Crosier Kilgour & Partners Ltd.
CONSULTING STRUCTURAL ENGINEERS

March 5, 2018

Our File No. 2018-0224

City of Winnipeg
Planning, Property and Development
65 Garry St - 3rd Floor
Winnipeg, Manitoba
R3C 4K4

Attention: Mr. Brent Novak, P.Eng.

Dear Mr. Novak

Re: Carlton Street North Skywalk
Vehicle Impact

On March 5, 2018, the north elevation of the skywalk connecting the RBC Winnipeg Convention Centre (WCC) with the Delta Hotel was hit by the boom of a construction bin delivery vehicle travelling southbound on Carlton Street. The point of impact was approximately at the join between the third and fourth precast cladding panels from the east end of the west span (see Figure 1). The impact location also corresponded to the location of the vertical truss member.

Figure 1: Partial North Elevation

Supplemental top anchors (blue arrows)

Approximate location of bottom anchors (yellow arrows)

The skywalk is a bridge structure has two spans. The steel framing for the west span consists of a Pratt-style truss constructed of hollow structural steel (HSS) members. The steel truss spans in the east-west direction between a 10" x 60/78" cast-in-place concrete beam at the WCC side, to cast-in-place post-tensioned cantilevered concrete beam at the opposite end. The east span consists of single Pratt-style truss on the north elevation of the skywalk that is connected to the concrete wall on the south side of the skywalk via steel W-Section and HSS members.

The existing precast cladding panels are 4" thick and conventionally reinforced. Each panel is connected to the truss frame at four points; two rigid connections at top, and two adjustable connections at the bottom. Based on the configuration of the connections, the majority of the vertical cladding load is transferred to the structure in bearing through the bottom connection. The top connection provides lateral stability and transfers horizontal wind loads to the frame. The top connection points have been supplemented with additional supports tubes due to deterioration of the concrete around the original anchors.

As can be seen in Figure 1, the impact has caused substantial structural damage to two precast cladding panels, including the upper anchors. The original precast panel shop drawings indicate that the bottom anchors are located approximately 1'-2" from the bottom of the panel in each corner. Based on the visible damage to the panels, it is likely that the bottom anchors have also been compromised and the panels are currently being supported by the remaining two anchors. To address concerns that the affected panels could be potentially unstable, Carlton Street immediately below the area has been closed to traffic. The skywalk has also been closed to pedestrian traffic.

To address the immediate concerns of the stability of the precast panels, it is recommended that all loose areas of concrete be removed, and temporary supports be provided to replace the lost anchors. Although further design would be required, the temporary anchors could consist of an angle bracket bolted to the back of the precast panel and secured to the existing concrete floor. Alternatively, the two affected panels could be removed. Note that the existing strip windows are supported on the precast panels. Thus, temporary support for the glazing will also be required.

The point of impact corresponded to the location of the vertical truss member. Although no obvious damage was observed, a follow up site inspection is required once the debris has been removed to confirm the condition of the truss members.

I trust this provides the information you require. Please contact the undersigned if you have any questions.

Yours truly,

Derek J. Mizak, P.Eng.

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