Condition Assessment Report for

The Grand Halle

The Former

Immaculate Conception
Roman Catholic Church Building

Broad Street at Third Avenue
Johnstown, Pennsylvania

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Introduction

Nature and Purpose of this Report

The report that follows is a Condition Assessment for the building now known as the:
Grand Halle on Broad Street
(Formerly Immaculate Conception Church, a German-Language Roman Catholic Parish)

Location:	308 Broad Street (the north corner of Broad Street and Third Avenue) Cambria City (neighborhood), Johnstown, Pennsylvania
Built:	1906-1908
Designed by:	William P. Ginther, architect (of Cleveland, Ohio)
N.R. Status:	A Contributing Resource in the Cambria City Historic District, Listed in the National Register of Historic Places, 1991

When a building of this architectural quality, historical status, and size is in public use, part of any maintenance, repair, or management task is to keep in mind the building's historic value and how it makes an impression on the public. The community loves this building for its history, the highly visible way that it serves as a neighborhood landmark on a busy thoroughfare, its availability as a venue for events, its acoustics, its colorful spaciousness, and the grandeur its users experience when they attend events here. This makes it most appropriate to treat it as a historic artifact in any question that arises about its maintenance or its long-term continued use. As an artifact, the building is the text of several important stories. It tells part of the history of the former congregation, housed here for a century, which was an important component in the diverse mosaic of ethnic groups in Johnstown. More than just that, however, it embodies an important narrative about its own architectural history, including how the design developed. The building's unspoken message, alongside other work by the same firm, illustrates of the biography of its designer. It also embodies many dimensions and lessons in its complex set of building materials and construction techniques, some of which were "cutting edge" for their time. The design also continues to speak to visitors through all these components. An attempt has been made in this document to draw out the architectural story, to show that each part of the building is part of this story, and to give the Steeples Project as much historical insight as possible, so they can interpret the building as well as use it and maintain it.

Having the best information on all materials and how they relate to one another is important before proceeding on any work. In working with a building like this, it is important to look at all sides of each component, to understand both the element in question and its context. Maintenance and small-scale upgrades should begin with the principle of "doing no harm." It is unfortunately all too easy to start with the wrong set of priorities and use all the available resources doing something that is not essential while something else that needs to be addressed is rapidly becoming a greater threat to the building's future. It is also too easy to set out to solve a problem with one material or one part of the building, and inadvertently do irreparable damage to an adjoining element or part of the building in the process. For example, one might focus on missing mortar in a few locations. The mortar may or may not be part of a larger structural problem or a moisture problem. But if someone sets out to replace missing mortar without enough information, several things could go wrong. A contractor or design professional might decide to repoint the entire building when it is not needed. In the process, the evidence of the original style of the pointing or composition of the mortar could be lost. The bricks might get damaged in the process of removing the mortar that had nothing wrong with it, or the new mortar might be too hard and result over time in breaking the bricks it touches. It is better to know first what kind of bricks and mortar were used in erecting the building, what some of the common pitfalls of this material might be, how much of the mortar is good enough to leave as it is, and so forth. It is also important to have the best analysis possible of the structural concerns, moisture concerns, or life-cycle issues either causing or caused by the missing mortar in the first place. Part of the purpose of this report is to give as comprehensive a sense as possible about the materials that relate to each part of our recommendations.

For a building as large, well designed, and important as this one, it is essential to have a recently completed condition assessment and to keep it on file with all other information available to the owner about the building's condition. This report should be filed with any other similar reports from the distant or recent past as well as new information as it becomes available. Treat the report like the medical file that a doctor or hospital might keep on a patient, and add to the file as new information surfaces. The present Condition Assessment is also typically a component of a larger organizational framework for this kind of information about a given historic building of this importance and size; when prepared at a larger scale, this is called a Historic Structure Report, or HSR. An HSR can be tailored to the needs of a specific client, a specific time period, or a specific situation. However, it is intended to be a comprehensive document about the past, present, and future of a building. The statement of current conditions, or "Condition Assessment," is the specific task at hand in the present report, but it is also a key part of what would be included in an HSR, a document that may be appropriate for this building someday, so the present condition assessment has been prepared with that in mind. The former Immaculate Conception Church building, now known as the Grand Halle, is an important enough resource that it deserves the most careful attention as it is used, interpreted, maintained, rehabilitated, and restored.

Executive Summary

This Condition Assessment Report for The Grand Halle, the Former Immaculate Conception Roman Catholic Church of Johnstown building, follows a comprehensive format designed to include as many historic components as possible. It was prepared in the spirit of a larger report format, a Historic Structures Report (HSR). The format encourages a thorough understanding of the building's whole story and of the past, present, and future of each of the building's most permanent or character-defining architectural features and building materials. It is designed to create an understanding of the building materials used in the original construction of the former church building and how these materials age over time. This kind of report can also be an important tool to use in understanding the relationship of these materials, both to each other and to the problems that have developed that will need to be addressed as part of a long term maintenance plan. The Immaculate Conception building is now over 100 years old and some materials have reached the end of what would normally be their serviceable life. The report enumerates the imminent problem areas in the attached Priority Action Item Bullet Point assessment that follows.

The document should be used as a tool in developing plans for future maintenance and repairs. It can serve as the foundation for all future research, repair and maintenance work. It is recommended that new information be kept together with this report, as it becomes available, making the document the most comprehensive resource on all aspects of the building's history, construction, condition, and maintenance.

Both short and long-term repairs as well as maintenance projects are identified in this report. There is an emphasis on the identification of those repairs that are most basic and critical for ensuring the property's integrity both as a large historic resource and as a functional building. The report also attempts to foresee where major capital projects will likely be needed. This includes those parts of the building or aspects of the design that will require major work to address inherent design problems (such as accessibility) or major repairs due to long periods of deferred maintenance over the history of the building. It also addresses those parts of the building where components will need to be replaced due to the typical lifespan of certain building materials. The sections of the report that prioritize projects were developed by identifying those items that are most critically important to address in the near future and where work is needed as soon as possible for safety or integrity reasons. It was also developed by identifying those that need to be targeted sooner rather than later in order to allow ample time so that fundraising projects and capital campaigns can be pursued. This is all in light of the possibility that extensive capital will be required to undertake one or two of the largest or more complicated repair or replacement projects expected to be necessary before long.

The project team engaged the help of specialized roofing and masonry contractors wherever possible to assist in determining these budget costs, but the complexity of the structure and the difficulty in physically investigating many of the areas, in particular the roof, has resulted in assumptions being made that will at some point require additional analysis and/or research. Access to the roof alone may be expensive due to its height and given all the current safety requirements. The information that is presented in this report is mainly based on what can be seen from the bell tower, looking across the adjacent surfaces, as well as upper wall areas, parapets, and flashing. The roof is too high for construction lifts and would most likely be best accessed from a crane. Therefore, it may be wise, at a future time, to engage the services of a company that has access to such equipment to get a more thorough view of the problem areas before establishing a complete repair plan, allowing the organization to determine the best course of action for financial planning and for undertaking such large-scale repair and replacement work.

While this report sets out to give priority to the most important repairs and to develop a hierarchy for addressing them, it does not imply that that the prioritization would never change. Conditions often worsen in unpredictable ways over the course of time due to natural, accidental, or other unforeseen causes, and, as a result, a new basis for prioritization often unfolds after such an analysis has been completed. The action items are discussed in detail and are grouped in order of their current priority for attention. The two items that are most urgent are repairs to the lower roof above the side entrance vestibule and rest rooms and the repair of the main roof ridge cap. The repairs on the asphalt shingled area of the lower portion of the roof are being made as this report is in its final stages of completion, and the rest rooms are about to be expanded in a project approved for its attention to preservation and code issues. The rest room project is funded and about to begin. It provides a way to address damaged plaster, code issues, and other issues in this area that have become critical. The copper cap at the crest of the roof remains a relatively new but critical problem, still needing to be addressed.

Several items should be monitored in the upcoming year or years. However, these are not necessarily areas where the project team recommends work or budgetary allocation in the near future. These include: the bulge in the walls, in and just below the belfry stage of the tower; the cracks in the foundation and walls separating the tower from the rest of the building; and the broken ceiling plaster ornament at the east corner of the choir loft. The limited amount of exterior wood trim on the church needs to be painted in the next three years, and repairs should be made to the parapets and all other areas where there is loose brownstone in the same time frame (loose brownstone pieces need to be removed, and, ideally, the missing parts of the decorative profiles, drip edges, etc., should be replaced as soon as possible by castings and patches made of a custom-matched material). Several small-scale items that need attention soon are listed in the Priority Action Items list (items I-M), as are two larger-scale items. The two larger items regard ornamental plaster and the slate roof, both areas where specialized trades will be needed. The decorative plaster needs to be removed and replaced with new castings, primarily for appearance reasons (there are currently no safety reasons, and the chronic nature of the deterioration is due to moisture coming in as a result of roof deficiencies and other exterior envelope problems). The large slate roof may eventually need to be replaced, and this is likely to be a very costly item requiring a major capital campaign to undertake. It is possible, however, that the existing slate has enough remaining life expectancy (e.g., 20-30 years) that the initial repair project should be to replace the flashing first. This will involve carefully removing the slates at the edges, replacing or repairing the copper flashing at parapets, tower walls, and valleys, and reinstalling the slates.

The budgetary numbers found at the end of this report reflect these considerations. After the new rest rooms have been installed and the related accessibility issues have been addressed, the client needs to address the roof cap immediately, with some consideration to future roof work needed in the slate roof areas. A budget has been estimated for the copper cresting (roof cap) phase of the work, as well as a budget for the flashing. In the long run, replacement of the entire slate roof is likely to be the largest project at this site in the upcoming century, and it will be most appropriate if a new roof of 100-year slate or better is used, however it is understood that alternative roofing materials may need to be considered to meet budgetary constraints.

Summary of Items in Order of Priority

Items Needing Immediate Attention:

A. Moisture Problems in the Exterior Walls of the Toilet Room/Vestibule Area and Roof
B. Sections of Copper Roof Ridge Cap Are Missing or Damaged

Items Requiring Ongoing Monitoring and Possibly Needing Attention Soon

C. Foundation/Wall Crack
D. Bell Tower Wall Bulge
E. Plaster Ornament at Choir Loft

Items Requiring at Least Some Attention in the Next Three Years

F. Repainting Exterior Painted Trim
G. Exterior Brownstone Trim Pieces
H. Parapet Walls at Roof

Smaller Items Needing Attention Soon, Perhaps in Combination with Other Projects

I. Missing or Dislodged Brick at Rear of Apse
J. Crawl Space/Basement Ventilation
K. Brownstone/Brick Masonry Damage at Fasteners
L. Exterior Basement Concrete Steps and Landing
M. Electrical Wiring in Belfry

Larger Restoration Items Needed, but in a Larger Project

N. Ornamental Plaster Leaf Pattern around Windows
O. Slate Roofing

Street corner view of the Grand Halle, formerly Immaculate Conception Roman Catholic Church, corner of Broad Street and Third Avenue, photographed July 2014

The Building as a Whole

General Architectural Description with Reference to Unusual Characteristics

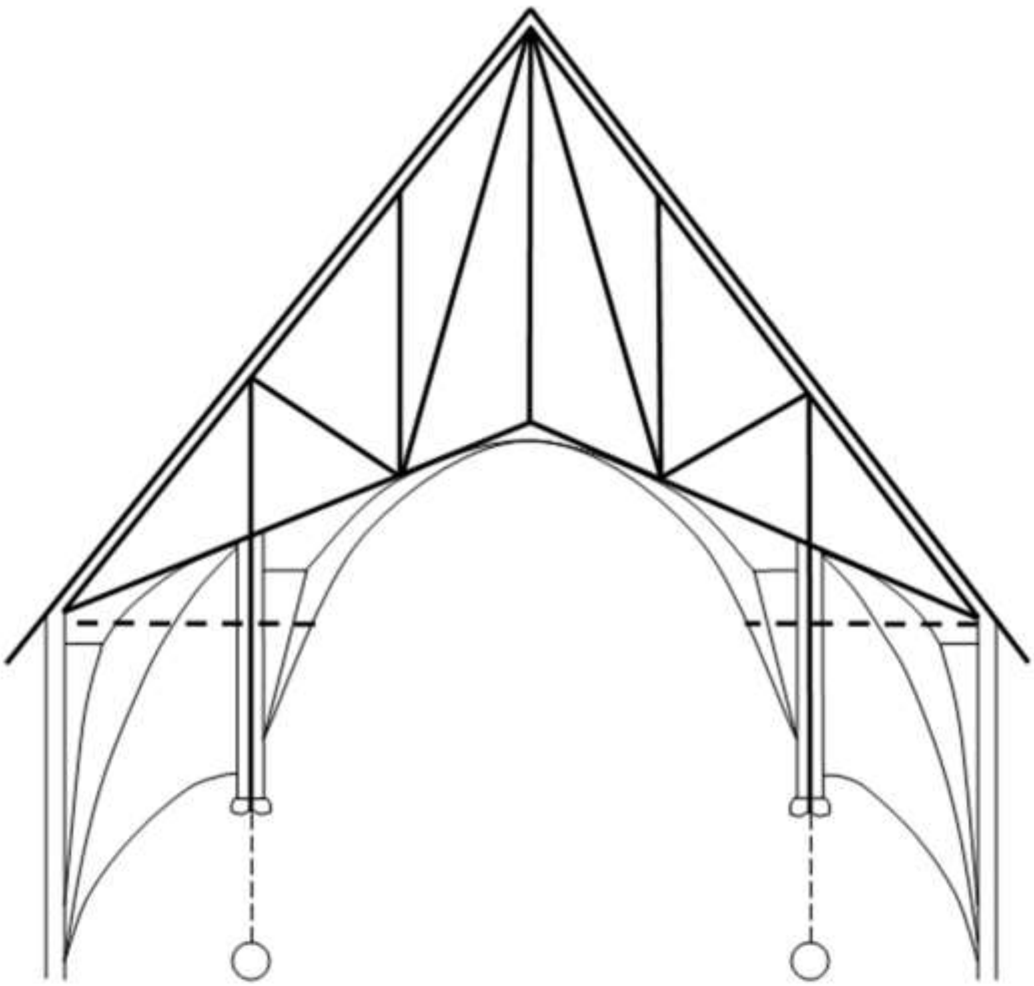
The former Immaculate Conception Church Building is a beautiful and complex piece of architecture, even though it has a relatively simple overall form and only a few rooms. The design, in terms of architectural style, building materials, and engineering, is clearly indicative of a specific moment in history. The design uses masonry walls, believed to be bearing walls,[1] that form a composite system of several different kinds of masonry. The walls bear on a poured-in-place foundation of concrete that may contain some reinforcement. The roof makes use of steel trusses to span over a large sanctuary without using columns along the side aisles that flank the nave. The concrete foundation, the steel framing in the roof, and the yellow face brick in the upper exterior portion of the walls are all materials that were relatively new innovations in the first decade of the twentieth century. The lower exterior portion of each wall is faced with rock-faced brownstone, a material that was much more popular in the nineteenth century and which was generally passing out of use at this time due to a change in color preferences and the realization that it did not hold up as well as other kinds of stone. The top line of the stone-faced area is a machine-cut belt course of brownstone with a sloped upper surface and an overhang with a drip edge beneath it. Brownstone was also used as the top trim on windows, where there are also projecting drip edges, at the locations where buttresses step in to a smaller size, at the copings where the walls form parapets, in pinnacles at the corners of the tower, and in similar locations.

Though simple in its largest characteristics, each part of the building is made more complex by added details. An example is the roof, which is mainly one immense gable in form, although interrupted by the cross-gable effect of a transept and several smaller features. The roof surfaces are pierced by towers at the two corners of the façade. It also has two gabled ventilation dormers midway between the towers and the transept, and it finishes to the northeast with five smaller triangular facets of roofing over a seven-sided apse. Near the apse is a chimney. Surrounding the bottom half of the apse, at the northeast end of the building, there is an area with a much lower and simpler roof, providing spaces for a side vestibule, a baptistery, a vestry, and a relatively modern set of rest rooms. The roof over this part of the building is clad in asphalt shingles. The pitch of this part of the roof is low enough that the asphalt surface is not visible from grade.

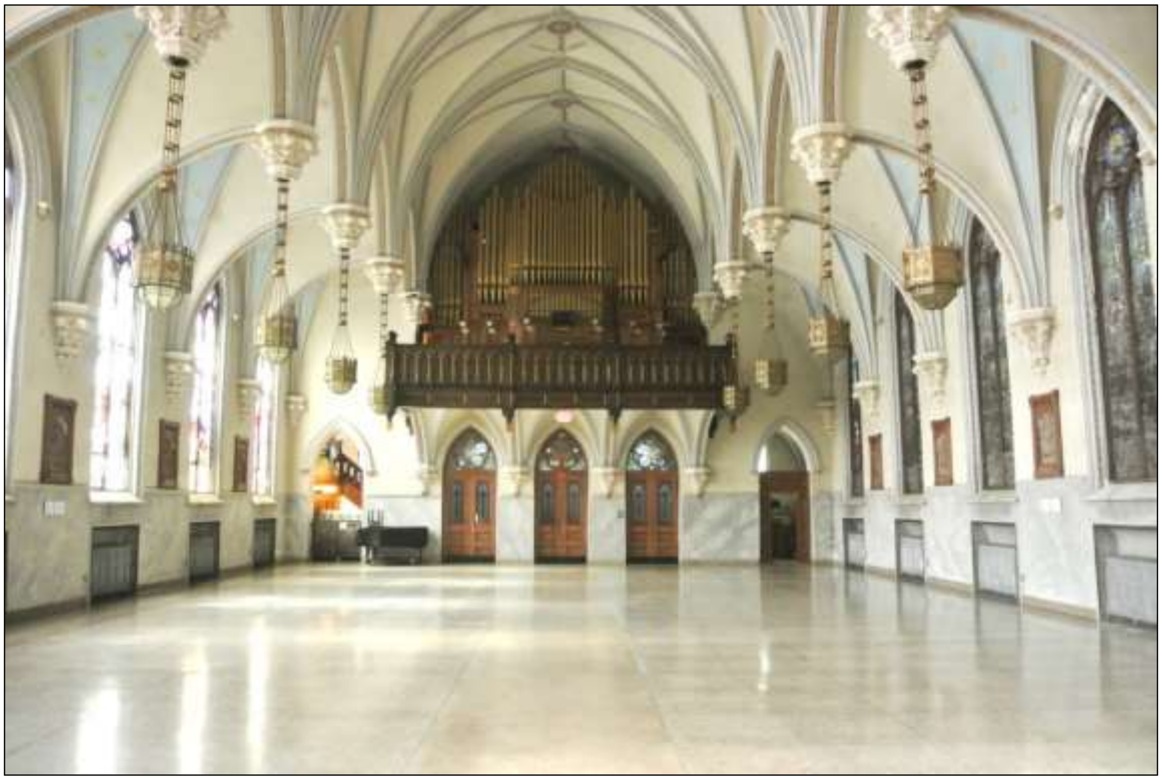
The Gothic appearance of the overall form is relatively straightforward. However, on the exterior, it is enriched by a colorful mix of masonry materials, and on the interior, by a very complex ceiling. The style was largely achieved by use of pointed openings at doors and windows, stepped buttresses between bays, a 130-foot high corner bell tower with a

[1] It is believed that the steel trusses in the roof framing bear directly down on the two walls that form the sides of the sanctuary. The 2008 Lenz engineering report suggests that this is the most likely scenario. However, the same walls are reinforced with brick buttresses, and it is possible that these contain steel beams carrying part or all of the load of the roof frame for the walls. If there are steel columns, they would not only carry the roof load, but also provide lateral support to the walls (as the buttresses also would do without steel). If the walls are bearing, the weight of the roof and the way the walls are held in contact with the trusses (by the roof weight and/or fasteners) is part of what would keep them plumb.

spire, and a very large and steep roof. These were relatively common, traditional elements of any Gothic design. By contrast, the structural design of the building is not based on Gothic principles. A more modern approach in the hidden structural elements allowed for a completely innovative ceiling design that uses steel while blending the visual characteristics of three different variations on Gothic-style ceilings (vaulted, scissor trusses, and hammerbeam trusses) and makes some use of the diverse engineering and construction techniques associated with these ceiling types historically.



