

## 2019 Schools Roofing Review

[REDACTED] High School

[REDACTED] School

[REDACTED] School

[REDACTED] School

[REDACTED] School

[REDACTED] School

[REDACTED] School

[REDACTED] School

[REDACTED] School

Prepared for:

[REDACTED]

Prepared by, Dan O'Neil

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December 31, 2019



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Date: 31 12 2019

[REDACTED] Schools

## BACKGROUND:

As requested, O'Neil Consulting performed a site investigation on November 15 & 16, 2019, to review the condition of the existing roofing system on the above schools. [REDACTED] requested the investigation.

## METHODOLOGY:

O'Neil Consulting undertook to perform the following to assess the condition of the roof and to prioritize repairs and replacement on the following seven schools:

- Interview with site personnel to obtain recent performance, repair history and existing roof leaks.
- Review of original drawings, previous investigation reports and repair documentation provided by the client.
- Visual review of all exposed roofing elements.
- Visual review of structural elements and roof underside for unusual deterioration.

## Roof Review [REDACTED] Schools

### OBSERVATIONS (ROOFING):

[REDACTED] SCHOOL



The building is a one and two storey building with a low slope roofing system. The roof consists of several distinct roof sections identified on the figure above. Low slope roof areas are 2 ply SBS, steep slope roof areas are surface fastened metal, fastened with bolts sealed with neoprene seals. The transition area between the sloped metal roof and the 2 ply SBS system has been problematic and should be taken apart and redone.

See photos and comments in photographic documentation.



## Roof Review [REDACTED] Schools

Both roof systems should provide substantial life expectancy.

The sloped metal roof should be monitored for deterioration of the neoprene seals in the fasteners and they should be replaced prior to leakage as that can cause the fastening surface to rot and fasteners could pull out.

### [REDACTED] SCHOOL



The building is a one and two storey building with a low slope roofing system. The roof consists of several distinct roof sections identified on the figure above. Low slope roof areas are 2 ply SBS and PVC roof systems manufactured by Duro-last, (areas in white).



## Schools

PVC roofs are a single ply system and, in this case, mechanically fastened to the roof deck, they tend to be more prone to damage due to rooftop activity and are easily damaged by vandals. Continuous movement due to strong winds can also cause problems. In many areas the fasteners are protruding above the collapsing roof systems below and this is a potential membrane rupture problem.

The SBS roof sections are relatively new and should provide a good service life expectancy

See photos and comments in photographic documentation.

## SCHOOL



The building is a one and two storey building with a low slope roofing system. The roof consists of several distinct roof sections identified on the figure above. Low slope roof areas are Built up roof (BUR) and PVC roof systems manufactured by Duro-last, (areas in white).

PVC roofs are a single ply system and, in this case, mechanically fastened to the roof deck, they tend to be more prone to damage due to rooftop activity and are easily damaged by vandals. Continuous movement due to strong winds can also cause problems. In many areas the fasteners are protruding above the collapsing roof system below and this is a potential membrane rupture problem.

## Roof Review



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## Roof Review [REDACTED] Schools

The BUR roof sections are showing their age and have limited service life expectancy, there is evidence of blistering and exposed felts which generally limits the future life of the roof system.

See photos and comments in photographic documentation.

### [REDACTED] SCHOOL





## Roof Review [REDACTED] Schools

The building is a one and two storey building with a low slope roofing system. The roof consists of several distinct roof sections identified on the figure above. Low slope roof areas are Built up roof (BUR) and SBS roof systems.

The BUR roof sections are showing their age and have limited service life expectancy, there is evidence of blistering and exposed felts which generally limits the future life of the roof system.

The SBS roof sections are relatively new and should provide a good service life expectancy

See photos and comments in photographic documentation.

### [REDACTED] SCHOOL



The building is a two-storey building with a low slope roofing system. The roof consists of several distinct roof sections identified on the figure above. Low slope roof areas are SBS roof systems.



## Roof Review [REDACTED] Schools

The SBS roof sections are relatively new and should provide a good service life expectancy

See photos and comments in photographic documentation.

### [REDACTED] SCHOOL



## Roof Review [REDACTED] Schools

The building is a one and two storey building with a low slope roofing system. The roof consists of several distinct roof sections identified on the figure above. Low slope roof areas are 2 ply SBS and PVC roof systems manufactured by Duro-last, (areas in white).

PVC roofs are a single ply system and, in this case, mechanically fastened to the roof deck, they tend to be more prone to damage due to rooftop activity and are easily damaged by vandals. Continuous movement due to strong winds can also cause problems. In many areas the fasteners are protruding above the collapsing roof systems below and this is a potential membrane rupture problem.

