

**WATER DAMAGE AND MOULD ASSESSMENT
PORTABLE CLASSROOM FS 115 (Library)
MINISTIK SCHOOL**



Submitted to:
Elk Island Public Schools
683 Wye Road
Sherwood Park, AB. T8B 1N2

Submitted by:
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February 2017

EIPS.93

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EXECUTIVE SUMMARY

RH Services Inc. was retained by Elk Island Public Schools, to conduct a water damage and mould assessment of the old portable classroom (FS-115 Library) located at Ministik School in the county of Strathcona, Alberta.

The purpose of this assessment was to determine the extent of water damage and mould amplification within the structure. The portable was connected to the corridor serving FS-111 to the east and abutted FS-109 to the south.

The initial assessment was undertaken on Saturday, January 28th 2017. At this time a visual inspection was undertaken of the Library and the exterior of the portable. The roof and crawlspace were not accessed.

Samples of suspected mould growth were collected for confirmation by optical microscopy. An Infrared camera and moisture meter were used to locate and delineate areas of water damage and potential mould amplification. The findings of our investigation and sampling are presented in this report with recommendations on required or suggested actions.

The portable in question FS-115, was a very old style ATCO trailer of wood frame construction with corrugated steel siding, aluminium sliding windows and a curved roof.

The presence of mould was confirmed in some of the building components, although the concentration of viable mould in the air was within the Health Canada Guidelines when tested on January 5th 2017. (Analytical report 8890 in appendix A).

Action is required and the portable was well beyond its service life¹.

1. *It should be noted that the life expectancy of a portable classroom that is well located and maintained is in the area of twenty years. (Atco Structures and Logistics)*



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1.0 INTRODUCTION

An initial assessment of the old portable classroom (FS-115, Library) at Ministik School was undertaken by RH Services Inc. on Saturday, January 28th 2017.

Visual inspections were conducted within the portable and of the exterior. The roof and crawlspace were not accessed at this time.

An infrared camera was used to locate and explore for water damaged areas and a moisture meter was used to confirm if excess moisture was present in these areas. Walls and ceilings were opened in representative areas to examine the conditions and to collect samples of suspected mould growth, for confirmation by optical microscopy.

1.1 BACKGROUND

The area investigated consisted of one portable, currently used as a Library, located on the northeast corner of the original 1951 building and adjoining the portable classroom FS-111 to the east and abutted to FS-109 to the south. See the Aerial view below.



Photo #1: Aerial view
FS-115, Library

The original 'Atco Trailer' was a very old style not often seen as indicated by the curved roof. It was well passed its service life expectancy of twenty years.

RH Services Inc. were retained to investigate for water damage and mould amplification, to assist the school board with future planning.



2.0 SCOPE OF WORK

The following services were provided by RH Services Inc.:

- Site inspection;
- Visual assessment;
- Thermal imaging and moisture content measurement;
- Intrusive investigation inside walls and ceilings;
- Report production, documenting observations and suggesting actions.

3.0 SITE INSPECTION

RH Services Inc. undertook the initial site inspection on Saturday, January 28th 2017, at this time the school was vacant for the weekend.

Exterior Observations

The roof drain in the corner where the portable joins the gymnasium was cracked and leaking, and the grading runs from the gymnasium to the portable. The roof water flows across the library roof from a scupper.

The layout of the portables in relation to each other and the gymnasium created an area of poor air circulation and dampness. Water was entering the underneath of FS-115. The crawlspace was not accessed.



Photo #2:
Location of FS-115 left in relation to FS- 109 centre and the gymnasium right.

Note the grading and drainage issues.

Crawlspace

The crawlspace underneath the portables was not accessed at this time.



Interior Observations

A walk through of the Library was conducted and no obvious water damage was initially evident, with newer suspended ceiling tiles in good condition.



Photo #3:
Initial impression upon entering the Library is favourable with no obvious water damage.

With further investigation it becomes apparent that the initial beauty is only skin deep and not far below the surface are the signs of an aging and deteriorating trailer.



Photo #4: Above the new suspended ceiling tiles is the original cellulose ceiling with water staining.



Photo #5: Close up showing location of sample 4468.01 with Fungal mycelia indicating mould amplification.



