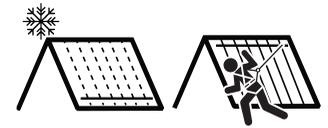




CASE STUDY — Former Territorial Courthouse NHSC Dawson, Yukon, Canada



X-Gard™ 1.0 & S-5-V™ Clamp

AT-A-GLANCE

Architect of the Building

Thomas William Fuller of the Federal Department of Public Works

Architect of the Upgrade

Hazen Sise

Investor

Parks Canada

General Contractor

Wildstone Construction Group

Roofing Contractor

ARCAN

Roof Profile

26-gauge, 27.75" panel, double mechanical lock standing seam

Snow Retention & Fall Protection Supplier

ATBEST Inc.

Industry

Institutional & Heritage

Project Stats

Roof Measured:

+/- 5,000 square feet

Roof Pitch: 7:12 and 1:12

S-5! Products Supplied:

S-5-V clamp (302), X-Gard 1.0 (186)



The Situation:

Due to the historical nature of the project, the particulars of the new metal roof, and the area's considerable snow loads, the contractor needed a penetration-free, fully engineered, aesthetically pleasing snow retention solution designed and engineered to last the life of the roof. Also, any fall protection system in snow country must be protected with snow retention to prevent it from snow avalanche danger.

The Result:

The X-Gard pipe system provided the superior holding strength required for the expected snow accumulation in this northern climate. The S-5-V clamps complemented the fall protection system used for the project, providing the safety and security desired.

The Project

Built in 1901, the Former Territorial Court House is a handsome, two-story, wood-frame building, prominently located within the Dawson Historical Complex, a designated National Historic Site, in the Yukon Territory of Canada. Historically associated with the establishment of a federal presence in the Northwest and the assertion of Canadian sovereignty, this rare turn-of-the-century courthouse is one of only two early territorial courts remaining in Western Canada. In 1967, it was acquired by the Canadian Parks Service.

Throughout the years, the building has required many modifications. In 2023, the Parks Service determined a new roof was required and selected a 26-gauge, double-folded mechanical lock standing seam metal roof, which was rollformed on site. To ensure life safety, the project features S-5! X-Gard 1.0 snow retention and Fallprotec SecuRail Pro fall protection together with S-5-V clamps.



The Challenge

Located 265 kilometers (165 miles) south of the Arctic Circle, Dawson is subject to considerable snow loads. The courthouse required a snow retention system that could restrain snow loads of 50.5 pounds per square foot – one that would not penetrate the roof and maintain a pleasing aesthetic.

The roofline geometry is uniquely complex, featuring two different slopes (primary roof is 7:12), dormers, and a cupola together with the wide seam spacing of 70.5 centimeters (27.75 inches), which required engineering two rows of snow retention.

In general, a steep slope roof like this would make it difficult to install snow retention because contractors could not safely walk on the roof without scaffolding, lifts or fall protection.

Given this was a government building and a historical site, there were more stringent requirements for the roof project, including a higher level of engineering, documentation and professionally engineered stamped drawings.

The Solution

Roofing contractor, ARCAN, selected X-Gard 1.0 by S-5! for its compatibility with the project's standing seam roof. With unprecedented holding strength, X-Gard 1.0 is the strongest one-pipe snow guard system designed for maximum load/span conditions and reduces the risk of rooftop avalanches, preventing property damage and even personal injury.

It is mechanically attached with round-point setscrews, gripping the seam securely without penetration and without damage to the panels' protective finishes, which was of utmost importance for this heritage building.

ARCAN worked with ATBEST, an exclusive distributor of Fallprotec systems in Canada, to provide a reliable, engineered fall protection system together with a snow retention system incorporating S-5-V clamps designed and engineered for this particular roof profile. Having worked together on many snow retention projects, especially in the Yukon, this was their first project including both snow retention and fall protection.

The Fallprotec Securail Pro is a horizontal safety line that is both rigid and highly versatile. It is

lightweight and has a high moment of inertia, which makes it more resistant to bending and allows for large spans between brackets, (up to 6 meters)—ideal for securing work sites with low fall clearance. As such, it is recommended for complex structures that have irregular fixing options.

Long-Term Outlook

The Parks Service was able to achieve the quality look it wanted with a snow retention system that maintains the roof integrity, reduces the risk of rooftop avalanches, and provides superior holding strength required for the area's heavy snowfall. At the same time, S-5-V clamps provided a combined high pull-out and shear strength required for fall protection systems.

How Did S-5! Products Help?

- Provided a penetration-free solution with outstanding holding strength for both fall protection and snow retention
- Designed and engineered on a site-specific basis
- Extensively tested for load-to-failure results

"We exclusively use S-5! clamps for fall protection systems, since they have the biggest catalog of test reports for roof profiles. This gives me reliable data for allowable loads so I can safely design systems for critical fall protection applications. With this reliable data, I can always get my projects sealed by our professional engineer. We also use the S-5! Snow Calculator and test reports for designing snow retention systems, especially in critical high snow load and liability projects in Canada."

— Colin Dunn, Technical Director, ATBEST Inc.



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