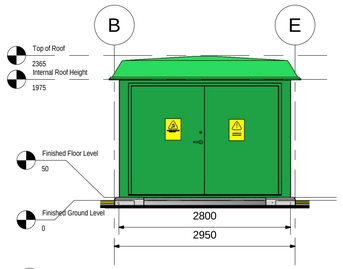
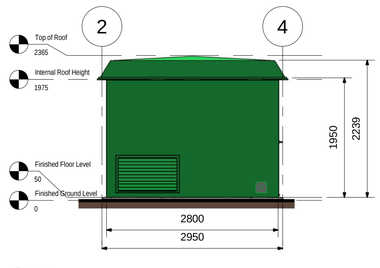
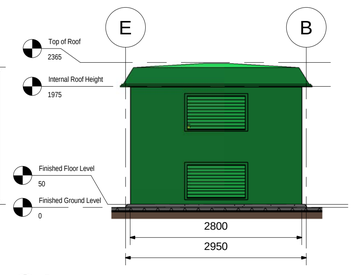


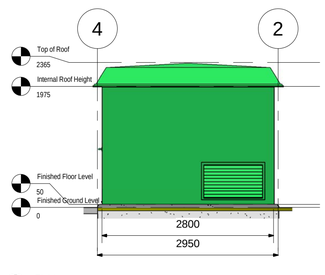

1 Front
1 : 50



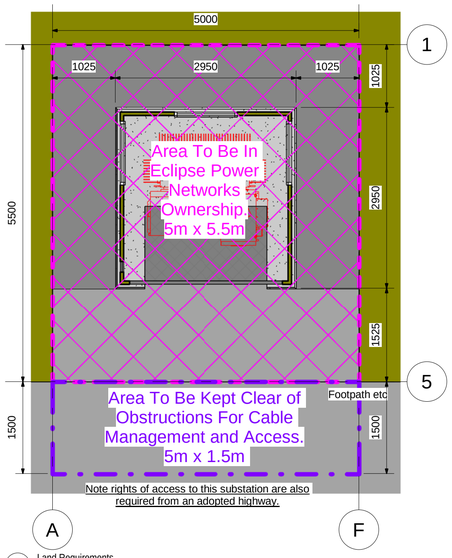

2 Left
1 : 50



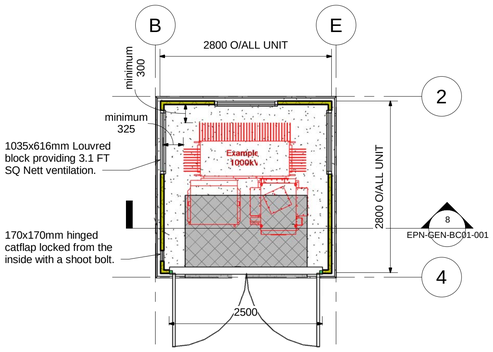

3 Rear
1 : 50



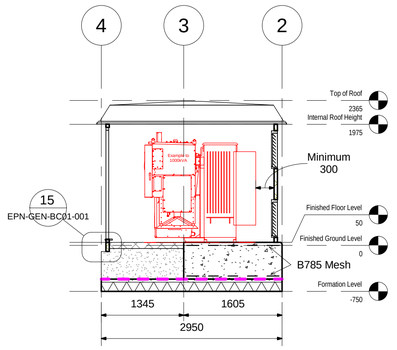

4 Right
1 : 50



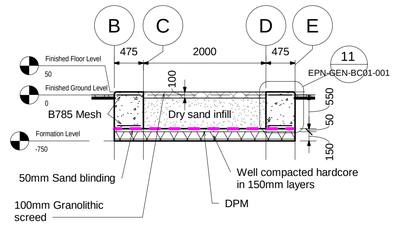

5 Land Requirements
1 : 50



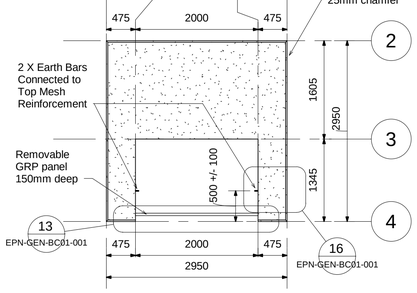

6 Floor Plan Layout Up to 1000kVA
1 : 50



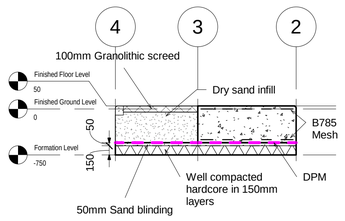

7 Section 1
1 : 50



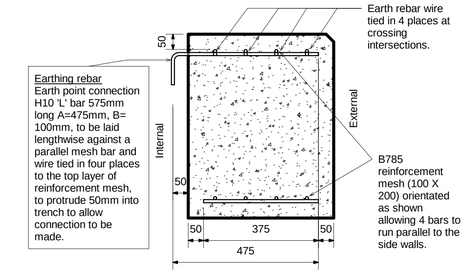

8 Section 2
1 : 50



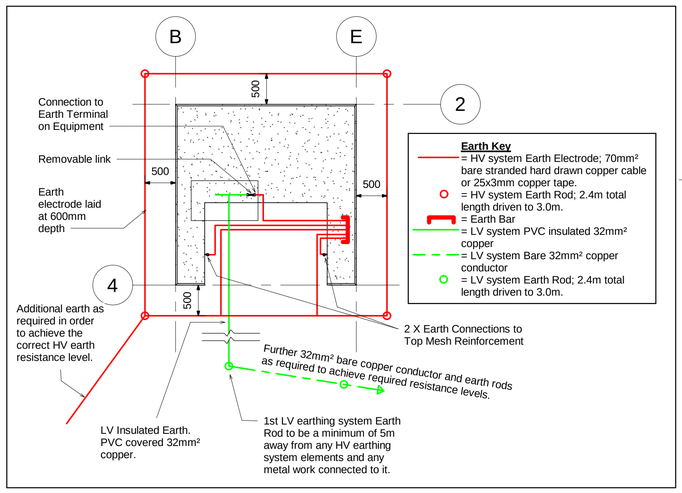

9 Foundation Plan
1 : 50



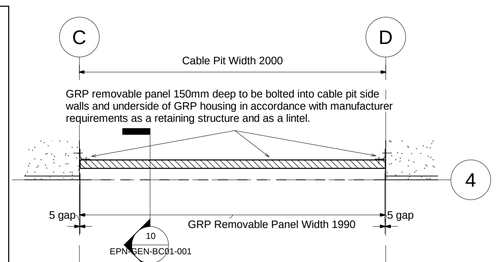

10 Section 3
1 : 50



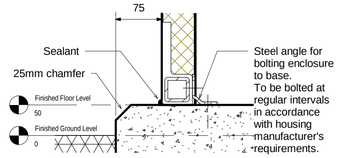

11 Mesh and Earthing Bar Section
1 : 10



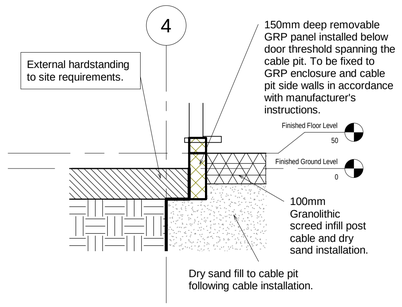

12 Earthing Plan
1 : 50



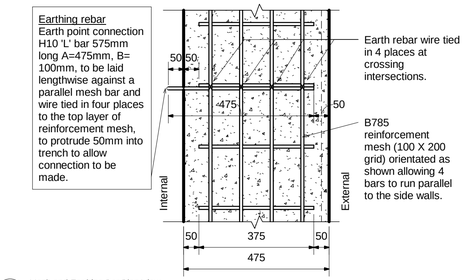

13 Foundation Plan - Callout 1
1 : 20




14 Unit Fixing Detail
1 : 5




15 Section 1 - Callout 1
1 : 10




16 Mesh and Earthing Bar Plan View
1 : 10

**General Notes**

All dimension are in millimetres unless otherwise stated.
All proprietary products are to be installed in accordance with the manufacturer's recommendations.
Ensure all areas trafficked by people have a level finish without any trip hazards.
This design is for a standard packaged substation to 1000kVA. However depending on the final equipment ordered where either it is larger then usual, additional protection panels, battery chargers, large LV distribution cabinets, etc are required/ used then the larger substation as per EPN-GEN-BC02-001 is to be utilised; although in instances where space is still deemed unsatisfactory then it's advisable to have a pre-design consultation with EPN as to the substation selection/ design required.
The substation should be placed a suitable distance from nearby properties in order not to be a noise nuisance, earth risk, and to reduce any potential EMF risks. Currently the spatial requirements for a GRP housing in a domestic environment is expected to vary from 7m to 19m to the nearest property depending on the final equipment specification and site requirements; but it is the developer/ designer's responsibility to correctly specify this in which ever environment it is in (e.g. domestic, industrial, commercial, mixed use). Where a smaller spacing is required than is possible with a GRP housing a brick/block substation could be considered.

