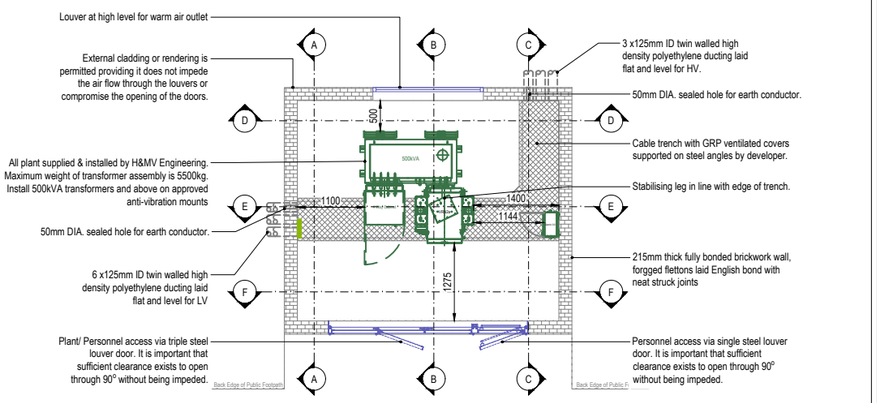
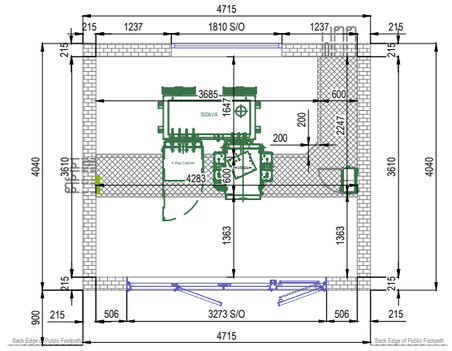



Substation General Arrangement Plan
Scale 1:50




Substation Setting-Out Dimensions
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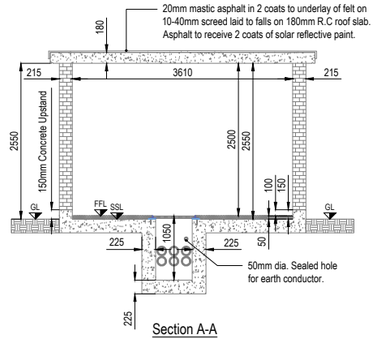
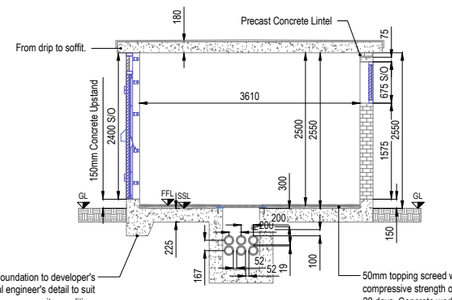
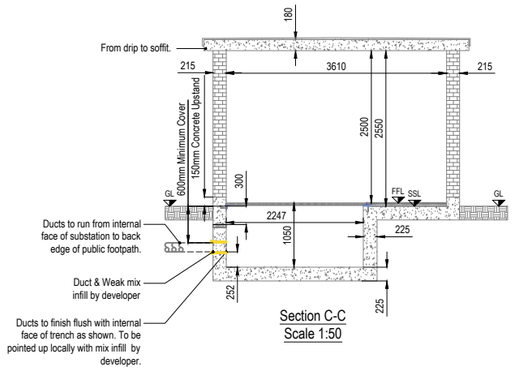


