CONCEPT STUDY:

INTERIOR PLASTER RESTORATION
SANCTUARY AND WORSHIP AREAS

THE CHURCH OF ST. JOSEPH
36 Bleecker Street
Greenwich, NY 12834

February 2011 (rev 3/11)
I. PROJECT SCOPE

Preservation Architecture has undertaken this Concept Study of Interior Plaster Conditions to address the feasibility of interior plaster restoration in the Sanctuary and Worship Areas of the Church of St. Joseph’s. Included in the study was a cursory assessment of Attic spaces, exterior walls and roofs in order to determine the relationship of interior plaster damage to past or ongoing water infiltration. The primary goals of the study are to quantify and estimate required interior repairs and to develop an approach to the plaster restoration project that minimizes impact on Sanctuary and Worship Area use. For the evaluation of existing conditions and development of options for plaster repair and the preliminary cost opinion, Preservation Architecture was assisted by Edward Zemeck, P.E. of EDZ Associates.

Observation of exterior and interior conditions occurred from ground or with vertical access using ladders and a 35’ boom truck positioned on the east and west sides of the church: hands-on inspection of the steeple and dome were not included in the study scope. Other locations were observed using binoculars at the exterior and ladders or binoculars at the interior. Interior investigations included, at three locations, seven probes that extended through the plaster to the lath in order to help determine the method of wall construction, typical patterns of cracking and plaster separation, and the condition of plaster anchorage keys. Additionally, the entire Attic space was observed, including area above the Altar.

II. BUILDING DESCRIPTION

A summary of known construction efforts, reported in the 1978 publication Saint Joseph Parish Greenwich, New York written by Joseph L. Shannon, O.S.A., is as follows:

<table>
<thead>
<tr>
<th>YEAR</th>
<th>EVENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1903</td>
<td>Cornerstone laid</td>
</tr>
<tr>
<td>1905</td>
<td>Constructed halted: building was bare walls and a roof ($47,000 expended)</td>
</tr>
<tr>
<td>1909</td>
<td>Work on interior resumed and completed (under direction of Hopkins and Gratton) Church dedication May 8, 1910. Construction complete with exception of few “luxuries”</td>
</tr>
<tr>
<td></td>
<td>• Masonry: Sheehan Bros. (Mechanicville)</td>
</tr>
<tr>
<td></td>
<td>• Roof slate, tinning and galvanized iron: (William and Manogue (Troy)</td>
</tr>
<tr>
<td></td>
<td>• Painting: Henry Schuldt (Troy)</td>
</tr>
<tr>
<td></td>
<td>• Stained Glass: M.T. Lamb (Brooklyn) Carpenter: Nial Bros. (Troy)</td>
</tr>
<tr>
<td></td>
<td>• Woodwork: sacristy floors 2 1/2” face Alabama “combed grain” pine</td>
</tr>
<tr>
<td></td>
<td>• Interior finishing entirely accomplished ($25K)</td>
</tr>
<tr>
<td></td>
<td>• Altar and Pews (quartered white oak): J.F. Phillips Company (Dubuque)</td>
</tr>
<tr>
<td></td>
<td>• Heating System: Parker and Cleveland (Greenwich)</td>
</tr>
<tr>
<td></td>
<td>• Plumbing: George Bowman (Troy) confirm</td>
</tr>
<tr>
<td></td>
<td>• Electrical: Clute Brothers (Cohoes)</td>
</tr>
<tr>
<td>1910-1914</td>
<td>New organ loft; all windows contain stained glass.</td>
</tr>
<tr>
<td>1917</td>
<td>Elaborate wooden Gothic housing added to statues of The Blessed Mother and St. Joseph within Sanctuary; and statues of St. Rita and St Anthony outside Sanctuary (all since removed).</td>
</tr>
<tr>
<td>1917</td>
<td>New Altar outside communion rail: large white circular stairway with concave shell sounding board approached from Sanctuary</td>
</tr>
<tr>
<td>1923</td>
<td>Bell installed in tower (Meneely Bell Company, Troy)</td>
</tr>
<tr>
<td>c.1931-1939</td>
<td>Pulpit removed</td>
</tr>
<tr>
<td>1937</td>
<td>All land deeded by Augustinian Society of New York to St. Joseph’s Church</td>
</tr>
<tr>
<td>c.1940</td>
<td>Main Altar rebuilt; new Hammond organ</td>
</tr>
<tr>
<td>c.1947</td>
<td>New pulpit salvaged from St. Augustine Church, Troy</td>
</tr>
</tbody>
</table>
A. **Building Exterior and Structure**¹

Located at the northeast corner of the intersection of Bleecker and Hill Streets in Greenwich, St. Joseph’s was constructed on the site of the older 1871 church which was moved 40' to the east in 1903 in anticipation of the new structure. At the same time the original rectory was relocated across the street to 35 Bleecker Street.

