Methodology

Lerner|Ladds+Bartels assembled a group of industry professionals in order to assess conditions of the various building components. Each firm submitted a preliminary report which identifies deficiencies and offers solutions to the problems.

The exterior of the church and school were photo-documented and assessed using a man-lift to generally determine the extent of work required for renovations. The photo-documentation was then edited and noted to portray both unique/specific conditions and to identify general areas requiring attention. Based on consultant reports and site observations it was then possible to determine a realistic cost projection for restoration of the main entrance facade and a five year restoration plan for the balance of the complex.

Following is a list of Consultants, with a prime contact:

<table>
<thead>
<tr>
<th>Roofing</th>
<th>Apollo Roofing &amp; Sheet Metal, Inc.</th>
<th>Eric Jansen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masonry</td>
<td>R.D. Preservation Co., Inc.</td>
<td>Ron Diodati</td>
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</tbody>
</table>

Christian Ladds, AIA assessing the condition of the terra-cotta joints with Jerry of R. D. Preservation Co., Inc.

Lift supplied by R.D. Preservation Co., Inc. to conduct the assessment of the exterior and roof. Lift access was limited to Diman Lane and Angell Street.
For the purpose of this review, the building analysis has been considered in three parts: The main church entrance facade, the balance of exterior masonry and roofing, and the masonry vaults in the Sanctuary.

**Main Entrance Facade**

- **Roofing**
  - **Copper Roof:**
    The coated copper roof over the main dome of the church, towers and in miscellaneous areas (i.e. copings, flashing, etc.) is in very good condition and does not appear to require work at this time. However, although the lift would not reach the gutter line of the domed roof, it appears from the deteriorated terra-cotta soffit below that some gutter work may be required. A long term plan should be considered for maintaining these roofs to prevent any problems in the future.

    The arch pediments at the main entrance that have missing pieces and failing joints have been covered with mastic in an attempt to prevent any further water infiltration. These areas may be contributing factors to the spalling terra-cotta and masonry around the entrance and should be addressed as soon as possible with copper caps.

    The floor below the three arches located directly above the center entrance should be covered with copper as an added preventive measure to ensure that water is not allowed to stand and penetrate the terra-cotta or grouted joints.

- **EPDM Roof:**
  - EPDM roofing has been installed directly behind the parapet of the entrance, over the vaults of the Sanctuary and over the connector section of the building between the Sanctuary and school. This type of roofing did not show any visible sign of fatigue during our inspections and is in relatively good condition. However, the roof currently has asphalt walk-pads that are starting to become brittle and crumble during use. Many of the valleys and low points of the roof have been flashed with EPDM membrane and then counterflashed with lead coated copper step flashing depending on location. Many of the internal roof drains located at flat roof sections require cleaning and replacement of the screen baskets.

**Recommendations:**
- Install new pitched 20 oz. copper flat locked soldered seam roofing system over the floor of the three arches with related base and counter flashings. The terra-cotta caps should be covered with a new 20 oz. copper flat locked soldered seam caps and should lock onto a continuous cleat, at the front edge, and turned up 4” vertically. New flashing will be inserted into the new reglets and extended down over the 4” upturned flashing against the masonry wall. The walk-pads on the EPDM roof should be replaced and internal drains cleaned and screen baskets replaced.

**Current Exterior/ Interior Conditions**

- **Methodology**
- **Current Exterior/ Interior Conditions**
- **Photo-documentation**
- **Budget/ Scope**
- **Summary**
- **Original Consultant Reports**
Main Entrance Facade

Masonry

- Deteriorated and failed masonry joints
- Efflorescence on masonry surfaces indicating moisture penetration
- Spalling brickwork and terra-cotta
- Cracked, chipped and broken terra-cotta
- Mismatched mortar and brickwork

The entrance facade area of the building between the towers is in need of targeted masonry restoration and cleaning. Several problems exist, including but not limited to the following:

- Deteriorated and failed masonry joints
- Efflorescence on masonry surfaces indicating moisture penetration
- Spalling brickwork and terra-cotta
- Cracked, chipped and broken terra-cotta
- Mismatched mortar and brickwork

The main entrance arch is showing significant damage and wear. In many areas, the detail in the terra-cotta columns and caps has worn off or has fallen to the ground in pieces. The custom formed brick arch shows signs of water infiltration from above, presumably through the floor of the three arches directly overhead. The efflorescence pattern on the face of the masonry also points to water penetration from the arches.

