *The Old World Builds the New: the Guastavino Company and the Technology of the Catalan Vault, 1885-1962*, published by Columbia University's Avery Architectural and Fine Arts Library and the Ira Wallach Art Gallery. [51] This exhibition traveled to Washington, D.C., Pittsburgh, and Spain. The documentation of extant work in New York City also includes a widely-accessible walking tour and guide to over 230 Guastavino constructions of various types, published under the auspices of Columbia University.[52] Some preserved and restored New York examples of buildings containing Guastavino vaulting, such as the Oyster Bar in Grand Central Station and Ellis Island, are known to a broader public. In Boston, where there are approximately sixty-five buildings containing Guastavino work, the Department of Architecture of the Massachusetts Institute of Technology is providing documentation through their Guastavino Project, sponsored by the Building Technology Department. There, the study of timbrel construction, led by Professor John Ochsendorf, has been widened to include Guastavino projects throughout the United States and Spain.[53] Other published research on Guastavino has examined his work and life in Asheville and western North Carolina.[54] In Spain, there has been a corresponding interest in the design work of the elder Guastavino in Barcelona and its nineteenth-century Catalonian context, and the ensuing work

---

[49] Parks, 1999, p. 24.

[50] Parks, 1996, p.17-19; 30.

[51] Parks, 1996

[52] Parks, Janet, and Neumann, Alan. *The Old World Builds New York: Guastavino Construction in Manhattan, 1886-1954; A Walking Tour Guide*, 2nd Edition. New York: The Trustees of Columbia University in the City of New York, 2000, n.p. (Hereinafter cited as, Parks, 2000). The New York Landmarks Conservancy has also made expert advice available to the public concerning the appropriate maintenance of Guastavino constructions.

[53] Program in Building Technology, Department of Architecture, Building 5-418, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139-4307: publicly posted information on the Program in Building Technology. (Additional information concerning Ochsendorf's work is in note 10.)

[54] Austin; Fowler, Ann, "The Mark of the Builder: Rafael Guastavino's Masonry in Asheville, North Carolina," *ARRIS Journal of the Southeast Chapter of the Society of Architectural Historians*, Vol. 2. Atlanta, Georgia: Southeastern Chapter of the Society of Architectural Historians, 1991, p.43-58; *Rafael Guastavino: Barcelona to Black Mountain*. Asheville, N. C.: Asheville Art Museum, 2001 (Exhibition catalog; surveys Guastavino Company projects in other North Carolina cities); National Register Nomination. Rafael Guastavino, Sr., Estate, also known as Rhododendron, 1989.

in the United States.[55] This information documents the fact that, in spite of the elder Guastavino's influence and prominence as an architect and engineer in Spain, in the United States the role of the Guastavino Company was largely that of engineer and builder. Concurrently, the Guastavinos were the creators of architectural spaces that would have been aesthetically and technically impossible without their insights, and their work has not been replicated.

Saint Lawrence: Rafael Guastavino Sr., Architecture and Engineering

Guastavino planned to construct a family burial chapel at Rhododendron soon after his move there, and his farming staff initiated a gradual process of collecting large stones from the property to use in its foundation. [56] He published the drawings for the building, which included a thirty-foot dome and a choir loft, in the *American Architect and Building News* in 1896. [57] The timing and nature of his first contacts with Saint Lawrence parish are unclear. At the time he moved to Black Mountain, his initial involvement with the congregation was apparently limited due to his recent civil second marriage, which had not yet been recognized by the Catholic Church. Eventually the impediments were resolved and a strong relationship with the parish developed. [58] Abbot Leo Haid, the Vicar Apostolic (Bishop) of North Carolina from 1888 until 1924, later described how Father Peter Marion, the pastor he had appointed to Saint Lawrence in 1895, had "conceived the idea of a new church" shortly after his arrival, due to the very small size of the existing building. [59] In another more extended account, Haid stated that, after Guastavino's move to Rhododendron, he drew designs for "an edifice which would symbolize the indestructibility and beauty of …the religion he loved." Haid said that, following these early designs, "… years pass; [they are] admired in the parish home and the abbey; but the task is too great" for Father Marion, alone, to undertake the fundraising and construction requirements for the building. "Convinced that what one cannot accomplish, two may do," Haid appointed a second priest to the parish, Father Patrick Marion, Peter Marion's younger brother. Subsequently the work was begun, "under the tutelage of the celebrated architect," with Patrick Marion making a study of architectural drawings and construction methods in order to serve as Guastavino's foreman. [60] Parish sacramental records show that Patrick Marion was established at Saint Lawrence by April, 1903. [61]

---

[55] Tarrago, Salvador, ed. *Guastavino Company, (1885-1962), Catalogue of Works in Catalonia and America*. Barcelona, Spain: Collegi d'Arquitectes de Catalunya, 2002.

[56] Guastavino, Rafael, IV, p. 52.

[57] *American Architect and Building News*, February 29, 1896, p. 1053.

[58] Guastavino, Rafael, IV, p. 51-52.

[59] *Asheville Citizen*, October 18, 1909.

[60] Hintemeyer, Felix, Fr., OSB, "Rev. Peter G. Marion's Jubilee," *The Belmont Review*. Belmont, N.C.: Belmont Abbey College, June, 1917, p. 324-25. The article incorporates the entire text of Haid's sermon for the celebration, held on May 9, 1917, with much of the sermon being an account of the roles of Guastavino and the Marion brothers in the building.

[61] Basilica of Saint Lawrence. Parish office, baptismal and marriage records.

In that same year Guastavino produced the earliest known drawing for Saint Lawrence, at present in the Saint Lawrence parish archives in Asheville, North Carolina. Dated October, 1903, and bearing Guastavino's title block, it is simply captioned "General Plan" (Exhibit 1). Although in English, it includes Spanish turns of phrase with lettering similar to the title block ("Sagrary," a relic chapel common in Spain but not America; "Parrochial Church of San Lorence"). As it was finally constructed, the plan of Saint Lawrence follows this 1903 drawing systematically, maintaining its overall proportions, oval dome and nave, chapel spaces, choir, sacristy, and stairs. Later alterations to the 1903 drawing were limited to minor changes in the pulpit position and immediate altar area, and entrance details. [62]

Although there are no drawings or items pertaining to the construction of Saint Lawrence among the Guastavino Company records at Columbia University, other than the previously mentioned tile factory order cards, a few drawings in addition to the 1903 General Plan are in the Saint Lawrence Parish archives. The parish collection also includes ledgers recording expenditures and receipts during the construction of the building, and these begin in October, 1905, closely concurrent with the earliest extant drawing date after the 1903 General Plan (in September, 1905). In addition to Guastavino title blocks, many drawings also bear the title block of Richard Sharp Smith, an Asheville architect who had worked with Guastavino at the Biltmore Estate, as supervising architect. Like Guastavino, Smith had established residence in the area by 1895, the year of Biltmore's completion.

