

**B. M. ROSS AND ASSOCIATES LIMITED**  
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File No. 82071A

November 1, 2018

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

Dear Sir:

**RE: Storage Shed at the West end of the Huron Park Arena**

At your request we met with you on October 12, 2018 to review the west wall of the shed at the west end of the Huron Park Arena. It is understood that staff have raised concerns about the alignment of the wall.

**Observations**

Pictures of the storage shed and wall of concern (west wall) are included in Appendix 1.

The concrete foundation wall is about 1530 mm above grade. Measurements on the inside of the foundation wall reveal that it is off plumb (top leaning outwards) by about 5.4%. Measurements were recorded on the inside of the wall (63 mm / 1220 mm and 66 mm / 1220 mm) for future reference.

The stud wall resting on the concrete foundation wall is about 1680 mm in height. Measurements on the inside of the stud wall reveal that it is off plumb (base leaning outwards or top leaning inwards) by about 3.3 %. Measurements were recorded on two studs on the inside of the wall (40 mm / 1220 mm).

The shorter concrete retaining wall continuing past the shed is about 760 mm in height and is leaning outwards at the top by as much as 7.3% south of the shed. There is an 8 mm shear ledge in the concrete foundation wall where the tall and short retaining walls meet near the north end of the shed.

There is a noticeable kink in the steel trim at the north and the south ends of the building.

The concrete floor in the shed is badly cracked and appears to have settled about 75 mm adjacent to the west concrete foundation wall.

## **Comments**

Unfortunately, we do not have much in the way of photos of the shed building from our previous arena inspections, nor do we have measurements in the vicinity of the shed for comparison.

We understand that the west wall of the shed was originally constructed and used for a retaining wall to hold back snow removed from ice resurfacing operations. It is understood that with the purchase of new ice cleaning equipment, snow removed from ice resurfacing could be piled elsewhere allowing staff to frame a shed around and on top of the concrete.

We could not find any evidence that the foundation or framing have moved since the shed was constructed. We suspect that the concrete foundation wall has been off plumb for some time largely because of its original use as a retaining wall.

## **Short-Term Recommendations**

The overall misalignment of the west shed wall is cause for concern, particularly if staff feel that the movement has happened after the shed framing was constructed. The wall is a load bearing wall and there is a large elevation difference between the shed roof and the arena roof, making the roof susceptible to increased loads from snow drifting.

We recommend monitoring the movement of the west foundation wall and the stud wall at the end of each ice season to compare the amount of movement to the numbers that were recorded on the inside of the wall on the date of our review. Movement of the wall by an additional 20 mm over a length of 1220 mm would suggest that reinforcement or replacement is required prior to the next ice season.

We recommend providing a positive connection between the top of the foundation wall and the bottom of the stud wall, and between the top of the stud wall and the rafters. An example for improvements is included in Appendix 2. However, staff or a builder, may have some more practical means for improvements.

Downspouts should be installed to direct rain water away from the building.

We wish to point out that removal of the shed, without removal of the Olympia Room, will require some consideration to the stability of the remaining Olympia Room. Some plywood wall sheathing may need to be removed to help accomplish this.

As discussed, there may not be a lot of benefit to tying the west foundation wall back to the wall of the Olympia Room as it is not apparent that this wall was designed for any horizontal loads.

As discussed, if the Municipality is concerned that the wall has moved recently, it could be considered appropriate to discuss the situation with the property owner west of the shed. It may be possible to park vehicles elsewhere and place one row, or stepped rows, of concrete blocks for some additional passive resistance.

### Longer-Term Recommendations

Over the five-year period we recommend that the Municipality work towards replacement or renovations for the shed and Olympia Room. Work should take both rooms into account.

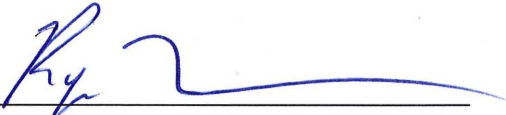
Please call if you have any questions or concerns,



Yours very truly

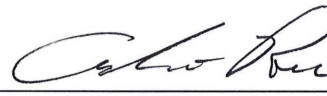
B. M. ROSS AND ASSOCIATES LIMITED

Per

  
Ryan Munn, P. Eng.



