

WASHINGTON DC SUBSTATION

Rebuilding Without Downtime

| Solutions

STAKKAbox™ Ultima Connect

Plastibeton® Custom Covers

A leading energy provider that services customers in Maryland and the District of Columbia approached Oldcastle Infrastructure for a solution to repair a set of critical substations. Federal agencies require utilities to identify key substations essential to the performance of the power grid. There are approximately 55,000 substations nationwide, many in extreme disrepair. In this case, the concrete trenches housing multiple cable platforms in the substations were breaking down and cracking. If this critical substation were to power down, it could have disastrous implications for the electrical grid.



CHALLENGE

Trenches physically protect communication cables that control the devices that automate the grid. Replacing these trench systems in the substations safely and without taking an outage presented significant obstacles. Especially when considering that the critical power surrounding Washington DC is 500 kV.

To repair these trenches, the contractor would typically remove the trench and in the process disturb the cables. Additionally, rebuilding the trenches without disturbing the cables was simply not feasible.

Any disturbance or break of the existing cables could cause an outage in the substation. Also, during the problem-solving stage of the project, we were presented with another unique situation: the site's physical position restricted the ability to use mechanical means inside the substation.

The repair work also had to be accomplished with the substation operating hot. If an outage were to occur, all cabling would have to be exposed, dug up and rerouted, which would take up to a year or more to remedy. This would again mean the loss of power to critical areas.

SOLUTION

The first two traditional solutions presented, namely cast-in-place and precast cement were time consuming and costly. Cast-in-place was further eliminated by the site limitations on heavy mechanical equipment.

The Oldcastle Infrastructure team approached the drawing board on this highly challenging project with a collaborative, problem-solving framework. Through customer-centric ideation and an innovative mindset, we arrived at an out-of-the-box solution.

We found a solution to reconfigure a STAKKAbox Ultima Connect product. Normally used to make highly effective manhole vaults, individual pieces of STAKKAbox Ultima Connect were repurposed to make a trench that was high strength while also being lightweight and flexible.

The team demonstrated the STAKKAbox Ultima Connect and installed a pilot section to determine if the product would work. Although skeptical at first, the construction team realized the value of the Ultima Connect system and the speed of installation. More importantly, the key requirement of not touching or moving communications cables would be met.

continued

Solution continued

Additional enhancements included:

- Supplying orange Plastibeton Custom Covers to give a clear visible signal of pedestrian rating.
- Redesigning support beams to reduce weight and allow for greater interior room.
- Designing supports to ease installation and increase lateral support on the structure.

Ultimately, the team created an innovative system to replace the existing trench, while allowing for future expansion. The customer was convinced the solution worked once the concept was proven on site.



BENEFITS

Safer substation

As safety hazards were eliminated, crews can now walk safely around the substation. All cable is encapsulated and extremely well protected by the STAKKAbOX Ultima Connect system. Safety orange Plastibeton custom covers are now much easier to notice to prevent vehicular traffic.

Better protected grid

Our protective Plastibeton custom covers are built to last. They will not decay or break down over time.

Zero maintenance

Yes, zero maintenance requirements for years to come. The customer really appreciates that.

Trusted partnership

The customer asked, "Can you fix my problem?" In close consultation with customer and contractor, the team found the best solution for this challenging scenario.

Customized solution

The flexibility of STAKKAbOX Ultima Connect system allowed for the development of this clearly lighter, non-conductive product that can be assembled quickly, lifted safely by hand and fits perfectly into tight, complex configurations.

Blueprint for success

There are some two-dozen more substations in the region waiting for this customized fix, some with up to 10,000 feet of trench in substations measuring two miles long. The Oldcastle Infrastructure team is on it.

Robust connections

The ability to reach out across the network of CRH companies and innovate together is key to Oldcastle Infrastructure's operational success. It's all about finding the right solution for the customers' needs.

