

PLEASE READ CAREFULLY.

IF IN DOUBT ASK

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REVISION HISTORY				
ECO No.	REV.	DESCRIPTION.	DATE.	APPROVED.
10-18	B1	REVISED AND RE-ISSUED PER CM OCT 18	OCT 18	CM, ESB
05-19	C	RE-RELEASE IN LINE WITH NEW DOC-280518-DFK	MAY 19	CM - ESB

"Filehub Ref DOC-150916-CHU"

NOTES:

1. GENERAL.

Always check for and download the latest version of this drawing from the ESB website.

These drawings are to be read in conjunction with **ESB specification** 'Construction Standards for MV Substation Building (DOC-280518-DFK)' and the 'National Code of Practice for Customer Interface which may be downloaded from ESB's website (www.esb.ie/esbnetworks).

This specification / drawing is not for use where generator plants such as; windfarms, solar farms, landfill gas, biomass or hydro plants are being connected to the (MV) system.

Failure to comply in full, with the requirements of this specification will delay installation of supply.

Please refer to Annex B of DOC-280518-DFK for a list of common errors in design and construction of MV Substations.

These drawings relate to the ESB MV Substation and do not show the customers switch room. For more information refer to DOC-280518-DFK Section 2.4

2. PLANNING PERMISSION.

The customer is responsible for obtaining planning permission for the MV sub-station building.

3. FIRE SAFETY REGULATIONS.

The substation building must comply with the FIRE SERVICES ACT, and all regulations made under this act. The location and construction of the sub-station building must also comply with the Fire Safety requirements of DOC-280518-DFK Section 2.6

Electrical smoke detectors are only permitted if mounted on the substation door. A special hatch is fitted to the door at the manufacturing stage. The door supplier must be advised of this requirement. Plastic flexible trunking is required, and no earth wire is permitted. Air sampling systems are permitted provided the pipe work is non-conductive and the equipment does not require the substation to be opened for annual inspection of the pipe work.

4. SAFETY - STATUTORY OBLIGATIONS

The customer is responsible for managing safety for the entire building project in accordance with Irish Safety Legislation and section 3.2 of DOC-280518-DFK.

5. CRITICAL ASPECTS OF THE BUILDING.

5.1 RE-INFORCING STEEL.

Refer to DOC-280518-DFK Section 4.5

5.2 SUBSTATION WALLS.

See sections 4.1 and 4.3 of DOC-280518-DFK

5.3 SUBSTATION ROOF.

See sections 4.1 and 4.11 of DOC-280518-DFK

5.4 EARTHING - MV & LV EARTHS.

5.4.1 Floor steel earthing will be carried out and tested for in accordance with requirements of section 5.1

NOTES CONT....:

5.4.2 'Copper Earth Mat'. A copper earth will always be required outside substation doors. The earth mat will be purchased only from an approved ESB supplier. The earth mat will be placed at a depth of 200mm below ground and the earth mat tail will carry into the substation in the central cable duct. See sections 4.8 of DOC-280518-DFK

5.4.3 MV and LV earths will always be required at the ESB substation, the earth can extend up to 25 meters. Therefore, the surrounding grounds cannot be finished until these earth wires have been installed and tested. Details of the location for the earth wire must be discussed with the local ESB representative.

6. EXTERNAL WALL CLADDING.

External wall cladding may be considered in place of the outer leaf. Any proposed cladding material should be maintenance free. It should not diminish the ventilation or damp proofing properties of the building.

Non-metallic, non-flammable cladding is the preferred option as it does not present a safety risk from an electrical point of view. Sharp edges are not acceptable. Cladding should not provide a climbing aid onto the building.

7. SUBSTATION DOORS.

Substation doors must be sourced from an ESB approved supplier. A list of 'ESB Approved Material Suppliers for LV, MV, 38kV & 110kV Associated Works' is available to download from ESB's website. (www.esb.ie/esbnetworks).

The size of opening required for the installation of the doors is detailed on this drawing.

External cladding may be permitted on doors (refer to point 6 above) provided there is no breach of the galvanising. Cladding shall add no more than 40mm to the overall depth dimension of the doors.

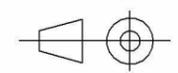
The extra weight bearing on hinges should not be excessive. The doors shall open through 180° and it is not permitted to significantly extend the hinges to achieve this. The normal function of the doors, such as locking / access mechanisms, ventilation and any other facilities shall not be impeded. Sharp edges are not acceptable.

If a smoke detector is required, this must be advised to the approved door supplier at the time of ordering.

A drip rail must be provided at the top edge of the door if it is fitted flush to a multi storey building facade

If required doors may be painted to blend with the building facade.

See sections 2.7 and 4.10 of DOC-280518-DFK

 <p>Units 9, Castlepollard SC, Oldcastle Road, Castlepollard, Co. Westmeath, Ireland.</p>		<p>CLIENT:</p> 							
<p>PROPRIETARY NOTE THE USE, DUPLICATION OR DISCLOSURE OF THIS DATA (IN WHOLE OR IN PART) FOR ANY PURPOSE WITHOUT THE WRITTEN PERMISSION OF GFB ENGINEERING & DESIGN SERVICES OR THE NAMED CLIENT COMPANY IS STRICTLY PROHIBITED.</p>		<p>APPROVALS:</p> <p>DRN BY: GB</p> <p>APP BY: CM, ESB</p>							
 <p>FIRST ANGLE PROJECTION</p>		<p>MATERIAL SEE NOTES</p> <p>FINISH SEE NOTES</p>							
<p>PROJECT NAME: MV SUB STATION BUILDING</p>		<p>DRAWING TITLE: ESB SINGLE MV SUBSTATION BUILDING</p>							
<p>Construction Details</p> <table border="1"> <tr> <th>SIZE</th> <th>DESCRIPTION</th> <th>DRG No:</th> </tr> <tr> <td>A3</td> <td>CONSTRUCTION DRAWING</td> <td>A3D.205071-16A</td> </tr> </table>		SIZE	DESCRIPTION	DRG No:	A3	CONSTRUCTION DRAWING	A3D.205071-16A	<p>SCALE: 1:10 REVISION C SHEET 1 OF 17</p>	
SIZE	DESCRIPTION	DRG No:							
A3	CONSTRUCTION DRAWING	A3D.205071-16A							

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NOTES CONT

8. CUSTOMER SWITCH ROOM.

Not shown in this drawing but must be provided if required is a customer switch room adjoining the ESB substation.

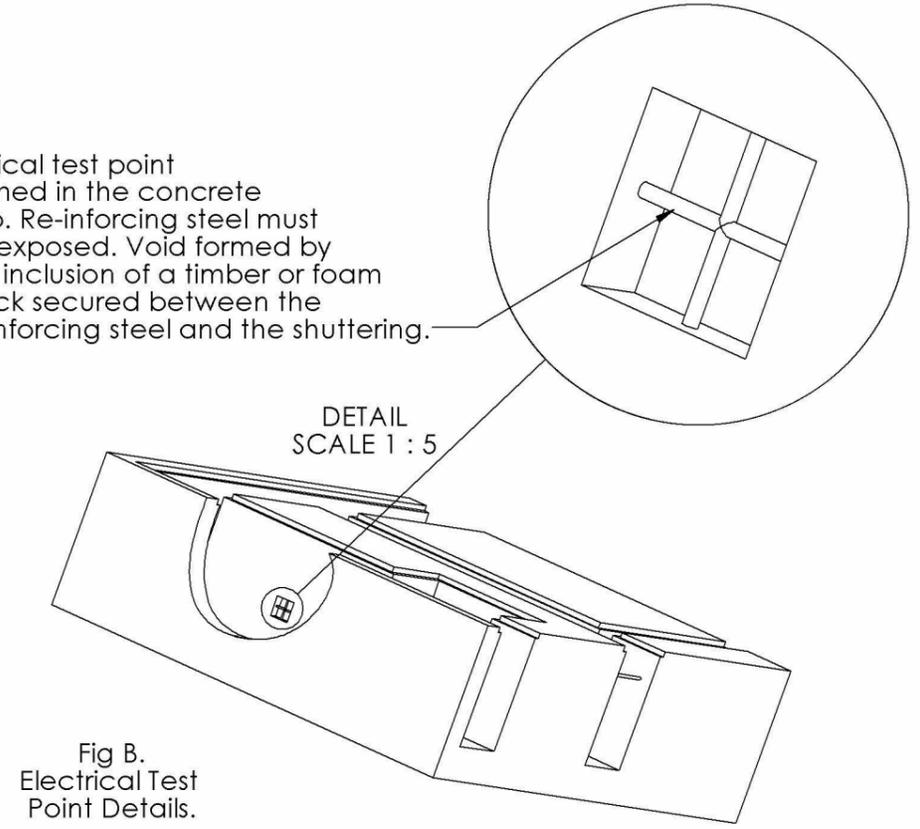
The switch room houses the customers main circuit breaker and revenue metering. The customer switch room is normally positioned on the right-hand side but can be located on the left or to the rear of substation. However the layout of the ESB substation floor **must** remain in the same orientation as detailed in this drawing. See section 2.4 of DOC-280518-DFK

9. HOUSE SUPPLY.

See section 4.12.1 of DOC-280518-DFK

10. DRAWING STRUCTURE.

This drawing is structured in a manner to clearly illustrate the requirements for the building components (foundation, walls, ducting, roof etc.). If in doubt you should contact your ESB representative who will clarify any ambiguity that may arise.



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NOTES CONT.....:

11. IMPORTANT NOTES

11.1 This drawing contains important notes placed about the various sheets which make up the drawing set. These notes should be carefully studied as they contain important information, non-adherence to which will cause conflict to the specification requirements. See also Annex B of DOC-280518-DFK for a list of common errors in design and construction of MV Substations.

11.2 The substation building is not designed to be load bearing. All structures above and adjoining the building must be supported independently.

12. KEY TO DRAWINGS.

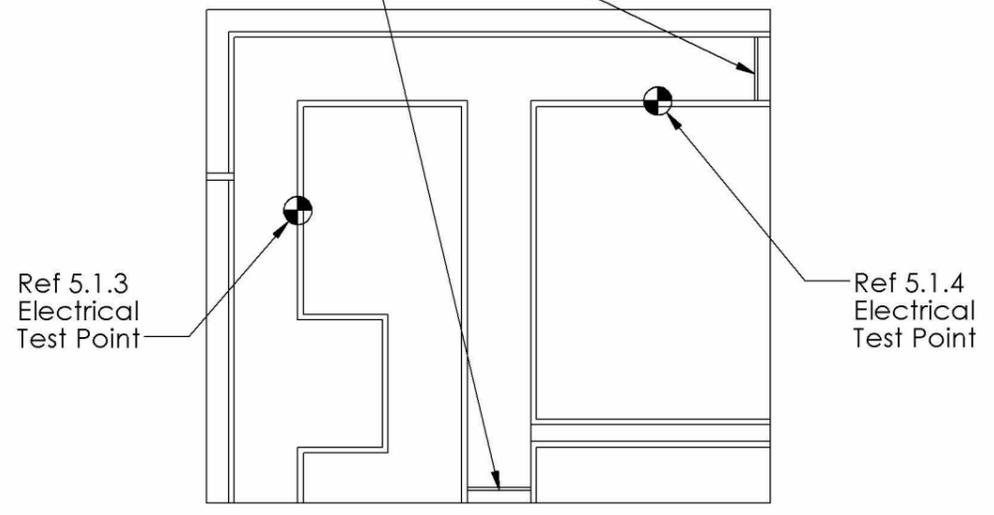
Sheet No. Description & Application.

