ATTACHMENT A

July 31, 2017

Art Groot, Manager, Facility Planning and Operations
City of Nanaimo
500 Bowen Road
Nanaimo, BC V9R 1Z7

Email: art.groot@nanaimo.ca

Dear Art,

RE: Frank Crane Arena/Beban Social Centre Metal Cladding **RJC No. NAN.102947.0003**

As requested by the City of Nanaimo and in accordance with our proposal dated February 21, 2017, Read Jones Christoffersen Ltd. (RJC) completed a metal cladding condition assessment of the buildings comprising the Frank Crane Arena and the Beban Social Centre. RJC attended the site on July 12, 2017 and was assisted by Saywell Contracting Ltd. to make the exploratory openings. A lift was necessary to access the metal siding as they were installed about 13 feet above the ground surface. Some of the walls of the Arena were set back and located above the roof of the main building, as were the metal clad walls of the Social Centre (Photo 1).

Photo 1 - View of the Arena Exterior

The site investigation was limited to the metal cladding that forms part of the enclosure assemblies on these buildings. In addition to a visual review, nine randomly selected exploratory openings were made by removing the screws on the panels to expose the back face and the general arrangement of this assembly. All removed panel fasteners were replaced and the panels were secured to the back-up framing in its original position.

The review was made on a random basis with no attempt to observe or inspect every element or portion of the building enclosures. A review of the stucco and masonry walls or the roofs and the structural components of the buildings was not in the scope of work (Photo 2).

Descriptions and observations regarding the condition of adjacent building enclosure components are provided and where applicable, recommendations for renewal or replacement of those components are included in the discussions of our findings.

Photo 2 - View of the Walls of the Social Centre

Our review was based on on-site observations and various architectural drawings. The building elevations of the arena were not included in the set of drawings that was made available to RJC.

1.0 OBSERVATIONS

1.1 General

The dates on the drawings would indicate that the buildings were designed and constructed in the mid 1970's using cast in place concrete foundations, structural steel roofs and concrete block masonry walls. Metal cladding was applied to the upper portions of the walls on the four elevations of the buildings.

It appears that the structure over the shallow pool on the side of the parking lot was added at a later date with some form of stucco clad walls. Also a small section finished with metal siding was added around the entrance to the arena between the two buildings. Drawings or detailed information on these additions was not available to RJC at the time of the investigation.

Metal siding is, for the most part, limited to the upper part of the exterior walls where their primary purpose is to serve as a rain shedding surface. It is connected to a system of 2" wide cold formed sections that support the panels on the exterior side and a metal back pan on the interior side with fiberglass batts sandwiched between the two panels to provide thermal insulation. The term used on the original architectural drawings is "insulated metal panel" assembly.

The appendix to this report shows the buildings' elevations, where the numbers in the squares indicate the approximate location of the exploratory openings (Appendix A – Exploratory Openings).

1.2 Site Observations

The fiberglass insulation between the back-pan and the siding was generally stained black, possibly from moisture resulting from condensation between the two layers of metal, which could be verified during winter operating conditions. This phenomenon combined with the thermal bridging caused by the metal framing could result in a substantial reduction of the effectiveness of the thermal resistance of these walls.

The backsides of the panels were galvanized, not coated. Typically, corrosion of metal panels or framing was not observed in these interior spaces between panels. White oxidation products were observed on the surfaces of the galvanized materials and the fibreglass batts inside the cavity. . This is illustrated in Photo 3 of Exploratory Opening #1 on the elevation of the Arena located in Appendix A. The conditions shown in this photograph are representative of the subsequent exploratory openings, unless noted otherwise.

Photo 3 - View of Space between Metal Siding and Metal Back-pan

Photo 4 shows a close-up of a typical panel profile. In this instance the paint is chipped on the corner of the flutes with some surface corrosion; this occurs throughout on the panels of both buildings. In this close-up it can be seen that the coating on the face of the panels has faded. Surface corrosion was also noted in several locations on the lip at the bottom of the panel and the closure angle.

The thickness of siding was measured to be 16 gauge and with profile dimensions that are very similar to the section shown in Photo 5, copied from a current catalogue. Most of the wear and tear was noted on the corners of the flutes (marked in this picture). This was observed to occur on panels all around the buildings but was more prevalent on walls with southern and western exposure to UV radiation from the sun

Photo 4 – Surface Corrosion at Corner of the Flutes and Flashing Angle.

The screw fasteners were found to be corroded in many locations and the rubber washers were brittle.

