

## Reducing Maintenance Workspace Risks

### Objective

Create workspaces suitable for maintaining batteries and BEV support equipment.

### Justification

Maintenance of batteries and BEV support equipment primarily takes place in two locations, the BEV maintenance bay and the charging bays. The design of both bays had to accommodate moving the batteries around independently of the vehicles and have ways of handling the cables and coolant lines.

The regular maintenance activities for the battery packs were unexpectedly frequent, involving disassembly and rebalancing of packs and modules. The modules alone weigh approx. 120 kg and moving them via trolleys risked back strains. The chargers and cooling equipment also required ongoing cleaning, filter replacement and preventative maintenance.

### Implementation

For the BEV maintenance bay, a dedicated facility was created to separate BEV activities from the diesel fleet. The bay included a concrete slab floor, an overhead gantry crane, chargers and cooling equipment for disassembling/assembling packs, and height-adjustable trolleys for moving modules. The height of the overhead crane ended up being too low, slightly complicating the disassembly of packs.

The maintenance bay was located at the clean air raise on the ventilation circuit, to improve air quality and reduce dust circulation. The charging bay was similarly located at a clean air raise, to lower the overall maintenance burden of the chargers and cooling equipment.

### Progress to Date

Based on learnings by the maintenance teams, the following recommendations were made to further improve the use of the workspace:

- The concrete floor should be as flat as possible for moving and assembling modules and packs.
- Install plastic wheels on the trolleys to better manage loads on rough floors.
- Apply low friction (neoprene) coatings on the storage tables to make it easier to move modules on and off the trolleys.
- Appropriate drainage is needed to avoid standing water in the maintenance bay.
- Install jib arms to improve cable and coolant line management.

