

Spray Foam Succeeds Where EPS Fails

Spray Foam Insulation Protects New Water Reservoir in National Park



Over 2,400 square miles of mountain parks, and pristine lakes and streams, makes Kananaskis Country a must see when visiting the Canadian Rockies. Kananaskis Country is located west of Calgary and borders the town of Canmore and Banff National Park. Kananaskis Country includes five Provincial parks, four wildland Provincial parks, one ecological reserve, and several Provincial recreation areas. Known as Alberta's Mountain Playground, Kananaskis Country was officially dedicated as a protected area 25 years ago.

Kananaskis Village had an aging water system that was in severe need of an upgrade. A \$59.6 million dollar infrastructure improvement project called for the construction of a new 106,000 cubic foot water treatment plant using membrane technology and



a UV disinfection system. The project also included 6.2 miles of PVC / HDPE distribution pipe, combined with two 124,000 and 106,000 cubic foot concrete reservoirs.

Both reservoirs needed to be buried and insulated to help protect them from freezing during the cold winter months. The first unit specified expanded polystyrene (EPS) rigid insulation board rather than spray polyurethane foam. The 4 foot by 8 foot board stock was fastened with strapping to try to hold the insulation against the walls and roof of the structure. Upon backfill, the EPS did not hold up and started breaking into little pieces. The EPS board stock was too fragile to withstand the heavy earthmovers that were used to bury the holding tank. The jobsite became a mess of broken polystyrene. It took several weeks to clean up the site, order more board stock, and carefully backfill to ensure the new boards would not break.

Besides the problem with strapping and breakage, gaps existed between the boards and caused a loss in insulation value. During the backfill process, dirt packed the gaps between the boards and created a thermal bridge where heat loss could flow through the path of least resistance.

After the polystyrene disaster on the first reservoir, the GC made the call to Midgaard Spray Foam Systems. Spraying the structure with 2" of Quik-Shield 112 2 lb closed-cell polyurethane foam solved all three of the EPS board stock problems.

With greater shear strength, spray foam does not have any problems adhering to the structure and staying in place during the backfill. Just one square foot of spray foam can have shear strength exceeding 7,000 pounds. Two-pound closed-cell spray foam also has high tensile strength that can exceed 300 pounds per linear foot. This enables spray foam to hold up to the weight and pressure exerted on it during the backfill process.

Built on the side of a mountain, the second, larger reservoir looked like a giant concrete block, measuring 80' square by 20' high. The concrete cistern





will hold 927,000 gallons of water, enough for the daily use of over 14,000 people.

Midgaard was scheduled to spray the reservoir in the fall, but seasonal rains had hit. The ground was very wet, making the dirt roads that lead to the structure a giant mud pit. The crew tried to make it out with their box truck, but neither vehicle was equipped with 4-wheel drive. Shortly down the muddy road, one of the trucks got stuck in the muck. After battling the mud for a few hours, they were forced to call in the assistance of a loader from the reservoir jobsite. They tied off the rigs with a heavy tow strap and the loader helped pull them up the muddy hill to the jobsite.

The rain also left puddles on the roof deck, requiring additional prep work before the spray foam application could begin. Because spray foam is best applied to warm and dry surfaces, the crew hauled up a couple large portable forced air propane heaters. The heaters not only did the job of drying out the concrete deck, it also provided heat to the surface which allowed for better application of the foam.

Working within a Provincial park meant additional care had to be taken to avoid negatively affecting the nearby forest and wildlife. At the jobsite, a 2x4, four foot tall, temporary wooden wall was erected around the perimeter of the building. With a 20 foot drop off the roof of the reservoir, the wall served

as fall protection and mitigated the chance of an accidental tumble. A clear, polyethylene sheet was then draped over and mechanically attached to the wall. The poly sheet served as a wind screen to help lessen the risk of overspray to the nearby forest. Wind speeds were also periodically monitored. When wind speeds exceed 12 mph, an additional hand-held wind screen was brought near the spray applicator, to help catch overspray. The winds were pretty calm on both install days and never reached 20 mph, which was the cutoff point for shutting down the spray application. Excessive winds can carry overspray hundreds of feet and it was important to Midgaard that the forest was free of overspray.

The Quik-Shield 112 spray foam was applied as a seamless continuous insulation layer to the cistern, which prevented thermal bridging from taking place. During the backfill process, the spray foam performed as designed, and had no issues whatsoever. The GC was extremely happy with the results.

Luke with Midgaard stated, "Installing a site applied, chemically based product, into a fresh water reservoir, really speaks to the amount of confidence and acceptance people have now developed for spray foam in general. The fact that we were able to go into a provincial park and complete this application, I think is pretty significant."



MIDGAARD

SPRAY FOAM SYSTEMS LTD

Midgaard was formed out of the certainty that spray foam insulation is fast becoming the insulation of choice for professional residential builders, commercial project applications and smaller residential projects. Our superior performance and consistent overall coverage combined with technological breakthroughs in the past ten years, have made spray foam an efficient and cost effective insulation solution.

The Midgaard team combines years of spray foam application experience with an established history of delivering residential and commercial building services. We excel at meeting the highest standards for customer satisfaction in spray foaming practices. We are confident that your experience with us will exceed your expectations.

QUIK-SHIELD

The Quik-Shield brand is owned and operated by SWD Urethane (www.swdurethane.com) and represents over 40 years of spray foam experience in the construction industry. SWD Urethane is one of the most innovative system houses in the spray polyurethane/polyurea marketplace and is committed to developing meaningful solutions.