The SBS roof sections other than the Siplast area are relatively new and should provide a good service life expectancy. The Siplast roof area should be recapped in the next few years due to granule loss.

See photos and comments in photographic documentation.

### [REDACTED] SCHOOL



The building is a one and two-storey building with a low slope roofing system. The roof consists of several distinct roof



## Roof Review [REDACTED] Schools

sections identified on the figure above. Low slope roof areas are SBS roof systems.

The SBS roof sections are relatively new and should provide a good service life expectancy.

See photos and comments in photographic documentation.

### [REDACTED] SCHOOL



The building is a one storey building with a low slope roofing system. The roof consists of several distinct roof sections identified on the figure above. Low slope roof areas are SBS roof systems.

The SBS roof sections are relatively new and should provide a good service life expectancy

See photos and comments in photographic documentation.



## Roof Review [REDACTED] Schools

### [REDACTED] SCHOOL



The building is a one and two storey building with a low slope and steep roofing system. The roof consists of several distinct roof sections identified on the figure above. Low slope roof areas are 2 ply SBS, steep slope roof areas are surface fastened metal, fastened with bolts sealed with neoprene seals.

Both roof systems should provide substantial life expectancy.

The sloped metal roof should be monitored for deterioration of the neoprene seals in the fasteners and they should be replaced prior to leakage as that can cause the fastening surface to rot and fasteners will pull out.

See photos and comments in photographic documentation.



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## Roof Review [REDACTED] Schools

### Roof areas prioritized for work in 2020

The budget price includes 10% contingency and 10% for consulting. GST not included.

School	Roof Area	Size	Budget
[REDACTED] School	BUR Roof Areas	14,050 sq.ft	[REDACTED]
[REDACTED] School	BUR Roof Areas	8,800 sq.ft	[REDACTED]
[REDACTED] School	Transition Between Metal and SBS area Repair	N/A	[REDACTED]
		Total	[REDACTED]

### Roof areas recommended for Reroof in the next 5 years

The budget price includes 10% contingency and 10% for consulting.

School	Roof Area	Size	Budget
[REDACTED]	PVC Roof Areas	41,000 sq.ft	[REDACTED]
[REDACTED] School	PVC Roof Areas	11,400 sq.ft	[REDACTED]
[REDACTED] School	PVC Roof Areas	24,300 sq.ft	[REDACTED]
[REDACTED] School	Siplast Roof Areas - Recap	8,600 sq.ft	[REDACTED]
		Total	[REDACTED]



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## Roof Review [REDACTED] Schools

### LIMITATIONS

This report is limited to the visual observations recorded during the site visit and condition review only. This report does not include a review of structural capacity of the building elements and is not intended to confirm that the roof has been constructed in accordance with building codes, plans, specifications, or other jurisdictional authorities, or will remain watertight in its current condition.

Achieving the objectives stated in this report has required O'Neil Consulting to arrive at conclusions based upon the best information available to O'Neil Consulting at time of report preparation. No investigative method can completely eliminate the possibility of obtaining partially imprecise or incomplete information; it can only reduce the possibility to an acceptable level. Professional judgement was exercised in gathering and analyzing the information obtained and in the formulation of the conclusions.

The passage of time will alter the roof assembly's condition and may affect the accuracy of the information provided in this report. The material presented in this report has been prepared for the Clearview Schools for numerous schools in Alberta. Any action taken based on the information provided in this report by an Third Party is the responsibility of such Third Party. O'Neil Consulting accepts no responsibility for damages, if any, suffered by any Third Party as a result of decisions made or actions based on this report.

This report has been prepared in accordance with generally accepted study and or accepted practises. No other warranties, either expressed or implied, are made as to the professional service provided under terms of our agreement and included in this report.

We trust this meets your present requirements. If you have any questions or concerns, or if we may be of further assistance, please do not hesitate to contact the undersigned.

Yours truly,

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Roof Review [REDACTED] Schools

## Appendix A

### Photographic Documentation

## Roof Review [REDACTED] Schools

### 1) [REDACTED] School Overview



### 2) Ceiling damage at the transition from the sloped metal to the SBS roof, east end.



## Roof Review [REDACTED] Schools

- 3) Area over the ceiling damage, the transition area is coming apart and should be taken apart and redone.



- 4) Neoprene fastener repairs on the sloped metal roof, the condition of these fasteners should be monitored and replaced before leakage occurs. The neoprene becomes brittle due to UV exposure and can cause leaks into the fastening layer, this can cause rotting and fastener failure.





## Roof Review [REDACTED] Schools

- 5) The low slope SBS roof area is in good shape and should last for many years. There is ponding in some areas.



- 6) View to the north of the SBS roof.



**Roof Review [REDACTED] Schools**

- 7) Overview of the lower roof.



