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July 11, 2012

Dave Atthill
Manager Facility Services
Municipality of South Huron
322 Main St. S., Box 759
Exeter ON N0M 1S6

RE: Structural Review of the South Huron Recreation Centre

At your request we completed a visual review of the structure of the Recreation Centre in Exeter on June 26, 2012. We are not qualified to review mechanical or electrical components.

It is assumed that the building was designed for live loads prescribed by the codes at that time. For this reason, the present review does not include any analysis of structural elements. The inspection was aimed at identifying areas of deterioration as compared to the probable as-constructed state.

Arena Structure

The arena is a steel rigid frame building with tapered columns and beams. The columns are connected to the beams with bolted moment connections. The three sections of beam are connected together with bolted connections also. Steel purlins span between the rigid frames at close spacing. Review of the arena roof structure was assisted by use of a hydraulic, portable lift. As reported in 2007, the view was obstructed by low-E fabric over the entire rink surface and puck netting at each end of the rink. It was still possible to pull back the fabric in some places and view the purlin-to-girder connection but the overall condition of the purlins was not available to be observed. Hands-on inspection of the purlins and top flanges of the beams was not achievable for most of the roof structure. Despite this, we were satisfied that the roof is in good condition.

We understand that the steel structure was painted in 2003. There are some minor paint failures and localized rusting on the top flange and at many of the bolts that connect the top flanges together. However, this deterioration is superficial and is not significant to the structure at this time.

Exterior Masonry Walls

The exterior walls consist of concrete masonry blocks. The building is clad in steel siding. As such, it was not possible to review the outside face of the masonry block. From the inside of the building, there is evidence that water has penetrated the concrete block. This is most evident at the east exterior wall at Mechanical Room #2 and Dressing Rooms #3 and #4 and the north end wall of the arena. This leakage is unlikely a result of wall penetration as the steel siding will act as a rain screen. From the roof top, we did not observe any seal, or lap, that would prevent water on the roof from getting behind the steel flashing and leaking into the walls. As outlined in 2007, the symptom of this problem is damaged paint (we note that the dressing rooms have been recently painted) but the concrete block may be weakened by the water leaching.

We noted some stepped cracking in the east wall of a small lean-to addition on the east side of the building. This cracking is common in masonry block walls and could be re-pointed.

Community Centre (Hall)

The roof structure above the community centre consists of engineered steel roof trusses supporting metal decking. The structure is hidden behind a drop ceiling. Panels were removed at five locations to access the steel trusses. We did not observe any signs of deterioration of the steel trusses. We did note some damage to the metal decking at about the centre of the roof. We suspect that the damage has existed since the building was constructed.

As requested, we reviewed the building plans stored at our office to determine if there was a provision for a separation wall to divide the hall. From review of the plans and the roof it appears that the raised flashing located approximately above the middle of the room hides an expansion joint and is not intended for structural support. However, during our review we noticed that there is one location where the truss spacing decreases to 600 mm (2') from the 2130 mm (7') spacing for the remainder of the room. Depending on the loading above from mechanical units, etc., this might be an option for location for a divider wall. In the past, we have designed reinforcements for steel roof trusses to carry additional weight. As such, it may be possible to divide the building at a number of locations to suit your needs.

Foyer

The roof structure above the foyer consists of engineered steel roof trusses supporting metal decking. The structure is hidden behind a drop ceiling. Panels were removed at four locations to access the steel trusses. We did not observe any signs of deterioration of the steel trusses.

Roof

We understand that a modified bitumen roof system was installed over the arena in 2000. We reviewed the roof as part of the overall structure review. We did not observe any punctures or damage to the roofing material. However, as noted above there does not appear to be any system in place for preventing water from penetrating behind the flashing along the east wall. We recommend that you review this with a qualified roofing contractor. It is our opinion that a drip ledge and eavestrough could be installed to reduce the amount of water that is able to leak behind the walls.

The roofing system over the foyer/hall consists of built-up roofing covered with gravel. We assume it is the original system. We recommend that the Municipality start to budget for new roofing material to be installed in 6 to 10 years. A qualified roofing contractor should be consulted prior to budgeting.

