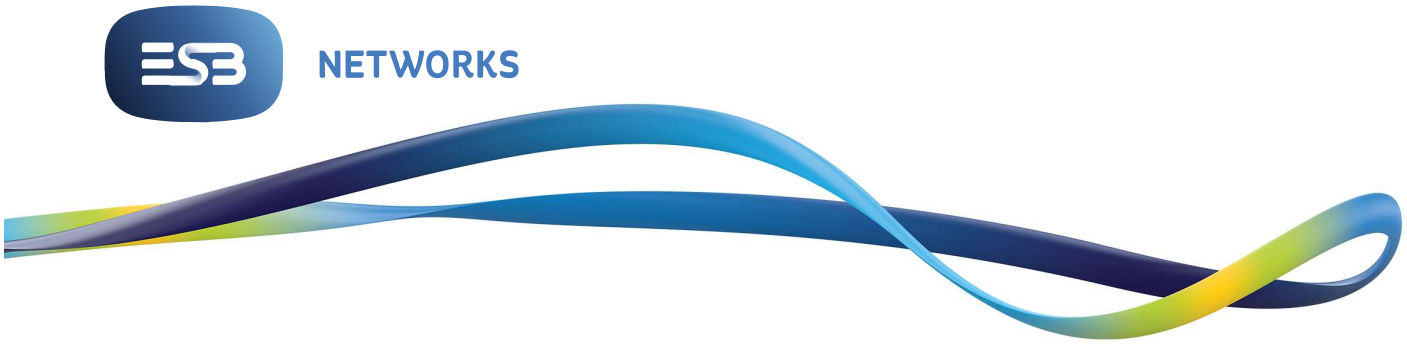

MV CUSTOMER CONNECTION - MV EGIP STANDARD MODULE SUBSTATION

DOC-010720-FUV

Introduction

In order to support the Irish Government's National Climate Action Plan, ESB Networks needs to develop standard options to facilitate faster and optimised connection options for renewable and customer connections to our network.

As part of the Irish Government's Climate Action Plan 2019, there are several targets within the Electricity sector that must be met by 2030 including "*the development of up to 1.5 GW of grid scale solar energy, an increase in onshore wind capacity of up to 8.2 GW*". As the generation market in Ireland is moving towards low carbon renewables, there has been a marked increase in smaller Independent Power Providers (IPPs) looking for connections to the electricity network. A significant number of Solar connections are expected to come on-stream from 2021. As an IPP could have a solar farm constructed in a much shorter timeframe than, for example, a windfarm development, ESB Networks will have to deliver a Medium Voltage (MV - 20 or 10 kV) Embedded Generation Interface Protection (EGIP) Substation connection in a considerably shorter timeframe than our current standard.

The aim of this project is to support the renewable generation industry by facilitating a faster connection of embedded generation to the Distribution System. ESB Networks has developed an MV EGIP Standard Module solution that will allow for 1 to 20 MVA*[1] connection to the ESB Networks MV System. This solution will remove the requirement to build a free standing MV block building, that requires significant on-site construction, with a module that can be factory built and then deployed onsite thus allowing for faster connection to the system.

Note 1: Generation Connection load capacity is still subject to system voltage present at connection node, local system capacity and possible system reinforcement requirements upstream of connection.

Background

Currently, if an IPP requires an MV connection, the standard connection requires a free standing MV EGIP block building as shown below.