- 1 THRU 2 Cover sheets. The information contained in these sheets is of a general nature and is important to the build configuration. It should be studied in detail and any ambiguity clarified with your ESB representative before design and construction begins.
- 3 of 17. Illustration drawing. This drawing gives an overview of the finished substation building and also contains a detailed index to the contents of the drawing set from sheets 4 through 17.
- 4 THRU 17 Detailed drawings and specifications of the build requirement for the MV Substation Building.

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Ref 5.1.1 Bonding Point

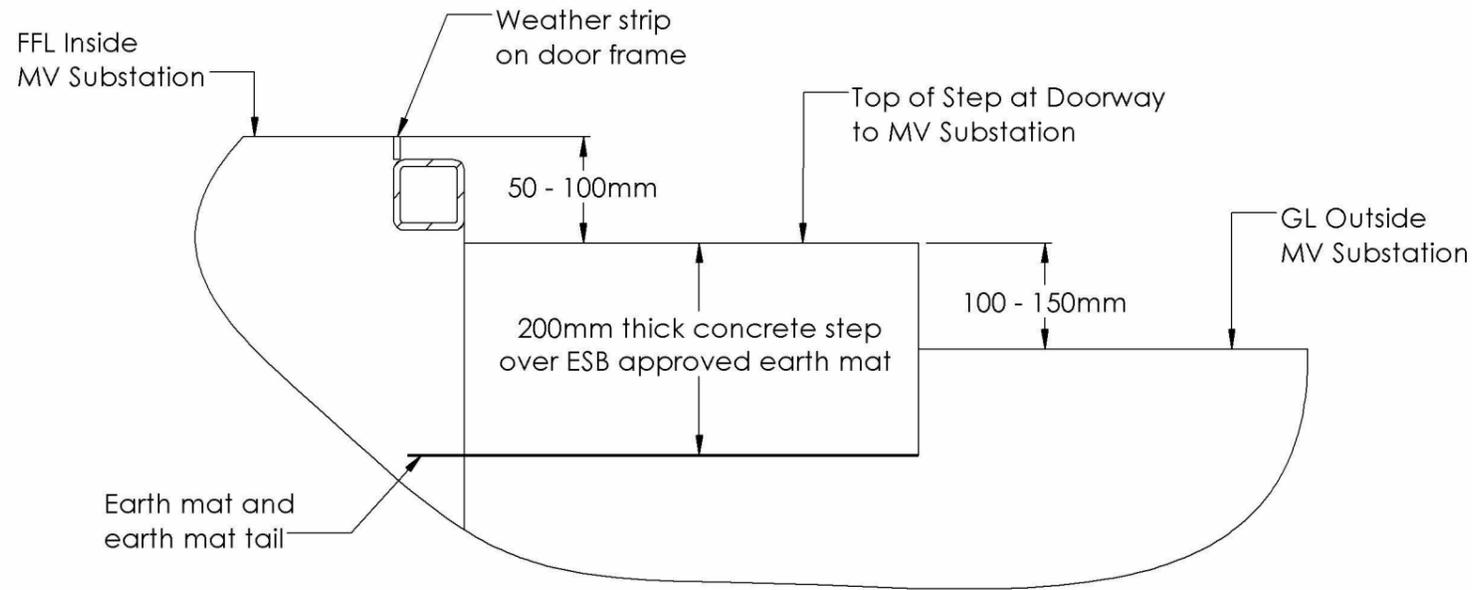
Figures A and B below, to be read in conjunction with note 5



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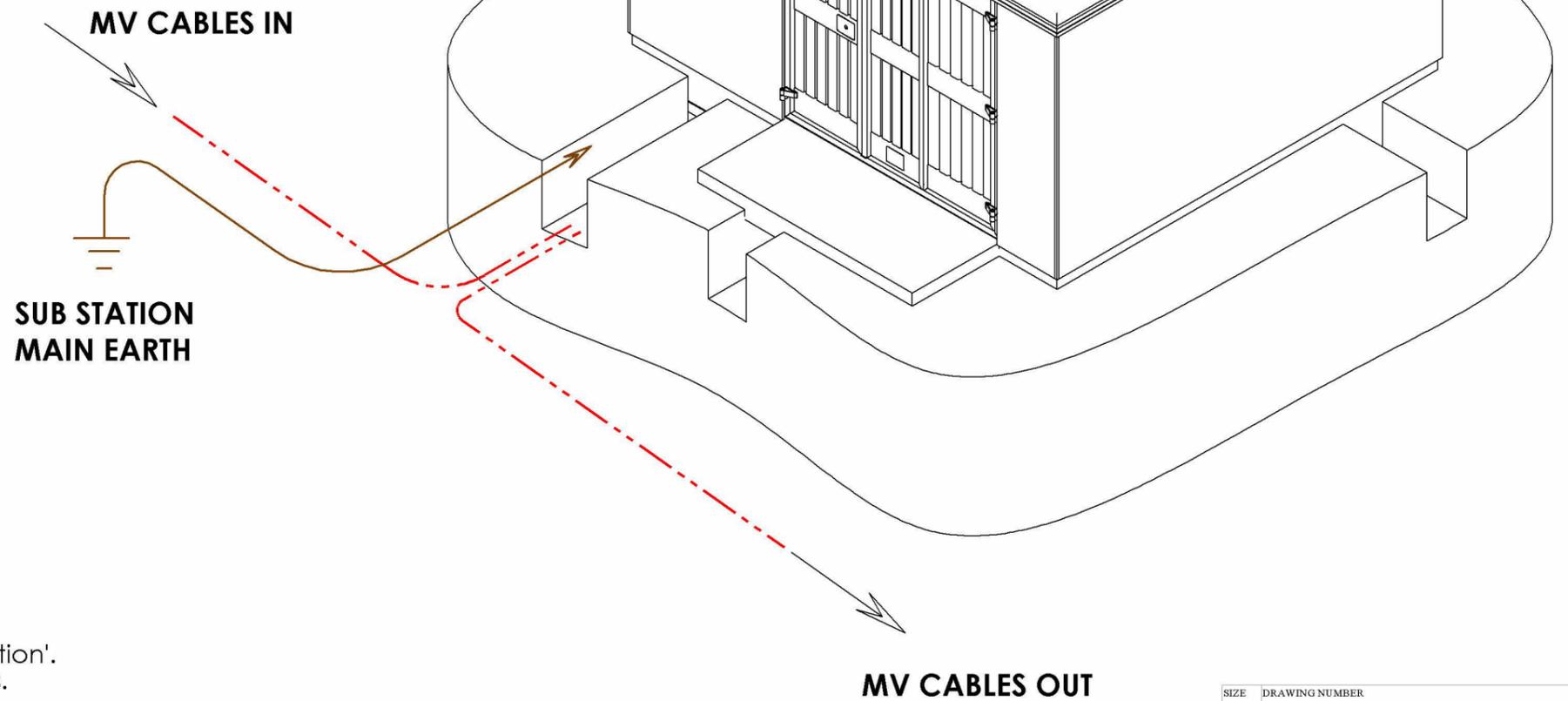
Illustrated Above, Requirements for FFL Inside, Outside Step Level & Outside Ground Levels.

ESB MV Sub-Station Building

Detail Drawings & Specification for the ESB Substation Building.

Sheet Index:

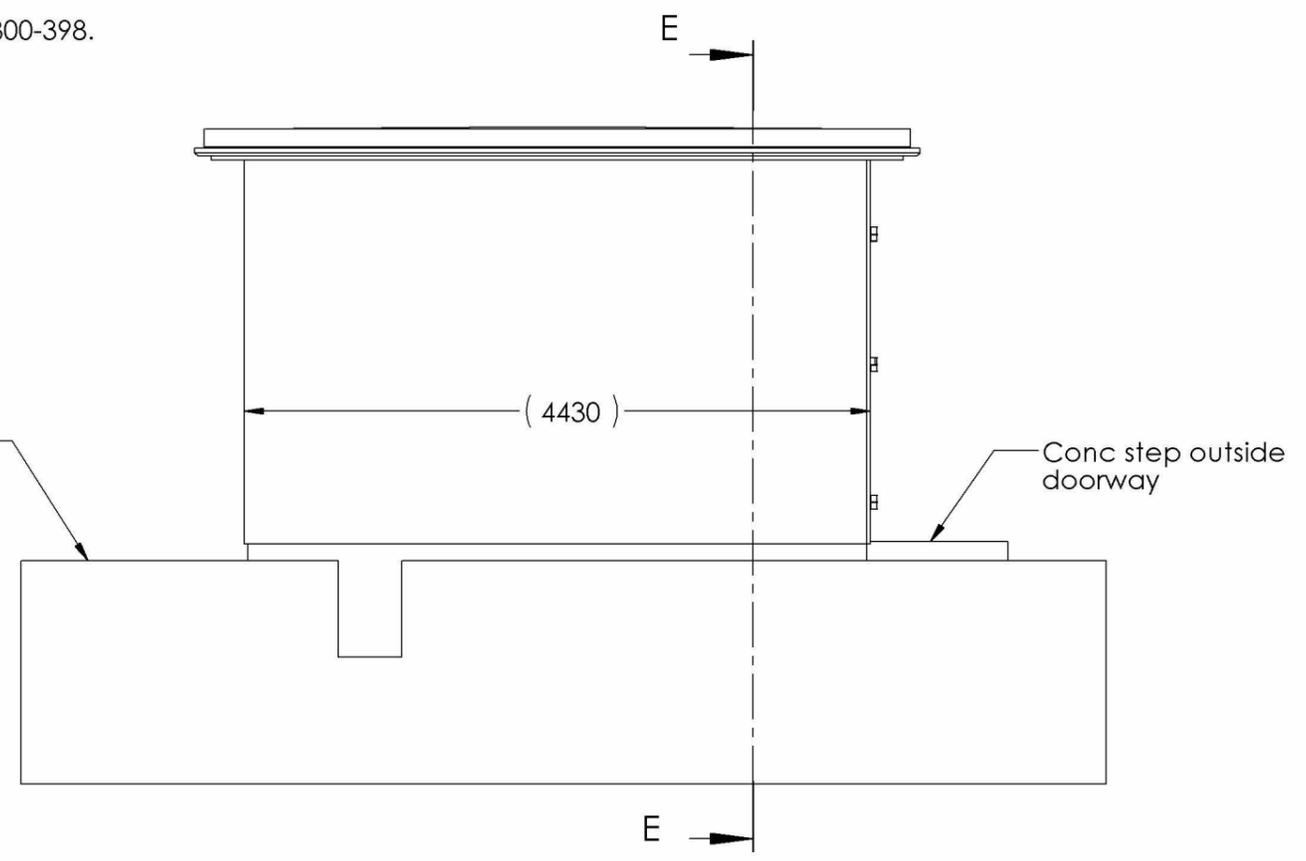
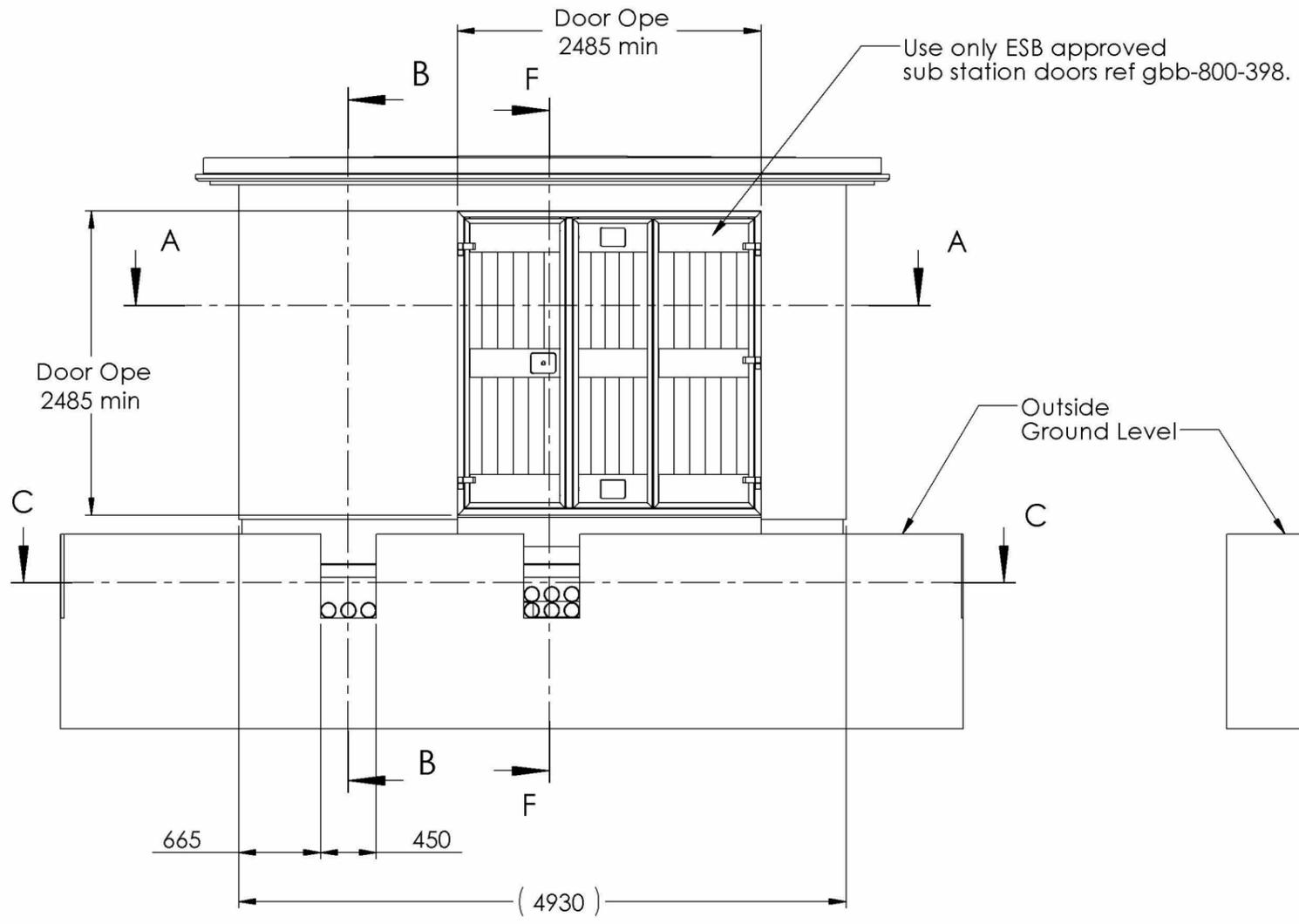
- Sht No: 4 - Elevations.
- Sht No: 5 - Sections & Elevations.
- Sht No: 6 - Sections & Elevations.
- Sht No: 7 - Detail Views 1.
- Sht No: 8 - Detail Views 2.
- Sht No: 9 - Site Excavation Details.
- Sht No: 10 - Strip Foundation Details.
- Sht No: 11 - Rising Walls & Duct Ope's.
- Sht No: 12 - DPC, Ducting & Floor Slab.
- Sht No: 13 - Floor Slab.
- Sht No: 14 - External Walls.
- Sht No: 15 - Roof In Place
- Sht No: 16 - Roof Detail For 'Incorporated MV Substation'.
- Sht No: 17 - Internal / External Finishing Requirements.



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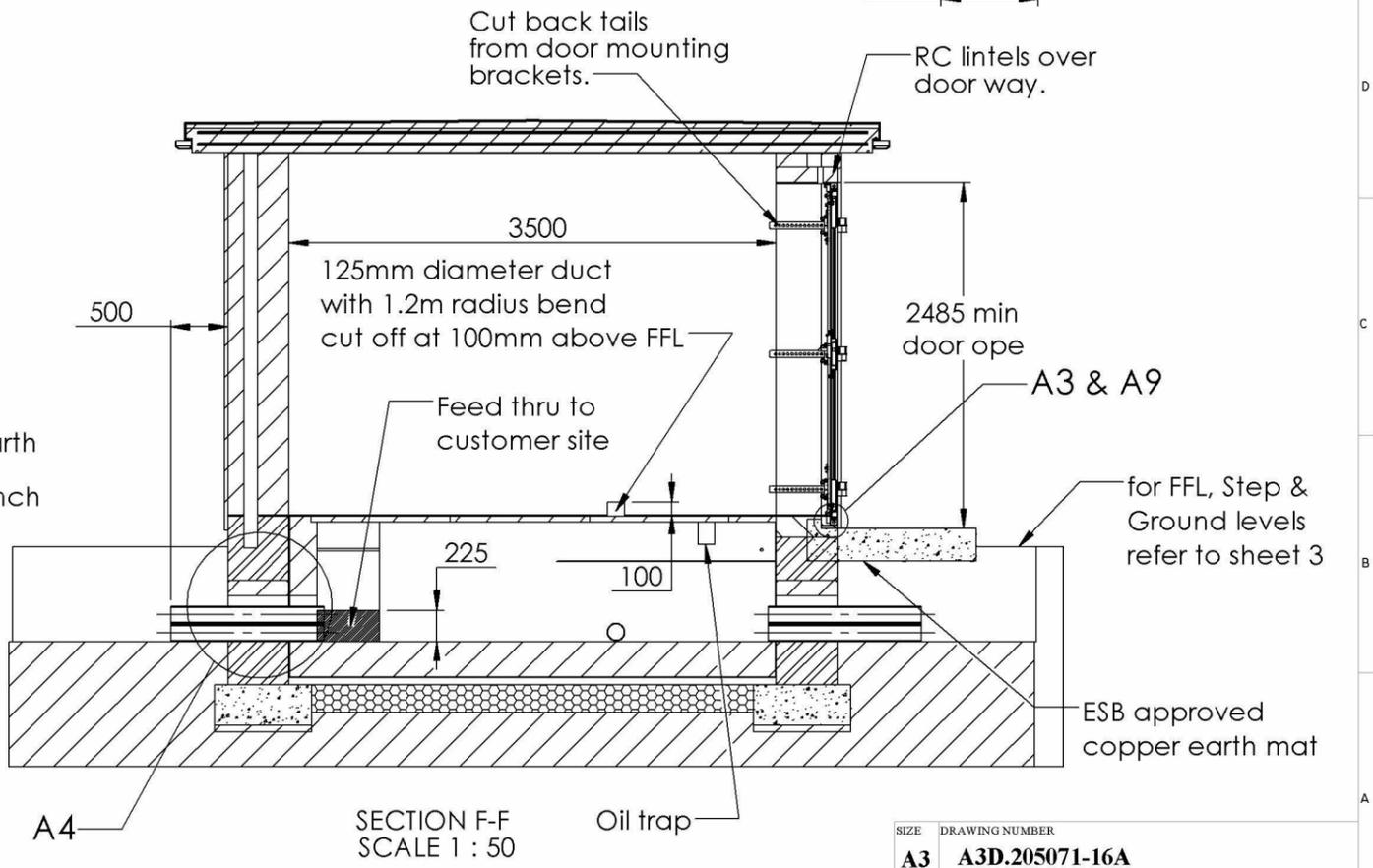
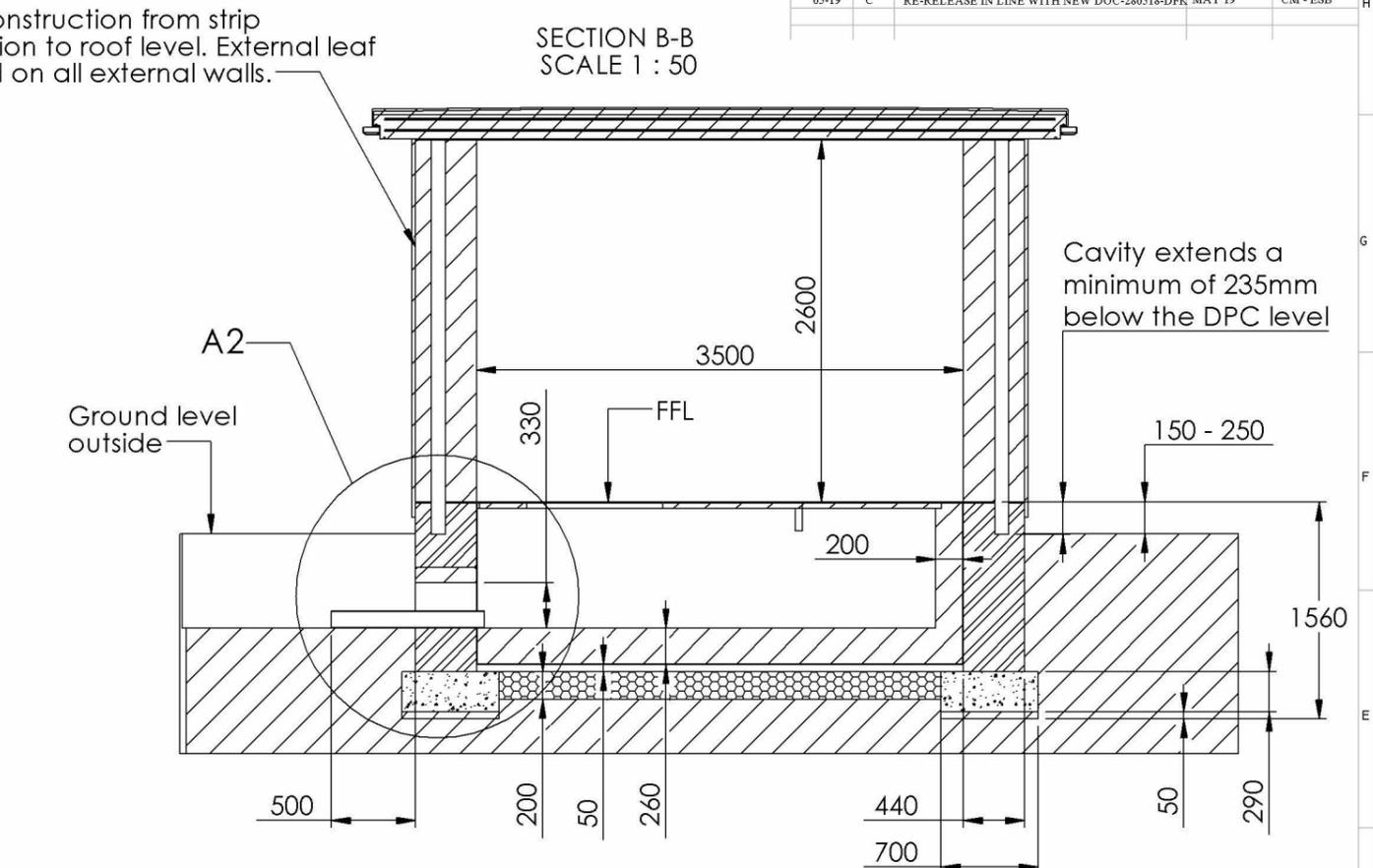
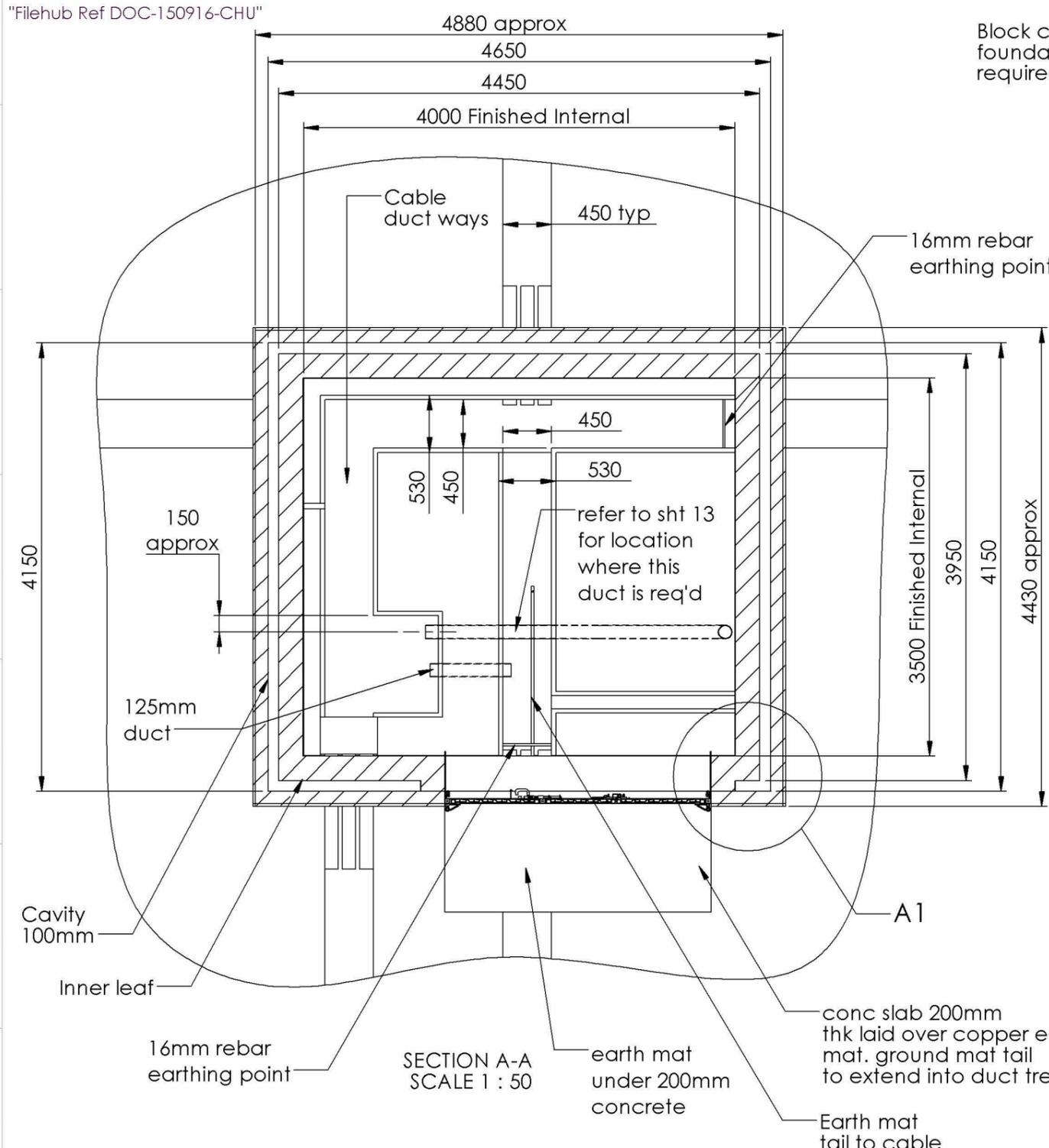