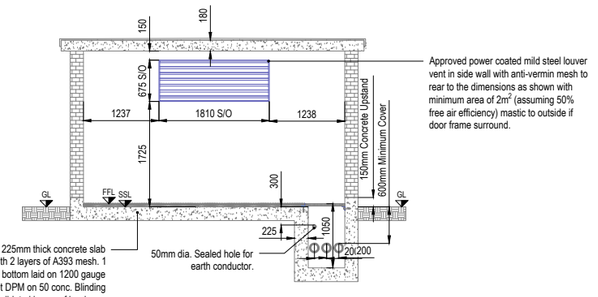

Section A-A
Scale 1:50




Section B-B
Scale 1:50




Section C-C
Scale 1:50




Section D-D
Scale 1:50

**General Notes:**

- Do not scale from this drawing. No variation to the stated dimensions or materials specified will be permitted without prior written consent from H&MV engineering.
- All dimensions are in millimetres.
- The running of sprinkler system, heating, gas, telecom's, water and other services through or under the substation area is not permitted.
- Workmanship and materials to conform to the latest edition of the relevant codes of practice or british standard.
- Location of the site shall be overlaid on the ordnance survey map and added onto the project specific drawing.

**Planning, Location and Position**

- Position and orientation of the substation shall be agreed with H&MV prior to the commencement of any building works on site.
- Substations shall be located adjacent to a public highway or reached by a private dedicated access way with full control and associated legal rights.
- The developer is responsible for obtaining all planning consents and building regulation approvals.
- Unimpeded access for UK Power Networks / IDNO personnel is required at all times, 365 days of the year (24/7). Any doors or gates on the access route shall be locked with the standard dual UKPN / IDNO locking suite.
- Access via 24 hour security is unacceptable.
- Proposed soft landscaping adjacent to the substation (e.g. planting schemes) shall allow for future plant growth without compromising access or ventilation through doors and louvres.

**Foundation and reinforced concrete**

- As stated on drawing or to suit the site condition.
- Sufficient cover to the reinforcement to achieve a 4 hour fire rating (50mm minimum).
- Ground contaminants shall be removed, local soft spots shall be minimum area of 2m² (assuming 50% free air efficiency) mastic to outside if door frame surround.
- For preliminary design, assume 50kN/m² increase in ground pressure at formation level.
- Structural concrete to be poured on 50mm gen1 mix concrete blinding on 1200 gauge geomembrane, on sand blinding, on well compacted dtp1 type material.
- Reinforcing bars to be electrically continuous.
- A sulphate resistance cement combination to BS EN197-1:2011 shall be used unless otherwise specified by the designer.
- RC32/40 concrete mix with 20mm aggregate to BS 8500-2 shall be used unless otherwise specified by the designer.
- All reinforcement shall have a 50mm minimum cover to provide a four-hour fire resistance.
- Top of all concrete works shall be finished smooth and level within +/-2mm over 2000mm.
- Ribbed bar reinforcing to BS 4449, strength grade B500B.
- Steel fabric reinforcement square mesh to BS 4483.
- Bending schedule to structural engineer's design.
- Reinforcing bars shall be electrically continuous across the substation's foundation reinforcement. The reinforcement design shall indicate where welded or exothermic type connections are required.
- Steps are not permitted within the substation.

**Floor slab**

- To the structural engineer's specifications to sustain loads shown, the entire access route is to be capable of sustaining the equipment load.
- Standard floor slab thickness of 225mm minimum reinforced concrete with a suitable wearing screed with a minimum compressive strength of 40N/mm² after 28 days. Concrete works finished with steel float to within +/-2mm over 2000mm.
- Reinforcement to developer's structural engineer requirements.

**Roof**

- 180mm minimum normal density reinforced concrete or greater to suit the span with sufficient concrete cover to reinforcement to achieve 4 hour fire rating.
- Pitch roof designs will require the standard concrete roof slab below but the requirement for mastic asphalt can be reduced to two coats of waterproofing treatment or built-up proprietary roofing (e.g. riw 'synthaprufe' or similar).
- Roofing components shall be low maintenance i.e. UPVC Fascia boards instead of timber, roof void shall be adequately vented.
- Hollow beams, precast planks or lightweight concrete on metal decking are not be permitted.
- Roof shall be fully weatherproofed; the standard detail shall have a 20mm mastic asphalt finish in two coats to underlay of felt on a minimum 1:80 fall to the rainwater outlet. Edge of slab provided with a GRP roof edge trim.
- The top of the asphalt shall receive two coats of solar reflective paint.