Recommendations:

- The masonry on the main entrance arch should be carefully restored. This will involve removing all spalled bricks and all joints and re-building. The decorative terra-cotta pieces should be carefully documented, cut/removed, recast and replaced.

Exterior of Complex

Roofing

- Slate Roof:
  Slate tiles cover a substantial area of the complex. The tiles are in relatively good condition and it appears that repairs have been made to the roof over the course of time. During the initial assessment of the slate roof, it was noticed that some tiles were missing and sections of gutters were damaged.

- EPDM Roof:
  The existing EPDM membrane roof is in good condition and would require minor repairs/patching and replacement of damaged boot flashings.

Recommendations:

- The existing gutter hangers should be re-attached and damaged sections replaced with 18 oz. tin coated copper gutters to match existing. Replace cracked slate tiles which have more than 2/3 of the exposed surface missing. A preventative maintenance program should be put in place to inspect the roof once a year, clean gutters and roof drains and perform minor repairs to ensure a watertight building. Install minor patches and boot flashings on the flat EPDM roof using matching materials.

Interior Masonry Vaults

Masonry

The masonry vaults in the Sanctuary show large telegraphing cracks in relatively the same location at each vault. Further investigations should be conducted to determine the cause of the problem.

Recommendations:

- The exact cause of the horizontal cracks in the terra-cotta bricks cannot be determined based on the limited information available, but it is assumed that the problem lies in either the fasteners or deflection in structural elements that support the upper roof. It is recommended that a masonry section of the vault be opened for further investigation to determine the cause of cracking. Possible corrective measures should include replacing significantly damaged terra-cotta bricks and injecting a flexible type epoxy to bridge the cracks.

View of the three arches above the main entrance arch on Angell Street. Water penetration through the floor of these arches could be a contributing factor to the spalling masonry of the arches above the entrance.
Photo-documentation

Photo-documentation is a visual aide in denoting potential problem areas. Images are demarked with numbers that correspond to a brief description of what was observed on site. Many images are representative of typical areas that exist throughout the complex.

1. Cracked terra-cotta.
2. Spalled brick faces.
3. A typical area of damaged masonry.
4. Damaged and mis-matched slate tiles.
5. Damaged copper gutters and hangers.
6. Holes in EPDM roofing membrane system.
7. Spalled bricks on chimney.
8. Damaged boot flashings around pipes.
9. Efflorescence on bricks due to water penetration.
10. Failing terra-cotta joints.
11. Missing metal fascia over wood trim on dormer.
12. Temporary mastic over terra-cotta joints at entry arch.
13. Silicone on bricks at windows.
15. Spalled terra-cotta caps.
16. Uneven horizontal terra-cotta section.
Photo-documentation

Photo-documentation is a visual aide in denoting potential problem areas. Images are demarked with numbers that correspond to a brief description of what was observed on site. Many images are representative of typical areas that exist throughout the complex.

17. Failing joints and peeling paint at circular window located on central dome.
18. Mis-aligned terra-cotta band. Image also indicates spalling brick faces and failed masonry joints.
19. Bricks on main dome showing efflorescence on face, indicating water intrusion into masonry.
20. Mis-matched bricks on towers and worn asphalt walk pads on the EPDM roof.
21. Cracked brick due to improper fastener installation.
22. Damage to terra-cotta decorative stone on entry arches and failed joints.
23. Mis-matched brick and infilled masonry opening at the office entry.
24. Efflorescence and moss growth at front entrance, failed masonry joints.
25. Efflorescence and sections of spalled brick surfaces.
26. Severe damage to brick and terra-cotta due to water penetrating the masonry from behind.
27. Temporary repairs of decorative terra-cotta.
28. Spalling brick and missing joints at ridge of main entrance pediment.
29. Damaged decorative terra-cotta stones at entry arch.
30. Similar condition of damaged terra-cotta stone due to water infiltration.
31. Damaged terra-cotta pilaster relief.
32. Stained terra-cotta caps and failed joints.
Photo-documentation

Photo-documentation is a visual aide in denoting potential problem areas. Images are demarked with numbers that correspond to a brief description of what was observed on site. Many images are representative of typical areas that exist throughout the complex.