Before work commences be sure to read and fully understand the requirements as detailed in DOC-280518-DFK

ESB MV Sub-Station Building

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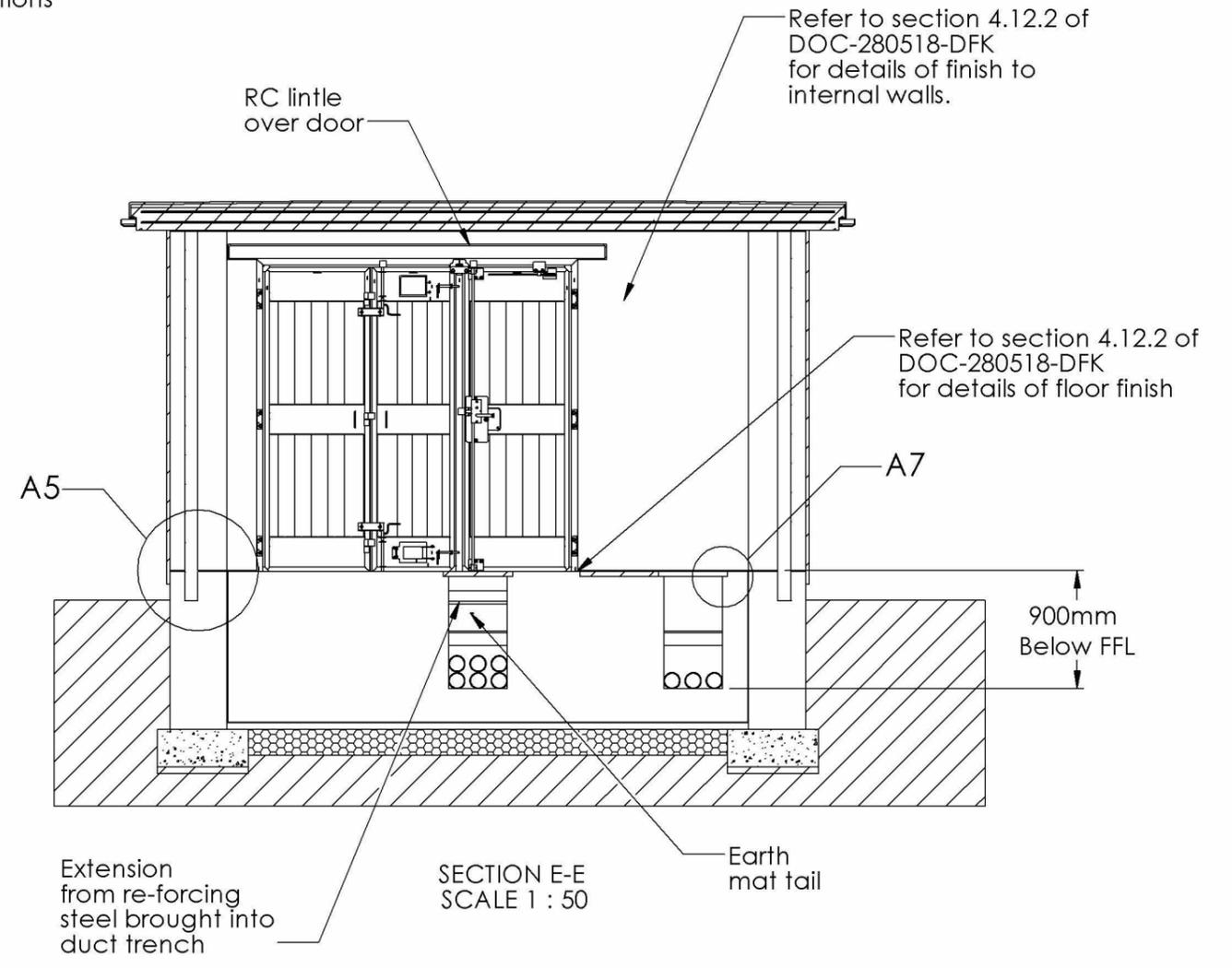
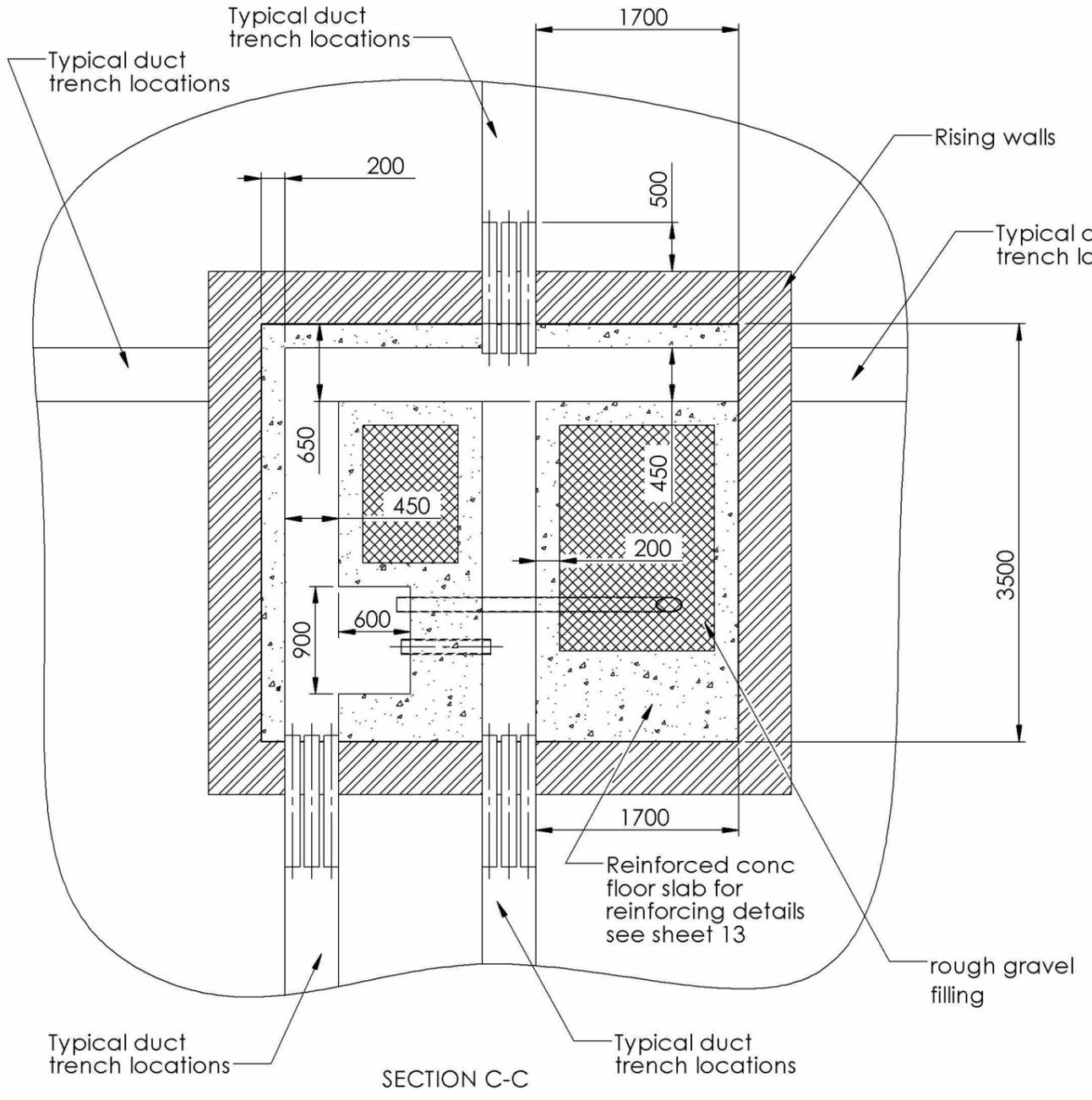
A number of possible cable duct routes are shown on all four sides of the substation building. Details of cable trench layout shall be discussed with a local ESB representative to determine duct installation best suited to the particular site.