The above diagram is to show how the different roof and ceiling types are combined here. The truss at the top is the scissor truss, showing the configuration of members found in most locations in the attic. The ceiling plaster is located below it, much of it at a considerable distance below it, hung by strips of wood cut to create the curved shapes needed. The vertical members found where columns would typically be between the nave (center space) and side aisles, come down and terminate with decorative plaster ornaments (represented by crown-like figures at the top of the vertical dotted lines that come up from the circles), from which light fixtures (the circles) added later now hang by chains (the vertical dotted lines). The horizontal dotted line represents the horizontal member that would typically be found in a hammerbeam truss, suggested here by the way the form divides the upper volume of the space into three parts (although the more noteworthy discontinuous members here are the verticals).



Above is the sanctuary (nave and side aisle areas) looking toward the chancel and apse where the altar was formerly. Below is the same space looking toward the narthex, organ, and choir loft.

In the interior, the ceiling is the most important design element, distinguishing this building from other gabled, rectangular, basilica-plan churches. Although the steel trusses made it theoretically possible to keep the ceiling design simple, the designers added a very complex set of truss elements and wood framing members (including many scribed boards hidden on the reverse side of the plaster), hanging down from the basic scissor-truss form and finished as curved plaster surfaces. This move divided the upper half of the volume of the nave into bays in both directions. It made the cross-section of the form similar to the hammerbeam truss ceilings of Gothic churches and halls in medieval England. Unlike the exposed beams of the classic examples of hammerbeam ceilings, this ceiling was finished as a series of plastered vaults, mostly groin vaults, corresponding to the six bays of windows on the long side of the form and the three-bay design of the nave and side-aisles in the other direction. Rather than showing off open framing, as the hammerbeam design typically does, a multi-bay design, similar in having no visible bottom chord, was used here to create the appearance of vaults as typically found when supported on columns. Although groin vaults developed historically as a way to build compression-based stone ceilings over columns, there are no columns extending to the floor in this design: one finds, instead, that the ceiling is floating over the space with light fixtures hanging down where columns would typically have been. The fixtures stop about ten feet above the floor (light fixtures are shown in here in a 1912 image of the interior, but the fixtures then had a different design).

Apart from the ceiling and some of the other Gothic flourishes, the interior is remarkably simple. It has a full-height basement only in a limited area in the north corner. At the first story, the front section (Broad Street side) is divided into three areas, a narthex at the center flanked by two equal size rooms at the base of the two towers, as is typical of basilica-plan churches. The space at the base of the bell tower contains a four-flight dog-leg stairway winding up to a choir loft. The space at the base of the shorter tower (west corner) is a small, square room, now used as a coat room (originally a shrine chapel, then a baptistery, but later containing confessionals). At the next level up, the area above the narthex contains most of the organ mechanisms, while the console is in the choir loft which projects over the first bay of the nave. The room above the coat room (/former baptistery) is a simple, square room reached by way of the choir loft. Though it has a high ceiling and is finished with plaster, its main function was to house a small amount of blower machinery for the organ, and as a storage space.

Without interruption by columns, the sanctuary (i.e., including both the nave and the side aisle areas) is dominated by the ceiling and the ominous way that it floats over the otherwise open space. The floor is terrazzo, with a subtle pattern that indicates where the walkway aisles passed between the pews. It was installed in at least two construction campaigns (the sanctuary originally had a wood floor, either on wood framing or on the current reinforced concrete slab, but this had to be redone after the St. Patrick's Day Flood of 1936, which caused the floor to buckle; the center portion of the terrazzo installed in 1936 was damaged in the 1977 flood and had to be redone in the flood recovery project completed in 1978). The transept only extends out slightly, adding a foot or two to both sides of the space. The main effect of the transept is to create a higher and wider bay containing larger stained glass windows. Below the large windows, there is a wood-paneled area in each gable end wall of the transept, a remnant of the church's original confessional booths, a focal point at each side of the larger sanctuary space.

The chancel occupies the northeastern-most bay of the sanctuary as well as the space within the apse. The altar, communion rail, and other chancel furnishings are missing, but the chancel area has a raised floor with a slate finish (the slate was added in 1978). The bottom ten feet of the apse walls are paneled in a curtain wall of wood on a little more than four of seven facets (the altar and the center part of the backdrop paneling, the pieces that previously connected these two remnants, were removed when the church closed). Above the wood paneling, the facets rise as plastered surfaces separated by plaster ribs to form a vaulted ceiling with a complex groin vault-like design corresponding to the semi-dodecagonal shape of the apse.

In the side walls of the sanctuary, there is a stained glass window in each bay. The sills of the windows are high, a little over five feet above the floor. At a point just above the window sills, there is a horizontal rail of decorative plaster. Below this line, the plastered wall is painted light blue with a marbleized treatment to give it the effect of a wainscot. The area beneath each window contains a rectangular recess with a large cast-iron radiator delivering steam heat in winter.

The plaster work around the windows and throughout the ceiling is a complex design with many cast or bench-run decorative details, such as rope-form ribs. The ribs flanking the windows have a leaf pattern on part of the exposed face that resembles a frond, or unopened fern, every foot or so of their length. As seen from the attic, the plaster was formed over punctured metal lath. The lath was affixed to hundreds of one-inch-thick wooden boards that had been scribed and cut to the various curves as needed. The wood framing, lath, and plaster are all supported by the same steel trusses that carry the roof. The basic truss design is scissor trusses, but it was modified to allow for hangers about 15 feet in from each of the side walls, in the locations where there would typically be side-aisle columns. Each hanger also carries the weight of one light fixture.

The sacristy and vestry areas surrounding the apse at the northeast end of the sanctuary are simpler in design. Although they have a high ceiling, nearly 20 feet in height, it is much lower than that of the nave. These smaller rooms have plain walls, plain ceilings, and very little wood trim at the openings. The functions (sacristy and vestry) appear to have been interchangeable, and the uses were reversed at some point. The east room (Third Avenue side) was damaged in a fire in the 1980s. It was rebuilt afterwards, and the walls were furred out with dimensional lumber (about four inches) and gypsum wallboard. Also, a new wall of shelves and a small sink were added in 2014 for use during catered events. The north room has more of the original finishes. It has a large vestry cabinet that was relocated at some point, and it also has a janitor's sink and several other utilitarian elements such as switch panels, fire alarm switches, security devices, etc. Northwest of the north room, there was another room of almost the same size, but the location was partially taken up by restrooms added about 1975. The restrooms are about to be expanded and completely rebuilt soon. Outside the restrooms, there is now a two-part vestibule leading to a side entrance facing Broad Street. As per the planned work, the rest rooms will ultimately take up the remainder of the original elongated corner room (the upper part of the vestibule area). This entrance is accessed by way of a narrow walkway confined by the proximity of the former rectory, now a private residence.

Immaculate Conception Roman Catholic Church of Johnstown - Timeline

1859 **-** Immaculate Conception Roman Catholic Church was created as a German language parish in 1859. It was the oldest Catholic congregation in Cambria City, a neighborhood of Johnstown largely built as houses for workers at the Cambria Iron Works. The neighborhood had five other Roman Catholic churches, representing other ethnic groups, until they were merged and all but one of the buildings were closed. It also still has a Byzantine Catholic Church as well as one or two Protestant churches.

1859-1906 **-** The parish built two other churches prior to the present one. The first church of this congregation stood on the current site, completed in December 1859.

1870-1889 - Land was acquired in 1870 across the street to allow for the growing congregation to build a new church when needed. A foundation for a new church (the second) was under construction on this site when the 1889 flood struck.

1889-1891 – A rectory and the new (second) church were completed by 1891. The cornerstone for the new church was laid in 1890. A Slovak Catholic congregation used the first church for a number of years before it was torn down to build the current building.

1906 **-** The cornerstone for the current building was laid in 1906 under the leadership of Father Trautwein who came to this parish in 1897.

1908 – The current building was completed in 1908

1921-1930 – Work was done to repair the roof in 1921 and again in 1930.

1936 – The building was flooded in the St. Patrick's Day Flood of 1936. It had wood floors (most likely over wood framing, but possibly over reinforced concrete) until that time, but they buckled from the flood and were replaced by terrazzo (apparently over the current reinforced concrete floor slab, possibly installed at that time).

1950 – The church was redecorated in 1950, including putting asphalt tile down in the chancel area and in the sacristies.

1959 – The roof was repaired again in 1959. The gray replacement slate was put on at this time. It was installed with copper nails (the 1984 church history seems to say that all the re-usable original slates were removed and reattached with copper nails at this time). The church history notes that the project would not have been necessary had copper nails been used in the first place.

1968 – A Parish Council was formed for the first time for this church in 1968.

1970 – The church was redecorated, using "golden buff" paint as the body color in the nave walls, trimmed with ivory and blue. The deep red in the chancel walls was replaced by using blue for the first time. Blue was also added into recessed grooves in the wood curtain wall surrounding the altar.

1977-1978 – Substantial work was needed after damage caused by the 1977 Johnstown Flood. The floor had buckled and a large portion of the terrazzo had to be replaced. The front doors were warped and had to be replaced with the current aluminum ones. The plaster walls were damaged (the damage reached five feet above the floor, almost the entire wainscot portion below the windows). A vinyl coating was installed over the wainscot area surfaces in the nave. It was expected to be a permanent solution requiring no periodic plaster repair work or painting; however, it only lasted five years.

1983 – A project was begun that included taking down the vinyl coating in the wainscot area and painting the plaster in a "marbleized" pattern. This project included recasting and repairing decorative plaster details in several areas.

6 December 1983 – Before the 1983 project was completed, an arson fire struck the east corner sacristy room (now the catering kitchen, on the Third Avenue side of the chancel). It burned through the wood curtain wall into the chancel area. The heat was high enough in the church to melt some of the organ pipes (distance-wise, an entire city block away), and these needed to be restored, though the basic working of the organ went undisturbed.

1986 – The spire portion of the steeple was struck by lighting in 1986 and had to be rebuilt using a steel frame and all new materials above the brick walls of the belfry stage.

2009 – The Johnstown-Altoona Diocese merged five Roman Catholic churches in the Cambria City neighborhood into one (one of these, St. Casimir's and St. Emerich's, was already a combined parish from an earlier merger). The former St. Stephens Roman Catholic Church building, less than two blocks from Immaculate Conception, became the remaining worship site now containing Resurrection Parish.

2011-Present – In 2011, the Diocese decided to close four churches within the new combined parish, St. Casimir's and St. Emerich's, St. Columba, Immaculate Conception, and St. Rochus. An organization was formed called "Save Our Steeples" to look into acquiring three of the church buildings. It eventually merged with another organization known as "1901 Church, Inc." which had formed in Jennerstown, Pa., in 2001 to save a church there. This allowed the Cambria City group to operate under the same charter and 501(c)(3) designation. Three church buildings (St. Casimir's and St. Emerich's, St. Columba, and Immaculate Conception) were sold to the newly expanded group. The core Save Our Steeples members, meanwhile, largely made up of people from the three parishes, became the "Friends of the Steeples Project." Since then, the Steeples Project has sponsored workshops on re-use of the buildings and courted various tenants and potential buyers for certain buildings. It has operated Immaculate Conception as an events venue for weddings, concerts, etc., since 2011. The group has raised some funds for rehabilitation, constructed an accessibility ramp, added catering kitchen facilities, added air conditioning, undertaken other projects, and is about to install new accessible rest rooms in an expanded area approximately where the rest rooms are now.

William P. Ginther and the Design for the Immaculate Conception Church Building

The design for the Immaculate Conception Church Building was by William P. Ginther, a Cleveland architect who specialized in Roman Catholic Churches and other buildings owned by the Roman Catholic Church. Ginther was born in 1858 in Akron, Ohio, and was apparently recognized for his talent at drawing from the time he was a young person.[2] He attended a local Akron institution called Buchtel College (now the University of Akron). However, his talent for drawing was recognized by other architects before he graduated, and he left the university early, in 1879, to enter into an apprenticeship under another Akron architect by the name of Frank Wheary. Before leaving Wheary's office in 1886, he helped in designing McKinley Church in Canton, Ohio.[3] In 1889, he made a tour of Europe to study architecture. After returning from the tour, he designed at least sixty-three churches. Although he also designed some other buildings for church properties, such as parish residences and schools, the rectory at Immaculate Conception was one of only a few "parish residences" he designed, one of only two outside Ohio. He also designed some hospitals, and he wrote about hospital design for an Ohio publication in 1913.

Ginther used the same style, or almost the same style, of ceiling as found at Immaculate Conception in several churches he designed. He had experience working out the details of this design, since this was not the earliest example.

In 1901-1905, Ginther constructed a Gothic variation on this ceiling design at St. Mary's Church in McKees Rocks, Pennsylvania (originally a German language ethnic parish, this church is still in use, but is now the main worship site used by a merged congregation known as St. John of God parish). The McKees Rocks building is probably the most spectacular example of his work.[4] The design of the ceiling at St. Mary's is almost identical to that of the Immaculate Conception of Johnstown building. One difference is that the massing of St. Mary's is proportionally taller, with taller Gothic arches forming the groin vaults over the nave. The light fixtures are also much smaller. In general, St. Mary's is a rich design with many layers of interior and exterior ornamentation. The transept at St. Mary's is deeper (about 10 feet deeper) in each direction than that at Immaculate Conception (the transept at Immaculate Conception is only about one foot in depth, a slight recess from the remaining plane of the side walls of the sanctuary to either side). The

[2] Most of the biographical information on William P. Ginther and most of the information on other churches and church-related buildings he designed is from the following source: W.S. Lloyd, editor, "William P. Ginther, F.A.I.A.," *The Ohio Architect, Engineer, and Builder*, Cleveland, Ohio: The Architect and Builder Company, Vol. XX, No.6, December 1912.

[3] Biographies of Ginther typically refer to a church in Canton, Ohio as the "McKinley Church." The name is probably a reference to First Methodist Episcopal Church of Canton, built 1881-1886, the church McKinley attended. McKinley was a staunch Methodist, and the church may have been commonly, but informally, called the "McKinley Church" around the time of his assassination in 1901. The name occasionally shows up on old post cards, but the proper name of the church was "First Methodist Episcopal." McKinley was a congressman in the 1880s, and was president from 1891 to 1897.

[4] St. Mary's Church, McKees Rocks, is discussed and illustrated in the article on Ginther in the 1912 edition of The Ohio Builder and Architect. The assessment that it is a more spectacular example of this same basic design is by the author of this section of the present report (Necciai) after have looked at other sources, including photographs of the church by various individuals. The church is a popular subject among photographers, and images of it, current and historic, are posted online.

transept at St. Mary's also leads to a small apse-shaped chapel in each direction. In the side walls of the sanctuary, St. Mary's has a pair of smaller windows below the large, Gothic arched window that marks each bay. St. Mary's also has clerestory windows in the groin vaults of the nave that are expressed in the exterior roof slopes as dormers. Some details between the two churches are identical, but St. Mary's sometimes has more layers of the same details, such as the rope-form plaster ribs in the ceiling. One difference between the two churches is that St. Mary's has a large rose window over the choir loft, where Immaculate Conception has its massive bank of organ pipes. St. Mary's also has two equal-height towers in the façade, each with a tall spire, and there is also a lantern over the crossing point of the transept crowned with its own spire of considerable height.

Ginther used a similar Gothic ceiling design at St. Philip's Church, in Crafton, Pennsylvania in 1903-1906.[5] It is almost identical in the ceiling design, choir loft area, and other upper details to what is found at the former Immaculate Conception building, but the church differs in other ways, such as the depth of the transept and the treatment of the lower walls in the transept area.

In 1905, Ginther used a structurally similar ceiling design at his home church, St. Bernard, in Akron.[6] St. Bernard is Romanesque in style and has a pair of tall, symmetrically placed towers marking the façade, all constructed in rock-faced ashlar. In keeping with the Romanesque style, the curvilinear forms of the vaults and other elements in the St. Bernard ceiling are all made from half circles or quarter circles, so that there are no pointed arches. This makes the ceiling seem more flat and makes the space seem "boxy" in general. But the overall form, the arrangement of plaster elements, and the structural distribution of the added weight they bring to the trusses above are all nearly identical.

At St. Anthony's of Cambridge Springs, Pennsylvania, Ginther used exposed hammerbeam trusses constructed of wood.[7] They are unusual in having rows of "sawtooth" ornamentation in the form of repeated half circles along the edge of almost every member of the otherwise bold and simple form of the exposed wood trusses.

Ginther designed many other churches with similar ceilings. Several of those that are known have columns between each side aisle and the nave. Although the columns are the main difference in the visual appearance, it is perhaps more important that this difference places the groin vaults in a compression relationship to structure below them when the columns are present. Thus, it changes some of the structural forces that need to be supported by the trusses. In other words, although the trusses are hidden in almost all cases, they are likely to have been designed differently where there are columns to provide support from below. The design at the churches that do not have columns relies on a great deal of support for complex hanging details. At the Immaculate Conception building, at least, this means that the riveted steel members in each truss are carrying more ceiling

[5] The link to Ginther is from *The Ohio Architect, Engineer, and Builder*. The analysis here is based on images retrieved from various online sources in 2014-2015. Like St. Mary's Church, McKees Rocks, St. Philip's is frequently photographed and many images of it are posted online.
[6] *The Ohio Architect, Engineer, and Builder,* Vol. XX, No.6, December 1912.
[7] *The Ohio Architect, Engineer, and Builder,* Vol. XX, No.6, December 1912.

weight than usual, and it also means that something was needed to form the vault shapes that hang down in this manner. Many pieces of wood were used at the Immaculate Conception building to create the various groin vault forms. The wood is in hidden locations, but may have fire-related or structural implications in the long run (the original concept of a groin vault or barrel vault was to allow for the possibility of using masonry in the curved ceiling forms, supported on columns or walls with the possibility of little or no wood or metal, since all the members can be stacked in compression).

While the ceiling is the most spectacular element, Ginther used several relatively new materials in innovative ways at the Immaculate Conception Church building in order to achieve this kind of design effect. The poured-in-place concrete was a new material as was the use of reinforced concrete. The blend of yellow face brick and brownstone decorative details as the exterior finish of walls that were otherwise red common brick and red clay furring tile was characteristic of the times. The brick color was referred to as "buff" at the time, and the finish on the face of the exposed bricks was referred to as "semi-glazed." [8]

Although brownstone was then passing out of popularity, yellow brick was a relatively new material. The brick walls were probably constructed with metal ties, allowing the face brick to be laid up in stretcher bond. The metal ties were another new material of the times, as was the perforated metal lath used in making the ceiling vaults. Decorative plaster details that rely on imported gypsum carried from distant quarries was also a new innovation, at least in this part of the world. The riveted steel trusses that support the roof and ceiling were another innovation that was relatively new at this time. The brick-sized hollow clay tile used as a lath material behind the wall plaster was another new material. Interestingly, the church's style relies heavily on medieval Gothic sources, but the construction was almost entirely accomplished with material that had just become available about 1900. The greatest exception, of course, is the use of brownstone, a material that was then passing out of fashion and generally out of use, so much so that most of the brownstone quarries closed not long after this building was built. The 1908 newspaper article about the church (as quoted in 1984) specifically identifies the stone as being "Hummelstown brownstone."

[8] *Immaculate Conception Church, Johnstown, Pennsylvania: 125th Anniversary, 1859-1984*, Johnstown, Pa., 1984, page 27, quoting from a 1908 newspaper article: "New Catholic Church Beautiful Structure," *Johnstown Tribune*, , 23 June 1908.


Immaculate Conception Building, Sept. 2014 (chancel on left, choir loft on right)


Immaculate Conception as shown in a 1913 publication (chancel on left, choir loft on right)


St. Mary’s R.C. Church, McKees Rock, Pennsylvania, as shown in a 1913 publication (chancel on left, choir loft on right)

St. Philip R.C. Church, Crafton, Pennsylvania

St. Bernard R.C. Church, Akron, Ohio

St. Anthony's Church
Cambridge Springs,
Pennsylvania
(Hammerbeam trusses)

Immaculate Conception
Roman Catholic Church
Johnstown, Pennsylvania
as envisioned in an early
rendering (published 1913)

Immaculate Conception Building
("Grand Halle") 30 July 2014

Foundation and Exterior

Foundation — The foundation is poured-in-place concrete. The concrete walls may have been poured with spread footings with iron or steel reinforcement, although it is difficult to know this for certain, or to know for certain if it was done correctly.