The drawings with Smith's title block raise the question of his role at Saint Lawrence. Guastavino had been known internationally by this time as a master in his profession, an expositor with seminal accomplishments, whereas Smith, although previously employed in the offices of Bradford Gilbert and Richard Morris Hunt, had not begun to work independently until after Biltmore was completed (over time, his work was to become regionally influential). [63] In contemporary accounts Guastavino is consistently named, and usually extolled, as the architect and designer of Saint Lawrence, and no one else. Contemporary articles never mention Smith, including those relating to events such as the building's dedication, Bishop Haid's published recollections, or other sources. [64] The explanation may possibly be found in another of Guastavino's projects as design architect. Ochsendorf has written that, in 1903, through the company's American office, Guastavino designed a factory near Barcelona, Spain, where it was necessary to have a local architect as the signatory for the project; Smith may have been instrumental at the church in some similar manner. [65] Other than Saint Lawrence, Guastavino had no apparent necessity to obtain local certifications, if that was the issue, since his company operated nationally (at times internationally), where he managed the offices of his company in New York and Boston, as described above, through correspondence with his son. Smith's limited involvement apparently ended in 1906, having started in the Fall of 1905, based on the ledger record and the dates of the drawings. The construction expense ledger, covering 1905 through 1910, contains a single entry of $50 in payment to Smith in 1906, with no other payments to him in any other year in the ledger. For that same year, Guastavino listed charges amounting to $140.65, specified as drafting, which he then returned

[62] Basilica of Saint Lawrence. Parish archives. Series D1.

[63] *Richard Sharp Smith, An Architect and His Times: a Retrospective*. Asheville, N.C.: Historic Resources Commission of Asheville and Buncombe County, 1995, p. 8. Exhibition Catalog, in collaboration with the Asheville Art Museum.

[64] *Asheville Citizen*, February 3, 1908, p. 1; October 17, 1909, p. 1; October 18, 1909, p. 1. *Asheville Times*, October 16, 1909. Hintemeyer, p. 325. *Guide to…St. Lawrence*, p. 16, 27 – 36.

[65] Ochsendorf, p. 2.

as a donation. [66] In her article, "The Mark of the Builder: Rafael Guastavino's Masonry in Asheville, North Carolina," Ann Fowler has summarized his role by commenting, in effect, that these drawings are the only documents indicating Smith's involvement, and that the building's considerable Spanish antecedents indicate a Guastavino design. [67] Ochsendorf states that although "Smith's name is on some of the later [post-1903] drawings," the drawings show "no design influence from Smith, either in plan or vertical components." [68] Where Guastavino's 1903 "General Plan" explicitly showed his design of the horizontal components of the building, contemporary published sources and all collateral information, including accounts of Guastavino's construction supervision, reiterate and are consistent with the fact that the vertical components of the structure, including its corbelling, curving walls, towers and brick arches, complete Guastavino's own design. Ochsendorf states that: "There is no doubt that Guastavino served as primary architect for the Basilica of Saint Lawrence: from the overall form, to the details of the tile eaves, it is clear that the building was designed from top to bottom by Guastavino." [69]

The extant drawings fall into groups based on those with and without architect title blocks, drawing type, and lettering characteristics. The majority of these can be identified as development drawings.

The final façade design of the building is, in broad terms, similar in composition and style to three unsigned and undated, small pencil drawings of Spanish baroque facades at the Saint Lawrence archives (Exhibits 2, 3, and 4). [70] It can be seen that one of these three elevation designs relates to the front entrance details shown in the 1903 General Plan; the other two show a flush entrance. A fourth unsigned and undated drawing, a plan, shows radial points for the dome, and uses lettering similar to that seen in Guastavino's 1903 General Plan, but the entrance is shown flush, as in the final design (Exhibits 5 and 6; note that Exhibit 5 is a detail of Exhibit 6).

Three simple plan drawings in the parish archives are based on Guastavino's 1903 General Plan (Exhibits 7, 8, and 9). The 1903 components and proportions are all retained, adhering to the same overall composition, including the dome, chapels, stair locations, etc. The drawings resemble templates and show the use of Smith's title only. Preliminary, in terms of indicating primarily general outline features, with similar lettering on each, they consist of a "Foundation" plan dated September, 1905; an undated similar "Foundation" plan; and an undated "First Floor" plan. [71]

Both Guastavino and Smith titles are seen on floor sections in the parish collection, dated October, 1905 (cross-section), and November 7, 1905 (longitudinal), using similar lettering (Exhibits 10 and 11). The only date, on each, is incorporated within

[66] Basilica of Saint Lawrence. Parish archives. Series MA1. Construction expense ledger: vertical notation for 1906, opposite December, 1905 entries; and December 15, 1906.

[67] Fowler, p. 53. (See note 54).

[68] Ochsendorf, p. 2.

[69] Ochsendorf, p. 2.

[70] Basilica of Saint Lawrence. Parish archives. Series D1.

[71] Basilica of Saint Lawrence. Parish archives. Series D1. (See *An Architect and His Times* … , p. 21; shows a duplicate of the Basilica archives "Foundation" plan that has the 1905 date).

the Guastavino title block, at the lower right. Smith's title blocks do not include review dates. [72] The fact that they are developmental in nature is clearly shown by the slanted floor in the longitudinal section which was not in the final design, and in other details.

The same slanting floor is retained in a full longitudinal section dated January 15, 1906, also from the Saint Lawrence archives (Exhibit 12). Other details in this drawing did not become part of the final design, including some entrance components, and the small cap and finial at the top of the tower. Otherwise, major elements of the final interior design are easily recognizable throughout the drawing: the towers, dome and clerestory; choir; central side windows and major wall niches for statues; vestibule, apse, and two sacristy floors. The drawing date is included with Guastavino's title, at the lower right. Smith's title is entered at the left, but does not include a review or revision date. [73] The lettering on this drawing is noticeably different from that of the others mentioned above. It is a lettering style that is very frequently seen in published examples of drawings from the work of both Guastavino and Smith, and appears virtually identical when used by either office. [74]

