First Presbyterian Church of Marietta

Preservation Plan and Assessment of the Historic Sanctuary Structure

Historic Preservation Team:

Lord Aeck Sargent Architecture, Inc.

Preservation Architects

Willett Engineering, Inc.

Structural Engineers

Nottingham, Brook & Pennington, Inc.

Mechanical, Plumbing and Electrical Engineers

Wiss, Janney, Elstner Associates, Inc.

Mortar Analysis

Welsh Color & Conservation, Inc.

Paint Analysis

Lord Aeck Sargent Architecture

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First Presbyterian Church of Marietta

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1.1. Introduction and Goals of the Preservation Plan

It is the goal of this Preservation Plan to provide the First Presbyterian Church community with a clear and detailed understanding of the recent history of the physical development and impacts on the Historic Sanctuary. This understanding is based on a brief description of the general building and development history of the Sanctuary, starting with its dedication in 1854. The history of the building is documented through archival research and through analysis of historical paint and mortar. The report involves assessment of the existing interior and exterior conditions, including a structural assessment and specific consideration of the tower.

The critical event in the evolution of the Sanctuary was in 1905 when it was decided to completely rehabilitate the Sanctuary in a colonial revival style which to date still displays most of the character defining elements from that period. The only major deviation from the appearance of that period are the changes which had been made to the bell tower.

The findings and recommendations of the Preservation Plan are designed to provide the congregation with the information needed to anticipate repair and maintenance issues as well as the background needed to make informed decisions about repainting the interior and some of the exterior features of the sanctuary. Lighting and Air conditioning will also be addressed to provide further background and information regarding the current situation.

Research into the characteristics of the brick mortar is part of the work undertaken during this phase and it is essential to the understanding of the exterior masonry condition after the 1979 rehabilitation was completed.

1.2. Structure of the Preservation Plan

Findings, Documentation and Recommendations are structured by Architectural Specification Divisions # 2 through # 16.

Architectural specifications are structured according to major trade and scope of work groups with some additional disciplines added to cover the conventional approaches to bidding and dividing construction projects into understandable sub groups. The primary organizational feature are trade groups like masonry, carpentry, concrete, interior finishes like plaster and paint etc.

It appeared appropriate for this Preservation Plan and Assessment to apply this division structure as the organizing element to report all findings and recommendations in this format. In addition we included parts of the measured architectural drawings with notes and images to immediately illustrate the related findings. The only report which does not completely fit into this framework is the report by the structural engineer since this discipline does cover numerous trades and has overarching characteristics. We are including the structural report in the appendix. That is also where A complete set of measured drawings is also included in the appendix.

Approximately 1950's Color Postcard of the Sanctuary

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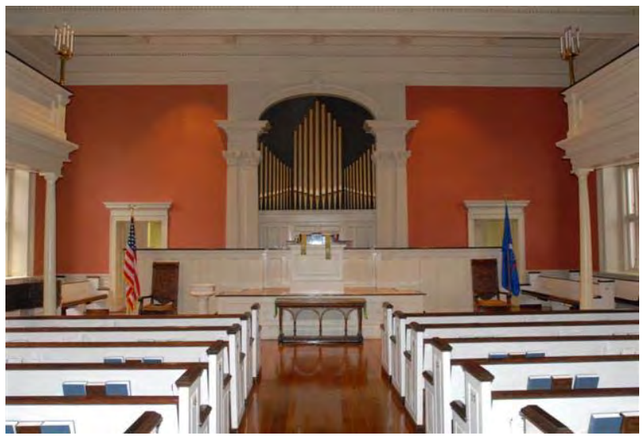


1.3. Executive Summary

Key Points, starting with the most import findings:

1. The re-pointing mortar used in 1979 is Portland cement based only and harder than the brick. Further investigation is needed. (See Division 4: Masonry).
2. The metal tower base: water problems, structural problems at the floor level of the belfry and at the junction between the tower base and the roof. (See Division 7: Thermal ,Moisture and Div. 13: The Bell Tower).
3. The temporary foundations underneath the balcony columns should be improved – subject is under consideration by the team. (See Division 2: Concrete and Structural Report in the Appendix)
4. The slate roof in general does require some repairs with matching slate and a totally new flashing detail at the tower base. (See Division 7: Thermal and Moisture)
5. Eaves on the front gable/east side are sagging and create an uneven roof plane with can cause difficulties for the slate tiles. (See Division 7: Thermal and Moisture)
6. The metal entablature and the gutter edge show signs of corrosion which needs to be addressed. (See Division 5: Metals)
7. The attic and crawlspace insulation should be replaced and improved. (See Division 7: Thermal and Moisture)
8. The age (over 40 years) of the air condition unit on the roof. (See Division 15: Mechanical and Plumbing Report)
9. The bent balcony column presents no danger.
10. The plaster repairs from the 1979 project are showing in the form of fine crack lines and should be addressed before repainting the Sanctuary. (See Division 9: Finishes)
11. The original (1905) paint color of the Sanctuary walls and the original (1905) trim color and metal ceiling color. (See Division 9: Finishes)

As a result of several site visits in August and September 2008 by architects from Lord Aeck Sargent, mechanical and electrical engineers from Nottingham Brook and Pennington, and structural engineers from Willett Engineering Company the following is a summary of findings:

1) The current test results for the 1979 re-pointing mortar established the fact that in departure from the issued specifications, a purely cement based mortar mix was used, without any lime component in strong contrast to the also tested original, fully lime based mortar (1853), which is still in place at the east elevation and corner pilasters and inside the narthex. The consequences of this cement based mortar application are still under review. However it can be stated that this re-pointing mortar is stronger than the original brick and may apply additional stress to the exposed brick surfaces. There is general brick and original mortar erosion condition at the building which needs to addressed soon, however without urgency.

2) The original metal tower base, the floor of the belfry and the connection between the tower base and the slate roof will need to be further investigated, most suitably as part of a repair scope of work in the near future since the building envelope is compromised in these areas. At the east gable wall, the two main structural posts and the connected beam holding up the belfry floor are showing signs of wood decay and need to be fully investigated.

3) The basic structural condition of the Sanctuary is very sound, including all foundations. The condition of the long-term "temporary" block foundation underneath the balcony columns should be addressed in the near future, however without urgency. Any slight lateral impact, seismic or otherwise, could disturb the dry stacked blocks and expose the floor to unusually high stress from the balcony column.

4) The slate roof was fully removed and reinstalled in 1979 and is still in very good shape according to external, visual inspection. Minor repairs are required but no major scope of work has been noted, apart from the flashing work around the tower base mentioned above. All replacement slate should be matched more closely to the original slate in all dimensions to maintain visual continuity. Observation from the attic to detect any leaks will continuously be required.

5) An area of additional concern is above the eastern gable eaves because the slate roofing plane is sagging over the edge and no longer fully flat. The original bracket support inside the metal cornice is currently not known to us and thus difficult to assess for its continued durability.

6) There a few areas of corrosion at the original metal entablature and the 1979 gutter installation. The cause for some of these defects may be water penetration from behind and needs to be addressed to avoid further corrosive action.

7) The attic insulation is falling off in several areas. It may be appropriate to re-insulate with a higher quality and insulation value to save energy.

8) Since air conditioning was installed in the Sanctuary in 1956 it appears that the same air-handling unit has been in operation. It may not be premature to consider replacement of the unit before it stops working to minimize the inconvenience and select the best possible energy efficient equipment for its replacement.

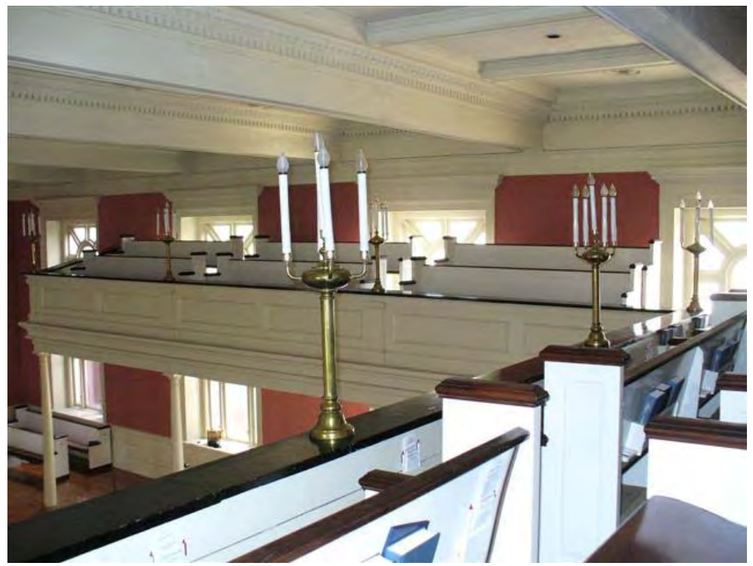
9) The slightly bowed column at the end of the north balcony does not require any intervention

10) Careful examination of the 1979 plaster intervention at the Sanctuary walls showed that several previously repaired cracks are showing up again as fine cracks on the plaster surface. It is recommended to work on these cracks as part of the paint preparation.

11) Paint samples were extracted in various locations in order to establish the earlier used colors for the Sanctuary walls and the principal trim color. The 1905 wall color started out somewhat similar to today's Sanctuary color, which started to be interpreted into a much darker red over time. The trim did not change as dramatically over time and started out in 1905 as a yellowish white. Parts of the external metal cornice and entablature had been treated with sanded paint in the 1905 stylistic modification of the Sanctuary which resulted in more stone-like appearance of these metal elements. It is difficult and costly to reproduce the sanded paint effect nowadays and may therefore not be advisable. Color samples and specifications for the identified paints are provided as part of the paint analysis report.

In view of the above points we want to add one more general point concerning building code related issues: currently the historic Sanctuary has no emergency exit hardware on any of the exit doors, four doors are swinging into the space against the path of egress, there are no emergency lights or exit signs and none of the doors have handicap hardware and the handrails are mostly non compatible with regard to the accessibility code. In addition, there is an exception for places of worship in place which permits the Sanctuary to operate without a sprinkler system. As far the code compatibility is concerned, it will have to be achieved as soon as there is a major restoration/preservation project underway, usually assessed by cost versus building value. The fire protection system should be considered mostly for the sake of safeguarding the building as much as for general safety concerns. The sprinkler system will also have to be installed as soon as there is a major restoration/preservation project underway.

In summary, the Sanctuary is in principally in very good shape, but, as with all heritage structures, ongoing maintenance and the occasional major repair are essential parts of successful stewardship for important historic buildings.



1.4. Action Matrix of Proposed Improvements

Division	Action Description	Priority Level	Restoration	Adaptation	Site: East	Site: North	Site: South	Site: West	Exterior: East Elevation	Exterior: North Elevation	Exterior: South Elevation	Exterior: West Elevation	Exterior: Narthex	Exterior: Roof	Interior: Crawlspace	Interior: South Stair	Interior: North Stair	Interior: Sanctuary	Interior: Balcony	Interior: Attic
1	**General Conditions**																			
	Pre-Construction Investigation																			
	Conduct Environmental Survey of Regulated Materials	1																		
	Remove and test sample bricks for absorption and compression	1																		
	Remove existing batt insulation in tower to inspect structure	1																		■
2	**Existing Conditions & Site Work**																			
	Site Work																			
	Install new, code compliant handrails at East entrance	1 or 2			■															
	Install new, code compliant handrail from upper to lower sidewalk	1 or 2			■															
	Replace concrete steps at sidewalk with matching marble	3			■															
	Direct irrigation away from masonry walls	1			■	■	■													
	Clear vegetation at masonry walls	1			■	■	■													
	Maintain clear storm drain inlets and positive drainage flow	1			■	■	■													
	Pest Control	1			■	■	■													
3	**Concrete**																			
	Install tubular concrete foundations underneath each balcony column. Construction phasing will be very important due to the need for shoring support (10 required).	1 or 2													■					
	See Structural Report for this Division as well	1 or 2													■					■
4	**Masonry**																			
	Replace spalled and eroded brick	1							■	■	■	■	■							
	Investigate brick and commission production of replicas	1							■	■	■	■	■							
	Repoint areas of deteriorated original lime mortar	1 or 2							■	■	■	■								
	Remove all 1979 Portland mortar and repoint with matching mortar	1 or 2								■	■	■								
	Reinforce round masonry opening in East gable with arch/lintel	1 or 2							■											
	Crack repair to be implemented, including east gable wall	1							■	■	■	■	■							
	Masonry sealing (to be decided)	2							■	■	■	■	■							
5	**Metals**																			
	Remove corrosion and refinish affected areas	1							■	■	■	■	■							
	Eliminate water penetration behind cornice and entablature	1							■	■										
	Clean and refinish ornamental capitals	1 or 2							■	■	■	■								
	Replace damaged ornamental metal	1 or 2							■	■	■	■	■							
	Install bird protection at capitals	1 or 2							■	■	■	■								
	For metal wall at Tower base see Division 13	1											■							
	Curch bell and support structure: clean and protect against corrosion	2 or 3																		■
6	**Wood and Heavy Timber**																			
	Remove insulation for inspection (select areas only)	1																		■
	Inspect all structural wood members - tower segment of attic	1																		■
	Replace in kind all damaged and compromised wood members	1																		■
	Floor: Check and re-set all adjustable jacks in crawlspace	1													■					
7	**Thermal & Moisture Protection**																			
	Remove existing and install new foam insulation	1 or 2																		■
	Remove insulation in crawl space and reinstall new foam insulation																			■
	Reframe / replace deteriorated framing at belfry (prep. for roofing)	1												■						■
	Install new metal roof over belfry floor level	1												■						
	Install completely new flashing at tower base	1												■						
	See Division 13 for further recommendations and coordination	1 or 2												■						■
	Slate roof: Replace all slipped and damaged slate tiles	1												■						
	Slate Roof: Replace non fitting black slate tiles in select locations	1 or 2												■						
	East Cornice: investigate cornice suport structure and re-build	1 or 2												■						
	East Cornice: re-roof with existing slate tiles	1 or 2												■						
	Repair bowed gutter, correct slope and drainage	2												■						
	Re-attach copper leader pipes w/ stainless steel fasteners	2								■	■									
	Repair damaged downspouts	2								■	■									
	Seal downspout penetration against metal cornice	2								■	■									■
8	**Doors and Windows**																			
	Change egress doors to swing to the exterior (if required)	3							■								■			
	Install Power Assisted Door Opener at ADA entrance	3							■								■			
	Change hardware to be ADA compliant	1														■	■			
	Replace non-historic glazing to match historic cathedral glazing	3														■	■			
	Replace missing window hardware to match original	3														■	■			
	Recaulk deteriorating seals	1														■	■			
	Round Window: Repair, restore and refinish (prevent deterioration)								■								■			
	Reattach header trim to wall	1															■			
9	**Finishes**																			
	Repair cracks in ceiling plaster (stair tower)	2														■	■			
	Repair fine cracks in wall plaster	1 or 2														■	■			
	Paint Wood Windows and trim (routine maintenance)	1 or 2														■	■			
	Paint Interior Wood Doors (routine maintenance)	1 or 2														■	■			
	Replace balcony carpeting to match existing	3																	■	
	Painting - Interior (walls and ceiling)	3														■	■			
	Painting - Exterior - Entablature	2							■	■	■	■								
13	**Special Construction- Bell Tower**																			
	Disassemble tower base, remove slate roofing (in parts), install redesigned flashing where tower base meets slate roof, re-install base and slate roofing	1								■	■	■								
	Inspect fiberglass tower components (inside and outside)	1 or 2								■	■	■								
	Seal windows to protect from weather	1								■	■	■								
	For new roofing see Division 7	1								■	■	■								
	Spot repair surface of fiberglass material	2								■	■	■								

1.4. Action Matrix of Proposed Improvements

Division	Action Description	Priority Level	Restoration	Adaptation	Site: East	Site: North	Site: South	Site: West	Exterior: East Elevation	Exterior: North Elevation	Exterior: South Elevation	Exterior: West Elevation	Exterior: Narthex	Exterior: Roof	Interior: Crawlspace	Interior: South Stair	Interior: North Stair	Interior: Sanctuary	Interior: Balcony	Interior: Attic
15	**Mechanical: Heating, Ventilating and Air-Conditioning**																			
	Replace rooftop cooling unit and all connections	1 or 2																		
	Insulate ceiling diffusers	2												■						■
	Install vapor barrier to underside of roof deck	2												■						■
	Replace shield flex connector and protect from weather and sun	1												■						
16	**Electrical**																			
	Install Fire Alarm System	1														■	■	■	■	■
	Install egress lighting	1														■	■	■	■	■
	Install Security System	1 or 2														■	■	■	■	■
	Structural																			
	Repair/Replace belfry support structural framing: see Division 6	1												■						■
	Construct individual support piers for balcony columns: see Division 2	1													■					

Priorities:

1 - Conditions that if not addressed in the short term (0-2 years) will lead to further and potentially substantial loss of historic fabric and require greter intervention and cost to repair. The conditions may require action to comply with current safety and accessibility codes.

2 - Conditions that are resulting in the loss of historic fabric and should be addressed in the medium term (3-5 years) to arrest deterioration and prevent further problems.

3 - Conditions that if not addressed will not lead to further deterioration or condition problems. However, if implemented, will enhance the historic and visual qualities of the building.

1.5. Conceptual Project Budget

Division	Conceptual Project Budget	Priority Level	Low Range	High Range	Remarks
1	**General Conditions**				
	Pre-Construction Investigation				
	Conduct Environmental Survey of Regulated Materials	1	$3,500	$6,500	
	Remove and test sample bricks for absorption and compression	1	$4,500	$6,000	
	Remove existing batt insulation in tower to inspect structure	1	$500	$750	
	Sub Total		**$8,500**	**$13,250**	
2	**Site Work**				
	Install new, code compliant handrails at East entrance	1 or 2	$4,500	$6,500	
	Install new, code compliant handrail from upper to lower sidewalk	1 or 2	$5,000	$7,000	
	Replace concrete steps at sidewalk with matching marble	3	$12,000	$15,000	
	Direct irrigation away from masonry walls	1	$500	$650	
	Clear vegetation at masonry walls	1	$300	$500	
	Maintain clear storm drain inlets and positive drainage flow	1	$500	$650	
	Pest Control	1	$1,500	$2,000	
	Sub Total		**$24,300**	**$32,300**	
3	**Concrete**				
	Install tubular concrete foundations underneath each balcony column. Construction phasing will be very important due to the need for shoring support. (10 required)	1 or 2	$40,000 $4,000 each	$60,000 $6,000 each	
	See Structural Report for this Division as well	1 or 2			
	Sub Total		**$40,000**	**$60,000**	
4	**Masonry**				
	Replace spalled and eroded brick Investigate brick and commission production of replicas	1	$7,300 $25 per unit	$9,100 $30 per unit	assume 75 bricks to be replaced labor $40 /$60 plus material
	Repoint areas of deteriorated original lime mortar	1 or 2	$11,900	$13,600	
	Remove all 1979 Portland mortar and repoint with matching mortar	1 or 2	$20,700	$25,300	
	Reinforce round masonry opening in East gable with arch/lintel	1 or 2	$3,500	$7,000	
	Crack repair to be implemented, including east gable wall	1	$1,500	$2,750	
	Masonry sealing (to be decided)	2	$6,300	$9,450	
	Sub Total		**$51,200**	**$67,200**	
5	**Metals**				
	Remove corrosion and refinish affected areas (cornice & entablature)	1	$1,300	$2,100	
	Eliminate water penetration behind cornice and entablature	1	$1,500	$2,000	
	Clean and refinish ornamental capitals	1 or 2	$1,000	$2,500	
	Replace damaged ornamental metal	1 or 2	$1,000	$2,500	
	Install bird protection at capitals	1 or 2	$500	$1,200	
	For metal wall at Tower base see Division 13	1	NA	NA	
	Curch bell and support structure: clean and protect against corrosion	2 or 3	$750	$1,200	
	Sub Total		**$6,050**	**$11,500**	
6	**Wood and Heavy Timber**				
	Remove insulation for inspection (select areas only)	1	$800	$1,500	
	Inspect all structural wood members - tower segment of attic	1	$3,500	$6,500	
	Replace in kind all damaged and compromised wood members	1	$25,000	$60,000	
	Floor: Check and re-set all adjustable jacks in crawlspace	1	$1,000	$2,000	
	Sub Total		**$30,300**	**$70,000**	

Division	Conceptual Project Budget	Priority Level	Low Range	High Range	Remarks
7	**Thermal & Moisture Protection**				
	Remove existing and install new foam insulation	1 or 2	$8,500	$9,200	5" thickness of spray-in insulation
	Removcve insulation in crawl space and reinstall new foam insulation	2 or 3	$4,290	$4,650	3" thickness incl. difficult access
	Reframe / replace deteriorated framing at belfry (prep. for roofing)	1	see Division 13	see Division 13	
	Install new metal roof over belfry floor level	1	$7,680	$8,320	$60 mat and labor
	Install completely new flashing at tower base	1	see Division 13	see Division 13	
	Slate roof: Replace all slipped and damaged slate tiles	1	$5,100	$7,000	
	Slate Roof: Replace non fitting black slate tiles in select locations	1 or 2	$7,200	$8,500	
	East Cornice: investigate cornice suport structure and re-build	1 or 2	$12,000	$15,000	
	East Cornice: re-roof with existing slate tiles	1 or 2	$3,300	$4,200	
	Repair bowed gutter, correct slope and drainage	2	$7,200	$9,800	
	Re-attach copper leader pipes w/ stainless steel fasteners	2	$800	$1,400	
	Repair damaged downspouts	2	$750	$950	
	Seal downspout penetration against metal cornice	2	$500	$900	
	Sub Total		**$57,320**	**$65,325**	
8	**Doors and Windows**				
	Change egress doors to swing to the exterior (if required)	3	$2,400	$3,200	4 doors to reverse swing
	Install Power Assisted Door Opener at ADA entrance	3	$12,000	$15,000	
	Change hardware to be ADA compliant	1	$15,400	$21,000	7 double doors
	Replace non-historic glazing to match historic cathedral glazing	3	$600	$900	
	Replace missing window hardware to match original	3	$750	$900	3 units
	Recaulk deteriorating seals	1	$450	$600	
	Round Window: Repair, restore and refinish (prevent deterioration)		$3,500	$4,800	
	Reattach header trim to wall	1	$350	$500	
	Sub Total		**$35,450**	**$46,900**	
9	**Finishes**				
	Repair cracks in ceiling plaster (stair tower)	2	$2,500	$3,900	
	Repair fine cracks in wall plaster	1 or 2	$5,200	$7,800	
	Paint Wood Windows and trim (routine maintenance)	1 or 2	$14,000	$21,000	
	Paint Interior Wood Doors (routine maintenance)	1 or 2	$6,900	$9,500	
	Replace balcony carpeting to match existing	3	$2,210	$3,200	
	Painting - Interior Walls and ceiling	3	$10,000	$16,000	
	Painting - Exterior - Entablature	2	$9,500	$11,000	
	Sub Total		**$50,310**	**$72,400**	
13	**Special Construction- Bell Tower**				
	Disassemble tower base, remove slate roofing (in parts), install redesigned flashing where tower base meets slate roof, re-install base and slate roofing	1	$45,000	$75,000	incl. slate work
	Inspect fiberglass tower components (inside and outside)	1 or 2	$2,750	$6,000	
	Seal windows to protect from weather	1	$600	$1,400	
	For new roofing see Division 7	1	NA	NA	
	Spot repair surface of fiberglass material	2	$2,500	$3,500	
	Sub Total		**$50,850**	**$85,900**	

1.5. Conceptual Project Budget

Division	Conceptual Project Budget	Priority Level	Low Range	High Range	Remarks
15	**Mechanical: Heating, Ventilating and Air-Conditioning**				
	Replace rooftop cooling unit and all connections	1 or 2	$45,000	$55,000	
	Insulate ceiling diffusers	2	$2,500	$4,500	
	Install vapor barrier to underside of roof deck	2	$8,800	$11,000	
	Replace shield flex connector and protect from weather and sun	1	$600	$800	
	Sub Total		**$56,900**	**$71,300**	
16	**Electrical**				
	Install Fire Alarm System	1	$12,000	$15,000	
	Install egress lighting	1	$5,500	$7,200	
	Install Security System	1 or 2	$4,500	$6,500	
	Sub Total		**$22,000**	**$28,700**	
	Total		**$433,180**	**$624,775**	

Priorities:

1 - Conditions that if not addressed in the short term (0-2 years) will lead to further and potentially substantial loss of historic fabric and require greter intervention and cost to repair. The conditions may require action to comply with current safety and accessibility codes.

2 - Conditions that are resulting in the loss of historic fabric and should be addressed in the medium term (3-5 years) to arrest deterioration and prevent further problems.

3 - Conditions that if not addressed will not lead to further deterioration or condition problems. However, if implemented, will enhance the historic and visual qualities of the building.

1.4. Building History of the First Presbyterian Church

(based on the publication "God at Work", published in 2000, historic photographs and architectural drawings from 1974 and by 1979) and the earlier published: History of the First Presbyterian Church 1835 to 1976

1853 Original Masonry Construction:

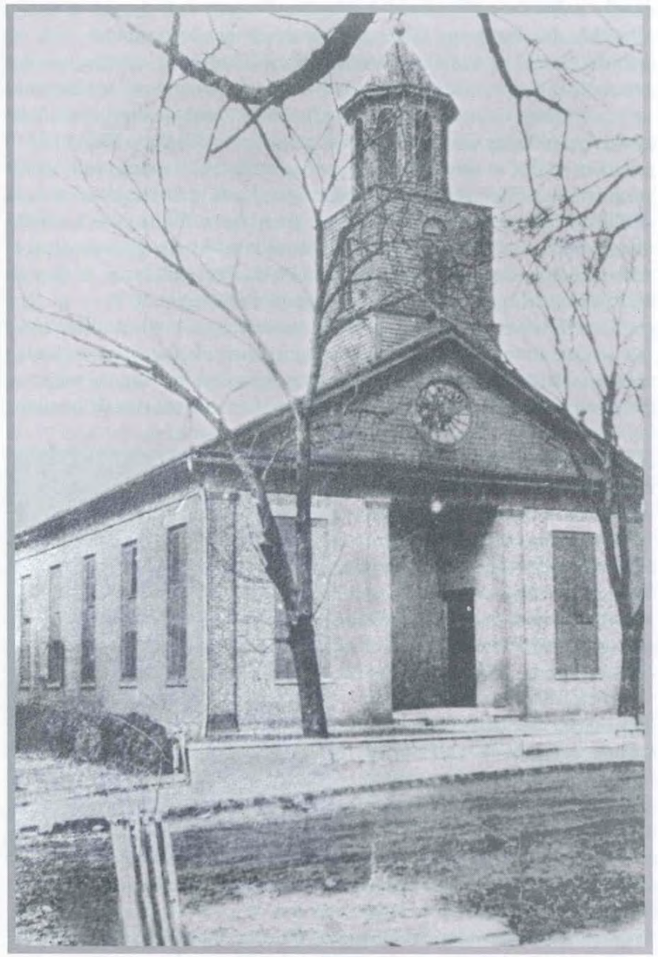
The First Presbyterian Church of Marietta Church was dedicated at its current location on June 10, 1854.

Built for a congregation of 96 members to replace the earlier wood church (dating back to 1843) with a new Greek Revival masonry building.

The Church building remained as built 1854 with only minor alterations until 1899 when a Sunday School addition was constructed and enlarged in 1922.(page 9, A History… 1835 - 1976) This became later known as the "Old Fellowship Hall" which was removed in 1975. This structure was constructed to the west of the Sanctuary, thus providing protection against the element for the two doors in the west wall, leading into another part of a church structure, starting in 1899.

1865- the Sanctuary was used as Civil War hospital. $5000 reparations for war damage were received

Some fifty years after the "War between the States" - in 1864 Marietta was captured - the church received payment of $ 5,000 reparations from the Federal Government for the use of the church as a Federal Hospital. That information suggests that this additional money became available in 1914.



Earliest known photo of church, taken between 1899 and 1905. Notice the dark painted entablature and steeple and the unpaved street.

