



S Y S T E M
S O L U T I O N S
E N G I N E E R I N G

MEMO

To:	Westside Group	Job No:	921-001
Att:	Peter Smith	Date:	31/05/21
From:	Ross Pickering	Pages:	5
Project:	Beerenberg farm – Arc Flash Study		
Re:	Arc Flash Study		

To Peter Smith,

As requested, System Solutions Engineering (SSE) have performed 4 arc flash calculations on switchboards at the Beerenberg Farm at 2106 Mt Barker Rd, Hahndorf SA 5245. This memo will therefore be broken up into three phases with the additional information of the arc flash risk at the battery energy storage system (BESS). The calculations are based on the information provided by Westside Services or sourced by SSE that includes, single line diagrams of switchboards, and the site and technical data of equipment.

The intent of this memo is to provide the Arc Flash Boundary and level of PPE required at all four phases. All calculations are based up IEEE 1584 and are therefore subject to the same limitations outlined in that standard.

To determine the Arc Flash Boundary and level of PPE required SSE have taken into account the following.

- Site single line diagrams
- Site operations
- Enclosure size
- Electrode configuration
- Three phase bolted fault current
- Gap between electrodes
- Working distance
- Equipment technical data

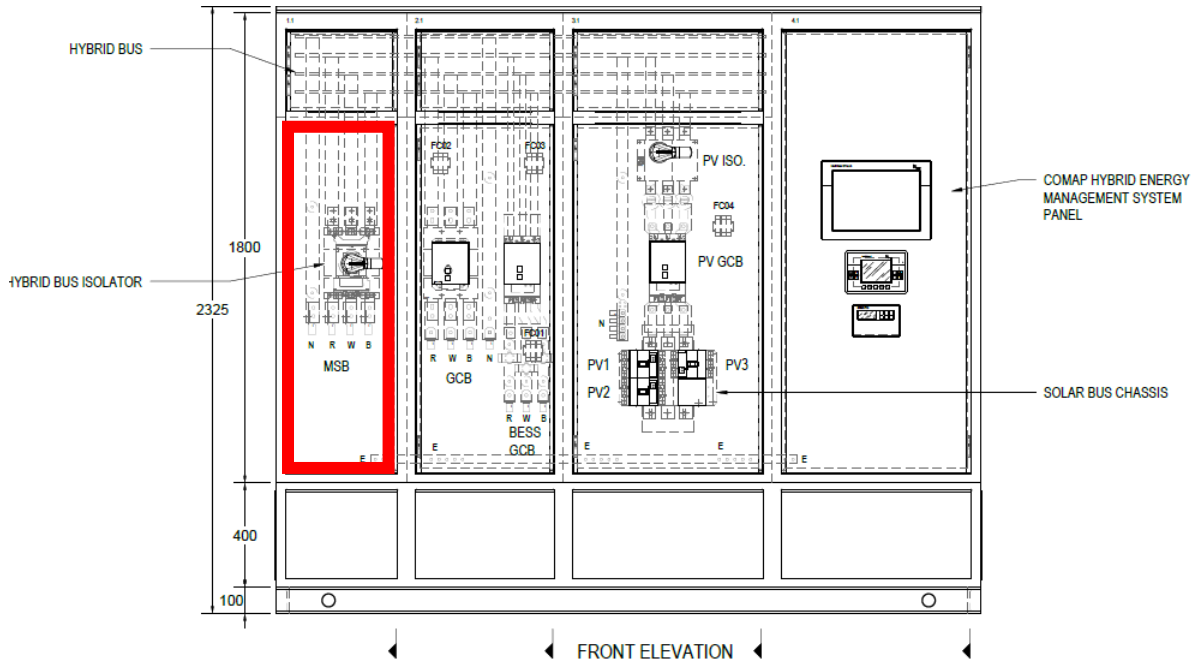
First Stage

The first calculation was performed on the Hybrid System Board while there is a temporary supply connected (3 phase, 20A 6kA). The calculation also takes into account the solar installation, BESS and generator connections.

Based on the worst-case scenario the three-phase bolted fault current was determined to be 36kA (The short circuit withstand current of the switchboard). The worst-case scenario was determined to be at the Hybrid Bus isolator.