A front elevation drawing with this identical lettering style, title blocks, date, and general arrangement is reproduced in the catalog for an exhibition at the Asheville Art Museum in 2001-02 on the Guastavino Company's work in North Carolina. The January 15, 1906 drawing date is incorporated with Guastavino's title block at the lower right, and, also as in the other drawing, there is no review date attached to Smith's title block at the left. Part of the same development series as the full longitudinal section, indicated by the date, it also shows the same the caps and finials at the tops of the tower domes, and entrance elements, that were changed for the final design. A second reproduction in the same exhibition catalog, which is labeled a revision, also has the date, May 24, 1906 included under Guastavino's title block at the right, with Smith's title block at the left having no review date underneath. It shows the left half of a front elevation, in the left half of the drawing, without the upper portion of the tower. Most of the details seen in this portion are as constructed (minor exceptions being the small finial at the left end of the pediment, incomplete door details, etc.). The right half of this drawing shows the right half of the rear elevation, similar overall to final construction, but with somewhat different window and door placement.[75]

Three other drawings are known only through second-generation, reduced copies, which are compromised in much of the visible detail; the copies originated from photographs taken of various overlapping portions of three blueprints. The copies are in the Saint Lawrence archives. [76] These three sets of copies do provide additional context, however, since the title

[72] Basilica of Saint Lawrence. Parish archives. Series D1.

[73] Basilica of Saint Lawrence. Parish Archives. Series D1.

[74] Parks, 1996, p. 53, 59, 61; *An Architect and His Times* …, p. 19-20, 23.

[75] *Rafael Guastavino: Barcelona to Black Mountain*, [p.1]. The two drawings cited (blueprints, held by the Asheville Art Museum) are reproduced in a small format in the catalog. Appreciation is expressed to Mr. Frank Thompson, Curator, for his March 11, 2010 confirmation of the dates and title blocks, which are somewhat difficult to read in the catalog reproductions. (See note 54).

[76] Basilica of Saint Lawrence. Parish archives. Series D1. The provenance of these drawings is unknown. The copies of the 'mosaic' photographs of the drawings appear in a 2001 contracted roofing report. Reference to them is best made concerning the title blocks and dates, as said above, rather than the poor reproduction of drawing detail.

blocks and most of the lettering of the blueprints are clear and legible, although the copies are produced in a segmented, overlapping order. All three use the same lettering and general arrangement as that of the previously-described full longitudinal section and two exhibition catalog elevations. One of these second-generation drawing reproductions, an elevation of the east side of the church, carries the date of the same development series, January 15, 1906. The date is placed under Guastavino's title at the right, as in the other three similar drawings. Smith's title is at the left with no date, also like the others, and the copy is clear enough to see the same, later-revised, tower cap and finial. The copies of the second drawing of this group show the Smith title block but no review date at the left. The date, May 25, 1906, is written under the Guastavino title block on the right, with a caption in the center of the drawing, "Plan Level over First Roof." In the third drawing of the group, none of its copies show a title block for Smith. Given their origin, it is possible that the copies omitted such a title rather than its being absent from the original blueprint itself, but the two other sets of copies contain separately-photographed images of each title block, and the Guastavino title block of this drawing is also photographed separately. Here, the date, February 7, 1907, is included below this title block, in the same position as with the other drawings, and the main caption reads "Plan or Diagram of Elliptical Centers and Elliptical Parallels or Rings for Main Dome." Notwithstanding the segmented copies, the information in this 1907 drawing is tentatively consistent with the departure of Smith from Saint Lawrence in late 1906. In any case, it demonstrates that Guastavino was still involved in the production of drawings at this time.

Guastavino's design of Saint Lawrence may have had an early precedent in the Rhododendron chapel drawings. Chronologically, the design specific to Saint Lawrence was developed during Guastavino's early discussions with Bishop Haid and the pastor, as his clients. Those contacts resulted in his 1903 General Plan, the first documented drawing of the building. This design was replicated in the plan drawings with only Smith's title block, which have no substantive conceptual additions beyond the 1903 drawing. All other titled drawings show both Guastavino's title block and his review date, whereas there are no indications of Smith's review in any of them, in terms of dates or other context, other than his title block alone. Among the four untitled and uncaptioned drawings, the single one with lettering is similar to the lettering in Guastavino's 1903 drawing. Other collateral evidence discussed below, including specific design precedents, the incorporation of tiles into exterior design components, and the use of timbrel horizontal components throughout the whole building, is consistent with the conclusion that Guastavino was the designer of Saint Lawrence in its entirety, beginning with his earliest conceptions through the execution of the building's details. This is underscored by the professional conclusions stated by Ochsendorf and Fowler.

Following the appropriate preliminary foundation work, the laying of the cornerstone was on October 21, 1906. Guastavino contributed a sterling silver trowel for the cornerstone ceremony, which was inscribed as his tribute to Father Peter Marion and Bishop Haid. [77] The Asheville newspaper compared Guastavino's supervision of the construction to his watching "the steady growth of the church with the solicitude of a father for his child," and said that Guastavino "bore nearly half the expense" of the construction costs. The dome of the church was supplied by him without charge. [78] The parish donation

---

[77] Basilica of Saint Lawrence. Parish archives. Secure storage.

[78] *Asheville Citizen*. Asheville, N.C.: February 3, 1908, p. 1
Ochsendorf, p. 2. (Concerning the phrase, "the solicitude … child," Ochsendorf uses the same phrase, quoting a letter from Guastavino's wife; she may be the source of the identical wording in the *Asheville Citizen*, where the newspaper article does not state a source.)

ledger corroborates his considerable financial contribution, suggesting that he provided large amounts of funds for construction.[79] Guastavino provided all of the tiles for the building, absorbed almost half of the overall cost of the building construction, and donated his architectural design and construction supervision. [80]

The construction expense ledger shows that labor and most materials were supplied within Asheville. The parish distributed its purchases among several brick suppliers, hardware dealers, etc. Tile shipments for Saint Lawrence were sent from the company factory in Woburn, Massachusetts, as seen in the factory order cards in the Guastavino collection at Columbia University. There are numerous notations concerning freight for tile in the parish construction ledger. [81] Though Rhododendron was nearby, it is uncertain whether its facilities had a role in producing any of the tiles for Saint Lawrence.

The elder Guastavino's widow, Francesca, was quoted as saying that "samples" of tile from Rhododendron were placed in the church, without distinguishing whether these were structural or for finishing the apse and chapels. [82] The National Register nomination for Rhododendron reiterates the tradition that some tiles for the church were said have come from there.[83] At least two kilns had been constructed at Rhododendron, possibly as many as four, around 1898, with a capacity for thousands of tiles at one firing to control the quality and consistency of glazes and materials, and to experiment with various local clays, including those from portions of the estate. Although the site is now mostly in ruins, a sixty-foot tall corbelled chimney remains, seeming to be redolent of Guastavino's early factory projects in Barcelona.[84] The production effort at these facilities, even if experimental in nature (or an "immature" operation, as later described by their business

---

[79] Basilica of Saint Lawrence. Parish archives. Series MA1. Construction donations ledger (on page opposite the date, February 19, 1906).

