



August 1, 2013

Mr. Brian Schaffer  
City of Medicine Hat  
460 Spencer Street SE  
Medicine Hat, AB T1A 1Y7

Dear Mr. Schaffer:

RE: Medicine Hat Veiner Centre Flooding - Structural Review

RJC No.: LTH.109363.0001

Read Jones Christoffersen Ltd. (RJC) and several City of Medicine Hat representatives were on site June 27, 2013 and July 16, 2013 to observe the structural condition of the Veiner Centre building. The visit on June 27<sup>th</sup> was an initial assessment to determine if the building was safe for clean-up purposes. At that time the main floor was in process of having water removed along with other material that was damaged by the influx of water. The basement of the building was still partially submerged in water and was in process of being pumped out. The July 16<sup>th</sup> visit was a final review of both the main floor and the basement area since all water had been removed. Finishing material that was submerged by water had been removed except for the kitchen area and equipment, and the marmoleum flooring in the gathering space west of the kitchen. In addition, the original 1974 drawings, 1981 Renovation drawings, 1997 Flood Restoration and Renovation drawings, and the 1986 Transit Shelter have been provided to RJC.

## 1.0 OBSERVATIONS

### 1.1 Exterior Walls

Based on our observations, the exterior wood framed walls were exposed to the flood water, and the exterior sheathing (gypsum board) was completely saturated. Overall the wood framed studs appeared to be slightly saturated at the base of the wall and the visual condition of the wood appeared to be in an acceptable condition, except for a few studs that appeared to have mold or rot present. We cannot comment at this time if the condition of the studs that had mold or rot present was a result of this flood or previous floods. It is recommended that the wood framed studs be allowed to dry and any mold should be removed.

For the exterior wood framed studs to properly dry, and remain dry, it is recommend that the exterior sheathing along with the exterior brick veneer be removed, and the sheathing be replaced with new material that is appropriate for this application. The removal and reinstallation of the brick veneer is required because the flood water reached about 1.0

meters above the bottom course of brick veneer. Silt and debris from the flood water was able to penetrate behind the brick veneer and has now settled at the base of the wall between the brick veneer and gypsum sheathing, thus plugging the bleed holes. This was observed from within the building where gypsum sheathing had been removed to expose the backside of the brick veneer. The current condition will not allow for proper ventilation / airflow behind the brick veneer, thus creating a zone for future moisture buildup. The removal of the brick veneer will allow for the proper removal of damaged sheathing and installation of new sheathing, and allow proper cleanup behind the brick veneer.

## **1.2 Main Floor Slab-on-Grade**

The main floor slab-on-grade is located west of the kitchen area between gridlines B-G/1-4. Based on our review of the 1971 drawings the existing concrete slab-on-grade is 100mm thick reinforced with 150x150 wire mesh, has 6.0mil poly underneath, and there is 200mm of crushed gravel. Our observation of the condition of the slab-on-grade was limited and no formal comment can be made at this time due to the marmoleum flooring not haven been removed in the bulk of the area. In a small area, a portion of the marmoleum was removed while on site and a layer of silt / sediment was present between the slab-on-grade and marmoleum flooring.

While walking over the slab-on-grade area, it was observed that the floor sloped down from north to south and there were several high / low spots. This was visually confirmed at the base of interior wood and steel stud walls where leveling agent has built up and is almost over top of the walls base plates. Upon discussion with representatives from the City of Medicine Hat, we were informed that over the past years, starting after the first flood in the 1990's, this leveling agent has been applied numerous times. This may suggest that the soil condition below the slab-on-grade, footings of the south foundation wall, and the strip footing for the interior load bearing wall on gridline 2/E-G has been compromised to some degree and settlement is occurring. Without performing additional investigation, it is difficult to determine the extent of the condition at this time.

## **1.3 Main Floor Suspended Slab**

Main floor suspended slab located in area of gridlines 1-4/G-R is comprised of three different floor systems. The area designated as the "Dining Area" (gridlines 2-4/H-M approximately) is concrete topping on metal deck (100mm total thickness) supported by steel beams below. The remaining floor area is either 150mm thick reinforced cast-in-place concrete or 200mm thick hollow concrete span-deck. Based on site observation the metal deck and cast-in-place floor systems appear unaffected by the flooding. However, the span-deck has many through penetrations for electrical and mechanical services which can allow water to enter into the hollow portion of the span-deck. Steps should be taken to be sure water is removed from the span-deck to prevent future damage.

## 1.4 Basement Area

The basement floor appears to be concrete slab-on-grade, and upon review of the drawings we are assuming the slab-on-grade is approximately 100mm thick. It is unclear of the slab-on-grade reinforcement details, if there is poly below the slab-on-grade, and the type or depth of sub-base material.

While performing the walk through of the basement area it appeared that the construction of the structural elements such as the foundation walls, concrete columns, and slab-on-grade were constructed in a similar method compared to today's practices. It was observed that the slab-on-grade was not physically connected to the foundation walls or concrete columns. This is evident by the presence of a wood trim, roughly 38mm in thickness, between the foundation walls and slab-on-grade. Also, there is a similar detail around each concrete column, but the trim is much thinner. Upon noticing these details, we questioned the City representatives in regards to the sediment deposits left behind after the water was pumped out. It was indicated that near the final stages of pumping the water, the workers observed some of the remaining water draining down below the slab-on-grade at the joints between the slab-on-grade and concrete columns and foundation walls, leaving behind sediment deposits at these locations. We cannot comment on the amount of sediment deposits because the deposits were cleaned up prior to the walkthrough.

Based upon the physical appearance of the slab-on-grade and the information that was shared, there are some concerns that arise. With water being observed to flow down below the slab-on-grade at the base of the concrete columns and foundation walls, then it can be assumed that water could have entered the basement at the same locations. If water did enter through these joints, then the integrity of the sub-base may be compromised; and because this is the third flood event where the basement has been flooded we cannot comment on the full extent without additional non-destructive or destructive investigation. However, on this notion, while on site we performed a very basic non-destructive blow test on certain areas of the slab-on-grade. The blow test is a test where a heavy object, like a hammer, is dropped onto or hits the slab. Based upon the physical sounds heard from the blow tests, it is possible there is "hollow" spots under the slab and further testing should be performed to determine if there is undermining and potential damage. In addition, the concrete column pad footings are not very large or deep. These structural elements should be exposed and examined for possible bearing surface disturbance under or around the footings. Without performing additional investigation, it is difficult to determine the extent of the condition at this time.

## 2.0 GOING FORWARD

Upon completion of the site review and review of existing drawings, it is Read Jones Christoffersen Ltd. opinion that the integrity of the structure has not been compromised to an extent that the building cannot be safely occupied. However, there appears to be physical signs which indicate that there are structural issues that will need to be addressed to ensure the longevity of the building. Unfortunately, these issues are related to the foundations of the structure and the costs associated for possible repairs can be costly.

Should you have any questions, please call.

Yours truly,

**Read Jones Christoffersen Ltd.**

**APEGA Permit to Practice No. P00152**

Neil Pozzi, P.Eng.

Project Engineer

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