Exterior:

Cupola: Above the narthex, Hexagonal steeple on a square base. Both levels had wood siding, and windows centered on each face. The configuration was a rounded arch transom on top of above tall rectangular windows. Steeple pin was metal with cross based on a metal ball.

Pediment: wood siding (most likely wood shingles) with large circular window with 16 segments and a center pane.

Sanctuary windows: (triple hung) wooden rectangular sashes with clear glass and a monolithic granite headers and lintels. Sashes painted dark color. The windows are difficult to see because of the closed wooden shutters in the one surviving photograph from that period.

Paint colors:

Walls and columns: white, light cream. Doors, trim, pews, gallery, ceiling beams: dark stain or dark paint?

Exterior trim: dark painted entablature, weathered wood siding .

Stone floor at entrance portico: remaining markings from 1860's cooking fires.

Wood shingle roof (not documented)

First Presbyterian Church of Marietta

Preservation Plan and Assessment of the Historic Sanctuary Structure

This early picture of Church Street facing south shows the Presbyterian Church and neighboring houses before 1905. (Courtesy of Marietta Museum of History)

Interior:

Interior configuration: no central aisle, no central main entrance. Pews lined up in a single central bay with a central dividing wall and access only from the sides, lining up with the side entrances at the narthex.

Organ and Choir loft located at the southwest corner of the building. At the center of the west sanctuary wall, the Pulpit is emphasized by a recessed arched opening with simple dark band of trim. Double doors at northwest corner.

Single stairwell at the northeast corner of the building, enclosed within the narthex.

Heart pine floors, running parallel to the east west axis/ length of the aisles.

Lighting: likely to have been candles at the beginning and later gas fixtures - there is no photographic documentation. Dual electrical lamp fixtures suspended from the ceiling of the sanctuary in a central line perpendicular to the pulpit are shown in the earliest interior photograph, dated 1903.

Pipe Organ:

Earliest organ and choir loft were to the left of the alter, as seen from the sanctuary, in the southwest corner. This was the first pipe organ in the church, donated in 1869.

Sanctuary interior in 1903, decorated for the wedding of Leila Leake and J. Lewis Turner

1905 Renovation:

The congregation and the building committee were talking about and considering to remodel the Church building in already in 1894.

However ,only in 1902 was there a meeting to decide how to change the Church. The congregation voted in July 1902 to remodel the Sanctuary in the "colonial style" and keep the galleries and not to "modernize" and remove the galleries. The vote was 59 for colonial versus 13 for modernization. The project was complete in 1905 and constitutes the first major change to the Sanctuary since its original construction in 1854.

Interior:

Major changes:

New main entrance, aligned with new central interior aisle.

Center aisle created with new pews placed in two banks extending under the galleries.

New metal ceiling work installed: cornices, cladded coffering, horizontal ceiling panels. “finest steel ceiling, cream tinted, massive beams”

Paint:

Walls painted with oil paint in Pompeian Red

windows, doors, gallery, wainscoting, pews: “old ivory with mahogany trimming highly polished”

Carpet: green velvet

Red cushions on top of white painted pews

New “upright chandeliers with 60 electric lights” mounted to gallery railing replaced dual lamp chandeliers suspended from the center ceiling of the sanctuary. Currently, new brass fixtures and new flame bulbs have replaced the original chandelier’s glass globes.

New Steam heat was installed - likely through the placement of radiators, piped from below and supplied from a boiler.

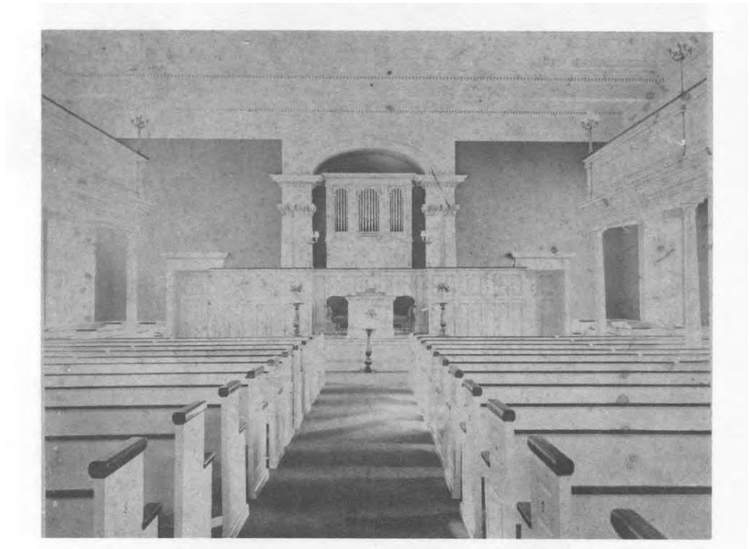
First Presbyterian Church of Marietta

Preservation Plan and Assessment of the Historic Sanctuary Structure

Organ:

Relocation of the organ and choir loft from southwest corner of the building to the center of the west wall was part of the major changes at the Sanctuary.. A new organ was recessed into arched opening behind pulpit. Arched opening framed with ornamental elements and wood pilasters. The choir and pulpit remain in same plan configuration today. However, the elevation of the choir walls have been lowered

There was a new pipe organ installed in 1914. It is in the central arch behind the alter and its display pipes are housed in a cabinet with three arched openings.



Interior in 1914

This 1914 organ was modernized in 1951 and replaced in the 70's (recently replaced …) See the following image of the organ during Easter service in 1958. page 31 - History from 1835-1976.

Combined choirs, Easter 1958

When it was decided to replace the Old Fellowship Hall with a new building, this 1914 organ had to be removed since its pipes were in the wall adjoining the hall.

A new Austin organ - in the Sanctuary - was dedicated in May 1976, at the same time as the new Fellowship Hall was dedicated.

1905 Exterior:

Cupola was replaced with more massive version, based on a mix of classical revival style and Spanish colonial style. It also featured an open bell story and some bells. The base for this bell tower was dimensioned to support the new double bay design, including the balcony and its balustrade above the belfry and below the cupola.

Windows:

"Cathedral glass" was used to glaze the new windows, replacing the original triple hung windows within the same opening. The sash consists of a bold, triple central bay with an arched top section, flanked by three narrow window panes on each side with a group of four small panes on top, divided by a 45 degree muntin from the top arch into the upper corner of the window. Currently all windows are covered with permanently installed exterior plexiglass storm windows (pre-1979).

Metal Cornice:

All sides of the Sanctuary and the east gable received extended sheet metal entablatures, richly decorated with new dentils, brackets and classical ornamentation.

The brick pilasters were incorporated into new/improved metal entablature and lost some of their visual characteristics.

New wood Corinthian columns with sheet metal capitals are framing the entrance.

Trim painted white, replacing dark paint at doors, windows, entablature,

At pediment, rose window decreased in size. Brick replaces wood cladding.

New slate roof using the "very best Virginia slate" did get installed. It is uncertain if this roof replaced an earlier slate roof or a wood shake roof.

1945 Five Year Plan (completed in 3 years):

Purchase the Cole Apartment Building to the south of the Church and convert into an educational building. That building was dedicated in May 1947: John Patton Memorial Fellowship Building.

Plans to put chimes into the belfry - that was implemented immediately.

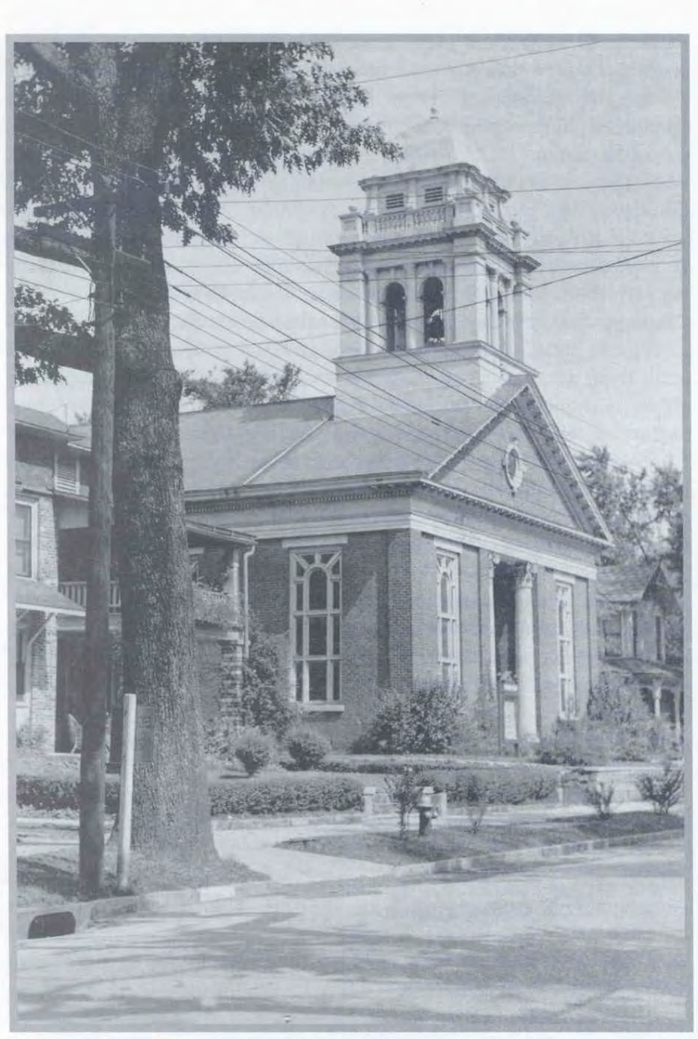
Provide a Chapel inside the Educational Building - the Clover Memorial Chapel - dedicated in Sep. 1950

1956: Installation of Air Conditioning

In May of 1956 air conditioning was installed in the sanctuary.

According to an initial observation of the dedicated equipment for the sanctuary,

The mechanical engineer estimated correctly that the existing air handler on the adjacent roof top does date back to the 1960's (before we confirmed the 1956 date). The diffusers in the o1905 ceiling date therefore back to 1956 as well.



Sanctuary with Cole Apartments on left and Ward House on right, about 1945

1960

Cotten Memorial Building (Christian Education Building) started in March 1960 and completed in September 1960, located behind the Patton Building.

During the 60's: purchase of all the properties to the north of the Church up to Kennesaw Avenue.

1969 - 1972

It is uncertain when the second stair in the north foyer was constructed: the decision to install it was made in 1969. There is no date given for its construction.

The Steeple:

…it became necessary to remove from the Church the ornate and heavy metal-covered wooden belfry which many years before had replaced an earlier steeple destroyed by wind. The weight of the belfry was determined to be a hazard to the walls of the sanctuary.

Strong disagreement among the congregation as to whether it should be replaced, the congregation in August 1969 approved installing a new steeple. The new steeple, in design similar to the early one destroyed by wind, was hoisted into place on April 24, 1972 (36 years ago).

1974

A new Long range planning committee started to meet in 1971 and made recommendations in 1974: Sheetz and Bradfield, Architects were engaged to provide the long term plan.

The long term plan was adopted in May 1974: removal of the Old Fellowship Hall (that was done in May 1975) to be replaced by a newer, larger building with kitchen, Fellowship Hall w/ stage etc.(the hall which exists there now, known as the "Holland Hall") dedicated on Easter Sunday 1976. The new Austin Organ was dedicated in May 1976. The need for a new organ had been expressed in 1972 already.

1979 Major Building Rehabilitation

Exterior:

Masonry Restoration

- Structurally unsound or missing bricks were removed and replaced using brick of similar age, texture, and color - it is not obvious if and to what degree this was actually implemented. If it was done, the replacement brick did match very well.
- Existing mortar joints removed min 5/8" depth using tuck pointer plugging chisel.
- New tuck pointing used high lime mortar color matched to existing mortar – *this did not get implemented as specified.*
- After mortar cured, hand washed with Sur-Klean 600 and potable water.
- Narthex walls and floor were hand washed with Sur-Klean 600 and potable water.
- Window headers and sills sandblasted to original stone.

Metal Cornice and Narthex ceiling:

- Existing paint softened with Cerfax paint remover applied by hand. Then sandblasted. There was no request to document what kind of paint was there before, if it was "sanded" and if was toned differently?
- Missing or deteriorated metal repaired or replaced with 22ga. Galvanized metal. Replaced dentils fastened with stainless steel rivets and solder.
- 1 coat galvanized metal primer followed by 2 coats eggshell sheen enamel
- Where needed, metal cornice was to be re-attached to structure.

Exterior Wood:

- Cleaned with detergent solution to remove dirt and chalk. Mildew removed; not specified how.
- Exterior latex primer. Then 2 coats exterior acrylic emulsion low luster paint.
- Includes doors, windows, and columns.

Roof:

- All slate tiles were removed and reused for re-roofing with copper nails.
- 1 layer Conglas, Type 40 fiberglass felt.
- Replace existing gutter with 16oz. red cold roll copper gutter. Lead coated in some areas.
- New metal flashing installed at base of tower.
- Re-work structure under tower to level roof in this area before re-roofing.
- Jack posts out evenly to plumb vertically beneath tower. Install 4" steel pipe beside
- Scab on 6'- 0" member of same size at every rafter within steeple opening
- Introduce steel structural elements

After 1979:

Roof repairs had been done after 1979 – see documentation on slate roof under Division 7: Thermal and Moisture protection. Some of the repairs observed look like there were done following the slate repair standards

1979 Interior:

Wood Surfaces:

- 2 coats alkyd satin enamel applied to all wood surfaces, including doors, windows, wainscot, handrails and columns.

Plaster Wall Surfaces:

- Loose plaster pulled and patched to match existing.
- 1 coat latex primer then 2 coats flat latex wall paint.
- Installed new electrical fixtures switches, and sound systems.
- Anchored and repaired plaster where balcony meets wall on both sides.
- New electrical panel box installed in north stairwell.

Ceilings

- Underside of balcony: plaster ceiling and lath replaced with 2 layers of ½" gyp board
- North Stairwell: plaster cracks repaired and repainted at ceiling.
- South Stairwell: existing acoustical tile replaced with 2 layers of ½" gyp board on furring strips.

Floor:

- Carpet removed after construction to protect existing wood floors. No notes on refinishing wood floors.
- Carpet currently in stair rooms and on stairs, and balcony.

Metal Work: Cornice, Dentils, Arch above choir, Cladding beams and perlins, on horizontal ceiling.

- Sandblasted after applying paint stripper.
- Inspected and repaired all joints, seams, and laps.
- Dents in metal were filled in and sanded smooth.
- 1 coat galvanized metal primer then 2 coats eggshell sheen enamel.
-

Choir Loft:

- Modified. Was deeper, less long. Pulpit was longer to hold a sofa behind podium.

Pews:

- 1902 pews replaced with new of similar design.
- velvet cushions for acoustics
- Currently- Front pews removed to make room for musicians

Balcony Lighting:

Currently, new brass fixtures and new flame bulbs have replaced the original chandelier's glass globes.

Division 2 - Site work and Accessibility

Storm drainage inlets below rain leader pipes from the roof gutters along south and north side of the Sanctuary look superficially to be in good working order. It is very important to keep them clear of debris and check them inside for possible accumulation of leaves and organic matter.

Side walks and steps directly connected with the Sanctuary at the main east entrance are all in good shape.

The Sanctuary's front entrance is principally grandfathered as far as handicap accessibility is concerned. There is an alternative route through the new church main entrance, the hallway and entering the Sanctuary through one of the north side entrances, on the altar side of the Sanctuary. This will principally suffice. However, as far as door hardware is concerned, door width and thresholds the accessibility of the Sanctuary could still be questioned and the grandfather status is essential.

Access to the choir/music loft behind the altar is very narrow and not usable by a handicapped person. Also, there is no handicap access to the balcony.

Recommendations:

Maintain grandfather status as long as possible. Check out all options before starting on any major work in and around the Sanctuary. The existing metal handrails at the entrance and to the sidewalk do actually not comply with the current h.c. requirements.

Long-term plan is to improve accessibility and it should include upgrade of handrails and hardware at the east entrance and at key doors.

See also Division 8: Doors and Windows for further recommendations.

The double steps at the sidewalk could be reworked to create uniformity and replace the concrete ones with marble for aesthetic reasons only. The basket weave brick sidewalk paving could be restored by removing/replacing deteriorated brick.

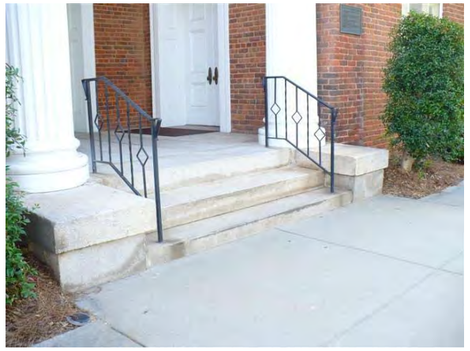
Double material steps: marble and concrete

Marble stairs to sidewalk

Area drain next to building foundation

Division 3 – Concrete, including Crawlspace and Foundations (Reference also Structural Report)

A) Sidewalks around the church on all three sides are in good shape, including the front entrance condition and the entrance steps to the main east entrance of the Sanctuary.



Sidewalk at main entrance to Sanctuary

B) Concrete ring beam on top of narthex walls inside the attic from the 1979 repair work: structural characteristics are unknown; strength is unknown; reinforcement - if any - is unknown. In order to find out, it would be required to find structural documents and/or the responsible structural engineer to confirm and document the condition of this collar/ring beam. LAS made some attempts to connect with the structural engineer listed on the 1979 drawings but did not succeed in establishing communication. Future use of the beam for tower re-construction would possibly require testing of the concrete and investigation of all ties and reinforcements. It may also be possible to add internal ties to the masonry - after testing the historic masonry for its strength. Given the historic use of a basic lime mortar mix, the tensile strength of the brick may be rather limited.

With reference to the concrete block support at the foundation level see documentation of the foundation level following these findings, as well as the Structural Report under point A) in the Appendix

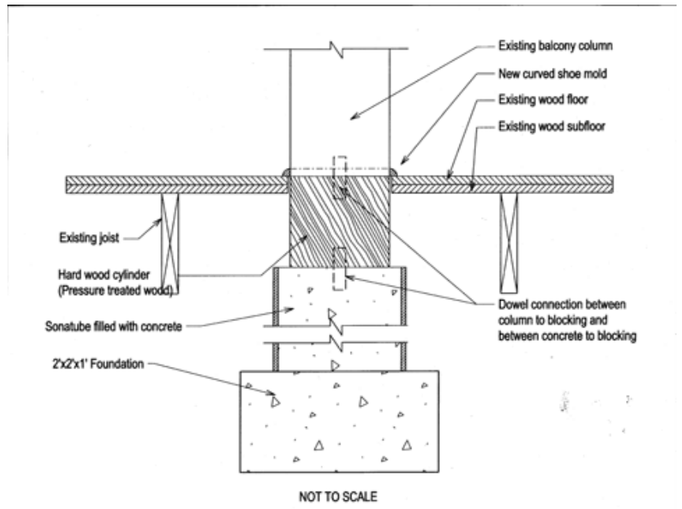
Recommendations:

Balcony Column Foundation Replacement

The existing column support is inadequate. Re-building of the individual supports is recommended from the top down. The reason for this approach is due to the difficult access from the crawl space and the need to create a separation between the column and the floor for structural reasons. Careful and selective removal of the floorboards in the immediate vicinity of each column will be required. This process will require a temporary support of the balcony load next to the column to be re-supported by the new foundation. Create a large enough opening to install new, “Sonatube” concrete column below the existing Balcony column. These individual, round columns will have a 2’x2’ footing. Existing dirt in crawlspace to be excavated for foundation size only, to the same level as the trench bottom. After curing time, hard wood cylinder to be inserted and secured with dowels between bottom end of column and top of concrete to make a fully continuous, load bearing connection.

Reinstall wood floor with a newly cut round opening, fitting tightly onto the new intermediate column base cylinder. This will achieve the separation between the column and the original wood floor of the sanctuary. Refinish floor to match existing.

Sketch of column foundation:



Steel post failing to support joist

Typical steel jacks to support floor joists at midspan.

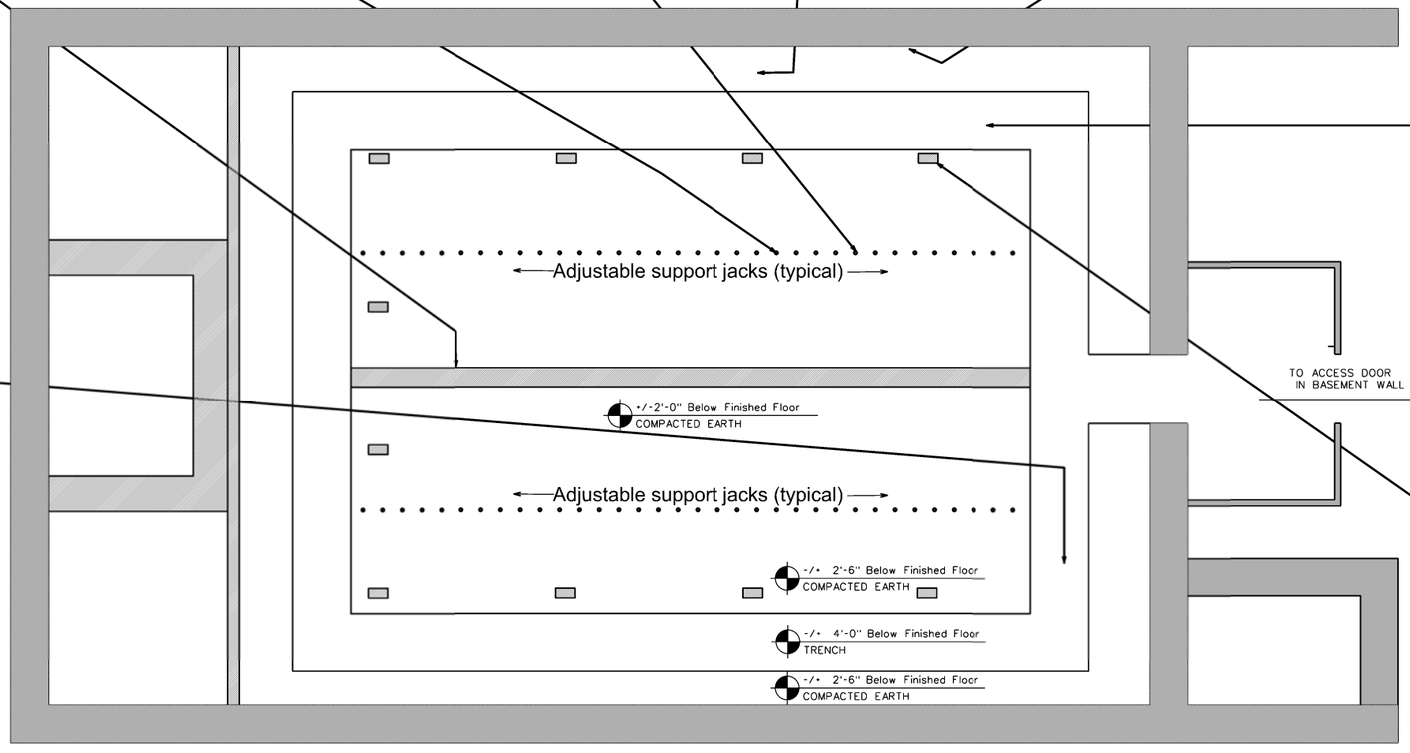
Compacted soil between mechanical duct trench and exterior foundation wall

Floor joists sitting on top plate on granite foundation wall

Granite wall

Trench for mechanical ducts

Granite exterior foundation wall to the left, ductwork on compressed soil to the right



Crawlspace Floor Plan

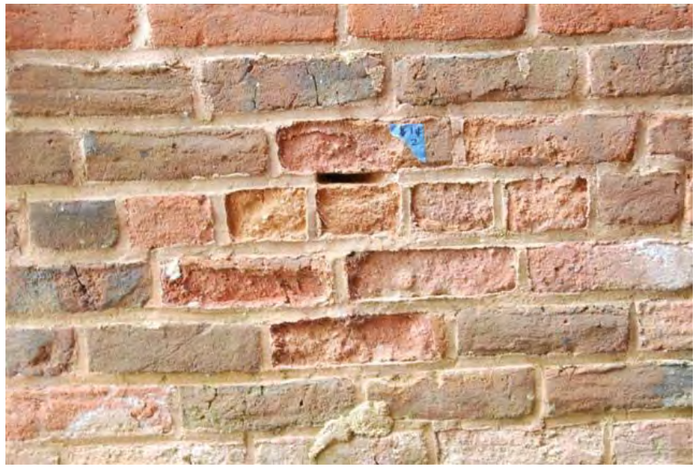
Concrete block supports too close to edge of compacted soil

Division 4 - Masonry

There are several specific areas where the exterior brick of the exterior walls of the Sanctuary is either eroded or started to spall. Erosion is deterioration of brick or mortar due to weathering forces such as wind and rain. Spallation is deterioration of brick due to expansion and contraction of the brick and adjoining mortar in the wall. When the forces become too great, the exterior face of the brick separates from the wall in a shearing motion. Without the protective exterior face, spalled brick may then further deteriorate by erosion. The majority of both erosion and spallation occur 2-3 feet above grade.

During our investigation we found a medium size group of brick exfoliated on the north side towards the front (Church Street) and the back, in the recessed area next to the new entrance building. There a few bricks out front on the east side next to the Narthex pilasters. Both of these occurrences are at between 2 and 3 feet above grad. After inspecting the east brick gable it was noticed that at the bottom of the east gable wall was a large number of strongly eroded bricks, likely also caused by wind and rain action.

The 1979 scope of work did ask for replacement of broken and damaged brick (spall damage?) but that was not documented and it is not currently known if and how much of the original brick may have been replaced. There are three possible causes for the currently existing damage: A) the original brick was not quite as well produced and fired as desirable and therefore is not holding up any longer, i.e. it does show signs of stress and starts to exfoliate and undergoes spallation. B) Since the re-pointing mortar used in 1979 is not compatible with the 1853 brick it may causes the surface of some of the brick to spall. C) The specifications for the 1979 work did not ask for sandblasting the brick surfaces, but there is the possibility that the brick surfaces were treated abrasively at that time and is starting to show signs of weakness. All three causes could also occur together and reinforce each other.



In order to determine the cause and effect more clearly it would be necessary to carefully and selectively remove several bricks from the wall and test them for their compressive strength and water absorption characteristics. Before or during the brick testing is in progress it would be necessary to start with the replication process of the existing brick through custom brick producers since the exterior wall restoration will require some brick replacement under most circumstances. Since the brick removal and testing process may result in further loss of the bricks, the method of coring the brick and measuring the core may be an alternative testing solution.

Meanwhile, LAS had removed mortar from two areas for petrographical testing: the east side/front of the church where the mortar was not replaced according to the 1979 scope of work and from the north side, towards the back, where the brick spall is occurring. Additional samples were taken at both sampling location beyond the surface sample. The full depth in both case amounted to approximately 3". After the extraction of the mortar from the depth of the setting bed it had consistently turned into sand with very few pieces of mortar remaining.

The results of the mortar analysis are following the elevation drawings. In short, the 1979 pointing mortar is totally based on white Portland cement and the original, remaining mortar is a totally lime based mortar.

The mortar inside the Narthex and at the east elevation does show the remains of a colored line or a highlight painted onto the center of the mortar joint. It is uncertain if this was a protective coating someone applied a while back or if it was to highlight and express the mortar joints differently then with their natural mortar color. It is possible to remove small units of this coating and have it analyzed if this is considered of interest by the owners. There is a chemical lab attached to Georgia Tech which is most capable in determining such substances. If the owner is interested we can set out to investigate the origin and date of this particular mortar treatment during additional research.

At the east elevation are also several areas where the mortar has been washed out or has eroded back from the front of the brick to a large degree. RE-pointing will be most important in these locations. The re-pointing mortar would have to match the original mortar very closely in order for it not to show and distract from the uniformity of the brick masonry. The 1979 re-pointing mortar, besides from its hardness, did also

not match the original mortar in color. Below the windows at the east elevation are several re-pointed areas within the original mortar joints and it is very obvious where the new re-pointing mortar has been inserted.