Drawing details show spaces of different width between the masonry walls and the metal panel assemblies, thus providing a drainage cavity. As most of these spaces are shown to be seven inches or more in width, they are likely to act as an air plenum rather than a drainage cavity. This was manifested at Exploratory Opening #2 (refer to the Arena elevation drawing in Appendix A) at a wall enclosing the swimming pool where warm air with a strong chlorine odor was noticeably blowing through this opening to the exterior (Photo 6).

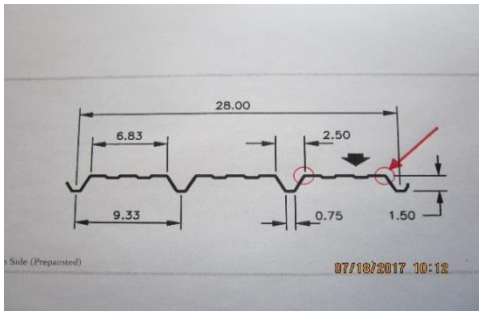


Photo 5 – Typical Panel Profile

The small addition in the area of the Arena lobby was constructed similar to the remainder of the building, except that the type of thermal insulation used was rigid foam that appeared to be in good condition (Photo 7).

Photo 6 – Warm Air Smelling of Chlorine blowing from Wall.

A fibre cement panel was removed from the soffit of the arena along the bottom of the metal wall running parallel to Bowen Road revealing a wide open space between the metal siding and the masonry wall of the arena. Refer to Exploratory Opening #5 of the Arena Elevations in Appendix A. A thin layer of fibreglass batt insulation was attached to these panels. No corrosion was found on the steel framing or metal siding assembly at the interior space between the metal siding assembly and the concrete block masonry walls. Refer to Photo 8 and Photo 9 (next page).

Some of the fibre cement soffit panels of the Social Centre were removed to review the condition of the metal siding. Refer to photograph #10. No anomalies with the siding were observed, however the T-Bar suspension system supporting the soffit panels is severely corroded and may require replacement in the near future to avoid dislodging of the panels and possibly resulting in a safety concern (next page; Photo 10).

Photo 7 – Rigid Foam Insulation used at Addition

The metal siding panels on the Social Centre exhibited the same features that were observed and recorded for the Arena building. There is surface corrosion on the exposed structural framing supporting the metal cladding on the roof enclosing the mechanical equipment (Photo 11). Cleaning and coating of the structural members would extend the service life of this structure.

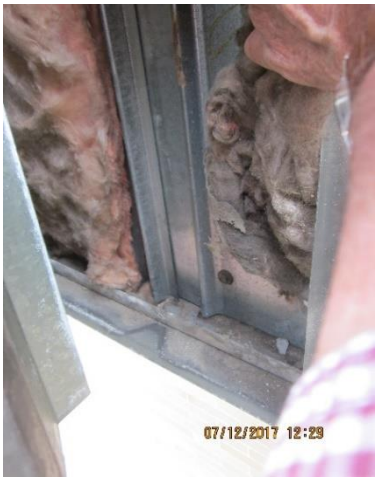


Photo 8 – Fibre Cement Soffit Panels

2.0 DISCUSSION AND RECOMMENDATIONS

The metal cladding as a stand-alone component on the enclosures of these buildings is in serviceable condition after approximately 40 years of service. Several options for renewal will be presented based on our observations and Owner's requirements for maintaining these buildings economically in the short or long term.

The building enclosure system, of which the cladding is only a component, is likely thermally inefficient compared with current standards. This should be considered when making investments to increase the service life of the metal siding of these buildings.

Photo 9 – Fibreglass Insulation between Back-pan and Metal Siding.

2.1 Short-term Options

The metal siding on this building has provided a long service life that can be extended by re-coating of the original factory-applied coatings with a field-applied coating system, protecting them from corrosion while enhancing the esthetics of the facades. The industry has developed procedures, performance standards and high performance coating products for over coating metal building components. The small amount of corrosion observed on the metal siding of these buildings and the heavy gauge of metal used would make this an option for renovating the metal cladding.

Photo 10 – Corroded T-Bar in the Soffit of the Social Centre

However, with this option there is only limited or no opportunity for decreasing the energy consumption from heat loss and therefore the operating costs of these facilities.

In this case, RJC recommends that the soffit panels and their suspension system on both buildings be replaced to avoid dislodging of the panels which present a safety concern.