Refer to general notes (sheets 1 & 2) for details of steelwork and wall construction requirements.

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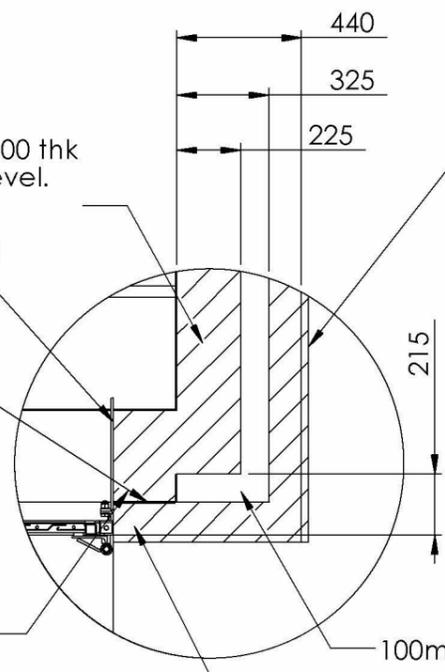
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Internal leaf construction
solid conc blocks 215 x 440 x 100 thk
laid on flat from DPC to roof level.

Door hanging
brackets

Vertical DPC
at cavity closing



External rendering finished
to blend with surrounding
buildings. The finish must be
maintenance free.

Cladding may be considered
providing it meets with the
criteria laid down in section
4.10.4 of DOC-280518-DFK

The cavity at the door reveal
must be sealed by returning
the inner leaf tight to the
outer leaf

DETAIL A1
SCALE 1 : 25

External leaf construction
solid conc blocks 215 x 440 x 100 thk
laid on edge from DPC to roof level.
Cavity must be kept clear and bridging
with bedding mortar prevented.

100mm cavity

Door weather
strip

Door frame
bottom member

66

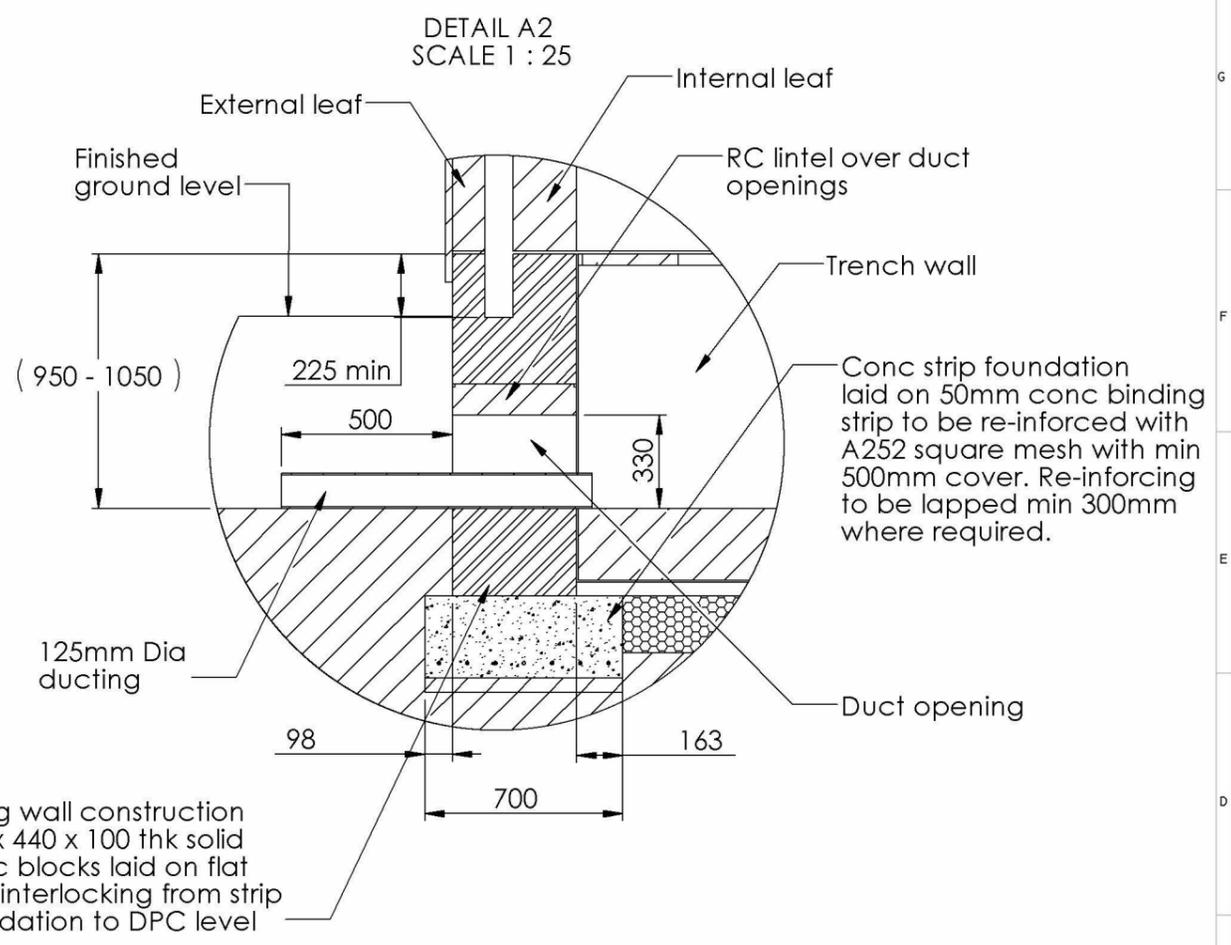
(50 - 100)

finish off concrete
after fitting of doors.

DETAIL A3 & A9
SCALE 1 : 3

Refer to general notes (sheets 1 & 2) for details of steelwork
and wall construction requirements.

DETAIL A2
SCALE 1 : 25



RC lintel over
cable ducting

Cable
ducting

The DPM will need
to be re-sealed around
ducting after it has been cut
to allow the ducts enter
the trench.

The ducts will be
spaced as required
and gaps between
them packed with
course sand

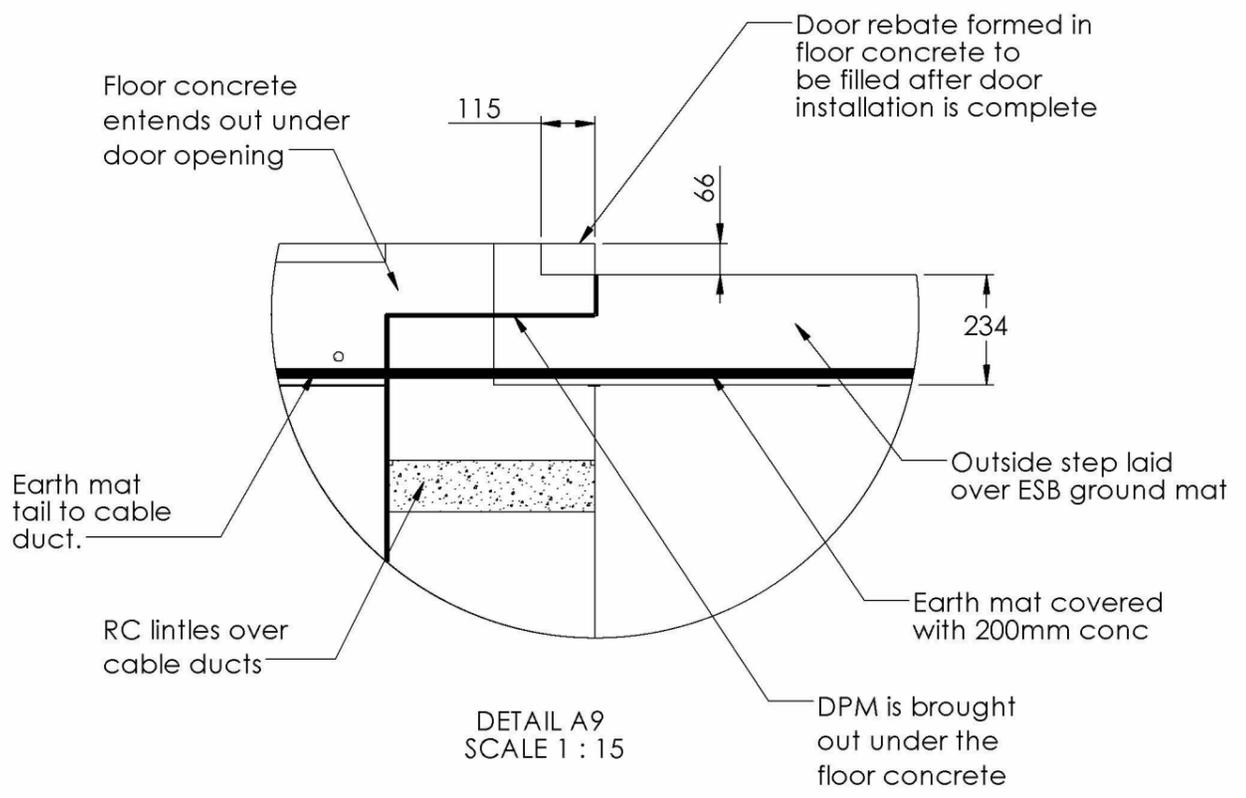
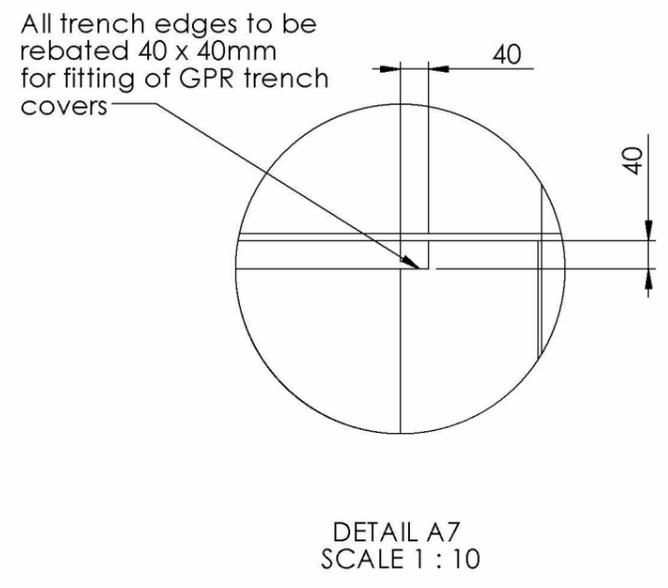
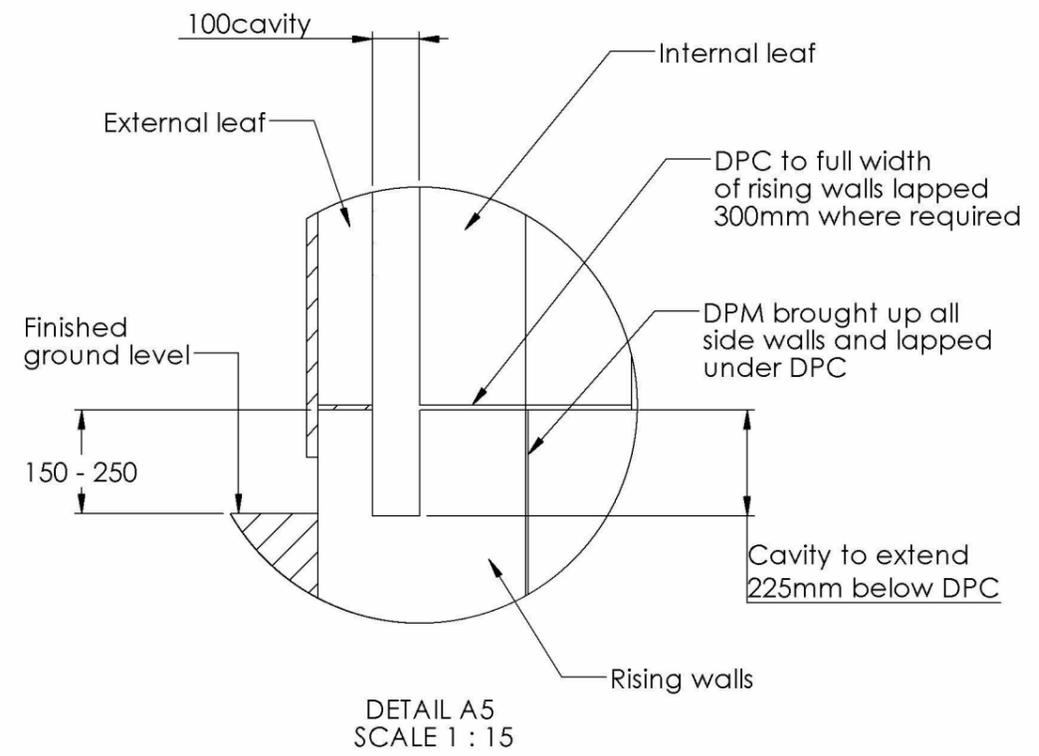
DETAIL A4
SCALE 1 : 25