Per

  
A. I. Ross, P. Eng.

:hv

# **APPENDIX A**

## **PHOTOS**



**East Elevation**



**Cracked Retaining Wall – Olympia Room**





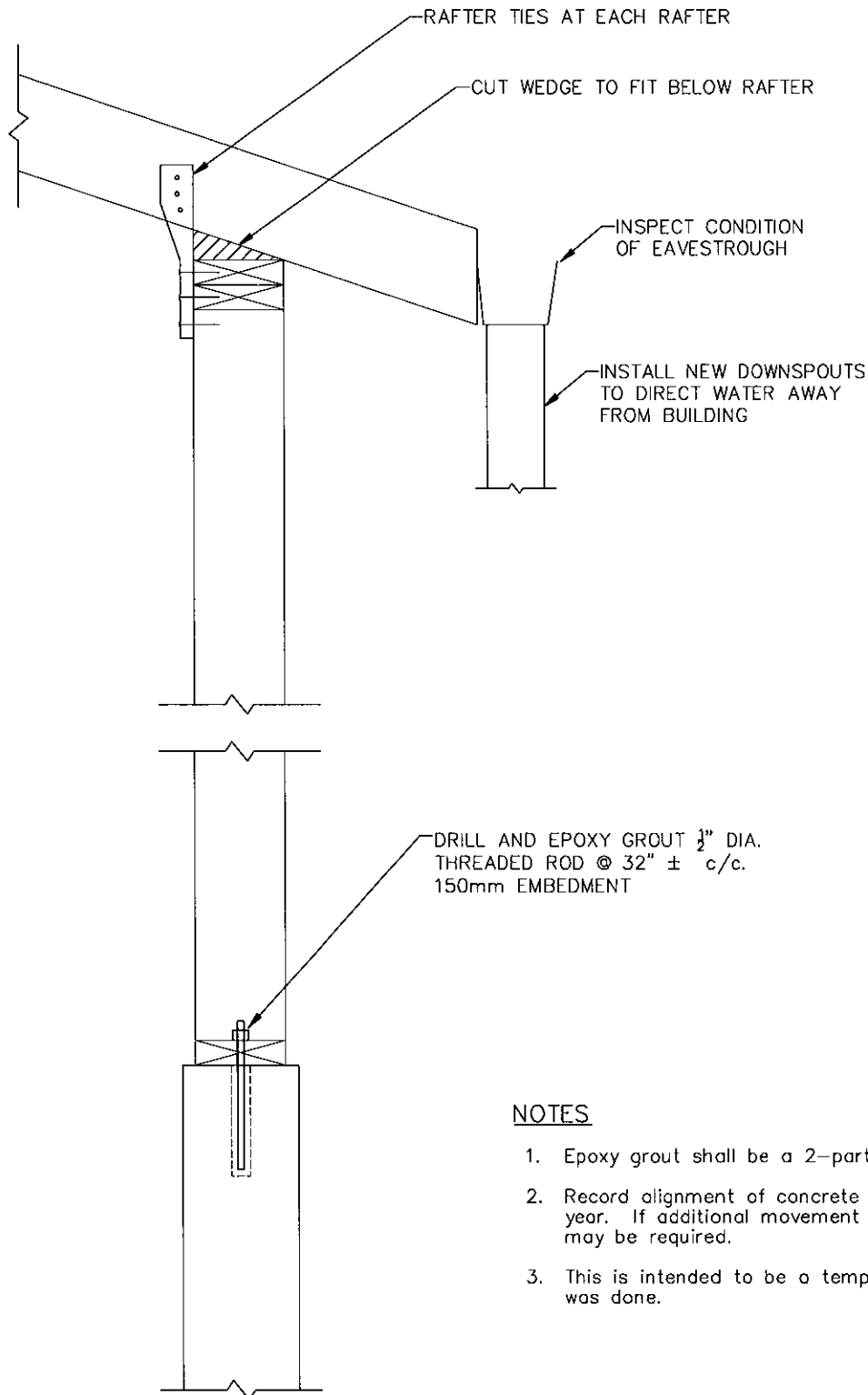
**Height Differential between Shed/Olympia Room and Arena**



**Roof Framing**

# **APPENDIX B**

## **REINFORCEMENT**



#### NOTES

1. Epoxy grout shall be a 2-part epoxy.
2. Record alignment of concrete wall and stud wall each year. If additional movement is observed, removal may be required.
3. This is intended to be a temporary repair. No analysis was done.

#### TYPICAL SHED WALL SECTION

N.T.S.



**BMROSS**  
engineering better communities

**Municipality of  
South Huron**

**Stephen Arena**

**Shed Wall Temporary Repairs**

**DATE**  
Nov. 1, 2018

**PROJECT No.**  
82071A

**SCALE**  
As Shown

**DRAWING No.**  
1