Photo 11 – View of the Equipment Enclosure at Roof of the Social Centre

Also with this option the screws with rubber washers used to attach the panels to the framing should be replaced as the access provisions which are likely required for painting are already in place.

2.2 Long-term Options

There are several ways to improve the thermal performance of the wall assemblies of this building and therefore decrease the operating costs. To start such a process, we recommend that an energy study be conducted of each building to determine the optimum configuration which will reduce the heating costs and to estimate the payback period of the Owner's investment.

For this option RJC recommends that the existing metal wall assembly be completely removed, including the framing, the backer panel and the soffits, to provide several opportunities or methods for improving the air/vapour barrier characteristics and the thermal insulation value of these buildings.

Alternatively, over-cladding of the existing metal siding and soffit system with well-insulated and airtight building enclosure is another option worth investigating.

It is likely that for any one of these options the building operations can continue as the metal cladding is for the most part well above grade and is located on the exterior side of the masonry building walls.

3.0 OPINIONS OF PROBABLE COST

The Opinions of Probable Cost (OPC) for the recommendations are noted below and include contingencies, engineering, and taxes. Costs are provided in 2017 dollars. The opinions are provided without benefit of design and may vary significantly from actual costs and are intended to convey the general magnitude of the costs that could be expected.

3.0 Short-term Options Described in Section 2.1

	Arena:	**Social:**
A. Recoat Panels	$ 150,000	$ 100,000
B. Replacement of Soffits	$ 30,000	$ 20,000
C. Replacement of Panel Fasteners	$ 20,000	$ 10,000

3.1 Long-term Options Described in Section 2.2

	Arena:	**Social:**
A. Energy Study of the two Buildings	$ 25,000	$ 15,000
B. Replacing or over cladding the existing metal wall assembly including the back pan and a new efficient thermal insulation	$ 1,500,000	$ 800,000

Please note that the above Opinions of Probable Cost (OPC) are intended to be used as a general guide for developing budgets and are not to be considered the actual cost of the project. The Client further understands that changes in project scope, materials, adjustments to design, etc. will affect the final project costs, which will be higher or lower than RJC's OPC. Any reliance the Client places on this OPC is at their own risk. RJC is not responsible for OPC's that do not reflect final project costs.

4.0 LIMIT OF LIABILITY

This review was made on a random basis with no attempt to review every element or portion of the buildings, but was limited to the metal cladding. The intent of the review was to determine areas of visually obvious defects or deterioration and the need for repair and to determine, in a general way, the overall quality and sufficiency of the assemblies reviewed but not to ascertain the quality or sufficiency of any particular component of the buildings, other than the metal cladding. Our comments are not a guarantee or warranty of any aspect of the condition of the buildings, whatsoever.

This report has been prepared for the exclusive use of the City of Nanaimo (the Client). The contents of this report may not be quoted in whole or in part or distributed to any person or entity other than by the Client.

Read Jones Christoffersen Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We trust this information meets your requirements. Please do not hesitate to contact the undersigned if you have any questions, comments or concerns.

Yours truly,

READ JONES CHRISTOFFERSEN LTD.

Prepared by:

John Hofman, B.Sc.

Reviewed by:

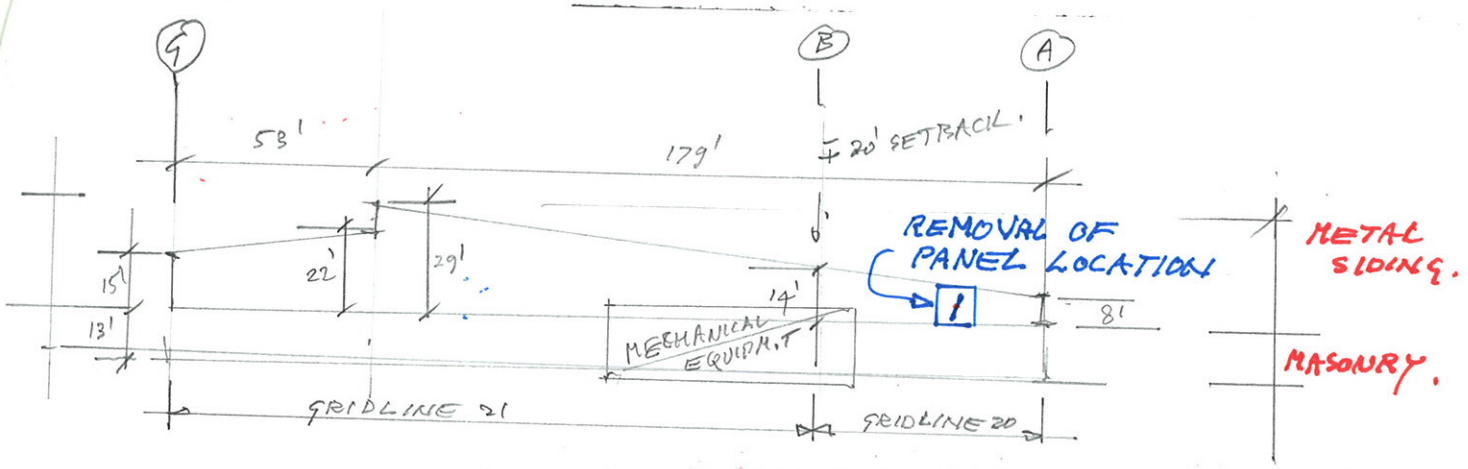
PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA B. RIBEIRO 31, 2017