Granite window headers and sills were sandblasted in 1979. This changed the texture of the stone, but the granite is generally in good condition. At the middle window on the South elevation (window 10), the granite header shows stain.

Recommendations:

Further investigation of typical bricks from the exterior wall is recommended. Once the results have been analyzed, a decision about the removal of the 1979 mortar and consequent re-pointing, can be made. The main concern is the amount of damage to the original brick which will be caused during the removal of a very hard Portland cement mortar from a very soft 19th century brick. In addition, the 1979 mortar was used to fill all cracks and voids in damaged brick as well, so there are many additional pockets of mortar which need to be removed once that process has been selected.

After careful laboratory examination of the brick it may be recommendable to re-seal the surface of the brick.

There are several cracks in the east gable segment of the exterior wall. All masonry cracks need to be filled and re-pointed. The round window opening may require additional support in form of a round lintel since the brick opening does not appear to have been structurally reinforced.

Scratched/ scored masonry

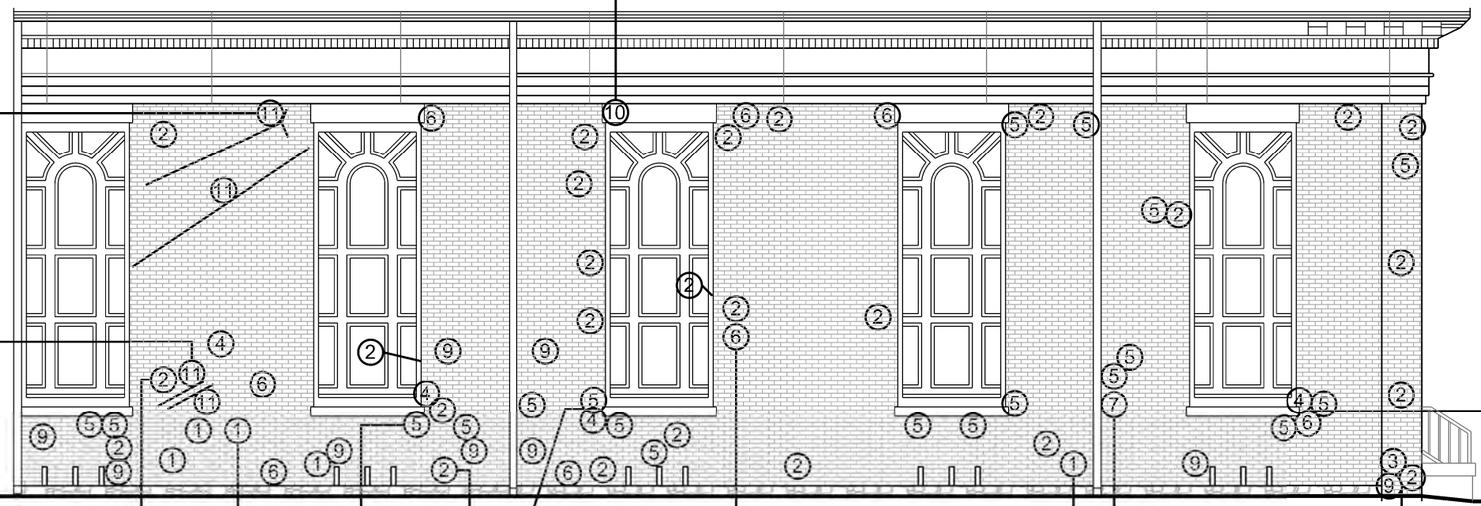
Scratched/ scored masonry

Failing brick surfaces

Spalled/ eroded brick with 1979 mortar

Cracked bricks

Efflorescence



Over pointed repair in 1979

Spalled brick with repointed 1979 mortar

Stress crack in masonry next to granite sill

Rusting nail fastened into brick

Granite lintel- sandblasted and stained

Over use of repointed 1979 mortar next to sandblasted granite sill

Eroded brick with deteriorated mortar

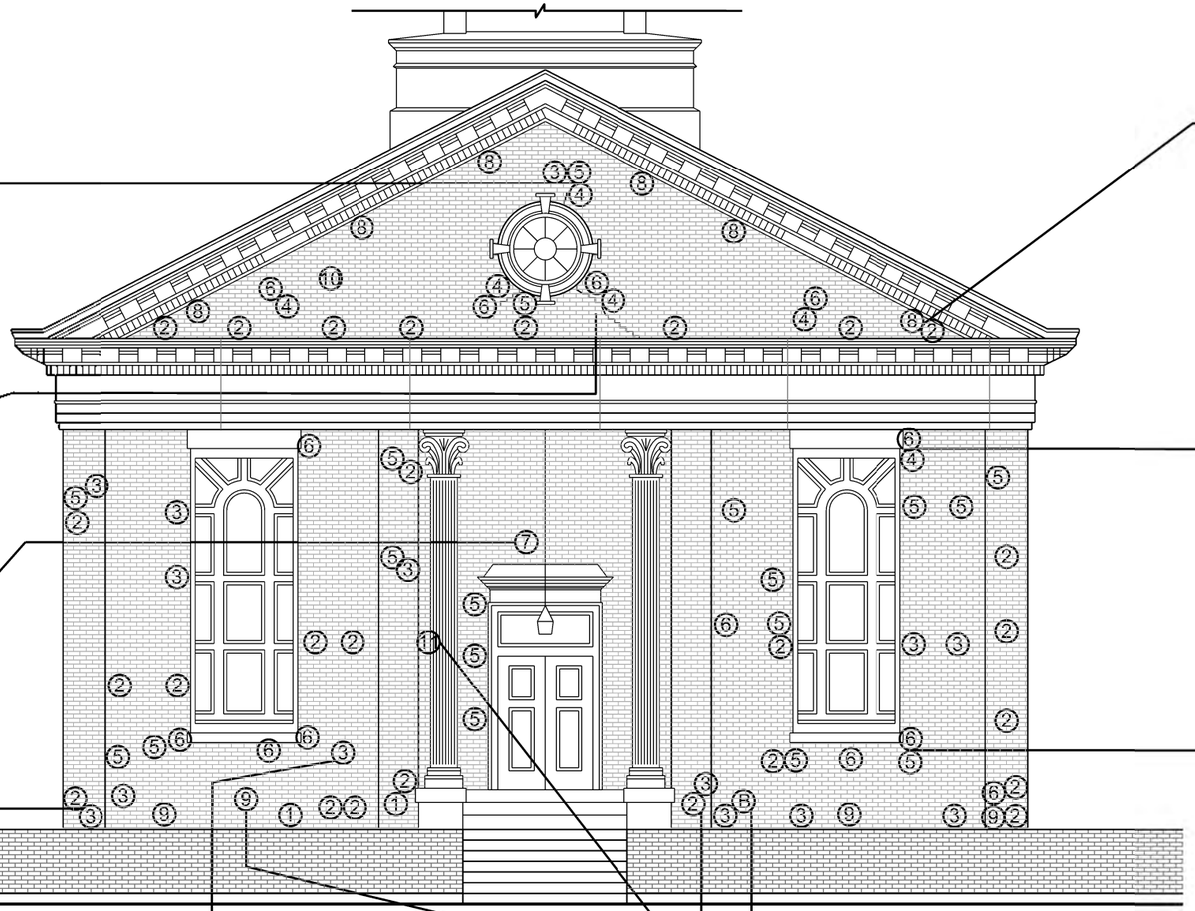
LEGEND

1. Spalled brick
2. Eroded/ failing brick
3. Deteriorated mortar
4. Cracked mortar
5. Cracked brick
6. Over pointed repair (1979)
7. Coroded fastener
8. Biological growth- Not Used
9. Efflorescence
10. Stained/ sand blasted granite lintel
11. Scored masonry

Strongly weakened masonry-
cracked brick and mortar

Poorly repaired masonry crack (1979)

Remnants of paint or mortar coating



Mortar sample 3 & 4

Oversprayed white paint on brick

Over pointed mortar (1979)

Cracked brick and non-matching mortar (1979)

Eroded brick, failing lime mortar not
repointed in 1979

Failing lime mortar

Efflorescence

Scored masonry

Eroded brick, failing lime mortar
not repointed in 1979

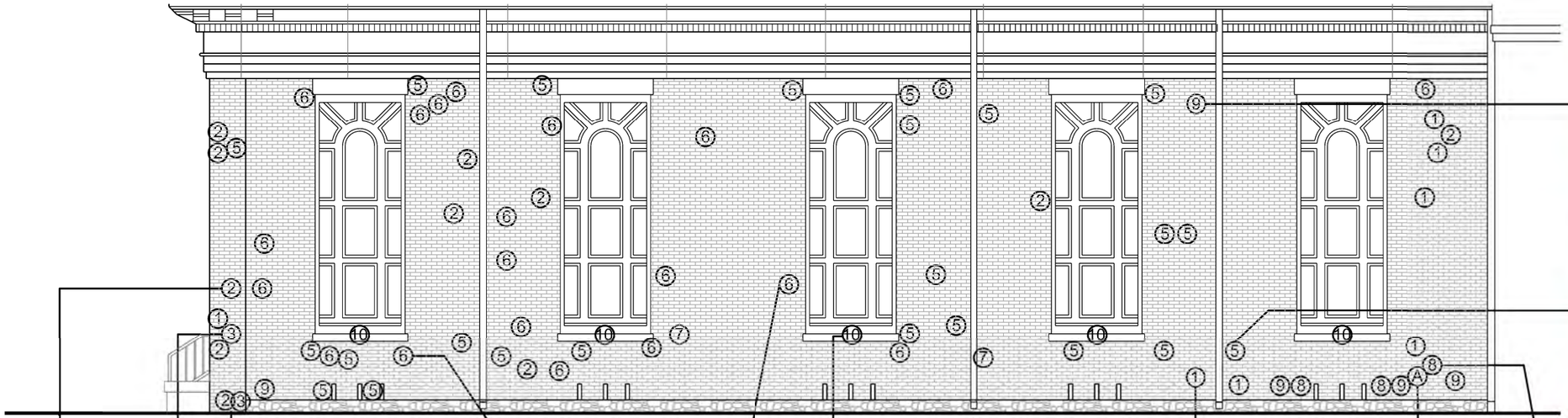
LEGEND

1. Spalled brick
2. Eroded brick
3. Deteriorated mortar
4. Cracked mortar
5. Cracked brick
6. Over pointed repair (1979)
7. Painted Mortar
8. Oversprayed white paint
9. Efflorescence
10. Bored holes
11. Scored masonry
B. Mortar sample 3 & 4

Lord Aeck Sargent Architecture
October 24, 2008

First Presbyterian Church of Marietta
Preservation Plan

4.4 East Masonry Elevation
Scale: 1/8" = 1'-0"



Efflorescence

Cracked brick

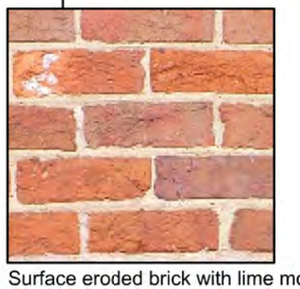
Biological growth

Eroded/ spalled brick with eroded lime mortar

Overpointed brick repair (1979)

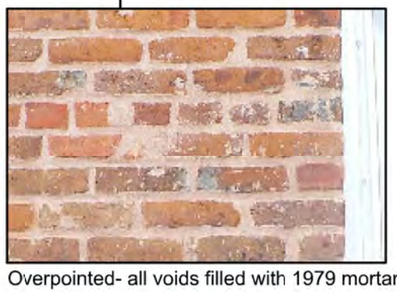
Sandblasted granite

Mortar sample 1 & 2

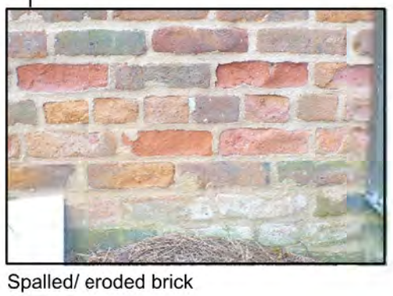


Surface eroded brick with lime mortar

Eroded brick in lime mortar not repointed in 1979



Overpointed- all voids filled with 1979 mortar



Spalled/ eroded brick

LEGEND

1. Spalled brick
2. Eroded brick
3. Deteriorated mortar
4. Cracked mortar
5. Cracked brick
6. Over pointed repair (1979)
7. Coroded fastener
8. Biological growth
9. Efflorescence
10. Sandblasted granite sill
11. Scored masonry

A. Mortar sample 1 & 2

Lord Aeck Sargent Architecture
October 24, 2008

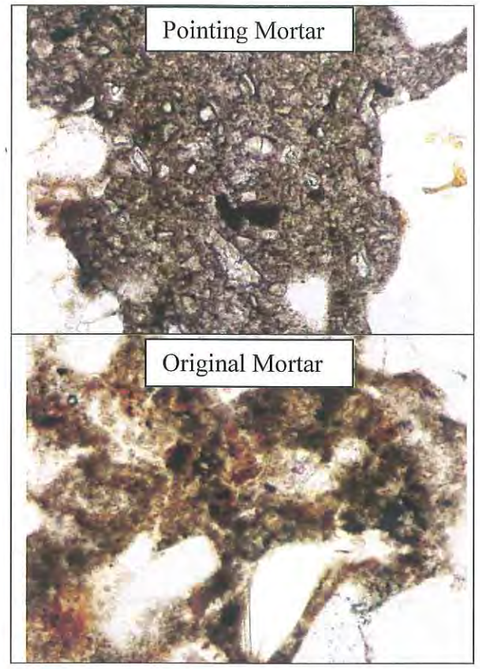
First Presbyterian Church of Marietta
Preservation Plan

4.5 North Masonry Elevation
Scale: 1/8" = 1'-0"

WJE

FIRST PRESBYTERIAN CHURCH
Petrographic Studies of Mortars

Marietta, Georgia



Final Report
September 23, 2008
WJE No. 2008.4217

Laura J. Powers
Petrographer, Associate Principal

INTRODUCTION

Petrographic studies have been conducted on mortar samples received September 8, 2008 to determine the general composition of the mortar. The mortar samples were reportedly taken by others from mortar joints in brick masonry at the First Presbyterian Church in Marietta, GA. The original portion of First Presbyterian Church was constructed in 1854. Additions and renovations were made between 1903 and 1905. Reportedly, mortar joints were re-pointed in 1979.

Samples

Five samples were received for the studies (Figures 1 and 2). Drawings and photographs showing sample locations were also received for reference. Sample designations were as follows:

#1 - Fragment, North elevation, exterior masonry above foundation, west of last window
#1 - Small units and sand from location above
#2 - 3"deep at location of #1
#3 - East elevation, lower portion of exterior masonry between stairs and window
#4 - 3" deep, below #3

PETROGRAPHIC STUDIES

Petrographic studies of the mortar samples were performed in accordance ASTM C 1324, *Standard Test Method for Examination and Analysis of Hardened Masonry Mortar* using the procedures outlined in ASTM C 856, *Standard Practice for Petrographic Examination of Hardened Concrete,* which is also applicable to mortar. Thin sections were prepared from each sample. The largest mortar fragment was cut in half, one side polished, and then mounted to a glass slide. Samples contained in tubes 1, 2, 3, and 4 were sieved and the largest particles in each were placed in separate small cups and encapsulated in epoxy resin. After the epoxy hardened, each sample was cut, polished and then mounted on a glass slide. The mounted samples were ground to a thickness of 20 to 25 µm. Thin sections were examined at magnifications up to 500X with a petrographic (polarized light) microscope to evaluate mineralogy and microstructure.

Samples #1 and #2

The larger mortar chunk (Sample #1) and many of the smaller fragments from tubes labeled #1 and #2 represent a relatively recent mortar that consists of crushed siliceous sand uniformly dispersed in a white portland cement paste (Figures 3 and 4). The mortar appears to be normally sanded (normal sand proportions). The paste contains abundant small particles of red mineral (iron oxide) pigment. The paste is heavily carbonated, but does not contain residual lime nodules (evidence of hydrated lime) or cement-size particles of finely ground limestone indicative of a masonry cement. Based on high cement content it is expected that this mortar has a high compressive strength.

The fine aggregate appears to be crushed or manufactured sand, based on the predominance of angular particles. The major constituents are quartz, feldspar, biotite mica, and granite. Opaque oxides, amphiboles, and garnet were observed in smaller amounts. Aggregate composition indicates that the source rock was granite.

The smallest fragments in Sample #2 resemble fragments detected in Sample #3 and #4, which are described below.

Samples #3 and #4

Sample #3 and #4 consist of reddish sand-size particles and powder. Thin section examination revealed that most of the larger particles are fine aggregate particles coated with reddish paste (binder). A few particles consist of paste-coated residual lime nodules, and a smaller number of dark-red particles consist of reddish clay nodules and brick. Fine aggregate mainly consists of angular to sub-rounded particles of quartz, and smaller amounts of a variety of rock fragments.

The larger particles in both samples consist of several fine aggregate particles bound in a heavily carbonated lime paste (binder) that contains red natural pigment (red clay), possibly kaolinite mixed with hematite (Figures 5, 6, and 7). Possible evidence of natural cement (irregularly shaped particles containing relict carbonate morphology) was observed. Evidence of portland cement particles (unhydrated, partially hydrated, or relict cement grains) was not observed. The condition of the sample prevented estimation of sand volume.

SUMMARY

Petrographic studies of the samples indicate that the harder mortar fragments represent more recent replacement mortar that is composed of crushed siliceous sand dispersed in a white portland cement paste that contains a red iron oxide pigment. Smaller fragments and powder material taken from a depth of 3 inches in the joints appear to represent original mortar composed of natural mainly siliceous sand dispersed in a hydrated lime paste that is now fully carbonated. The original mortar appears to contain red clay as a colorant. Possible evidence of a small amount of natural cement was observed in this mortar, but the properties of the mortar paste/binder are predominantly those of carbonated hydrated lime.

The composition (high cement content) and microstructural characteristics of the pointing mortar suggest that its compressive strength is higher than the original mortar. In general, if the compressive strength of the pointing mortar is higher than that of the original brick masonry it may have an adverse effect on durability and performance of the masonry walls.

Storage: Thirty days after completion of our studies, the samples will be discarded unless the client submits a written request for their return. Shipping and handling fees will be assessed for any samples returned to the client. Any hazardous materials that may have been submitted for study will be returned to the client and shipping and handling fees will apply. The client may request that WJE retain samples in storage in our warehouse. In that case, a yearly storage fee will apply.

Figure 1. Sample 1- largest fragment, shown as received.

Figure 2. Five samples received for petrographic studies. The largest fragment, shown in Figure 1, is at the bottom. Samples 2, 3, and 4 consisted mainly of powder.

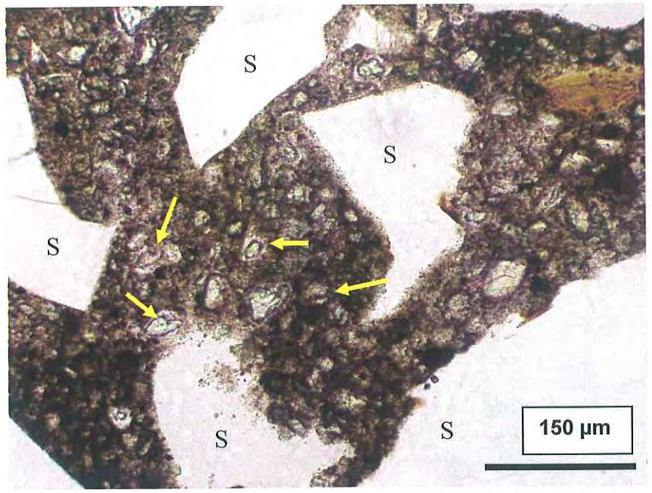


Figure 3. Sample #1 - The mortar is composed of siliceous sand (S) in white cement paste that contains well dispersed fine pigment particles. Arrows show examples of white cement particles. Thin section image. Plane-polarized light.

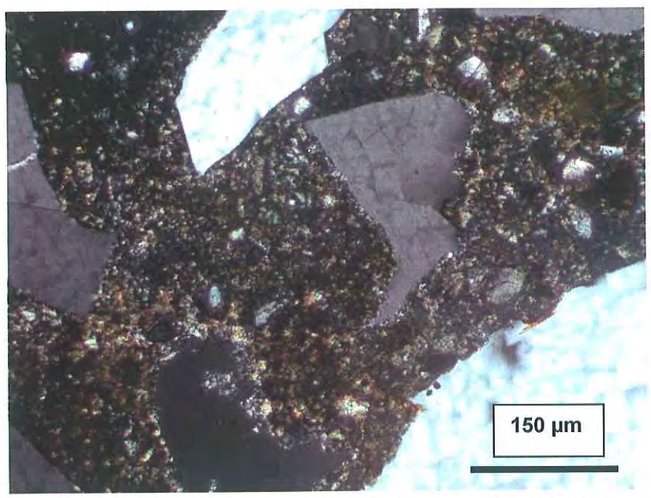


Figure 4. Sample #1 - Cross-polarized light view of field shown in Figure 3.

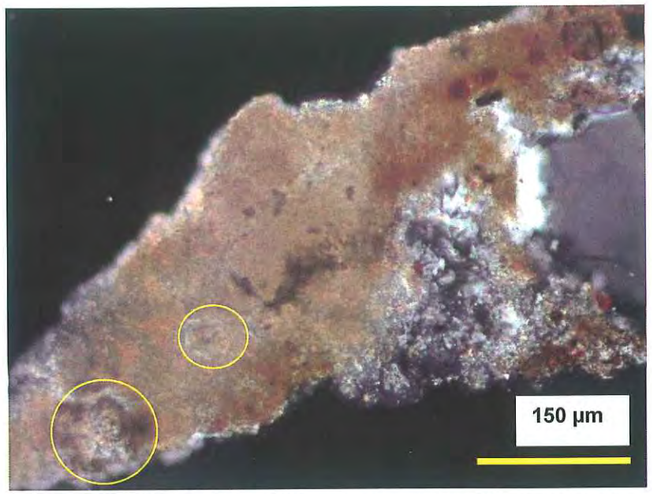


Figure 5. Sample #3 and #4 - The mortar consists of natural sand dispersed n a lime-rich paste that may contain a small amount of natural cement (circled). Thin-section image. Cross-polarized light.

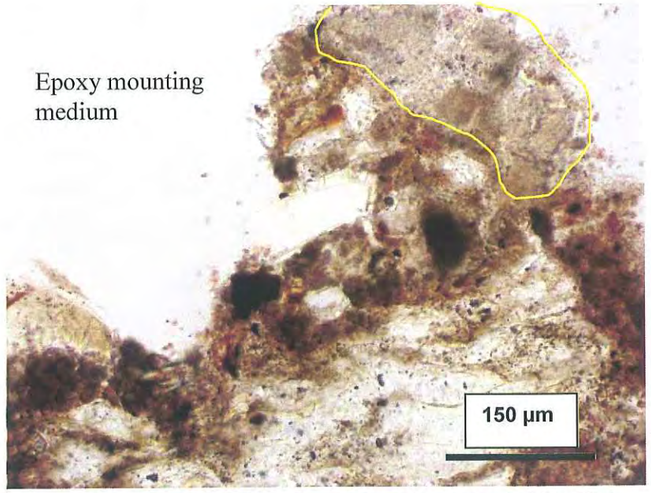


Figure 6. Sample #3 and #4 - Lime-rich region is circled. Reddish particles appear to be clay containing hematite. The smooth white areas are epoxy. Thin-section image. Plane-polarized light.

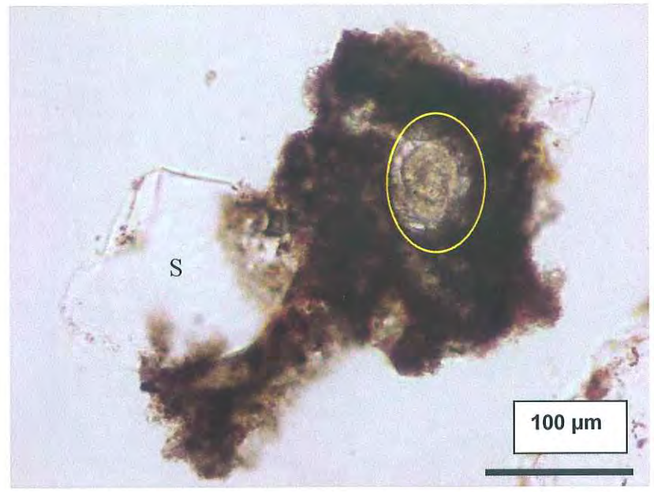


Figure 7. Sample #3 and #4 - Small particle consisting of a sand grain (S), reddish paste, and a cement particle (circled). Thin-section image. Plane-polarized light.

Division 5 - Metals

Metal cornice and entablature: The 1905 renovation introduced ornamental metal to the North, South, and East exterior elevations. All eaves, cornices, column capitals, and decorative brackets are made of galvanized sheet metal. During the 1979 renovation, all metal surfaces were to be sandblasted to bare metal and that treatment may have contributed to an uneven “oil-canning” appearance. This is exceptionally noticeable on the flat metal surfaces of the entablature.

The Corinthian Capital is completely made out of thin sheet metal

For the most part, the painted metal is in good condition. There are only minor scratches and cracks in the paint. In some areas, the metal cornice detail is damaged. The locations of minor damage and paint cracking are also documented in Division 7.4 Roof Assessment.

Thin sheet metal cornice and entablature at east gable

The major problem with the metal entablature and cornice is corrosion. Rust stains are most evident on the East elevation above the horizontal cornice. Corrosion can be resolved by chemical means or by replacing a severely deteriorated element. In any case, it is important to check behind the corroded metal to be sure structural framing has not deteriorated from moisture damage. And, if there is moisture damage, it is essential to correct the moisture infiltration at its source.

According to the paint analysis, there were areas of the decorative metal work which had a "sanded paint" treatment to simulate the appearance of stone work rather than shiny metal surfaces. Due to the vigorous paint removal program of the 1979 work there is only enough evidence to document the existence of sanded paint but not the distribution of it. See further discussion of “sanded paint’ in Division 9 – Finishes.

Cover metal sheet across the horizontal cornice at east gable

The horizontal cornice at the east gable is in need of further investigation and most urgently corrosion protection. The flashing at the wall may also be in need of upgrading. The substructure inside the cornice is unknown and may need to be inspected for structural integrity.

Column capitals: The Corinthian capitals on either side of the narthex are completely made out of thin galvanized sheet metal attached to a semi-structural steel shaft. It is in fair condition and needs cleaning and repainting to protect it from corrosion. The various bent and horizontal surfaces do provide ideal nesting and resting perches for various birds.

Recommendation: Eliminate any water penetrations behind metal work. Remove all corrosion from all metal surfaces by chemical or, if required, abrasive means. In case of advanced corrosion, replace metal element, minimizing loss of historic material. Re-prime and repaint to match existing. In case of the capitals, treat inner shaft with rust inhibitor and prime/paint to protect. Clean all surfaces intensively and review bird protection options if desired.

Tower base: The base of the tower is completely made out of galvanized sheet metal with remnants of multiple paint layers on top .

See Division 7 and Division 13 for description of current conditions and recommendations.

Integral gutters and down spouts: In 1979, all built-in gutters were replaced with lead coated copper gutters and flashing. The original gutters may have been uncoated copper. The leader pipes are made out of copper.

See Division 7 for description of current conditions and recommendations.

Steel structure: The steel structure and the steel beams supporting the bell tower is in good condition without visible corrosion or physical damage.

See also Appendix A: Structural Report.

No Recommendation

1970's Steeple steel support frame and recent wood frame intervention.

Church bell: The church bell inside the belfry and its carrier structure is cast iron, in good condition.