[80] Ochsendorf, p. 2.

[81] Research in the Guastavino Company Archives at Columbia University, through the MIT School of Architecture, Guastavino Project, has documented various tile shipments to Saint Lawrence from the Woburn factory, from September through December, 1907, and in December, 1908. Appreciation is expressed for information provided by Professor John A. Ochsendorf, MIT School of Architecture. Basilica of Saint Lawrence. Parish archives. Series MA1, construction expense ledger.

[82] Fowler, p. 50; Fowler quotes an article in the *Asheville Citizen*, B. G. Leiper. Asheville, N.C.: August 28, 1922. This remark reads ambiguously, one possible interpretation as if to suggest that the tile "samples" could have been from the earlier firings, prior to the 1900 Woburn factory.

[83] National Register Nomination. Rafael Guastavino Sr. Estate, Section 8, p. 4.

[84] Fowler, p. 50. Fowler includes a reference to archaeological studies conducted for the N. C. State Historic Preservation Office, by Michael Baker and Linda Hall in 1986.

manager), was a springboard to the more permanent 1900 Woburn factory. [85] The 1923 parish history states that Woburn was the source of tiles for church, and does not refer to Rhododendron. [86]

On the exterior of the building, Guastavino's dual expertise in design and construction included the broad incorporation of unglazed tile within the corbelling. It is used in various ways to support brick, and other tiling, within the components. The more elaborate of these constructions include the cornices of the front towers, not only at the tower cap, but also at the cornice dividing the first and second levels of the tower proper, and at the façade cornice. Other examples of this robust integration of tile and brick are seen within the cornice below the dome parapet (aligned with the façade cornice); the cornice across the rest of the exterior underneath the side wall parapet; and the cornice dividing the second and third levels of the central three-bay pavilion.

Guastavino supervised the dome construction on a daily basis. [87] Its copper final sheathing was postponed until the other work on the building was completed. [88] Its place in the larger design of the building is described below.

The contract for the windows, dated January 10, 1908, stipulates Guastavino's representation and approval, as the building's architect, for the designs of the cartoons and color drawings. [89] The maker of the windows, the Royal Bavarian Establishment of Francis Mayer and Company, in Munich, Germany, had won four gold medals at the World's Columbian Exposition in Chicago in 1893, where, as mentioned above, Guastavino had designed the Spanish pavilion and addressed the Fourth International Congress of Architects. Bishop Haid had installed Mayer windows in the 1894 Abbey church at Belmont, North Carolina, and the company had executed designs earlier for the Vatican. [90] Mayer windows featured detailed arrangements influenced by the paintings of Hans Holbein and others. At Saint Lawrence, the figures are animated and portray a variety of themes organized in arresting compositions. The components of the windows are colored glass fired with

---

[85] Fowler, p. 53. See: Parks, 1996, p. 23. The Rhododendron facilities produced a limited number of commissioned tiles for the personal residence of the architect, Stanford White, with whom Guastavino had previously collaborated on the Boston Public Library and other projects. See also: *Journal of Preservation Technology*, Volume 30, No. 4, facsimile item (n.p.) following page 59. Probably as a result of his experience at the Rhododendron facilities, Guastavino filed a patent application for a kiln design in 1899, titled "Improvements in Kilns for Glazing and Enameling Clays, & c..." (patent granted March 26, 1901).

[86] *Guide to ... Saint Lawrence*, p. 36.

[87] *Guide to …Saint Lawrence*, p. 19, 28. *Asheville Citizen*. February 3, 1908, p.1.

[88] *Guide to ... Saint Lawrence*, p. 28. The dome was never sheathed with slate shingles, as stated in the 1976 NR nomination.

[89] Basilica of Saint Lawrence. Parish archives. Series MA1. Mayer and Company, Munich, Germany, contract for the building's windows, dated January 10th, 1908, and related entries in the construction expense ledger.

[90] Baumstein, Paschal. *My Lord of Belmont: A Biography of Leo Haid*. Belmont, North Carolina: Belmont Abbey, 1995, p. 123.

overlay color, and standard leading. Two windows in the Saint Joseph chapel, taken from the earlier 1887 wooden church on the property, were incorporated into Guastavino's design of the church. [91]

At the time of Guastavino's death in 1908, most of the church was finished with the exception of some exterior items (permanent door, some finials, etc.), some mechanical completion, and, in particular, the high altar and chapels. [92] At the time, Rafael Guastavino Jr., as described, had been responsible for the supervision of major company projects for nearly two decades. With that background and with his engineering experience, he accomplished the remaining work at Saint Lawrence, including the completion of the glazed polychrome interior finish tiles of the church, while skillfully managing other company projects. [93]

Although the national significance of Saint Lawrence is not based on its decorative tiling, the polychrome designs with which the younger Guastavino covered much of the vertical walls across the high altar and chapels attract much interest. This tiling is non-structural, unlike the finely-finished and glazed tile surfaces on many of the horizontal timbrel components. The designs are scaled to relate to both distant and proximate viewpoints in the building, where the large apse figures are open to the dome and nave, and the surfaces of the chapels use appropriately smaller elements and patterns. Within the spaces of the two chapels, the high altar, and the apse panels, particular border patterns and tile designs are repeated, further relating the areas to each other. Much of this finish tile work includes strongly developed relief and inscription. The complex designs are created from thousands of custom tiles of different glazes and patterns, many as small as two inches square. In the Marian chapel, all of the surfaces at the front half of the space - floors, the walls, and ceiling - were covered with synchronizing tiling. The six vigorously-drawn, large figures in the apse were said to be difficult to execute; each of the assembled panels measures six feet wide and eleven feet high, with bas relief elements. The 1923 parish text described a process where these components required repeated firings in order to match glazes. [94] At the time of his completion of the church and its decorative tile, the younger Guastavino was also at Saint Lawrence to design his father's tomb. The burial space was configured in an area which had no particular function previously shown on the original plans, near the entrance to the Marian chapel. His design includes a door with his own tiling design, glazes, and relief panels with lettering, enclosed in an arched metal frame. The wall surrounding the door continues his glazed polychrome tile work, with figures in relief. [95]

A "few days" before the dedication ceremony, the adjacent 1887 church was demolished; it had continued in use during construction. Two days before the event, the tympanum was secured into position over the new church's main door and the Asheville newspaper said that on that same day "many visitors took occasion . . . to examine the church which stands as a

---

[91] *Guide to ... Saint Lawrence*, p. 28.