See image below for calculation enclosure and equipment.

During this phase, the arc flash boundary is determined to be 1300mm and PPE required is category 2.

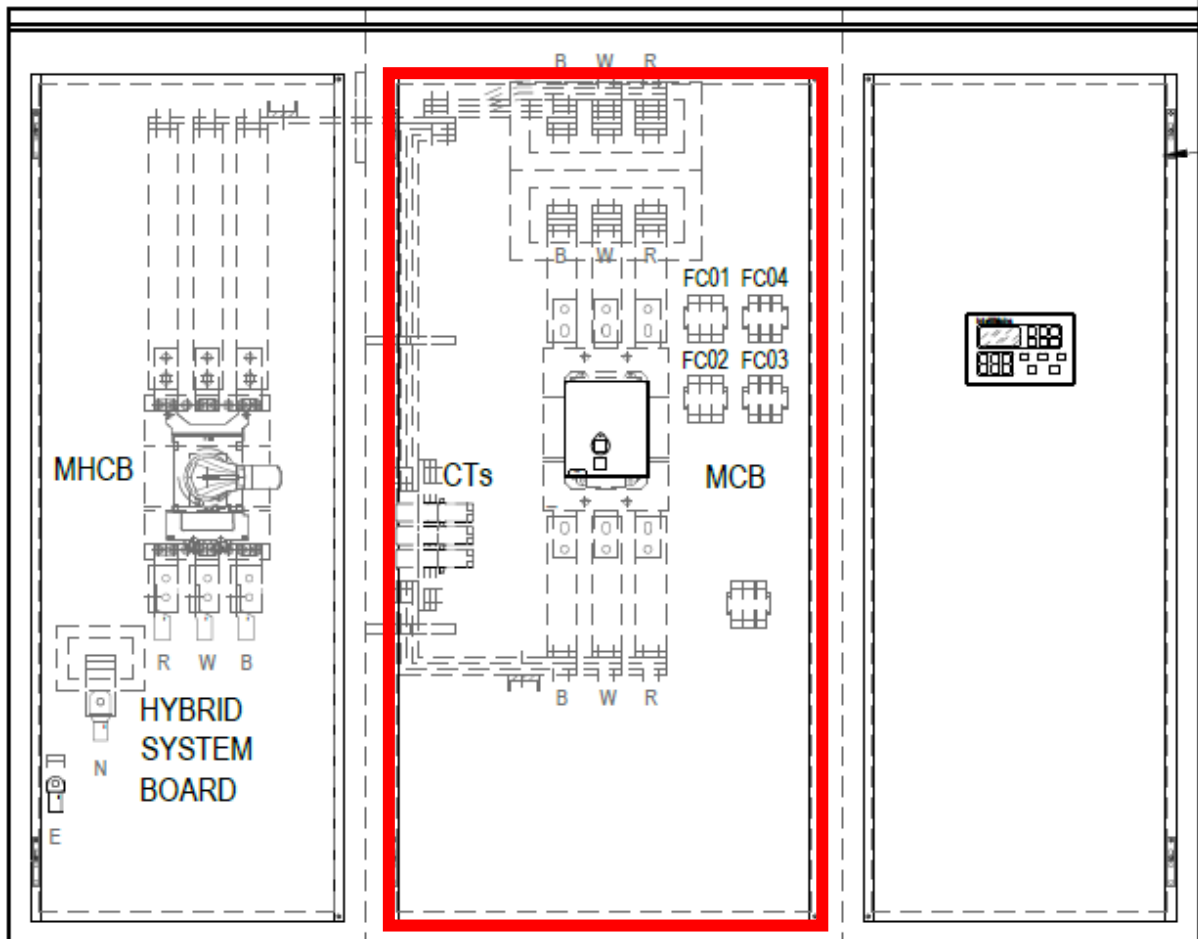


Second Stage

The second calculation involves a generator being connected to the motorised circuit breaker within the switchboard extension to simulate the connection to the grid. The calculation is based on the information from a 1000kVA generator. This calculation will continue to take into account the solar installation, BESS and generator installed.

