

**General**

This drawing is to be read in conjunction with document SUB-03-017 General Specification for the Civil Engineering and Building Design and Construction of Secondary Substations. It is the constructor's responsibility to confirm, before construction, that the details on this drawing are correct as per SUB-03-017.

This is a generic guidance drawing that is deemed suitable for construction. However the constructor should consider all site specific risk that will affect the design and operation of the substation. Proposed substation details are to be submitted for acceptance before installation.

**Concrete**  
General

The concrete shall be in accordance with the specification and attain the relevant cub crushing strength at 28 days.

Floor (Concrete 40N/mm<sup>2</sup> 28-Day Cube Strength)  
Floors of substations housing indoor switchgear shall have a visqueen damp proof membrane installed where graded stone infill is used.

A flat, level and smooth floor surface is essential for installation of plant. Tolerances to finished level expressed as a maximum permissible deviation beneath a straight edge with feet placed anywhere on the floor shall not exceed 1mm in 1m or 3mm in 3m. Floors to be cured, prepared & painted with 2 No. Coats of non-slip floor paint on completion.

**Brickwork**  
General  
All brickwork below D.P.C. to be H.D. category 1 min. 75N/mm<sup>2</sup> mean compressive strength and max 12% M.A. and durability designation F2 S2 (Ex Engineering Brickwork Class B) in English bond except for exposed faces.  
External facing brickwork to be H.D. category 1 min. 30N/mm<sup>2</sup> mean compressive strength and max 12% M.A. and durability designation F1 S1 or better.  
Internal facing brickwork to fair faced smooth textured solid concrete bricks, sized to match external facing bricks and with a mean compressive strength of not less than 20N/mm<sup>2</sup>.  
Class II mortar.

Walls shall be 215mm English garden wall bond or Collar jointed stretcher bond.  
Leaves of collar jointed double stretcher walls to be tied together by means of type 1 or type 2 stainless steel ties laid in every fourth course at 375mm centres and set back 38mm from outer face, ties are to be staggered.

SHS windposts shall be installed on the front and rear wall panels.

**Doors**  
Details of proposed doors shall be submitted to SPEN for comment, before work commences. Proprietary GRP faced aluminium or steel security doors are the preferred option, unless stated otherwise.  
An alternative option for hardwood doors (see Drg SP4000543 for details) or GRP doors is also available.

**Cable Trench & Slots/Ramp**  
On completion of cabling, cable trench to be filled with dry sand and skimmed with minimum 50mm depth of sand/cement screed over a visqueen membrane (top to be level with FFL).

**Roof**  
Standard Concrete Roofs (Concrete 40N/mm<sup>2</sup> 28-Day Cube Strength)  
Wherever practicable, roofs should be cast in situ reinforced concrete construction with a soffit finish. Slip joints shall be incorporated at wall bearings, polysulphide sealed externally. Internal / External faces of concrete to be fair faced. All external faces to be cured, prepared, primed and finished with a two coat high performance (Aliphatic) polyurethane waterproofing system (flat roof grade) with glass fibre mat reinforcement to initial coat, e.g.

1No. Coat of LPL bonding primer then  
2No. Coats of LPL Decothane.

Obtainable from Liquid Plastics Tel. 01772 259 781 or Equal System

All finishes are to be in accordance with the manufacturers recommendations.

Where permanent structural metal soffit shutters are used as part of a composite roof system these shall be corrosion resistant and the Constructor's proposals for screening or tagging for earthing purposes shall be expressly agreed with SPEN prior to construction.

**Ventilation**  
Ventilation shown is typical for a double 500kVA transformer substation.  
Ventilation unit opening sizes for 1000kVA transformers shall be a minimum 1002 x 450mm. The typical ventilation indicated may not be adequate in certain supply conditions which might require additional or alternative ventilation arrangements.

**Steelwork**  
All steelwork is to be hot dipped galvanised in accordance with the specification and shall provide fixings for earthing.

| <b>Related Typical Deemed to Satisfy Drawings</b> |           |
|---------------------------------------------------|-----------|
| Hardwood Doors                                    | SP4000543 |
| Meter Cupboards                                   | SP4078901 |
| Vent for Brickbuilt substation                    | SP4000542 |

|                    |                  |                                                                 |
|--------------------|------------------|-----------------------------------------------------------------|
| Rev.<br><b>3.0</b> | Date<br>27/11/17 | GENERAL UPDATES TO REFLECT CHANGES TO<br>CIVILS POLICY DOCUMENT |
| Drawn              | C.B.             |                                                                 |
| Checked            | G.R.             |                                                                 |
| Approved           | G.R.             |                                                                 |



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TYPICAL TRADITIONAL BUILDING DETAILS FOR  
11kV BRICK BUILT SUBSTATION  
(DOUBLE SIDE BY SIDE)

|           |        |         |        |          |        |
|-----------|--------|---------|--------|----------|--------|
| Location  |        |         |        |          |        |
| STANDARDS |        |         |        |          |        |
| Drawn     | Date   | Checked | Date   | Approved | Date   |
| M.T.      | JAN.09 | A.J.R.  | JAN.09 | C.W      | JAN.09 |

|               |                  |            |
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