Recommendation: Cleaning and corrosion protection

Cast iron bell in belfry

Division 6 - Wood and Heavy Timber

Attic and Roof framing: The original heavy timber framing of the attic has to support both, the free-spanning ceiling (approximately 45 feet) and support the heavy slate roof (there has been no information found which would contradict the assumption that the Sanctuary always had a slate roof). The individual post and beam members are approximately 8"x9" in cross section. It is our assumption that there is a tension rod installed below the ceiling beams to provide structural support, covered by the extensive metal beam cover which is much deeper than required for the wooden beam spanning across the ceiling. The post and beam joining is following the basic principals of mortise and tenon. Most of the structural members of the heavy timber framing assembly are holding up very well. Mostly in the bay comprising the tower base are water damage and other wood deterioration problems immediately noticeable. Both horizontal spacing rafters between the cross frames are deteriorated and have been doubled-up during earlier repair projects. However, there are still several conditions of wood damage which need to be addressed.

Below the tower, original framing members were reinforced during the 1979 renovation. Due to water infiltration from the base of the tower, several structural members continue to deteriorate. Additional 2x6 framing supports were introduced within the last 5 years to support the ridge beam and rafters. This recent framing is in good condition (See Structural Report in Appendix A.).

Original 1853 heavy timber framing in the attic; note insulation detaching from roof underside.

Recommendation: See East gable wall below

East gable: The original east gable enclosure construction was probably a wooden super structure designed to hold a wood shingle surface. During the 1905 modification of the church, this wooden wall was replaced with a

two wythe brick wall. The brick/wood lintel construction bridging the narthex entrance opening is mostly inaccessible and thus it is unclear to us at this point in time how it functions structurally. Spanning the narthex opening, there seems to be masonry arch resting on a lintel (steel from 1905?). The remaining, visible wood beams are no longer functional due to water damage and termite attacks of the wood. However, the currently existing structural system spanning the narthex is inaccessible, covered from below by the metal ceiling and from above by the wood beam and masonry construction in place from the earlier construction.

As far as the structural support for the belfry floor is concerned, there are two heavy timber posts standing directly inside the brick gable wall, in line with the standard heavy timber posts forming the roof truss system. There is no visible cross bracing support besides the attachment to the brick gable wall. No such attachment could be detected for the upper portion of the posts. A double cross beam on top of the posts does provide support for the rafters of the belfry floor. However, in the corners this structural system is again compromised due to moister penetration, rot and possibly termite attacks - dry rot may also be present (see image – parts of it are misleading since the insulation is hanging vertically making it look like a wall surface in the corner)

Recommendation: Remove all insulation from the inside of the roof/attic space. Clean all debris and using strong lights start to examine all structural wood members, including heavy timber beams and posts, in the vicinity of the tower base. That will reveal the extent and the kind of damage which has accumulated over the years. Under the current circumstances it is not possible to investigate and draw correct conclusions. However, it is fully noticeable that parts of these wood framing areas are fully compromised and need replacement in the near future.

This repair scope will have to be tied to the overall consideration and evaluation of the durability of the bell tower enclosure and the steeple and its life expectancy. See also Division 13.

Double Beam across the gable wall and original post all shows signs of deterioration; (southwest corner).

East Gable Round Window

Double Beam across the gable wall, original post shows signs of deterioration; new board material attached to support the horizontal load (southeast corner).

Buckets are lined up for drip water collection (time frame unknown)

Sanctuary floor framing: The sanctuary floors are in good shape and feel very solid. The central support for the floor joists is provided by a granite masonry wall with a center plate on top to hold the floor joists is also in good condition. Since the granite wall runs underneath the central aisle of the sanctuary, there is a slightly elevated ridge noticeable along the floor in the center of the isle. The relative firmness of the floor has also been generated by the installation of adjustable steel jacks at regular intervals and at approximately at the mid point of the span. Temporary block foundations support the floor at each balcony column location. See Structural Report in Appendix A.

Recommendations: Inspect all adjustable jacks and adjust their carrying tension sufficiently to support the joists without exerting too much upward pressure on to the floor. Replace/apply new insulation.

See Division 3 - Concrete for proposed balcony column foundation.

Floor joists on top of the granite foundation wall, at the base of the exterior brick wall.

Division 7 - Thermal and Moisture Protection

Roof Insulation

Insulation inside the attic is hanging loosely in parts and has fallen off the sheathing, Either the attachment was not working very well or there are leaks in the roof, the insulation gets wet and heavy and then falls down. There is insulation missing in the critical roofing area next to the tower base, where the roof is penetrated by the tower.

Recommendation: Remove all batt insulation from the attic space. Check for water leaks and possibly required repair to the rafter and sheathing before re-insulating with a more efficient and durable insulation system. Spray-on insulation may be suitable - will achieve a higher level of insulation and remain in place more reliably. It will also be more environmentally friendly than the currently applied batt insulation.

Failing insulation in the front section of the attic

Tower roof

Observation from inside the tower base has revealed that the floor framing above the tower base structure - which is the floor on which the bell carrier is resting - is mostly sound in its central portion but rather deteriorated along the perimeter and particularly at all four corners. There are several detailed images to make this point. On the south-west side of the tower, the rafters are partially deteriorated (and/or removed) and have been covered with plywood in a clearly temporary way. The northwest corner shows similar levels of water damage on the rafters/joists and from below/inside there was no new installation of plywood visible. These two west side corners of the tower base top are structurally well supported since a post 1979 structural wood support system had been installed.

Additional structural support for belfry floor rafters

All rafters are supported from below by a beam running north-south - the rafters running from east to west. However it is the condition at their ends, at the corner, which are no longer holding up. There is a high probability that the framing of this belfry floor is still the original framing, either from the first tower of the church (1853) or from the 1905 version of the tower. In either case it may be necessary to consider reworking this floor/roof surface to make sure that it is fully sealed again and long lasting, with a new and improved roof surface - lead coated copper or similar. See also section drawing A301.

Water damage to beam at belfry floor, NW Corner

Floor joists for belfry floor, outside of the steel frame, SW corner

The flashing and connection between the metal surface of the tower base and the slate roofing through which the tower base is penetrating is the most crucial for the durability of the roof, and the tower area in particular. Further investigation may well be required since it is not easily possible to walk the roof areas next to the tower in order to inspect. The bucket lift did help to get us closer to the source of the potential roofing/flashing failure along the perimeter of the tower base. What is needed is a whole new flashing detail which works as a retrofit. Since it is hard to attach anything to the outside of the metal base it may be necessary to rework the base sheets of the tower base and insert a whole new flashing assembly over a newly reinforced roof decking. This would have been a good approach when the slate had been taken off the roof in 1979.

From a waterproofing point of view the tower base is resting on top of the slate of the gable roof surface and needs to be sealed off along that edge and perimeter. We did observe several water marks on the rear wall of the Sanctuary, up on the balcony, right below the tower-roof penetration.

Also, there are several strategically placed water collection buckets placed inside the attic, below the tower perimeter.

Recommendation: This repair scope will have to be tied to the overall consideration and evaluation of the durability of the bell tower enclosure and the steeple and its life expectancy. See also Division 13 and the images related to the tower exterior.

Floor corner at belfry level; fiberglass wall immediately next to floor opening

Slate roof evaluation and recommended repair

The slate roof was reviewed from the neighboring roofs via binoculars and photographs and from the bucket lift. The condition of the slate roof is principally very good. A slate roof installation expert (Steve Yoder: Classic Slate & Tile Inc.) also reviewed the existing condition on LAS' behalf and gave the roof an very good rating and stated that it has still several decades of life expectancy. The majority of the currently existing slate material, is assumed to have been installed during the 1905 reworking of the church, is a Vermont Gray slate, a semi-weathering type which over the years has weathered into the dominantly brown-gray-buff shades seen on the majority of the roof surface right now.

The 1979 scope for the slate roof covered removal and re-installation of the existing slate roof, the replacement of broken and chipped slates and the re-alignment of all slate tiles during re-installation. The roof inspection showed that this 1979 scope of work had been implemented as shown on the drawings. The replacement slate was apparently another Vermont Gray slate which matches well with the original Vermont Gray, although it was called for as an unfading variety and shows no weathering. The other material option listed was Buckingham-Virginia and according to our current understanding that could be the slate used during repairs following the 1979 work.

Judging from the color match and the correlation between the fastening method of the slate and the distinct color and thickness variation, it is possible to identify most of the repairs which were undertaken following the complete removal and re-installation of the slate roof in 1979. These later additional repairs are likely to have used a so called Buckingham Black slate, which is truly black and will not weather, that means it will not blend in with the original slate over time. The black repair slate does show consistently greater thickness and in some locations a lack of fit as far as the width of the inserted units is concerned. The most recent slate repairs are also recognizable by their copper wire hooks at center of the lower, exposed edge of the tile. Without removing all tile up to the ridge and several tiles next to the repair location, it is basically impossible to insert and nail a new tile on to the roof. The wire hook is placed before the tile is inserted and after the tile is put in place, the hook is custom fitted to the tile and bent to hold it firmly. However, several of these repair tiles are not wide enough to properly fit into the space left by the broken/lost older tile.

There are also several re-used tiles from the '79 work which were turned upside down and now have their first set of nail holes exposed. These holes have been closed with small beads of sealant and are still holding up. This condition is only visible through inspection from above the roof and not from the ground.

Recommendations: Replace all tiles which have slipped and fell off the roof. Possibly replace the black repair tiles, particularly in areas where they are the only tile in a surrounding of original grey slate tiles.

Open slate roofing along perimeter of tower base and install new full scale copper flashing. Completely restore 1905 tower base and re-roof tower perimeter area with existing slate.

Remove slate roofing along the cornice area at the east gable. The roofing plane is not flat at the overhang but curved downward. Investigate the bracket construction, make required corrections and re-roof with existing slate tiles.

See Roofing Drawings following these statements.

Gutter and downspout evaluation and repair

According to the 1979 construction documents, the gutters and leader pipes had been completely rebuilt in copper and lead coated copper. The built-in gutters are called for to be made out of red copper; the flat, outer eave portion of the gutter assembly was to be made of lead coated copper. The eave assembly/entablature made out of galvanized thin sheet metal (below the built-in gutter) was to be restored and repaired only. There are several rust spots along the edge of the outer surface of the gutter, mostly at the juncture between the restored original and the new built-in gutter assembly.

The overall gutter assembly along the north side of the church is somewhat curved in the bay over the second window bay from the back (west). There is an additional overflow protection at the last bay of the gutter, starting at the shared new exterior wall of the Holland Hall building. However, in general, the gutters are functioning well and holding up without any major defects.

New copper leader pipes had also been called for in the 1979 scope of work. Their insertion into and through the metal entablature and cornice is not well detailed but appears to be working. The attachment of the leader pipes to the masonry is achieved with copper brackets which have been nailed into the and into the mortar joints varying by location. The nails and fasteners are mostly made out of standard iron and prone to rusting which is bad for the masonry.

See also Division 5 - Metals

Recommendations: Observe flow pattern at roof edge and in the gutters during a strong rainfall. Make adjustments and drainage corrections to improve the controlled water flow.

Correct bent and damaged leader pipes - limited occurrences. Replace wall attachment brackets where damaged and remove all fasteners into masonry with stainless steel fasteners and non-pressure anchors.

Gutter and entablature on North side

Sagging eave roof plane

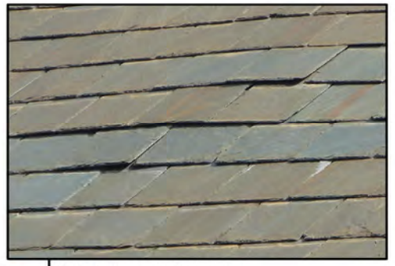
Galvanized steel ridge cap

Chipped corners of original slate

Black replacement slate tile does not match existing

Recently installed black slate replacement tiles at West end of roof

Missing slate tile



Slate improperly laid down

Failing/ missing slate repair

Damaged metal cornice detail

LEGEND

- (A) Loose or missing slate tile
- (B) Uneven roof plane
- (C) Major gaps between original and repaired slate tiles
- (D) Major chips or cracks in slate tile
- (E) Minor chips or cracks in slate tiles
- (F) Galvanized steel ridge cap
- (G) Paint scratched or cracked
- (H) Rust stain
- (I) Metal cornice detail damaged

Black replacement slate does not match size of previous tile

Black replacement slate is not wide enough

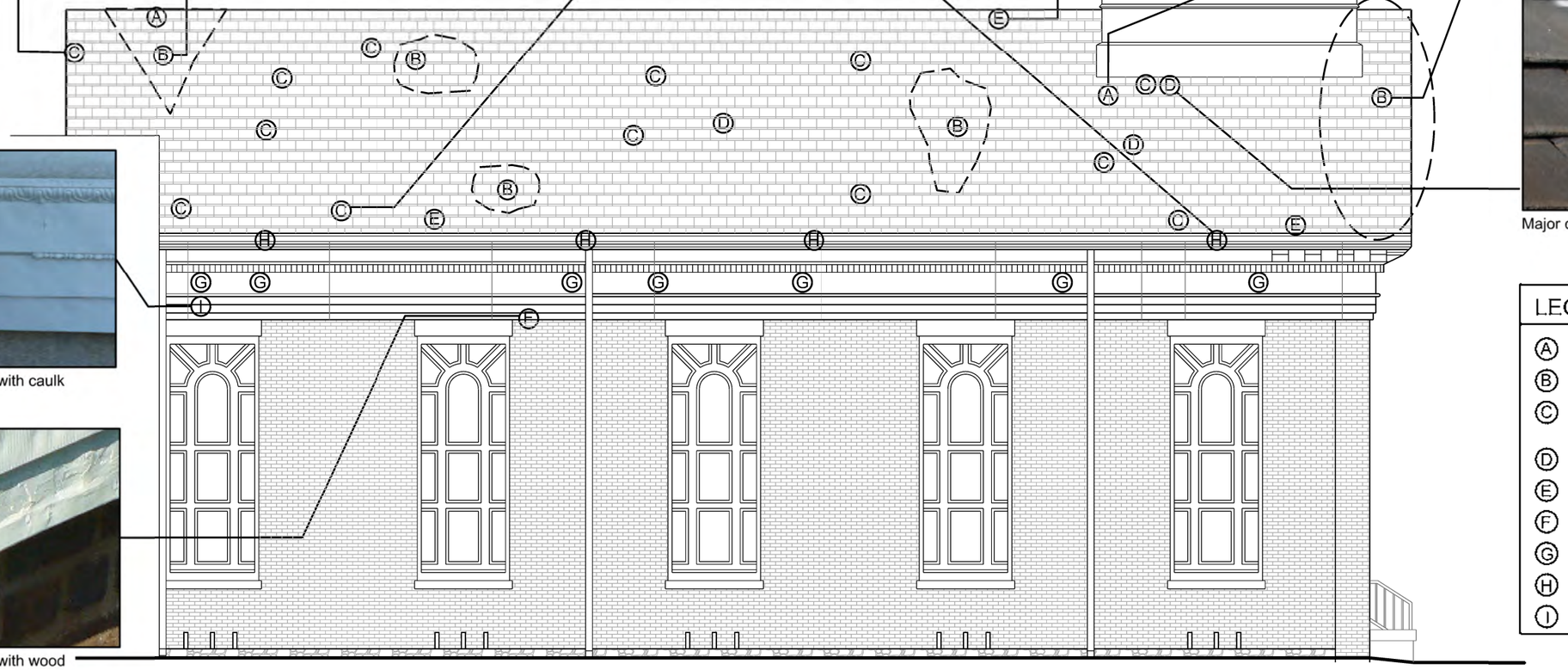
Chipped slate edges near galvanized steel ridge cap

Missing slate tile

Sagging ridge line with black replacement slate tiles

Rusting connection between original entablature and new gutter

Sagging eave (curved surface)



Major chip in slate tile

Metal entablature repaired with caulk

Metal entablature repaired with wood

LEGEND

- (A) Loose or missing slate tile
- (B) Uneven roof plane
- (C) Major gaps between original and repaired slate tiles
- (D) Major chips or cracks in slate tile
- (E) Minor chips or cracks in slate tiles
- (F) Wood supporting metal entablature
- (G) Paint scratched or cracked
- (H) Rust stain on painted metal
- (I) Metal cornice detail damaged

Division 8 – Doors and Windows

Doors

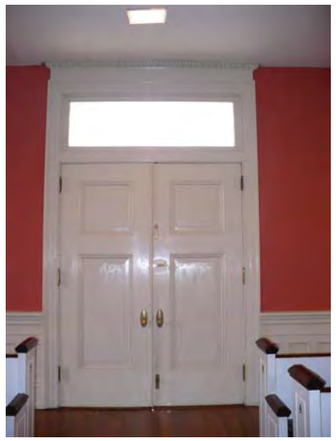
All doors of the historic sanctuary are solid wood panel construction painted a creamy white to match surrounding trim. All doors are in good condition with brass finished hardware. Every exterior door face matches the raised paneled appearance of the interior door face. Except where noted, the typical door trim is 5-1/2" wide, topped by a flat frieze and egg and dart entablature. Existing door knobs are non-compliant with current ADA standards.

At the east entrance, all the exterior doors have transoms with translucent textured glazing. All doors to the exterior maintain historic door knobs, hinges, and latch bolts at the floor and header. A modern brass deadbolt is presently used to secure each exterior door. All three doors lack panic push bar hardware and both side doors (**#101 and #102**) open to the interior, in non-compliance with accessibility codes.

This central entrance (**door # 100**) was added during the 1905 renovation. It consists of a pair of double paneled doors, swinging toward the exterior. The interior decorative trim of Door 100 does not have enough clearance below the balcony ceiling to reach its full height.

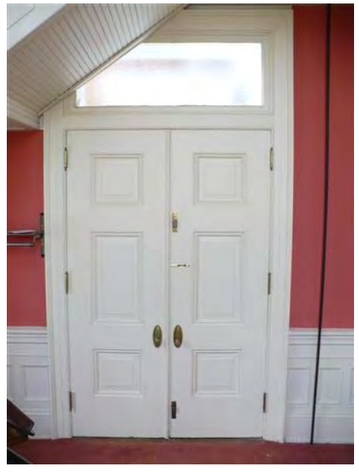
Door 100 trim is constrained by balcony ceiling

Door 100 Exterior



Door 100 Interior

Door 101 Exterior



Door 102 Interior

Typical exterior brass door knobs for doors 100, 101, 102

Door 101 historic latch bolt

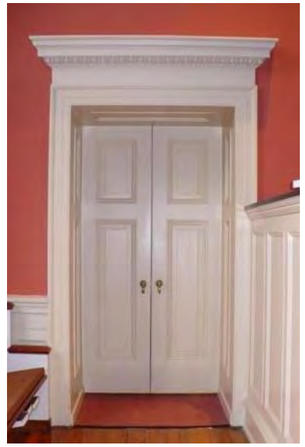
Door 101 modern dead bolt

Doors #103 and #104 connect the two stair vestibules to the sanctuary. The double doors swing outward into the vestibule toward the exit, with modern brass push plates, pull handles, kick plates, and signage. The center pivot hardware is mounted at the header and wood threshold. Each door features two raised panels.

Door 103 seen from Stair Vestibule

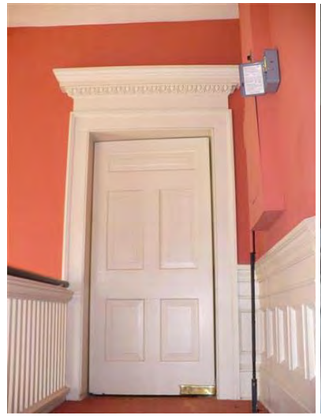
Doors #105 and #106 connect the sanctuary to Holland Hall. The double doors swing toward the exterior of the sanctuary with modern brass knobs and latch bolts styled to match the historic brass hardware found on the east exterior doors. The doors match the raised double panel format of doors 103 and 104. The sanctuary side of the door is recessed 2'-0" beyond the plaster walls, with a carpeted threshold and wood paneled door frame at the header and jambs. The Holland Hall side of the door is flush to the wall with inscribed corner medallions replacing the typical egg and dart header trim. Doors 105 and 106 function as the ADA accessible entrance to the sanctuary. To comply with ADA requirements, one of these entrances should have an automatic door opener. The reason for this requirement is that the individual width of the door leaf is insufficient to accommodate a wheelchair and the wheelchair user cannot be expected to open a double door.

Door 105 seen from Hallway

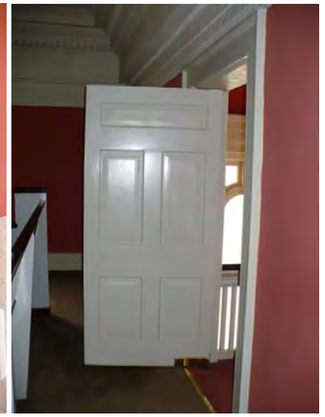


Door 105 seen from Sanctuary

Doors # 201 and # 202 connect the stair vestibule with the balcony. These 5-panel doors have swivel hardware, allowing them to swing into the balcony space and into the stairwell landing. However there is no responding hardware mounted on the stair side. The center hung pivot hardware is mounted at the header and threshold. Door 202 exhibits some damage to the door where it is connected to the pivot hardware at the header and threshold. Door 202 has a wood threshold and evidence of a previous knob and keyhole. Door 201 was only installed during the construction of the North stairwell in the early 1970s.



Door 202 seen from South Stair



Door 201 seen from balcony

Recommendation: Review for ADA compliance and easy function of all hardware elements. Consider panic hardware for general security in addition to code requirements. Review all door width and direction of door swings for code and security purposes.

Review exterior doors from a "forced entry" point of view.

Windows

The sanctuary and the two vestibules feature 12 cathedral glazed windows. These new windows replaced the original 1854 triple hung wood sash windows within the same opening. The 1905 windows consist of a bold, triple central bay with an arched top section, flanked by three narrow window panes on each side with a group of four small planes on top, divided by a 45 degree muntin from the top arch into the upper corner of the window. All regular, major window units were operable awning windows to allow for full direct ventilation to the outside. After the installation of permanent exterior plexi-glass storm windows (pre 1979), the opportunities to open the awning windows had been eliminated. This has been further reinforced be having painted over all separating joints of all windows i.e. they are currently painted and caulked shut. The caulking seal shows signs of deterioration in some select areas.

Generally, the inoperable brass awning hardware is in good condition. However, one set of awning hardware is missing at windows 2 and 11. At windows 2-4 and 9-11, the awning hardware has been installed above its original location to avoid conflict with the height of the balcony floor. Replacement textured glass panes are evident at windows 1, 2, and 6.

The interior window trim is 5-1/2” wide and matches the flat frieze with egg and dart entablature of the door headers. The interior trim is in good condition except for certain locations. At window 4, the header trim is beginning to detach from the wall. During the 1979 renovation, windows were repainted on the interior and exterior. However, paint was not fully removed at all locations such as the interior of windows 2 and 12, and the exteriors of windows 9 and 10. The painted interior mullions of windows 2 and 12 are peeling significantly. At windows 3, 7, 8, paint at the interior header is peeling. At window 10 the side trim paint has peeled down to a large patch of bare wood.

Recommendation: Besides a few paint corrections and possibly a glass replacement to match the original there are no major issues with the windows, besides routine maintenance. Window header at # 4 needs to be reattached to wall.

Window 4: Header trim detaching

Window sill with old paint layers and new peeling

Round window: The round window in the attic was installed during the 1905 renovation to replace an earlier, larger round window. The current window has a 5" thick wood frame with clear glass. The central round pane is surrounded by 8 radiating panes with minimalist metal mullions. The window is in fair condition despite deteriorating paint coating. The window opening is apparently contributing to stress cracks in the surrounding masonry. There is no arch or circular masonry ring to support this round opening. Obviously this condition was created during the initial construction of this masonry gable wall.

The exterior wood trim is still in a fair condition but does require paint removal, careful priming and painting after possibly applying wood restorer to strengthen deteriorated segments.

Recommendation: Fully restore round wood window, reinforce with wood restorer, prime and paint. Assess requirement to introduce a circular stainless steel lintel for structural reinforcement and to stabilize the gable wall.

Division 9 – Finishes

Floor

The heart pine wood flooring in the sanctuary run parallel to the pews with planks 5-1/2“ wide. After the 1905 renovation, the floor was covered with “green velvet” carpeting. It remained carpeted until 1979, when construction notes indicate removal of carpet after the renovation work was complete in order to protect the wood floors. There were no notes regarding the refinishing of the wood floors. Currently, the floor is in good condition, coated with a clear, glossy polyurethane. There are aluminum floor registers (size 6”x12”) installed along the aisles, connected to the hot air heating ductwork in the crawl space.

The carpet on the balcony floor is grey-green and also thickly padded. It appears aged and stained in several places.

The flooring at the choir loft is a modern wood imitation "hardwood" floor in good condition. The flooring at the pulpit is a 4”x 4” parquet style wood tile framed by a 4” black painted wood edge trim, also in good condition.

Flooring at pulpit and choir loft

Both the stairwell floors are covered with a burgundy-red carpet. It is fairly new with a thick acoustical padding to absorb the sounds of stair traffic.

Recommendation: Replace balcony carpet

Carpet and wainscot in stairwell

Wood trim & Wainscot

All walls in the sanctuary and stairwells have wood wainscot paneling 36” high. A photograph from 1903 shows dark stain on the pews, doors, door trim, and arched opening trim. It is unclear whether the wainscot pre-dates the 1905 renovation in which the windows, doors, gallery, wainscoting and pews were noted as “old ivory with mahogany trimming highly polished.” (in ”God at work” publication). The wainscot, windows, doors, door trim and window trim are currently painted a creamy white and are in good condition. These items were refinished in 1979. In several areas underlying paint layers were not completely removed, for example on widow sills all previous paint layers are still underneath the most recent paint layer.

Sanctuary Wall

The plaster walls are in fair condition. The walls are painted the current version of “Pompeiian Red” in a continued attempt to match historic descriptions of the “Pompeiian Red” oil paint introduced during the 1905 renovation.

The current paint analysis of samples taken from the Sanctuary walls and the stair case walls revealed no paint layers from an earlier date than 1905. The assumption can be made that all interior plaster was either replaced or installed for the first time. However there are several variations of the "Pompeian Red" following the first layer. We documented the first one which is most likely the one used in 1905, when the Sanctuary was transformed into the church environment we are seeing today, in most aspects.

The first "Pompeian Red" was more a red brown color as compared to today's color and several shades of red brown had been painted over the years. We would recommend to use the original 1905 paint for the next repainting of the Sanctuary since it can be identified as a character defining feature which can be maintained by using this original color. That will also be true for the trim and woodwork color which the paint analysis identified as a "Yellowish White". Again, this is the 1905 paint for all woodwork inside of the Sanctuary, and on the exterior as well. The identified "Yellowish White" would be the most appropriate paint color to use, provided the goal is to maintain the historic character of the Sanctuary as closely as possible. See the following page containing the results of the paint analysis for the wall color in the Sanctuary and for all the woodwork.

The same "Yellowish White" color which was used to paint the woodwork was also used for the exterior ornamental metalwork. Before we had completed the our paint sampling and the paint analysis, we developed the hypothesis that part of the exterior metal ornamentation would have been modified by mixing it with quartz / river sand to make it look more like real stone material would have been used. We first noticed the color change and a two tone paint scheme for the exterior ornamental elements

on a 1950's color postcard. The change in color was achieved by mixing sand into the otherwise standard "Yellowish White" and the sand color will generate the additional, second tone. This method was very popular at the time, but the sanding of paint is no longer a standard method and not easily reproducible today.

During our paint sampling process we did collect original layers of sanded paint at the middle seam and corner of the original metal base of the tower. The paint samples showed clearly that "sanded paint" had been used on the exterior ornamental metal. Due to the extensive paint removal program of 1979, chemically and with sandblasting, it would also be very difficult to distinguish between areas treated with sanded paint and areas without sand in the paint. Further research into pictorial documentation would be required in order to determine the full extent to which the sanded paint had been applied. There is a high probability that all of the 1905 bell tower exterior was painted to look like a masonry structure.

Pages 9.2 and 9.3 indicate the various locations from where the paint samples had been taken. Wall paint was determined based on sample # 5, 6, 12 and 20. The trim color determination used sample # 3, 7, 15 and 18 to establish the earliest “Yellowish White” trim color. The “sanded paint” was found in sample # 22, 23, 24 and 27.