The floor and the support piers are also concrete. The floor is known to be reinforced concrete (the reinforcements rods are visible in some locations, in part because they may have been set too low, and because some of the reinforcing rods have rusted enough that the thin layer of the concrete below them has fallen away in some places; the 2008 Lenz report also referred to the floor slab as reinforced concrete).[9] There is enough difference in the surface qualities of the floor deck (bottom surface, as exposed in the crawlspace) and the walls to suggest that the church could have had wood framing (wood beams and joists) supporting the floor initially, and that the reinforced concrete floor could have been added a few decades after the building was first built. The 1984 church history states that the church initially had wood floors, but that they had to be replaced in 1936 as a result of the St. Patrick's Day Flood, which caused the wood to buckle.[10] The history also says that the terrazzo was installed at that time. However, it does not clearly state what was below the wood floor boards until 1936, which leaves open the possibility that the reference to wood floors relates to floor board installed over a the concrete slab. (The terrazzo also suggests that it was installed in two campaigns, at different times, after the reinforced concrete slab was in place; in Catholic churches, the part of the floor area under the pews is frequently wood, or tile on wood, with a more durable surface in the aisles; the wood base allows the pews and kneelers to be fastened more easily; however, the church history also explains that the terrazzo was damaged in the 1977 Johnstown Flood,[11] so it is likely that the evidence in the color difference dates from that time).

The floor is supported on truncated concrete piers (tapered in as they rise), about 30-inches-by-30-inches at their widest, on a grid of approximately 15 feet in each direction. (See further material history below). The 15-foot span is at the high end of what is typical for reinforced concrete. It is also not known at this writing if spread footings were used below grade at the walls or piers, or how they might have been designed.

The area in and around the boiler room reveals a couple of interesting aspects of the concrete. The "pour lines" and lines left from seams in the forms are visible in the walls (the lines have become exaggerated by erosion; the lines now may represent areas where water or other substances could enter the material). A quartz-like aggregate was used at the surface, and this is now exposed to a greater degree than may have been intended, as a result of erosion. The concrete is thick and it was only poured to grade. Beginning at grade, the brownstone rests on it, and common red brick was used on the inside side of the walls as a back-up material.

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9 H.F. Lenz Company, "Immaculate Conception Church," *Diocese of Altoona-Johnstown, City of Johnstown Catholic Churches, Building Evaluation Report*, Johnstown: H.F. Lenz Company for Diocese of Altoona-Johnstown, 2008, pages 124-125.
10 *Immaculate Conception Church, Johnstown, Pennsylvania: 125th Anniversary, 1859-1984,* page 32.
11 *Immaculate Conception Church, Johnstown, Pennsylvania: 125th Anniversary, 1859-1984,* page 38.

 

Truncated piers of poured-in-place concrete, as seen in the crawlspace (image on the left) support the floor slab (ceiling surface in both images). A closer-up view of the wall (image on right) shows that the builders used brick above grade on the inner side of the wall. The slab was installed above this. The concrete is a slightly different color, and the lines from pours and forms differ, all suggesting that the slab could have been added after the building was built. Note that the reinforcement rods in the slab are close to the bottom surface, rusting, and becoming exposed.

Notably, the 1984 church history indicates that the entire church was underwater in 1977, up to a few inches below the window sills of the sanctuary. This complete submersion of the mechanical room area resulted in replacing the boiler, wiring, and other equipment in this space in the 1978 flood recovery project.[12] The work may have been completed without submitting plans for the boiler room configuration to the state for code approval. Plans were submitted and approved in 1994, however.[13]

The crawlspace provides minimal access, especially to the front areas of the building. The space contains a thick layer of moist but dry "mud" that remains from the 1936 and 1977 floods; this deposit may have decreased the height of the crawlspace by as much as a couple of inches. Some materials that had been stored here, such as pieces of the communion rail from an earlier building that once housed this congregation, have been reduced to decaying debris by the flood waters and the resultant mud deposits.

The crawlspace area is intended to be ventilated by at least six ventilation openings with open grates. Several of these were covered with loose-fitting steel plates at some point, probably to keep animals out or address water entering the building as accumulated snow melts. The plates may have been intended to be placed over the grates only seasonally. By the beginning of the present project, at least one of the steel covers had come loose and was leaning against the wall next to the opening. The steel plates may have limited the ventilation too much. The openings were changed again in the course of this project, when an air-conditioning system (wall-mounted units at several locations in the sanctuary) was installed. The air-conditioning project added pipes passing through the ventilation openings, reducing the size of each opening affected. The remaining area of each opening was not properly enclosed with a new ventilation grate when the project was

[12] *Immaculate Conception Church, Johnstown, Pennsylvania: 125th Anniversary, 1859-1984*, page 39.
[13] Unattributed Drawing of "Partial Basement Plan," approved by Supervisor of Boiler Section (Pennsylvania Department of Labor and Industry), 29 December 1994.

completed. Thus, the total area for ventilation has been reduced, and, at the same time, there is also now no real barrier against animals entering the space.

The image on the left shows the slate roofing with a color difference where slates have been replaced. The copper cresting at the top has begun to come loose. The image on the right shows the asphalt roofing on the lower roof and the broken rain leader discharging onto it.

Roof — The main roof is slate. Most of it is over 100 years of age. If it is typical slate quarried in Pennsylvania, such as "Pennsylvania black slate," it is at the end of its life. Pennsylvania black slate typically lasts 75-125 years; it will fail sooner if the nails fail, which often happens due to use of galvanized ferrous metal nails, popular around 1900; slate roofs installed with copper or brass nails will last the longer. It should be noted, though that the exact lifespan of Pennsylvania slate varies from example to example. The original slate in most areas on this roof appears to be in very good condition compared to other buildings of this age. The older slate is darker than what is typical for Pennsylvania black slate, and this could suggest that it came from a different quarry area,[14] and/or a higher quality than usual of slate was originally used. (Pennsylvania black slate gradually turns gray as it ages. While the dark color of the slate here may indicate a better quality slate than typical Pennsylvania black slate, it also may reflect, at least in part, discoloration from twentieth century air pollution).

The 1984 church history indicates that repair work was done on the roof in 1921 and 1930.[15] Then, in 1959, a larger roof repair project was undertaken. Most (if not all) of the lighter gray replacement slates date from the 1959 project. The church history says that the project was necessary because of problems with the original nails (apparently ferrous metal, although it is not that specific). The history says that the replacement work was done with copper nails, but it also implies that all the older slate was taken off in this project and reinstalled with copper nails.[16] About 20% of the slates were apparently replaced in this project. The replacement slates are somewhat obvious because they are silvery gray, by contrast to the darker color of the original slate. There is a little more replacement slate

[14] As an example of better quality Pennsylvania slate, there was one part of the state where slate of a much higher quality was once quarried: Peachbottom slate, from a quarry no longer in operation in Lancaster County, Pennsylvania, is believed to be of a quality likely to last 200 or more years. Since it was first quarried in 1785, there are no extant examples of its use that are old enough to say for certain if it would last longer than 230 years.

[15] *Immaculate Conception Church, Johnstown, Pennsylvania: 125th Anniversary, 1859-1984,* page 31.

[16] *Immaculate Conception Church, Johnstown, Pennsylvania: 125th Anniversary, 1859-1984,* page 35.

on the southeast side of the main roof than there is on the northwest side (this is surprising since the northwest side is the "weather side" of the building).

Some of the replacement slates are broken (probably due to incorrect installation), as noted in the 2008 Lenz report.[17] Although the Lenz report says that the replacement units are in good condition, it also notes that the way some of them are cracked could lead to them having a shorter life.

A few limited areas of the roof have asphalt shingles (most importantly, the low roof over the rooms surrounding the apse area). There is a serious moisture infiltration problem in the northwest wall near the current restrooms. This is the space below the lower edge of the asphalt roofing. In the field work for the current project, it was difficult to determine the source of the moisture for certain. It may be coming from flashing that was installed incorrectly at the upper edge of this roof area (however, it seems that the moisture problems should be apparent directly under the incorrectly done flashing, and this is not the case). The problem also may be related to the lower edge of the roofing not having an appropriate ice guard detail (see additional analysis in the recommendations section of the report, below). Because of the low pitch of the roof in this area, snow accumulates and stays for long periods in winter (as reported to the team). Although it is apparent that there is a design problem of some kind in this area, the problem could be reduced by having a plan in place to remove as much snow as possible from the surface before it becomes rigid, stays in place for long periods, and melts away slowly. Heat tape can be a way to remove the snow (as noted in the recommendations section of the report, below).

The silvery slates installed as replacements in 1959 are clearly visible in both images, as is the loose state of the roof cresting. The left image is from July 2014, and the right image is from April 203. The left image also shows the snow guards, flashing at valleys and tower, and the gutters and rain leaders.

Roof Ridge and Flashing — The roof has a heavy copper ridge cap. It has come loose due to wind in several places. Some pieces are only minimally attached on the northwest side of the ridge, and they are still about to fall. As visible from the southeast side, a section of the cap is missing. From the attic, daylight can be seen through the roof in this area, and water is now likely to be coming in (plaster damage from this opening is most likely to appear at the center of the ceiling, although it may be delayed due to the incidental

[17] H.F. Lenz Company, "Immaculate Conception Church," *Diocese of Altoona-Johnstown, City of Johnstown Catholic Churches, Building Evaluation Report*, Johnstown: H.F. Lenz Company for Diocese of Altoona-Johnstown, 2008, page 132.

protection and absorption provided by the attic insulation; the wooden walkway is also above the plaster and directly below the ridge).

The roof flashing is also copper, as most of the flashing areas that are visible from the tower have turned verdigris. This includes the back edges of the stone coping at the parapets and several valleys in the roof. The church history says that the copper in (at least) the valleys of the roof was replaced in 1959.[18]

As discussed above, the flashing associated with the asphalt roofing on the roof over the sacristy spaces that wrap around the chancel apse was replaced incorrectly at some point. The replacement project involved removing flashing that had been installed (correctly) in a reglet in a mortar joint. In place of the original design, a wood member was affixed to the brick wall, and the new flashing was wrapped over this, with an applied sealant between the top edge of the wrapped wood and the bricks. This sealant has since failed. It was an inappropriate solution at the time, and it may be contributing to (if not the primary source of) chronic moisture problems in this area of the roof.

Gutter System — The gutters are made of a silver-colored metal (such as galvanized steel, or steel or copper with a coating of terne). At the downspouts, the water is directed to copper rain leaders. The rain leaders are relatively large in cross-section. The copper has attained a verdigris color. The bottom segment of the copper (about 6 feet) has been replaced by polyvinylchloride (PVC) plastic pipes as a result of the copper being stolen. These feed into a below-grade system. The condition of the below-grade materials is not known. It is also not known if the below-grade system is exclusively a storm sewer system, or if any of the rain water is being sent to sanitary sewers. In some areas, the copper has been partly crushed a short distance above the PVC pipes.

The gutters, downspouts, and rain leaders were repaired or replaced at different times in the church's history. The 1984 history mentions work on them as early as 1921.[19] They were undoubtedly replaced or repaired in the 1959 project, with a likelihood of other work being done more recently as well.

Fasteners Where Rain Leaders and Other Items Are Affixed to the Bricks and/or Stone — The building has a number of places where rain leaders, lighting rod cables, utility lines, and other items have been fastened to the face bricks or stone finishes. The fasteners have caused breaks or spalls in the stone, spalls in the bricks, and other problems. They were fastened incorrectly, drilling into brick faces or stone in areas that were not strong enough and that subsequently cracked. As part of any project to correct spalls in the brownstone in the future, the fasteners should be removed. They should be eliminated wherever possible. Where they are absolutely needed, they should be moved to locations carefully drilled into mortar joints, with appropriate fittings (lead plugs or plastic sleeves) to minimize future damage. The new locations should be selected by a design team member (an architect) to minimize the possibility of future spalls to materials that are important, highly visible, or difficult to repair.

Walls — The walls are a composite of brownstone and brick. Rock-faced brownstone was used at the base of the wall, stopping with a beltcourse of dressed brownstone, the top edge

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[18] *Immaculate Conception Church, Johnstown, Pennsylvania: 125th Anniversary, 1859-1984,* page 35.
[19] *Immaculate Conception Church, Johnstown, Pennsylvania: 125th Anniversary, 1859-1984,* page 31.

of which is sloped to shed water. The upper side of the sloped area levels off to support the brick and the bottom edge of the window sills. Brownstone has natural problems as a building material, especially if installed with vertical bedding planes, as appears to be the case in several locations here. Above the brownstone beltcourse, the exposed face of the wall is factory-pressed yellow brick laid in running bond (stretcher bond). There is machine-cut brownstone trim capping many of the brick details in the upper 2/3 of each wall. These details appear over windows and doors mainly on the front and on the side walls of the nave. Behind the brownstone and yellow brick is a back-up wall of several wythes of brick-sized units, generally common red brick. The interior wythe of the brick contains many brick-sized hollow units of red-clay furring tile, although in some areas, the innermost wythe appears to be common red brick. The running bond orientation of the yellow face bricks indicates that they were intended only to be a facing. Using the exterior layer of brick this way (without headers to bond it) was common at this time period for the first time in American architectural history because metal was available to tie the layers of the wall together. Earlier buildings had some bricks turned with their long axis running perpendicular to the wall, so the bricks themselves could serve as the "bond" between layers, tying the outer wythe to the wythe or wythes behind it.

The National Park Service now recommends addressing problems caused by vertical fault lines in face-bedded brownstone by breaking away all loose or structurally unstable material, parging the material with a carefully color-matched coating of a cement-based or composite product, and using castings of this product to replicate missing parts of details that were originally machine cut to precise shapes. See: http://www.nps.gov/tps/education/rehabyes-no/rehabyes1.htm for further information and guidance.

The way the sidewalk meets the stone walls is a potential source of problems. The concrete appears to be poured right up to the wall in many areas (the sidewalks were installed in 1979, with H.F. Lenz as the Civil Engineering firm, as per a brass plaque found in the sidewalk below the building's datestone). There should at least be some evidence of a separating element, for instance, a coated felt product as used for expansion joints. The sidewalk can expand and contract seasonally (in the natural freeze-thaw cycles) at a different ratio from the stone, and this can cause the harder material to break the softer one. An even greater worry is that the present configuration could trap water (from rain, overflowing gutters, melting snow, and other sources) in the soil below the joint. The current configuration gives little chance for the moisture to dry out. Accumulated water can feed biological growth (as is seen on the lower courses of the stone on the building's north side), cause rising damp, lead to deterioration of the stone, and lead to structural problems if the soil becomes wet enough to shift.

The access to the basement boiler room is by way of an open stairwell made of concrete. The steps are in weathered condition and almost completely covered with moss. There is a painted pipe railing around the top of the well on one side, with a brick wall on the other two sides.

Doors — Almost all of the building's current exterior doors are relatively recent (post-1970) replacements. The Broad Street entrance doors are anodized aluminum frames with full height amber-colored Plexiglas lights. According to the 1984 church history, they were installed as a result of the 1977 Johnstown Flood, when the flood water warped the original wood doors to the point that they could no longer be used.[20] Each light has a gold foil appliqué imitating Gothic tracery in each door leaf. The side entrance on Third Avenue has a flush steel door. They are in good working condition, although the Plexiglas looks like it is becoming discolored with age and the design is inappropriate to the building as a whole. The entrance door leading into the vestibule near the north corner (by the former rectory) has also been replaced by a flush steel door, but it is a single leaf in a reduced-sized jamb in an opening originally intended to have a pair of doors (plywood panels, about eight inches wide to either side, fill the remaining space). The door on the Third Avenue side is also a steel door, similar to the one at the vestibule on the Rectory side. Both of these doors are in good working condition, although the flush steel design is inappropriate to the building. If either of these doors is used with any frequency, it might be logical to replace the flush steel unit with a door that has a vision light. If so, the replacement should be a historically appropriate design in wood in a wood jamb, painted on the exterior side (decorative details should not be used unless exactly copied from photos or drawings of this building or doors in a similar location in a similar Gothic design by William P. Ginther). The one exterior door that appears to be original is the wood door to the basement boiler room. Is has five horizontal panels. It is a standard wood door for the time period. It may have been trimmed inappropriately in fitting it to this opening. It is painted, but the paint has failed to the point where about 30% of the surfaces are bare wood that is looking dry and gray from being exposed.

Windows and Trim — The windows are tall. In most places, each opening has a pair of pointed arches appearing together with a round window above, all within a pointed arch masonry opening. In most areas, the stained glass is in jambs, mullions, and/or sash frames made of wood, although some hollow metal framing elements were also used, especially at the bottom of the stained glass where a section opens as a ventilator. The trim on one transept window on the north side was recently painted. The windows all have metal caming, and most have stained glass depicting religious themes. Glass storm windows were added over the glass at some point before 1984. When a fire occurred in the sacristy area in 1983,[21] the stained glass in several openings needed to be reconstructed, and Plexiglas coverings were added at that time in this limited area.[22]

The exterior side of the window frames has painted wood. The paint has failed in most areas. Only one limited area has been repainted (the transept window on the northwest side, next to the vestibule doorway, located near and facing the rectory). The wood trim is limited, but found at windows on all sides of the building. It is overdue to be painted.

Towers — The bell tower is located at the south corner of the building, accentuating the intersection of Broad Street and Third Avenue. The spire rises above the belfry to a height of 130 feet (as per the 2008 Lenz report), high above the rest of the church as is typical of Gothic style churches. In the floor plan, a similar tower marks the west corner of the

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[20] See: *Immaculate Conception Church, Johnstown, Pennsylvania: 125th Anniversary, 1859-1984*, page 38. The history book does not literally say these doors were installed at that time, but it says that the flood caused the wooden doors to warp. Anodized aluminum doors were popular around 1978-1980.

[21] The fire occurred on 6 December 1983, just as a major interior repair and painting project was almost finished. The paint project, the fire, and the fire restoration project are discussed in *Immaculate Conception Church, Johnstown, Pennsylvania: 125th Anniversary, 1859-1984*, pages 43-49.

[22] The information that these coverings are Plexiglas was provided by former church member Mike Filo.

design, so that the two towers flank the narthex, creating symmetrically placed spaces. However, the west tower only rises a short distance above the roof. The south tower is designed as four stages: a two-story section with stairs up to the choir loft, a section above that, beginning about 28 feet above the choir loft floor; the second stage has stained glass lancet windows but no other function; the belfry is the third stage, and the spire is the fourth. The belfry contains three commemorative bells made at the MacShane bell foundry in Baltimore. They are rocking bells mounted on cradles and operated remotely by an electric ringing system.

Within the tower, the belfry area (bell stage) has open arches (or "windows"). These allow for ventilation, and they allow the bells to be heard over the maximum area from below. Openings of this type often have louvers to keep driving rain and snow from coming in, but this church (like some others) has only a grid of metal wire to keep out birds. Some belfries were designed from the beginning to have openings like the ones here. Whether the current design was the case from the beginning or not, it is probably best to maintain the design without louvers. The floor of the belfry area needs to be treated as a roof surface with sheet metal, rolled paper, membrane roofing, or a similar waterproof material as its surface. Even if there were louvers here in the earliest design, no such covering has been in place for a long time. The ventilation and sunshine coming through the openings allow the belfry area to dry as much as possible out after rain, snow, or humid air (after many years of being an open design, adding louvers could cause it to retain additional moisture). Some may advise adding louvers at this point to keep rain and snow out, but the current recommendation is to leave that aspect of the design as it is to maintain maximum air flow and sunlight. It is a higher priority to keep the roofing material below the bells in good condition and sealed. It would be a good idea, considering the evidence of moisture in the tower walls in the belfry area and in the next stage below it, to replace the current roofing in this area and install a modern membrane roof. It should be installed without any use of open flames.

The bell tower has areas where there is evidence of potential structural issues: two cracks in the masonry walls just outside the tower itself and a bulge where the tower meets the roof framing of the main roof over the choir loft and sanctuary.

The two cracks are evidence that the tower has separated from the rest of the building's foundation and walls. One crack passes through the southernmost doorway on the Broad Street façade. The other passes through the southernmost window bay on the southeast wall of the sanctuary (the sanctuary window closest to the tower on the Third Avenue side). Both cracks continue down to the basement. They have opened up to a surprisingly wide and consistent crack (about 3/16 of an inch), but the tower and the remaining walls of the building both remain adequately plumb and close enough together, and the floor lines of the tower still align properly with the adjoining floors of the sanctuary and choir loft. The cracks appear to be old and stable; where found in a painted plaster wall, some of the paint continues into the crack, indicating the openings are probably at least as old as the paint (believed to be maybe 30 or more years old in the area where one of the cracks is found behind the organ pipes).