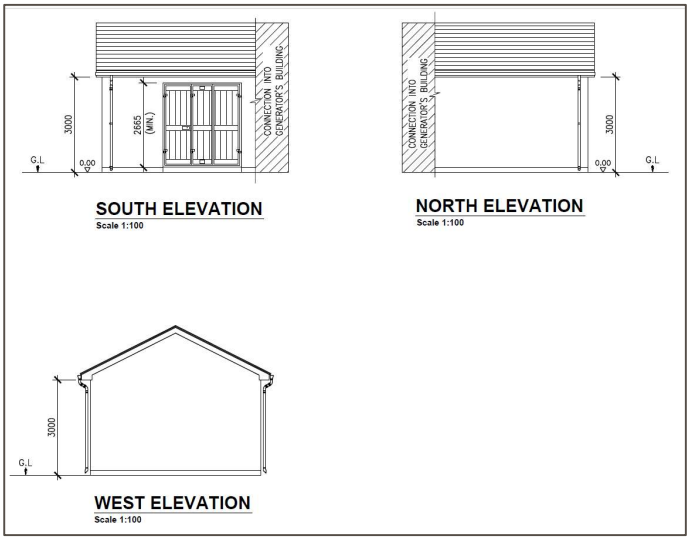

FIGURE 1 - CURRENT SOLUTION

Proposed Solution

ESB Networks proposed solution consists of a module that can be factory built and deployed to the IPP's site. The benefits of this solution are minimising construction work on-site and allowing a more efficient controlled delivery of MV EGIP connections.

The standard module will consist of largely the same electrical switchgear contained within the existing standard block-built substation. However, we have achieved several efficiencies in our overall approach to the substation layout and build which enable use of the module.

The module consists of:

- 3 bay MV switchgear
  (1 incoming MV cable circuit breaker supply, 1 metering & 1 outgoing customer disconnect);
- EGIP Protection
- Telecommunications terminal unit;
- Battery supply;
- External facing customer metering display panel;