Recommendation: Repaint the Sanctuary walls, ceiling and trim with the colors as they have been determined in the paint analysis during the next scheduled maintenance paint scope. The “sanded paint” two tone decision for the exterior should be reviewed with the Building Committee before a recommendation can be made.

Plaster:

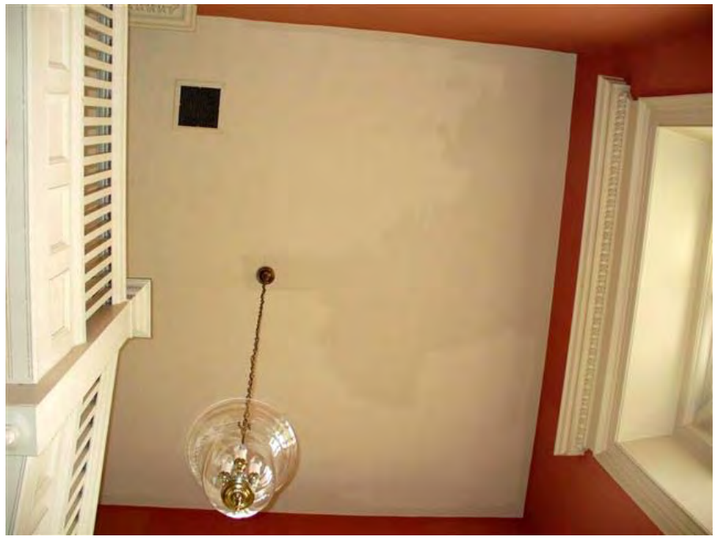
Several hairline cracks have developed in the select plaster segments, primarily following the area where plaster removal and/or repair had been indicated on the 1979 construction documents. It is the same tension and stress in the plaster walls which are re-surfacing. These fine hairline cracks are delineated on drawing A600 in the Measured Drawing set included in the Appendix. Most of these stress cracks originate at door frames and below the balcony attachment. In the both stair vestibules, plaster cracks are prevalent on the west wall adjacent to the sanctuary. In addition to repairing and repainting the plaster during the 1979 renovation, new electrical switches and sound systems were installed at the southeast corner of the sanctuary. Water stains are evident on the east wall of the balcony, originating from the attic.

Recommendation: Repair cracks in plaster by opening them up sufficiently to achieve a proper bond between the new plaster and the existing wall surface. It is also possible to use a reinforcement ribbon to cover the crack and imbed it into the plaster repair surface to prevent future cracking.

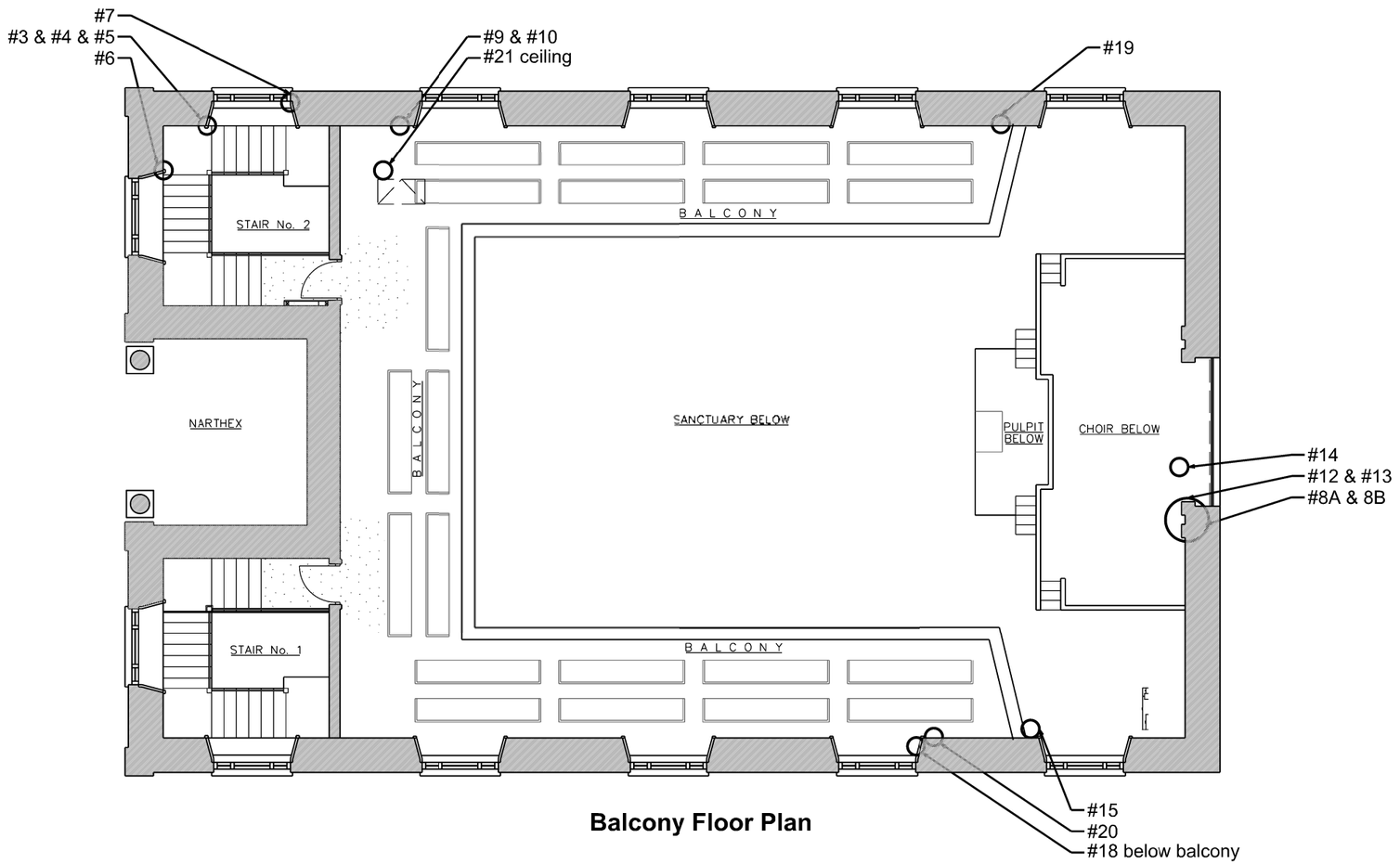
Ceiling:

The ornamental metal ceiling was introduced to the sanctuary in 1905. At that time, the system of cornices, cladded coffering, and horizontal ceiling panels was described as the “finest steel ceiling, cream tinted, massive beams.” 1. Currently, the ceiling is in good condition, painted white to match the wood trim. When air conditioning was introduced in May 1956, 19 round diffusers were installed along the central axis and perimeter of the sanctuary. At the northwest and southwest corners, large return air grilles occupy the entire coffer. Recessed incandescent lights have been placed throughout the sanctuary, centered in each coffer. A hatch accessing the attic is located in the central panel of the southeast corner coffer.

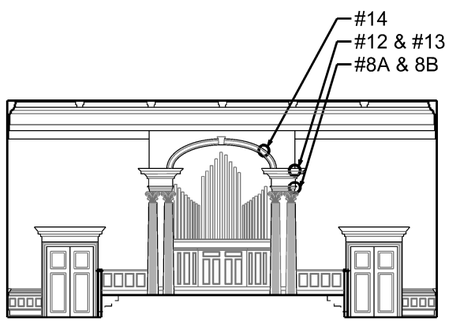
The plaster ceiling in the north vestibule was repaired and painted in 1979. In the south vestibule, 2 layers of ½" gypsum wall board replaced the existing acoustical tile. No notable damage was observed on the vestibule ceilings; however, the painting is visibly incomplete.



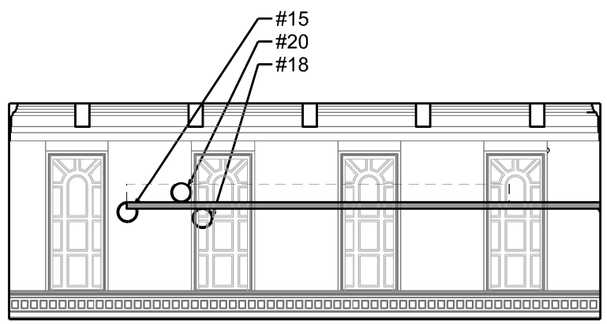
No Recommendation: only painting when the Sanctuary interior will be re-painted.



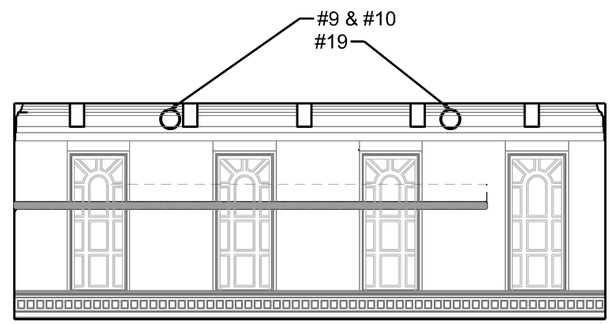
Balcony Floor Plan



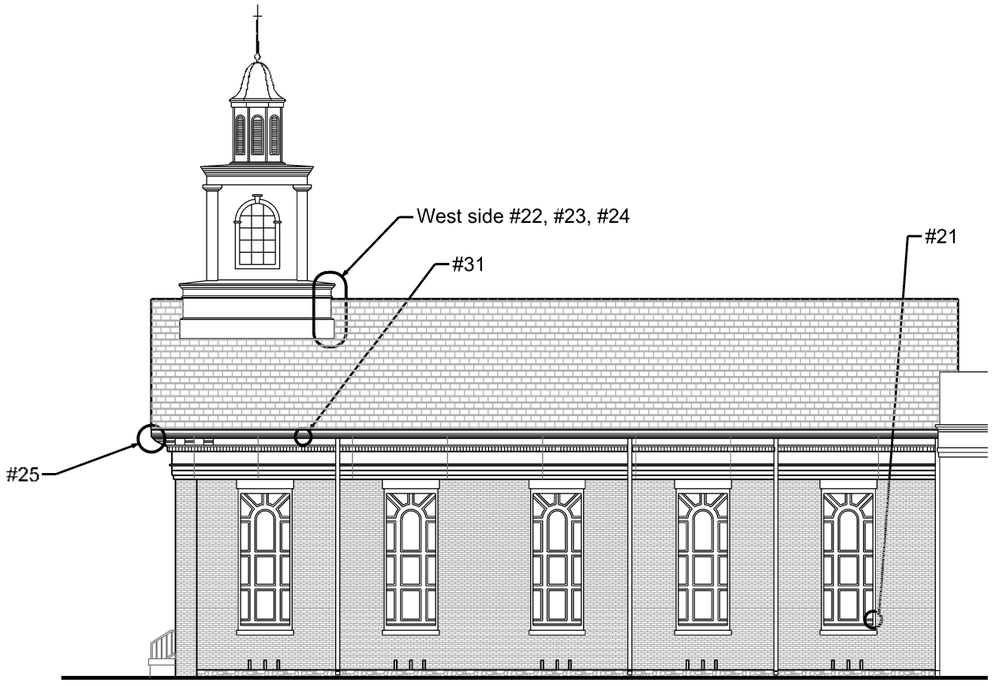
East Elevation



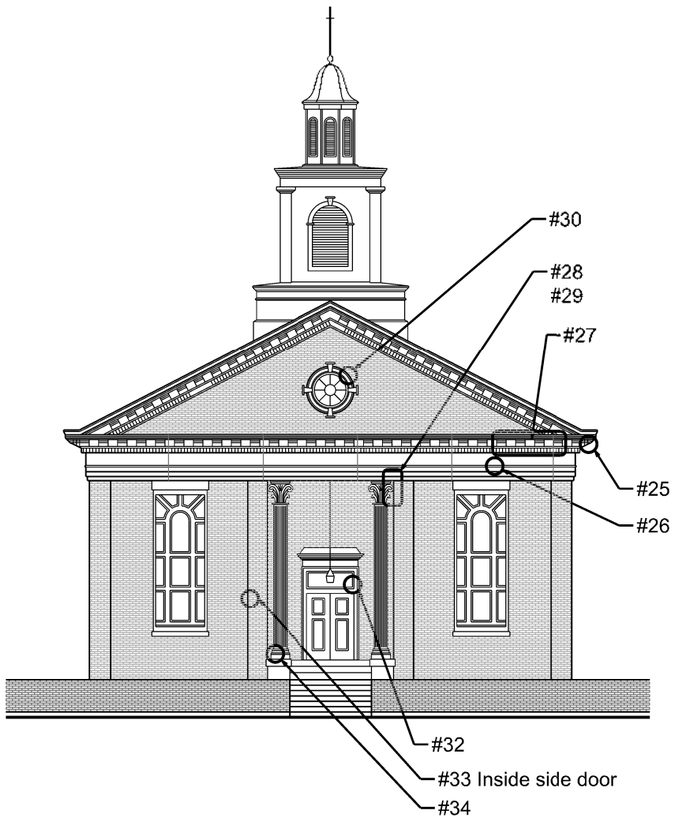
North Elevation



East Elevation



North Elevation



East Elevation

Division 9 – Finishes

Welsh Color & Conservation, Inc.
Analysis of Historic Paints and Wallpapers

P.O. Box 767
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Tel: 610-525-3564
E-mail: fswelsh@welshcolor.com
Website: www.welshcolor.com

October 7, 2008

Mr. Klaus Roesch
Lord Aeck & Sargent, Architects
1201 Peachtree Street
Atlanta, Georgia 30361

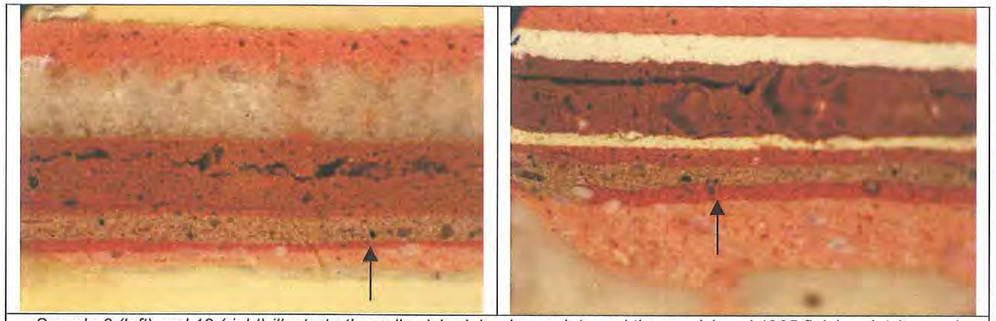
Re: First Presbyterian Church
Marietta, Georgia

Dear Klaus:

We received 14 exterior and 16 interior paint samples from your firm from the First Presbyterian Church in Marietta, which was constructed in 1854 and extensively remolded in 1905. We conducted a stereomicroscopical analysis of each sample to determine the layer structure and the original color of the ca. 1905 first finish coat. Many of the samples exhibit good paint layer evidence. None exhibited any paints that precede 1905.

Interior Paints

The samples from the plaster walls (except those associated with the altar area) show two yellowish pink primers followed by a grayish red finish coat. This color is 7.2 R 3.7/6, which is equivalent to Benj. Moore #2005-20. They are lead-based, oil paints and the red finish coat had a very low sheen originally. There are four later finish coats above this original layer and they are red also and are illustrated in the accompanying crossection photomicrographs below.

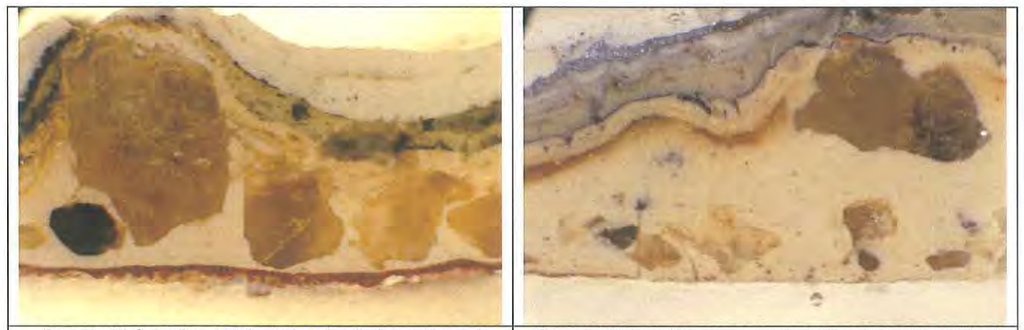


Sample 6 (left) and 12 (right) illustrate the yellowish pink prime paints and the grayish red 1905 finish paint (arrows)

The samples from the altar area plaster and the wood trim were primed with a yellowish white paint. The metal cornices and ceiling features had a moderate reddish brown, red iron oxide primer. The walls associated with the altar area, the wood trim, and the metal cornices and ceiling all show the same yellowish white 1905 finish paint color. This color is 2.4 Y 9/1.4, which is equivalent to Benj. Moore Navajo White. It is a lead-based, oil paint that had a low -semi-gloss appearance originally.

Exterior Paints

The samples from the exterior wood and metal trim features exhibit a yellowish white 1905 finish coat that was sanded to imitate stone. (The doors and sash would not have been sand painted.) Sanded paint was a very popular imitative painting technique from the mid-1700's to the mid-20th century. It was achieved by painting a surface then throwing sand onto it before it dried. The sand adhered on the surface. Together, the color of the paint and sand produced the final color and appearance of this imitative finish. The original color of the 1905 yellowish white, lead-based, semi-gloss, oil paint is 2.4 Y 9/1.4, which is the same color as on the interior. The sand used was primarily clear quartz. The two crossection photomicrographs below illustrate this original 1905 sand-paint finish.



Sample 26 from the metal cornice dentil shows the red oxide primer as the first layer and the yellowish white paint above with the sand embedded in the layer.

Sample 30 from the round window trim shows the original 1905 yellowish white paint with the sand embedded in the layer.

Samples of each color are included with this report. On our website, http://welshcolor.com/matching.html, we provide additional information on color matching new paint. If you have any follow-up questions or need additional color samples, please call me.

Sincerely,

Frank S. Welsh

Division 12- Furnishings

The furnishings in the historic sanctuary include the wooden pews, choir seating, minister seating, and auxiliary tables.

The historic 1902 pews were replaced in 1979 to be of “similar design.” The pews are not floor-mounted. Front pews are often moved to make space for music and special programs. See photo above.

The pews located in the balcony give the illusion that the balcony floor is sloped. The rear pew is elongated in height, with a carpeted riser platform to access the raised seating.

Typical first floor pew

Typical balcony pews. Carpeted riser platform is not attached to the pew.

There are two ornately carved wooden chairs at the base of the pulpit. Date of origin is unknown. The chairs are in good condition.

Ornately carved wooden tables are used in the stair vestibule to display church literature. Sometimes, the tables are used in the sanctuary for special programs.

Division 13 – Bell Tower (Special Construction)

The Tower Base

In Division 6 - Wood and Heavy Timber and in Division 7 Thermal and Moisture Protection the tower base and its roof condition have been described already. However, since the tower of this church has changed considerably over the last 100 years it is of importance to discuss this building feature as detailed as possible based on our current understanding of the situation.

It does appear that the 1905 tower design retained the earlier tower base. Consequent changes also retained the original tower base so that it is most probable that today's tower base at least in its dimensions, dates back to the mid 19th century beginnings of the church. Structurally the tower base is reaching through from the floor of the attic (above the narthex) to the floor on which the bell is standing.

The earliest church tower had most likely a wood shingle exterior wall supported by wood board sheathing.

The 1905 tower design changed the exterior finish to galvanized thin sheet metal, from the base all the way to the crowning cupola. The belfry, on top of the base, was almost as wide as the base, creating only limited horizontal ledges. When the bell tower was redesigned in the early 70's, the belfry section of the new fiberglass tower was designed to be much smaller than its predecessor. This change resulted in a free and exposed perimeter roofing area at the belfry level. This perimeter roofing is currently covered with standard built-up roofing material and is not preventing moisture to penetrate the tower base. The connection between the lower edge of the fiberglass tower and the belfry floor/roof is not as sealed as it may need to be in order to avoid any water penetrations.

The flashing at the bottom edge of the tower base is also insufficient to seal the roof against the tower base. It needs to be completely redesigned since - as explained above - this base has been re-used through all the changes which happened to the tower and it has finally become weak. The metal skin of the tower base may have to be carefully disassembled, part of the slate roofing has to be taken up and new copper flashing will have to be installed. The metal tower base will be re-installed and the slate roof will be reinstalled.

The belfry level roofing will have to be reworked as well as the flashing, constructed to create a flexible seal between the tower and the base.

See drawings following this narrative, illustrating the most common conditions of the exterior.

The Fiberglas Belfry and Steeple

The inner steel structure of the belfry and the steeple - dating from 1969/72 when the new fiber glass tower was installed - is holding up rather well. It does have a good amount of structural resistance. The outer surface is spotless and holds up extremely well. The fiberglass surface on the inside of the tower structure shows more signs of distress and aging.

See Structural Report for more information.

Belfry window: The colored glass windows at the tower belfry are located on the North and South elevations. The glass panes are pink, gold, and blue. The frame and mullions are in fair condition, some of the putty is cracking and will need to be replaced.

Louvered window: The two louvered openings at the tower belfry are located on the East and West elevations. The molded louvered panels are screwed into the exterior frame. The louver is coated with the same successful finish as the rest of the bell tower and their external surfaces are holding up very well.

design. This new floor/roof design would also provide a new floor surface for the bell to be placed on. The bell would have to be lifted out of the tower temporarily in order make the necessary repairs.

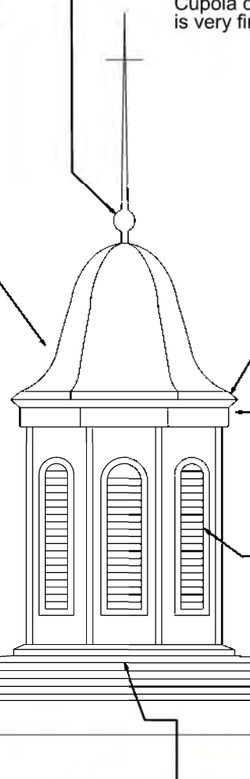
Recommendations: The fiberglass bell tower is generally in good condition, particularly as observed from the exterior. There are several connection details which may allow water penetration - however they are not changeable at this point in time. As long as the belfry floor and roof is water tight against the attic those connections need not be of concern. The interior material surface does appear to be disintegrating to some degree. It will take a fiberglass expert to determine the remaining lifetime of the fiberglass tower. The steel substructure is well designed, durable and well connected to the main structure of the Sanctuary. As stated earlier, the framing of the belfry floor, the wood support for this framing and the wood structural members holding the perimeter of the tower base are compromised on all four corners and need to be repaired and, in some cases, replaced. New roofing, preferably using coated copper or stainless steel needs to be installed in conjunctions with the recommended flashing

Fiberglass steeple cupola

Cupola spherical ornament

Cupola detail- fiberglass surface is very firm

Cupola edge detail



Fusion detail of steeple construction

Steeple base and roofing surface

Fiberglass roofing surface

Base of steeple and roof surface

Singular surface deterioration

Molded/ closed louver detail

Fiberglass roofing surface over belfry

Typical Steeple Elevation

Cornice and frieze detail

Cornice and frieze- not weathertight

Cornice detail

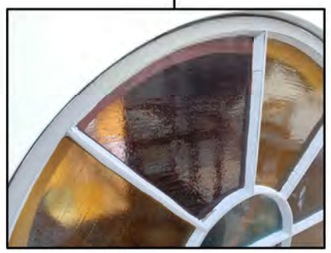
Capital detail- not weathertight

Captial and frieze detail

Fiberglass skirt and base at built-up roofing

Built-up roofing and base

Colored glass window at North and South elevations



Window detail

Built-up roofing and base

Edge of built-up roofing

North Elevation Tower Belfry

Louvered window detail

Louvered windows at East and West elevations

Built-up roofing suface over tower base

Flashing at corner base

Fiberglass skirt and built-up roofing

West Elevation Tower Belfry

Tower base metal cornice

Corner and finish detail

Historic paint layers on only joint in metal tower base wall

North side of tower looking West

Northside at tower base looking east

Flashing detail at Northeast corner

Skirt flashing at North side of tower base

Flashing at slate roof (Northwest corner)

East Elevation Tower Base

East side flashing gap, built-up roofing

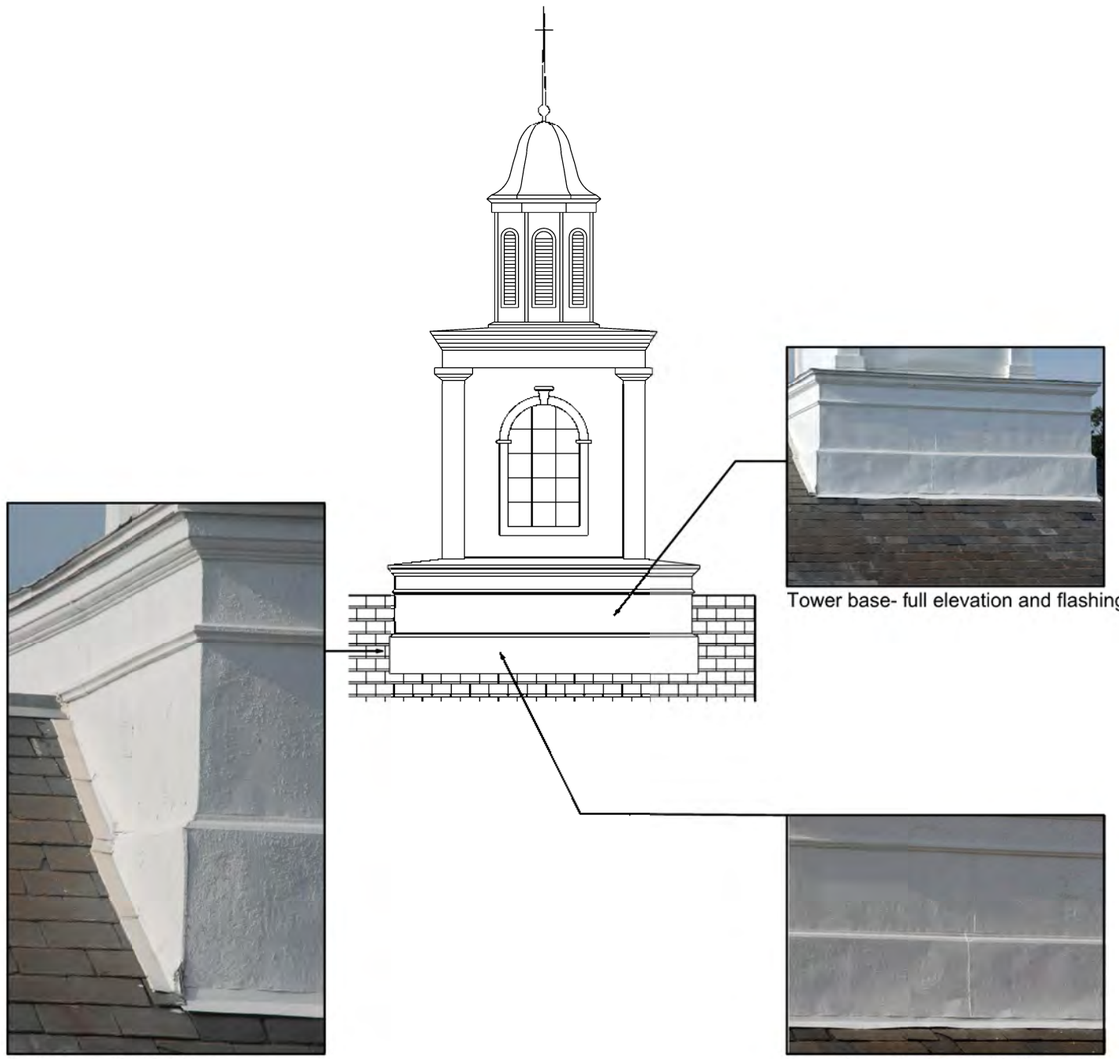
Original metal base of tower with hole

Flashing detail- metal skin not weathertight

Coroded gable cap on slate roof exterior of gable wall

East side, slate roof eave and tower base flashing

East Elevation Tower Base



Surface applied flashing
Bad corner detail

Tower base- full elevation and flashing

Tower base flashing behind metal skin on top of slate

South Elevation Tower Base

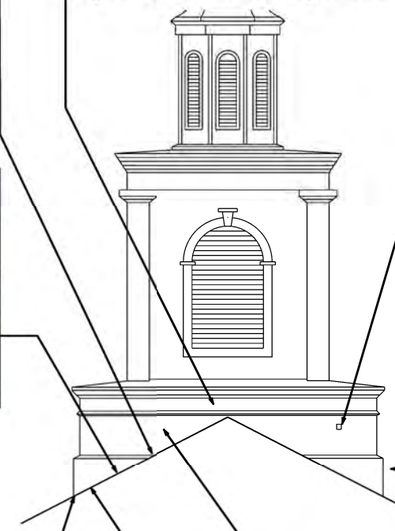
Flashing and slate interface with failing caulk

Original cornice frieze on top of tower base

Repair of metal tower skin

Multiple flashing approaches

Surface applied flashing



Flashing detail failing at corner

Flashing end caulking to create a tight seal

Edge of built-up roof over the tower base

West Elevation Tower Base

Division 15: Mechanical and Plumbing Report

HVAC Systems-General:

General Note: The chapel of the sanctuary was built in 1853-1854. It received a major renovation in 1905. In 1979 a renovation was undertaken.