DPM 1000 gauge
visqueen.

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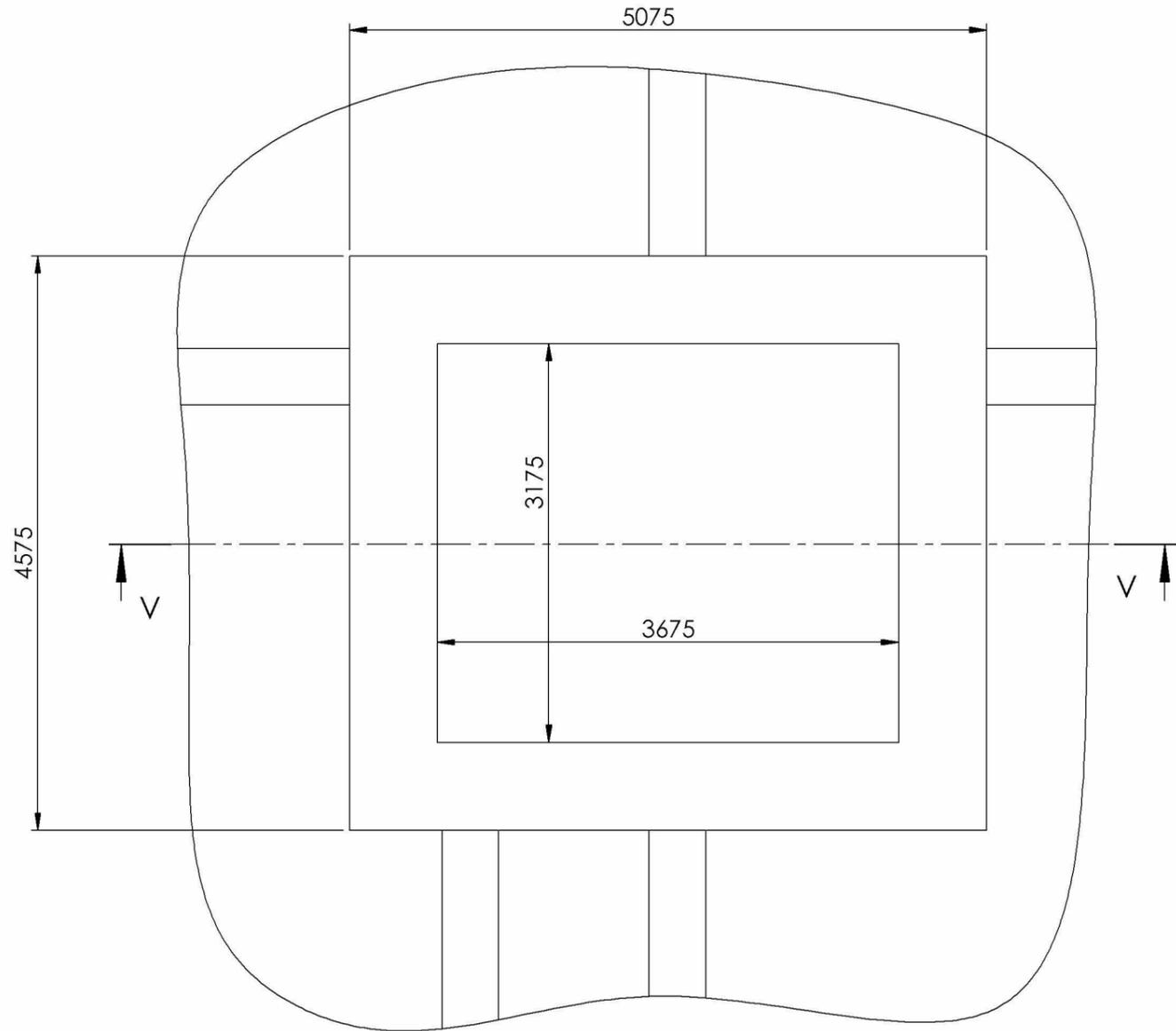


Refer to general notes (sheets 1 & 2) for details of steelwork and wall construction requirements.

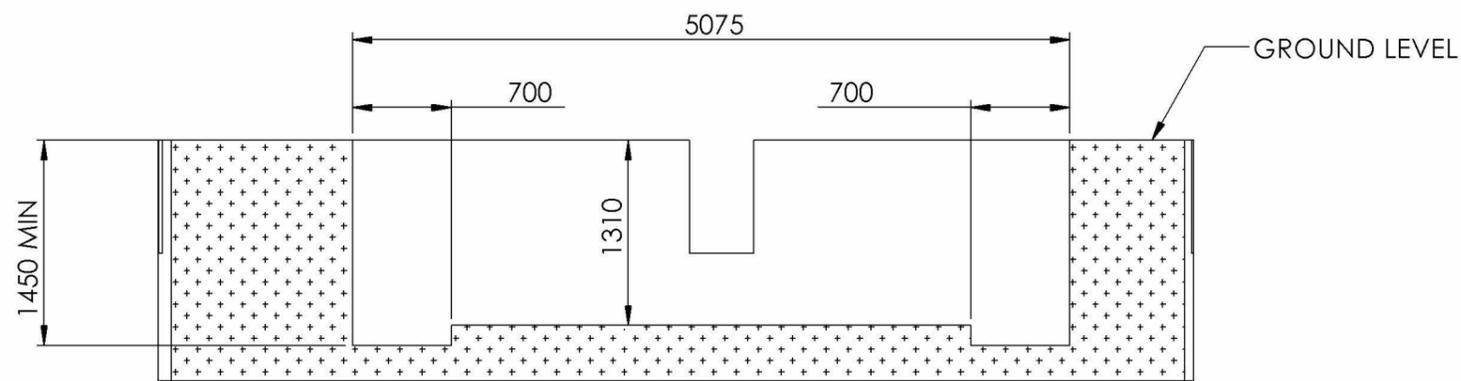
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FRONT END OF SITE



SECTION V-V

NOTES:

1. GROUND WORKS (EXCAVATION).

Excavation for strip foundations will be according to the dimensions shown on this drawing sheet. These dimensions are given as a minimum. However, it may be necessary to excavate deeper to reach a sufficiently firm stratum.

2. UNDERGROUND CABLES.

Underground cables constitute one of the the more common hazards encountered when digging in in the street, near buildings or on building sites, always assume electric cables will be present. If ESB cables, cable slabs or warning tape are uncovered then digging must stop until the site has been inspected and made safe by ESB personnel.

The customer is required to ensure that when digging is taking place, the location of all underground cables in the vicinity is known, maps giving the general location of cables are available from ESB. A cable avoidance tool, which should be used by a skilled person, can give a more precise location of cable position when used in conjunction with maps.

Refer to Section 3.2 of DOC-280518-DFK

A number of possible cable duct routes are shown on all four sides of the substation building. Details of cable trench layout shall be discussed with a local ESB representative to determine duct installation best suited to the particular site.

