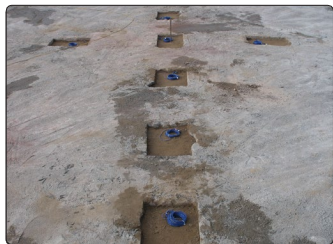


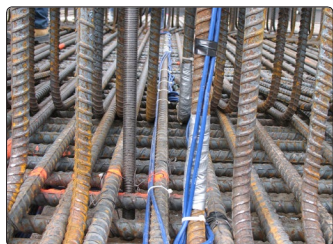
Wind Turbine, Eolien Corus (SNEEC), Gaspé, Québec



◆ 80 meter T-2 Wind turbine view



◆ Total pressure cells in foundation



◆ Instrumented reinforcement rebar with strain gages



◆ Load cells installation on anchors



Foundation steel pad reinforcement, anchors and tower instrumentation

SNEEC Eolien Corus is the “Wind Nordic Experimental Site” located in the Gaspé region. They assess turbine performance in relation to weather effects in Québec. The purpose of this instrumentation pilot project is to understand the structural behavior of its tower concept in cold weather conditions.

Renewable Energy Systems Canada (RES Canada), the designer of the wind turbine foundation and contractor for the entire project, has retained GKM Consultants to provide and install a variety of dynamic sensors.

A total of 55 measuring instruments have been installed at strategic locations in the foundation and on the 2.05 MW wind tower.

Among these, 21 Geokon model 3500 total pressure cells were buried at the contact of the bedrock/concrete foundation, 8 Geokon model 3000 load cells were installed on the bolt anchors at the base of the tower, 19 gauge resistive strain gauges were welded onto the structural reinforced steel rebar at the base pad, and 4 epoxied strain gauge rosettes were installed along the inner tower walls. In addition, three low frequency accelerometers were supplied and installed on the upper section of the tower (nacelle main frame).

Given the dynamic nature of the studied structure and the instrumentation used, all instruments had to be automated with a Campbell Scientific model CR-9000 automatic data acquisition system (ADAS) supplied by others for allowing a continuous sampling mode at every minute. A dynamic scattering mode of 200 HZ can also be turned on for a 5 minutes duration. Data recordings are sent to RES Canada’s affiliate, Renewable Energy Systems Americas’ server for interpretation and data analysis.

Our knowledge and know-how in the field of civil engineering instrumentation allowed RES to diligently receive high-end quality products and services.

GKM is proud to have participated in the development of the renewable wind energy resources that we have in Québec.