The HVAC system for the Sanctuary consists of a cooling only rooftop unit for cooling and a blower unit with a gas fired duct heater. The heating unit is located in the lower floor with its duct routed above the ground floor ceiling and into the sanctuary crawl space. Ductwork is fiberglass duct. From what we can see it appears to be in good condition. Heating supply grilles are located at each window and each stair. Return air appears to be drawn under the choir platform with ducted return to the blower unit. Heating system has an outside air connection that appears to be operational.

The cooling ductwork is lined metal (with no exterior insulation) installed in the attic with ceiling mounted diffusers. The 1979 CDH Drawings accurately represent the existing duct size and routing. Return air grilles for cooling are located in the ceiling over the Choir/Pulpit area. The return grilles are mostly concealed from line of site by the beams.

There are two eggcrate type grilles supplying a small amount (300 CFM total) of conditioned air into the attic. We assume the intent is to reduce humidity in the attic. However, the small air quantity will provide limited reduction of humidity in the attic. Roof insulation is fiberglass batts located at the roof level. However, at this time some of the insulation has fallen down.

The rooftop unit is manufactured by the Chrysler Corporation. We estimate that it is the very equipment which was installed in May 1956. It has a maximum fuse size of 250 amps and a maximum circuit ampacity of 192 amps at 208 volts, 3-phase. It is a model 1125-00E. The unit does not have any heating capability.

The stairwells have no air conditioning but do have a single grille in the ceiling which appears to be open to the attic. There does not appear to be any supplemental heat in the two stair cases. These stair cases are open between the 1st floor and 2nd floor. There is a floor register at one window in each stairwell. Floor registers are 5 x 14 aluminum bar grilles. The Narthex is open to outside.

Windows have been fitted with an exterior storm window glazing consisting of an aluminum frame with single pane glass on the outside. The material may be plastic.

The balcony ceiling diffusers are not insulated. Refer to picture.

The building maintenance supervisor, Dan, indicates that they are not currently having any issues with the operation of the heating and cooling for the sanctuary.

HVAC Recommendations:

Replacement of the rooftop cooling unit should be planned due the age of the unit. The Chrysler Corporation no longer makes HVAC equipment, thus generic parts would need to used if failures occur. At this time, the unit appears to be in serviceable condition. Coils did not appear to have deterioration that would be expected for a unit if this age.

Ceiling diffusers should be insulated to prevent condensation on the back of the diffuser. Although the attic has roof level insulation, the attic lacks a vapor seal to the outside. Thus humidity in the attic will approach outside conditions. We expect condensation to occur on a regular basis during the summer operation.

Flex connection at rooftop unit has holes in it. Flex connector needs immediate repair or replacement. Connection should have a cover to shield it from weather and sun.

PLUMBING-General:

There are no plumbing fixtures in the Sanctuary area being assessed.

Roof drainage is by downspouts. Downspouts spill into exterior grates. Refer to picture. We notice that in the attic around downspouts going through metal to side, there are gaps between the metal and downspouts. These should be sealed.

PLUMBING- Recommendation:

Seal penetration of metal fascia at attic level to be air tight.

1- Roof Drain Discharge at Grate

2- Fallen Roof Insulation in Attic

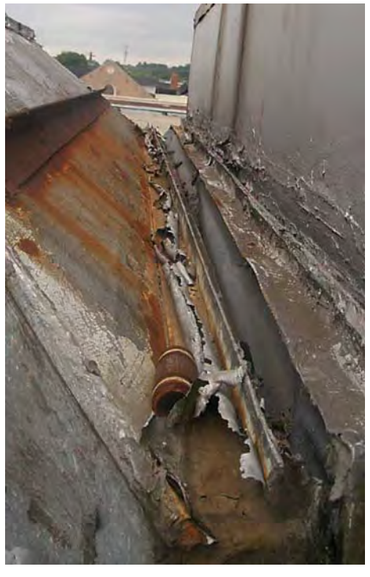
3- Supply Grille Discharging Into Attic

4- Internally Insulated Duct in Attic

5- Seal Opening Between Downspout and Metal Fascia

6 Un-Insulated Diffuser back in Attic-Needs to be Insulated

7 Outside Air Intake for Rooftop Unit



8 Flexible Connector at Rooftop Unit- Needs Repair of Holes

9 Rooftop Unit Compressor-Good Condition

10 Rooftop Unit

11 Gas Fired Heater for Sanctuary

12 Ceiling Diffusers in Sanctuary

14 Floor Register for Heating

15 Floor Register for Heating

13 Return Air Grilles for Sanctuary Cooling

16 **Exterior Storm Window**

17 Rain Downspout – All Appear To Be In Good Condition

Division 16 – Electrical Report

EXISTING LIGHTING: Tall windows on each side of the sanctuary provide most of the daytime illumination. Incandescent downlights in the ceiling add general area lighting. Aimed floodlights at the front add illumination to the pulpit and musical instrument areas. From the attic I observed the incandescent downlights. They contain a significant cast aluminum heat sink around the lamp socket, appearing to be good quality fixtures. Light fixtures circuits in the attic are connected with good quality metal flexible conduit to junction boxes, connected to the dimmers with steel EMT electrical metallic tubing.

EXISTING LIGHTING CONTROL: An array of dimmers are wall mounted on the left as one enters the rear of the sanctuary. Some dimmers are an integral dimmer and heat sink. Some dimmers are controls to the attic mounted dimmer. The attic mounted dimmer appears relatively modern and compact.

Future lighting depends upon the architectural opportunities, desired ambience, and desired light level. The Owner and architect determine the locations where fixtures may be mounted. I have seen churches illuminated with ceiling mounted fluorescent fixtures, downlight canisters, wall mounted cove lights, wall mounted sconces, beam-mounted fixtures, pendants, chandeliers, or aimed spotlights. Ambience: Lighting may be very indirect, very direct, or a combination of both. Color and quality of the light also affect ambience. The brightness of light is affected by sunlight as well as the artificial light levels.

Future lighting is also subject to the illumination technology. As an example, if new technology were to substitute for the existing incandescent lights, miniature fluorescent downlight canisters would have the same fixture appearance in the ceiling. Dimming ballasts and a new dimmer panel would be required. The color of the incandescent light output could be selected from warm white to sunlight white. Lamp life would be 20,000 hours rather than the incandescent's 1000 hours. 40 watt fluorescent lamps would have the same light output as 150 watt incandescent spotlamps. If more light were required, then more downlights would be required.

In 2008, LED light emitting diode lamps have yet to arrive at the light levels and quality enjoyed with miniature fluorescent lamps.

LIGHTING CONTROL: in 2008, fluorescent dimming has come of age. Dimming to 10% may be reasonably accomplished. Initially, fluorescent and dimming systems cost more than incandescent and their dimming. However , energy savings per given light level create a payback.

EMERGENCY EGRESS LIGHTS: There should be a code-required minimum light level along egress routes, to last for 90 minutes. This assumes a dark night and a power outage. To my knowledge the church has no emergency lighting generator. In the absence of an emergency generator, battery lights are the answer.

During a design, locations or methods would be determined to achieve the required light level. As a first estimate I suggest battery lights at each of the four main floor egress doors, balcony egress door, and centered along each side balcony. In some cases, "normal" fluorescent lights might serve double purpose as "emergency" lights.

EXIT SIGNS: Battery operated exit lights should provide at least a minimal level of egress lighting for main floor, balcony and stairs. Exit signs would be located at the two exit doors in the front, at the two exit doors in the rear, and at the balcony exit door.

RECEPTACLES: Existing outlets do have the grounding per modern standards. Where plugs are very easy to insert, the Owner may wish to replace the receptacle. A new receptacle will hold plugs tightly.

EXISTING RECEPTACLES CIRCUITING: Receptacles beneath the podium and organ pipes room have EMT conduit. Circuiting to the outlets located in the walls or balcony was inaccessible unless located in the crawl space.

FUTURE RECEPTACLES: This space contains four receptacles around the podium, one at the organ console, two on the main floor side walls, and four around the balcony wall. I perceive no need for any significant additional quantity of receptacles for the traditional and present use of the space: listening to a speaker and to music. If the church adds a significant quantity of receptacles, then circuits must be added, and additional breaker space must be created. Added circuits becomes involved with addition of a panel or panels to serve this space. Adding panels becomes involved with the overall facility power distribution study and modification.

LIGHTING CIRCUITING: existing lighting circuiting in the attic does have EMT metal conduit or steel sheathed Metal Clad cable. These are good modern materials for this application.

POWER PANELBOARD: The nearby panel which probably serves this space is a 1960's ITE panelboard. If new work were performed, it would be prudent to replace circuit breakers older than approximately 15 years old, since age deteriorates function. If breakers are not available for this obsolete panel manufacturer, the panel should be replaced.

LEVEL OF ELECTRICAL POWER DESIGN WORK: There are two situations.

- If new work keeps the same lights and outlets circuits, then it may be possible to reconnect circuits to the existing panelboard. However in a modern renovation this is highly unlikely which leads to the second case.

- A significant level of electrical power design effort should be planned when the architect and engineer are commissioned for the design work. Both new Arc Flash code requirements and old fashioned power design require this. A power system is similar to a balanced system of veins and arteries, wherein one thing affects another.

- The power engineer must learn the power system for the entire facility, consolidating records (if any exist) and site surveying to fill-in the gaps and verify information. Then the power engineer must perform a computer study for short circuit values at equipments. This research and study is neither quick nor inexpensive; both design time and cost should be planned as part of the design work.

- The new requirement is that the engineer must extend the computer study to find arc flash values at each panel, and have these arc flash labels applied to each panelboard.

Once the initial record drawing and the study is made, the church would deliver a copy to future power engineers as their starting point, saving funds in the process.

HVAC POWER: HVAC appears to be served from circuit breaker panels near the respective equipments. Should HVAC work be performed, the related conductor and circuit breaker should be replaced.

FIRE ALARM: At present in this building, the fire alarm system consists of one pull station in the front entry and one strobe/horn in the balcony. I observed that this building and the adjacent building contain fire alarm systems approximately 1960's vintage. When a building is "touched" with renovation work, a new fire alarm system will be required by modern code and the fire marshal.

It is preferable for one modern fire alarm panel to serve many buildings, with one unified report to the fire station. It is possible for multiple fire alarm panels of various vintages and descriptions to connect to one alarm reporting. It is my question if any building in this complex contains a fire alarm panel suitable to add a renovation project.

I suggest that the church list their buildings and the fire alarm vintage serving each. Then the church would make a fire alarm modernization plan. I see two options. The next project could provide the fire alarm panel suitable for the entire facility with fire alarm devices per building under later projects. Or the church could modernize fire alarm to all buildings with one project. The advantage to one comprehensive fire alarm project is that one contractor is responsible to make it work and to give one guarantee. In either case, the contract should be let to a general contractor or an electrical contractor since they typically have good project administration skills, and typically "boss" the fire alarm contractor. The fire alarm contractor should work under them since they are comfortable with this typical arrangement, and their primary skill is fire alarm work.

New fire alarm for this place of assembly may require fire alarm speakers rather than horns or bells. With modern technology the cost is the same. The speaker provides a selection of horn or whoop tones, and announces pre-recorded messages. Also with modern technology, the speaker and a strobe are one compact small unit for minimal architectural impact. Speaker/Strobes should be located at each exit door from the space: two at the front, two at the rear. If there were smoke, the position of the strobes and sound, as well as exit signs, could help guide people toward exits.

This place of assembly is not sprinklered. Therefore a smoke detector system would be required.

- I suggest a "beam type smoke detector" projecting an infrared beam across the sanctuary, with one wall mounted transmitter at the front and one wall mounted receiver at the rear.

- An alternative method is to provide multiple "smoke detectors" on the ceiling approximately 25 ft to 30 ft. on center, with wiring routed through the attic.

- A pull station should be located near the exit door in each of the two entries from the street. A pull station should be located near each front exit.

PUBLIC ADDRESS: I observed a paging amplifier in the organ pipes room, connected to a pulpit microphone and microphone jacks around the pulpit and organ area. Another amplifier and a small tape recorder exist in the rear balcony safety wall, concealed behind a door in that wall, on the left side as one enters the balcony. I found only one speaker. This speaker is located in the ceiling of the stairwell on the left as one enters from the street. The amplifiers appear relatively modern and appear to have good condition; although the proof is in their function. I observed a module attached to the rear of the main level rear seating, possibly for hearing impaired.

PA, recording, and hearing impaired functions are subjective according to the church's needs, rather than a code related issue

such as fire alarm. The church may continue to revise these systems according to the need at any given time.

TELEVISION: I observed a camera ceiling mounted in the ceiling, at the rear of the sanctuary balcony. Above it, a black cable approximately 1/4 inch diameter routes through the attic. TV is a subjective item rather than a code issue, and may be modified at any time to meet the church needs.

LIGHTNING PROTECTION: I observe a copper cable routed from the steeple lightning rod down through the attic into the wall on the left side as one faces the building from the street.

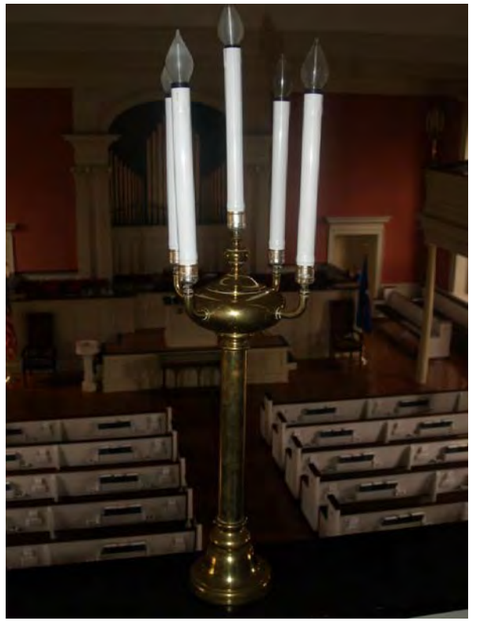
- The cable is fastened to one side in the steeple, with a tight turn. The cable should be refastened with a contoured turn of three feet radius.
- The cable should be fastened to the adjacent steel support through the attic area.
- Turns in the attic should have 3 foot radius.
- The grounding provisions whether ground rod or other method may be measured to determine whether resistance is below 5 ohms during dry conditions such as those experienced in recent summers. For good lightning rod performance such grounding should be achieved. Methods include deep bored holes with cable or rod inserted and concrete or "enhancement" bentonite clay mixes poured around; or air conditioning condensate draining onto the rod location.
- It is prudent to locate rods approximately ten feet from a building so that lightning energy entering the earth dissipates somewhat clear of the building's foundation.

SURGE SUPPRESSION: I recommend that the next church project include a new service-entrance Class C sized surge suppressor and corresponding new grounding rod on the main service panel or panels serving the church buildings. One lightning hit that is prevented pays for a surge suppressor. Surge Suppressors contain devices that send lightning or power company switching voltage "spikes" to ground, shunting them away from your equipment. Equipment includes but is not limited to organs, other musical instruments, paging equipment, lighting dimmer panels, lighting ballasts, copiers, computers, refrigerators, and air conditioning equipment.

In a given project, it is wise to provide a smaller sized Class B surge suppressor on any panel serving electronic equipment significant in importance or quantity.

Images illustrating the Electrical Report:

Fire Alarm Annunciator



Candelabra in Balcony

Speaker in Ceiling (from Attic)

Amplifier in Organ Blower Room

Electrical Panel Serving Sanctuary

Organ Blower – Good Condition

A) Structural Report

A representative of Willett Engineering Co. (WEC) was retained to observe and comment on the overall structural condition of the Sanctuary building, paying particular attention to the floor slab, balcony support members and the steeple framing. All information in this report is based on visual observations made during two site visits by a WEC representative on August 21, 2008 and September 12, 2008, and discussions with Mr. Klaus Roesch of Lord, Aeck and Sargent Architects.

The building construction of the church dates to 1854 as indicated by a plaque on the exterior wall at the church entrance. The balconies in the Sanctuary where added around 1860.

The church building frame consists of wood joists, beams and posts supported on masonry piers and solid exterior masonry walls. The roof framing consists of wood joists on heavy timber roof trusses spaced at approximately12'-0" on center spanning the width of the sanctuary.

Based on information provided by Mr. Roesch the original steeple has been replaced twice, once in 1905 by a colonial style tower, and again in 1972 by the present fiber glass steeple.

During our site visit, the following items were visually observed:

1. In the Sanctuary, the floor appears to be depressed in some areas. This is particularly visible along to the left and right sides (from the central axis of the room) and at some balcony post bases. (See Photos 1 and 2).

   The sanctuary floor framing consists of 3"x12" floor joist spaced at 24" on center supported by a continuous granite foundation along the central axis of the room and masonry walls at the building perimeter. At the mid span of each floor joist, additional support consisting of 3" diameter adjustable steel posts has been added at various locations sometime in the past, to provide additional supports. (See Photo 4)

   Calculations indicate that the actual floor framing system is adequate to support the applied assembly live loads of 60 psf (fixed seats).

   Each balcony post appears to be supported in the crawlspace by four (4) concrete masonry blocks resting directly on the soil. Wood shims are visible between the wooden post base and the top of the masonry blocks. It appears that the depression observed may have been caused by a combination of the crushing of the wood shim plate and soil settlement under the wooden post. (See Photo 3)

   One wood post supporting the balcony located to the right of the pulpit is bowed at the upper tier of the post. We believe that this condition is not recent and is structurally stable.

   (See Photos 11 and 12)

   A visual observation of the balcony siding and soffit did not reveal any undue cracking or deterioration that would indicate an ongoing problem with the balcony framing.

   We do not believe that the observed depression and the bowed post pose any concerns other than cosmetic. However, the proximity of the masonry piers on the side of the mechanical trench appears precarious given the absence of a visible foundation system.

   A possible solution may be to replace the actual masonry piers by a concrete pier and footing foundation system. We recommend that further analysis be done to find a more appropriate and permanent solution. See recommendation under Division 3 Concrete.

2. As mentioned previously, the steeple is not part of the original construction of the building and has been replaced at least twice in the past
   The actual steeple frame consists of lower steel "X" braced frames in the attic space located over the Narthex and upper steel "X" braced frames welded to the lower frames with steel tubes thru the bell tower wood floor. This upper frame is enclosed by a wall system consisting of wood and steel members covered in fiberglass and extending to the peek of the steeple. (See Photos 5, 6 and 7)

   The lower braced framed system of the steeple (See Photos 5 and 9) is supported on two 12" wide steel flange beams anchored to 24"X17" concrete grade beams poured over the original masonry walls along the perimeter of the lower narthex area. The steel beams are connected to four ¾-inch diameter tie rods (one at each end of the beam) and tensioned with the help of turnbuckles (See Photo 8). Each tie rod extends to the ground floor. The fastening to the foundation system was not visible.

3. During our site visit, we were asked to provide an opinion on what may be required to replace the existing steeple with one resembling the original colonial style.

   The installation of the present steeple required the removal of previous wood roof framing members which initially supported part of the original steeple and the sanctuary roof. This is evident by the addition of a new truss which provides the existing roof support and new post and beams for the steeple floor and lower roof support. (See Photos 5, 9 and10).

   The present steeple steel braced frame elements were set apart from the original wood members supporting the roof. We believe that the replacement of the present steeple in the future would require a similar bracing system but could utilize with greater importance the support provided by the narthex perimeter solid masonry walls as gravity support elements.

Assuming that the lower main entrance and adjacent stair area could be examined during the design phase, (this might require some degree of local exploratory demolition to facilitate visual access) a more aesthetic solution for the present tie down system of the steeple could be proposed.

4. The original structural framing of the gable end wall over the entrance of the church (visible from the base floor of the steeple) appeared to have been modified at some point to include a window and brick fascia (See Photos 13 and 14). The wood framing elements where partially concealed by insulation. We did manage to examine part of the wall framing. It consisted of heavy timber post (aligned with the sanctuary roof truss system) with 2x4 wood vertical studs infill and wood bracing nail to its exterior face. Some of the original wood members appeared to have been damaged by water infiltration and subsequently reinforced with new bolted wood elements possibly when the work for the latest replacement of steeple was done. The reinforcement appeared adequate and there were no visible major structural anomalies to the wall. However, in one location, we did observer light filtering thru the wall. We recommend that the gable end wall be reviewed by a qualified envelope specialist to determine its condition.

5. The lower base of the steeple, below the bell tower, appears to be leaning slightly toward the rear of the sanctuary. (See Photo 15). The structural framing in this area consist of wood joists resting on the sanctuary wood roof framing system which is independent for the steel framing supporting the steeple. From the underside, we observed that some of the wood joist appeared to have been damaged by water infiltration (See Photo 16). Part of these roof joists are presently being supported by new wood elements bearing on the concrete grade beam. The roof framing system of the base appears stable at the moment but it is unclear if the water infiltration is still occurring. We recommend that the roof be reviewed by a qualified roofing specialist to determine its condition.

Photo 1 – Slab depression at Post Base

Photo 2 – Slab depression at sanctuary floor

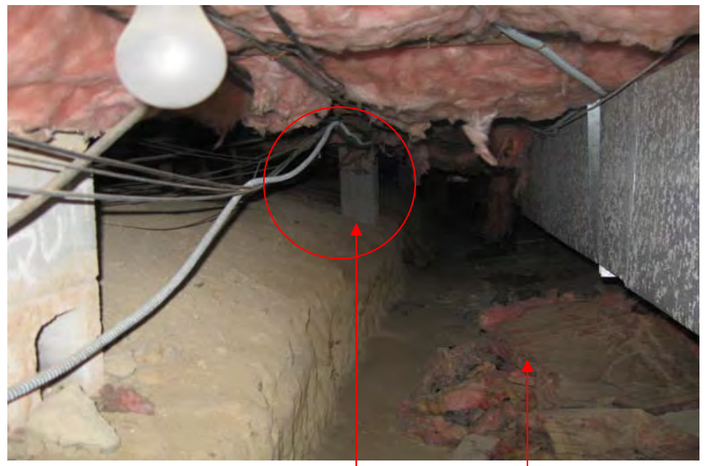


Photo 3 – Masonry pier for balcony post support

Photo 4 – Adjustable steel post for floor joist support

Photo 5 – Lower steeple support frame

Photo 7 – Transition between lower and upper steel frames

Photo 9 – Additional wood framing members for floor support

Photo 6 – Upper steeple support frame

Photo 8 – Tie rod at end of steel beam

Photo 10 – Additional wood framing members for roof support

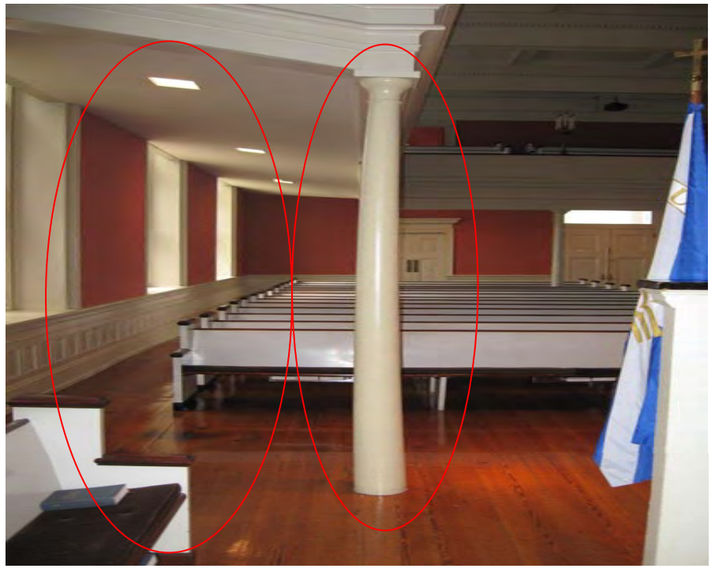


Photo 11 – Bowed post at right of pulpit

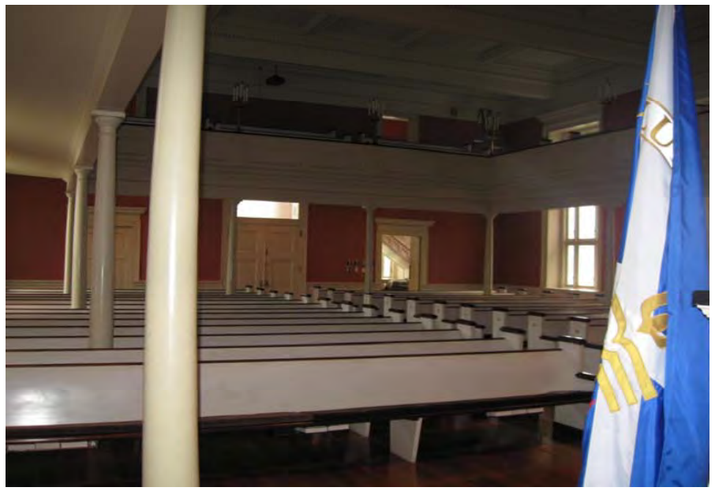


Photo 12 – Bowed Post

Photo 13 - Gable End Wall Framing (Base of Wall)

Photo 14 - Gable End Wall Framing (Reinforcement)

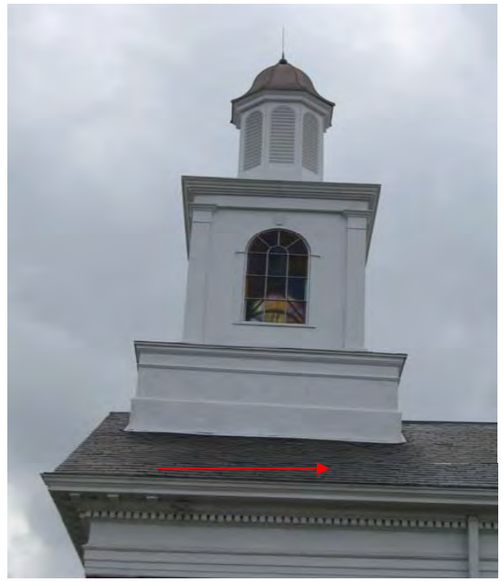


Photo 15 – Steeple View from East

Photo 16 – Damaged Wood below Steeple

First Presbyterian Church of Marietta

Preservation Plan and Assessment of the Historic Sanctuary Structure
Measured Drawings

Index of Drawings

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SHEET TITLE: Foundation Plan

