

## TB 0343 - XOLTA (BAT-79) Ground-Mounted Batteries

**Date:** 27/10/2023

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**Approved By:** Peter Langdon – Head of Asset Planning & Performance

### Purpose

To provide general awareness of XOLTA (BAT-79) Low Voltage (LV) ground-mounted batteries.

### Background

#### What is an LV ground-mounted Battery?

An LV ground-mounted battery is a grid-connected battery energy storage system (BESS) which is connected to the LV Distribution Network associated with a distribution substation (D-Sub) and via a LV switchboard.

#### How does it work?

LV ground-mounted Batteries help manage local LV network supply and demand, and support power quality. They can charge off excess solar generation (solar soak) and export this energy back into the network during periods of high demand. They may also be directed to charge at times of low spot market price and dispatched at high spot market price, which can occur at any time. Distribution connected storage improves network utilisation, reliability, and quality of supply for customers. The inbuilt inverters are grid following and have anti-islanding protection, they are designed to not inadvertently island the network.

### Technical Pilot

Endeavour Energy is currently rolling out LV ground-mounted batteries for various purposes:

- **Network support:** This is where an LV ground-mount battery is deployed purely to support the local network by reducing peak demand (forecast overloading), improving solar hosting capacity or solving a local quality of supply issue.
- **‘Community Batteries’:** This is a metered version of an LV ground-mount battery that is used for network support purposes at some times and purposes other than network support at other times. Under this arrangement, a retail partner can use the battery capacity for participation in the NEM wholesale markets at times when the battery is not required to provide network support services. The retail partner may also provide retail offerings to incentivize customers to participate in the Community Battery program.

### Installation Method

1. The XOLTA (BAT-79) is installed on a concrete padmount (poured at site / pre-cast with culvert), at an appropriate location with suitable clearances from other infrastructure.

- Both inverter and batteries are delivered in strong metal racks with a detachable top section housing the passive cooling unit. Four eyebolts are positioned to enable lifting of the rack base into final position.
- Once the rack base is positioned and fixed, the battery unit is installed on top of the rack base.
- LV switchboard is installed at a location near the BESS that can be easily accessible.
- All wiring from LV Network (feeder pillar) to LV switchboard and Battery (BESS) is completed.
- Where the meter has been installed, fuses and all connection are confirmed to be intact.
- Finally, the battery isolator (SPD) and the circuit breaker in the LV switchboard is closed.

Refer to the manufacturer's manual and drawing (to be published) for detailed installation instructions. Refer to Figures 1 to 5.

- Dimension & weight

| Description    | Dimension<br>(Width x Depth x Height) | Total weight |
|----------------|---------------------------------------|--------------|
| XOLTA (BAT-79) | 846x747x2180mm                        | 1083kg       |

- The router and antenna will be installed by Endeavour Energy's technician within the battery cabinets upon delivery to site.
- The antennas will be installed in the top cap as per the picture in Figure 3.

| Description                        | Qty |
|------------------------------------|-----|
| Teltonika RTUX12 (Router)          | 1   |
| RFI LTE MIMO Low Profile (Antenna) | 2   |

### Commissioning process

The following steps are to be adhered to once the installation is completed and is ready for commissioning: *Refer to the detailed commissioning instructions (to be published)*

- Ensure the Service Protective Device (SPD) and BESS circuit breakers (CBs) in the LV Switchboard are in the Open position, confirm LV supply is available at the line side of the SPD.
- Ensure that all connections on the XOLTA (BAT-79) battery are intact and the CBs inside the units are closed.
- Close the SPD and the BESS CBs within the Switchboard. Ensure all protective covers are fitted and secured.
- Contact the nominated Future Grid Engineer to remotely confirm that communication with the BESS has been established

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## Electrical Isolation – Normal Operation

The LV ground-mounted Battery should be electrically isolated from the network via the SPD (100A CB) and Battery Energy Storage System (BESS) 50A CB within the LV switchboard. Once supply is isolated at the LV circuit breaker, or for any network outage, the LV ground-mount Battery will automatically disconnect from the network via an internal AC & DC contactor in accordance with AS4777. The SPD can then be secured through the use of a locking device and a Danger Tag attached.