Standards. All workmanship, design and materials are to conform to the latest editions of the relevant codes of practice, British Standards and Eurocodes. These included but aren't limited to:

BS4449 & BS4483: Steel fabric and bar reinforcement
BS7671:
BS8000-2.2: Workmanship on building sites; code of practice for concrete works.
BS8500-1 & 2: Concrete specification and provision
BS EN 206: Concrete, specification, performance, production and conformity.
BS EN 1992-1-1: Design of concrete structures

Enclosure
The design is based on an Envico TR7 GRP housing with lock shroud and additional GRP lintel across the cable pit.
There can be minor differences in requirements to the TR7 unit depending on the DNO/ DSO region which are to be complied with. The region therefore needs clarifying with the manufacturer when ordering.
The housing is of GRP construction sitting on a concrete base with approximately 50mm of the concrete visible above finished ground level.
A GRP lintel/beam is to be provided by the GRP housing manufacturer and fixed to the underside of the door threshold and the ends attached via angle irons to the inside edges of the cable pit.
Housings are to have a minimum enclosure rating of IP23 as per 'BS EN 60529'.
Insulation and ventilation:
- This drawing has been generated on the basis that there are no thermal or insulation equipment requirements as the equipment being installed is rated for external use and heating is not needed at any point. In these cases insulation is only required to prevent condensation, and suitably sized ventilation is to be passive type.
- Where this is not the case early discussions are required with EPN as the design of the enclosure (e.g. U values etc) and additional equipment/ heaters/ dehumidifiers/ ventilation etc in accordance with the equipment requirements, relevant DNO requirements and building regulations may lead to commercial and footprint requirement adjustments.