Ancillary Rooms

In 2007 we noted that the blocks behind the water softener units in Mechanical Room #1 were in poor condition and this year we note that they have been parged.

As noted in 2007, there still exists a wide vertical crack in the north wall of Mechanical Room # 2.

We reviewed the space under the stands for the arena. The concrete appears to be in good condition.

We noted some paint peeling in the ceiling of the hallway outside of the dressing rooms. It is our opinion that the peeling is a painting issue and not a moisture issue. The metal decking in the exposed locations appears to be in fair condition.

Support Structure for the Air Conditioner Unit

We understand that the columns supporting the air conditioner unit were re-faced since the original columns were deteriorating. With the re-facing the columns appear to be substantial for the loads that they are required to carry. However, we noted vertical cracks in two of the four columns. We suspect the cracks are a reflection of cracking in the original interior column, and are likely the result of corrosion of the reinforcing steel. It is likely that the columns will have to be replaced in 6 to 10 years.

Recommendations

We did not observe any structural deficiencies that require repair within the next five years. It is recommended that the building be reviewed again in 2017.

There are some maintenance recommendations for the continuation of the structural strength of the building components:

- Try to arrest the leakage from the roof to the east exterior wall
- Re-point the wide crack in the northeast wall corner of Mechanical Room #2
- Re-point the cracking in the masonry wall of the small lean-to building along the east side of the structure.
- If the netting and Low-E fabric covering has to come down for any reason in the future, the top flanges and bolts of the beams over the ice surface should be reviewed.

Service life of the Structural Components

We understand that the Municipality is considering a substantial renovation to the recreation centre and you wish for us to provide a service life for the structural components. Considering that the building has been in service for about 37 years, we are of the opinion that you should expect 25 to 30 more years of service from the structural components. In that time you should anticipate the following repairs to maximize the service life structural elements:

- Re-paint the structural steel framing over the ice surface
- Replace bolts in the top flange connections
- Replace the roofing membrane over the ice surface
- Replace the roofing system over the community centre (likely twice)

As discussed, it is difficult to establish the condition of the concrete masonry blocks in the locations where they have been penetrated with moisture. It would be prudent to cut out a few blocks to review their condition.

As outlined above, we did not review any electrical or mechanical components. We could assist you in hiring specialists in these fields if you require.

Please call if you have any questions. As part of our quality control, this report was reviewed by Andrew Ross, P. Eng. Mr. Ross has extensive experience with building structures, and has inspected numerous arenas including the Exeter Arena in 2007.



Yours very truly,

B. M. ROSS AND ASSOCIATES LIMITED



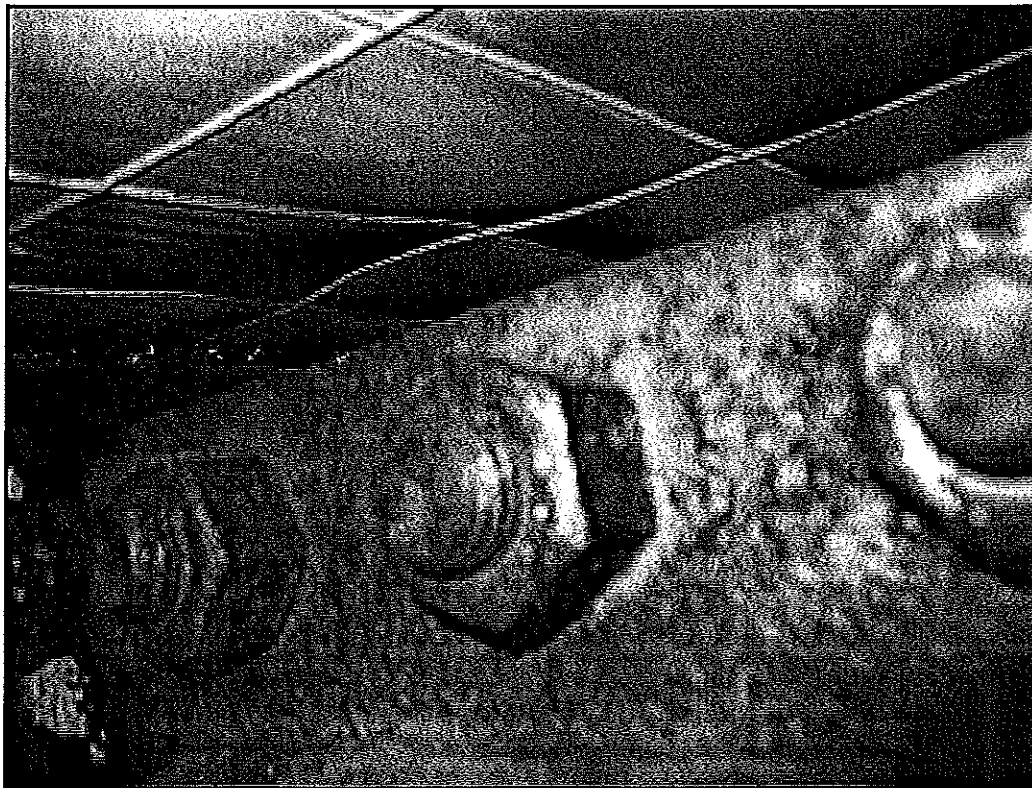
Per *Ryan Munn*
Ryan Munn, P. Eng.

