



## Tales from the tundra

### Erosion-control trailbuilding in 'Kwig,' Alaska.

Geosynthetics | February 2011

By Cory Schneider

Living around Green Bay, Wis., all my life, I've grown accustomed to fairly harsh weather conditions.

After all, Green Bay is often referred to as the "frozen tundra" because of its long, cold winters. (And, of course, the "frozen tundra of Lambeau Field" immortalized by Green Bay's beloved Packers football team.)

So when the call came for me to travel to a real frozen tundra in one of Alaska's remote areas to assist with constructing an ATV trail, I was up for the challenge. I'd been to remote areas in Canada fishing plenty of times and was certain that I could handle roughing it for a week!

My destination? The village of Kwigillingok, or simply "Kwig" as the locals call it, a small town of about 400 people, 400 miles west of Anchorage on the northern shore of Kuskokwim Bay near the mouth of the Kwigillingok River.

I flew from Anchorage via Bethel to Kwig on a small aircraft navigated by a bush pilot. I was warned about the remoteness of the site and encouraged "to bring my own food for the week." I was promised a room at either the local school or at a small cabin. Prior to researching, I pictured an area with mountains, dense trees, and polar bears, but later saw none of these.

All terrain vehicles (ATVs) are the only means of motorized transportation around Kwig, and are used extensively by the locals, mostly Yup'ik Eskimos. Most are employed with the school, village government, local stores, or through commercial fishing.

In cooperation with the village of Kwigillingok and the Western Federal Lands Highway Division of the Federal Highway Administration, a plan was approved to improve the Kuicuaq Slough subsistence trail at Kwig. The trail is a critical transportation link from the village to the confluence of two streams and to key fishing and hunting areas.

When the tundra is frozen, driving ATVs over the area is no problem. But when the tundra thaws, ATV traffic causes extensive damage and erosion to the wetlands ecosystem.

The plan specified an open-celled structural mat pavement system to facilitate travel and improve and protect the trail from damage caused by ATV traffic loads. The system was required to meet the following criteria:

1. capable of supporting all-terrain vehicles over soft and uneven ground,
2. allow vegetative growth through it,
3. provide support unfilled, and
4. capable of sustaining 100 passes by ATVs without showing significant wear.

Presto's GeoTerra structural mat system met the criteria and was selected for the trail-hardening material. Installed in more than 40 miles of ATV trails across Alaska in remote wetland areas, the system is a proven solution for bridging loads over wet soils.

The system's molded high-density polyethylene units are locked together with a connection device that allows constructing pavements or platforms in any configuration. The open cell design allows water and sunlight to permeate the system, allowing grass growth through the cells while protecting the vegetative root zone.

### North to Alaska

As part of the plan, an on-site representative was required during the installation to oversee construction and provide technical assistance. That representative was me!

So, equipped with an ample supply of dry soup mixes and some other necessities, I set off for Kwig. A 2,500-ft-long, 60-ft-wide gravel airstrip welcomed my arrival. Most impressive to me was the vastness of the open tundra, the scarcity of buildings, and the absence of a single tree as far as I could see.

Upon arrival, I was met by Emma, the tribal administrative assistant, and taken by ATV to my cabin, a one-room outbuilding fully equipped with a kitchen, propane furnace, and pumped water. An ATV was on-loan to me for the week for getting around to the store, cafe, and jobsite.

The ATV also came in handy during my occasional visits to the grocery for canned goods and bottled water. I also made nightly visits to Qayaneq, the local kayak shop/cafe, which had the only public internet and a TV.

The afternoon of my arrival—July 19, 2010—I met with members of the construction team, inspected the trail site, and discussed our plan for constructing the trail starting the next morning.

The trail was planned for a 6ft.-4in. width and a half-mile long, with intermediate turnout areas of 22ft. x 12ft.-7in. To allow year-round access to the route and to minimize damage to the tundra, the mat system was placed directly on the tundra surface without any excavation.

Ten local laborers, several ATVs, and two trailers were at our disposal to move constructed trail sections from the boardwalk into place over the tundra. Due to site constraints, 5ft-long sections, 6ft-4in. wide were pre-assembled and stacked on the existing boardwalk.

The 5ft-long sections were then assembled into 50-ft lengths and pulled along the existing path using ropes and ATVs. This added to the construction time, especially near the end of the trail when the sections were hauled nearly half a mile.

Per plans, a 2-in. gap was left between adjacent 50-ft sections to allow for expansion, with the seams held together using cable ties and anchors at the end of the 50-ft sections.

The trail functioned well under these conditions, with more than 50 passes of ATVs pulling more than 1,000lbs. (two 50-ft mats stacked on each other, each 50-ft mat consisting of 60 units, each weighing roughly 9lbs). This was certainly the most abuse the trail will take during its functional life.

The half-mile trail was finished in six days. It included two turnout areas and a parking/turnaround pad at the end of the trail.

When it was time to leave, I gathered my belongings and waited for my ride home. Other than no cell coverage, limited internet and TV, and a late bush pilot causing me to miss my flight from Bethel to Anchorage, all went smoothly.

I do have a new appreciation for the words *tundra* and *remote* and will never forget my experience in Kwigillingok!

Cory Schneider is the business development manager at Presto Geosystems in Appleton, Wis.



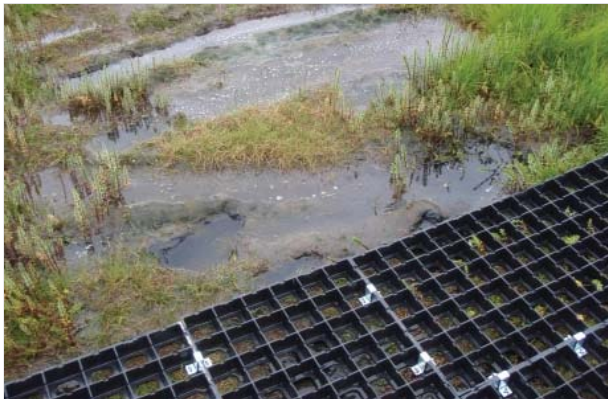
Photo courtesy of the author.



My home during a week's stay in "Kwig," Alaska. Photo courtesy of the author.



Damage from ATV traffic prior to installing a trail-hardening support system. Photo courtesy of the author.



Typical existing wet ground. Photo courtesy of the author.



The mat system can be constructed in any configuration. Photo courtesy of the author.



The trailbuilding units formed an interconnected structural mat pavement system. Photo courtesy of the author.



Moving pre-assembled 50-ft mat sections into position with ropes tied to ATVs. Photo courtesy of the author.



Moving pre-assembled 50-ft mat sections into position with ropes tied to ATVs. Photo courtesy of the author.



Copyright ©2011 Industrial Fabrics Association International. All rights reserved.