

MEMO



TO: Gary Tomlinson, MOECC Senior Environmental Officer

FROM: Darin Burr, Dillon Consulting Limited

DATE: October 29, 2014

SUBJECT: Modifications to Surface Sealing Protocols at Transmission Pole Foundation #316

OUR FILE: 13-8287

CC: Erick Matthiesen, Construction Manager, Longyuan Power
David Restivo, Environmental Monitoring Project Manager, Dillon Consulting Limited
Don McKinnon, Project Manager, Dillon Consulting Limited
Chad McAllister, Longyuan Power
Rebecca Crump, Longyuan Power

This memorandum provides our recommendation to modify the surface sealing requirements at transmission pole (T-pole) location #316. T-pole #316 is located directly south of 15th Side Road, along the transmission power line corridor. The pole was identified as requiring a surface seal in Dillon's July 24, 2014 technical memorandum issued to MOECC. Information on the construction of T-pole #316 was provided to Dillon from PowerTel Utilities Contractors Limited (PowerTel), who constructed the pole foundation.

T-pole #316 was installed in late July, 2014. Subsequent to pole installation, a borehole was drilled nearby to a depth of 12.8 metres below ground surface (mbgs) to assess subsurface conditions. Reported soil conditions were organic soils at surface, underlain by sand and silt to a depth of 2.29 m (top 1.5 m was not sampled). Silt till was observed between 2.29 mbgs and 7.01 mbgs, which overlaid sand, and some gravel and silt layers to the base of the borehole. Bedrock was not encountered during drilling. Saturated (i.e., flowing sand conditions) sands were noted by the contractor at a depth of 7.0 mbgs.

As a result of the "flowing sand" conditions, the construction technique for the foundation was modified. As reported by PowerTel, foundation construction involved first vibrating (using the Vibro Drill method) a 1.83 m (72") diameter steel liner to a depth of 5.5 m. No soil was removed at this time. A second 1.22 m (48") diameter steel liner was vibrated into the ground within the 1.83 m liner to an approximate depth of 5.8 m. As a result of the oversaturated conditions in the soil, the material between the two liners was unconsolidated and loose. A tremie pipe was inserted between the two liners to the base of the outer liner and cement was injected. The cement displaced the saturated soil material that was between the two liners resulting in the entire annular space being filled with cement. Following placement of the cement, soil within the interior of the 1.22 m diameter liner was removed by augering. To offset hydrostatic pressure from the base of the liner, water was used during the augering process to maintain a head in the liner. Following removal of the soil, the pole was installed, and cement was tremied into the annular space. A 0.6 m (2') wide, 2.13 m (7') diameter corrugated steel pipe (CSP) pole crib was placed at ground surface overtop of the ends of the 1.83 m and 1.22 m diameter liners, and filled with cement. In total, the contractor reported that approximately 18 m³ of cement was used for the pole installation.

Technical Memorandum

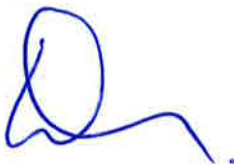
Dufferin Wind Farm Project Transmission Pole Impact Assessment

Page 2

Considering the construction techniques used at T-pole 316, application of a surface bentonite seal as per methods outlined in Dillon's July 24, 2014 memorandum are not deemed to be required. The outer steel liner was installed using a vibration method which would not produce an annular space between the liner and the surrounding soil. Furthermore, cement was placed to fill the annular space between the two liners and the pole, and therefore, development of preferential pathways for surface flow to enter into the aquifer is not expected.

We trust that this memorandum meets your needs at this time. If you have any questions about the recommended alterations to the surface sealing protocol for this pole foundation, please contact the undersigned.

Respectfully submitted,



Darin Burr, M.Sc., P. Geo.
Dillon Consulting Limited

