Designed to be
GROUNDED

Install. Validate. Protect.

Simple solutions for complex challenges

SAE has proven that innovative grounding solutions can be simple and cost effective while also providing the ultimate protection for your equipment and personnel. A newly built emergency services campus had a proposed traditional design that was impossible to install and very expensive. SAE solved this challenge with experience and innovation!

Published Date: August 2022

saeinc.com
1 877 234 2502 | 705 733 3307
info@saeinc.com

Project Name
Barrie-Simcoe Emergency Services Campus

Project Location
Barrie, ON Canada

Project Date
2018

Industry
Electrical Distribution

SAE Solutions Used
ConduCrete
Engineering Services

The Challenge

SAE was hired to conduct a grounding study and engineer a grounding system for a new 44kV transformer supplying the Emergency Services Campus in Barrie, ON.

A proposed grounding design was previously completed and issued by a different engineer; however, it was deemed impossible to install due to the size and complexity of the ground grid requirements. SAE was tasked to provide a solution with a smaller footprint that would still meet the ESA requirements for GPR and Touch & Step voltages.

The SAE SOLUTION

By utilizing grounding electrodes that penetrated into the lower resistivity deep soil layers, SAE engineers were able to reduce the overall footprint of the grounding system from a 250m x 100m grid, to a 5m x 4m ground ring around the transformer augmented with a 20m deep enhanced vertical ground well.

In order to determine this solution for the customer, the SAE Engineering Team conducted soil resistivity testing and identified soil layers with high resistivity (2600 ohm-m) near the surface and low resistivity (20 ohm-m) 12m-40m below grade. The high resistivity found near the surface explained the extensive requirements for the originally proposed ground grid. Grounding electrodes installed in the lower resistivity layers are much more effective at dispersing surge current and as a result, can reduce the overall system requirements.

The SAE grounding solution was cheaper to install and was completed in minimal time! The originally proposed grounding grid was extensive, requiring over 5300m of excavation, 2/0 copper wire and 22 ground rounds 3m long. The grid also required a new surface layer of 3000 ohm-m crushed stone to cover the entire grid area - almost 300 trucks!

In comparison, the SAE install was completed quickly and required only 40m of 2/0 copper wire augmented with ConduCrete and limited the crushed stone surface layer to the area 1m around the transformer and bollards.

ORIGINALLY PROPOSED

- 250m x 100m grounding grid requiring over 5300m of 2/0 copper wire
- Extensive excavation
- 3000 ohm-m crushed stone ground covering required for entire site

ACHIEVED

- 5x5m grounding ring around transformer
- 20m deep ConduCrete enhanced ground well provides a low resistance and low impedance ground with a minimal footprint
- NEW design saved more than $300,000!

Contact Us
today to improve your grounding

saeinc.com
1 877 234 2502 | 705 733 3307
info@saeinc.com