Australian First: Modular substations start to arrive on site

Rozelle Interchange
WestConnex
JOHN HOLLAND | CPB CONTRACTORS

In February 2022 an Australian first initiative was launched on site: to be the first road tunnel to be completed with modular substations.

The complex task to install nine substations on site, including seven underground substations, consisting of 8 Modules each, 56 modules in total, is underway. Once the process is complete there will also be a built in-situ underground plus an above ground substation.

The modules form together to make the Heavy Vehicle and Light Vehicle switching rooms inside the substations. The first 16 of 56 modules have been lifted down to the M4 Cut and Cover and sent to the relevant substation cavern. Standing at a height of 4.1m and measuring 4.25m wide and 9m long, these modules range in weight from 8.0-23.6t.

The modules are assembled and the electrical fitout completed by James Engineering in Brisbane. This involved JHCPB shipping various electrical equipment including Low Voltage Switchgear, Distribution Boards, busbar, variable speed drives and UPS cabinets to their Brisbane site. Once completed the modules are transported to Rozelle, lowered into the M4 Cut and Cover next to Shaft K and finally complete their journey to the substations via an Self Propelled Modular Transport (SPMT). Illawarra Engineering Services provides the equipment and services the crane and SPMT transport.

The modules' final journey via SPMT poses unique challenges to navigate the tight twists and bends through various cross passages, ventilation and maintenance tunnels plus mainline tunnels still undergoing civil works. Once the module is inside the substation cavern it will be unwrapped and put into position.

Mechancial and Electrical (M&E) Project Manager shared that this approach has three key advantages. The first is the reduction of work hours in the tunnel, also reducing the on-site program duration of substation allowing the Tunnel Civil Fitout (TCF) and Tunnelling teams to better prioritise their works and provided the M&E team with accountability for the substation buildings, which reduced the number of interfaces with other teams/disciplines.

Thank you to the many people who have contributed to the successful start of the substation module installs including: TCF and excavation teams who ensured the flightpaths and caverns were ready and completed to a high standard, the surface works team who assisted in traffic management, craneage and staging of M4 Cut and Cover works. Finally, a massive amount of effort from the M&E team in planning these works safely and efficiently whilst coordinating with various project teams.