

Parks Canada

Assessment Report
Canadian Rockies Hot Springs – Banff Upper Hot
Springs Bath House – Structural Review of Roof
Overhang for New Copper Gutter Assembly

Prepared by:

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Project Number:

Parks Canada: CRHS152017

AECOM: 60445999

Date:

October 19, 2015



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October 19, 2015

Scott Turnbull
Project Manager
Canadian Rockies Hot Springs
Parks Canada Agency
P.O Box 40
Radium Hot Springs, BC V0A 1M0

Dear Mr. Turnbull:

Project No: 60445999

Regarding: Banff Upper Hot Springs Bath House Roof Overhang—Assessment Report

This report presents the findings of the investigation conducted by AECOM Canada Ltd. (AECOM) at the Banff Upper Hot Springs Bath House on October 14th, 2015. The objective of the site review was to review the existing roof overhang construction at the bathhouse and its suitability for the addition of a new copper gutter assembly.

If you have any questions concerning this report please do not hesitate to contact the undersigned.

Sincerely,
AECOM Canada Ltd.



Nishal Rao, EIT
Structural Engineer
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NR:blg
Encl.

Distribution List



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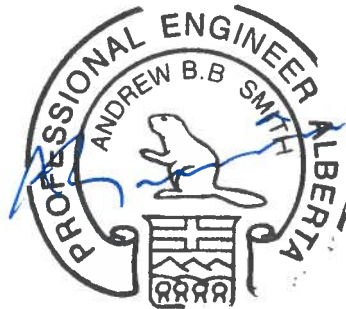
Revision Log

Revision #	Revised By	Date	Issue / Revision Description
0	Nishal Rao	Oct. 19, 2015	Original Report

AECOM Signatures

Report Prepared By:

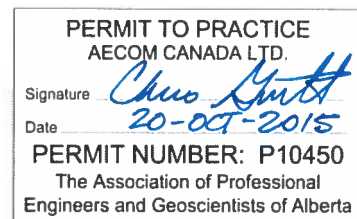
Nishal Rao, EIT
Structural Engineer



20-OCT-2015

Report Reviewed By:

Andy Smith, P. Eng.
Senior Structural Engineer





Executive Summary

This report assesses the structural condition of the roof overhang assembly and its suitability to carry an additional copper gutter and the associated loading.

The findings of the assessments are the following:

1. The roof overhang structure is able to carry the additional load of the copper gutter assembly without added support or retrofit.
2. The timber beams that make up the roof overhang appear to be in good condition and appear to be structurally adequate to support the additional loading.



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1. Background

The bathhouse identified in this report is located within the Canadian Rockies Hot Springs and has been earmarked by Parks Canada for infrastructure improvements. This report outlines the findings of an assessment of the roof structure of the Banff Upper Hot Springs Bathhouse, particularly the roof overhang—which will support a new copper gutter system. The purpose of the report is to identify if the roof can carry the additional loading of the gutter and associated snow load and to propose a solution if extra support is needed.

1.1 Overview

On October 14th, 2015, an AECOM representative conducted a site inspection wherein a portion of the roof cladding at the bathhouse was cut away to expose the structure below. It was observed that the roof structure is composed of 2" x 6" (38mm x 140mm) rafters and 2" by 6" (38mm x 140mm) outrigger rafters supporting the overhang both spaced at 2'-0" (610mm) o/c. See Figure 1 below for an overall view of the building and Figure 2 for the area of the roof that was cut away.



Figure 1: Overall View of Banff Upper Hot Springs Bathhouse



Figure 2: Cut-out and Exposed Portion of Roof

Upon inspection of the roof beams from the cut-out portion of the roof (see Figure 3 below) and from the upper level crawl space (see Figure 4 below), it was observed that the outrigger rafters are continuous over the block wall support and tie into the main rafters inside the building. A diagram of the presumed geometry of the roof overhang is presented in figure 5.



Figure 3: Close-up View of Roof Rafter (Upper Beam) and Outrigger Rafter (Lower Beam)