- 8) [REDACTED] School  
Overview

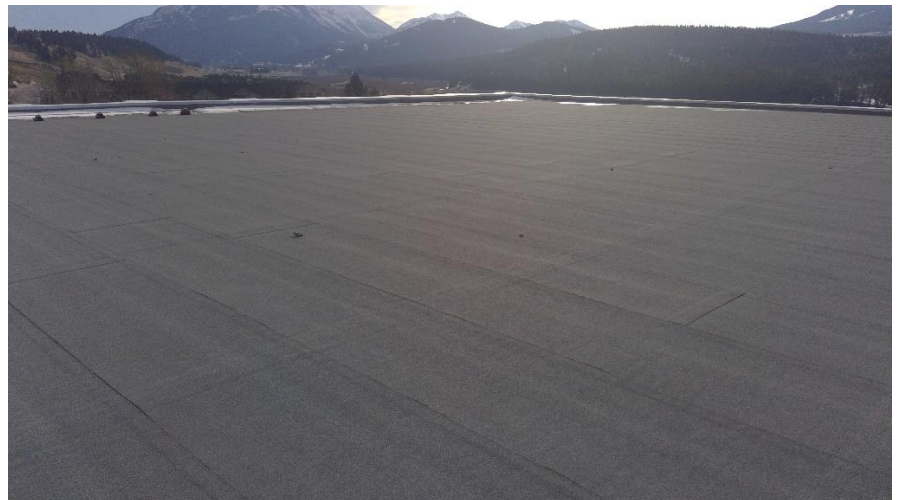


## Roof Review [REDACTED] Schools

- 9) Overview of the PVC roof areas to the west of the gym roof.



- 10) SBS gym roof is in good shape and should provide years of additional service life.





## Roof Review [REDACTED] Schools

- 11) There are areas of severe ponding on the PVC roof areas.



- 12) Exposure of the reinforcement in the PVC roofs due to UV exposure, This would indicate failure within the next few years.



**Roof Review [REDACTED] Schools**

- 13) Repair to an area where the fastener protruded through the roof membrane.



- 14) Protruding fastener (small circle)  
repaired seam (large circle)



**Roof Review [REDACTED] Schools**

- 15) Sever ponding in some areas.



- 16) Metal flashing has been refastened after partial blow of in the wind.



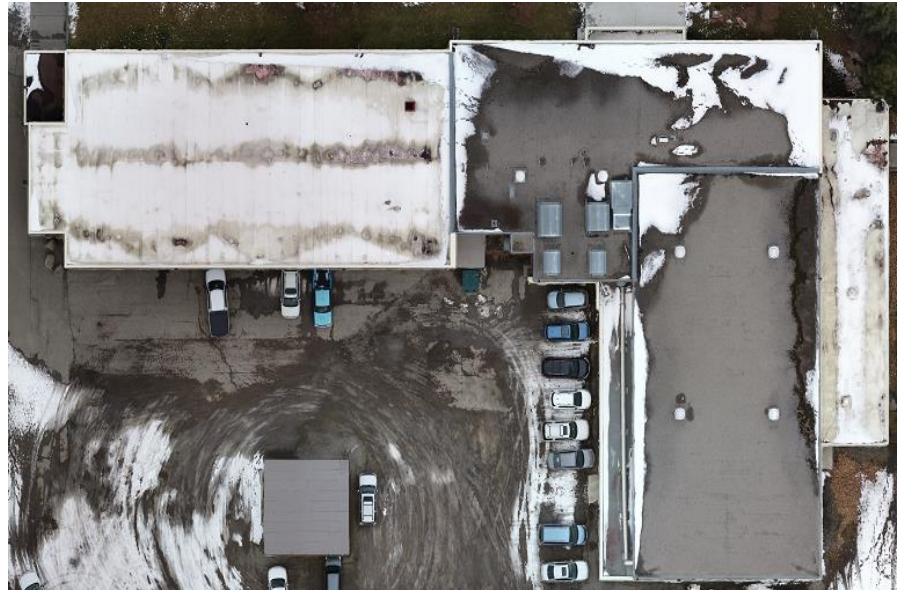


**Roof Review [REDACTED] Schools**

17) Patch repair on a unit curb corner.



18) [REDACTED] School Overview.



**Roof Review [REDACTED] Schools**

19) PVC roof section to the west.



20) Evidence of roof leakage under the roof hatch on the PVC roof area.





**Roof Review [REDACTED] Schools**

21) Built up roof section to the east.



22) Repairs by the RTU on the BUR roof.