Bernard Ribeiro, P.Eng.
Senior Project Engineer

JH/rt

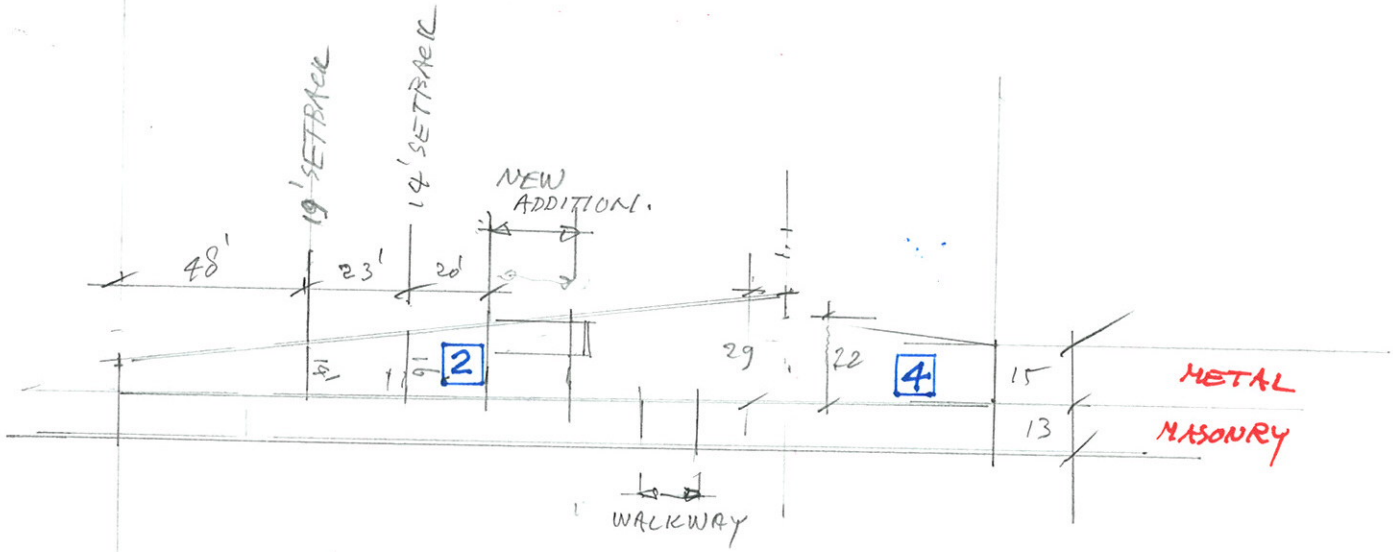
Encl. Appendix A – Exploratory Openings

Appendix A: Exploratory Openings



APPROXIMATE AREA OF METAL SIDING 4300. FT²

UTILITIES SIDE.