The bulge is potentially related. In the adjoining roof framing, a repair has been made in how the roof truss bears on masonry in the same area. At the opposite end of the truss, where it meets the west tower, the repair includes a large wall of concrete (about 5 feet by six feet, in some places, two feet thick) poured-in-place at the attic level to encase older framing members and masonry. It may have been intended to tie the steel and masonry components together, and it may also been intended to add weight at a strategic location.

Interior

Framing — The main elements of the roof framing are steel trusses. Most of the steel members are stamped with the name "Carnegie." The members are riveted together, with heated rivets, as was the procedure at that time. A linear steel truss runs through the building parallel to (and directly under) the roof ridge, connecting the scissor trusses. Similar linear trusses are also found at a lower level tying the trusses together near the eaves. The scissor truss design varies from location to location. At each gable end, it is simpler, while a more complex design was used at each location between the window bays. Each location between window bays has a vertical steel member that continues down below the bottom chord, where it serves as a hanger for one of the light fixtures and supports the groin vault components where columns would typically be found. Above, in support of the roof, the trusses support two rows of wood purlins with wood rafters and a wood deck to which the slate roofing is fastened. However, the groin vault pattern of the ceiling was achieved by adding a great deal of framing below this, including a few vertical steel elements and many layers of scribed one-inch-sheets of wood to which stamped metal lath was fastened to support the plaster. The steel is riveted, and vertical tie-rods were used in some locations, modifying the typical angles and scissor-like shape of a traditional scissor truss. No fireproofing was provided on the steel. In the late twentieth century, batt insulation was added over most of the plaster that forms the vaults.

Plaster — The building was built around the time that gypsum-based plaster and precast decorative plaster were replacing the earlier common plaster made from lime. Gypsum and limestone are closely related types of stone made up of nearly identical forms of calcium. Limestone is very similar to seashells in its chemical composition, and "lime plaster" can be made by burning either seashells or limestone, or some combination thereof. Gypsum is much more workable, especially for decorative details and precast components of ceilings, but it is only found in certain parts of the world. Improved transportation made it possible by 1900 to import gypsum to many areas where only locally-fired lime had been available previously. This led to (or accommodated) the sudden popularity of much more ornate plaster ceilings on buildings over a certain size or budget. While lime plaster is cruder and more difficult to work to create surfaces with fine edges (and it takes much longer to dry), it is also more forgiving when there is either movement or water infiltration. Small amounts of water can migrate through it under certain circumstances without destroying the visible surfaces. Plaster made from gypsum, on the other hand, is much denser, keeping water from migrating. It is thus much more likely to dissolve when it becomes moist from roof or wall leaks, plumbing leaks, rising damp, or condensation.

The design at the former Immaculate Conception Church building relies on a great deal of decorative plaster work, most of which was cast or bench-run on the site and then lifted into place as the walls and ceiling were completed. At least these portions of the plaster finishes are made of gypsum. The flat plaster in between could contain large areas made of lime. As the walls become wet from condensation or infiltration, the areas where gypsum plaster is exposed to the water will break down first. The plaster dissolves in a process described as "efflorescence," Latin for "blooming," because the water makes the plaster change into a salt-like substance, and the bubbles grow out in petal-like pattern also causing the paint surface to bubble and burst. In any areas where the plaster has effloresced, the only way to repair it is to remove the damaged material and replace it with new material. Where this is decorative plaster, the new material will need to be cast in molds made from similar areas in the building where the same details are found. The damage to the decorative detail near the south corner of the choir loft is mechanical, due to minor movement in the tower and the inability to reinforce this detail with wire (this is a plaster "squinch" coming down as a variation on the hanging details from which the lights are hung at the locations where there would typically have been aisle columns; the decorative details hanging above the light fixtures at the typical aisle column locations are wrapped in wire to keep them from falling apart, but the wire cannot encircle the detail at the corner of the choir loft, where it is partially engaged in the wall).

Windows — The stained glass itself is in good condition. Most of it appears to be plumb and adequately airtight. Stained glass tends to fail by developing bulges toward the bottom of the larger area. This is from the weakening of the caming (lead strips where two or more pieces of glass meet) over time and the weight of the glass moving downward. Eventually, the glass and/or caming will break within the bulge. Correcting the bulges sometimes involves adding metal braces to keep the material from shifting again into the same problematic position. If such bulging occurred in the past, it may have been corrected when the exterior storm windows were added, at some point before 1984 (in 1984, a small area of the stained glass was damaged in a fire, and that area has Plexiglas coverings, a typical product in the 1980s; by contrast, the glass coverings were typically a solution used in the 1980s). A narrative was developed at some point about the stories depicted in the stained glass windows. A copy of an undated typescript is on file with Penn Highlands Community College. It is listed in the bibliography.

Floor — The terrazzo floor surface and the slate floor of the chancel area are both in good condition. The terrazzo varies slightly in color, so that there are three colors, two tones of off-white and one of a light pink in certain border areas. The material was apparently installed in at least two campaigns, as noted elsewhere (the original floor surface was wood, but that material was destroyed in the 1936 flood; terrazzo was installed to replace it, but the center section was damaged in the 1978 flood). There are a number of cracks in the surface. None of them appears to be a problem that needs to be corrected. However, if any pieces break loose in the future, the repairs should be made by specialized craftsmen. Terrazzo can be repaired by adding new sections, but the work would need to be done by someone skilled in matching the aggregate and the tinted cement that makes up the background.

The slate floor at the chancel area presents other challenges. The slate was installed in 1978, according to the 1984 church history.[23] It was installed around the various levels of a raised altar. When the altar and its backdrop were removed along with the communion rail and pulpit when the church closed, the removals left unfinished areas that are now unsightly. It would be hard to match the slate to eliminate the scars in this area. However, it may be possible to use a different material for the uppermost area of the raised floor, and,

[23] *Immaculate Conception Church, Johnstown, Pennsylvania: 125th Anniversary, 1859-1984,* page 40.

in the process, salvage some slates from the upper level to be raised over scars in lower levels. The goal does not need to be to remove all evidence of the altar and other chancel furnishings, as they are part of the history of the building. A different material might be used intentionally to mark the former locations of the altar, communion rail, etc. The owners and any future designers should refer to the *Secretary's Standards for Rehabilitation* as a source of guidance in making any changes in this area.

Altar Area/Chancel Area Design — The design of the altar area/chancel area is likely to come up from time to time as an issue as the Steeples Project continues to make the building available for various uses. An altar of the type that was there originally is never likely to be reinstalled, since the building is not likely to be a Roman Catholic Church again, and since, even if it were, altar design within Catholicism was redefined as a result of the Vatican II Conference. However, the goal in modifying this area in the future should not be to remove all evidence of this part of the building's history. At the same time, future use may raise questions of whether the raised flooring areas are a tripping hazard, whether the area needs to be accessible to persons with mobility disorders, whether a more typical stage and some form of proscenium are needed for some uses, how the area is to be lit and accentuated, whether a backdrop should be added bridging the two remaining pieces of wood paneling, and similar considerations. The Steeples Project is currently planning to add an accessibility ramp which will address at least making it accessible, although several of the other issues, as listed above, will remain.

Choir Loft and Organ — For the purposes of this report, the organ can be considered to be mainly a musical instrument occupying space in the building, and the discussion of its condition can be limited to its exterior appearance and how it interfaces with the rest of the building. The visible elements are in good condition and not problematic. The organ console contains a plaque that reads: "Adam + Stein / 1900 / Baltimore." The choir loft is structurally cantilevered, with a solid wood railing that is too low to meet today's code requirements. The 2008 Lenz report says that it is large enough for only about six folding chairs.[24] Although Mike Filo, who was a member of the choir when the building was a church, says that the choir sometimes had as many as 30 people in the choir loft, the Steeples Project would be wise to follow the limit that H.F. Lenz had suggested for how many people should be allowed to occupy this space at any one time during events. The capacity should be posted if the choir loft is open or occupied by any groups of musicians. Public use may also require adding a safety rail above the wood railing.

Ancillary Rooms (tower rooms, stairs, vestibules, baptistery, vestry) — The church has several small rooms at the front and back of the sanctuary. On the Broad Street side, the small rooms include a narthex flanked by a room currently used as a coat room at the building's northwest corner and a stairway at the building's southeast corner.

The narthex is a long, narrow space, occupying the area between the three pairs of exterior entrance doors and the three pairs of doors leading into the nave. Along its long axis, this space is approximately half as long as the façade wall facing Broad Street is wide;

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[24] H.F. Lenz Company, *"Immaculate Conception Church,"* Diocese of Altoona-Johnstown, City of Johnstown Catholic Churches, Building Evaluation Report, Johnstown: H.F. Lenz Company for Diocese of Altoona-Johnstown, 2008, page 114.

it occupies the center portion of that wall. The interior is plastered with decorative details around the arches of the six doorways (three on each side). The plaster detailing matches that in the nave. The decorative details rise as ribs to form three groin vaults, one corresponding to each exterior and interior set of doors. Like the sanctuary, the bottom portion of each wall has a wainscot of plaster with a plaster top line at approximately five feet. The wainscot is painted in a marbleized pattern with light blue as the dominant color (also as found in the sanctuary). In the side walls, there are two plastered niches for statuary, one at each end of the space. The bottom line, or floor level, of each niche is a little over five feet above the floor of the narthex and sanctuary. Each niche is half of an octagon in plan and has a gothic arched top, with decorative plaster forming part of a shallow apse-like vaulted ceiling. The floor of each niche projects forward slightly from the wall, and the projecting lip is supported on a large corbel of decorative plaster. The narthex has a limestone floor, gray in color with a marble-like dark vein and a pinkish cast that varies from unit to unit. The doors on the interior side are mounted with double-acting swinging hinges that contain springs. These doors have heavy moldings forming a panel in the bottom half and securing a light of glass in the upper half of each door leaf. The glass is thick and has a beveled edge. At the center of each light, there is an etched pattern centered on a cross. The exterior doors are 1978 replacements in anodized aluminum frames and large panels of Plexiglas with a textured surface and embedded gold foil ornamentation in the form of silhouettes, as described elsewhere[25]. Above each door on each side is a stained glass transom in a gothic arch with tracery in wood that forms a cinquefoil in a circle.

The coat room and stairway are treated similarly, with decorative plaster around door and window openings. The coat room was originally a shrine, and then a baptistery,[26] and then it served as a confessional for a decade or two before the church closed. The entrance has been modified more than once as a result. The original opening is wide and tall, but it has been reduced to the size of a standard single-leaf door by adding panels above and below that resemble sidelights and a transom. The top portion of the doorway remains open. The walls and ceiling of this space have the same plaster treatment as found elsewhere, including a groin vault ceiling with ribs.

The corresponding southeast space contains a four-part dogleg stairway which winds in four flights, one flight rising along each of the four walls of the room. This room is much taller than the coat room, as the stairway winds up to the choir loft, and the walls of the space continue upward about 20 more feet to a flat ceiling. Beginning at the choir loft level, there is a smaller wood enclosure containing a leaning built-in ladder that provides access to the tower at this corner including the belfry. The enclosure is vertical beadboard painted white. The beadboard is stained from water that comes in through the openings in the tower at the higher levels. The enclosure occupies part of a landing. Next to it, on the same landing, is a door to a small corridor leading to the choir loft. The underside of this landing has a flat plaster ceiling with very old wallpaper. It is one of very few small flat

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[25] See: the "Doors" part of the Exterior section of the report above, and see: *Immaculate Conception Church, Johnstown, Pennsylvania: 125th Anniversary, 1859-1984*, page 38. The history book does not literally say these doors were installed in the 1978 project, but it says that the flood caused the wooden doors to warp. Anodized aluminum doors were popular around 1978-1980.

[26] *Immaculate Conception Church, Johnstown, Pennsylvania: 125th Anniversary, 1859-1984*, page 31.

ceiling areas in the building (and the only one with extant wallpaper), and the plaster and wallpaper have begun to break free exposing some of the wood lath. The floors of the top landing and the three intermediate landings at the corners are rubber tile from ca.1950 (or "asphalt tile," as it is called in the 1984 history book[27]). The tile is in good condition, as are most components of the stairway. The stair treads have no-slip tread covers (of vinyl or a similar rubber-like material). At the bottom of the stairs, there is a partial-height wrought iron gate to limit the access to the stairs, organ, choir loft, blower room, and access ladders to the belfry and attic to authorized persons. The gate is in good condition.

Above the coat room, there is a tall room in the west tower that mainly serves as a space for blower equipment for the organ, as well as seasonal storage. The room has plastered walls and a very high ceiling. The paint on the walls provides minimal coverage over the plaster and is aging. In one corner, a ladder is affixed to the wall to provide access to the attic access hatch; this is the primary way one can reach the majority of the attic cavity over the sanctuary, chancel/apse, and related spaces.

The rooms in the back of the sanctuary (northeast end of the building) wrap around the chancel area. They have high ceilings. One of the two rooms touching the chancel was built as a sacristy (room for preparing communion) and the other as a vestry (room for the priest to dress). At some point, these functions were traded between the two spaces.

The room at the east corner, along Third Avenue and east/northeast of the chancel, was destroyed by fire and rebuilt in the mid-1980s. In the rebuilding project, the walls were furred out using 2x4 studs, and the doors and the trim at all openings were replaced using a steel door at the exterior and no trim. The adjoining woodwork in the chancel area was also rebuilt at this time, carefully matched on that side of the wall to the original design. This room was recently refurbished as a catering kitchen area with a small number of cabinets, and small sink, and some shelving. Although there are almost no visible historic features in this area, the modern finishes and fixtures are in excellent condition.

The room on the north/northwest side of the chancel has a large vestment cabinet that was moved to this area before the church closed. It also has a janitor's sink, electrical service boxes and circuit breakers, an access panel to the attic, and several similar service features. It is located partly above the basement furnace room. The room is generally in good condition but has some surfaces that show a small amount of water damage, the plaster, paint, and some of the fixtures are showing signs of age, and some of the electrical and plumbing features could have been placed in less conspicuous locations.

At the building's west corner, there are four more rooms and a storage area. The four rooms are two vestibules, one coming in from the side entrance and one behind it, followed by a pair of rest rooms, one for men and one for women. The current rest rooms were installed in the 1970s. They are in aging condition and are about to be rebuilt. Above the two rest rooms is a full-height storage room access by a pair of standard-sized doors. The storage space doors are in the wall above the rest room doors, but there is no stairway, and a ladder has to be used currently to access them.

The two vestibules coming in from the side entrance at the building's north corner (the entrance near the chancel on the rectory side) have sustained substantial plaster damage caused by leaks in the roofing and in the flashing. The water problems have been exacerbated by other circumstances, such as the shade on this side of the building, at least

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[27] *Immaculate Conception Church, Johnstown, Pennsylvania: 125th Anniversary, 1859-1984,* page 34.

one broken rain leader shedding from the higher roof onto the lower roof, and several problems with how the asphalt roofing and associated flashing were installed, as discussed elsewhere in this report. The plaster is in poor condition. The rest rooms are also due to be rebuilt, and there are accessibility issues that will be addressed with that project.

Basement — The Basement consists of two spaces, a large, full-height furnace and mechanical room the expansive crawlspace that extends under the remainder of the building. The mechanical space has exposed concrete walls. It is accessed from the exterior by a concrete stairway that is in the shade and in poor condition from constantly remaining moist. This is compounded by about 90% of the surfaces being covered in moss. The wood door leading into this room from this exterior stairway (there is no interior access) has lost most of its paint and is in poor condition. The room contains a large boiler system in a sunken pit on the concrete floor of the full-height space. The boiler provides steam for a steam-based heating system. Some features of this space may have been designed to meet the stringent requirements of boilers. The boiler and all other equipment in this space had to be replaced in 1978 as a result of the 1977 Johnstown Flood,[28] but a plan was apparently not submitted to the state (Boiler Section of the Pennsylvania Department of Labor and Industry) for design approval until 1994. The mechanical space has a window and evidence of two or three others that have been closed in with masonry. The mechanical space is also connected to the crawlspace by way of a large opening (about 6 four feet by three feet) with no covering, and there are several holes into the crawlspace from the exterior large enough to allow small animals to have access. The crawlspace has a uniform layer of mud that was deposited in the floods of 1936 and 1977. Some things that had been stored in the basement, such as some old books and a few remnants of an old altar rail, are evident in the mud but gradually rotting away. The space is generally dry, but the mud retains moisture and has a light film of a white substance at the surface that may contain mold, a fungus, or something similar.

The crawlspace and basement are not separated from one another, and they both have features that could be allowing animal infestations. The crawlspace has ventilation openings that appear as window-like openings at the base of the brownstone on the Third Avenue side and on the side toward the rectory. Some of them have metal grates to allow air in and keep animals out. The ventilation provided by these openings is needed. However, some of the grates were covered at some point by removable steel plates. In other locations, pipes pass into the openings and the grates were not retrofitted to fit around the pipes. This situation became worse recently when the new air-conditioning units were installed in 2014, with additional pipes passing through these holes. The grates need to be repaired and to be redesigned to fit around the pipes. The full-height part of the basement has a sunken pit built for an earlier boiler. The pit has a large drain with no grate to keep animals out. This drain is a possible source of animals, just as the ventilation openings are. Both kinds of openings also need to function well in the case of high water, especially considering Johnstown's history of flooding.

Attic — Not counting the attic of the towers, the building's attic consists of two areas accessed by ceiling hatches, mainly the large attic cavity over the sanctuary, nave, apse,

[28] Unattributed Drawing of "Partial Basement Plan," approved by Supervisor of Boiler Section (Pennsylvania Department of Labor and Industry), 29 December 1994.

transept, and organ/choir loft area, and a lower attic over the rooms at the building's north corner (there may be a similar space over the current catering room at the building's east corner, but no access was found).

The large attic space over the sanctuary contains steel framing, plus wood scribed to support the metal lath of the groin vaults in the ceiling of the sanctuary. The attic extends as one large cavity over the sanctuary (nave and side aisle area) as well as over the apse. The attic spaces directly over the narthex and over the west tower are directly connected. The upper stages of the belfry are not connected to the larger attic, but instead have a separate set of access ladders. Within the large attic area over the sanctuary, a narrow wood walkway provides a walk-able path through the trusses and over the plaster ceiling materials (lath, insulation, etc.). The top surfaces of the groin vaults are covered with loose insulation. The cavities above the groin vaults create a highly irregular series of spaces in the attic that often extend 20 or more feet down from the walkway to forms that are pointed from below, such as the locations where most basilica churches have columns while this one has hanging light fixtures.

The main condition issues noted in the field inspection of the attic were two or three places where daylight comes in through unintended openings such as where the cresting is missing at the top ridge of the roof, and one location where a brick appears to be missing at the top of one of the wall facets of the apse.

Additional Reference Information on Individual Building Materials in Use

Concrete

Building Material History — The building was constructed at an interesting point in the history of concrete construction. Although the concrete was used in places that are not intended to be seen (such as the below-grade part of the foundation, all surfaces of the basement boiler room, and in the floor below the exposed terrazzo finish), it is an important part of this building. Below-grade, poured-in-place concrete supports all the other materials used in the design. This is a relatively early example of this material. Prior to the 1910s, poured-in-place concrete walls and reinforced concrete were used mainly in large projects in the major cities or in a few isolated locations where it was tried initially on an experimental basis. Beginning about 1910, the material became much more popular, appearing in many different kinds and sizes of buildings in a wide variety of communities, large and small.

Concrete was in use in Roman times, and some examples from that era have survived since then. However, it fell out of fashion, and, for centuries, was used only infrequently. In modern use, concrete became popular again due to several technological advances, such as the development of Portland cement and the introduction of steel reinforcing.

Cement was rediscovered in the eighteenth century and further developed in England in the middle decades of the nineteenth century. Portland cement is a mix of materials, primarily made by grinding stone to fine powders. Portland cement has the capacity to become very hard and stable after it is saturated with a specific amount of water, formed, and allowed to dry in a process called hydration. The Portland cement industry in the United States traces its beginnings to the 1880s in Pennsylvania's Lehigh Valley.

The word cement refers to this material when it is used by itself. When larger pebbles and stones (called "aggregate") are added to the mix, it becomes stronger for certain applications. Any time the finished material contains aggregate, it is correctly referred to as concrete. While some uses of "cement" refer to a finished material made only from cement powder and water, the name mainly refers to the dry powder used as an ingredient in making concrete, or to the powder mixed with water. The name itself actually derives from the way the cement mix is combined with aggregate to make concrete — the cement serves as the glue, or "cement," i.e., it "cements" the aggregate into one monolithic unit.