[92] Basilica of Saint Lawrence. Parish archives. Series MA1. Construction expense ledger: various payments made after February, 1908, included radiators (September, 1908), and main door (July, 1909).

[93] *Guide to ... Saint Lawrence*, p. 28. Collins, p. 199.

[94] *Guide to ... Saint Lawrence*, p. 28, 31. The source for this would be the Guastavinos or their employees.

[95] *Guide to … St. Lawrence*, p. 36.

monument to the skill of the late Rafael Guastavino, whose untimely death in the hour of triumph is deeply deplored." [96] Bishop Haid presided at the dedication liturgy on October 17, 1909, attended by the bishop of Charleston and nearly twenty priests. A large congregation was inside the church, of people "of all denominations in the city," and, outside, a "great multitude [was] gathered on Haywood Street." The Asheville newspaper reported that in his sermon the bishop spoke of the generosity of "the eminent architect, Raphael Guastavino, who gave not only his skill but in bountiful measure of donation to the church." The elder Guastavino's widow, Francesca, was present, as were Rafael Guastavino Jr. and his wife; Haid expressed his gratitude to the family for its support and contributions. He also recognized Fathers Peter and Patrick Marion for their roles. [97] At the time he died, Guastavino Sr., an accomplished musician, had been in the process of composing the music to be used at this dedication Mass. It was performed in the ceremony in its state of completion. [98] The *Sanctus and Hosanna* was published that same year, with the epigraph: "Dedicated to Saint Lawrence Church, Asheville, N.C.," by R. Guastavino. [99] Two newspaper accounts mention that, at that time, Guastavino's remains rested in the "crypt" of the church, presumably referring to a provisional interment in the basement before final burial. [100]

The elder Guastavino's remains were placed in their vault two months later on December 17, 1909. [101] The obituary at the time of his death said that "The ultimate completion of the structure was one of the wishes nearest to his heart." It was fitting to include his tomb in the building which has been described by Ochsendorf as "a shrine to both the man and his method of construction."[102]

In *Cohesive Construction*, Guastavino wrote, "the new construction is the renaissance of an old and noble system, for several centuries unused, but applied now owing to the necessities of the age … [W]ithout the mighty fact of the existence of some monuments in the 'Cohesive System' (sic) which testify epochs of undoubted progress in constructive art, it would be impossible to realize or believe in them." [103] His description of the timbrel construction of the past included Egyptian, Assyrian, and Roman works, continuing through the development of the system until his own time. In the description of Renaissance architecture, Guastavino names the period's most prominent domes which had employed cohesive construction, including, among others, the Baptistery of Florence, Saint Peter Basilica in Rome, Saint Paul Cathedral in London, and La Real capilla de los Desamparados, in Valencia, Spain (also named "Nuestra Senora de los Desamparados," translated, "Our

[96] *Asheville Times*, October 16, 1909.

[97] *Asheville Citizen*, October 18, 1909.

[98] Guastavino, Rafael, IV, p. 54. *Asheville Citizen*. February 3, 1908, p. 1.

[99] Guastavino, R. *Sanctus and Hosanna*, in "Sacred Music for the Service of the Catholic Church" [Series], Jennings Octavo Edition. Cincinnati: The George B. Jennings Company, 1909.

[100] *Asheville Citizen*, October 17, 1909, p. 1; October 18, 1909, p. 1.

[101] Basilica of Saint Lawrence. Parish archives. Series MA1. Construction donations ledger (December 17, 1909 entry).

[102] *Asheville Citizen*. February 3, 1908, p.1. Ochsendorf, P. 1,3.

[103] Guastavino, *Cohesive Construction* …, p. 9, 22.

Lady of the Forsaken"). The dome of the latter building was Guastavino's prototype for the Saint Lawrence dome. [104] In *Cohesive Construction*, Guastavino reproduces simple line drawings of its plan and elevation. The size and proportions of the ellipse of this dome are very close to those of the Saint Lawrence central dome, which is 82 feet by 58 feet - the los Desamparados dome is 82 feet by 49 feet (25 meters by 15 meters). [105]

The Saint Lawrence dome, faced with patterns of finish tiles, draws the eye upward into an open expanse. Contiguous with the ellipse of the nave, the vaulting arcs through the clerestory window arches near the base of the dome. The base visually converges with the curving elliptical plan of the interior walls. The main altar and apse are positioned immediately beyond the perimeter of the nave in a very strong composition, where the altarpiece, with its height and dynamism, is employed as a unifying component. The curvature of the panels flanking the apse emphasizes its depth. The views from anywhere within this broad enclosure are unobstructed by supports or corners, a feature of Guastavino's first 1903 design for the building. Ochsendorf refers to the cohesive construction dome as a "structural marvel." He observes that it is only four inches thick near the center, and therefore, due to its overall size, the ratio of its thickness to the radius is thinner than an eggshell. [106] The striking herringbone patterns, combined with the variegated tones and glazed surfaces of the tiles, generate a play of light across the dome which varies according to different lighting sources and time of day, particularly near the clerestory openings. The dome imposes a visceral sense of its expanse and depth, and it unifies the building. It does not dominate the rest of the space, however, but instead shields it, proportioned to the walls and arches below such that it imbues a sense of calm and harmony throughout the church.

In his role as primary architect, Guastavino chose to integrate his knowledge of cohesive construction by using it in every horizontal surface of Saint Lawrence. Ochsendorf describes the vaulting as being incorporated throughout, in "... the foundations to the tops of the towers." [107] Beginning with the basement and the foundation level, the floors of the nave, chapels, and all other main flooring areas are supported by the shallow timbrel basement ceiling vaults which are described in Section 7. These are similar in design to those in Saint John the Divine, the Boston Public Library, and other well-known company projects. [108] In the primary and secondary spaces, on and above the main floor, the dome, as described, and all the ceilings at Saint Lawrence, including those of the chapels, vestibule, choir, and sacristies, are likewise vaulted with cohesive construction, throughout the building. Completing the entire possible range of horizontal components, the stairs which interconnect the floors and access the towers are also timbrel vaults.

---

[104] Guastavino, *Cohesive Construction* …, p. 21 – 44. Fowler, p. 53. Austin, p. 72. *Guide to ... Saint Lawrence*, p. 16. (The 1976 Saint Lawrence National Register nomination includes mention of the 'Desemparados' prototype for Saint Lawrence.)

[105] Guastavino, *Cohesive Construction*…, p. 38; text associated with drawing p. 31.

[106] Ochsendorf, p. 2.