The Church was designed with a Latin cross form with Gothic-inspired elements and constructed between 1903 and 1910. In 1903, the architect for the church and rectory was Hopkins and Casey of Troy, NY; the architect noted at the completion of the work was Hopkins and Gratton of Cohoes. Construction was led by Lemuel Richards of Troy. The extended construction period reflects a hiatus in work following completion of the exterior envelope (walls and roof) due to funding limitations.

The Church is internally connected to the Rectory to the northwest and dominated by the 97' south steeple containing the primary entrance along Hill Street and the central high octagonal Lantern (clerestory) at the intersection of the N-S nave and E-W transept. The N-S ridge is approximately 56' high: the hipped roof above the Altar is at a lower elevation.

The Church was built with red Lansingburgh brick with tinted red mortar and rock-faced stone at exposed foundation walls; a slate roof (Pennsylvania black) at the main gables; and St. Lawrence marble at the water table, belt courses, coping stones on masonry buttresses, and windows and door sills, caps and arches. Relatively new copper roofing installations exist at the steeple, clerestory and above the Altar where original skylights/stained glass panels have been covered over. Gable and hipped roofs are terminated with varying slate and metal details. All gable ends have painted galvanized sheet metal coping atop brick walls that is flashed into slate roofs and terminate at the lowest level with decorative gablets above stone corbels. Sheet metal is also used at cornices and gable moldings, finials, and upper crosses. Exterior doors, interior vestibule finishes, and louvers at upper level of steeple are wood.

The wood framed, Gothic-style stained glass windows are set directly into plaster walls, with 1980’s-era Lexan, exterior-mounted energy panels except at the Basement. The Lexan has deteriorated due to UV exposure and obscures the stained glass. Available records are unspecific about original skylights and/or stained glass lay lights. The 5 ½’ diameter stained glass window depicting the Holy Spirit surrounded by angel’s heads at the center of the Sanctuary, and the 4 stained glass ceiling panels within the Lantern, were considered of higher quality than those of lower nave walls.

A large ramp and retaining wall structure installed in the 1980’s at the south elevation provides handicapped access to the Vestibule and Worship Area, although partially obscures the original masonry at these locations.

B. **Building Interior**

For the purposes of this report, portions of the Church are referred to as the Sanctuary (north), the Worship Area, the Choir Loft, (south), and the Lantern. The Sanctuary and Worship Area contain approximately 6800 sf at the first floor and an additional 780 sf at the Choir Loft. The height of the Worship Area to the top of the plaster ceiling is 33’, soaring to 68’ at the apex of the 45’ diameter, 90’ high Lantern. The width of the transept crossing is relatively narrow, creating the unobstructed views from all pews located within the column-less Worship Area.

Wood framing supports the roofs and framing for the flat and vaulted plaster ceilings. Ceiling lath and plaster are attached directly to wood framing: lath, plaster, and wood furring strips at exterior walls are anchored directly to exterior brick. Plaster surfaces are flat at walls, sides of Lantern, and the ceiling above the Choir Loft. Other panels of the interior vaulted ceiling are curvilinear following the lines of the vaults. Columns appear to be painted plaster over wood, while vault groining and painted column capitals and other decorative elements appear to be plaster alone. Varnished white oak wainscot matches wood trim at the windows and doors, pews, and within the Choir Loft, Vestibule and other interior locations. The floor surface is tile (possibly rubber), installed in 1958 and understood to be adhered with asbestos-containing mastic.

Electric lighting was originally provided by grouped fixtures on each column and 25-30 lights behind the Sanctuary arch concealed from the Worship Area. Lighting is currently a combination of pendant fixtures and flood lights installed at locations including above the Altar.