Per *A. I. Ross*
A. I. Ross, P. Eng.

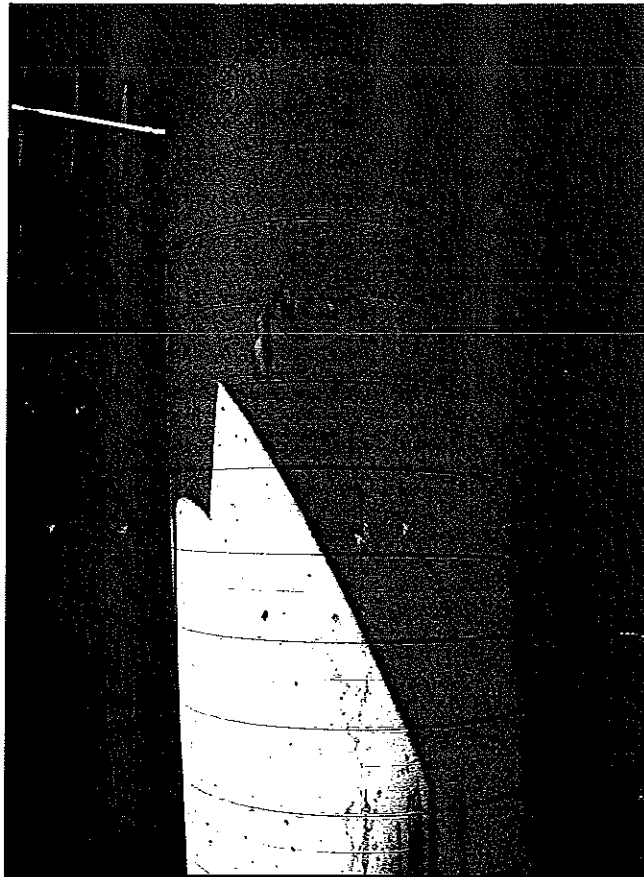
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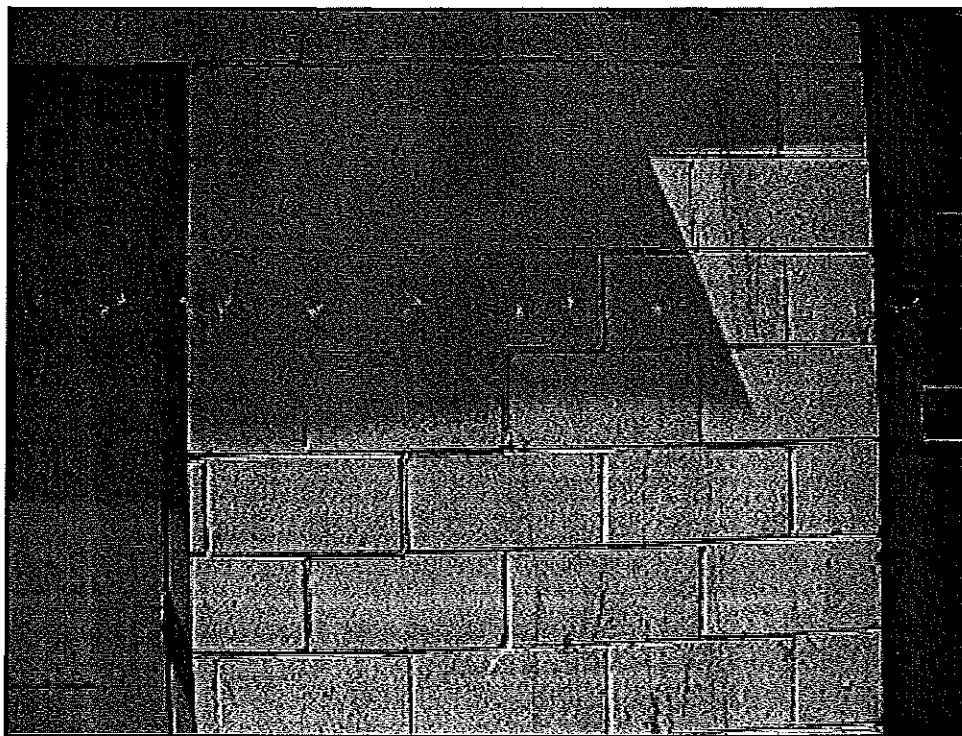
Arena Facing North