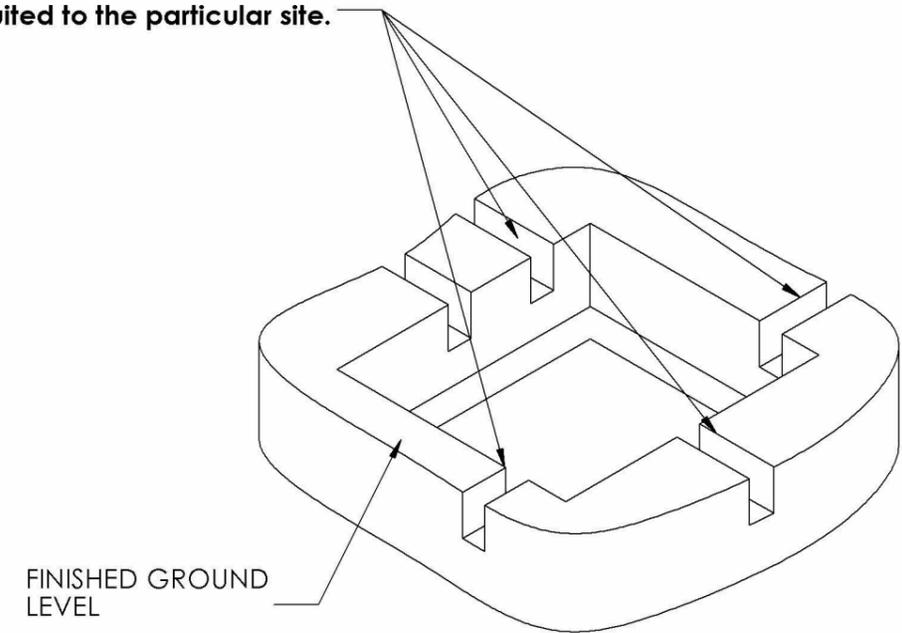
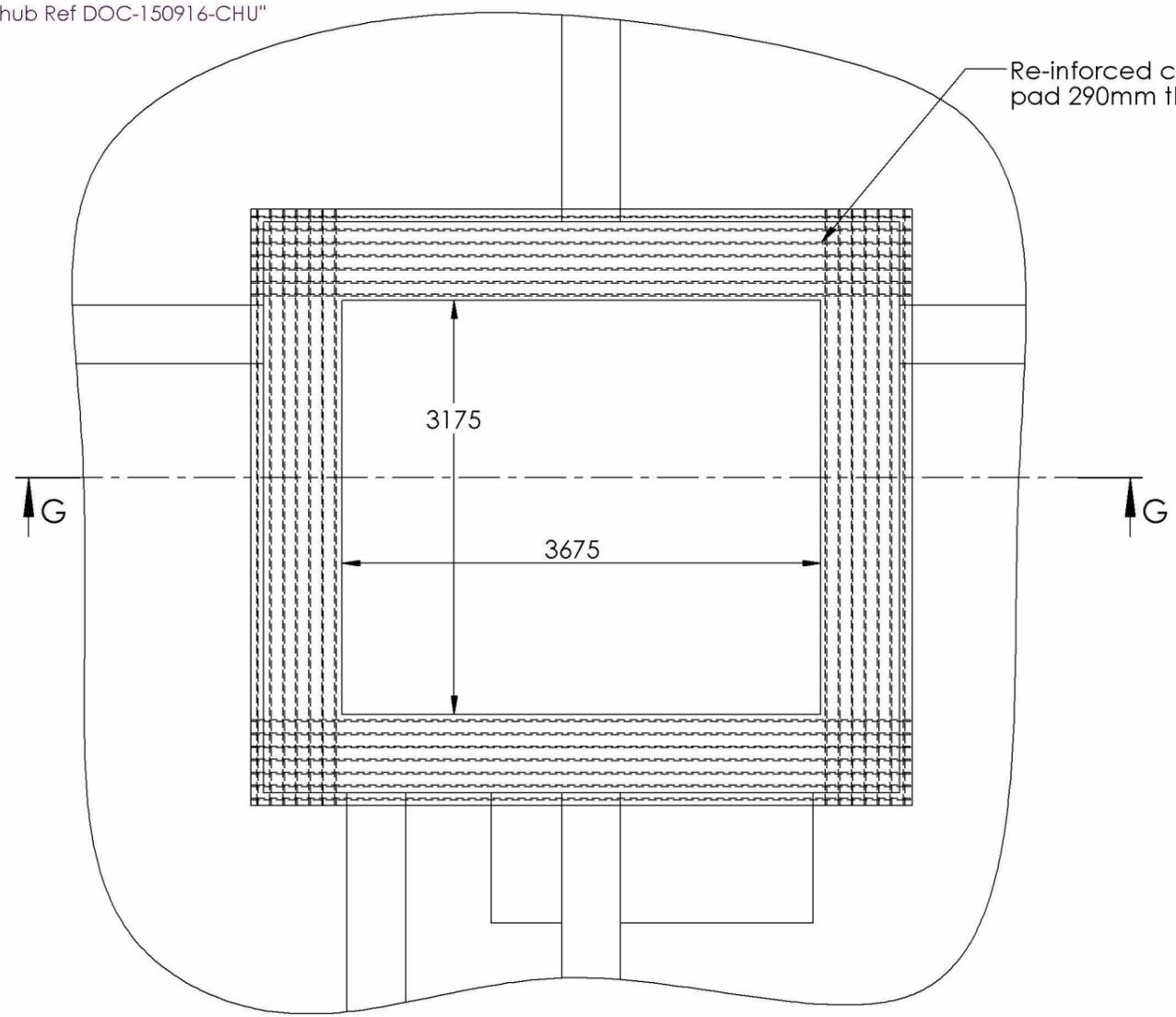


ILLUSTRATION TO SHOW EXCAVATION FOR STRIP FOUNDATION

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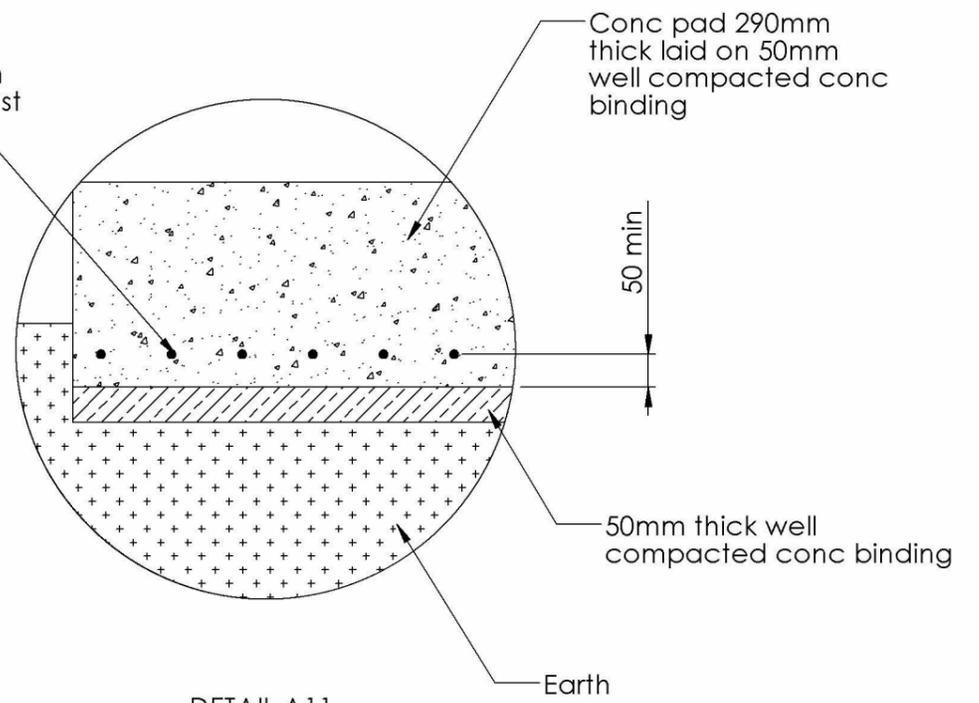
1. GENERAL.

The following notes refer to the requirements for the re-inforced concrete strip foundation.

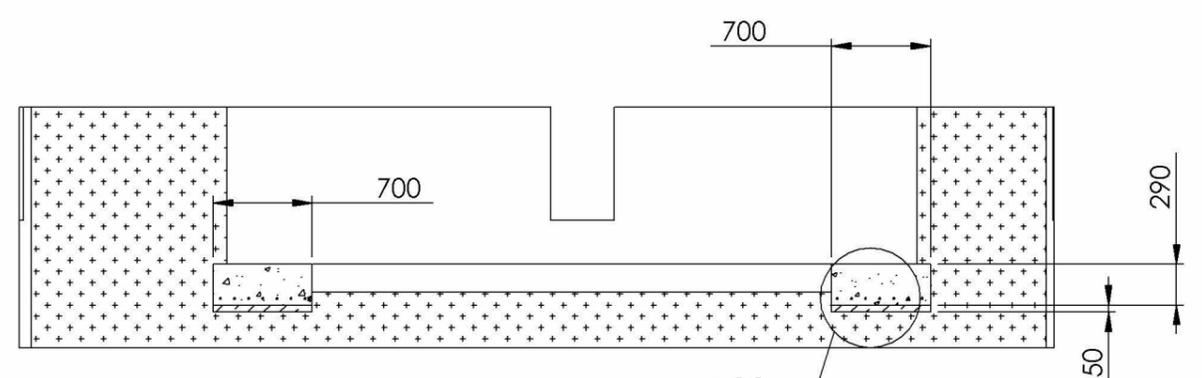
2. DETAILS.

The concrete strip will be a minimum of 700mm wide and 290mm thick, re-inforced with A252 square mesh lapped 300mm at all joints with at least 50mm of concrete covering. The strip will be laid on 50mm thick well compacted concrete binding laid in base of trench minimum depth of 1400mm below ground.

A252 Mesh lapped 300mm where required with at least 50mm cover of conc



DETAIL A11
SCALE 1 : 10



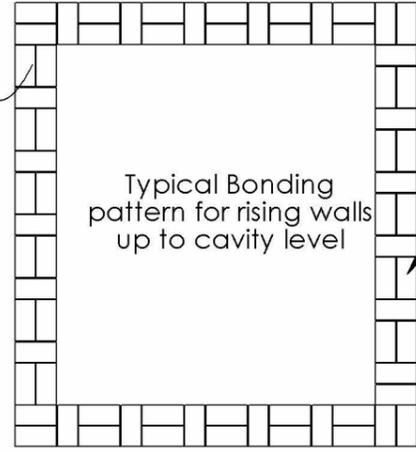
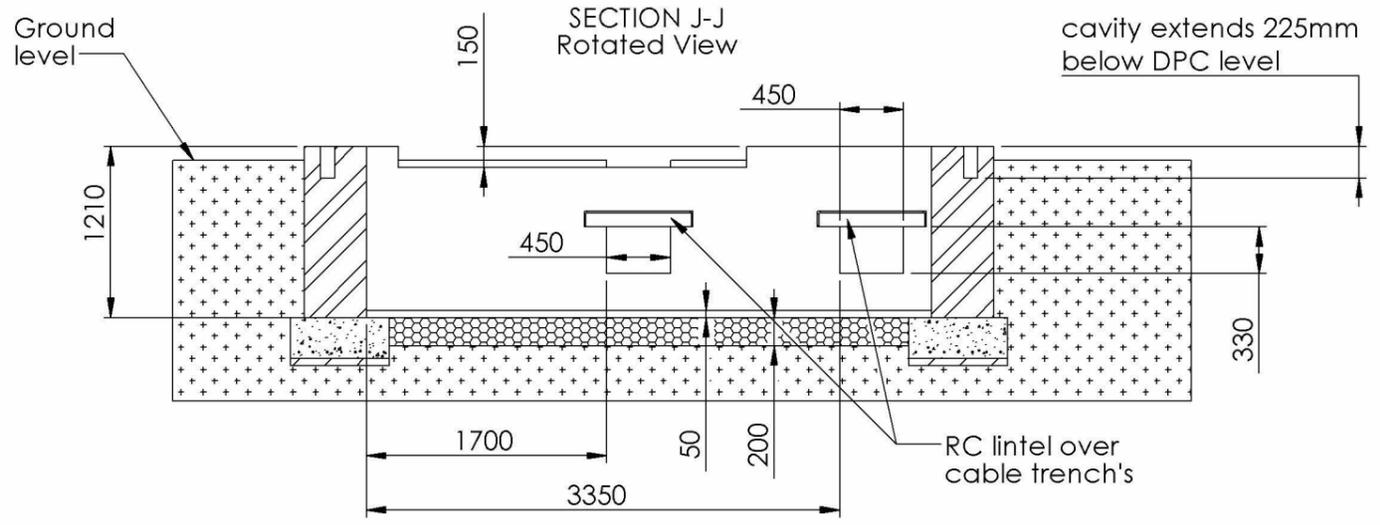
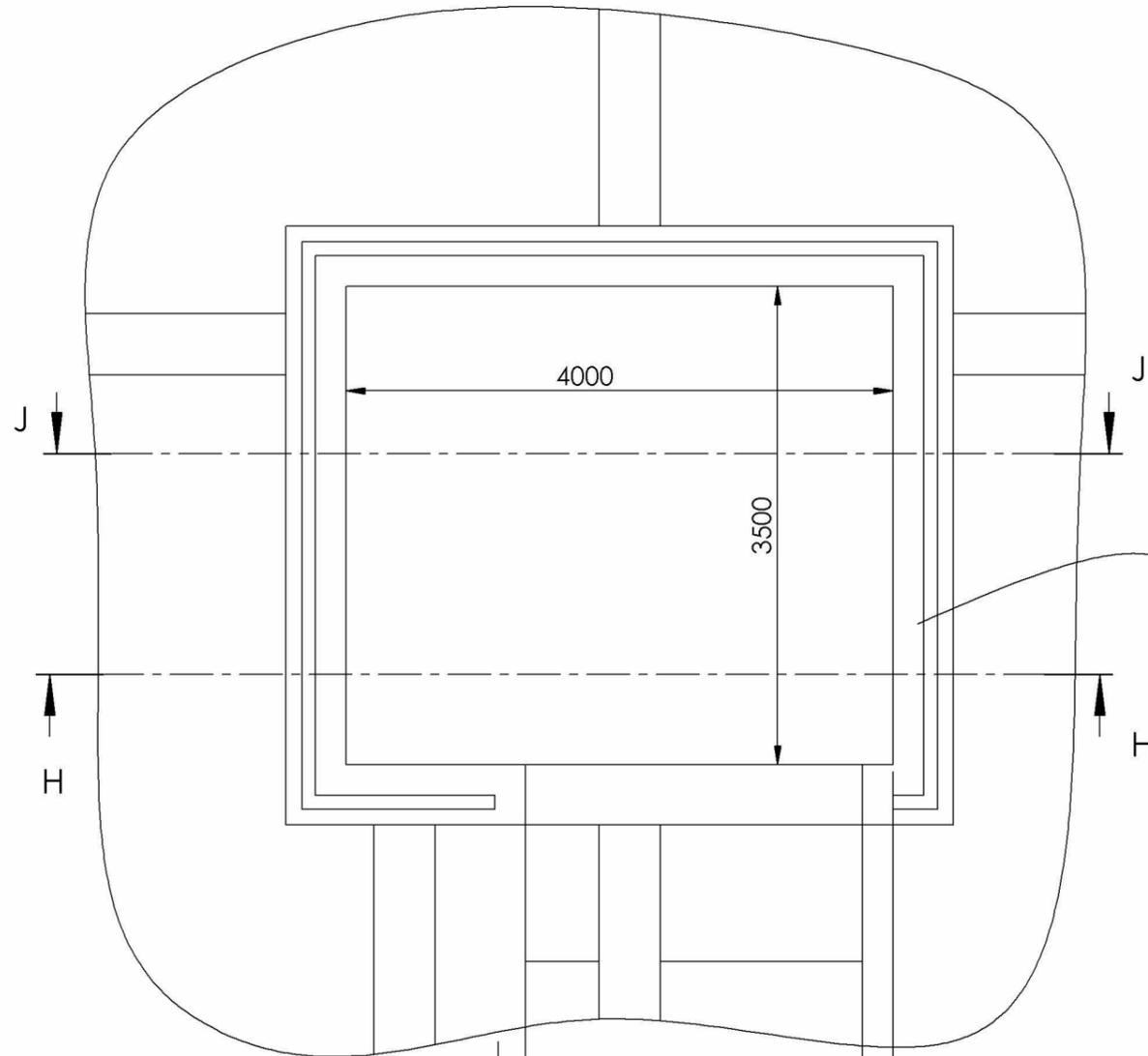
SECTION G-G