[107] Ochsendorf, p. 2.

[108] Fowler, p. 53; Collins; p.182 (figure 17).

Guastavino apparently never wrote extensively on the subject of timbrel stairs except for a brief mention in *Cohesive Construction*.[109] There, he stated that stair construction would require "a separate treatise." He briefly describes how individual calculations suitable to the configuration of the vault supporting the width and length of each flight were necessary, in terms of "two catenarias," a lower one in the intersection of the flight with the wall, and the second somewhat higher, in the "stream of the steps under the banister."[110] The resulting soffit vaulting which curves upward from the wall, laterally as it were, between the outer margins of the flight it supports, is a particular example of cohesive construction's adaptability, strength, and beauty. In the east and west towers, the vaulting passes some of the window openings with no contact on either side. As described in Section 7, timbrel vaults support their own weight; in effect, technically, the walls of the stairwell serve to hold the stairs upright. The catenary which is usually traced against a stair wall is actually no more than the calculated termination of the soffit vaulting. Although there is normally shallow mortising which traces the catenary into the side of the stairwell for ease of construction, it is not a necessary component of the vaulting, in the literal sense. Thus, the vaulting moves past the windows with nothing but its own support. The stairs at Saint Lawrence demonstrate adaptations to variable configurations. The northeastern stairwell conforms to its unusually-patterned "half-helix" plan constraints, partially curved and partially straight-walled, utilizing steeply-pitched vaulting to traverse the basement through the upper sacristy. The flexibility that is possible in the positioning of variable stair flights, landings, and doorways in straight-walled towers can be seen in the vaulting of the western tower. The vaulting of the eastern tower, with its lack of treads, is an exceptional exposition of the process of timbrel construction, with the plain undeveloped surface visible on both sides. An essential, unembellished example of the cohesive vault, it visually juxtaposes the great strength of the continuous, curving vault design, against the fine, two-tile-thin surface. Not only the types, but also the number of Guastavino stairways in Saint Lawrence are exemplary for a single building of its size - to name one comparison, the survey of Guastavino constructions in Boston has located three extant stairways in the entire city.[111]

Simply perceived in terms of contemporary, turn-of-the-century styles, Saint Lawrence is Guastavino's Beaux Arts interpretation, as primary architect, of Spanish baroque architecture. In all of his projects, however, he had been expressing his dedication to the renewal of a "noble system" applied "to the necessities of the age," whether through technical engineering studies, as an architect, as a builder, or in the production of tile. In the Saint Lawrence dome Guastavino gave homage to a major Renaissance expression of timbrel architecture, which for over three centuries had remained a significant testimony to the system's beauty and strength. His erudition is seen not only in the use of this important precedent, but also in the design of the entire building, structurally and aesthetically, wholly based on his thorough knowledge of the Renaissance architecture of his homeland. Notwithstanding the fact that the history of timbrel architecture includes other locales besides Catalonia and Valencia, the interrelated cohesive construction and the classic Spanish design throughout Saint Lawrence were indigenous for Guastavino. His colored exterior tiling patterns at the top of the facade towers are another prominent Valencian design characteristic.[112] Before Saint Lawrence, his timbrel designs and engineering insights had been

[109] Austin, p. 77.

[110] Guastavino, *Cohesive Construction*…, p. 133.

[111] Program in Building Technology, School of Architecture, Building 5-418, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139-4307: information publicly posted by the Program in Building Technology. (Additional information concerning Ochsendorf's associated work is in note 10.)

[112] Ochsendorf, p. 3.

adapted in numerous ways in America, part of many architectural styles which deployed timbrel architecture. As he integrated his own innovations in cohesive construction at Saint Lawrence in every possible way, Guastavino was concurrently incorporating them – in a very literal sense – within an authentically Spanish structure. Here, he personally acknowledged his predecessors, giving realization to a building which uniquely associates his masonry architecture with the country of its origin and, distinctively, with a church in the city of his birth.

Thus, it is unlikely that another edifice might have been more appropriate than Saint Lawrence for the relocation of the three hundred fifty-year-old, carved walnut Spanish altarpiece that is incorporated into the design of the altar and apse. Describing its origin, the 1923 parish history does not name the specific location, only mentioning "… a church in one of the cities of Northern Spain …." With more detail, the text describes how the Saint Lawrence altarpiece was originally part of a sixty-foot high carved walnut reredos, with ascending tiers of columns. This larger reredos was in danger of being crushed by its supporting apse wall, which could not be repaired. In raising funds to correct the building's severe structural problems, the reredos was "disposed of" (around 1900?). The passage concludes with interesting imagery: "… two of the columns of the second tier with the Crucifixion group were acquired for our church after some years of wandering, from place to place, as if seeking to reach the spot for which they were originally intended." [113]

The Guastavinos: Saint Mary Church, Wilmington, North Carolina

Saint Thomas Pro-Cathedral, of the Apostolic Vicariate (missionary diocese) of North Carolina, was renamed Saint Mary Pro-Cathedral during construction of its new building, in the period between the laying of the cornerstone on October 22, 1909, and the dedication on April 28, 1912. [114] It is known that by 1909, Wilmington and Asheville were being considered as possible future diocesan centers, each to have its own cathedral, if, decades later, the state should have a large enough Catholic population to support two fully-developed dioceses. There is no intimation in Bishop Haid's accounts of the beginnings of the Saint Lawrence building, including those quoted above, that the construction of the present Saint Lawrence had been initiated, however, as a cathedral project. [115] St. Thomas had been the state's Pro-Cathedral since the establishment of the Apostolic Vicariate in North Carolina in 1868. [116] It may be that the new building for the Saint Thomas / Saint Mary Pro-Cathedral evolved over time through the developing relationship among the diocese, the Guastavino Company, and the priests of the two parishes. The construction of the new Pro-Cathedral began as the construction of Saint Lawrence was being finished.

At the time of the Saint Mary cornerstone ceremony, Wilmington's *Morning Star* newspaper stated that the dome and roofing of the building were designed by the Guastavino Company, and that the dome would be a replica of "the Columbia Chapel,

---

[113] *Guide to ... Saint Lawrence*, 1923, p. 28. The text quoting Guastavino was written around 1922-23, and states that the purchase was made "some twenty years ago."

[114] *The Morning Star*, Wilmington, North Carolina, October 21, 1909; April 30, 1912. Courtesy New Hanover County Public Library, with appreciation to Mr. Clifton Lively, Saint Mary Parish, Wilmington, North Carolina.

[115] Baumstein, p. 238-240. Hintemeyer, p. 323-26.