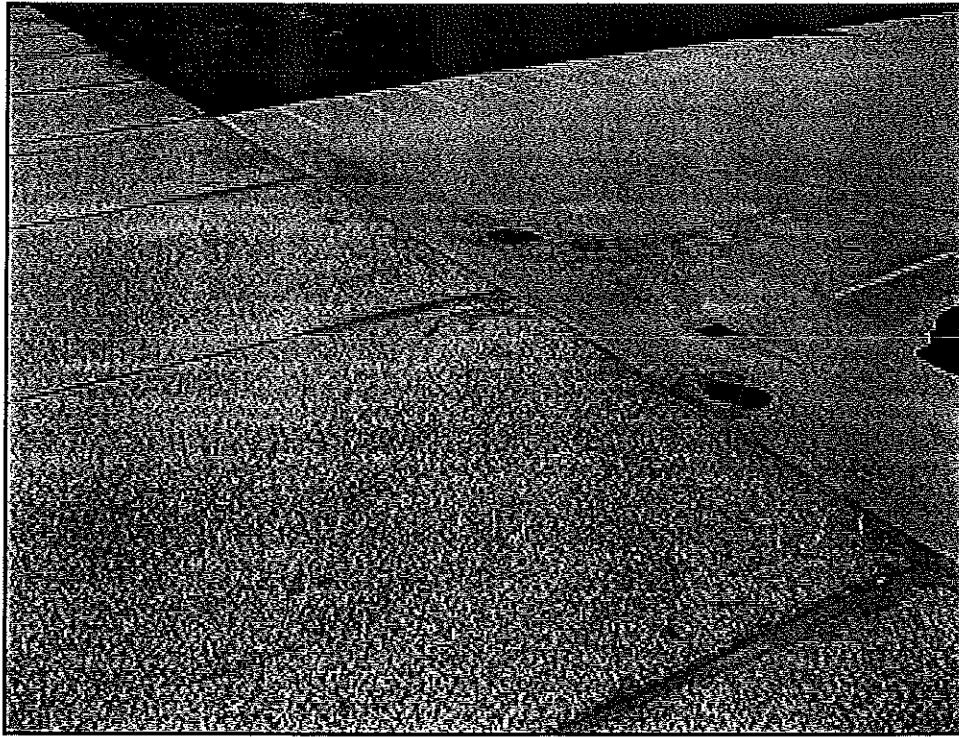
Bolts at Top of Beam



Column Below Air Conditioning Unit



Step Cracking
Small Lean-To Building



East Side of Arena Roof