During this stage the arc flash boundary and required PPE for the Hybrid Switchboard will be 1300mm and category 2 at the main isolator for the switchboard.

The arc flash boundary within the switchboard extension enclosure will be 1000mm and the PPE required is Category 2.

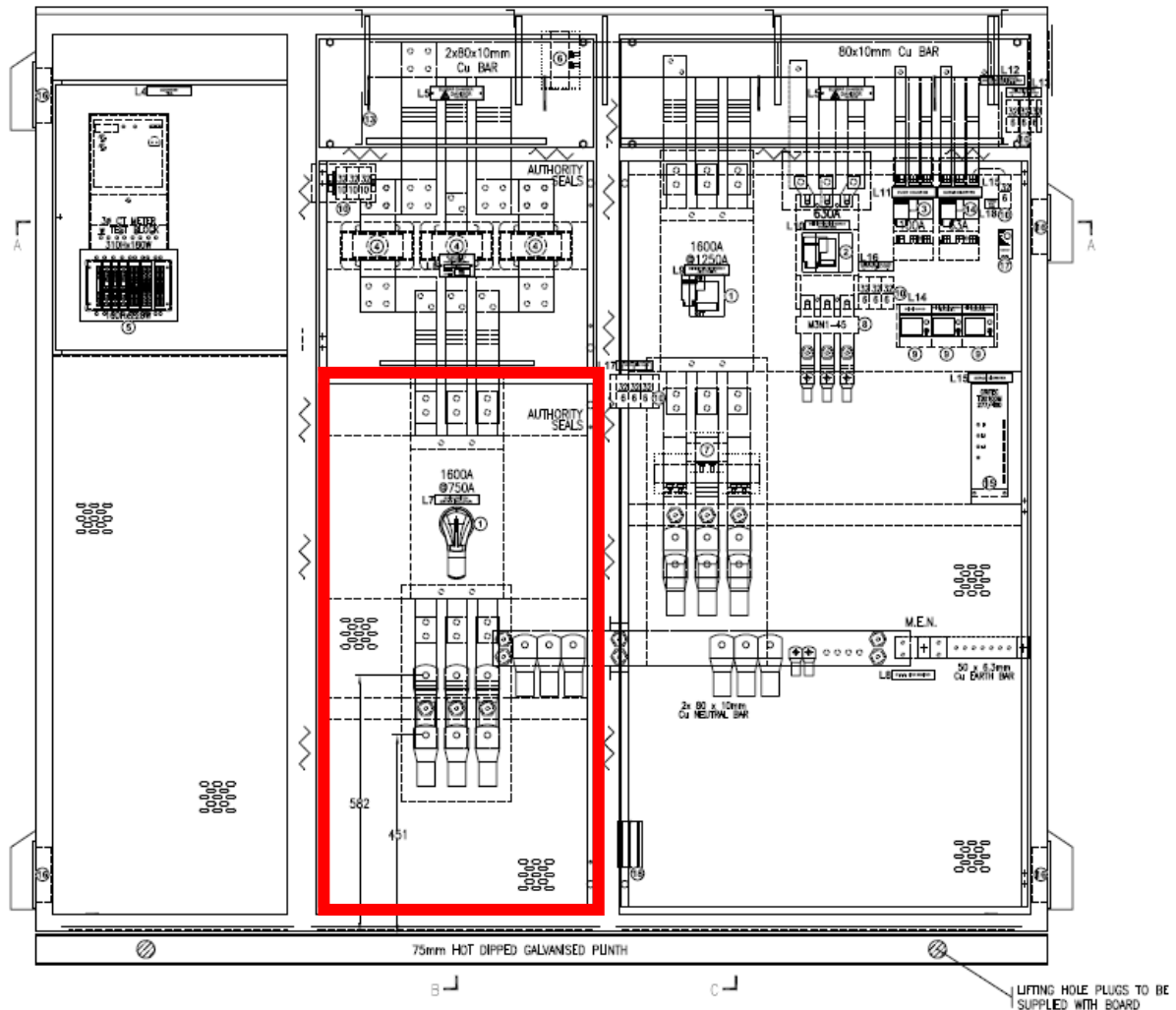


Third Stage

The Third calculation was performed when the transformer (1500KVA) is connected to the MSB. During this phase the worst-case scenario was determined to be at the main Isolator.

