

---

To: Nic Sparacio  
City of Manitowoc, WI

From: Philip J. Caswell, P.E.  
Stantec – St. Paul, MN

File: 193703931

Date: July 25, 2016

---

**Reference: Mirro Buildings Structural Condition Assessment**

We have completed the structural condition assessment of the existing building(s) on the Mirro site. While a more comprehensive report is being prepared, this memo is intended to describe the preliminary findings to help inform the City of the potential safety and security issues observed at the site.

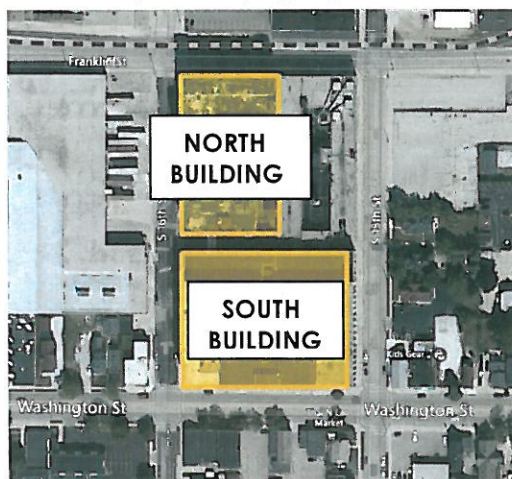
**Scope**

The Mirro buildings are slated for demolition, so the scope of this structural assessment was limited to a walk-through visual evaluation, noting any observed structural deficiencies that pose potential safety hazards to workers and others entering the site prior to demolition. It was not intended to document, in detail, features and details of the structural components for determining load capacity, quantifying the extent of material deterioration and strength loss, potential for renovation, etc. Non-structural safety hazards observed were also noted.

**Description of Buildings**

Following the partial demolition and removal previously performed on the Mirro site, there are essentially two buildings remaining, connected by a short, 2-story link. The buildings, while similar in size, were constructed at different times and are different building types. Due to the differences in construction materials used, one building shows little or no signs of deterioration and structural safety concerns, while multiple areas of severe deterioration and localized collapse were observed in the other.

The building situated at the south end of the site is older, and is constructed of steel beams and columns, with laminated 2x timber floors, spanning (1-way) between beams. The majority of the south building is 7 stories in height, with the northern 3-bay portion stopping at 5 stories. See Photo No. 1, attached. The roofs are essentially flat, sloping slightly to internal roof drains.



**Figure No. 1 – Building Locations on Mirro Site**

**Reference: Mirro Buildings Structural Condition Assessment**

The north building, covering the northwest portion of the site, is constructed of cast-in-place concrete and is 6 stories in height. The structural system consists of cast-in-place concrete flat plate slabs, with large concrete columns, column capitals and drop panels. See Photo Nos. 7 and 8, attached.

**Preliminary Observations**

The many potential safety hazards observed consisted of both structural deficiencies and hazards created in the course of previous demolition or other intentional actions. Particularly in the south building, large holes had been cut through the floor to facilitate moving demolition debris from upper floors down to the ground level. The holes have wooden barricades around them, and currently are secure enough for workers involved with the buildings to work around. See Photo No. 3. The wood finish flooring had previously been stripped throughout the south building, which, fortunately, also permitted direct visual observation of the condition of the laminated wood floor slabs.

Some of the other potential hazards identified included unsecured building components left from the previous demolition activities. These included a flight of fire exit stairs and unreinforced projections of brick, left dangling several stories overhead. ALL PERSONNEL entering the site should be warned of the potential safety hazards overhead, as well as at eye level.

Due to the use of wood for framing the roof and floor decks in the south building, water intrusion has damaged several areas over several floor levels. Some of the locations with serious wood deterioration have collapsed, while others are not safe for personnel to walk on. See Photo No. 4. These areas were identified and marked off with CAUTION tape. The damage is localized within the taped-off areas, so areas outside the tape are considered to be safe. See Photo No. 5. Small, more localized areas of deterioration were marked with orange spray paint. They, too, should be avoided. For many of the areas, it was not immediately apparent that the floor was unsafe, so all personnel entering the site should be notified of the conditions and be made aware of the markings and restrictions. See Photo No. 6 (prior to taping off the area).

All of the areas marked off as unsafe were documented, and will be shown graphically in the final report. The CAUTION tape and paint are considered to be temporary, however, so they should be replaced with more durable barriers or be inspected and maintained routinely.

In the north building, no structural distress or deficiencies were observed. Because concrete doesn't rust or rot, exposure to moisture and extreme temperatures did not adversely affect the condition of the concrete. The majority of the windows had been removed, so the interiors of the floors had been exposed to rain and snow. Water saturation in the concrete floor slabs was evidenced by the presence of small calcium stalactites on the underside of the slabs. Significantly, no rust was observed, so it is assumed that there has been no reduction in the structural load capacity of the floors. See Photo No. 8.



July 25, 2016  
Nic Sparacio  
Page 3 of 3

**Reference: Mirro Buildings Structural Condition Assessment**

**Security**

While not a focus of the structural condition assessment, it should be mentioned that access to the site should be restricted and security improved to permit only personnel approved by the City to enter the site. The current fencing is Rent-A-Fence, and so is not anchored to the ground and can be moved easily. The gap in the fence used to access the site should be made more secure with a lock and chain, or other means. There's no doubt that, if desired, trespassers will access the site anyway, but an attempt should be made to dissuade them from making the effort required.

**Conclusion**

The two buildings remaining on the Mirro site have been vacant and left exposed to the elements for the past few years. For the south building, this exposure, along with leaking roof drains, have allowed a significant amount of water intrusion to saturate and degrade the timber floor decks. Some have deteriorated to point of collapse under their own weight. This walk-through visual structural condition assessment identified these areas and temporary barriers were installed to restrict access to them by unknowing personnel.

If there is any significant time delay between now and when the buildings will be demolished, the temporary barriers should be replaced with more robust and durable barriers. In the meantime, all personnel accessing the site should be instructed to watch for hazards and to avoid the restricted areas.

If you have any questions about the information contained herein, please contact me.

**STANTEC CONSULTING SERVICES INC.**

A handwritten signature in blue ink that reads "Philip J. Caswell".

Philip J. Caswell, P.E.  
Senior Associate/Structural Team Leader  
Phone: (651) 604-4766  
Fax: (651) 636-1311  
Phil.Caswell@stantec.com

Attachment: Selected Site Photographs

c. Harris Byers, Kevin Kimmes - Stantec





**Photo No. 1 – View of South Building**



**Photo No. 2 – Overhead Hazards**



**Photo No. 3 – Existing Demolition Debris Opening**



**Photo No. 4 – Collapsed Roof in Southwest Corner**





**Photo No. 5 – Typical Restricted Area Temporary Barrier**



**Photo No. 6 – Unsafe Floor Area on 2<sup>nd</sup> Floor**





**Photo No. 7 – North Building**



**Photo No. 8 – Typical View of Structural System**