Allan Avis architects inc.

SITE VISIT REPORT

Name of Project: Blyth Memorial Community Hall
Attic Investigation

Project No.: 1727

Location: 431 Queen Street, Blyth, Ontario

Report No.: 01

Contractor: N/A

Date/Time of Visit: February 8, 2018

AAA Personnel: Jason Morgan
Matt Nigh

Weather: -11°C, Cloudy with Light Snow

Others Present:
Karen Stewart - Blyth Arts & Cultural Initiative 14/19 Inc.

Building Permit No.: N/A

Report by: Jason Morgan

Affix Professional Seal Here

ONTARIO ASSOCIATION OF ARCHITECTS
JASON P. MORGAN
LICENCE
6670

Signature:

Distribution:
Pat Newson - Township of North Huron

REPORT

ACTION BY:

PURPOSE OF VISIT

1 .1 This site visit was conducted to review the conditions in the attic space, located directly above the original 1920 Memorial Hall portion of the building. Large icicles, ice damming and snow melts have been experienced in this area of the roof. The goal of the visit was to identify potential causes of these conditions and to provide recommendations to address the issues. — Info

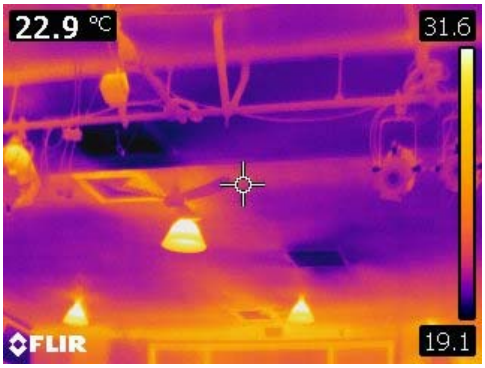
It should be noted that, this site visit did not include destructive testing or disassembly of existing systems and assemblies. This site visit report outlines visually observed conditions, with the use of thermography imaging techniques to analyze conditons. We have relied completely on these visual observations of existing conditions in preparation of our report and recommendations.

Further review and design work would be required to implement the recommendations and to explore options outlined in this report. This report is not intended to be the basis of a complete design.

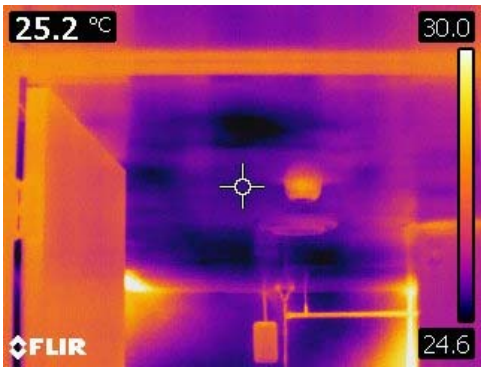
OBSERVATIONS AND COMMENTS

1 .2 The exterior of the building was reviewed, revealing one area with noticeable heat loss. The area of soffit on the north side of the A/V Control Booth was recorded at 11.9°C. This area of the soffit is in the same area reported to have large icicles and ice damming, causing damage to the gutter and downspouts. Icicles are shown in the photos below. It was reported by the General Contractor, who completed recent renovations in the building, that the exhaust fan from the A/V Control Booth does exhaust directly into this vented soffit area. Info

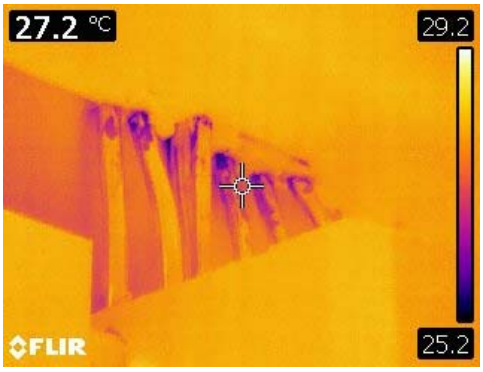
1 .3 The ceiling of the Upper Hall was reviewed and scanned with the thermography camera. There were no concerns, such as cold zones, indicating missing insulation, or areas where large amounts of air-leakage were occurring. Thermography scans indicated a relatively even temperature gradient over the entire ceiling. Info



1 .4 The Balcony Level, in the East Exit Stair, adjacent to the A/V Control Booth, was reviewed. This area was noticeably warm and had an ambient temperature of 33.6°C. AAA was made aware of issues with the HVAC system in this area, prior to the site visit, so the result was not unanticipated. In this same stairwell, the ground floor level temperature measured 8.6°C. Thermography scans of the ceiling indicated cold areas in the centre of the ceiling. Investigations in the attic revealed that mechanical ducts and sprinkler lines, interrupting the continuity/thickness of the attic insulation, were the likely cause of these cold areas. Additional insulation could be added in this area, but these cold zones (areas of heat loss into the attic) are not suspected to be a primary cause or a contributing factor of the snow melting on the roof of the building. Info