As a cast finish material, concrete is stronger than cast cement used by itself. However, even concrete is not strong enough for certain applications, because it tends to break into pieces under pressure when it is under tension or under a specific kind of diagonal force called "shear" (shear is a combination of tension and compression, acting at opposite diagonals; it is the stress placed on every part, or on each molecule of a material used to span over an opening, over an open area, or across an unevenly supported surface; the name comes from the tendency of the material to shear off next to the support members). Like stone, concrete is likely to develop cracks from the bottom up (where the tension is greatest) and break under shear forces. Adding reinforcement bars of ferrous metal (typically steel) toward the bottom of the concrete while it is still wet provides a way of adding tensile strength, holding the concrete in one piece in order to prevent breakage from the bottom under shear forces. Reinforcement allows the concrete to span in a way that is similar to wood beams, but often at even greater distances.

Cement, concrete, and reinforced concrete were used in various applications in the nineteenth century. Concrete was used in constructing a few houses in the United States, at least as early as the 1840s. The first use of reinforced concrete in the United States appears to have been in 1879. However, structural use of concrete in exposed walls and in building elements that need to span over openings or from wall to wall (as floors and ceilings) did not become popular until the twentieth century. Some early examples include the Henry Chapman Mercer buildings in the Doylestown area of Pennsylvania, built 1908-1916. Mercer used exposed poured-in-place concrete walls, as well as concrete floors and ceiling vaults, to build buildings more than four stories in height. At the time, this was considered an eccentric choice of construction methods. Thomas Edison advocated the use of exposed, poured-in-place concrete even earlier, in the first decade of the twentieth century. Edison opened his own concrete factory in 1902. His idea for building poured-in place concrete houses was adopted in the construction of one or two residential developments around Pittsburgh as early as 1907. The idea was used at a larger scale in 1916 in building a neighborhood of eighty houses within the Borough of Donora, Pennsylvania, known as Cement City [National Register 1995].

Reinforced concrete, also known as "ferro-concrete," became an important building material in modern architecture by the 1960s. It was not only used to create spectacular above-ground monumental designs, but it also became ubiquitous by the mid-twentieth century as a material for spread footings under almost every building with a masonry or concrete foundation that extends into unstable soils or below the frost line. The engineering for spread footings became standard by 1962, but the assumptions used at that time in standardizing the procedure were largely based on calculations developed in 1913 by an Illinois-based engineer and professor named Arthur Newell Talbot.[29]

This Building — Given the above context, the former Immaculate Conception building is a relatively early example of the use of this then-new material. Poured-in-place concrete was just coming into common usage in below-grade foundations in 1906. It may have been in common use to create spread footings by this time, but the method had not yet been standardized, and it is difficult to say if spread footings were used in erecting these walls. It is also difficult to know for certain if reinforcement was added even if spread footings were used (it is possible to test the concrete to see if steel or iron is present using an instrument called a pachometer, but it is difficult to reach or test the footings). Steel reinforcement was used in the floor slab, as it spans over a crawlspace, but there is a strong chance that the concrete floor slab was not in place until after the 1936 St. Patrick's Day Flood.

The floor is supported by beams that rest on four rows of piers, the spans between the support elements (whether walls or piers) is approximately 15 feet. The concrete in the walls is only up to grade, above which the interior side of the walls are built of brick. There is a difference in the appearance of the concrete used in the walls and that used in the floor deck, as seen from the underside. The top surface of the floor was originally wood (probably on wood framing), which was replaced by terrazzo (over the reinforced concrete

[29] Talbot, Arthur N., "Reinforced Concrete Wall Footings and Column Footings," *University of Illinois Bulletin*, Vol. 67, March 1913, pages 1-116.

slab), as a result of damage sustained in the St. Patrick's Day Flood in 1936, according to the 1984 church history.[30]

Brownstone

Building Material History — Brownstone is a specific kind of sandstone, quarried in locations where stone of a deep brown color was found. Most of these quarries were in a narrow formation that runs parallel to the Eastern Seaboard extending from Portland, Connecticut, though the town of Hummelstown in the Harrisburg area of Pennsylvania (the stone in this building was identified in 1908 as being Hummelstown brownstone[31]). Brownstone was very popular in the middle decades of the nineteenth century. It was so popular between the 1840s and 1880s in certain east coast urban areas that the name is also synonymous with the word "rowhouse" in cities like New York (the word is even used in these cities for all-brick rowhouses in addition to stone ones). In these locations, it was frequently used in sawn units with machine finished surfaces and decorative edges. By the early 1900s, it was still in use, but its use tended to be limited to rockfaced walls on churches, courthouses, and similar buildings, and trim elements in certain brick buildings. Both trends are reflected here. The decline in use was probably due to a realization that it is less durable than other exterior building materials, and it caused many problems for buildings built in an era when the assumption was that stone buildings would remain in good repair much longer than these ones actually did.

Despite the beauty of its color, brownstone was found to be one of the least stable kinds of building stone in the long run, and it fell out of favor by the 1920s. Most of the remaining quarries closed shortly after this as a result.

As a form of sandstone, brownstone is a type of sedimentary stone. Like other sedimentary stone, this means that it was formed in layers and thus has "bedding planes," i.e., parallel fault lines, running through it. These lines were always horizontal before the stone was quarried. By the mid-nineteenth century, builders were using stone as a facing over brick walls or other kinds of masonry. It is easier to move and install the stone if it is cut into layers that are as thin as possible for a given application. It is also easier to cut the stone parallel to the bedding planes. Thus, most stone facings using sedimentary stone were installed with the bedding planes turned vertical (perpendicular to the way the stone was found in the quarry). Installation in this orientation is often called "face-bedded" as opposed to "quarry-bedded. Installation with vertical bedding planes leads to water gradually entering the upper edge, eroding along the fault line of the bedding plane, and breaking the stone. This process is accelerated in the freeze-thaw cycle, as ice forms in the eroded areas, like an expanding wedge that pries the layers apart.

This Building — Brownstone was used to face the lower exterior side of all walls at this building. In these locations, it is rock-faced with a machine-cut overhanging top course. Machine-cut brownstone was also used for decorative elements and functional elements in the upper portions of each wall, such as in forming arches to make the transition when the otherwise brick buttresses are stepped-in and over each window or door opening. Around the front entrance, there is a large ensemble of brownstone details, including overhanging gargoyles, niches for statues, and finials capping the arch over each door opening. The

[30] *Immaculate Conception Church, Johnstown, Pennsylvania: 125th Anniversary, 1859-1984,* page 32.
[31] *Immaculate Conception Church, Johnstown, Pennsylvania: 125th Anniversary, 1859-1984,* page 27.

way the stone has begun to break down in numerous places shows that the machine-cut (smooth-surfaced) pieces were generally installed with vertical bedding planes. The rock-faced stone at the bottom of the walls may be quarry-bedded; it appears to be more stable, and, at any event, presents fewer potential problems from falling pieces.

Yellow Brick, Clay Tile, and other Brick-Sized Units

Building Material History — The brick used here was a recently developed, new material at the time, in contrast to the locally made red brick found in most of the older buildings in the area. Until the 1890s, most brick was made from clay found in the vicinity of the building. The units were typically made at the site in wood forms, dried in the sun, and then fired on-site, in primitive piles of brick, alternating with green wood, and covered with mud (as a sealant). The piles were called "ricks." The ricks were lit and allowed to burn for a limited time of a day or two and then doused with water. This produced a material that varied in hardness, color, and in other ways. While units that were uniform in appearance could be selected and used as face brick, they still had a range of variations in the surfaces and edges that gave brick construction of this era (pre-1880) a hand-made look. The hardest bricks were only at about the same level of permeability and strength as a red clay flower pot (i.e., relatively easy to break or erode). Most brick was red because that was the color that typical clay from local sources turned at the limited temperature available in the traditional firing process. However, some areas had clay that would fire to a lighter color, more of a yellow or beige, in the on-site ricks.

Around 1890, it became popular to make the brick look more uniform. Several processes were introduced in the 1890s through the 1910s to create uniform surfaces, also making the red brick units harder and more waterproof. By about 1910, most brick was made from clay that was custom mixed to a specific water content, pressed into moulds by machines, fired at a very high temperature to make it hard, and finished with a glaze or a factory-controlled surface texture. With improvements in transportation and other technologies, more variety was available in the sources of clay any one manufacturer might use. Finished bricks could also be shipped to almost any building site by the early 1900s. Slate gathered as a waste product in mining coal, for instance, could be ground up and used to make clay for brick. A wide range of colors suddenly became possible from light tones of ivory and cream to dark brown. Other colors could be added using glazes. Special products were developed by hollowing out the bricks. Hollow units made using a very wet clay mix were typically referred to as tile. Although many types of tile were made as exterior finish materials, hollow tiles with ribbed surfaces (furring tiles) were also used on the interior side of brick walls as a back-up material for wet-applied plaster.

Brick was laid in patterns, usually referred to as the "bond" of the brick wall. This name derives from the fact that any brick wall that rises more than a few feet and supports itself structurally as well as carrying a load (e.g., supporting the floor and/or roof framing) needs to be made up of two or more layers (or wythes) of brick that are "bonded" to one another so they work together and share the load. Bonding was traditionally achieved by turning some of the bricks perpendicular to the rest so they spanned over the joint between the two wythes. About 1900, it became common to use special face brick on the outside of a wall of common brick. The face brick was often laid up with extra thin joints called "butter joints." It was possible to bond the face brick to the back up wall using metal ties instead of the traditional perpendicular bricks. The hard, factory-made brick of this era were also developed hand-in-hand with Portland cement-based mortar.

This Building — The walls at the Immaculate Conception building are composed of a back-up wall (two or more wythes) of factory-made red brick that is faced with brownstone at the base (about 35% of each wall area) and, above the stone, faced with machine-pressed yellow brick with Portland-cement-based mortar in butter joints in the upper 65% of each wall. The face brick is entirely laid in stretcher bond, an indication that metal ties were most likely used in the construction. In general, the walls are almost all plumb, the mortar is in good condition in 95% of the surfaces, and the finish brick appears to be free of evidence of chronic water problems in most areas. The innermost wythe of brick contains brick-sized furring tiles designed to bond with the interior plaster. There is also exposed furring tile in the interior of the bell tower (not plastered) and in a few places in the first story, such as the locations where a set of low-relief sculptures depicting the Stations of the Cross had previously been mounted. In all these locations, the furring tile was mixed in with plain common brick, suggesting that the plaster work did not require that 100% of the backing material be scored.

The building's exterior mortar is thin, convex butter joints with a Portland cement base. In most areas, they are in good condition. In the limited areas where the mortar joints are damaged, one can see the apparent causes, including deterioration of adjoining brownstone, fasteners added for lightning cables and rain leaders, and places where the walls have become saturated with moisture due to problems with flashing, roofing, copings, and other water-shedding components. Only limited repointing is needed, and repointing would only be appropriate here in combination with repairs to the adjoining materials causing the problems. Any pointing work should be limited to spot pointing in areas where the original material is clearly damaged or loose. New pointing should match the color and shape of the original joints. Although the mortar is believed to contain a high complement of Portland cement, it is recommended to use less Portland cement in the new mortar to avoid breaking adjoining and fragile materials.

Slate Roofing

Building Material History — Slate roofing varies from location to location. Slate has been popular in the United States, especially for churches, since the mid-nineteenth century. It was also very popular to use slate roofs on houses, schools, even some factory buildings between the 1870s and the 1920s. The slate for many buildings in Pennsylvania came from quarries located in the state. Vermont and Virginia also had well-known slate quarries. Most slate from Pennsylvania is referred to as "Pennsylvania black." A few specific localities had slate with special color traits (e.g., Bangor slate, from Bangor, Pennsylvania) or a much longer lifespan (e.g., Peachbottom slate, from southern Lancaster County). "Pennsylvania black" slate was commonly used in all parts of the state around 1900. Despite its name, this type of slate usually fades to a gray color. It then starts to flake off at the surface as it begins to fail from age. Under the general category of "Pennsylvania black," there is a great deal of variation in quality and lifespan (for instance, some slates had a vein of other substances in it, used decoratively, and this sometimes leads to a much shorter life). It generally has a life-span of 100-120 or more years. The material was most popular between 1870 and 1910, and this means that many of these roofs now need to be replaced. In some cases, the slate that looks like Pennsylvania black is from a better than usual quarry, or it lasts much longer for other reasons. The lifespan of slate is also affected by repairs and by the kind of fasteners used (brass or copper nails last much longer than galvanized ferrous metal ones, for instance). Inspection by a qualified slate roofer every year or two, with an allowance for some replacement, is a good idea for any slate roof that has is approaching or past 100 years of age. Great care needs to be taken in the repair work to avoid breaking intact slates in the work area. Good fasteners should be used. The slate roof will last longer into the future if brass or copper nails were used in the original roof application. Galvanized ferrous metal nails (iron or steel) were popular a century ago, especially on less expensive roofs, but in these cases, the roof typically begins to fail due to the deterioration of the metal as the nails break down, approximately 100 years after the initial installation.

This Building — A roofer visited the roof in the fieldwork for this project. A final assessment of the slate has not been made, but the slate is in much better condition than most Pennsylvania black slate roofs of this era. This is partly due to the large number of slates that were replaced in 1959. The 1984 church history says that the damage was due to the kind of nails originally used, and it appears to say that all the slates were removed and reinstalled at that time to replace all the nails with copper ones.[32] At present, however, the slate is holding up while the edges of the roof are deteriorating from the deterioration of copper flashing and the loss of the copper roof cresting features. The slate should be investigated further, but the roof will continue to fail due at the ridge and at the valleys due to the loss of the flashing and cresting if these are not addressed immediately. Also, as discussed below, the asphalt roofing of the lower portions of the building represents an even more serious set of problems needing immediate attention.

Asphalt Roofing

Building Material History — Asphalt shingles were developed around 1900 as an alternative to wood shingles. The original idea was to saturate felt or paper with tar-like materials (such as coal tar) available as a by-product of certain processes using coal. The idea evolved from flat roofs where tar had been applied in large quantities as a sealant. Paper, felt, or gravel had been added over the sealant to make it possible to walk on the surface. This led to the idea of manufacturing a product that could be nailed on the way shingles were. The earliest version was more like what is typically called "tar-paper." To make the roofing look more attractive on pitched roofs, the bituminous coated papers were cut into pattern referred to as "shingles." The shape of wood shingles was imitated in the way the product was cut along the exposed edges. Adding fine gravel over the tar made it possible to enhance the choices of textures and colors.

This Building — The roofing over the area of the lower section of the building that wraps around the apse (the part of the building containing the sacristy rooms as well as the adjoining rest rooms and side entrance vestibule) was replaced at some point with asphalt shingles. The flashing was done incorrectly, and the lower edge of the roof appears to have been installed without any measures to address ice build-up. Consequently, the exterior walls below this section of roofing have been subject to a high level of moisture causing

[32] *Immaculate Conception Church, Johnstown, Pennsylvania: 125th Anniversary, 1859-1984,* page 35.

efflorescence in the plaster. The asphalt roofing itself appears to be in good condition, but the entire asphalt shingle area is at a state of failure due to the moisture that is penetrating into the attic cavity and down into the walls below. The slope of the roof is minimal for this kind of roofing, and the moisture infiltration may be due in large part to accumulation of snow in winter months.

Another area where asphalt shingles were used is on the vertical surfaces of the two ventilation dormers that appear on each of the two largest slopes of the roof, midway between the Broad Street towers and the transept. The louvers are painted wood in a Gothic arch design. Three sides of each dormer (the vertical walls) are clad in asphalt shingles, although the top roof of the dormers appears to be slate. The asphalt shingles used in these areas are not known to be causing serious problems at this time, but they are old and due for replacement.

Metal Details in the Roof Design

Building Material History — Roof systems typically rely on sheet goods, such as sheet metal, to seal areas such as valleys, the back edges of parapets, and similar locations. In slate roofs, these details are especially critical because the slates surfaces are themselves not airtight or watertight. They rely on water draining off from slate to slate. This type of roof can only be installed with a second material such as sheet metal at the valleys, vertical elements, and other edges. Roofs also typically have drainage systems (gutters and downspouts), and they usually have systems to ground electricity from lightning as safely as possible. Metal is used for these systems, as well as for roof ventilation systems, systems to hold back snow, some decorative details, things like weathervanes, and the like. On churches, the sheet metal was often copper, which is shiny orange like a new penny when first installed. It turns brown in a short period of time (less than a year) and develops a “verdigris” (copper green) patina over a period of about 25 years. Because of the color factors, replacement of copper details is sometimes done all at one time, or chemical treatments are used to cause a premature patina when small pieces are replaced with new copper, in order to match the older materials.

This Building — The roof system relies on heavy copper ridge caps, copper sheet metal flashing at parapets, chimneys, towers, and valleys in general, a gutters system with spouting and rain leaders, and a lightning rod system that uses copper cables that extend to the ground. The gutters are silver-gray in color and appear to be either galvanized ferrous sheet metal or terne-coated copper or steel. The rain leaders are copper, although the bottom sections were stolen at some point, and these sections have been replaced with polyvinylchloride (PVC) pipes that lead to below-grade drains. Ventilation is addressed mainly through two large dormers with wood louvers. The roof also has four lines of heavy copper fleur-de-lis style snow guards on the larger slopes and a smaller number in the more limited areas. These hold snow that has accumulated on the roof surface from sliding abruptly off the roof (both a safety concern and a common cause of serious mechanical damage to roofs). More importantly (if installed correctly), they hold the snow back above the wall line, since temperature of the roof surface is much warmer over the interior space that it is over overhanging eaves. The effect of the warm surface melting the bottom surface of the snow causes water to run down the edge of the roof, where the cold surface over the eaves contributes to it forming icicles. If the snow breaks free suddenly after ice has formed, the abrupt movement can result in damage to the building.

Several pieces of the copper roof cresting were blown off of the top of the roof by heavy wind around the time the current project was started. Some of the copper cresting was hanging precariously from the upper part of the roof on the side toward the former rectory. An opening in this part of the roof does not always let in a large amount of water, depending upon wind and other circumstances from rain, and very little moisture was observed at the center of the attic, where water damage from the missing cresting would be most likely apparent. However, the roof has begun to come apart from the top, and the loose material needs to be repaired. The dangling pieces are also a danger to neighbors, passersby, and people entering or exiting the building. The pieces that were loose at the beginning of the project are heavy gauge copper with a verdigris color; they will difficult to replace with matching elements if the extant pieces become further damaged from falling or are lost. There is much more water damage from the copper flashing at valleys where it has begun to fail. This is apparent in the parapet part of the façade wall as seen from the belfry. The moisture coming in through this flashing has begun to cause deterioration in the wood sheathing and framing as well as the stone and brick components of the walls.

The asphalt-surfaced lower roof needs immediate attention. The moisture coming in, probably from the poor design of the upper flashing, has apparently caused the substantial water damage as seen in the plaster surfaces at the exterior walls. Since the plaster damage is at the opposite side of the roof slopes, it appears to indicate that the water is migrating down along the rafters. Water is also coming in through the roofing at the bottom edge of the roof as a result of lack of an ice dam detail, and as a result of snow being allowed to pile up on the roof surface. A system for melting the snow and ice uniformly (such as heat tape) or removing the snow manually (by hand shoveling) needs to be put in place, at minimum, until the asphalt roof area can be redesigned and replaced.

Some of the downspouts and rain conductors also need attention in various places. The PVC rain leaders at the bottom of the wall apparently work well, but a plan should be in place to replace them with something that matches better at some point in the future. Some rain leaders on the north side of the building are missing upper pieces and/or are not carrying the water adequately away from the building. Another issue with the rain leaders in general is that many of them are mounted to the bricks or stone in ways that have caused these materials to break. This is also true of the cables coming down from lighting protection system.

Glass, Stained Glass, and Storm Coverings

Building Material History — Churches most often have stained glass windows, especially those designed in the Gothic style. The glass is held in place by strips of lead, copper, or a similar metal with many soldered joints (the metal strips are called “caming”). Stained glass typically fails by sagging toward the bottom of the tall window ensembles. Many churches have covered their stained glass to have the insulative effect of a storm window, plus an added layer of protection against breakage by things like stray baseballs, bullets, and vandalism. This also helps curtail the sagging. From the 1950s until about 1980, the coverings were typically made of glass. Around 1980, churches began using synthetic covering materials such as Plexiglas and a similar product called Lexan. Lexan is fireproof, but it yellows over time.