A full Basement of approximate 70’ height (top of gravel to bottom of first floor joists) exists beneath the entire Sanctuary and Worship Area. Extensive work undertaken in the 1990’s included drainage improvements, installation of a 4’ thick gravel floor and the installation of wood furring and insulation board at perimeter walls.

The Attic is accessible via a ladder and hatch into the tower at the SE corner of the Choir Loft. On reaching the intermediate tower level, Attic access continues through an opening in the north tower (masonry) wall. Travel around the Attic is difficult but possible by climbing on, above, and below structural timbers supporting the roof, Lantern and hung ceiling framing.

¹ All dimensions approximate.
C. Construction and Repair History

There is evidence of many campaigns of exterior brick repointing as well as other maintenance items such as select replacement of isolated slate and metal flashing at various locations. Dates for the following recent projects have been provided by the Church or the Saint Joseph Parish publication.

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1958</td>
<td>Decoration of walls and ceiling, rubber (sic) tile flooring in aisles and baptistery, complete overhaul of church lighting and new fixtures, pulpit relocated (R.E. Panzroni, New York City)</td>
</tr>
<tr>
<td>c.1968</td>
<td>Carillon installed</td>
</tr>
<tr>
<td>c. 1975</td>
<td>Roofs repaired, gutters sealed, brick replacement, windows renewed, exterior metal and wood surfaces painted. Project included covering of original skylight with copper (Al Haguley and Son, Hudson Falls)</td>
</tr>
<tr>
<td>1977</td>
<td>Interior redecorated, except dome: interior walls, Sanctuary, pews, all woodwork. Baptismal font moved to front of church; Reconciliation Room relocated to old baptistery; Sacristy floors sanded and varnished and new vestment case (George D’Ambrosio Ecclesiastical Art Studios, Pelham Manor)</td>
</tr>
<tr>
<td></td>
<td>To be confirmed: if lights between lay-lights &amp; skylights were abandoned due to difficulty in changing bulbs</td>
</tr>
<tr>
<td>1988</td>
<td>Chimney Repairs</td>
</tr>
<tr>
<td>1989</td>
<td>Sanctuary Remodeling (Ceiling and Altar Frontals, Lectern hangings) Exterior brick masonry repointing, cleaning, brick replacement Drywall replacement in church</td>
</tr>
<tr>
<td>c. 1980s</td>
<td>Construction of accessible ramp and entrance, S elevation</td>
</tr>
<tr>
<td>1990-2</td>
<td>New hot air heating system Basement: Addition of gravel at floor and installation of rigid insulation at perimeter walls</td>
</tr>
<tr>
<td>1990</td>
<td>Roof repairs</td>
</tr>
<tr>
<td>1991</td>
<td>Roof repairs</td>
</tr>
<tr>
<td>1991-2</td>
<td>Accessible ramp and retaining walls</td>
</tr>
<tr>
<td>1991-2</td>
<td>Septic tank and parking lot / drainage</td>
</tr>
<tr>
<td>1992</td>
<td>Roof repairs</td>
</tr>
<tr>
<td>2003</td>
<td>New hydronic heating system replacing older steam system</td>
</tr>
<tr>
<td>2004</td>
<td>Tower roofing (complete); limited exterior repointing and roof repairs including replacement of most valley flashings.</td>
</tr>
</tbody>
</table>
III. FINDINGS: EXTERIOR AND INTERIOR CONDITIONS

A. Exterior

Exterior observations exposed numerous conditions requiring attention. Although most conditions do not appear to be currently associated with ongoing water entry, conditions not addressed will, over time, permit water entry into exterior brick walls and damage bricks, mortar, and interior plaster. Localized areas of deterioration are noted on the exterior elevation drawings and roof plan included in this study.

- **Missing Slate.** Slates are missing at various locations on roofs. An annual cycle of roof inspection and repair should be initiated.

- **Exterior Metal.** The most significant and widespread exterior condition is the deterioration of galvanized sheet metal coping at gable and roof ends, untouched in the 2004 exterior repair project. Copings are rusted and in many areas have lost the ability to shed water. Observed conditions related to failure of these copings include:
  - Upper wall brick masonry directly beneath metal coping is anticipated to be in poor condition due to long-standing water entry. Repointing and some rebuilding are anticipated.
  - Metal flashing beneath slate shingles at intersection with vertical sections of metal coping appears to be inconsistent and incomplete. In particular at lower areas, visible gaps and rust indicate areas of water entry. Significant paint loss and likely through-rusting of metal have occurred.