[116] Baumstein, p. 83.

of New York." Joseph Taft of New York City was named as consulting architect. Over two years later, in its account of the Pro-Cathedral's dedication on April 28, 1912, the same newspaper recounted the "the plans [sic] of the building were first outlined in sketches by the late Rafael Guastavino, the famous architect, but death called him before the plans could be completed." Implying that the younger Guastavino might have later contributed more to the design than only the dome and roofing, it continues, ". . . his son, Rafael Guastavino Jr. decided to carry out his father's desires in the matter, and he completed the work." [117]

The Saint Lawrence expense ledger contains two entries which are assumed to refer to the Saint Mary project: October 14, 1908, "Two Masons $23.00 ... car fare to Wilmington $16.00;" and April 6, 1909, "One Mason $10.00 … his fare to Wilmington $8.23." [118] The Saint Mary groundbreaking had been May 20, 1908, and the masons apparently were sent to assist with foundation work there while Saint Lawrence was being finished. At the Saint Mary dedication ceremony Bishop Haid was reported to have expressed his gratitude to Father Patrick Marion for his work of "superintending the construction of the Cathedral," since the time of the laying of its cornerstone in October, 1909. Haid referred to Saint Mary as "an everlasting monument to the work that he . . . so faithfully performed." [119]

The current parish of Saint Mary (it is no longer a Pro-Cathedral) has located one plan and one longitudinal section in its search for documentation of the building. [120] Both drawings are captioned, "St. Thomas Church Wilmington, N.C.," with the lettering style described above regarding the Saint Lawrence drawings, i.e., those dated during and after January, 1906. They are both signed by Joseph Taft, over a plain caption, "Consulting Architect," without any other title block. The original date of the plan is labeled "New York, April 1, 08;" this date is stricken through, with the wording "Revised Dec. 1, 08" immediately above, in the same general lettering style. The longitudinal section is similar, with the date "April 30, 1908" stricken through, and "Revised December 1st 1908" written to the right. There are no additional signatures associated with the revision notes. The dates of the drawings are shortly before the groundbreaking date, and the revisions are ten months before the cornerstone ceremony.

Generally, Saint Mary and Saint Lawrence share Spanish baroque design similarities, particularly the exterior entrance façade, front towers, and central dome. The buildings differ, however, in essential ways. Saint Lawrence had the full attention of the elder Guastavino from its conception and establishment, through nearly all of its construction, until his death. Historic and intellectual origins specific to the design of Saint Lawrence are known through the elder Guastavino's own published writings, which is not the case at Saint Mary. At Saint Lawrence, he observed the construction of the entire building - the positioning of the foundation stones, the erection of the brick walls and corbels, along with the development of the tiling and vaults - unlike any other remaining building in the United States including Saint Mary. After his death, it is certain that the finish at Saint Lawrence was completed entirely under the direction of his son, who knew the father's ideas for that building intimately. Over time, the decision to construct Saint Mary could have been an outgrowth of the design and

---

[117] *The Morning Star*, April 30, 1912. Courtesy New Hanover County Public Library.

[118] Basilica of Saint Lawrence. Parish Archives. Series MA1. Construction expense ledger.

[119] *The Morning Star*, October 21, 1909; April 30, 1912.

[120] Appreciation is expressed to Mr. Clifton Lively, Saint Mary Parish in Wilmington, North Carolina, for providing access to copies of these drawings, and for extensive information provided by telephone January 25, 2010.

construction of Saint Lawrence. At Saint Mary the particular roles and responsibilities of the younger Guastavino, Joseph Taft, and even to a degree Patrick Marion, are interrelated in some measure. Their roles occur in relationship to whatever may have been known and used from the elder Guastavino's design. Saint Mary is undoubtedly, and very visibly, a Guastavino-inspired structure, whoever might be considered the prime architect, although Guastavino Jr. seems to have "carried out his father's desires in the matter," from his father's "sketches." Saint Lawrence is entirely the design of the first major expositor of timbrel construction since the Renaissance, his personal project through inception and creation, and the site of his interment.

The church received full traditional consecration in the Roman Catholic rite on October 13, 1920, the first in North Carolina, conducted by Cardinal James Gibbons. Gibbons, one of the most significant figures in the history of American Catholicism, had founded Saint Lawrence parish in 1868, in his role at that time as the first Vicar Apostolic of North Carolina. [121] Saint Raphael, the religious namesake of father and son, is permanently evoked in this Guastavino building, in the uppermost window facing the tomb in the Marion chapel, and in the large polychrome image immediately to the right of the main altar.

At present, Saint Lawrence is open to the public fifteen hours each day, with open access except during services. Other than the service attendance, the church currently welcomes more than 135,000 visitors yearly, including guided tours, walk-ins, and scheduled concerts and programs.

Clarification: Rafael Guastavino and Stanford White

As a clarification to the 1976 Saint Lawrence National Register information, the references to Stanford White's participation in the Marian chapel, quoting a tradition to the effect that White "donated funds" and made a "personal contribution" (Section 7, page 2, and Section 8, page 2), can be placed in further context. [122] The 1923 parish history takes care to credit the benefactors of Saint Lawrence during and after its construction, and does not include a reference to White. The pastor's donation ledger contains no references to him. [123] It is possible White donated funds to the project through the Guastavinos beforehand. Though the elder Guastavino and White were friends and collaborators, whatever White's erstwhile contribution, work on the Marian chapel commenced in 1908, whereas White's untimely death had occurred two years previously, in 1906. The finish work in the Marian chapel is wholly that of the younger Guastavino.

---

[121] *Guide to ... Saint Lawrence*, 1923, p. 22-23.

[122] There are no citations for either statement in the text, either in Item 7 or Item 8 [Sections 7 and 8].

[123] *Guide to ... Saint Lawrence*, p. 19. Basilica of Saint Lawrence. Parish archives. Series MA1. Donations ledger.

BIBLIOGRAPHY

Books, catalogs, monographs

Baumstein, Paschal. *My Lord of Belmont: A Biography of Leo Haid*. Belmont, North Carolina: Belmont Abbey, 1995.

Guastavino, Rafael. *Essay on the Theory and History of Cohesive Constriction Applied Especially to the Timbrel Vault*. Read Before the Society of Arts, Massachusetts Institute of Technology, Boston, by R. Guastavino, Architect. Boston: Ticknor and Company, 211 Tremont Street, 1892.

Guastavino, R. *Sanctus and Hosanna*, in "Sacred Music for the Service of the Catholic Church" [Series], Jennings Octavo Edition. Cincinnati: The George B. Jennings Company, 1909.