SCALE (U.N.O.): As Noted on Drawing

DRAWN BY: LL

JOB NAME: First Presbyterian Church of Marietta

LOCATION: 189 Church Street, Marietta, GA 30060

ISSUE DATE: 10/24/08

JOB NO.: 28057-00

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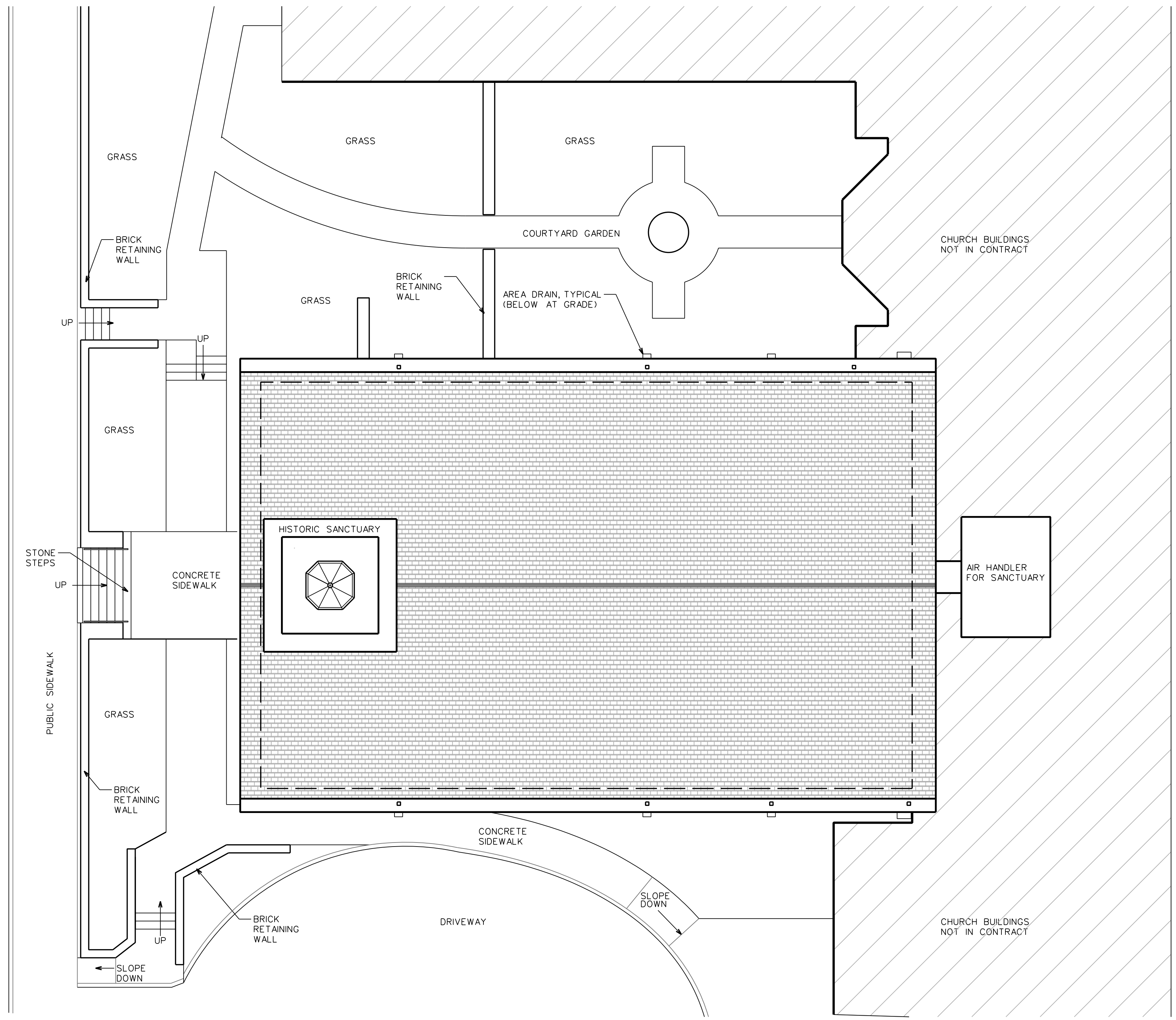

A1 Site Plan

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MATERIAL KEYNOTES

GENERAL NOTES

SHEET SPECIFIC NOTES

KEY PLAN

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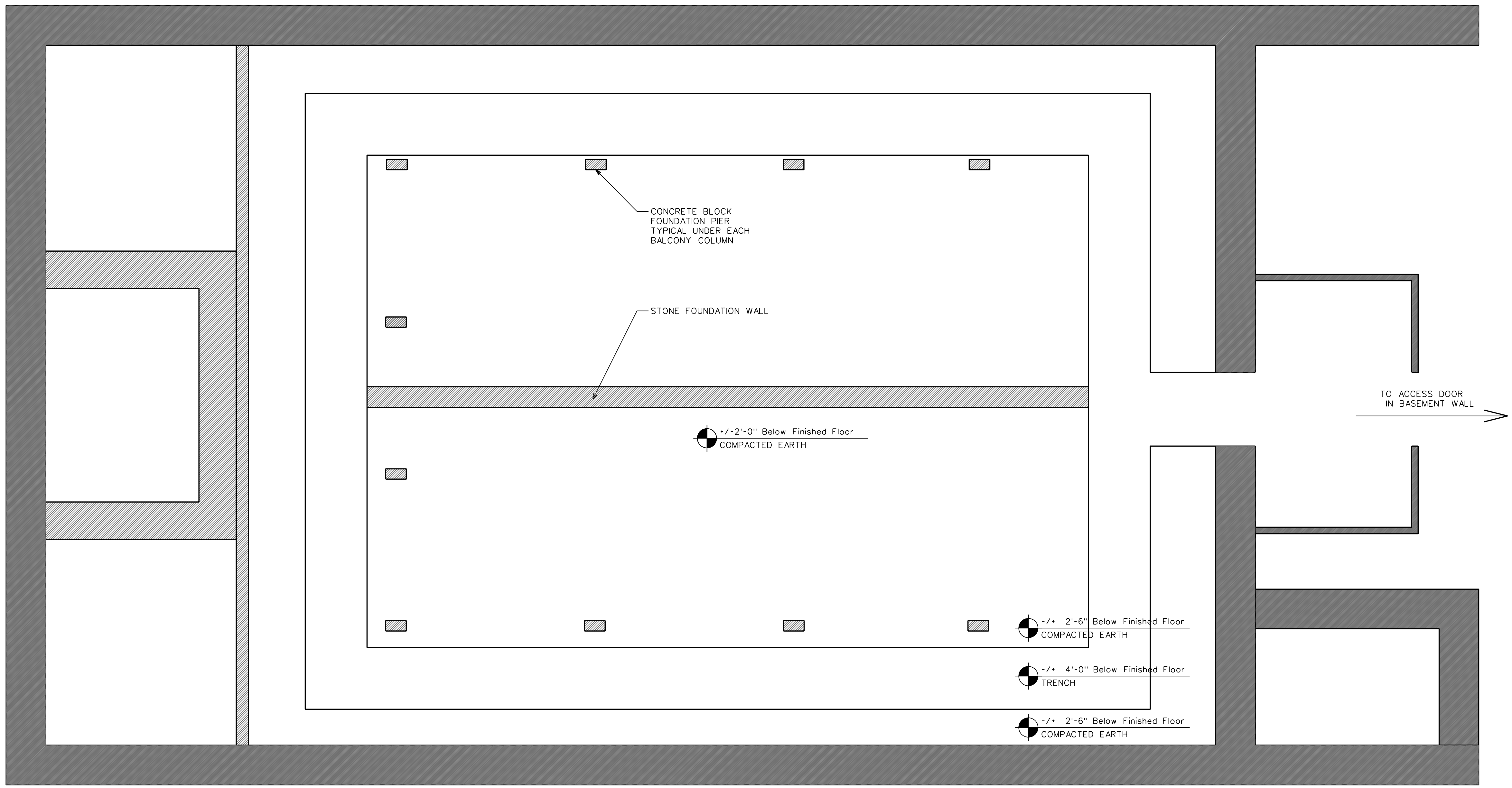

A1 Foundation Plan

0 4 8 FT

MATERIAL KEYNOTES

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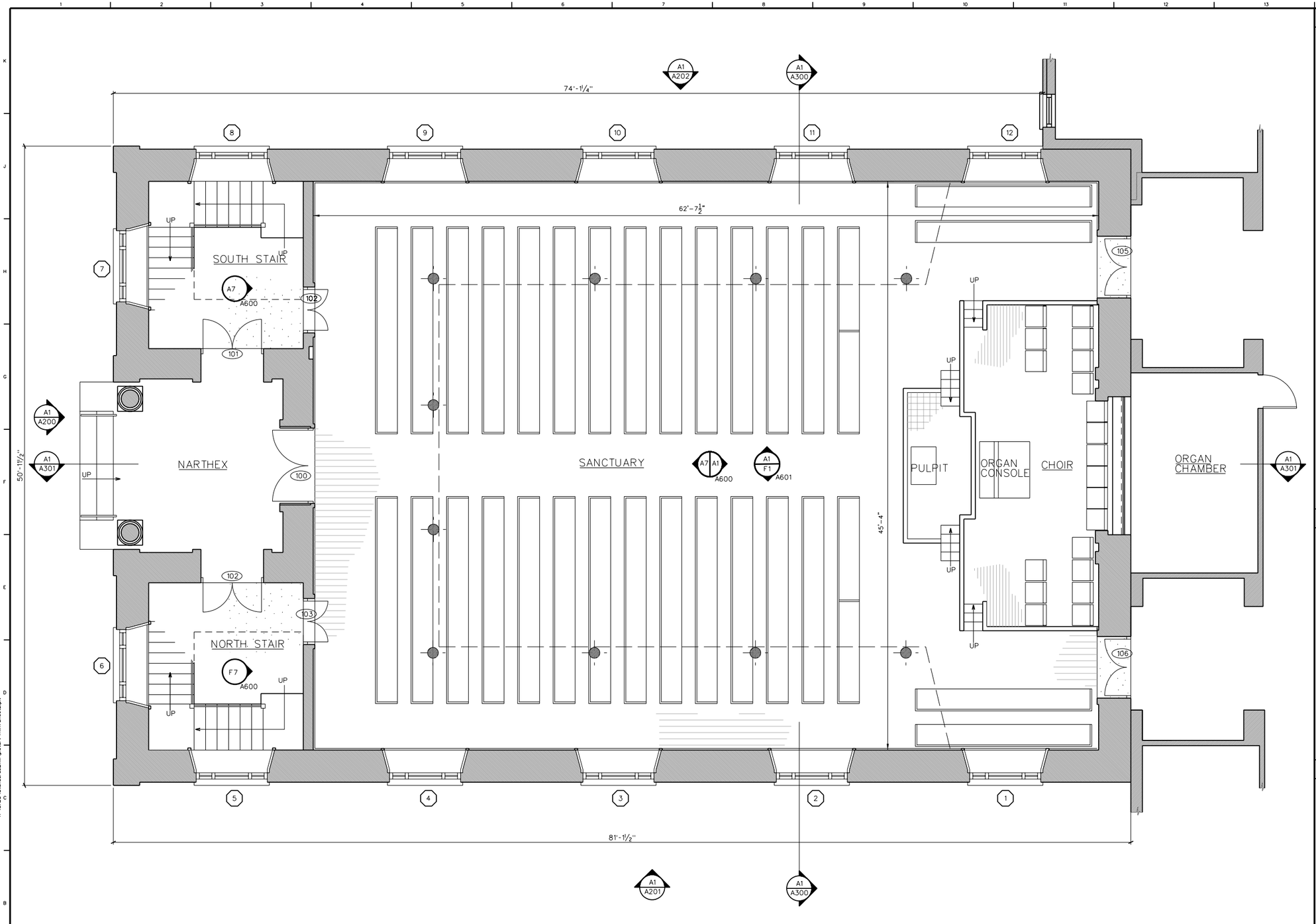

A1 First Floor Plan 0 4 8 FT

MATERIAL KEYNOTES

GENERAL NOTES

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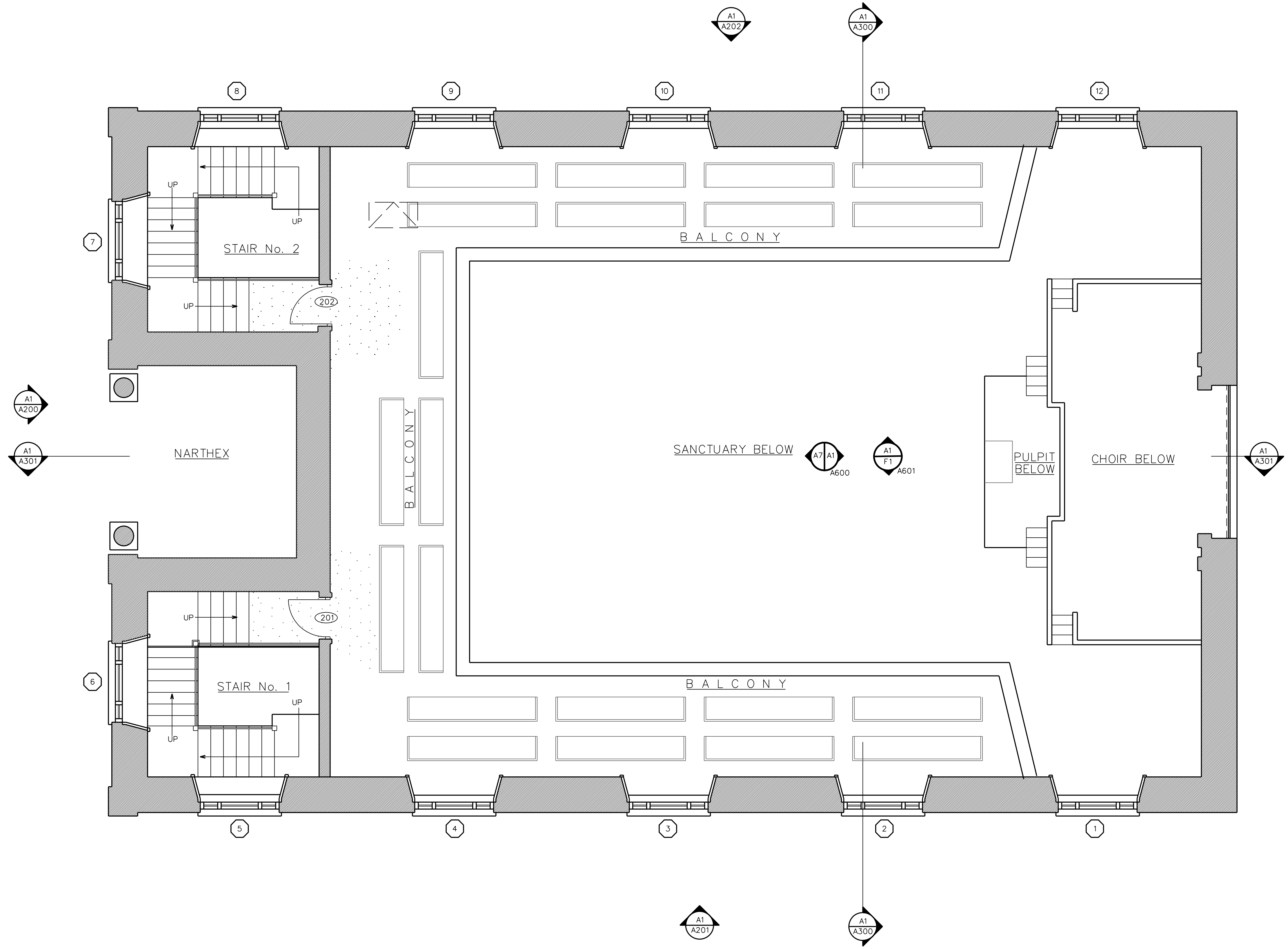

A1 Balcony Floor Plan
0 4 8 FT

MATERIAL KEYNOTES

GENERAL NOTES

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Balcony Floor Plan

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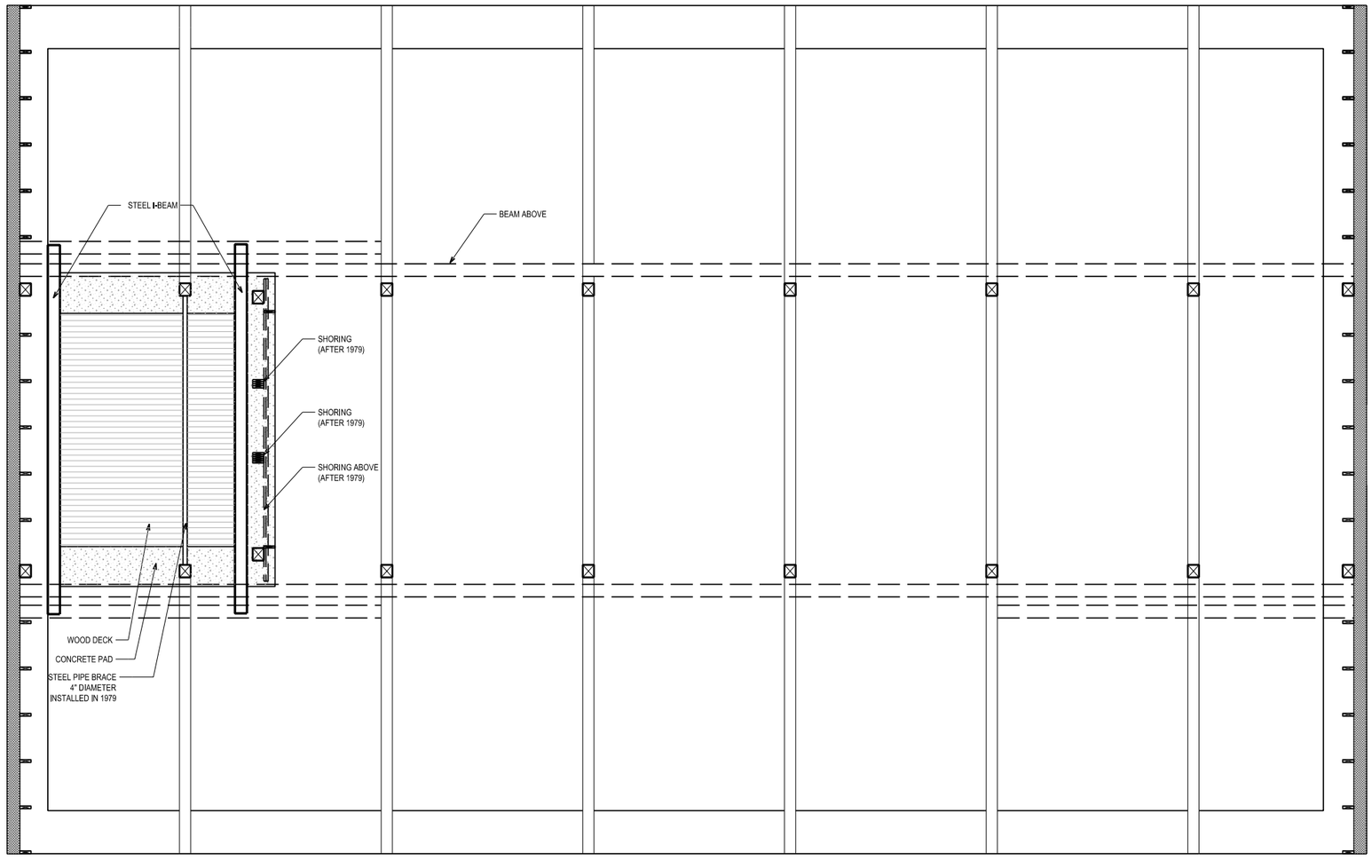

A1 Attic Plan
0 4 8 FT

MATERIAL KEYNOTES

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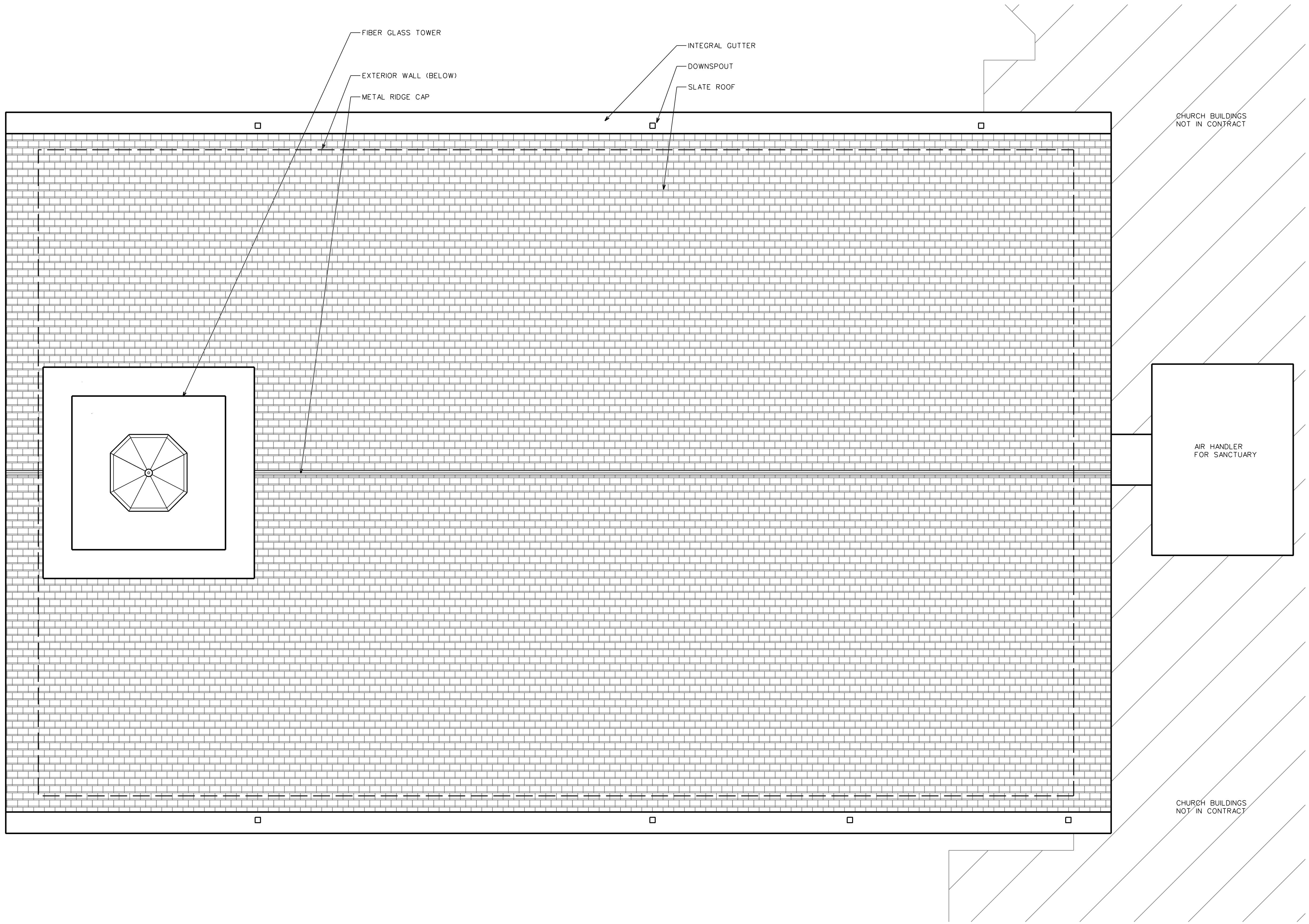

A1 Roof Plan
0 4 8 FT

MATERIAL KEYNOTES

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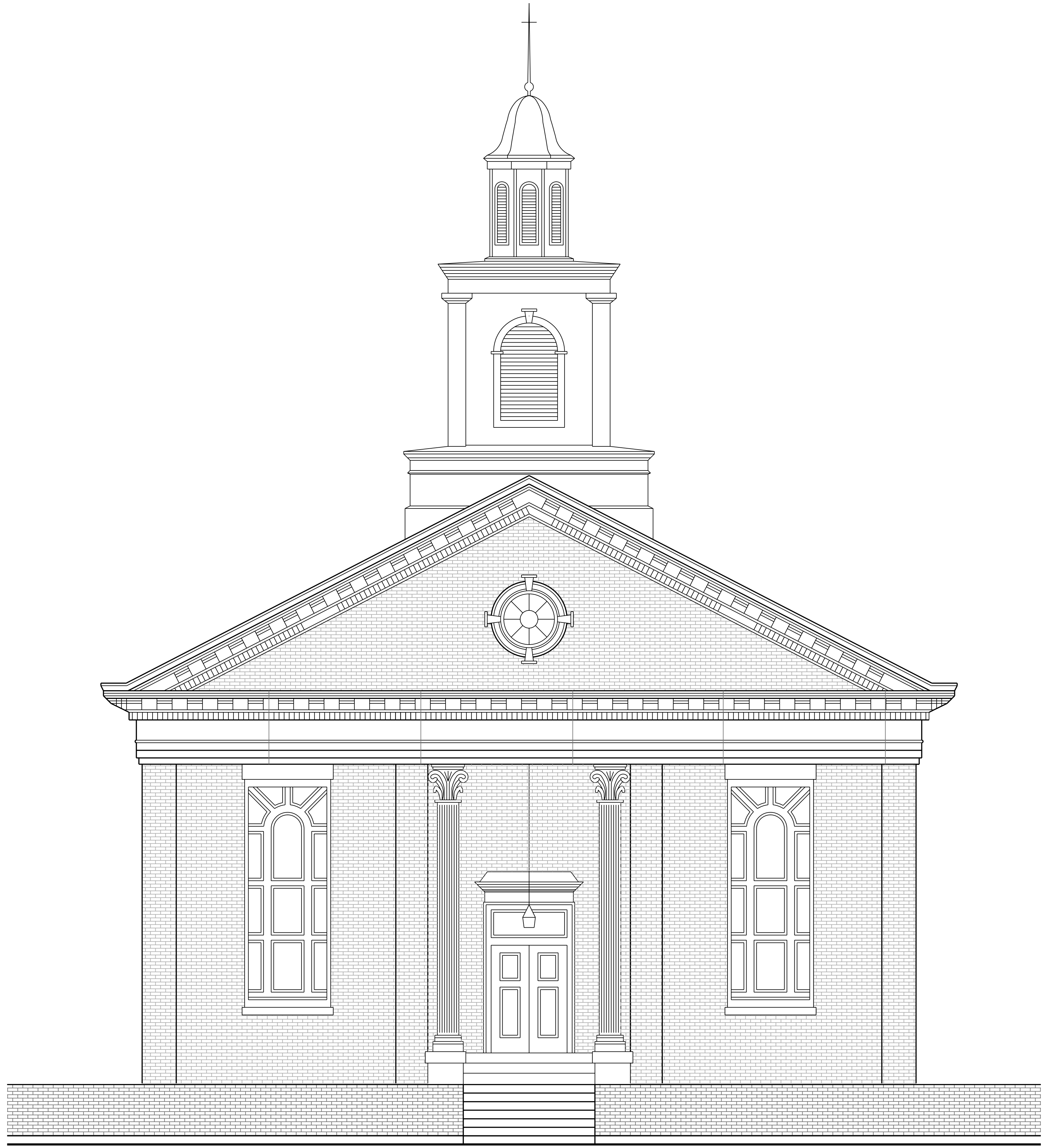