Comprehensive repairs at the metal coping will likely include the following work. Further investigation will need to confirm extent and location, and the condition of 2004 work.
  - From cornice to ridge, removal of all metal coping and an approximately 18" wide band of slate shingles.
  - Repointing/rebuilding of upper areas brick masonry.
  - Installation of new metal step flashing and salvaged and new slate.
  - Restoration/replacement of metal coping and ornament; repainting.²
  - Restoration and painting of other exterior metal including cornices, missing/deteriorated ornamental finials, cornice/roof at intermediate level of steeple, and roof ridges.

- **Buttress Coping Stones.** At many buttress locations, mortar joints have eroded due to water run-off from failed metal coping above. Water entry into brick masonry has caused build-up of efflorescence (white salts) and loss of brick material (spalling). It is understood that some repointing occurred as part of the 2004 project.

- **Masonry Joints.** In select and various locations joints have lost their mortar and integrity. This condition is most evident at the north end of the west elevation adjacent to the Rectory.

- **Basement Windows.** Although unrelated to plaster conditions, some Basement windows are in poor condition.

**Recommendation.** Efforts to address above-noted conditions should be made as soon as possible and prior to undertaking interior plaster repairs. Identified locations remain a potential source of water entry and plaster failure in the immediate future, most notably at the arch located at the south end of the Altar. Ongoing water entry and cracking will continue to weaken the plaster and accelerate the rate of deterioration.

B. Interior Plaster

The original plaster installation appears to have included only one coat of plaster (scratch coat) in lieu of the traditional three coats. [Existing plaster is approximately 1/4" – 5/16" thick, in comparison with traditional early 20th century plaster of almost 1" thickness (3/8" scratch coat, 3/8" brown coat, and 1/2" finish coat).] It is unknown if the installation of a single coat was based on budget or expediency, or if the two subsequent coats were anticipated but not executed. The current plaster surface is rough in texture, typical for the scratch coat in order to maximize bonding with the subsequent brown coat, and appears to have some lime and a mid-sized aggregate. Testing will be required to determine the original composition in order to ensure the compatibility of patching material with existing plaster to remain.

Observed interior plaster failure throughout the Sanctuary and Worship Area appears due to separate causes:

- **Roof Leaks.** At many locations water entry from the roof has caused failure of large areas of plaster. Much of the damage can be traced to staining visible on wood framing and sheathing in the Attic. While it is believed that most

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² To minimize maintenance cycles, alternate materials to original painted/galvanized sheet metal merit further discussion. To be considered are red copper, lead coated copper, and stainless steel.
leaks have been repaired, suspect areas at roofs and exterior walls are shown on drawings and discussed herein. Exceptions where leaks may be current (based on observed wetness or interior daylight visible in Attic) include:

- Ceiling above Altar, in particular above St. Therese candle station. Leakage appears due to the gaps at the roof hips where slate-to-slate joints are open.
- Lower sections of main roof between transept and tower, both E and W elevations.

- **Plaster Failure.** Large areas of plaster loss and extensive areas of plaster cracking, are visible throughout the Sanctuary and Worship Area. Some cracks are severe and are associated with delamination of plaster from the wood lath. Much of the cracking is minor, generally following the lines of the lath and not extending through to the plaster keys. At many locations the appearance of the cracks is exacerbated by paint blistering. Most plaster failure appears to be the result of the following key factors:
  - Inherent flexibility of the complex wood structural framing system at Attic and ceiling levels to which plaster lath is directly connected.
  - Inherent weakness of the one-coat plaster system.
  - Previous or ongoing water entry from roofs or through brick masonry exterior walls

In 2004, a large section of ceiling plaster fell onto the east pews. At the request of the diocese, Fr. Chris Welsh inspected the church and directed that section of seating closed. A contractor was retained to knock down loose plaster in this area and other locations with similar conditions. No other substantial plaster failure has occurred since.