**Walls**

- Option 1: 215mm fully bonded brickwork. frogged flettons constructed in english bond with neat struck joints, walls to be fair faced on the inside.
- Option 2: two skins of brickwork laid with e.m.l. horizontal bed joint reinforcement every 3' course with no cavity, inner skin to be of common flettons, external skin to harmonise with adjacent brickwork.
- Option 3: 180mm min. rc concrete with sufficient concrete cover to reinforcement to achieve a 4 hour fire rating.
- Engineering brick or block are not permitted.
- Providing that non-combustible material is used, brickwork walls may be rendered or clad externally if specifically required by the planning conditions.

**Door**

- Sunray Engineering UKPN approved powder coated mild steel louvre door with anti-vermin mesh to rear with louvre panel over door frame. To the dimensions as shown with minimum clear opening of four leaf door 3273mm (W) S/O x 2400mm (H) S/O. Threshold elevations to be 225mm Max. - 100mm Min. external and internal. Active leaf to be right hand hung and fitted with A 2 point locking system secured externally by hasp & staple and operated internally by Briton panic bar (padlock free issued by UK Power Newtwork).
- Passive leaves to be fitted with A 3 point locking system operated internally.
- Generator cable access Hatch to be LHS (Right Hand Side)
- Steel doors shall be connected to the substation earthing system via the earthing lug on the door frame.
- Mastic To outside of door frame

**Vents**

- Sunray Engineering UKPN approved Approved power coated mild steel louver vent in side wall with anti-vermin mesh to rear to the dimensions as shown (1610mm (W) S/O x 675mm (H) S/O) with minimum area of 2m² (assuming 50% free air efficiency).
- Mastic to outside if door frame surround.

**Ducts**

- 125mm internal diameter twin walled high density polyethylene ducting to EAS 02-0000a or BS EN 61386, laid flat and level.
- Number and entry positions shall be verified by UK Power Networks.

**Waterproofing**

- The whole of the substation must be impervious to the ingress of water.
- Flood risk assessment has been carried out by RMA environmental Ltd - Document Reference: RMA- RC1680 - on the 18th 05 2017 and is concluded that the site is located on Flood Zone 1 and, therefore, flood risk from rivers and the sea is considered to be low and no additional flood mitigation measure is required.

**Finishes**

- Floor to receive two coats of grey concrete floor paint.
- Walls and ceilings to receive two coats of white emulsion.
- Approved doors and vents to receive power coated finish, standard colour green 14-c-39 or developer to specify the colour to harmonise with the adjacent premises and advise the manufacturer.

**Infill to area around cables**

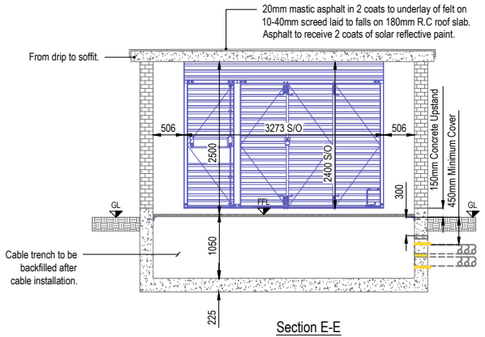
- After cable installation, seal all cable ducts, fill trenches with sand with 100mm above top duct and to a minimum of 500mm below the top of gratings.

**GRP gratings and supports**

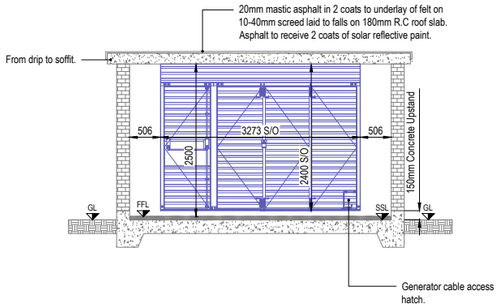
- 38mm deep moulded grp gratings, open type with gritted surface, green.
- Gratings shall be seated level with no noticeable rocking or sliding and shall be left in position.
- Cut off openings for cable penetrations ensuring the gratings can be removed with cables in-situ while remaining stable.
- Steelwork for grp grating supports shall be galvanised.