A1 East Elevation
0 4 8 FT

MATERIAL KEYNOTES

GENERAL NOTES

SHEET SPECIFIC NOTES

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SHEET TITLE
East Elevation

SCALE (U.N.O.)
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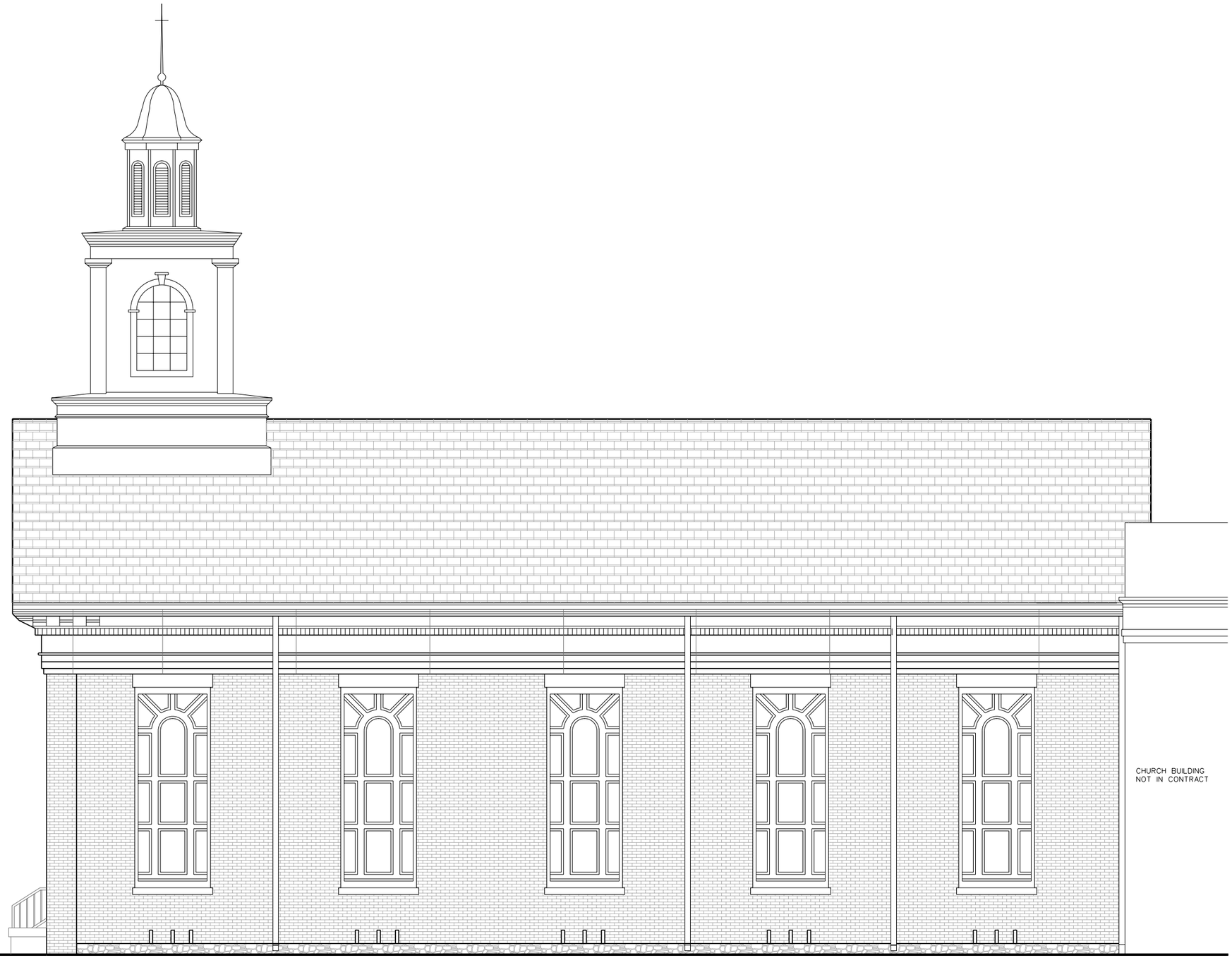

MATERIAL KEYNOTES

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LOGO

SHEET TITLE: North Elevation

SCALE (U.N.O.): As Noted on Drawing

DRAWN BY: LL

JOB NAME: First Presbyterian Church of Marietta

LOCATION: 189 Church Street, Marietta, GA 30060

KEY PLAN

SEAL

PROJECT NORTH

ISSUE DATE: 10/24/08

JOB NO.: 28057-00

DWG. NO.: A201

NOT FOR CONSTRUCTION

A1 North Elevation
0 4 8 FT

A1 South Elevation
0 4 8 FT

MATERIAL KEYNOTES

GENERAL NOTES

SHEET SPECIFIC NOTES

KEY PLAN

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SEAL

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CONSULTANT LOGO

SHEET TITLE
South Elevation

SCALE (U.N.O.)
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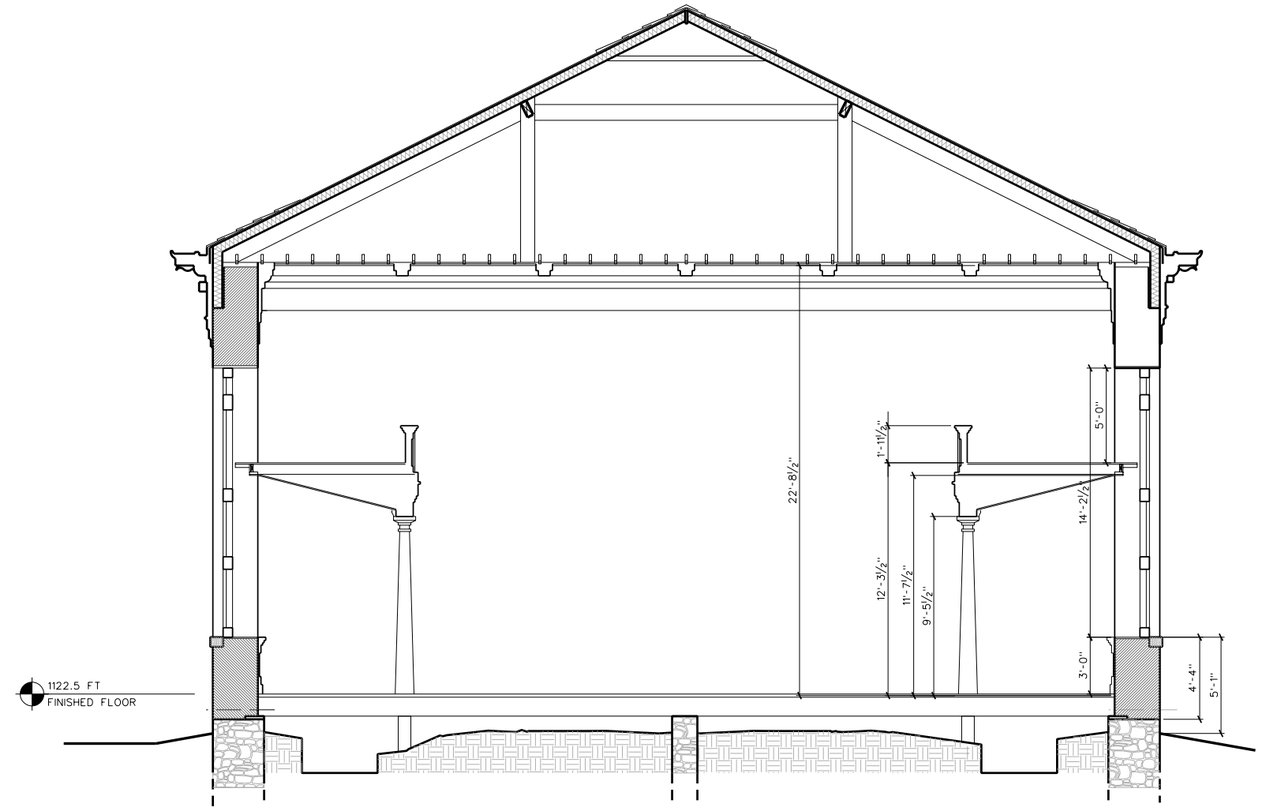


A1 Building Section– Transverse

0 4 8 FT

MATERIAL KEYNOTES

GENERAL NOTES

SHEET SPECIFIC NOTES

KEY PLAN

PROJECT NORTH

SEAL

REVISION:

LORD · AECK · SARGENT
ARCHITECTURE

www.LordAeckSargent.com
(877) 932-1401 fax (877) 932-1401

SHEET TITLE: Building Section- Transverse

DRAWN BY: LL

SCALE (U.N.O.): As Noted on Drawing

JOB NAME: First Presbyterian Church of Marietta

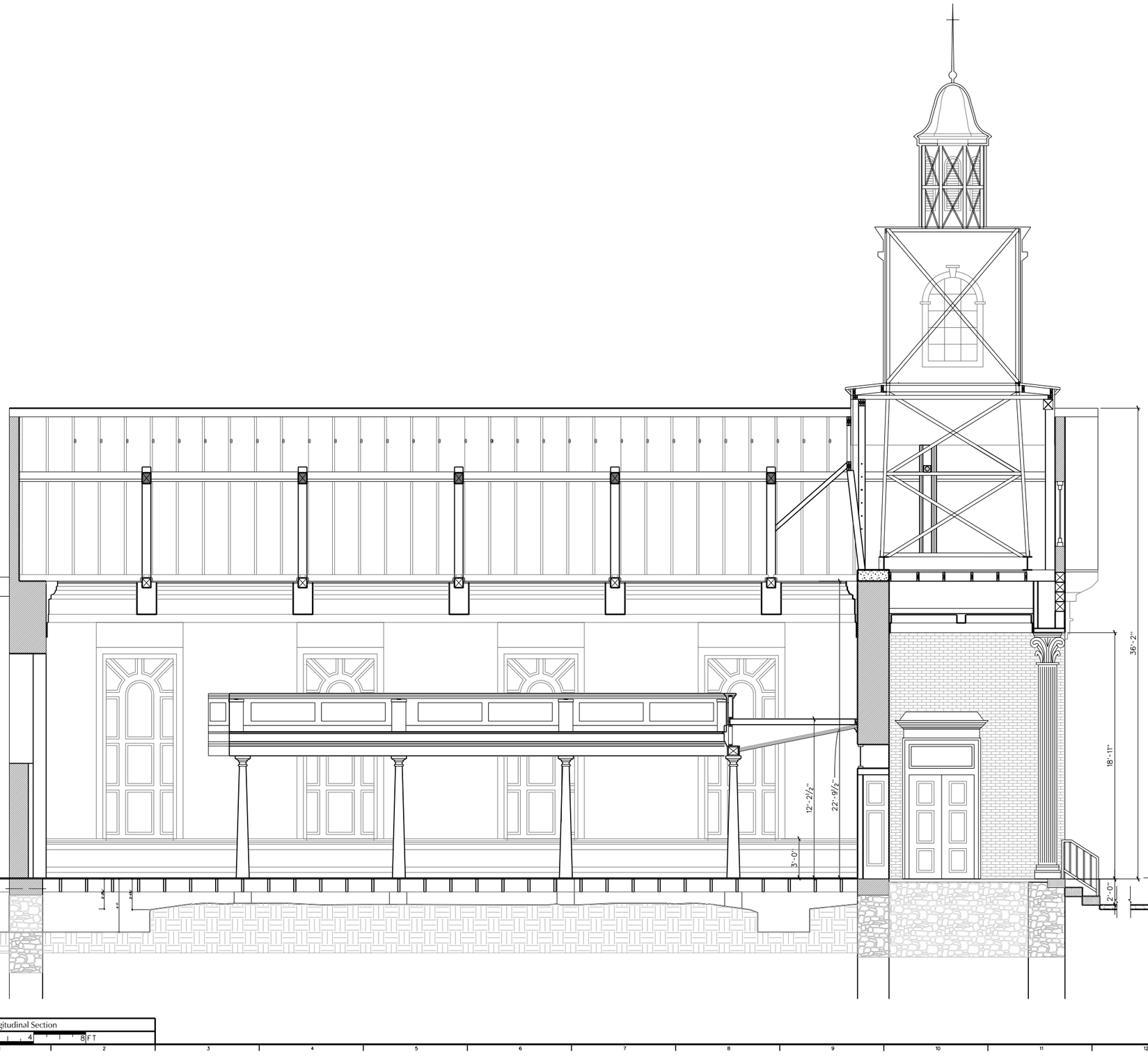
LOCATION: 189 Church Street, Marietta, GA 30060

ISSUE DATE: 10/24/08

JOB. NO.: 28057-00

DWG. NO.: A300

NOT FOR CONSTRUCTION



A1 Longitudinal Section
0 4 8 FT

MATERIAL KEYNOTES

GENERAL NOTES

SHEET SPECIFIC NOTES

KEY PLAN

PROJECT NORTH

SEAL

REVISION:

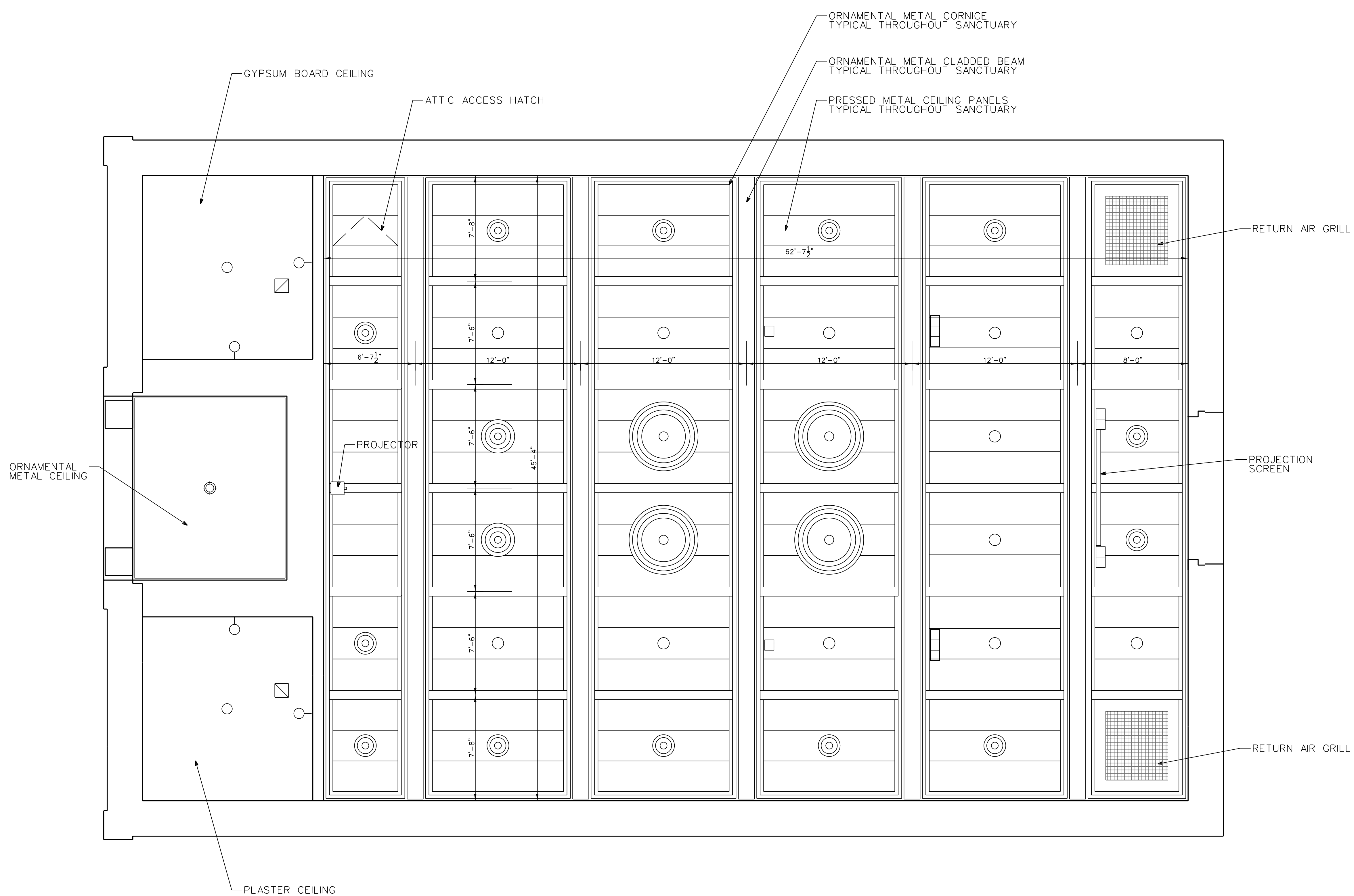
LORD · AECK · SARGENT
ARCHITECTURE

SHEET TITLE: Longitudinal Section
SCALE (U.N.O.): As Noted on Drawing
DRAWN BY: LL

JOB NAME: First Presbyterian Church of Marietta
LOCATION: 189 Church Street, Marietta, GA 30060

ISSUE DATE: 10/24/08
JOB. NO.: 28057-00
DWG. NO.: A301

NOT FOR CONSTRUCTION



A1 Reflected Ceiling Plan

0 4 8 FT

llaquian
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MATERIAL KEYNOTES

GENERAL NOTES

SHEET SPECIFIC NOTES

- AIR SUPPLY DIFUSER
- INCANDESCENT SURFACE MOUNTED ACCENT LIGHTING
- INCANDESCENT RECESSED DOWN LIGHTING
- INCANDESCENT PENDANT LIGHTING
- INCANDESCENT SCONCE LIGHTING
- RETURN AIR GRILL

KEY PLAN

N

PROJECT NORTH

SEAL

REVISION:

LORD · AECK · SARGENT
ARCHITECTURE

SHEET TITLE
Reflected Ceiling Plan

SCALE (U.N.O.)
As Noted on Drawing

DRAWN BY
LL

JOB NAME
First Presbyterian Church of Marietta

LOCATION:
189 Church Street, Marietta, GA 30060

ISSUE DATE
10/24/08

JOB NO.
28057-00

DWG. NO.
A400

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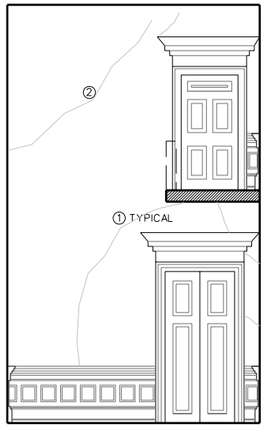
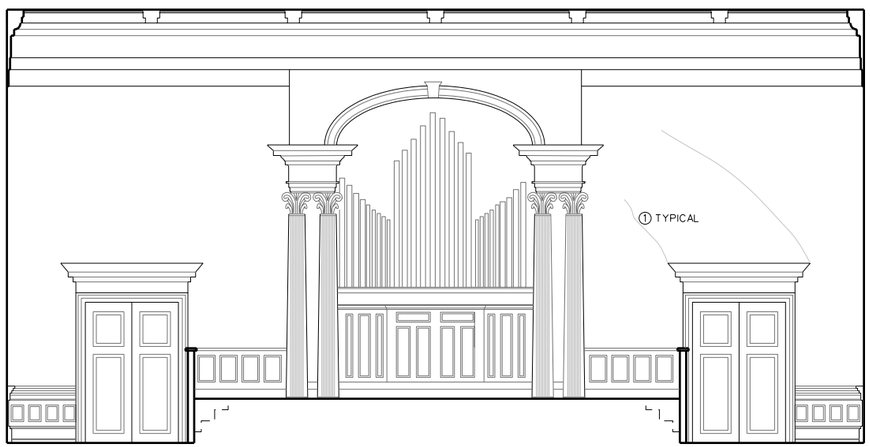
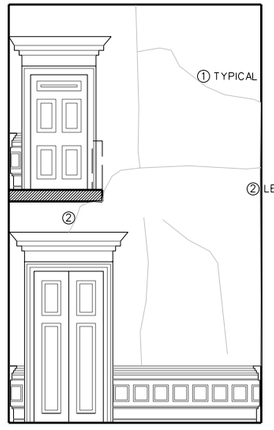


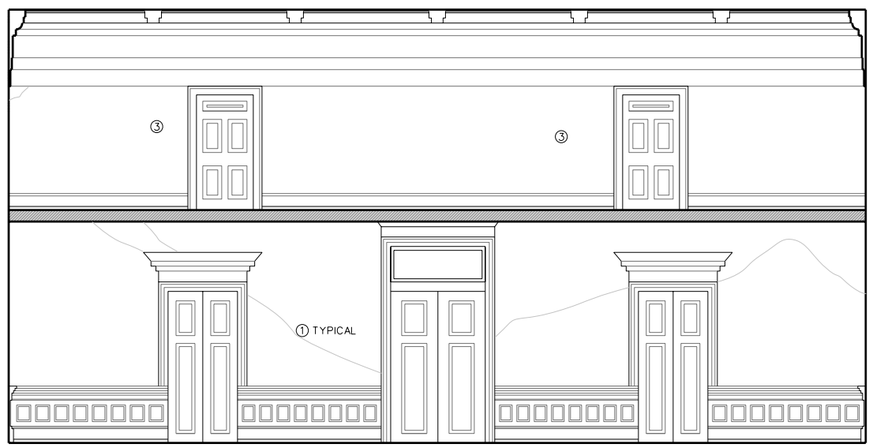
F1 South Stair Vestibule Interior Elevation
0 4 8 FT



A1 East Interior Elevation
0 4 8 FT



F7 North Stair Vestibule Interior Elevation
0 4 8 FT



A7 West Interior Elevation
0 4 8 FT

MATERIAL KEYNOTES

GENERAL NOTES

SHEET SPECIFIC NOTES

① PREVIOUSLY REPAIRED PLASTER SURFACES SHOWING FINE CRACKS AGAIN. NOT STRONGLY NOTICEABLE BUT MAY CONTINUE TO EXPAND. TYPICAL UNLESS OTHERWISE NOTED.

② PREVIOUSLY REPAIRED PLASTER SURFACES SHOWING MEDIUM CRACKS AGAIN. SLIGHTLY NOTICEABLE BUT MAY CONTINUE TO EXPAND.

③ WATER STAINS ORIGINATING FROM THE TOWER PENETRATION OF THE ROOF.

KEY PLAN

PROJECT NORTH

SEAL

REVISION:

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(877) 939-5673 fax (877) 939-5401

SHEET TITLE: Interior Elevations

SCALE (U.N.O.): As Noted on Drawing

DRAWN BY: LL

JOB NAME: First Presbyterian Church of Marietta

LOCATION: 189 Church Street, Marietta, GA 30060

ISSUE DATE: 10/24/08

JOB. NO.: 28057-00

DWG. NO.: A600

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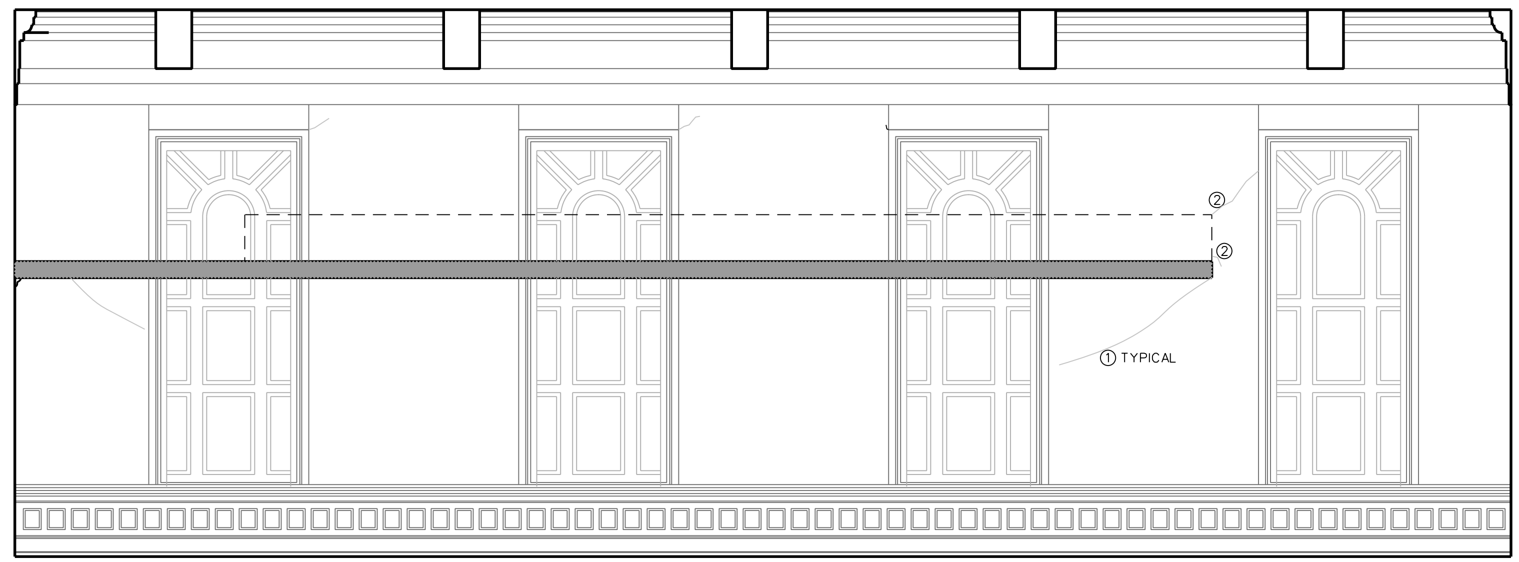
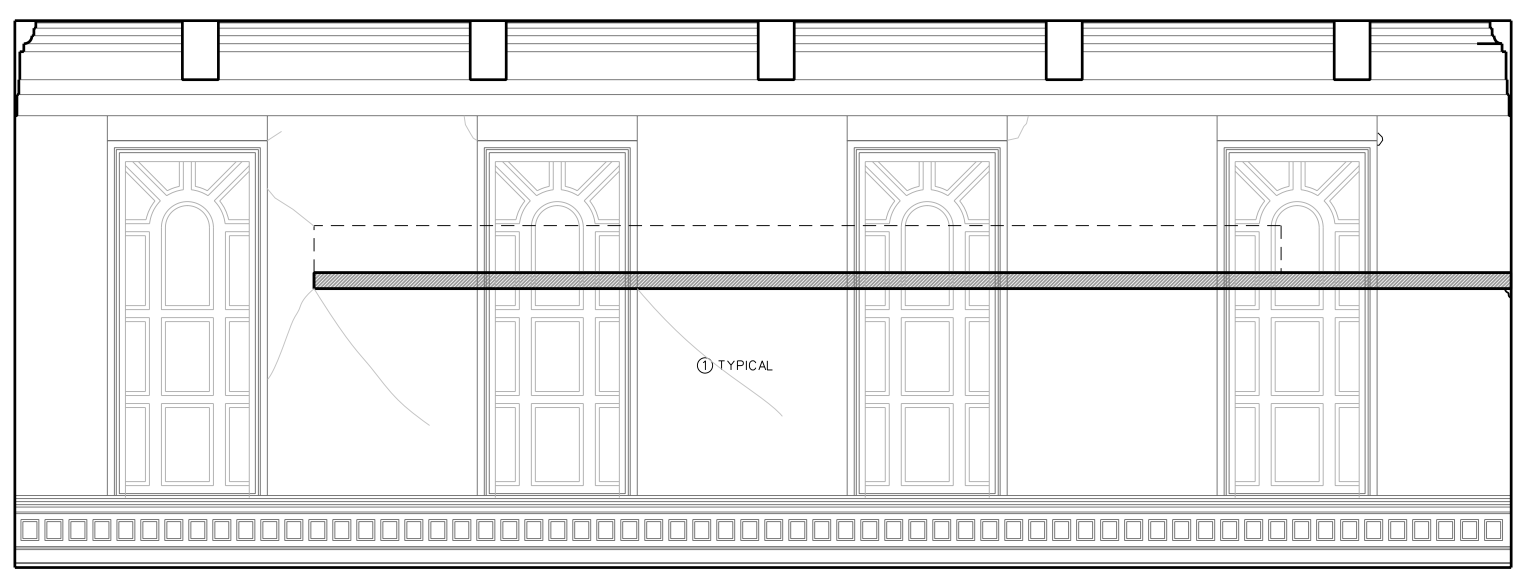


F1 South Interior Elevation
0 4 8 FT



A1 North Interior Elevation
0 4 8 FT

MATERIAL KEYNOTES

GENERAL NOTES

SHEET SPECIFIC NOTES

① PREVIOUSLY REPAIRED PLASTER SURFACES SHOWING FINE CRACKS AGAIN. NOT STRONGLY NOTICEABLE BUT MAY CONTINUE TO EXPAND. TYPICAL UNLESS OTHERWISE NOTED.

② PREVIOUSLY REPAIRED PLASTER SURFACES SHOWING MEDIUM CRACKS AGAIN. SLIGHTLY NOTICEABLE BUT MAY CONTINUE TO EXPAND.

KEY PLAN

PROJECT NORTH

SEAL

REVISION:

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SHEET TITLE: Interior Elevations

SCALE (U.N.O.): As Noted on Drawing

DRAWN BY: LL

JOB NAME: First Presbyterian Church of Marietta

LOCATION: 189 Church Street, Marietta, GA 30060

ISSUE DATE: 10/24/08

JOB NO.: 28057-00

DWG. NO.: A601

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