**Recommendations:**

1. **Due to the criticality of failed plaster in the ceiling above the communion rail, as soon as possible plaster in this area should be netted and firmly anchored to solid framing members in the Attic.**

2. **In order to regain access to seating in the east pews, ceiling netting should be installed to secure any loose plaster in this area. The cost of such netting is estimated at $9000 - $10,000.**
IV. TREATMENT: PLASTER REPAIR AND PAINTING

Plaster conditions have been evaluated to determine the extent of work necessary by individual panel, as illustrated in report drawings. The required level of work for each panel has been classified as one of three categories:

Note 6: General repairs (repair of some cracks and minor areas of plaster loss)
Note 7: General repairs at 50% of panel area; new plaster at 50% of panel area
Note 8: 100% new plaster

Various treatment options ranging from minimal crack repair to crack repair followed by a complete skim coat on all plaster surfaces were presented to the Church committee. All options were considered to be equally stable with respect to attachment to existing lath and brick. Application of additional layers of plaster to create a full 3-coat plaster system less subject to cracking was rejected due to the additional weight that could impact existing plaster stability and the potentially adverse impact on the acoustics of the Sanctuary and Worship Area.

The selected repair approach is the least expensive of those explored but an approach that will provide substantial visual improvement over existing conditions. It is understood that some minor surface imperfections will remain visible and there is a likelihood that some cracking will reappear over time.

The scope of work associated with recommended plaster repairs and painting includes the following:

1. Repair of major cracks (> 1/16”).
2. Removal of damaged or unsalvageable areas of plaster.
3. Reanchoring of loose plaster sections.
4. Installation of new plaster where missing or deteriorated.
5. Preparation of existing painted surfaces for repainting.
6. Repainting.

As part of the plaster and repainting efforts, the following research and testing are recommended:

a. Determine original plaster composition to serve as the basis of formulation of repair plaster.
b. Conduct historic research and paint analysis (photographic research; sampling of paint chronology at various locations) to determine the original colors and decorative schemes.
c. Test various plaster repair techniques and materials to improve durability of repairs:
   o Plaster/epoxy injections or use of special washers to improve adherence of loose but stable sections of plaster to lath.
   o Use of high lime mix at critical locations to improve flexibility.
   o Addition of expansion joints at critical locations to increase flexibility and reduce cracking.

Additional work items associated with plaster repairs may include flooring improvements, asbestos abatement, electrical and lighting repairs, and wood repairs and refinishing at pews, wainscot and decorative trim elements. The final scope of restoration and repair work will be determined in the next phase of architectural investigations that are beyond the scope of this preliminary study.
V. CONSTRUCTION PHASING AND PRELIMINARY COST OPINION

Alternate approaches to the interior plaster repairs have been considered in the context of three phasing options with varying impacts on project duration, impact on worship use, and cost. These phasing options are illustrated on drawing A.13 of this study.

Phasing Schedule I, with an estimated construction period of 9 months (crew of 5-7 workers) to 1 ½ years (crew of 3-5 workers), permits no worship in the Sanctuary and adjacent spaces while the Contractor has full access to these areas.

Phasing Schedules II and III are alternate approaches with longer time periods and higher costs associated with mobilization, which includes the considerable efforts associated with mounting and dismounting of work area enclosures, stopping and starting of repair, painting, and clean-up. Drawing A.13 illustrates possible means to separate work areas via the use of full height polyethylene on the sides of scaffolding. Ventilation for each work area would be required (blowers, fans, and temporary duct work). It is expected that the selected Contractor may present alternate approaches.

PHASING SCHEDULE I: Single construction effort. Worship: No worship in Sanctuary and Worship Area.

Advantage:
- Shortest construction period
- ($) Cost Effectiveness

Disadvantage:
- Worship relocation (Locations to be discussed with entire parish for all options prior to work commencing.)

PHASING SCHEDULE II: 3 construction efforts (separate work areas contained). Worship: One-half Altar (E or W) available through project duration.
- South Entrance (Narthex), including Choir Loft
- Worship Area and Sanctuary (E)
- Worship Area and Sanctuary (W)

Advantage:
- Worship in Worship Area and Sanctuary always available

Disadvantage:
- Extended construction period
- ($) Some premium paid for each mobilization
- Inconvenience due to relocation of construction zones

PHASING SCHEDULE III: 4-5 construction efforts (separate work areas contained). Worship: One-half Altar (E or W) available through project duration; Option III-C relocates Altar to front of communion rail.

