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**170 – 176 Second Avenue North Buildings
Nashville, Tennessee**

The removal of the heavily damaged portions on the 2nd Avenue side of the buildings at 170, 172, 174, 176 is almost complete as part of the Phase 1 demolition permit. Unfortunately, as the removal and clean-up process has progressed, more damage to the structure has been revealed. On May 25th we met at Building 176 with Bill Fay and George Guckert of Tiny's Demolition and they demonstrated the instability of the wall facing 1st Avenue. The wall has a noticeable bow in the middle of the wall and there are signs of separation from the structure, and the wall could be displaced by simply pushing on it. The wood floor joists are parallel to the wall, however, there is a steel beam at midspan that supports the floor joists that is bearing at midspan of the wall and it appears that the steel beam is bearing in a pocket of the multi-wythe brick. It is possible that the steel beam may be helping to hold the wall in place, however, with the current eccentricity in the wall, and the vertical load applied to the wall, its structural integrity is a real concern. Once the instability of this wall was realized, 1st Avenue in the vicinity of the wall was closed to traffic in the interest of public safety and a fence has been erected. I observed the condition of the wall today, and likely due to the recent rain, some bricks have come loose from the wall at the lower level.

At the on-site meeting of June 7th, we were informed by Tiny's Demolition that a similar condition exists at the 1st Avenue wall of Building 174. I observed the condition of the wall today from inside the building at each level. The condition of the wall is not as severe as the wall of 176, but there is a crack between the demising wall of 176 and the east wall of 174. The brick and mortar in this corner have deteriorated and this is the location where the downspout is missing, which is likely contributing to the condition. Building 172 is the short

building, and the east wall facing the courtyard was heavily damaged from the blast and also has a distinct bow in the middle of the wall. At my visit today, this wall has collapsed more at the upper level and continues to move outward to the east. The east wall of 170 appears to have been reconstructed or repaired fairly recently which is evident from the difference in the color of the mortar. This wall appears to be tied to the floor system and there is no visible lateral movement. The north wall of 170 that faces the courtyard has some slight visible separation from the building and the mortar in some areas of the wall appears to be relatively soft.

The on-site meeting on June 7th included several representatives of Metro Nashville and the question was raised of how to mitigate the danger of these unstable walls, especially with the 4th of July celebration only about four weeks away.

When we first looked at these buildings very soon after the bombing it was hoped that we could remove the obviously damaged portions, and then the remaining structure could be repaired and renovated. However, at that time there was a lot of debris covering the floors and against the walls, and the damage to these century old structures was not apparent. Now that they have been cleaned out to some degree, the actual damage to the structures is becoming more apparent. The structural integrity of the loadbearing multiwythe brick walls is one of the major concerns. The mortar in these walls that bond the brick together has always been an issue when renovating these buildings on 2nd Avenue. As is common for walls of this age, the strength and integrity of the mortar is variable and can vary greatly even in the area of a single wall. This is most likely due to how the mortar was originally mixed, and the environmental conditions that they walls have been exposed to over many years. As Tiny's Demolition was removing some of the walls that had become unbraced, the mortar was so weak that they were actually able to remove large portions of the wall with a hand-held shovel.

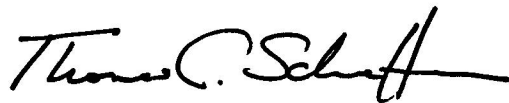
Public safety is the primary concern of everyone currently involved, and at this time it appears that the most expedient method to eliminate the potential for failure of these walls on the 1st Avenue side may be to demolish these walls and the structures they support, saving the brick as much as possible for future reuse. As mentioned above, the Phase 1 demolition is almost complete, and except for the walls on 1st Avenue, for the most part what is remaining is temporarily stable. However, the brick wall between 170 and 172 is badly out of alignment and continues to partially collapse as the removal of the damaged structure it supports has progressed, the east wall of 172 continues to move and collapse, and the condition of the east wall of 176 has worsened.

A lot of the structure is now visible and although what remains is somewhat stable, it has become apparent that if the building is to be renovated, most, if not all, of the structural floor members will have to either be removed or strengthened in order to comply with the load requirements of the current Building Code. Also, either cast-in-place concrete or concrete masonry shearwalls, or structural steel frames will be needed to resist the Code required lateral loads due to wind and earthquake forces. In addition, if any of the loadbearing brick walls are to remain, it is recommended that a historic structural brick

specialist be contracted to inspect and perform material tests of the brick and mortar to determine the integrity and structural capacity of the walls. This process could take several months and the outcome of the tests may still likely require the removal and reconstruction of all or portions of the walls. And, in the interest of safety, before any of this testing takes place, temporary shoring and protection structures should be constructed adjacent to these walls to protect the public and the adjacent properties in the event of a full or partial collapse of the masonry walls. It is due to the amount of time and expense involved to accomplish all of this and the urgency with opening up the streets and the 4th of July festivities, that it appears that the most urgent solution may be to demolish the structures and rebuild.

Also, at the on-site meeting of June 7th we were asked to develop a fencing or barrier plan that would contain the structure and protect the public should the walls on 1st Avenue fail and collapse. These brick walls are partially loadbearing and what would happen should they fail is uncertain and variable, and I cannot give an opinion as to exactly how it would collapse. I would suggest as a minimum that the affected area should extend horizontally at least equal to the height of the building, and the barrier would likely need to be several stories tall and be able to take the impact of the debris as it spreads.

STRUCTURAL DESIGN GROUP

A handwritten signature in black ink, reading "Thomas C. Schaeffer". The signature is written in a cursive style with a long horizontal flourish extending to the right.

Thomas C. Schaeffer, PE, SECB