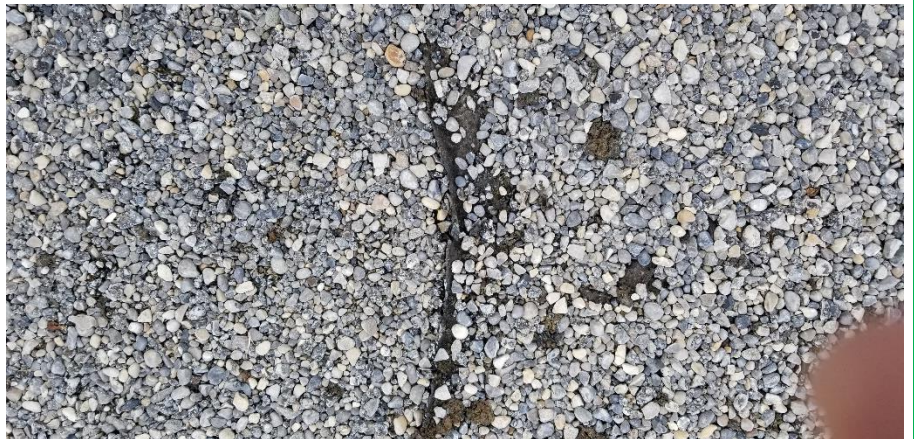


**Roof Review** [REDACTED] **Schools**

- 23) Felt exposure and evidence of blistering on the BUR roof.



- 24) Felt exposure and evidence of blistering on the BUR roof.



**Roof Review [REDACTED] Schools**

- 25) Felt exposure and evidence of blistering on the BUR roof.



- 26) Livingstone School Overview





**Roof Review [REDACTED] Schools**

- 27) BUR Roof section evidence of blistering, felt exposure is prominent.



- 28) The BUR areas to the south are not quit as bad.





**Roof Review** [REDACTED] **Schools**

- 29) Exposure of the felt seams and asphalt exposure on the BUR roof.



- 30) Felt exposure typical.



**Roof Review [REDACTED] Schools**

31) [REDACTED] School Overview



32) The roof is SBs and for the most part is in good shape; some minor repairs are required.





**Roof Review [REDACTED] Schools**

- 33) The seal around some plumbing vents has cracked and should be resealed.



- 34) Some areas of ponding water.





**Roof Review** [REDACTED] **Schools**

35) Evidence of repair.



36) Repaired seam.



**Roof Review** [REDACTED] **Schools**

37) [REDACTED] School – Overview



38) PVC roof section to the west of the sloped metal roof.





**Roof Review [REDACTED] Schools**

39) Substantial ponding in many areas.



40) No membrane protection under pipe supports.





**Roof Review [REDACTED] Schools**

- 41) Drain undersized to provide proper drainage.



- 42) Severe ponding in some areas, also the wall to the left should have been clad or a gum lip flashing installed.



**Roof Review [REDACTED] Schools**

- 43) The roof should be protected under the panel in this picture.



- 44) Fasteners protruding above the insulation could work their way through the roof membrane. Also, there is evidence of damage to the membrane from UV exposure, exposed reinforcement.



**Roof Review** [REDACTED] **Schools**

- 45) This curb is much lower than the industry standard of 8 inches.



- 46) Siplast roof area with granule loss, failure is not imminent, but this is a rare opportunity to recap rather than reroof.





**Roof Review** [REDACTED] **Schools**

47) Granum School - Overview



48) Granule loss in some areas



**Roof Review** [REDACTED] **Schools**

49) Interply blistering should be repaired.



50) Unusual vent.





**Roof Review** [REDACTED] **Schools**

51) Tenting membrane on the parapet.



52) Damaged vent.





**Roof Review [REDACTED] Schools**

53) Stavely School Overview.



54) The cap membrane has granule loss in many areas.



**Roof Review [REDACTED] Schools**

- 55) Evidence of numerous repairs on the roof.



- 56) There is interply blistering in some areas, this should be monitored.





**Roof Review [REDACTED] Schools**

- 57) Debris should be removed on the upper north roof.



- 58) Some tenting on the parapets, this should be monitored.





**Roof Review [REDACTED] Schools**

- 59) Blistering and crazing in the membrane in areas exposed to the most heat, this should be monitored.



- 60) Evidence of hail damage in some areas.



**Roof Review [REDACTED] Schools**

61) [REDACTED] School Overview



62) Gutters around the steep-slope roof should be cleaned.



## Roof Review [REDACTED] Schools

- 63) Upper SBS roof is relatively new and has no apparent issues.



- 64) Sloped metal roof is fastened by screws with neoprene seals, these should be monitored as the neoprene becomes brittle over time due to UV and this can cause leaks into the fastening surface and possible rotting.





**Roof Review** [REDACTED] **Schools**

- 65) These fasteners look relatively new so some may have been replaced already.



- 66) Gutter should be cleaned.