1 .5 The A/V Control Booth was reviewed and was found to generally have good air sealing around electrical and data conduits, penetrating through the ceiling. The ceiling-mounted exhaust fan was running in this room the entire time of the visit, in order to extract the heat generated by lighting dimmer racks and other electrical equipment in the room. Info



1 .6 The attic space was reviewed and found to be relatively warm. The temperature at the time of the review fluctuated between 6-8°C. The temperature of the underside of the roof sheathing, at the midpoint of the roof slope, was 4°C. The temperature at the underside of the roof sheathing, above the insulated supply-air duct, located in south east corner of attic was 14°C. Therefore, melting of snow on the roof would occur in all of these locations, especially above the supply-air duct in the south east corner of the attic. This duct location is also an area where heavy ice damming and icicles were reported, and were visible on the exterior of the building during this review (although to a lesser degree than what had previously occurred). This duct and the duct opposite in the attic are existing to the building and not part of the 2017 renovation project. Info

1 .7 During review of the west gable end of the attic, fibreglass batt insulation was found packed into many gaps between the roof strapping and extending out beyond the gable, forming the roof overhang. We assume this batt insulation is existing and was installed to stop wind-driven snow from entering the attic. The batt insulation decreases airflow from the vented soffit into the attic. The continuous ridge flashing, at roof peak, is not vented and it is our understanding that this was installed during the roofing of the 1990 renovation project. Red arrows, in the image below, point to the batt insulation between strapping and at the non-vented ridge flashing. Info

1 .8 The typical eave condition, at the heel/base of the trusses, had insulation baffles (1'-0" wide) centred in each truss space. In most locations, the baffles were compressed and the loose-fill cellulose insulation was tight to the underside of the roof sheathing. Both of these factors will restrict airflow into the attic. The temperature of the sheathing, just above the insulation baffles, located at the heel of the truss, was approximately 1°C, as shown in the below image. Info

RECOMMENDATIONS

1 .9 The best way to reduce the amount of snow melt, ice damming and icicles, on the roof and eave, is to lower the temperature in the attic, matching the outdoor air temperature as closely as possible. Info

The attic is congested with HVAC, electrical and A/V systems. This congestion, as observed through thermography, is contributing to a significant amount of heat being released, transferred and conducted from conditioned spaces below and into the attic. It is not practical to relocate, or significantly contain, insulate and isolate these systems from the attic. Therefore, the most efficient way to lower the temperature of the attic is to increase the amount of ventilation in the space. Although some recommendations below address mitigating the heat loss from conditioned spaces below, the primary focus is on strategies to reduce the ambient temperature in the attic and in noticeably problematic areas, by increasing attic ventilation.

Consideration needs to be given to recommendations when, and if, they are implemented, as it may be more efficient to combine items of work, i.e., if high level exterior work is being completed, it may make sense to combine multiple upgrades, to take advantage of specialized equipment, such as aerial work platforms.

As stated prior, further review and design work will be required to implement the recommendations listed below; this report is not intended to be the basis of a complete design or used to direct construction activities.

1 .10 **Recommendations:**

Info

1. Replace existing ridge flashing, on the main upper roof of Memorial Hall, with continuous vented ridge flashing. This will help increase ventilation and the "change-over" of air in the attic.
2. Reroute exhaust duct from exhaust fan installed in the ceiling of the A/V Control Booth. Provide new insulated and sealed duct, routed to a new storm-proof louvre, installed in east gable, located out of view, behind the bell tower cupola.
3. Remove batt insulation from gaps between strapping in west gable. Install fibrous mesh venting material (mortar net) to allow greater air movement/ventilation and reduce wind-driven snow from entering attic.
4. Rake-back the loose-fill cellulose insulation and create an air gap at the truss heel location, between the top of insulation and the underside of roof sheathing. This will allow free air movement from the soffit into the attic and keep the sheathing and roofing cooler, thereby, reducing snow melt.
5. If the cellulose insulation cannot be adjusted from within the attic, to create an air gap, per item 4, temporarily remove the soffit from the exterior and install plywood baffles in each truss space, providing a minimum 1½" airspace below the roof sheathing, allowing free air movement from the soffit to the attic.
6. Install storm-proof louvres in the west gable, located above lower gable roof to the west, in order to increase attic ventilation.
7. Temporarily remove the vented soffit around the area of supply air ducts, located in the southeast and northeast corners of the attic. Once accessible, the insulation around the ducts will need to be reviewed and options explored to create an airspace between the top of the duct/insulation and the underside of roof deck. The reason is to provide free movement of outside air from the soffit area into the attic. It may be found that the duct needs to be modified in order to create enough airspace. Further review and consideration is required.
8. Mechanically ventilate the attic, when temperatures are at or below freezing, if the above natural/gravity ventilation strategies are found to be inadequate.

- END OF REPORT -

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