Option III-A
- South Entrance/Narthex and Worship Area (E)
- South Entrance/Narthex and Worship Area (W)
- Sanctuary (E)
- Sanctuary (W)
- Choir Loft

Option III-B
- Worship Area (E)
- Worship Area (W)
- Sanctuary (E) and Transept (E)
- Sanctuary (W) and Transept (W)
- Choir Loft and South Entrance/Narthex

Option III-C
- Altar (E and W) and Transepts (E and W)
- Worship Area and South Entrance/Narthex (E)
- Worship Area and South Entrance/Narthex (W)
- Choir Loft

Advantage:
- Worship in Worship Area and Sanctuary always available

Disadvantage:
- Longest construction period
- ($$) Highest premium paid for each mobilization
- Greatest inconvenience due to relocation of construction zones
### TABLE 3: INTERIOR PLASTER REPAIRS: BASE PROJECT COSTS AND PHASING OPTIONS

<table>
<thead>
<tr>
<th></th>
<th>Construction Schedule Option I ($)</th>
<th>Construction Schedule Option II ($)</th>
<th>Construction Schedule Option III ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> Pre Construction Testing: Historic Paint and Finishes Assessment, Environmental, Upper Level Plaster Adherence</td>
<td>15,000</td>
<td>15,000</td>
<td>15,000</td>
</tr>
<tr>
<td><strong>2</strong> Removals and Preparation</td>
<td>350,000</td>
<td>425,000</td>
<td>500,000</td>
</tr>
<tr>
<td><strong>3</strong> Plaster Repairs</td>
<td>175,000</td>
<td>175,000</td>
<td>175,000</td>
</tr>
<tr>
<td><strong>4</strong> Painting (Decorative)</td>
<td>262,500</td>
<td>262,500</td>
<td>262,500</td>
</tr>
<tr>
<td><strong>5 Total 1</strong></td>
<td>802,500</td>
<td>877,500</td>
<td>952,500</td>
</tr>
<tr>
<td><strong>6</strong> General Conditions, O&amp;P (Contractor)</td>
<td>96,300</td>
<td>105,300</td>
<td>114,300</td>
</tr>
<tr>
<td><strong>7 Total 2</strong> (Line 5 + 6)</td>
<td>898,800</td>
<td>982,800</td>
<td>1,066,800</td>
</tr>
<tr>
<td><strong>8 Total 3</strong> (Line 7 with 25% Contingency (Bond, Architectural / Engineering Fees, Unforeseen conditions)</td>
<td>1,123,500</td>
<td>1,228,500</td>
<td>1,333,500</td>
</tr>
<tr>
<td><strong>9</strong> Interior Improvements (Abatement, lighting, limited woodwork, flooring)</td>
<td>100,000</td>
<td>100,000</td>
<td>100,000</td>
</tr>
<tr>
<td><strong>10</strong> Limited Exterior Repairs (Roofing, Masonry)</td>
<td>150,000</td>
<td>150,000</td>
<td>150,000</td>
</tr>
<tr>
<td><strong>11 Total 4</strong> (Line 8+9+10)</td>
<td>1,373,500</td>
<td>1,478,500</td>
<td>1,583,500</td>
</tr>
</tbody>
</table>

**Estimated Project Duration**

|                               | 9 mo     | 10 mo    | 12 mo    |

**Notes:**

1. Detailed estimates for Interior Improvements (Item 9) and Exterior Repairs (Items 10) have not been prepared in the scope of this study.

2. Based on review of the potential project scope, it is assumed that the funds allocated herein for this work are sufficient for the purpose of undertaking plaster restoration and painting.

3. Refer to drawings A.13 for locations of proposed scheduling of work.

4. Line Item 1 includes environmental testing to determine presence of asbestos and lead in proposed work areas. Costs associated with any required abatement can be estimated once testing results are made available.
VI. ADDITIONAL

A. Energy Conservation

- Insulation. Based on the assessment of historic construction and existing conditions, the installation of insulation at exterior walls, ceiling or underside of roof is not recommended:

  1. Exterior Walls. Plaster is applied directly to wood furring strips attached to 2x2 framing attached to brick masonry walls. Insulation at exterior walls would require complete removal of all interior finishes and reframing interior walls, a complex project that would be difficult to achieve and that would adversely impact plaster and wood details, wainscot and trim.