Dimensions: 4.3 m x 2.9 m x 3.3 m

Module material: insulated double skinned steel panel

Module Weight: max 20,000 kg

Plinth support: 6.3 m x 4 m

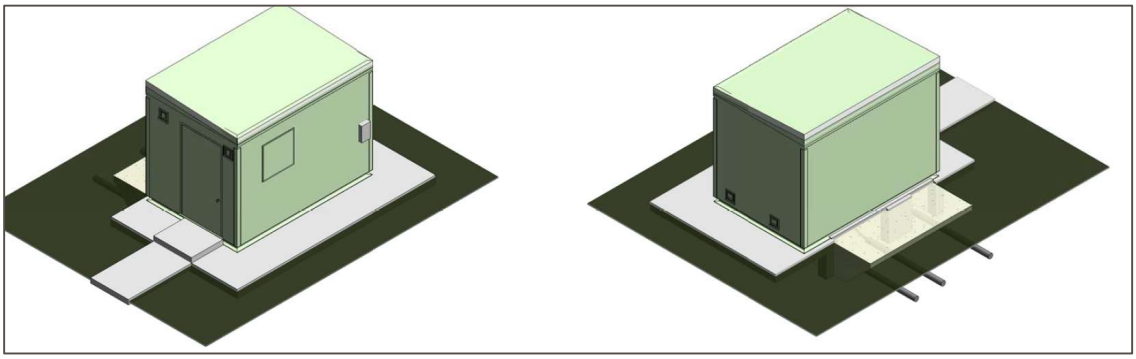

FIGURE 2 - PROPOSED SOLUTION

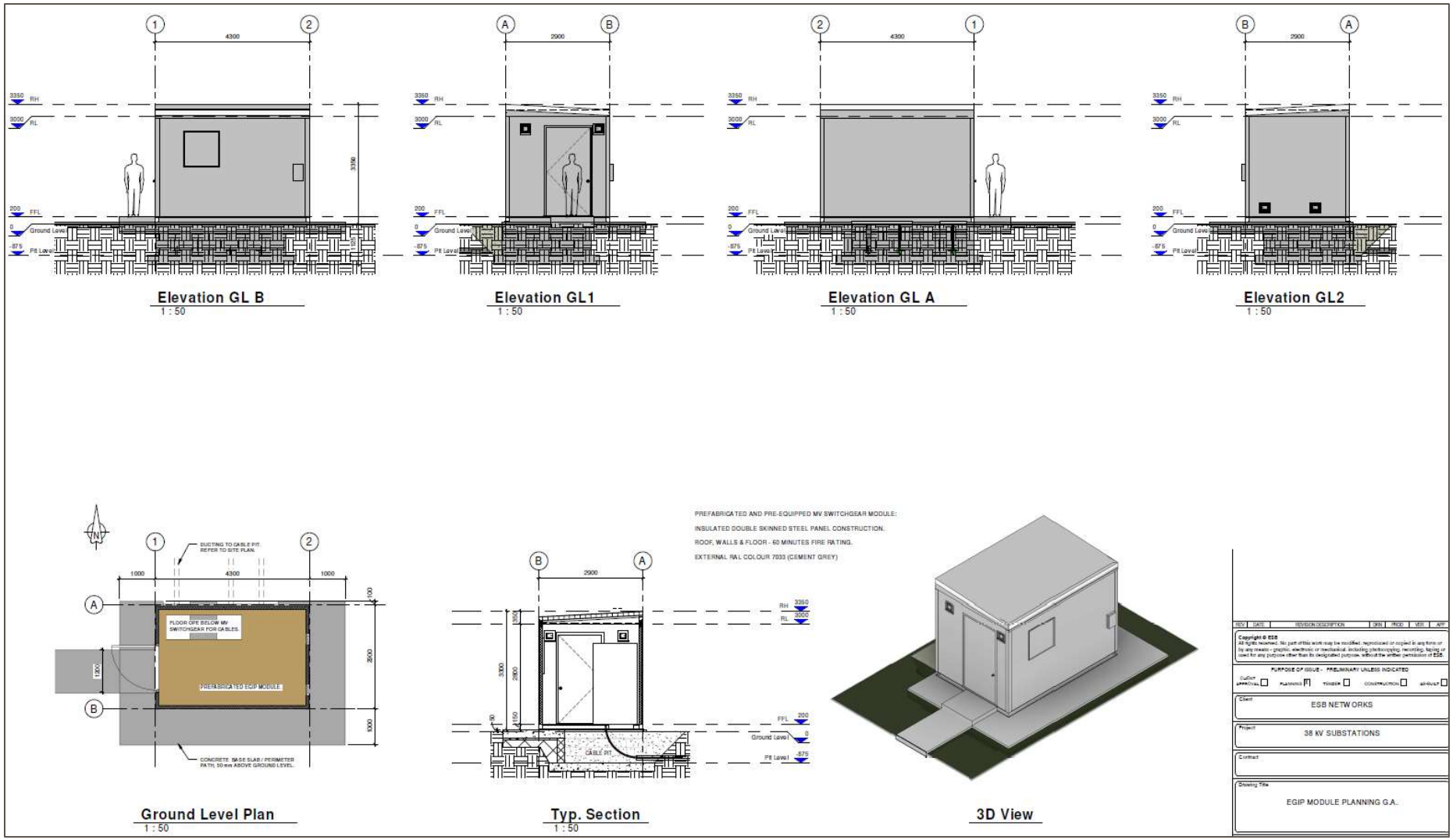

FIGURE 3 - DRAFT PLANNING DRAWINGS

Draft Plinth Drawings

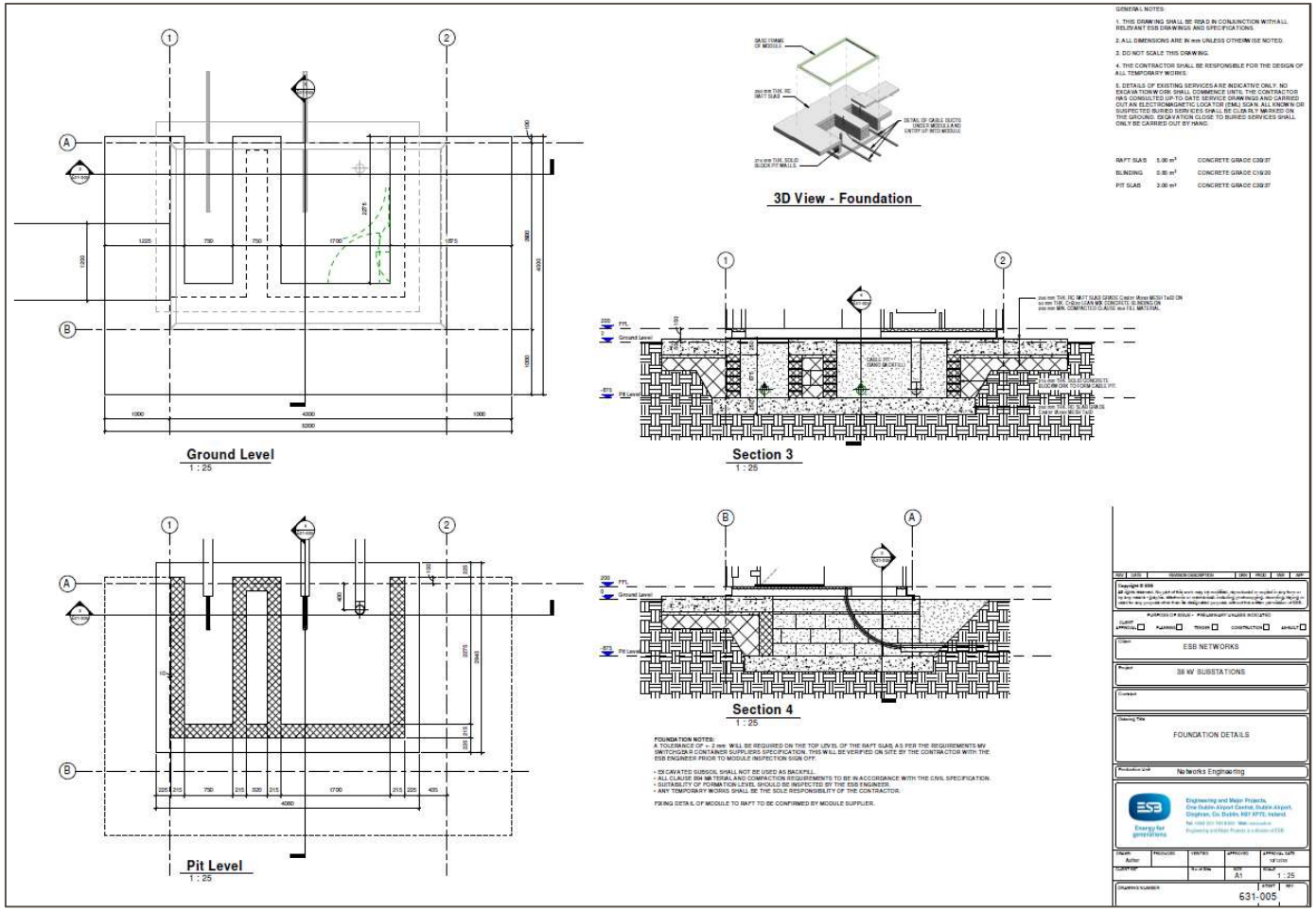

FIGURE 4 - DRAFT PLINTH DRAWING

Module Demonstration and Consultation

ESB Networks welcomes stakeholder views on our proposed solution. To enable this, we are arranging a showcase of a standard module build at ESB Networks National Training Centre in Portlaoise in Q1 2021. Also, in advance of this showcase event there will be a consultation period including a public webinar event.

The aim of both stages is to highlight the benefits of the proposed standard module and to ensure that our final enduring modular solution will cater to the majority of IPP MV customers.

The key benefits of our proposed solution are:

- Reduced MV Substation construction time on site
- Reduced requirement for commissioning work on-site, thereby removing conflict with civil works stage of project that can regularly occur
- Reduced Footprint of MV Substation
- Standardised Modular design providing the industry with certainty on design and build requirements for MV EGIP connections

In advance of our showcase event, ESB Networks is seeking stakeholder feedback on our proposed solution. We are hosting a public webinar event on Friday 11th December and our consultation will close on Friday 15th January 2021. We would welcome any stakeholder feedback or interest in attending our webinar event. Please email innovationfeedback@esbnetworks.ie with comments or indicate if you would be interested in attending our webinar event.