Explosion relief is to be incorporated with a lift off roof to dissipate 250MVA arc energy in accordance with TCR20/97. This is to be accomplished via suitable design and slides for the roof to return to its original position.
Exposed metalwork (internal and external, including door furniture) is to be either stainless steel or hot dip galvanized to a minimum thickness of 85µm in accordance with 'BS EN ISO 14713-1' and 'ISO 1461'.
Doors: Left hand leaf to be fitted with Danger of Death signage in accordance with EPN's requirements, and a shrouded Espagnolette latch suitable for dual locking via padlocks. Right hand leaf to be fitted with 2 galvanised shoot bolts and signage in accordance with EPN and DNO standard requirements..
The housing is to be fixed and water sealed down to the concrete foundation in accordance with manufacturer recommendations.
Colour/ External finish: The enclosures are to be UV resistant smooth finished and unless overruled by planning requirements coloured either Holly Green (14 C 39) or Brown (08 D 45) (Colours to BS4800 & 5252).

Foundations
This drawing is provided on the basis that the site ground conditions are stable, flat and are not at risk of flooding. Where this is not the case designs need to be provided for adequately handling these.
Excavations to be kept free from water at all times.
Minimum laps in reinforcement to be H10= 450mm and Mesh= 450mm (unless proved otherwise as per BS EN 1992-1-1).
Minimum concrete cover to reinforcement to be 50mm on all faces.
Foundation concrete is to be either:
- For areas of designated chemical class up to DC-1: RC32/40, max 20mm aggregate size, minimum cement/ combination content of 320kg/m³, max w/c ratio 0.55, Cl 0.30 (these are in accordance with DC-1, XD1, XC2 and XF2 requirements).
- For areas of designated chemical class DC-2 and above: As above except W/C ratio, min cement and combination quantity and types require additional selection in accordance with BS 8500-1 & 2.

Note: The addition of admixtures to improve workability is allowed provided this is undertaken by the batching plant in accordance with their mixture design.
Blinding concrete to be an appropriate designated GEN3 concrete mix.
The final designed mix, water content, exposure class, slump, sulphate resistance and chemical class is to be designed to site specific requirements.
Concrete designed strength is to be achieved within 28 days.
Chairs may be required to support the top reinforcement layer.
A ground bearing pressure of 50kN/m² with maximum differential settlement of 5mm has been designed for at a flat and compacted formation level. Failing this extra dig and soft spots are to be filled with an appropriate designated GEN1 or 3 concrete mix.
Concrete mix is to be vibrated sufficiently to remove voids and the top surface is to be level with steel float finish.
Suitable anti-vibration pads are required under the packaged substation.

Formed Finish
Fine smooth and straight finish to exposed plinth sides.
Abrupt irregularities to be not greater than 3mm. Gradual irregularities, expressed as maximum permissible deviation from a 1m straight edge, to be not greater than 3mm.

Duct to be inserted
Ducts to be adequately sealed upon installation of cables, the duct sealing system is to completely fill the space, leaving no gaps and finish neatly and used strictly in accordance with the manufacturer's instructions. CSD Rise or similar approved sealing system to be used.

L.V. Electrical/ Services Generally
Where the Transformer Mounted LV distribution fuse cabinet provides a power socket and light there is no additional requirement within the enclosure for EPS. However when this is not the case, and/or the DNO has a specific requirement then this is to be designed and installed in accordance with the DNO's requirements.

| Revision Number | Revision Date | Revision Description | Drawn/ Checked | Approved By |
|---|---|---|---|---|
| B | 01/08/2018 | Clearance requirements added | CWF/CWF | CWF |
| A | 26/07/2018 | Minor modifications | CWF/CWF | CWF |
| O | 06/06/2018 | Original | CWF/CWF | CWF |

Revision Schedule

1:10 0 100mm 200mm 300mm 400mm 500mm 600mm 700mm 800mm 900mm 1m
1:20 0 400mm 800mm 1200mm 1600mm 20m
1:50 0 1m 2m 3m 4m 5m
1:100 0 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m



ECLIPSE POWER NETWORKS GENERATION
25 Osier Way, Olney Office Park, Olney, Buckinghamshire MK46 5FP United Kingdom
Telephone: 01234 486487 Web: www.eclipsepower.co.uk e-mail: networks.enquiries@eclipsepower.co.uk

Drawing Number: EPN-GEN-BC01-001
Revision: B

Drawing Name: 11kV Close Coupled GRP Substation to 1000kVA

Scale: As indicated
Paper Size: A1

Drawing Status : For Information Only