This Building — All windows in this building are glazed using leaded glass (small pieces of glass arranged in patterns and held together by strips of "caming," typically made of lead). Most of it is stained glass, though some areas have glass arranged in caming with little or no color. Most of the stained glass is covered with storm coverings added in the mid- to late-twentieth century. Most of the coverings are made of glass. The windows here do not appear to be showing the typical sagging that plagues the leaded and/or stained glass in many older churches. This may be due to corrective measures taken when the glass storm covers were installed. The coverings on the windows at the building's east corner were replaced in the chancel area after a 1983 fire set by vandals. The replacement material was reportedly Plexiglas (as per discussion with Mike Filo).

Wood Exterior Doors
Building Material History — Churches typically have wooden doors, and at the front doors are traditionally painted red. Some historians trace this back to a tradition of painting the doors on Gothic churches in the middle ages with a red paint made from oxblood (at the time, most churches had very little other wood trim in need of painting). By tradition, fresh oxblood was applied when the church's mortgage had been paid off, and thus many churches today consciously maintain red wood doors with the purpose of symbolizing financial stability.

This Building — The front doors at this church were once wood doors painted red. After the 1977 Johnstown Flood, they were replaced with aluminum-framed doors (in a dark bronze, or "anodized" shop-finished color; see below). At least two other doors were replaced by metal doors. The basement door is the only remaining exterior wood door. It is painted red, but the paint is at a critical stage of failure. About a third of the surface of the door has exposed and dry wood.

Metal Doors
Building Material History — The new doors and replacement doors installed on public buildings since the 1960s have typically been metal, either metal frames with large lights, or flush, "hollow-core" doors, sometimes with vision lights cut into them.

This Building — Replacement doors with metal frames and large lights of Plexiglas were installed in 1978 or shortly afterward in the three doorways of the narthex entrance in Broad Street façade. They have a gold-colored foil as a decoration set in the Plexiglas. The foil decoration imitates the shape of a Gothic pointed arch. Flush, "hollow-core" doors were used as replacements in the doorways at the two side entrances near the chancel. They do not have vision lights.

Exterior Paint
Building Material History — Gothic style churches typically have very little wood trim or other kinds of exterior details that require painting.

This Building — The building has very few exterior painted details. The painted surfaces are confined to the wood trim around windows, the hollow-core metal doors, basement door, door frame, and nearby window letting light into the boiler room, the ventilator grates and steel plate covers at the basement openings, the louvers on the two attic ventilation dormers, and a few other limited areas, such as wood trim where it is exposed in a few places at the eaves. As noted elsewhere, the exterior paint on this building is at a point of failure, or past it, in most areas where a paint-type coating is needed. The main exception is the one large transept window, on the northwest side of the building, which has been repainted recently.

MacShane Bells

Building Material History — Churches with towers and spires traditionally had bells in at least one tower. The bells provided a musical tone and a way to call worshippers to church, or communicate information about other events, such as funerals, fires, etc. In addition, the bell itself provides a weight that helps on many churches to hold the spire in place during heavy winds. Bells were traditionally installed in a rocking frame. The lateral movement and vibration rocking motion is actually bad for the structural integrity of the tower.

This building has bells in the belfry from one of America's more important historic bell foundries, the MacShane Bell Foundry in Baltimore. While there were bell foundries at nearer locations in Pennsylvania, the Pennsylvania foundries primarily made signal bells for factories, steamboats, and similar uses. MacShane was one of the bell companies with a good reputation for producing bells that rang with musical quality. The bells were not investigated in detail, but they are rocking bells on ferrous metal frames.

This Building — The metal in the frames is deeply pitted from rust. The bells are operated by wheels connected by chains to motors. The motors and other equipment (wiring, etc.) are also showing signs of age and corrosion. The floor surface (roofing material) of the belfry area needs to be replaced, and in doing this, the metal could be cleaned up and possibly painted to curtail further deterioration. The wiring, motors, and other mechanical parts need to be checked for safety, and some components are not properly mounted, are rusting, and appear to need replacement. If any work is to be done on the operating mechanism for the bells (such as motor replacement), it is the recommendation of this report that the rocking cradles be disabled, that the bells be fixed in place, and that new strikers be added to strike the bells without rocking them. The strikers should be operated by a remove system below using new low voltage wiring if possible.

Interior

Wood and Steel Framing

Building Material History — Traditionally, most Gothic style church buildings have masonry bearing walls supporting a roof that is framed, in all or in part, using wood. There are three or four common ways to construct a roof over a basilica-plan church (center nave and side aisles), especially when built in the Gothic style. One is to create a vaulted ceiling, which allows masonry units to be used arching over the space. This continues the structural logic of the walls up and across the ceiling, creating a fireproof enclosure, and providing surfaces that have distinctive acoustical qualities. Placing a logical, water-resistant roof surface over the vault usually (though not always) involves using at least some wood framing. Another is to build trusses, traditionally made of wood, that span from wall to wall. A truss is a design that uses linear members to form triangular shapes that are joined at the corners. By comparison to other polygons, triangular assemblies are rigid, even if the corners are hinge joints. This also isolates the forces so that some members are in compression and others are in tension. The bottom chord (usually a horizontal or nearly horizontal line) of the truss typically carries the load of the ceiling. A popular truss type for church roofs is the scissor truss, where the bottom chord forms two slopes. Scissor trusses create an optical illusion, making church ceilings seem as if they follow the slope of the roof without needing the diagonal structure of trusses. A third kind of ceiling popular in European churches and halls over the ages used exposed trusses. The design of the trusses could vary greatly, and some carpenters developed clever ways to combine truss forms to create attractive details in the exposed truss work. A well-known example is the hammerbeam truss, where there is a partial line coming in from each wall, creating the appearance of a large tie beam that has been cut away at the middle. By adding members above and below, often using curved members, this style of truss can be beautiful and functional at the same time.

This Building — In designing this building, William P. Ginther combined the three ceiling types discussed above. He and his design team (most likely, the engineers on the team) designed a series of riveted steel scissor trusses that were erected to support the steeply sloped roof and leave room for a ceiling that rises at the center. These trusses are entirely hidden in a large attic found above the plastered ceiling. Instead of a ceiling with two slopes, as often found below scissor trusses, the ceiling design here mimics the form of a series of groin vaults over a basilica plan — except that the typical row of columns was never placed under the vaults to support the vaulted shapes at the line where each side aisle meets the nave. Instead, the ceiling dips down to form a sharply pointed decorative plaster element at the bottom supporting a light fixture where each of the columns would typically be. To accomplish this, hidden steel hangers were placed above the ceiling, directly over each typical column location. These vertical hangers, as essentially "cut-off" columns, are similar in their conception to the cut-away horizontal sections that look like tie beams in a hammerbeam truss design, except that the main missing line segment emphasized in this church's design is the vertical line, in each place where a column is expected to be. The result is a rich ceiling design that combines the three most common kinds of ceilings potentially used in Gothic churches.

Because the scissor trusses are hidden, and they serve to support something below that is much more complex than the roof above, the design of the steel trusses differs from other applications. In fact, the scissor truss design appears in at least three different forms: one nearest the front and back walls, one at the intervening locations between the window bays where the hangers are needed (above the typical side aisle column locations), and the third scissor truss type used parallel to the two gable-end walls of the transept (and thus appearing perpendicular to the main ridge line of the roof).

Above the steel framework are wood purlins (large wood beams, of a square cross-section, running parallel to the roof ridge equally spaced at two different locations on the steel trusses to support the rafters). They appear at the panel points of the steel trusses. Above the purlins are the evenly spaced wood rafters, and they in turn support sheathing. The sheathing here is solid, although slate roofs are sometimes installed on strips of wood with gaps between them instead of solid sheathing (the air flow is believe to extend the life of the slate; although a slate roof is normally neither airtight nor watertight, it works by diverting the water down over the slates which are carefully overlapped to keep water from entering directly). The sheathing in this case is boards that are placed very close together and appear to have either lap joints or tongue-and-groove joints on the edges where they meet. This sheathing design is much more airtight than what is found in slate roofing on wood lath. It does not, however, appear to have shortened the life of the roof.

Wood Trim, especially where there's a Translucent Finish

Building Material History — Churches often had a great deal of interior wood trim that was stained and varnished, as was the case with many other buildings in the late nineteenth, especially public buildings. It was also common to use painted (or "faux") grain in the finish. When the finish is translucent, the varnishes are often shellac-based as opposed to oil-based. Shellac finishes and rubbed oil finishes can give a beautiful depth to the wood. However, this can also be lost over time if the finish becomes dark and dirty or discolored from later layers of varnish added in an attempt to clean up the finish. In the early twentieth century, it was very common to add layers of oil-based varnish as much as every five or ten years, in an effort to address the effects of pollution and delicate finishes damaged by human touch, wear-and-tear, minor remodeling projects, and similar kinds of changes or problems.

This Building — The building has wood interior doors in several locations and wood trim with a stained and translucent finish in several locations in addition to doorways. Examples are the paneled curtain wall behind the chancel, the three former confessional areas (two in the transept walls and one inside the doorway to the west tower room now used as a coat room), the face, railing, and related elements of the choir loft, parts of the face of the organ, and the stairway up to the choir loft. The building also contains a built-in closet built of stained and natural-finished wood in the side vestibule and a large piece of stained wood furniture in the form of a vestry cabinet in the sacristy area. With the exception of the paneling and related wood in the backdrop of the chancel (which was restored after a 1984 fire), and the doors from the narthex to the sanctuary (which may have been refinished), the stained finishes on the original woodwork in the church are very dark, most likely much darker than they were intended to be as the result of periodic "clean-up" projects.

Floor Framing

This Building — In this building, the only wood-framed floors are in limited areas, specifically the second floor areas over the narthex leading to the choir loft and blower room. The wood floors are covered in rubber tile in most areas. They appear to be structurally sound, although they are also slightly "creaky." This is generally not a structural issue (it is most likely from slightly warped floor boards under the rubber tile). The choir loft is an exception, where the wood floor is part of a structural cantilever over an open space. The H.F. Lenz report suggested a limit of six people in the choir loft, and this should be posted and followed. Some of the spaces around the chancel have wood flooring on wood joists that rest on the reinforced concrete. These are the areas where the bottom of the reinforced slab is clearly visible in the ceiling of the mechanical room in the basement.

Plaster, Both Flat Plaster (Possibly Lime Based) and Decorative (Gypsum) Plaster

Building Material History — Until about 1900, most flat wall plaster in the United States was made from locally produced lime, made by burning limestone and/or seashells (whichever was most available in the area). Lime plaster is applied in several coats over lath or solid walls made of masonry or brick. The finish coat used more refined materials to achieve a smooth finish. Gypsum is a stone found in certain areas that can be ground to make a more refined plaster, especially for the final coat in a traditional, multi-layered finish. It is also much more suitable for casting than lime plaster. Plaster made from ground gypsum is often referred to as "plaster-of-Paris," because one place where abundant deposits of gypsum are found is in the vicinity of the French capital. As many people know from working with plaster-of-Paris, gypsum plaster dries very quickly, much more quickly than other kinds of plaster (lime plaster, by contrast, can take years to dry). Because of this and other properties, such as its very fine natural grain, gypsum plaster can be shaped (molded, sanded, etc.) to create very fine edges and intricate patterns. With improved transportation and discovery of new gypsum deposits in the United States, gypsum became popular as a plaster material especially around 1900 when there was a sudden demand for very delicate decorative plaster using pre-made castings.

Lime plaster has traits that worked well when plaster was directly applied to masonry exterior walls, without wood lath. It could be made to stick to rough masonry, and it is also very forgiving when condensation appears or when moisture leaks into the building. Lime plaster has a texture like pumice, and a small amount of moisture can migrate through it, finding its way and drying out without doing major or even noticeable damage. Gypsum plaster, on the other hand, is much harder and more brittle, and it can make very crisp edges, but it tends to dissolve when it comes into contact with even small amounts of water.

When plaster breaks down this way, the dissolving finish plaster tends to burst through the surface or through the paint in patterns that look like small blossoms, called "efflorescence" (Latin for "blooming"). Once this occurs, the only way to repair it is to dig out all the damaged plaster and replace it with new castings. Sometimes, the castings were installed on top of a base wall of flat lime plaster, and it may be possible to leave a larger percentage of the flat lime plaster in place while digging out and replacing mainly the castings, other decorative work, and any in-filled areas where gypsum plaster (or modern vinyl-based spackling compound) has been applied.

This Building — The way the plaster has failed in the side vestibule may be a clue to how different kinds of plaster were used in this building. The plaster has been affected by enough water that the surfaces are seriously damaged and large areas of paint have peeled away, particularly in the northwest wall of the lower section of the building, from the vestibule entrance to the ladies' room door. However, the wall itself, including the bulk of the plaster, appears relatively solid. The damage has left a crazed pattern of many zigzagging cracks in the plaster surface. This appears to indicate that lime plaster was used directly on the masonry, in the traditional way, possibly with a gypsum plaster finish, or with gypsum plaster used to fill fine cracks that developed over time. In other areas, such as the interior moldings at the tops of some of the windows, the majority of the plaster is definitely cast gypsum. In these locations, the plaster has been seriously affected by the moisture. The decorative work at the top of the window in the west corner of the sanctuary, for instance, has been almost dissolved into efflorescence. According to the 1984 church history, some sections of the cast plaster were recast and replaced in the 1978 project following the 1977 Johnstown Flood.[33]

Interior Paint
Building Material History — In most buildings of this era, the plaster was painted shortly after completion with several coats of oil-based paint. In churches and some other public buildings, it was common to add sand to the plaster or to one of the first paint layers to give the walls a stone-like texture. The sand is typically embedded in the paint, several layers beneath the surface. As the space is repainted, the texture becomes more subdued, but it typically affects the way the walls look for many years. It is difficult to match the sand-finish appearance when repairs are made, because the new work areas will typically not have as many layers of paint on them. In the last 40 years, many owners have switched to latex paint or other paint types, and this, too, affects the appearance as the layers build up over time.

This Building — It is not known at this writing how old the currently visible coat of interior paint is. According to the 1984 church history, the interior was repainted many times between the 1920s and 1983. Several dates are given in the book, for instance, for when blue paint and marbleized finishes were first used. However, the paint has failed in a few areas specifically because of efflorescence as the plaster got wet from leaks in the exterior envelope and/or from condensation. The top coat of the paint appears to be latex. The decorative scheme was to use an off-white shade for the majority of the surfaces, and to accentuate this with a smaller amount of blue, with small areas in gold or other colors. The paint has failed in a few places, but this appears to have been a result of age, impact, and other typical wear-and-tear factors in only a few places. In many more places, the damage is the result of moisture affecting the paint and/or the loss of the plaster beneath the paint to efflorescence caused by moisture.

Terrazzo
Building Material History — Terrazzo is a specialized kind of concrete using aggregate that produces color when ground, cut, and/or polished and using light colored cement or grout in a relatively thin layer. The material is cast in place with dividers, typically of brass, with the casting overfilling the spaces available. Then the top surface is ground down to the line of the bass divers, exposing decorative colors in the aggregate stones.

This Building — As mentioned elsewhere, the terrazzo has aggregate with at least two different tint colors, and the deeper color appears mainly in the side aisle areas, reflecting that it was installed in more than one campaign. The first floor surface around the pews was wood. The wood surface (or subsurface) would have provided a material appropriate to fastening the pews and kneelers. The terrazzo, which was first installed after the 1936 flood and repaired after the 1977 flood, is generally in good condition with only a few cracks. It does not appear to need repairs at present, but any future repairs should be made by a craftsman experienced with installing and matching this material.

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[33] *Immaculate Conception Church, Johnstown, Pennsylvania: 125th Anniversary, 1859-1984,* page 43-44.

Slate Flooring

This Building — Slate Flooring is an unusual material for the chancel area of a building of this age. It was installed in 1978.[34] The slate is in good condition and has a highly polished finish. However, there are large areas in the chancel that did not have this finish because of the way the altar was previously configured. Removal of the altar left unsightly areas of exposed wood, including some tripping hazards and some awkward narrow passages. It is likely that modifications will be made in these areas in the future They should be made by moving some of the slate where possible, and by infilling with a material that is not overly conspicuous. Removing all evidence of the altar would not be the goal, and adding an altar back in is not likely to be a goal either. However, this evidence of the building's history should be respected and preserved, in keeping with the *Secretary of the Interior's Standards*.

Rubber Tile floor (and/or Vinyl Asbestos Tile, or VAT)

Building Material History — Tile flooring made of rubber or a rubber-like composite (it is referred to as asphalt tile in the 1984 church history) became popular as an improvement on earlier linoleum flooring. Linoleum itself was an advanced variation on floor cloths, a kind of floor covering similar to rugs but made using a plain muslin base and painting decorative patterns on it. With linoleum, the factory-applied decorative paint coatings were thick, but they would eventually wear off. Some companies began making linoleum tiles around 1900, and then the idea emerged of using a material that was made in all one thick layer, so that the decorative pattern would not change as the material became worn down. This led to rubber-based tiles that had a marble-like vein in them. By the 1950s, some companies started using vinyl and adding asbestos to make the material fireproof. This product came to be called vinyl-asbestos tile, or VAT. The size and typical colors of the tiles also changed as a result of changing fashions. In the 1970s, when asbestos was outlawed as a carcinogen, the tiles dimensions and typical colors changed again just as all asbestos was removed from the products.

This Building — This kind of tile flooring is found in a few limited areas of the building, such as the landing at the top of the stairs to the choir loft. The tile was installed in 1950.[35] Based on the dimensions of the tiles, it is believed to be rubber tile without asbestos content. It is in good condition, but it needs to be maintained periodically by removing old wax and applying new wax layers.

Additional Building Materials and Related Considerations

In the spirit of the above information, it is appropriate to conclude by adding that the building contains many other materials, primarily at a smaller scale, that may merit further analysis in the future. This includes the specific kinds of glass, especially stained glass, and the specific metals used in the stained glass assembly. It also includes plumbing and electrical fixtures as well as hidden plumbing, and wiring. The building has some recently installed accessibility features not addressed in depth here. Some parts of the building may contain asbestos or other hazardous materials, though not in great quantities. The attic was designed to have ventilation by way of louvers and other similar features. There are also

[34] *Immaculate Conception Church, Johnstown, Pennsylvania: 125th Anniversary, 1859-1984,* page 40.
[35] *Immaculate Conception Church, Johnstown, Pennsylvania: 125th Anniversary, 1859-1984,* page 34.

special considerations as a result of the narrow space between the church building and the former rectory. These considerations involve a property line, an unusually narrow passage at the back of the former rectory, a shared concrete sidewalk that lies in the shade and has a drain that needs to be maintained to avoid rising damp and similar moisture-related concerns. The site also has a history of flooding, which may bring additional special considerations to the table. All of these topics may merit further study as other analyses are undertaken as specific projects are designed and implemented.

Priorities and Recommended Actions

Overview of Priorities

Based on all of the information collected and analyzed for the building, a series of priority action items were identified. Some of the items require lower relative costs and effort to complete, while others, such as roof and masonry repairs, will require a much greater effort and capital to execute. For each of the following recommended priority action items, a supporting written narrative is provided in this section of the report. The prioritization of the items is not fixed, but should be used as a guide to inform decision-making and especially the need for fundraising and capital campaigns. The emphasis of the prioritization focuses on the stabilization and conservation of the building; in essence attacking any item which if neglected will most likely lead to a further deterioration of the building and/or potentially compromise its ability to function as an attractive venue (and therefore jeopardize the building's primary revenue source for maintenance and its longevity).

A large percentage of the cost of many of the exterior repairs will be to access the uppermost portions of the building. The use of a crane and/or scaffolding will be necessary for workers to safely reach these areas. Since many of these separate action items are located in the same areas, cost savings can be anticipated by combining projects that could hopefully utilize the same scaffolding. Thought should be given during any fundraising to combine projects or portions of projects whenever possible.

