

# Soil Reclamation Unit Helps Save Environment

## Challenges

In emergency situations, such as during hazardous fires, people may have little time to react and often implement the best measures at hand to save lives and infrastructure. Because of this, the first measures introduced often focus on mitigating the immediate threat and do not consider the long term. To prevent hazardous fires, products like firefighting foam are often used which contain contaminants such as perfluorooctane sulfonic acid that can harm water and soil, potentially endangering animal and plant life.

Having recognized the danger to the environment from the use of harmful products such as fire suppressant foams, there has been a drive to provide a method to cleanse the soil of the contaminants. To support this, ACE Automation asked Wesco to help automate a soil reclamation unit. The primary purpose of the machinery was to heat corrupted soil to a point where all the contaminants are neutralized.

## Solution

In order to accomplish this task, the Wesco technical team collaborated with ACE Automation, end user engineers and relevant manufacturers to customize a modular design build of the soil reclamation unit. Each load is a 40-foot shipping container weighing 40,000 pounds. The unit itself is two loads and if a generator or transformer is needed, it requires an additional load.

The design and build of the unit was a truly collaborative effort and brought forth a number of unique design/build opportunities. The electrical configuration included a 3MVA

highline transformer and for the secondary, a 600v 3-phase 3-wire (delta-wye configuration). This powers a classic 12-pulse AC drive system. The 12-pulse arrangement allows the harmonics from the first drive to cancel the harmonics of the second. The enclosed drive with an integrated passive filter tunes the harmonics to deliver clean power. The electrical system powers a rotating cone that delivers the heating process to cleanse the soil. The unit can handle 2-5 tonnes of soil per hour, however, it depends on the moisture content and the amount of contaminants present.

## Results

- Within three months, the team delivered an efficient, environmentally friendly method to facilitate soil reclamation
- The customer is confident that the previously contaminated soil has been reclaimed
- This solution can be duplicated again in the future



Ingenuity delivered.

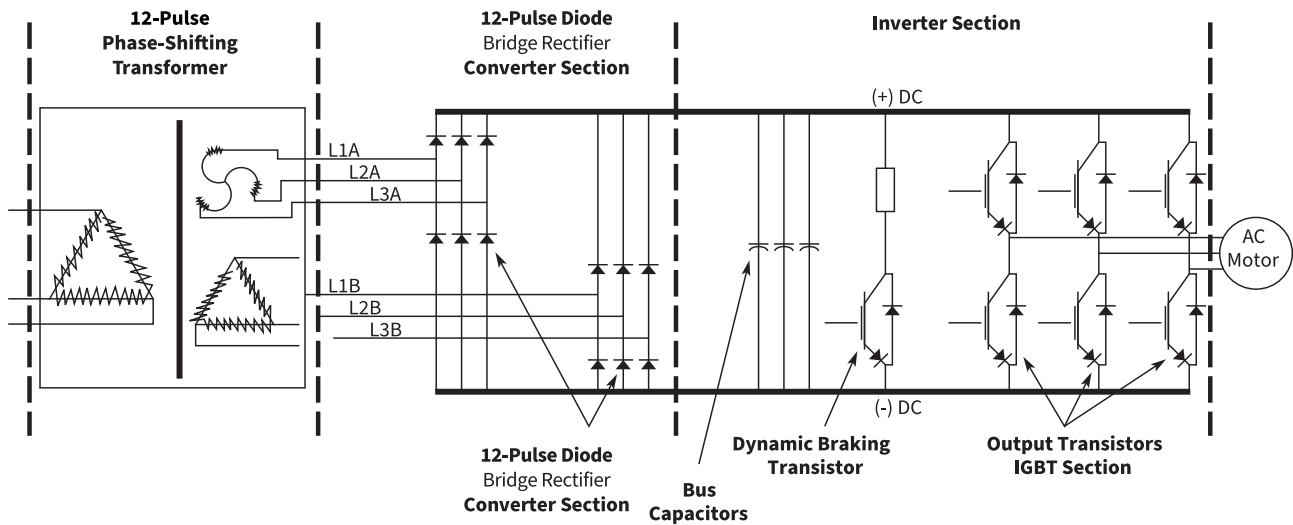
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However, the equipment also required automation to operate efficiently. The customer needed remote access, visualization and machine automation to complete the soil heating and cooling process. An Industrial Internet of Things (IIoT) solution was envisioned to optimize control and allow remote management. With the Exor Corvina platform, J-Smart touchscreen and ExWare IoT gateway, different permissions for remote access to the machine was granted to the integrator and end user. Remote monitoring and local machine automation enabled programming changes, speed and temperature control as well as centralized data logging (presented in personalized dashboards). This allowed operators to set standardized controls, have full visibility to the heating and cooling process and provided greater efficiency and safety in operating the unit.

### Basic 12-Pulse Rectifier with “Phase Shifting” Transformer



### Results

The custom soil reclamation unit successfully superheats the soil to remove the contaminants and, after cooling, yields pure, natural soil. The advanced design and the clean power used within the system, meets utility requirements for total harmonic distortion going back into the grid.

Within 3 months, the team delivered an efficient and environmentally friendly system that mitigates risk to our delicate ecosystem. The customer has peace of mind that the contaminated area has been reclaimed and returned to its healthy, natural state due to their efforts and working with the Wesco industrial automation team.



Ingenuity delivered.

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