33. Clogged drains and worn out screen baskets on EPDM roofing.
34. Coated masonry joints that are starting to show signs of deterioration.
35. Damaged terra-cotta caps temporarily fixed with mastic.
36. Cracked and soft mastic filled joints at ridge of terra-cotta pediment.
37. Spalling bricks behind three arches over main entrance.
38. Spalling brick faces above the three arches over main entrance.
39. Cracks in terra-cotta stones next to tower and discolored masonry.
40. Deteriorated flashing cap and masonry.
41. Failed silicone joint around louver located at main dome.
42. Failed masonry joints and spalling brick faces next to louver.
43. Damaged flashing and failed sealant at reglet.
44. Worn out decorative face of terra-cotta stones.
45. Severe damage to terra-cotta stone work and failed joints.
46. Failed copper seam at sill of louver located at main dome.
47. Horizontal cracks along edges of vaults in Sanctuary. This occurs at all three masonry vaults in this space.
48. Close up view of crack in Sanctuary vault.
To better envision a potential restoration process, needs were assessed by Lerner | Ladds + Bartels based on their own observations and the observations of their consultants.

The following scope and budget estimate is divided into two types of work anticipated to provide a comprehensive plan to revitalize the complex: The "main entrance facade" and the "interior masonry vaults", and a five year restoration budget for the rest of the complex.

All pricing is based on 2006 dollars.

The budget includes soft costs such as fees, general conditions, overhead and profit, and design contingency.

<table>
<thead>
<tr>
<th>Entry Facade/ Interior Vault Repair Budget:</th>
<th>$310,000.00</th>
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<tbody>
<tr>
<td>• General requirements (i.e.: testing and quality control, temporary facilities, temporary protection during construction, cleaning, etc.)</td>
<td></td>
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<tr>
<td>• Install copper at floor of three arches above main entrance</td>
<td></td>
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<tr>
<td>• Re-point and replace masonry</td>
<td></td>
</tr>
<tr>
<td>• Replace decorative terra-cotta stones</td>
<td></td>
</tr>
<tr>
<td>• Repair terra-cotta stones (stones showing less than 30% decay)</td>
<td></td>
</tr>
<tr>
<td>• Replace masonry and terra-cotta joints</td>
<td></td>
</tr>
<tr>
<td>• Install copper caps with reglets over pediments</td>
<td></td>
</tr>
<tr>
<td>• Repair interior masonry vaults</td>
<td></td>
</tr>
<tr>
<td>• Scaffolding and staging as required</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>5 Year Restoration Budget: ($220,000.00 per year)</th>
<th>$1,100,000.00</th>
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<tbody>
<tr>
<td>• General requirements</td>
<td></td>
</tr>
<tr>
<td>• Detailed investigation and analysis of building systems</td>
<td></td>
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<tr>
<td>• Replace flashing boots on the EPDM roof</td>
<td></td>
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<tr>
<td>• Repairs on the EPDM roof</td>
<td></td>
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<tr>
<td>• Repair or replacement of gutters on the slate roof</td>
<td></td>
</tr>
<tr>
<td>• Assessment and replacement of damaged slate tiles</td>
<td></td>
</tr>
<tr>
<td>• Inspection and cleaning of drains, gutters, etc.</td>
<td></td>
</tr>
<tr>
<td>• Minor roof repairs as needed</td>
<td></td>
</tr>
<tr>
<td>• Selective masonry and terra-cotta re-pointing and replacement</td>
<td></td>
</tr>
<tr>
<td>• Scaffolding and staging as required</td>
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</tbody>
</table>

Non-highlighted area denotes area of work for base scope.

Non-highlighted area denotes a typical area of work for interior vaults.

Arrows point to a typical crack that can be found on vaults.
Summary

The church complex exterior is in relatively good condition but requires some restoration to enable future generations to appreciate the historical value and continued services it provides to the community. Performing the outline scope of work for restoring the main entrance and interior masonry vaults will address the most pressing problems, and the phased renovation plan spread over five years will further the restoration effort.

The main areas of repair involve the masonry of the church, and would include a major restoration effort at the main entrance and minor areas of re-pointing and replacement. The mortar is generally in good shape, and the masonry joints should only be replace as needed. The existing areas of repaired and infilled openings with dissimilar brick are esthetically displeasing, yet generally sound. However, it is recommended that these areas be monitored on a yearly basis for indications of failure.

The different types of roof applications on the complex appear to be in relatively good condition and no major repairs or replacements need to be considered at this time. However, there are minor areas of repair that should be addressed, and a yearly maintenance program be implemented to ensure a water tight building.

The entrance facade masonry is a crucial area requiring attention. Any further deterioration of the decorative reliefs on the entrance terra-cotta and brick masonry arches should be prevented. Immediate steps should be taken to restore these ornate details before more damage occurs to this historically significant facade.
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