**Drawing Reference:**

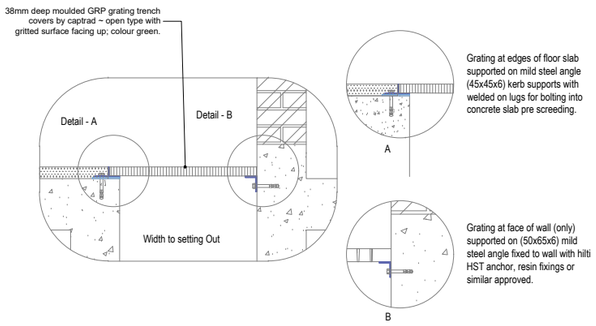
- EAS 07-0000: Approved equipment list - civil
- EAS 02-0000: Approved equipment list - cables & ducts
- EDS 07-1119: Substation Electrical Services
- EDS 07-3101: Pre-design requirements for secondary substations
- EDS 07-3102: Secondary substation civil design standard.
- EDS-07-3102-01-Freestanding Brick Built Substation




Section E-E
Scale 1:50




Section F-F
Scale 1:50




GRP Grating & Steelwork Detail

Note:
Alternative roof designs to harmonise with adjacent premises are acceptable providing they still have the standard concrete slab detail below ~ in all cases developers to submit detailed proposals for consideration. guttering and downpipes omitted for clarity.




Standard & Alternative Roof Designs

## Material Specification Details

| Equipment / Material | Specifications | Approved Supplier | Owned By | SAP Number / Standard |
|---|---|---|---|---|
| Transformer | Tier 2, 500kVA, ONAN, 11/0.433kV | Lucy Electric | IDNO - EAN | ENATS 35-01 |
| LV Cabinet | 800A 4 -Way,Transformer Mounted LV Cabinet | | IDNO - EAN | ENATS 37-02 |
| RMU | VRN2a, 200A rated, SW1 and SW2 actuators fitted, CB pre-wired for actuator, FPI CT's fitted for SW1 and SW2, TLF protection, transformer mounted non extensible, bottom cable entry. TLF 10A | | DNO - UKPN | 14950F |
| RTU | Lucy Gemini 3.0 | Lucy Electric | DNO - UKPN | 14463F |
| | Umbilical Cable - 12m | | | 66924V |
| | Wall Mounting Bracket | | | 66920P |
| HV Ducts | 125mm Solid Rigiduct (6 metre length) | Polypipe | UKPN | 25045J |
| LV Ducts | 125mm ID, Class 2, Solid Rigiduct | Polypipe | IDNO - EAN | ENATS 12-24 |
| Tile Tape | Tile tape for use up to 22kV must be marked UK Power Networks. Provided in 40M coils x 200mm (wide) x 2.5mm (thick). To be laid over entire run of cable and joints | Centriforce | UKPN | 04039G |
| Marker Tape | Last Mile Marker Tape 150mmx0.1mmx365m | Boddingtons Ltd. | IDNO - EAN | ENATS 12-23 |

| Rev | Date | Description | CHK | APP |
|---|---|---|---|---|
| 00 | 29.02.24 | Draft Design | AO | HA |

Revisions


H&MV ENGINEERING
High Voltage Specialists
Eden House, 454 New Hythe Ln, Aylesford ME20 7UH
Tel: 020 3481 4608
https://www.hmvengineering.com
Email: info@hmveng.co.uk


Client: Churchill Retirement Living

Project: Former Roundstone Caravan Site

Title: Substation Construction Detail

Not For Construction

| Date: | Drawn: | Designed By: | Checked By: | Approved By: |
|---|---|---|---|---|
| 29.02.2024 | HA | HA | AO | HA |

Project Manager : Scott Fisher
Telephone: 07753286559

Scale: 1:200
Project No: GB7001
Project Status: In Progress

| Project Code | Originator | Zone/ Volume | Level | Type | Disc | Doc. No |
|---|---|---|---|---|---|---|
| GB7001 | HMV | SW | 00 | DR | E | 1000 |

Status Code: S0
Suitability Description: Design For Approval
Revision: 00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