See image below for calculation enclosure

During this phase the arc flash boundary is determined to be 1500mm and PPE required is category 3.

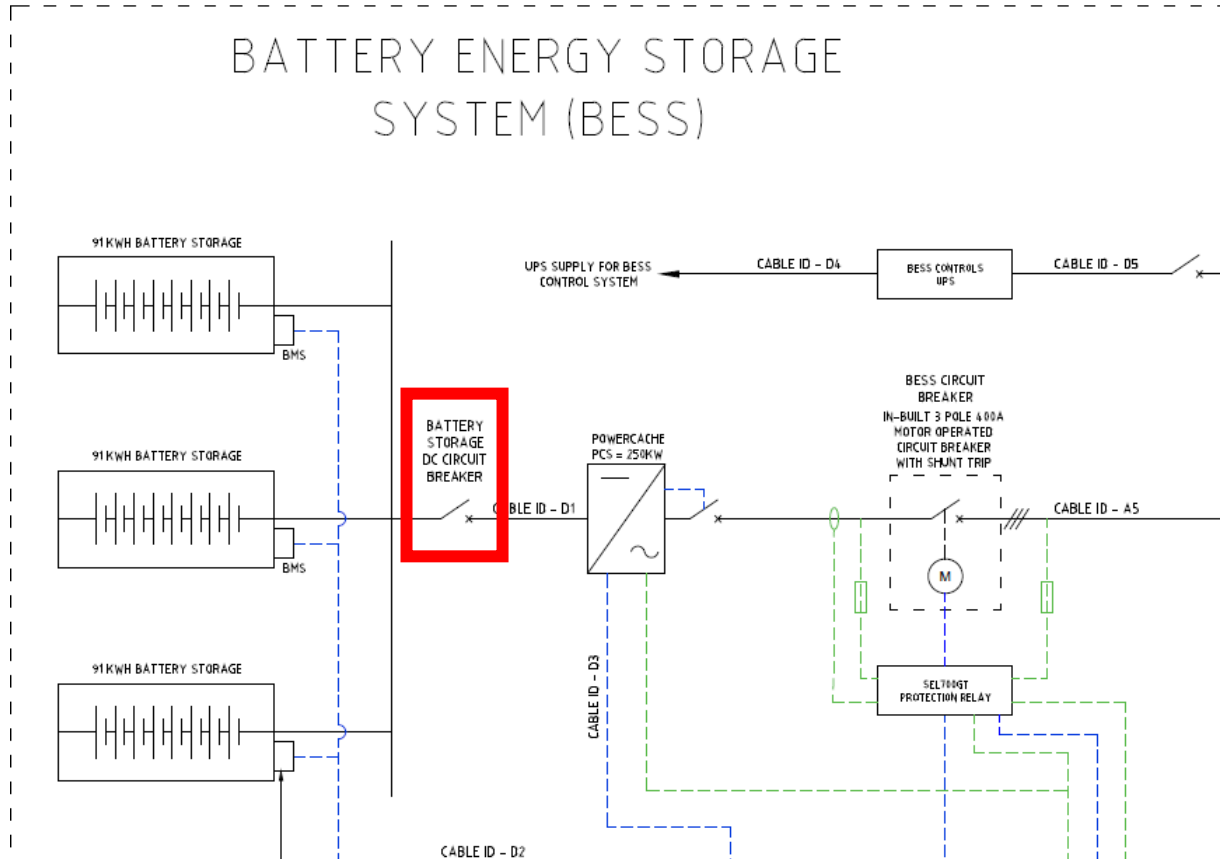


Note: The Hybrid System switchboard will have the same arc flash boundary and PPE equipment required during this stage

Additional Information

The fourth calculation was performed at the battery energy storage system (BESS) during this phase, the worst-case scenario was determined to be at the DC Isolator. See image below for calculation point on the single line diagram.

During this phase the arc flash boundary is determined to be 1000mm and PPE required is category 1.



Yours sincerely
System Solutions Engineering Pty Ltd

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Electrical Engineer

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