## Electrical Isolation – Emergency Operation

An additional LV Isolation point has been incorporated into the electrical reticulation design associated with LV BESS installations, this is either a dedicated fuse strip at the LV Switchgear in the DSUB or LV Links installed within a LV Pillar. In the event of an emergency where it is unsafe to approach the BESS Unit, isolation can be undertaken this additional isolation point

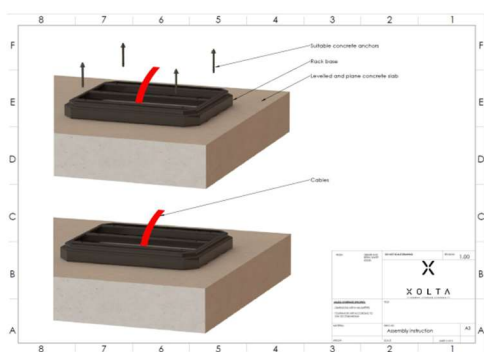


Figure 1 – Mounting position

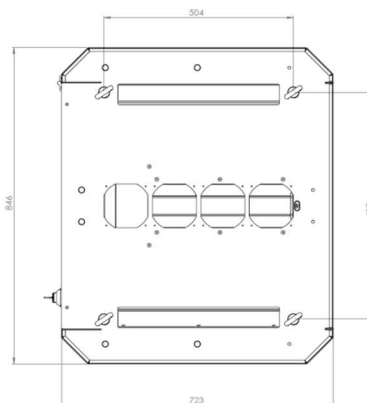


Figure 2 – Lifting position



Figure 3: BESS Antenna

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Figure 4 – LV Switchboard



Figure 5 – XOLTA (BAT-79)

## Fire Risk and Response

**If there is a fire, stay away from the battery. Electrical isolation is via the network isolation point & LV control panel SPD. Fire and Rescue NSW should be notified immediately.**

Endeavour Energy continues to engage with Fire and Rescue NSW on an agreed response plan in the event of both pole and ground-mounted battery fires. Once an agreed plan is in place it will be communicated broadly via Safety Bulletin. Fire and Rescue NSW are to be notified of all new ground-mount battery installation locations. The XOLTA (BAT-79) outdoor BESS is built with a special closed metal housing design to prevent fire propagation between battery modules in the extremely unlikely event of thermal runaway. The cabinet is made of vandal resistant steel. In addition, to assure safe operation, the XOLTA (BAT-79) battery packs are equipped with 12 temperature sensors (two sensors per battery module).

## Transport and Storage

XOLTA (BAT-79) ground-mount battery units shall be stored and transported in an upright position on their supplied pallets. Rotating the batteries to a horizontal position should be avoided.