Summary of Items in Order of Priority

Items Needing Immediate Attention:

A. Moisture Problems in the Exterior Walls of the Toilet Room/Vestibule Area and Roof (See #10, below)
B. Sections of Copper Roof Ridge Cap Are Missing or Damaged (See #12, below)

Items Requiring Ongoing Monitoring and Possibly Needing Attention Soon

C. Foundation/Wall Crack (See #1, below)
D. Bell Tower Wall Bulge (See #2, below)
E. Plaster Ornament at Choir Loft (See #4, below)

Items Requiring at least some Attention in the Next Three Years

F. Repainting Exterior Painted Trim (See #8, below)
G. Exterior Brownstone Trim Pieces (See #9, below)
H. Parapet Walls at Roof (See #11, below)

Smaller Items Needing Attention Soon, Perhaps in Combination with Other Projects

I. Missing or Dislodged Brick at Rear of Apse (See #3, below)
J. Crawl Space/Basement Ventilation (See #6, below)
K. Brownstone/Brick Masonry Damage at Fasteners (See #7, below)

L. Exterior Basement Concrete Steps and Landing (See #14, below)
M. Electrical Wiring in Belfry (See #15, below)

Larger Restoration Items Needed, but in a Larger Project
N. Ornamental Plaster Leaf Pattern around Windows (See #5, below)
O. Slate Roofing (See #13, below)

Description of Priorities, Actions and Estimate of Probable Costs

1. Foundation/Wall Crack: The foundation may or may not be reinforced concrete, and it may or may not have spread footings. The walls have cracked from the concrete foundation wall up through the bricks above the front door closest to the tower and also at the first window bay of the sanctuary. Essentially, the tower appears to be no longer connected to the rest of the building, although the floors are still aligned, the walls are still generally plumb, and the crack is old and not too wide (about 3/16 of an inch wide). The tower could still be connected by reinforcement in the foundation wall, or at the attic trusses, or other similar elements tying the building together. The crack is difficult to see in the crawlspace, because one has to crawl over 140 feet from the full height section of the basement to the corner at the base of the tower.






Crack in wall viewed from crawl space. Crack in wall viewed from area behind organ.

Action: The existing crack should be monitored to determine if there is only seasonal movement and to watch for other movement that may represent a more serious condition.

There are a couple of simple methods to monitor the crack. The first is to use a piece of tape (or just mark the wall) with horizontal and vertical marks drawn on each side of the crack. The distance between the marks is measured and noted. Changes can be recorded on a regular scheduled basis. The second method is to purchase a device like the inexpensive Avongard Crack Monitor - http://www.avongard.com. This device fastens to the wall spanning the crack and consists of overlapping acrylic plates with a crosshair grid that will display both horizontal and vertical movement. If there is no appreciable movement observed over time then the condition has stabilized but if movement is detected, a structural engineer should be consulted.

Estimate of Probable Cost: Avongard Crack Monitors are available directly from the manufacturer's website and are currently $17.00, each, plus shipping. They can be installed by staff at little cost using anchors or epoxy. If movement is suspected, the services of a structural engineer can be contracted to determine what additional measures will need to be taken.

2. Bell Tower Wall Bulge: Possibly related to the above condition, there is a slight bulge and out of level condition in the brick coursing, in the northwest wall of the tower's second stage (the room at the top of the first ladder but below the belfry) where it meets the main attic area. The bulge may relate to a repair (made in the last 30 years) on the opposite side of the same truss (first truss in attic) where concrete was poured in an area above the lower tower to reinforce the bearing wall for this truss. The area of the bulge in the tower is the opposite bearing point for the truss, and the other side of the wall is visible only from the catwalk in the attic. The area of brick around the steel truss is not neatly formed and could be causing the bulge by being laid improperly for carrying the required load. This area is not accessible except by climbing across the plaster ceiling; therefore further investigation was not performed. (Photos are attached). There may be some evidence from the photos of darkened areas of the underside of the roof at this point which may be an indication of current or past roof leaks at the flashing to the tower wall. Movement in this area could be causing both a structural problem and a moisture problem, and either one can greatly accelerate the other.

Interior of the tower first level below belfry.

  

Exterior wall of the tower from the attic, showing roof truss bearing condition.

 

Opposite end of same roof truss showing previous repair to bearing wall.

Action: The wall below the belfry should be monitored for further movement and other problems, such as moisture or disintegration of bricks due to movement and a crack opening up. It may be prudent in the future to engage the services of a structural engineer to evaluate this condition and follow any recommendations identified as necessary. The engineer or other personnel should check the site on a regular basis, possibly twice a year (based on a time of year when the temperature and humidity are high, and when the opposite weather conditions are present). The property should also be checked after periods of heavy or prolonged rain to look for evidence of moisture along the wall or the underside of the sheathing as well as any signs of movement at the cracks in the walls.

Estimate of Probable Cost: The wall can be monitored by staff for movement and the services of a licensed structural engineer can be retained on an annual and/or as needed basis to inspect this condition and report on any changes to the structure. This work could be performed on an hourly or lump sum proposal basis.

3. Missing or Dislodged Brick at Rear of Apse: The first photo taken from the attic shows the missing brick. It is not clear if there is a reason for this or if the brick has just become dislodged.

Interior View from Attic | Exterior View from Ally

Photos showing location of missing or dislodged brick at rear of apse.

Action: Investigate the condition from the rear of the building by the gutter to determine whether it is necessary to replace the brick or close off the opening. This could be a source of birds and/or bats. If there is a reason for the opening to remain, it should be screened to prevent animals/birds from entering.

Estimate of Probable Cost: The location of this issue is not easily accessible from either the interior or exterior. Unless it can be accessed by a ladder it should be combined with other work in order save money therefore no separate cost estimate is provided.

4. Plaster Ornament at Choir Loft: The plaster ornament at the corner of the choir loft is deteriorating and has pieces missing. The plaster was already broken when the current condition assessment project started in mid-summer 2014, but most of what is now missing (September 2014) broke free and fell out toward the end of the summer. The broken plaster may be the result of movement in the tower, as discussed above, or from the possible related water infiltration issues noted.

Plaster ornament in March 2013.

Plaster ornament on 7/30/14.

Plaster ornament on 9/18/14.

Action: The plaster ornament should be monitored closely for further damage and it should also be tested with a moisture meter to see if there is currently higher than normal levels of moisture present. Proper replacement of this ornament will require casting gypsum plaster to match intact details as they can be found.

Estimate of Probable Cost: Due to the highly specialized nature of decorative plaster work, an experienced plaster repair and restoration contractor should be retained to perform the work. An anticipated cost for this repair including recasting any decorative moldings would be in the range of $2,000 to $3,000 for this ornament.

5. Ornamental Plaster Leaf Pattern around Windows: The leaf ornaments in the interior window surrounds are expected to be especially complex castings when it comes time to repair them. The design is challenging, not only because the rounded surfaces are complicated in the straight runs, but also because they curve at the top. Also, in plan, they are more than half a circle in radius while, at the same time, they are engaged in the wall (this is likely to require an unusual type of mold for recasting). In almost all areas with this detail, the leaf pattern appears to have lost much of its detail due to the way thick layers of paint have been applied over the years, and possibly also due to chronic moisture issues. At one or two window openings, a larger percentage of the details have been lost more recently at the top of the window opening due to some combination of wall movement and cracks opening in the wall from the top of the window through to the exterior brick, eaves, and gutter areas. The moisture caused efflorescence, dissolving some of the plaster as it moved into the cracks from above and then migrated through the plaster itself.

View of plaster leaf moldings at windows.

Photo of example of damage to decorative molding.

Action: The moisture sources need to be analyzed carefully and completely solved. The exterior openings need to be sealed. Any work needed to assure that the roof edge, gutters, and other drainage elements are watertight should be undertaken as soon as possible. Spot pointing may be needed in exterior areas outside the windows where the damage appears. At some point in time, after the moisture problems are solved and the walls are completely dry, all gypsum plaster affected by efflorescence will have to be removed. The plaster in these areas will need to be replaced using castings made from molds taken from areas where the details are intact.

Estimate of Probable Cost: Due to the undetermined source of the moisture infiltration, a cost for the repair/restoration cannot be accurately estimated at this time. Once the moisture problems are resolved, an experienced plaster repair and restoration contractor can be retained to perform the work if desired.

6. Crawl Space/Basement Ventilation: A number of the ventilation grilles placed at the bottom of the exterior walls along the Third Avenue and the former Rectory sides just above sidewalk level have either been completely or partially closed up by their use as chases for pipes, etc. In at least one case, the grille is missing and the remaining opening has nothing to prevent birds or rodents from entering.

Crawl space vent partially obstructed.-Crawl space vent closed.-Vent open and properly protected by grille.

Action: Moisture migrating upward from under the concrete slab and crawlspace areas combined with any that has entered through the foundation walls can be reduced by proper cross ventilation. Re-establish the designed ventilation for the crawl space/ basement at the six places where ventilators were originally installed. This involves placing rodent-proof grates over the openings and addressing any seasonal issues (e.g., addressing how accumulated snow and ice outside the wall melts without causing excessive moisture and salt to enter the building). This may mean installing operable vents that can be closed off in the winter when humidity is much lower and opened in the warm months when moisture is present. Since piping for the current cooling system reduces the size of the ventilation openings, it might be appropriate to consider a design that involves forced ventilation such as a fan to keep the crawlspace area dry.

Estimate of Probable Cost: This work can be performed with volunteers or part of another project at a nominal cost.

7. Brownstone/Brick Masonry Damage at Fasteners: Metal fasteners inappropriately placed directly into the brick or brownstone have caused damage and spalling of the masonry.



Brownstone and brick masonry damage caused by inappropriate fasteners.

Action: Remove inappropriate fasteners anchored into the bricks or brownstone (at rain leaders, lightning rod cables, etc.) as soon as possible. Where absolutely needed, new fasteners should be placed in new holes drilled into mortar joints, with lead or plastic plugs to keep the fastener from placing pressure on the adjoining masonry. (The selection of locations should be directed by an architect.) The broken brownstone areas at current fastener locations should be repaired using a cementitious or similar filler material color-matched to the stone. There are similar spalls in the brick, but they are less problematic; the spalls larger than one square inch at bricks should not be filled with cementitious materials; new bricks may be needed instead. The work should be designed and directed by an architect, particularly in areas where the bricks have been damaged.

Estimate of Probable Cost: Some of this work can be accomplished from the ground level but there are additional areas high along the building face and parapets that will need to be repaired, most likely in conjunction with other work to maximize cost savings. No budget costs are provided at this time.

8. Repainting Exterior Trim: Almost all painted exterior wood or metal trim on the building needs to be properly prepared and painted. This includes the window trim, the basement window and door, all painted door jambs, the attic ventilators, any exposed eave areas (for instance, at the attic ventilation dormers), etc.


Photos of window trim and sill.


Photos of window trim and sill.

Action: Undertake a maintenance plan which includes a schedule for repainting these areas. Those items that are high on the building or roof will need to be contracted to a company that is properly equipped to handle the work.

Estimate of Probable Cost: The cost for work that can be reached from the ground, or from ladders or portable scaffold should be in the range of $10,000-$15,000. Painting the attic ventilation dormers should be included as part of other similar work in order to obtain cost savings for the setting of scaffolding/equipment so no estimate is provided at this time.

9. Exterior Brownstone Trim Pieces: There are areas where the brownstone trim, particularly at window openings, has deteriorated and pieces have delaminated and are missing.



Photos of damage to brownstone trim below and around windows.

Action: These areas need to be investigated to make sure they are watertight since it is possible that these are sources of moisture infiltration into the building. Missing areas of trim can be fabricated using cementitious materials and other broken pieces repaired with sealant. Loose pieces should be removed where they appear above shoulder height, especially in any area where there is a walkway directly below.

Estimate of Probable Cost: Budget costs for these areas will need to be determined on a case by case basis depending on location and complexity of repair. A specialized contractor like Raimondo, Inc. Masonry Restoration Contractors will need to be consulted to develop case by case or combined project estimates. They have past experience with this building doing repairs for the Diocese.

10. Moisture Problems in the Exterior Walls of the Toilet Room/Vestibule Area and Roof*:* There are three issues relating to the moisture problems in these exterior walls and all involve the roofing and flashing.

Problem #1: Moisture entering the exterior walls of the single-story toilet room and vestibule area is causing the existing plaster to effloresce, which is quite evident and represented in the photos below. At some point in the past, the last re-roofing over this area was performed with three-tab asphalt shingles and is at least the third roofing material to be located there. (Evidence exists of two previous installations of roof to wall flashing, which was located higher up on the wall.) Observation of the underside of this roof structure, from the access panel located over the Sacristy, indicates dark, water-damaged roof sheathing and rafters at multiple locations along this entire roof area. There is also some visible wood rot and at least one noticeable soft spot in the roof sheathing observed from above. This condition appears to be ongoing.

The single-story roof areas are estimated to be about a 4/12 pitch. Even though this is above the minimum slope requirements of shingle manufacturers, it is not steep enough to prevent the build-up of ice and snow, particularly against the higher wall of the main structure. Due to the orientation of the building, the snow and ice does not clear and poses a potential problem for ice dams when it builds up in the gutter and then backs up under the singles. Once it contacts the warmer air within, it melts and saturates the wall and portions of the adjacent roof. At the time of the shingle installation, the practice of installing an "ice and water shield membrane" may not have been available, so protection from this condition was limited. There is no ice melt or heat cable installed on the lower roof edge and gutter.


Photos of lower roof flashing to wall.


Photos of lower roof flashing to wall.


Photos of underside of roof sheathing from access panel above Sacristy.


Photos of underside of roof sheathing from access panel above Sacristy.


Photos of water damage to paint at exterior wall of restroom area.

Action: For this condition to be fixed permanently, the roof over this area should be replaced, including the roof sheathing and any damaged or rotten rafters, and a self-adhering "ice and water shield membrane" installed along the bottom perimeter of the roof and preferably under the entire roof as well. The flashing at the top of the roof to the wall should be replaced correctly at this time to correct the situation occurring there as well. It might also be prudent to install ice/snow melt cables in the gutter and roof edge for further protection. These cables can be operated by a sensor that automatically turns them on and off at a preset temperature condition.

A temporary fix/workaround may be just to install the cables at this time to prevent further damage. However, that will not be a suitable alternative to the complete replacement of the roof area as indicated above.

Problem #2: The high wall between the toilet room area and the Nave and Chancel/Apse (an exterior wall above the lower roof to which the top course of asphalt shingles is flashed) has potential for additional water infiltration due to conditions created by the last re-roofing project. New aluminum flashing was installed here when the lower roof was replaced. The original roof was flashed with copper that was properly inserted into the mortar joints of the brick, but the new asphalt shingle roof was not flashed in this manner. Instead, a wood 1x4 board was applied to the exterior face of the brick and covered with new aluminum flashing. The top edge of this flashing was then caulked against the wall. This is a less than preferred method and sometimes done so that it is easier for the roofer by avoiding cutting the new flashing into the brick joints. This system, however, relies entirely on caulking (sealant) to be the only means of keeping moisture from getting behind the aluminum flashing and into the structure. In addition to this, the two original layers of higher copper flashing were removed by either shearing them off at the face of the wall or by pulling them from the joints, resulting in open "slots" that have not been sealed or re-pointed. Melting snow or ice contacting the brick here can then penetrate into the wall and eventually migrate into the plaster surfaces.

Action: The newer flashing should be properly replaced with flashing that is installed into the joints of the brick and is higher above the roof against the wall. The brick joints where the original flashing was installed should be cleaned up, and any pieces of original flashing should be removed. The joints should then be re-pointed to close up the areas that are currently open, or, as a less-than-preferred alternative, properly sealed with caulking.

If the existing roof is to remain at this time, the flashing should be completely resealed and checked periodically as part of a scheduled maintenance plan for the roof. This is not a long-term solution, however, to the proper replacement of the flashing.

Problem #3: The copper downspout from the higher roof gutter to the top of the lower roof is severely deteriorated, resulting in water running down the face of the brick and on the roof surface against the adjacent flashing.

Action: The existing downspout should be replaced with a new copper fabrication that is extended where the elbow contacts the roof to clear the adjacent wall. As a possible temporary or less expensive option, a downspout could be fabricated from another metal to replace the existing. (This may be desirable if there is concern of copper theft where it is easily accessible.) Careful attention should be paid to the type of material used since dissimilar metals can cause corrosion unless they are properly separated. Copper will react with aluminum, causing it to deteriorate over time.

All downspouts should be inspected and repaired/replaced as required to prevent further water infiltration issues.

Estimate of Probable Cost: Working with Major Builders, Inc., an estimate was developed for replacement of the asphalt shingle roof, sheathing, underlayment, and flashing of the lower roof over the restroom areas only. This project should address the three problems noted above. The cost is estimated to be approximately $11,000 and the project is currently underway. It does not include the installation of ice/snow melt cables at this time.

11. Parapet Walls at Roof: There is some deterioration of the parapet wall and coping (extending above the roof) at the front building wall. This was observed from the tower belfry and documented in photographs taken recently for this report. The rectory side was not visible and should be checked as well. Damage consists of spalling and deteriorating brownstone, mortar joints in poor condition, and flashing that needs to be repaired/replaced. There is also damage to the brownstone from fasteners used for the lightning protection system. Eliminating the possibility of water infiltration in these areas is important for protecting the interior of the building from future damage.


Photos of front parapet wall from tower belfry.

Action: Working on these areas will be difficult and require scaffolding and/or work from a crane. The brownstone coping needs to have any loose material removed and to be repaired/re-pointed where required. The copper step and counter flashing should also be checked and repaired/replaced if necessary. During the coping and flashing repair, some roofing slates will be lost to damage and will need to be replaced along with those already damaged or missing.

Estimate of Probable Cost: Working with TMR Roofing, a budget was developed for replacement of the stepped flashing along the front (Broad Street) gable parapet using 16 oz copper to match existing. Slates will be removed to install the flashing. Any slates along this parapet that are currently damaged, missing, or that become damaged during the installation of the new copper stepped flashing will be replaced. It is estimated that up to 35% of the slates affected by this repair will need to be replaced. The cost for this work, including supplying and setting up all necessary equipment is estimated to be approximately $106,000 with an additional $5,600 for each of the two towers flanking the Broad Street facade. There could be a cost savings for using aluminum flashing in lieu of the current copper in the range of $2,500 to $3,000. A large portion of the cost of this repair is related to setting up scaffolding to access the large area. The repair costs are only for the copper flashing replacement and there may be additional costs required for any brownstone repairs and re-pointing that are deemed necessary.

There are also gable roof sections facing Third Avenue and on the side facing the former Rectory (the end walls of the transept). The cost for replacement of the flashing along the parapet and stepped flashing at the roof is approximately $18,600 for each of the transept gables in copper. There could be a cost savings for using aluminum flashing in lieu of the current copper in the range of $500 per gable. Slates will be removed to install the flashing. Any slates along this parapet that are currently damaged, missing, or that become damaged during the installation of the new copper stepped flashing will be replaced.

These budget costs assume full replacement of the flashing and there could be some savings realized if not all the flashing material needs to be replaced.

12. Sections of Copper Roof Ridge Cap Are Missing or Damaged: At least three of the copper ridge cap sections are missing, including one section on the Third Avenue side and at least two sections on the Rectory side. Limited observation (due to limitations to access) in the attic area revealed only a small amount of water infiltration below the missing section on the Third Avenue side, mostly confined to a small disturbed area in the insulation on the ceiling directly below the missing roof cap. It was not wet at the time of visit.


Photos of missing ridge cap section from tower belfry.


Photos of missing ridge cap section from tower belfry.

Action: While missing sections of ridge cap may not be a major source of water infiltration, they should be replaced as soon as possible to prevent any further pieces from becoming loose due to wind catching the edge of the adjacent cap sections. If the remaining flashing is attached and in acceptable condition, the missing sections can be replaced with copper to match, or if another material is desired for cost saving purposes, the entire ridge should be replaced to prevent deterioration of dissimilar metals. If the entire ridge cap is to be replaced, copper would still be the preferred material, following the original design and material choice, but another metal could be used if there was a strong cost benefit for it.

Estimate of Probable Cost: Working with TMR Roofing, a budget was developed for replacing the entire copper ridge cap of the main building using 16 oz. copper to match the existing. The work would be done by crane in the winter months when it was available and not designated for roofing work. Any slates at the ridge that are currently damaged or that become damaged during the installation of the new copper ridge cap will be replaced. The cost for this work is estimated to be between $30,000 and $35,000. If you were to choose bronze painted aluminum in lieu of the copper for the entire ridge cap there would be an approximate $2,200 savings.

The cost to replace only the existing sections that are missing, according to the installation described above, would be approximately $10,000 in copper (copper would be necessary in a partial replacement project in order for the metals to be compatible. Combining copper and aluminum would cause corrosion with the possibility of the aluminum failing in a short period of time.)

