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July 17, 2020

Mr. Paul Steinke
Executive Director
Preservation Alliance for Greater Philadelphia
1608 Walnut Street, Suite 1702
Philadelphia, Pennsylvania 19103

Review of Proposed Demolition

St. Laurentius Church
1600-06 East Berks Street, Philadelphia, Pennsylvania
WJE No. 2015.3217.1

Dear Mr. Steinke:

At your request, Wiss, Janney, Elstner Associates, Inc. (WJE) has reviewed the proposed demolition of St. Laurentius Church, located at 1600-06 East Berks Street in Philadelphia, Pennsylvania. The subject building was constructed from 1885 to 1890 and is listed on the Philadelphia Register of Historic Places. A demolition permit application, dated July 2, 2020, is currently under review by the Philadelphia Historical Commission. WJE reviewed the application and other available documents and made observations at the exterior of the church on July 9, 2020.

WJE's review focused on the Brief Description of Work on the application, "Demolition of building due to imminent collapse of steeples," which embodies two assertions: (1) that collapse of the steeples is imminent, and (2) that mitigation of this risk requires demolition of the entire building. Each of these assertions is discussed separately below, following a description of the structure and background information.

Description of Structure

The main portion of the church is rectangular in plan, approximately 60 feet wide (facing East Berks Street) by 120 feet long (along Memphis Street), with its long axis oriented roughly north-south. Most of the building is covered by a steeply sloped gable roof with slate shingles, except at the northeast and northwest corners, where masonry towers approximately 20 feet square rise above the gable and terminate in wood-framed, copper-clad steeples with a maximum height of about 135 feet.

Exterior walls supporting the main gable roof are of mass masonry construction, with an outer wythe of brownstone over random schist rubble backup. The exterior walls of the towers are of similar construction up to the watertable that roughly aligns with the choir loft. Above the watertable level, the exterior walls of the towers are mass masonry shells surrounding structurally independent timber framing that supports the tower floors, bells, and steeples. The lowest level of each timber frame aligns approximately with the watertables, below which the loads they carry are transferred into the exterior masonry walls.

Document Review

The demolition permit application includes a June 14, 2020, report by the Harman Group, and a July 2, 2020, report by Thornton Tomasetti (TT). The findings of these reports are discussed in this and the following sections. Both refer to previous reports by five other engineering firms dating back to 2013.

Of the referenced reports, two by O'Donnell & Naccarato Structural Engineers (O&N), dated October 14 and December 24, 2013, and one by Ortega Consulting (Ortega), dated April 28, 2014, were also available for WJE's review. A series of six reports by Joseph B. Callaghan, Inc. (JBCI), dated between July 28, 2016, and February 12, 2019, and a report by Structural Design Associates, dated December 16, 2019, were not available for our review but are summarized in the TT report. The Harman Group report also lists a seventh report by JBCI, dated July 10, 2019.

The first O&N report indicates that exterior masonry distress, including vertical cracks of up to 1-1/2 inches in width at the towers, existed as early as 2013. This report recommends various short-, intermediate, and long-term exterior repairs. The second O&N report presents three options for the towers—reconstruction, demolition, or stabilization—in conjunction with exterior restoration, as well as a fourth option for demolishing the entire church.

In summarizing the Ortega report, TT states, "Mr. Ortega notes that more studies are required but confirms that the building is dangerous, recommends shutting the building and confirms the need to demolish towers." TT's summary is not consistent with the Ortega report, which does not itself conclude that the building is "dangerous," which states that Mr. Ortega "was first contacted … after the Chuch had been closed," and which states that "there is not yet sufficient information … to make an informed decision as to the best course of action." The Ortega report recommends further evaluation of the temporary stabilization option presented by O&N, noting that "the cost should be significantly less" than estimated; the demolition option "requires more study" and its estimated cost "seems low." It is unclear how TT interpreted this language to indicate that Mr. Ortega found the building to be dangerous.

Of the seven engineering firms producing reports, only JBCI seems to have produced multiple reports based on multiple site visits over a period of several years (i.e., 2016 to 2019). Based on summaries in TT's report, the JBCI reports in 2016 and 2017, like the Ortega report, also recommended further study and monitoring. Monitoring efforts that were later undertaken by JBCI included two three-dimensional laser scans: a baseline scan documented in their March 6, 2018, report and a second scan documented in their February 12, 2019, report. According to TT's summary, comparison of the two scans "found no significant movement," the significance of which is discussed below. JBCI's January 29, 2019, report documents exterior repair and stabilization efforts performed after an area of brownstone veneer fell from the northwest tower onto the sidewalk protection.

WJE also reviewed a letter from David Perri, PE, of the Philadelphia Department of Licenses and Inspections (L&I) to Jon Farnham of the Philadelphia Historical Commission, dated July 9, 2020. This letter confirms that "L&I has not yet downgraded the building to 'Imminently Dangerous' nor ordered partial or complete demolition," expresses concern about the impact of freezing weather in the coming winter, and concludes that "Work on the towers to stabilize or deconstruct to a safe height must commence quickly."