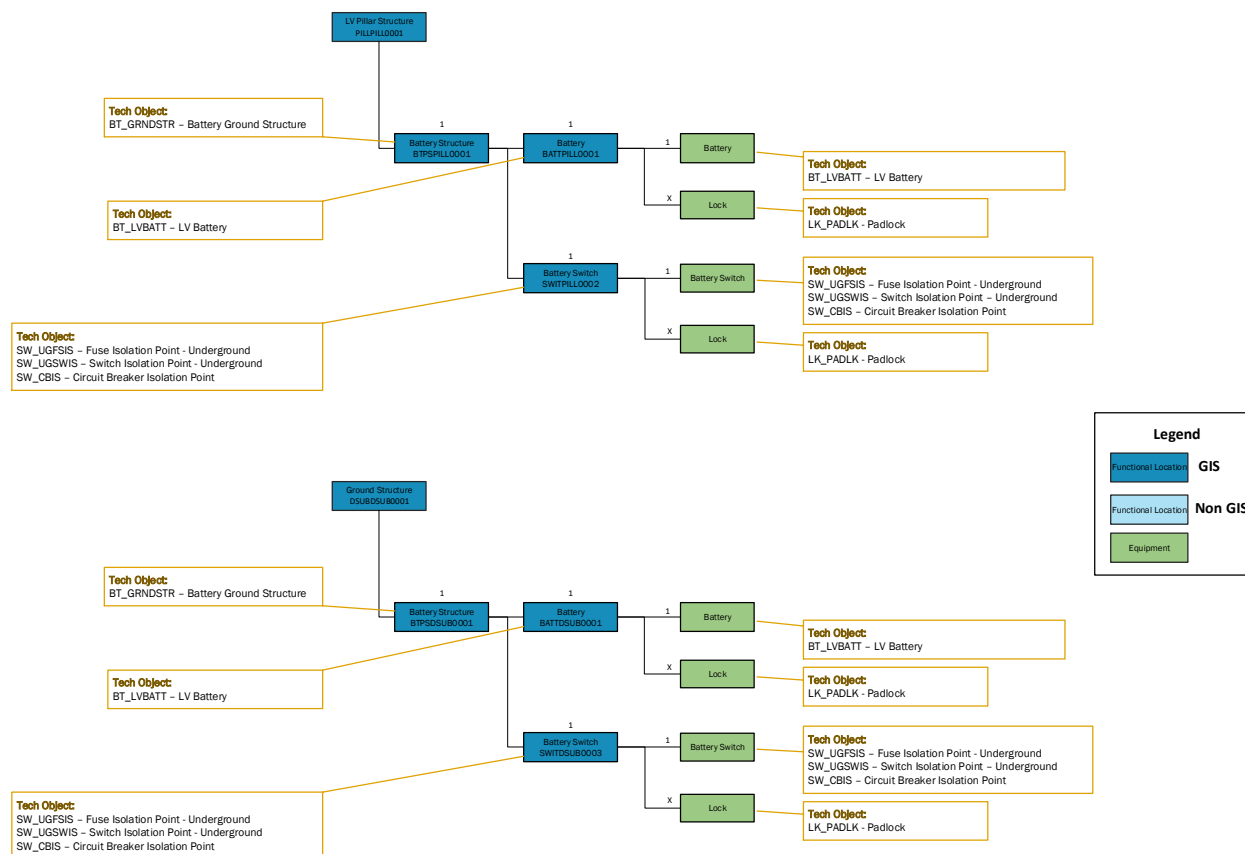
The XOLTA (BAT-79) batteries are not required to be stored indoors.

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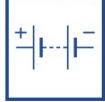
### SAP Structure

New Tech objects will be setup in SAP to support the following Functional Location hierarchy:



### GIS and Designs

New Features will be added in GIS to enable capture of Community Batteries. New tool palettes will be added to GISCAD to allow designers to add Community Batteries to design drawings.

|                  |                                                                                       |
|------------------|---------------------------------------------------------------------------------------|
| GIS – UG Battery |  |
| Circuit Diagram  |  |
| UG Component     |  |

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## Material codes

The material codes for the LV ground-mount battery and LVCB panel are as follows:

| Material Number | Manufacturer's part number | Description                                                         |
|-----------------|----------------------------|---------------------------------------------------------------------|
| -               | 101120                     | XOLTA (BAT-79) battery Pack – 6 modules                             |
|                 | 101150                     | XOLTA (BAT-79) BPU MASTER                                           |
|                 | 101152                     | XOLTA (BAT-79) Rack                                                 |
|                 | 001170                     | Inverter communication box                                          |
|                 | 101110                     | XOLTA (BAT-79) 30 KW Inverter                                       |
| TBA             | TBA                        | LVCB panel (including fuses and CB, enclosure and mounting bracket) |

## Implementation

XOLTA (BAT-79) one (1) unit is installed at Bungarribee site and commissioned.

XOLTA (BAT-79) two (2) more units to be installed and commissioned in FY 24.

XOLTA (BAT-80) similar to XOLTA (BAT-79) additional units will be installed and commissioned in FY24.

## Impacted Standards

The standards impacted by this change are:

- MDI 0028 – Underground distribution network design
- MCI 0006 – Underground distribution constructions standards
- SDI 2XX – Low Voltage Outdoor Batteries – XOLTA (BAT-79) “to be published”
- SAD001 – Project Drawing Standard
- SAD002 – GISCAD Design
- SAD005 – Network Asset Information (NAI) System Symbolology

## Contacts

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