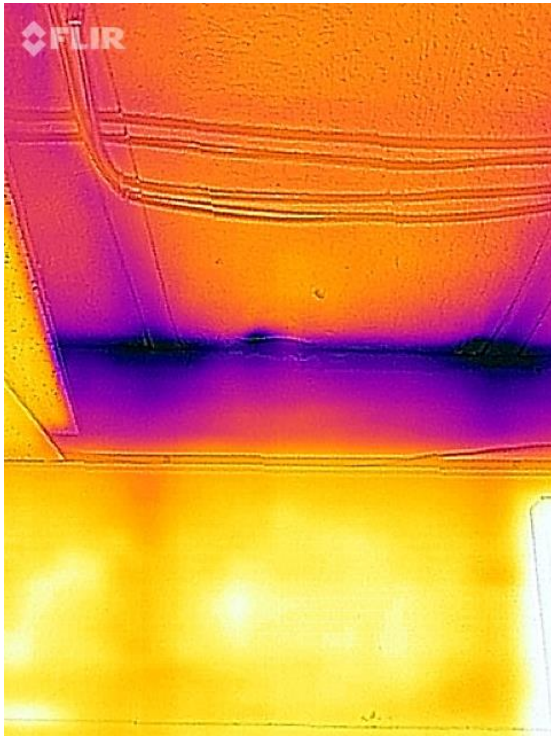


Photo #6:
Thermography at the wall to ceiling joint showing cool spots in blue potential condensation areas that coincide with the water damage and mould growth shown in photos 4 and 5.

The joint at the floor to wall was also found to be a considerable cold spot and any moisture from condensation can be trapped by the vinyl base boards and cause mould amplification, destructive investigation confirmed the presence of mould in six of eight locations investigated.

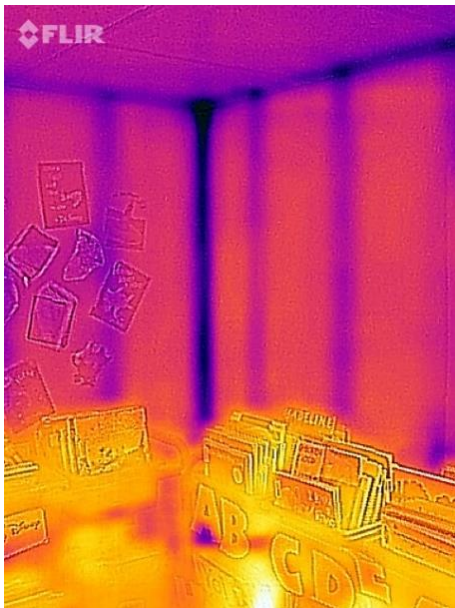


Photo #7: Northeast corner showing cold transfer through framing

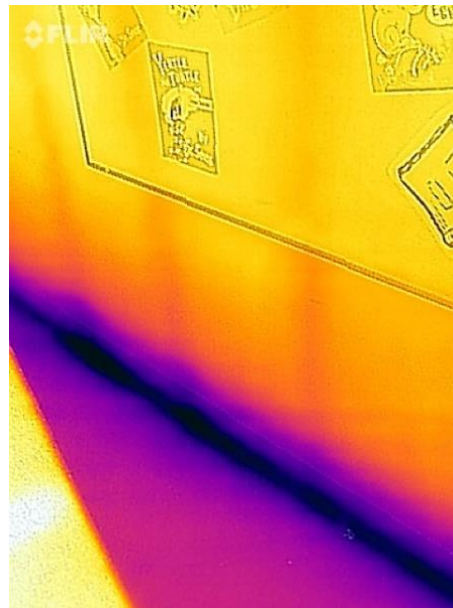


Photo #8: Typical cold transfer at the floor to wall joints.



Removing the baseboards confirmed the mould amplification caused by cold bridging/air infiltration at the floor to wall joint.



Photo #9: Northeast corner with baseboard peeled back.



Photo #10: Sample 4468.04 *Stachybotrys* sp. On the front face of the drywall.



Photo #11: *Chaetomium* sp. On the reverse side of the drywall.

Similar conditions were found on the east and west side. The north wall could not be accessed.

Specifics

Ceilings: The ceiling of the portable was 2'x4' suspended ceiling tiles. The original cellulose tiles with plastic joint strips, were in place above the suspended ceiling. The roof was curved. Fungal mycelia (sample # 4468.01), were present on the old ceiling.



Photo # 12: Water damaged original ceiling in the mechanical room of FS-115.



Walls: The Library walls were drywall; the drywall was measured to have <10% moisture content (dry), but infra-red thermography indicated cold spots (air infiltration) that could cause condensation in certain conditions, and mould growth was confirmed along the east and west walls. (Samples #4468.02, 03, 04 and 05 in appendix A)



Photo # 13: Mould growth behind the baseboards on the west wall under the window adjacent to the air return grille.

Floors: The classroom floors looked to be in good condition (carpet), destructive investigation was not undertaken but it was noted that the plywood was in good condition in the areas inspected.

4.0 AIR SAMPLE RESULTS

An air sample was collected from the library on January 5th 2017 using a Reuter Centrifugal Sampler (RCS) the sample was impacted onto a Rose Bengal Agar growth medium. The sample was cultured then examined by optical microscopy to determine the number of colonies per cubic metre and the genus of the mould growth. This was compared to an exterior control sample and the Health Canada Guidelines. (Sample 8890.05 and 06 in appendix A).