Guastavino, Rafael, IV. *An Architect and His Son; the Immigrant Journey of Rafael Guastavino II and Rafael Guastavino, III*. Westminster, Maryland: Heritage Books, 2006. [The architect conventionally named Rafael Gustavino, Sr., in the United States, is in fact Rafael Guastavino II. Rafael Guastavino, Jr., as usually stated, is Rafael Guastavino III.]

A Guide to the History, Art and Architecture of the Church of Saint Lawrence, Asheville, North Carolina. Asheville, N.C.: [Saint Lawrence Parish], 1923.

Parks, Janet, and Neumann, Alan G. *The Old World Builds the New: the Guastavino Company and the Technology of the Catalan Vault, 1885-1962*. New York: Avery Architectural and Fine Arts Library and Ira D. Wallach Art Gallery, Columbia University in the City of New York, 1996.

Parks, Janet, and Neumann, Alan. *The Old World Builds New York: Guastavino Construction in Manhattan, 1886-1954; A Walking Tour Guide*, 2nd Edition. New York: The Trustees of Columbia University in the City of New York, 2000, n.p.

Rafael Guastavino: Barcelona to Black Mountain. Asheville, N. C.: Asheville Art Museum, 2001. Exhibition catalog; also surveys Guastavino Company projects in other North Carolina cities.

Richard Sharp Smith, An Architect and His Times: A Retrospective. Asheville, N.C.: Historic Resources Commission of Asheville and Buncombe County, 1995. Exhibition Catalog, in collaboration with the Asheville Art Museum.

Tarrago, Salvador, ed. *Guastavino Company, (1885-1962), Catalogue of Works in Catalonia and America*. Barcelona, Spain: Collegi d'Arquitectes de Catalunya, 2002.

Articles and periodicals

American Architect and Building News, February 29, 1896.

Asheville Citizen. Asheville, North Carolina: 1908,1909.
Asheville Times. Asheville, North Carolina: 1909.

Austin, Peter. "The Work of Rafael Guastavino in Western North Carolina," in *May We All Remember Well: A Journal of the History and Cultures of Western North Carolina*, Volume I. Asheville, N.C.: Robert S. Brunk Auction Services, Inc., 1997, p. 63-79.

Collins, George R. "The Transfer of Thin Vaulting from Spain to America," *Journal of The Society of Architectural Historians*, XXVII No.3, October, 1968, pp. 176-201.

Fowler, Ann. "The Mark of the Builder: Rafael Guastavino's Masonry in Asheville, North Carolina," *ARRIS Journal of the Southeast Chapter of the Society of Architectural Historians*, Vol. 2. 1991, p. 43-58.

Hintemeyer, Felix, Fr., O.S.B., "Rev. Peter G. Marion's Jubilee," *The Belmont Review*. Belmont, N.C.: Belmont Abbey College, June, 1917, p. 320-330.

Journal of Preservation Technology, Volume 30, No. 4. Special Issue: Preserving Historic Guastavino Tile Ceilings, Domes, and Vaults. Albany, N. Y.: Association for Preservation Technology, 1999.

Morning Star, The. Wilmington, North Carolina: 1909, 1912. (Articles provided courtesy of the New Hanover Public Library and Saint Mary Parish, Wilmington, North Carolina.)

Parks, Janet. "Documenting the Work of the R. Guastavino Company: Sources and Suggestions," *Journal of Preservation Technology*, Volume 30, No. 4. Albany, N. Y.: Association for Preservation Technology, 1999, p. 21-25.

Pounds, Richard; Raichel, Daniel; and Weaver, Martin. "The Unseen World of Guastavino Acoustical Tile Construction: History, Development, Production," *Journal of Preservation Technology*, Volume 30, No. 4. Albany, N. Y.: Association for Preservation Technology, 1999, p. 33-39.

Rossell, Jaume. "Rafael Guastavino y Moreno: Inventiveness in 19th century architecture," in Tarrago, Salvador, ed., *Guastavino Company, (1885-1962), Catalogue of Works in Catalonia and America*. Barcelona, Spain: Collegi d'Arquitectes de Catalunya, 2002, p. 45-59.

Sunday Star-News, The. Wilmington, North Carolina: 1947. (Article provided courtesy of the New Hanover Public Library and Saint Mary Parish, Wilmington, North Carolina.)

Tarrago, Salvador. "Consideracions [sic] on Guastavino's work in Catalonia," in Tarrago, Salvador, ed., *Guastavino Company, (1885-1962), Catalogue of Works in Catalonia and America*. Barcelona, Spain: Collegi d'Arquitectes de Catalunya, 2002, p. 7-15.

Wight, Peter B. "The Works of Rafael Guastavino," *The Brickbuilder*, X, 1901, pp. 79-81, 100-102, 184-188, 211-214.

Private Collections

Basilica of Saint Lawrence, Asheville, North Carolina. Parish archives.
- Items in Series D1, M1, and F (drawings, ledgers, contracts, correspondence, etc.).
- Recorded interview, Lucille Lamy, February 25, 2005 (active parishioner since early childhood, mid-1920s).
- Studies conducted by Wiss, Janney, Elsner, Inc., and Preservation Trades Company, September, 2005.

Saint Mary Church, Wilmington, North Carolina. Parish archives.
- Architectural drawings, articles, telephone interviews.

National Register and National Historic Landmark Nominations

Rafael Guastavino, Sr., Estate, also known as Rhododendron, Buncombe County, N. C. (National Register, 1986)

Biltmore Estate, Buncombe County, N. C. (National Historic Landmark, 1968)

PHOTOGRAPHS

The following information pertains to all photographs:

Church of Saint Lawrence – additional documentation
97 Haywood Street
Asheville, Buncombe County, North Carolina
Photographers: Nick Lanier (NL) and John Toms (JT)
Date: Lanier, November 7, 2007; Toms, August 22, 2009 All 2007 views show the building as it appears in 2010
Original digital image repository: North Carolina HPO, Raleigh, North Carolina

View description:

1. South façade and west elevation, looking north (JT)
2. West elevation and a portion of the north elevation of the church and 1929 rectory, looking southeast (JT)
3. East and north elevations, looking southwest (JT)
4. View of dome, looking north (JT)
5. Upper west tower, cornice detail, looking southeast (NL)
6. General view of sanctuary from choir balcony, looking north (NL)
7. Choir balcony arch detail, looking northeast (JT)
8. Saint Joseph Chapel, looking north (JT)
9. Saint Mary Chapel, looking north (JT)
10. Altar, looking north (NL)
11. West tower stairs, east and south walls (NL)
12. East tower stairs, east wall (JT)
13. East tower stairs, east and south walls (JT)
14. Basement, pier detail, looking southwest (NL)