  2. Ceiling. Plaster is attached directly to wood furring strips supported by an independent wood framing system beneath the roof. Given the fragile nature of the plaster keys and furring system, insulation is not recommended directly above the plaster. Insulation at this location would add weight to the plaster/lath system, would change the thermal character of the ceiling assembly in a manner that could adversely affect the structural integrity of the plaster, and could have significant impact on the acoustics of the spaces.

  3. Roof Rafters. Access to the underside of the roof frame is extremely difficult due to the complex structural framing and low height areas. Installing insulation to the underside of roof sheathing in a complete and consistent manner would be difficult and any inconsistencies could readily cause condensation and damage at adjacent surfaces. Insulation at this location would also significantly complicate the ability to identify and repair future roof leaks. Insulation above the roof is not possible due to the adverse and complex impact created by adding inches of height to the existing structure.

- Storm Windows. Improvements to the exterior storm panels should be considered for esthetic purposes, but will not have a significant impact on increasing overall energy performance of the building.

- Mechanical Systems. It is recommended that the Church explore alternate means to enhance the 2003-installed mechanical systems and to regulate the systems in response to the actual scheduled use of the Worship Area and Sanctuary. Opportunities for cost effective means of improving the existing system, to be evaluated by a mechanical engineer, may include the following:

  1. Modifications of existing equipment to increase efficiency and comfort.
  2. The ability to turn off or significantly reduce heat without causing condensation within the wall or plaster assemblies.
  3. Installation of a mechanical ventilation system in the Attic to ventilate warm air out of the building during summer months, if considered a significant issue to the congregation.

B. Other Improvements

The Church has independently and previously identified additional work considered as priority improvements. A summary of these is provided in the Table 4. Detailed scopes of work or cost estimates were not undertaken as part of this study.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
</table>
| 1 | (Handicapped) Accessible Toilet Room in Current current “Cry Room” | a. Infill of arched glass walls  
  b. Construct partitions around accessible toilet room  
  c. Provide all finishes and fixtures |
| 2 | (Handicapped) Accessible Doors at S Entry Sequence | a. Install automatic openers / push buttons at 2 pair of doors at ramp access to provide opening in sequence |
| 3 | Accessible Connection (Church and Rectory) | a. Create accessibility to Sanctuary in Church and to Rectory |
VII. PHOTOGRAPHS

1. South Elevation
2. South and East Elevations
3. West Elevation
4. North Elevation
5. Roofing: Lantern / Slate Roof intersection
6. North Elevation: Open joints in slate roofing above
7. West Elevation: flashing/roofing at tower and metal coping detail
8. Typical detail at bottom of metal coping: Note rusting and deterioration of masonry below
9. West Elevation Tower/ slate roof intersection: potential source of water infiltration
10. Cornice termination at brick masonry, with short term flashing solution (terminator bar)
11. Metal coping/slate roof intersection, typical detail
12. Fallen sheet metal ornament
13. Masonry buttress: Typical masonry deterioration
14. West Elevation: area of required repointing, south end
15. Sanctuary interior, looking North
16. Sanctuary interior, looking South
17. High lantern (north panels) and ceiling groining plaster
18. High lantern (east panels) and ceiling groining plaster
19. Lantern ceiling
20. Plaster detail: previous repairs at window returns
21. Plaster deterioration, North wall
22. Plaster deterioration detail
23. Ceiling framing/wood lath in attic, west wall
24. Ceiling framing/lath at lantern

VIII. DRAWINGS

A.01 Basement Plan
A.02 First Floor/Choir Loft
A.03 Reflected Ceiling Plan
A.04 Roof Plan
A.05 South Elevation
A.06 West Elevation
A.07 North Elevation
A.08 East Elevation
A.09 North and South Interior Elevations
A.10 East Interior Elevation
A.11 West Interior Elevation
A.12 Details
A.13 Phasing Strategy
5. Roofing: Lantern / Slate Roof intersection
6. North Elevation: Open joints in slate roofing above
7. West Elevation: flashing/roofing at tower and metal coping detail
8. Typical detail at bottom of metal coping: Note rusting and deterioration of masonry below
9. West Elevation Tower/ slate roof intersection: potential source of water infiltration
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