13. Slate Roofing: The roofing slate has been repaired years ago with a different slate that is lighter in color, and these areas are scattered over most of the roof. Based on what can be observed of the roofing slates looking out through openings in the tower belfry level and by photographs, there does not appear to be widespread deterioration of the slates. The slate does not appear to have the signs that the original material as a whole is about to fail due to age (such signs are typically fading color, flaked surfaces, a large number of cracked slates, etc., all appearing from uniform wear, but this does not appear to be the case here). There are, however, specific areas that should be addressed, such as places where individual slates are loose or missing, or where the main roof peak meets the front parapet wall. The flashing where the roof meets the towers should be checked, since there is some evidence of water staining on the underside of the wood and bricks under this part of the roof as indicated in a previous section of this report. This may have been repaired at some point in the past or may be a recurring problem.

Photos of slate roof.

Action: One cannot predict the remaining life of the slate with any degree of certainty. Different slate quarries produced roofing slates in varying degrees of quality. It is important to have the roof slates, ridge cap, and flashing inspected annually by a qualified slate roofer. The nails should also be checked to determine their condition. Repair or replace any loose slate with a close match to the original in shape, size, and color.

Any roofing slate replacement, either in limited areas or by complete re-roofing will be an involved process due to the height and slope of the roof. Scaffolding (or possibly a crane) will need to be used to access all the areas of the roof. Since this will also affect the flashing and other related items, it might be most effective to combine needed work into one project to help offset some of the costs associated with performing the work piecemeal, such as the need to repeatedly set up and move scaffolding.

Estimate of Probable Cost: It is not possible to determine or predict the amount of slates needing repair at any given time; therefore the cost for spot repairs should be considered in conjunction with other projects where possible. Repairs may be made using a crane or scaffolding erected to the lower edge of the roof and then ladders laid upon the roof to the peak depending on the location and circumstances.

The cost to install a complete new or synthetic slate roof of this size and difficulty will be quite large. Asphalt shingles with similar slate look profiles are available and may be considered as a less expensive alternative for material costs. The installation of asphalt shingles, while less labor intensive still requires the same effort to reach the roof as real slate, and a large portion of the cost will be in the equipment. It will be necessary to work with an experienced roofing contractor that has the capability to perform this work to get an accurate estimate of re-roofing costs should the need arise.

14. Exterior Basement Concrete Steps and Landing: There is a layer of moss and debris on the basement stairs and landing. This is creating a condition where water is standing on the concrete and it is not drying out. Eventually the concrete will deteriorate, especially from freeze/thaw conditions, and will require repair/replacement.

Photos of exterior basement stairway.

Action: Remove moss and debris and clean the concrete surfaces. Determine if there is a drain in the bottom stair landing and reopen it if possible. Keep an eye on the condition of the concrete in this area as it likely to need to be replaced in a few years.

Estimate of Probable Cost: This work can be completed by volunteers or at a nominal cost in conjunction with other projects. If removal of moss and debris reveals concrete that is in need of repair, an estimate can be obtained for this work after the surfaces are more clearly visible than they are now.

***15. Electrical Wiring in Belfry*:** Electrical wiring and receptacles located in the belfry level do not meet code and are not sufficiently weatherproof for the environment in which they are located. It is not known what circuits are currently live and outlet boxes and cable are not permanently fastened to the wall. The junction boxes also do not have covers and are exposed to weather.


Photos of exposed wiring in belfry level.

Action: Fasten all electrical cable and boxes to wall and install weatherproof box covers and GFI receptacles. Remove any wire or conduit that is no longer being used. Seal penetrations in floor to prevent water from leaking to floor level below.

Estimate of Probable Cost: A licensed electrician should be consulted to determine if any of the wiring is still being used and to provide an estimate to repair these electrical issues according to code.

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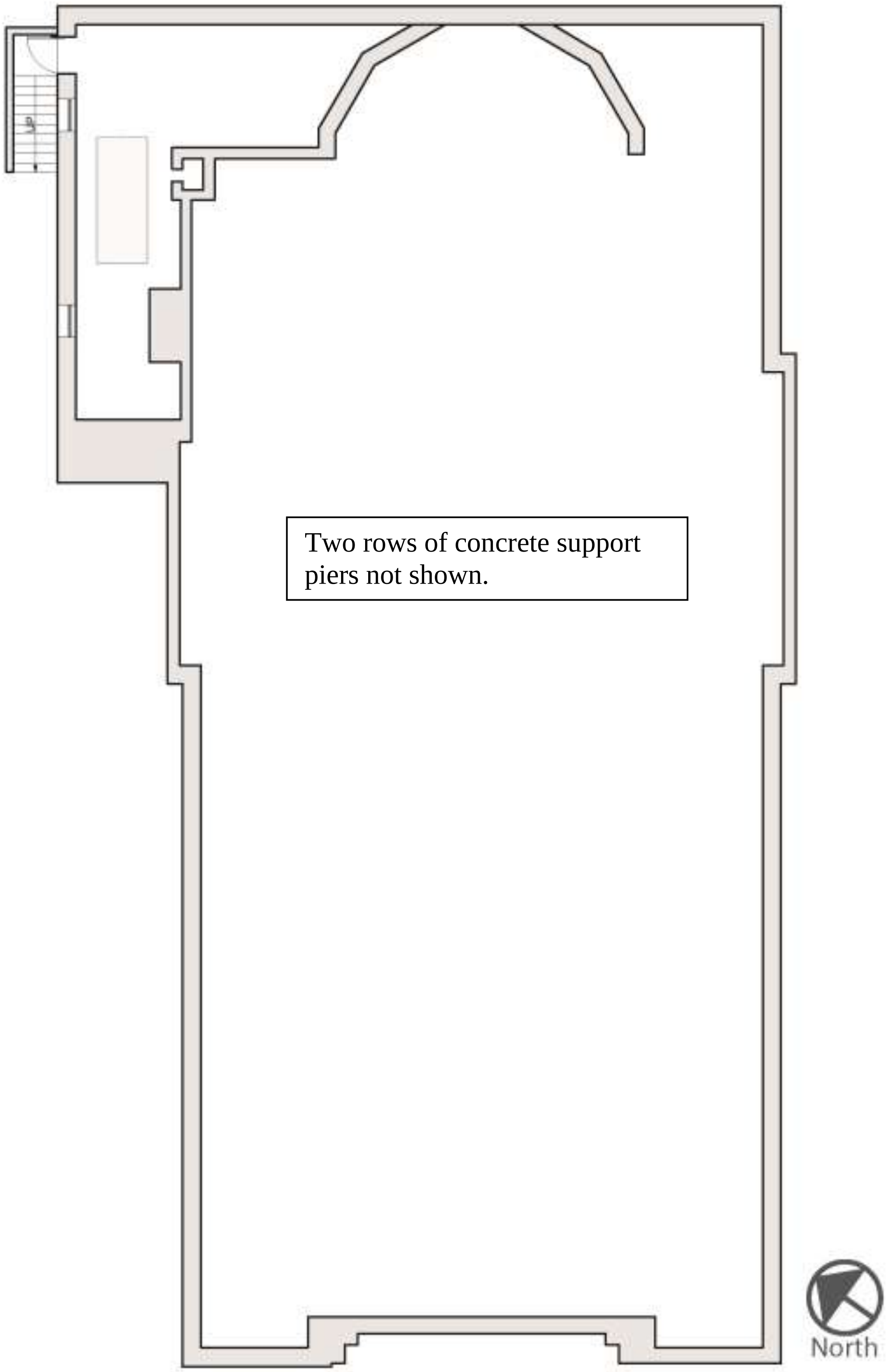
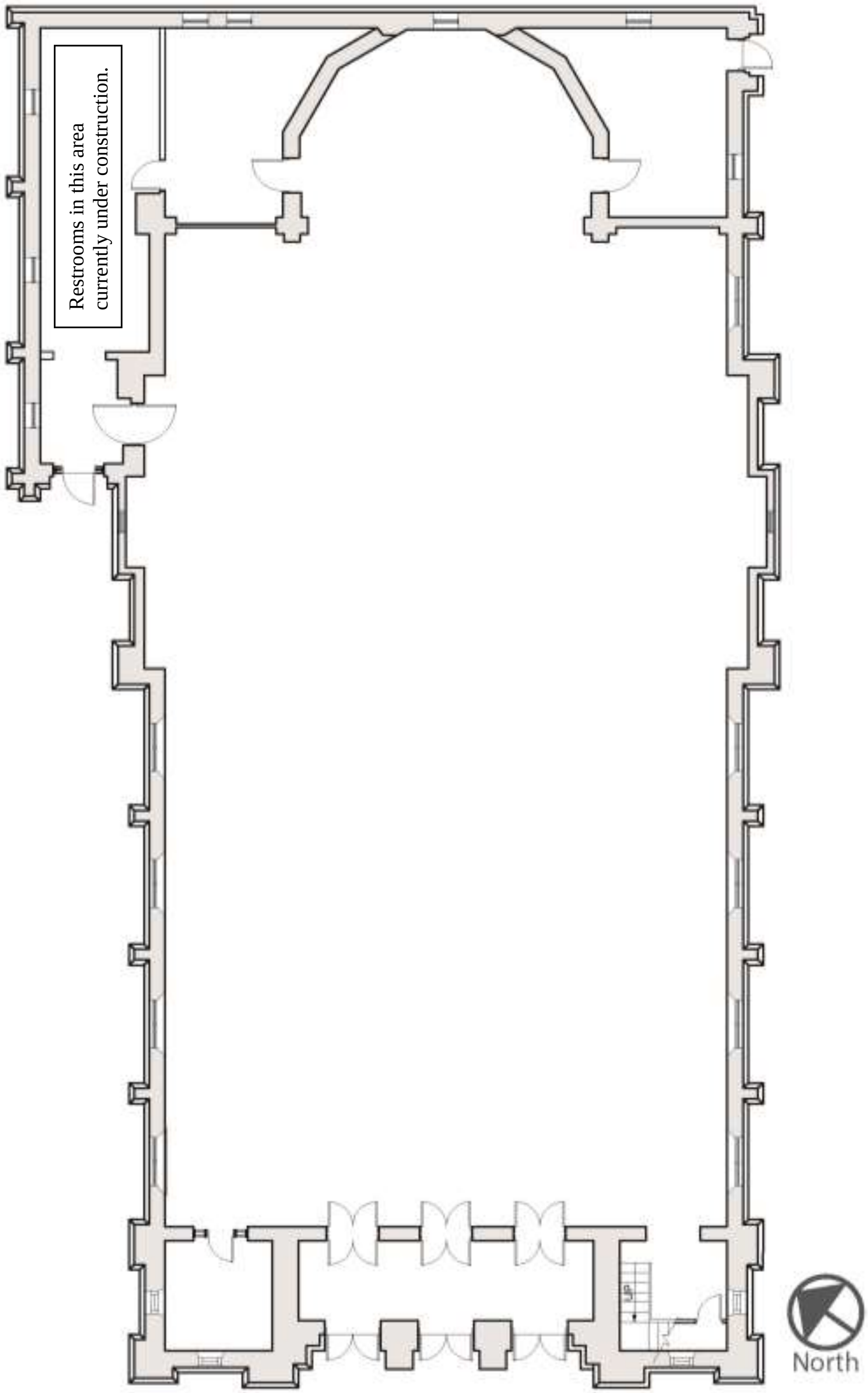
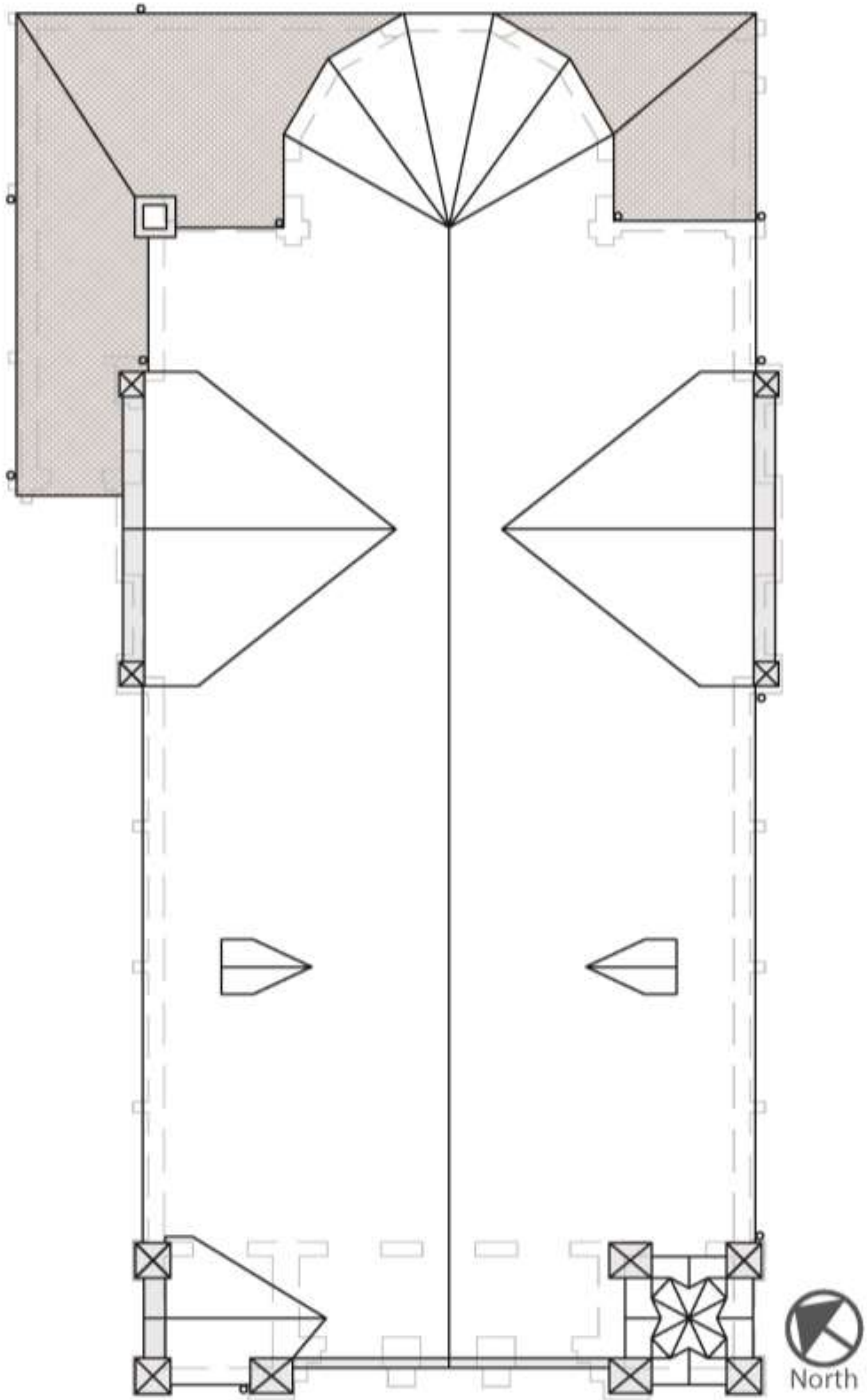


Basement Plan
Scale: 1/16" = 1'-0"



First Floor Plan
Scale: 1/16" = 1'-0"



Roof Plan
Scale: 1/16" = 1'-0"

Resource Information

This section of the report is set aside as a place for additional information on specific historic materials and how to care for them.   Think of it as an expandable appendix.

The section begins with a copy of the Secretary of the Interior's *Standards for Rehabilitation* and *Standards for Restoration*. These are the federal guidelines that apply to publicly funded or publicly licensed/regulated activities regarding historic properties. They are part of a longer document known as "*The Secretary of the Interior's Standards for the Treatment of Historic Properties (1995)*." The *Standards* outline four "treatments," including "reconstruction" (in which a building that is completely missing is recreated) and "preservation" (simply safeguarding against additional decay, without adaptation to a use, what people often call "mothballing"). The *Standards for Restoration* are for taking a building back as close as possible to how the property was at a specific moment in time in order to interpret that time, typically for a museum use or some other kind of interpretative use or study. The *Standards for Rehabilitation* allow the owner to adapt the building design to new uses (e.g., by adding new amenities, like restrooms or a kitchen, in out-of-the-way areas) without destroying the essential historic characteristics. The *Secretary's Standards* are issued by the National Park Service (NPS) and can be accessed at the NPS web site: http://www.cr.nps.gov/local-law/arch_stnds_8_2.htm. Accessing them online allows the user to review related guidance documents that the NPS also has posted on their web site. For instance, the NPS has a companion piece called the *Secretary of the Interior's Guidelines for Historic Preservation*, giving examples of what to do and not to do, in keeping with the *Standards*. (The site also contains *Standards for Professional Qualifications*, etc.)

Another kind of resource posted online by the National Park Service is a series called the "Preservation Briefs." They can be accessed online at: http://www.nps.gov/tps/how-to-preserve/briefs.htm. The series has been expanded gradually, and it now contains 47 different publications that cover the appropriate care of at least that many different historic building materials. A list of the most applicable Preservation Briefs available at the NPS web site is on a special page, below. The NPS also has a similar series more centered on case studies, called "Preservation Tech Notes." Other information has been developed by the Association for Preservation Technology (APT). These sources may cover some materials that the Preservation Briefs have not addressed.

Keeping a Copy On-Hand

The team would like to suggest that a copy of this report be placed in a three-ring binder and kept on hand at the building. Guidance documents, such as the Preservation Briefs, can be inserted into this Resource Information section as the need develops. Other things that might also be inserted include construction estimates or proposals, actions recommended by contractors, code officials, or others, hazardous materials reports, pest control reports, copies of maintenance manuals for built-in equipment, warrantees for construction work or equipment, security systems information, and similar documents. Think of this copy of the report, along with the attachments, as the equivalent of a hospital medical chart, with the building in the role of the patient.

Standards for Rehabilitation

(These apply to the building in any adaptation to a new use involving adding new amenities, especially in out-of-the way areas, while retaining or restoring key "character-defining features" of the most visible, or "primary," parts of the design.)

1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.

2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.

3. Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.

4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.

5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.

7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.

10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

Standards for Restoration

(These would be applicable if the building were to be presented as a museum, depicting a particular moment in the past and using it to interpret or represent that period in time. Reading through these Standards *may also help board members and staff in any situation where they are unsure whether the right concept for a given project, or for all future treatment, is* "Rehabilitation" *or* "Restoration," *since the* Standards *define a range of appropriate work for each kind of project.)*

1. A property will be used as it was historically or be given a new use which reflects the property's restoration period.

2. Materials and features from the restoration period will be retained and preserved. The removal of materials or alteration of features, spaces, and spatial relationships that characterize the period will not be undertaken.

3. Each property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate and conserve materials and features from the restoration period will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.

4. Materials, features, spaces, and finishes that characterize other historical periods will be documented prior to their alteration or removal.

5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize the restoration period will be preserved.

6. Deteriorated features from the restoration period will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials.

7. Replacement of missing features from the restoration period will be substantiated by documentary and physical evidence. A false sense of history will not be created by adding conjectural features, features from other properties, or by combining features that never existed together historically.

8. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

9. Archeological resources affected by a project will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

10. Designs that were never executed historically will not be constructed.

Preservation Briefs

The Preservation Briefs most likely to be applicable to the Grand Halle (former Immaculate Conception Church of Johnstown) Building are as follows:

(The Preservation Briefs may be accessed online at this address: http://www.nps.gov/tps/how-to-preserve/briefs.htm)

1. *Cleaning and Water-Repellent Treatments for Historic Masonry Buildings*
2. *Repointing Mortar Joints in Historic Masonry Buildings*
3. *Improving Energy Efficiency in Historic Buildings*
4. *Roofing for Historic Buildings*

10. *Exterior Paint Problems on Historic Woodwork*

15. *Preservation of Historic Concrete*
16. *The Use of Substitute Materials on Historic Building Exteriors*
17. *Architectural Character — Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving their Character*
18. *Rehabilitating Interiors in Historic Buildings — Identifying Character-Defining Elements*

21. *Repairing Historic Flat Plaster — Walls and Ceilings*
22. *Preserving Historic Ornamental Plaster*

24. *Heating, Ventilating, and Cooling Historic Buildings: Problems and Recommended Approaches*

28. *Painting Historic Interiors*
29. *The Repair, Replacement, and Maintenance of Historic Slate Roofs*

32. *Making Historic Properties Accessible*
33. *The Preservation and Repair of Historic Stained and Leaded Glass*

39. *Holding the Line: Controlling Unwanted Moisture in Historic Buildings*

43. *The Preparation and Use of Historic Structure Reports*