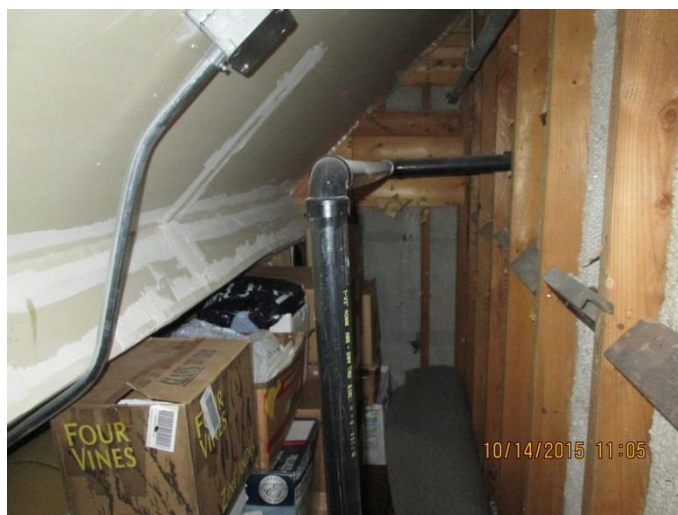


Figure 4: View of Roof Structure from Upper Level Crawl Space

1.2 Geometry of Roof Overhang Structure

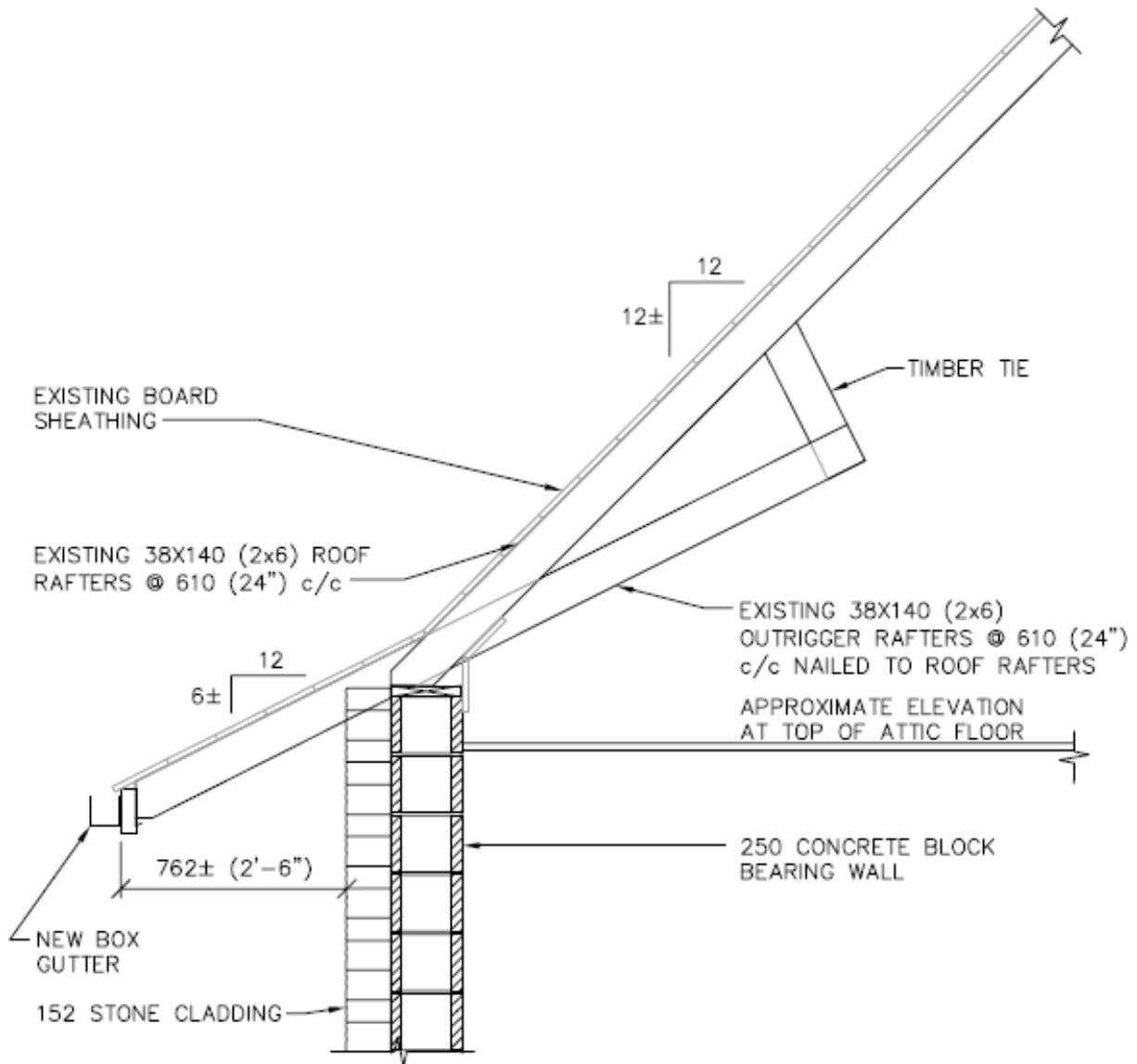


Figure 5: Presumed Existing Roof Framing Geometry at Bearing Wall



2. Assessment

Based on the geometry presented in Figure 5, the roof overhang joists were checked for the latest snow loading (according to Alberta Building Code 2014) with the addition of the new copper gutter. It was assumed that the roof overhang joists are S-P-F No. 2 sawn lumber.

The beams were found to be adequate to support the additional loads and, based on a visual assessment of the timber rafters, no additional support or retrofit is needed. See Table 1 below for a summary of the analysis results.

Table 1: Analysis Results

	Existing Condition	With New Gutter Added	2"x6" (38mm x 140mm) S-P-F No.2 Overhang Framing
M_r (kN-m)	0.75	0.82	$M_r = 1.04 \text{ kN-m}$
V_r (kN)	1.95	2.06	$V_r = 5.00 \text{ kN}$

3. Recommendations

1. No additional support is required for the roof rafters to support the loads from the gutter system based on the presumed geometry. It is AECOM's recommendation that, before construction, more of the roof structure is exposed so that the geometry shown in Figure 5 can be confirmed at each rafter.
2. The timber rafters appeared to be in good condition based on the portion of the roof that was exposed. It is AECOM's recommendation that the condition of all of the rafters that will support the new gutter system be confirmed before construction.