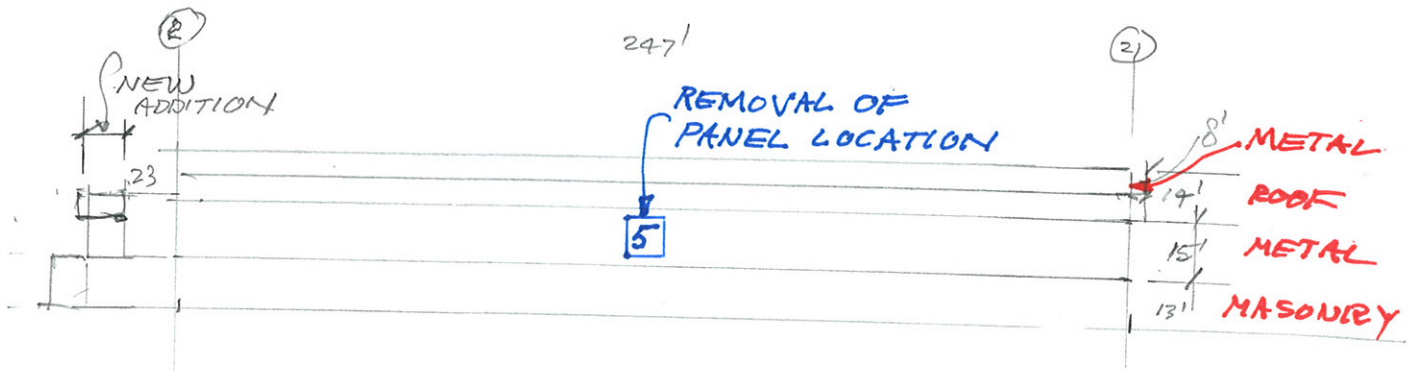
APPROXIMATE AREA OF METAL SIDING 4300. FT²

MAIN ENTRANCE SIDE

Read Jones Christoffersen Ltd.
Engineers

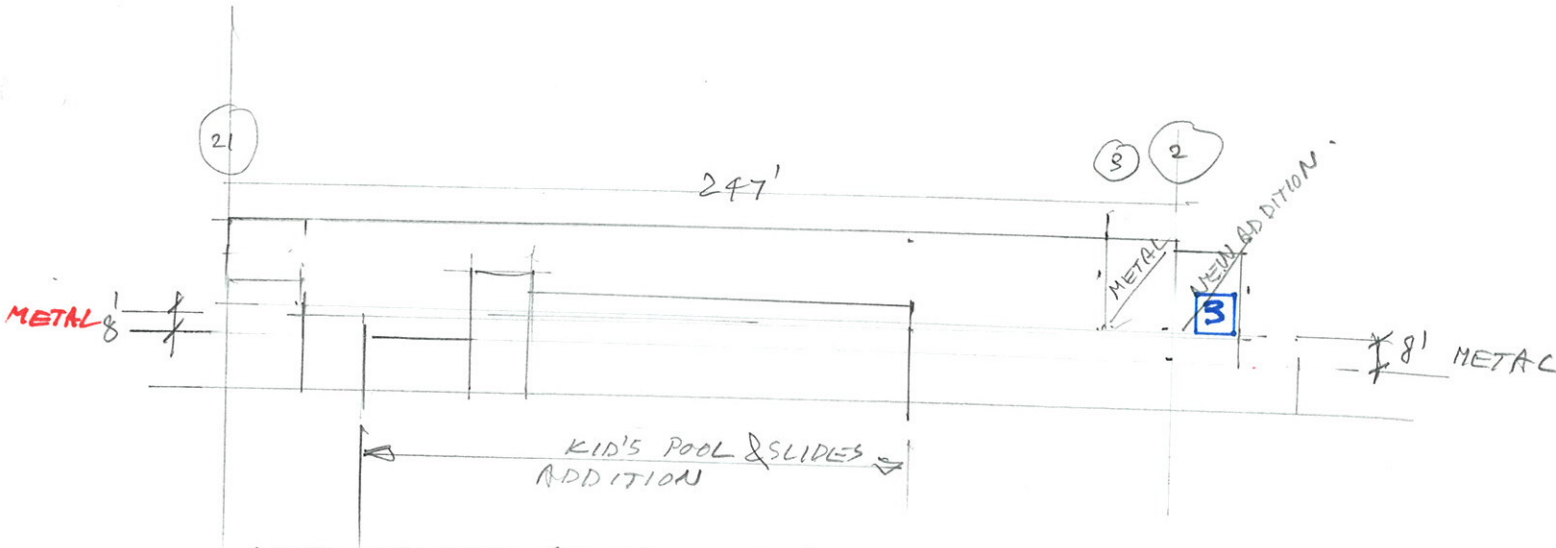
rjc.ca

ARENA ELEVATIONS.



APPROXIMATE AREA OF METAL SIDING 5900. FT²

BOWEN ROAD SIDE



APPROXIMATE AREA OF METAL SIDING 1500. FT²

PARKING AREA SIDE

Read Jones Christoffersen Ltd.
Engineers

rjc.ca

ARENA ELEVATIONS.