

# Secugrid®

Base course reinforcement

Project name  
100th Avenue Extension, Anchorage, US

Engineer  
Stantec, US

Consultant  
Golder Associates, US

Product  
Secugrid® 30/30 Q1





Naue's Secugrid® has demonstrated its effectiveness as a reinforcement geogrid in the surcharge construction process being employed on a challenging roadway extension project across North Klatt Bog to the south of Anchorage, Alaska.

## Challenge

Construction work on a 0.75 mile extension of the 100th Avenue east-west corridor in Anchorage commenced in November 2016.

Engineered by Stantec, this new stretch of roadway will provide a much needed connection between the city's two north-south arterial highways; providing improved access to business areas at the southern end of the city, and helping to alleviate traffic congestion on existing east-west routes.

However, much of the area to be traversed is an undeveloped 'Class B' wetland site – overlain by swathes of peat bog at depths of up to 10 feet in places. Development of infrastructure in this environment is both challenging and costly, and this project, with an expected total cost of \$18.7 million, is scheduled for completion in late 2018.

Construction of 100th Avenue has a lengthy history and, as far back as 2002, the Municipality of Anchorage Project Management & Engineering Department engaged consultants Golder Associates to investigate subsurface conditions along the length of the proposed traffic corridor. It was agreed that construction would be completed in two phases – Phase One of the project was completed in 2009.

Since that time, Phase Two of the project has been on hold. However in early 2011, environmental permitting activity resumed and an updated traffic analysis report anticipated future daily traffic volumes in excess of 30,000 vehicle movements a day. Planning was approved for the construction of a 3-lane section for vehicular traffic, plus additional provision for cyclists and pedestrians, giving a typical overall total width of around 100 feet.

## Solution

Roadway embankment constructions over peat will always be subject to settlement, and Golder Associates considered different options for this second phase extension to 100th Avenue, including: surcharge fill, full excavation, rolling surcharge, and lightweight fills. From these various treatments, surcharge fill, placed over a geogrid reinforcement material was the recommended option.

The current project has also been subdivided into Phase 2A and Phase 2B – with a period of around 6 months between the two phases – to allow sufficient time for settlement of the surcharge fill before embarking on roadway construction.

At the end of 2016, Phase 2A of the project was commenced and Granite Construction, the appointed contractor for the project, was required to place 200,000 tons of gravel material across the North Klatt Bog to start the peat consolidation process and establish an embankment prior to construction of the new roadway.

A soft peat bog will gain in strength as it is loaded with gravel, but excessive or too rapid loading can lead to failure of the soft subbase, causing the embankment to collapse.

Placement of a high-strength geosynthetic basal reinforcement layer over the saturated peat bog will resist and dissipate the loading effect of the gravel, including any surcharge, and will effectively ensure the long term stability of the embankment.

Installation took place over the 3 weeks from December 1st through to the 21st. Anchorage gets just 5 to 6 hours of daylight at this time of year, and average daily temperatures are well below freezing point. With snow falling on day one, many cloudy days and fog on others, the site conditions were unquestionably challenging, and speed of placement was paramount.

The engineering design specification required the installation of a geotextile reinforcement layer across the full width of the soft sub-base. ACF West, a long established distributor and installer of geosynthetic membranes, was successful in gaining the contract to supply the selected geotextile material which, for this demanding application, was Naue's Secugrid®.

ACF West and Naue were selected and approved by the contractor and engineer because of their extensive knowledge of construction in Alaska, and expertise in dealing with the prevailing ground conditions found at North Klatt Bog.

Naue's engineers, with many years of experience in construction over peat sub-bases around the world, were able to provide advice on the geogrid specification and best practice installation techniques.

Secugrid® is a structurally sound and stable geogrid, manufactured under stringent quality controls, from uniformly extruded and drawn polypropylene bars, welded together using Naue's patented welding technology. It can be supplied in a wide range of strengths, in both uniaxial and biaxial configurations, to provide tensile reinforcement for a multiplicity of civil and environmental engineering applications.

Secugrid® geogrids resist service tensile force loading with very low elongation, achieving immediate force connection and interlocking with the aggregate layer without primary deformation. Being lightweight, yet highly resistant to installation damage, Secugrid® is easy to install quickly, and is suitable for installation during virtually all weather conditions.

Standard cutting tools can be used for on-site trimming, and panels are joined with simple overlaps assuring continuity. This high-performance product provides simple, cost effective soil reinforcement, by strengthening naturally unstable subsoil.

Two layers of Naue Secugrid® reinforcement were installed during construction of the embankment, and a total of 100,000 square yards was supplied for the 100th Avenue extension project.