The interior sample was found to be acceptable and was within Health Canada Guidelines.



5.0 SUGGESTED ACTIONS

Although the air sample collected on January 5th 2017 was acceptable, conditions observed were such that blooms of mould can be anticipated during certain conditions, this is difficult to predict and measured mould results can vary drastically. We suggest that planning for replacement of the portable FS-115 be initiated. We further suggest that for continued operation of the portables air testing be conducted at least each term. A contingency for the installation of HEPA air cleaners should be on hand should elevated mould concentrations be encountered.

It has to be remembered when reading these recommendations that we are not privy to information regarding the demographics and long and/or short term needs of the community. From our position the recommendations are based on the logistics and value of the buildings as they currently stand. They may not reflect the effects, inconveniences and expenses that will be incurred to facilitate the staff, scholars and the community in general.

We believe that further investment in the portable is ill-conceived and from our past experiences with remediation of portables it should be considered highly likely that the extent of rot and mould will be significantly beyond what is anticipated.

It should be noted that the life expectancy of a portable classroom that is well located and maintained is in the area of twenty years. (Atco Structures and Logistics)

6.0 CLOSURE

We trust that the information in this report meets your present requirements. If you have any questions or require further explanation, please contact the undersigned at your convenience. We look forward to working with you in the future.

Yours truly,

RH Services Inc.

Rod Hall

RET. CRSP. ROHT.
Senior Consultant



APPENDIX A
ANALYTICAL RESULTS



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Mould Identification

Client: Elk Island Public Schools
 683 Wye Road
 Sherwood Park, Alberta.
 T8B 1N2

Job#: 4468 EIPS.93
Date: January 28th 2017

Ministik School FS 115 Library Portables

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| Sample number | Description, location of sample | Type of Sample | Genus of Mould | Loading |
|---------------|---|---|--|----------------|
| 01 | East side 6' north of door to corridor Old ceiling above suspended ceiling tiles (Water stained) | Bulk | Fungal Mycelia | Light |
| 02 | East wall north of door to exterior Drywall at baseboard | Bulk | <i>Stachybotrys</i> sp. | Heavy |
| 03 | North east corner At baseboard | Bulk | <i>Chaetomium</i> sp. <i>Stachybotrys</i> sp. | Light Heavy |
| 04 | West wall north end At baseboard | Bulk | <i>Stachybotrys</i> sp. | Heavy |
| 05 | West wall under south window At baseboard | Bulk | <i>Stachybotrys</i> sp. | Heavy |
| | | Legend: NG= No growth, means no evidence of mould growth observed Sample interpretations: Analysis using optical microscopy, loading subjectively described as heavy, moderate or light. | | |

Analysis by:

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Viable Mould Count Analysis

Elk Island Public Schools
683 Wye Road
Sherwood Park, AB
T8B 1N2

Job # 8890 EIPS.88.2
Date: January 11th 2017
Ref:

Ministik School

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| Sample number | Location of sample | Time | Volume Litres | Genus | Raw Count | CFU/M ³ |
|---------------|--|--|---------------|--|-----------------|--------------------|
| 01 | Exterior Control -6 ^o C light snow | Jan.5 th 2017 14:35-14:37 | 80 | <i>Cladosporium spp.</i> <i>Penicillium sp.</i> Total | 1 1 2 | 13 13 26 |
| 02 | FS 109 | Jan.5 th 2017 14:05-14:09 | 160 | Yeast Total | 1 1 | 6 6 |
| 03 | FS 110 | Jan.5 th 2017 14:10-14:14 | 160 | <i>Cladosporium spp.</i> Total | 1 1 | 6 6 |
| 04 | FS 111 | Jan.5 th 2017 14:16-14:20 | 160 | NG Total | <1 <1 | <6 <6 |
| 05 | FS 115 Library North end | Jan.5 th 2017 14:21-14:25 | 160 | NG Total | <1 <1 | <6 <6 |

| Sample number | Location of sample | Time | Volume Litres | Genus | Raw Count | CFU/M ³ |
|---|-----------------------------|--|---------------|---|-----------|--------------------|
| 06 | FS 115 Library South end | Jan.5 th 2017 14:25-14:29 | 160 | <i>Cladosporium</i> spp. | 1 | 6 |
| | | | | Total | 1 | 6 |
| NOTES: Media will be kept for 10 days only. Collection Media: Rose Bengal Agar in RCS sample Sterile Hyphae: Means filamentous mould growth without conidia or fruiting bodies, therefore not identifiable. | | | | Sample Interpretation: <ul style="list-style-type: none"> • Red highlight indicates concentrations in excess of Health Canada Guidelines • Blue highlight indicates concentrations of interest • Green highlight indicate exterior samples NG: means no mould growth after incubation period | | |

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