Discussion of Risk of Collapse

The *Philadelphia Building Construction and Occupancy Code* does not define the phrase "imminent collapse." However, the word "imminent" is not without meaning in common or engineering parlance. As Merriam-Webster defines "imminent" as "ready to take place," "imminent collapse" is generally understood to mean that collapse could occur at any time and without warning.

The Harman Group report does not use the phrase "imminent collapse." Instead, it assigns numerical probabilities to the collapse of portions of the towers within 3- and 10-year timeframes without providing any scientific basis for calculating those probabilities. Regardless of whether such probabilities could be calculated with a reasonable degree of engineering certainty, stating that collapse has some numerical probability within three or ten years does not communicate that collapse is imminent. Yet, TT incorrectly restates the Harman Group's conclusions as "the towers in their current condition pose a threat of imminent collapse." TT's statement that they "cannot confirm the timeframe stated in the [Harman Group] report" also does not support the conclusion that collapse of the towers is imminent.

WJE also notes the following:

- Exterior masonry distress, including vertical cracks of up to 1-1/2 inches in width at the towers, has existed since at least 2013. Although the cracks are highlighted as a structurally significant condition in subsequent reports, the reports reviewed by WJE do not include any monitoring results to confirm that crack widths have increased over time.
- The northwest tower remained standing despite an area of brownstone veneer falling in January 2019, confirming that the towers' exterior masonry shells have reserve capacity, i.e., they can continue carrying loads despite a reduction in thickness.
- Laser scan monitoring by JBCI in 2018 and 2019 did not indicate any significant movement.
- Repair mortar installed in January 2019 has likely slowed the rate of water infiltration to the interior of the masonry. Furthermore, repair mortar applied over large cracks has not re-cracked as of July 2020, confirming that there has been no significant movement at these locations.

Based on the absence of recent significant increases in distress or movement, it does not appear that collapse of the towers is imminent.

Discussion of Required Scope of Demolition

The Harman Group report is explicitly limited to the towers. Of the reports summarized by TT, only the Structural Design Associates report (not available for our review) appears to recommend demolition of the entire church. Both the Harman Group and TT reports include statements regarding the north facade between the towers, but neither recommends demolishing the remainder of the church.

Based on our document review and site observations, WJE is unable to discern an engineering basis for the applicant's statements that mitigating risks presented by the towers would require demolition of the entire church. WJE has been involved in other projects (most notably St. Anne's Church in Waterbury, Connecticut) where buildings have been returned to safe occupancy following deconstruction of masonry towers. All documents reviewed by WJE, including the letter from L&I, focus on the towers and consider

possibilities other than demolishing the entire church. This is consistent with our observations that the main portion of the church is in generally good condition, with only localized exterior masonry distress, and without any visible global distress such as distortion of the ridge or eaves of the gable roof.

Given the constraints of an urban site on narrow streets and the height of the towers, it is likely that their partial or total removal would require scaffolding access for hand demolition and temporary bracing to maintain structural stability. However, it is also likely that the scaffolding and bracing required for further investigation and development of longer-term stabilization measures would not be significantly different and could be left in place for an extended period of time for a small increment of cost. For example, an engineered scaffolding system connected by inclined rakers to temporary precast concrete weights placed in the street could provide both access and bracing for a range of options including deconstruction, longer-term stabilization, or reconstruction of the towers.

Conclusions

It is WJE's opinion that the current condition of the church's exterior masonry warrants action to mitigate risks to public safety. Prudence dictates that such action be taken quickly, just as potential falling hazards from any other building subject to Philadelphia's facade ordinance are required to be addressed quickly.

It is also WJE's opinion that collapse of the towers is not imminent, and that mitigating any risks that might posed by the towers does not require demolition of the entire church. Falling hazards could be mitigated more quickly and responsibly by erecting temporary stabilization for the towers, which could be completed in a matter of months. This would address L&I's concern about the coming winter while also allowing time for a more detailed evaluation and comparison of costs for options such as deconstruction, longer-term stabilization, or reconstruction of the towers. If deemed necessary once close-up access is permitted by scaffolding, some degree of weather protection could also be incorporated into the scaffolding system to limit deterioration from continued weather exposure.

The findings and opinions presented in this report are based on WJE's review of available documents, limited site observations, and previous experience with the evaluation of similar structures. This report may be amended or supplemented based on additional information made available to WJE.

We appreciate this opportunity to provide our professional services. Please do not hesitate to contact the undersigned if you have any questions.

Sincerely,

WISS, JANNEY, ELSTNER ASSOCIATES, INC.

Justin M. Spivey, PE, APT RP
Senior Associate