Refer to general notes (sheets 1 & 2) for details of steelwork and wall construction requirements.

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Rising wall construction
215 x 440 x 100 thk solid
conc blocks laid on flat
and interlocking from strip
foundation to DPC level.

Blocks to conform to IS 20.

The approved substation doors are available in one standard size. To ensure fit this dimension for the door ope must be held as specified

2485 +20 / -0 225

50mm well compacted sand
on 200mm well compacted
hard core

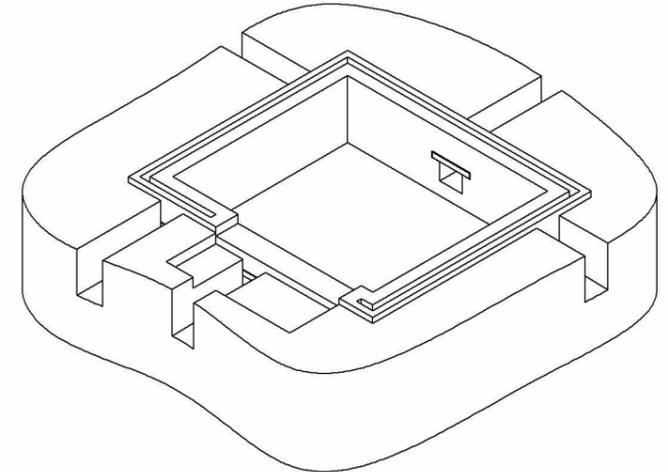
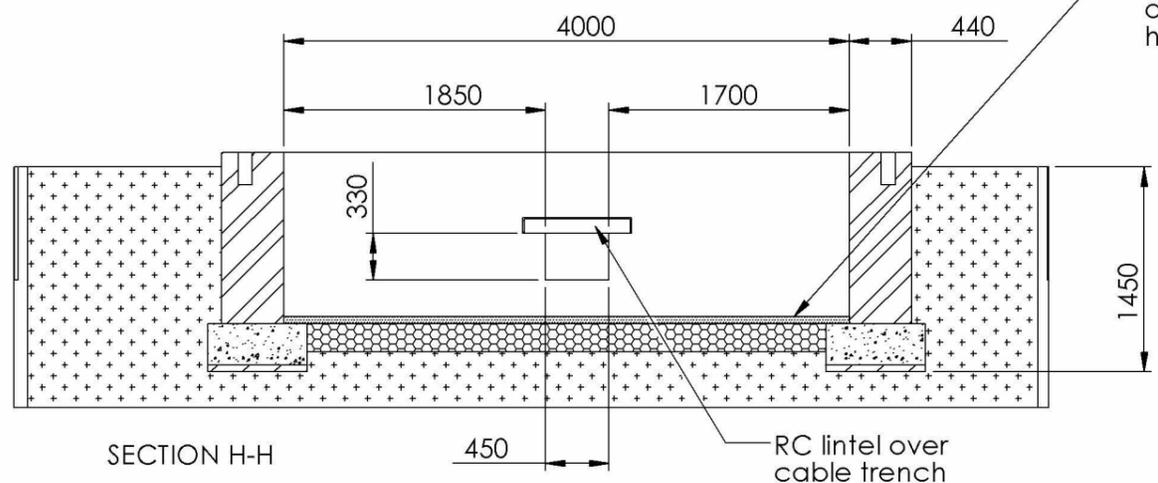
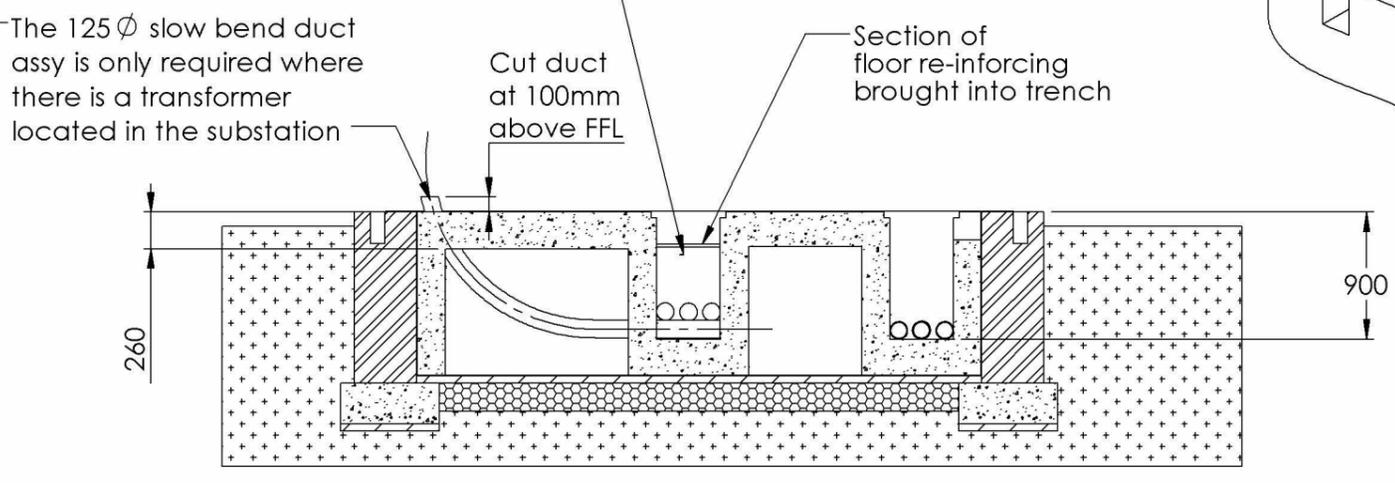
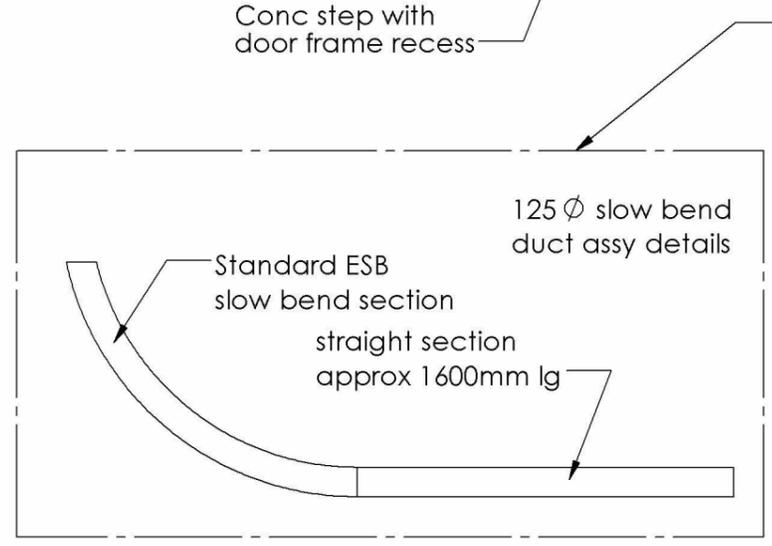
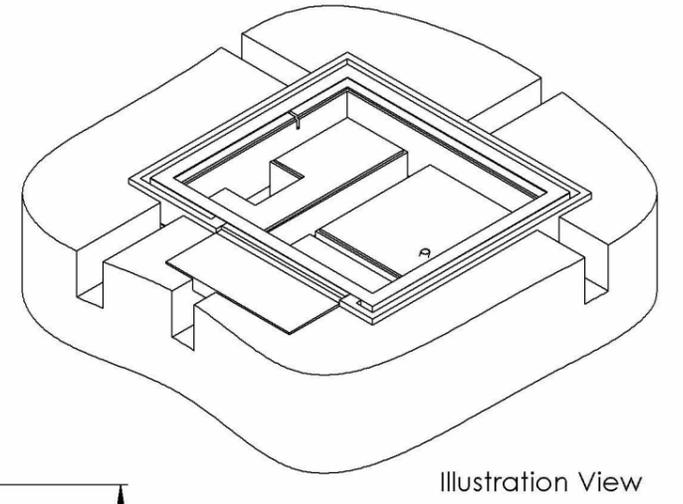
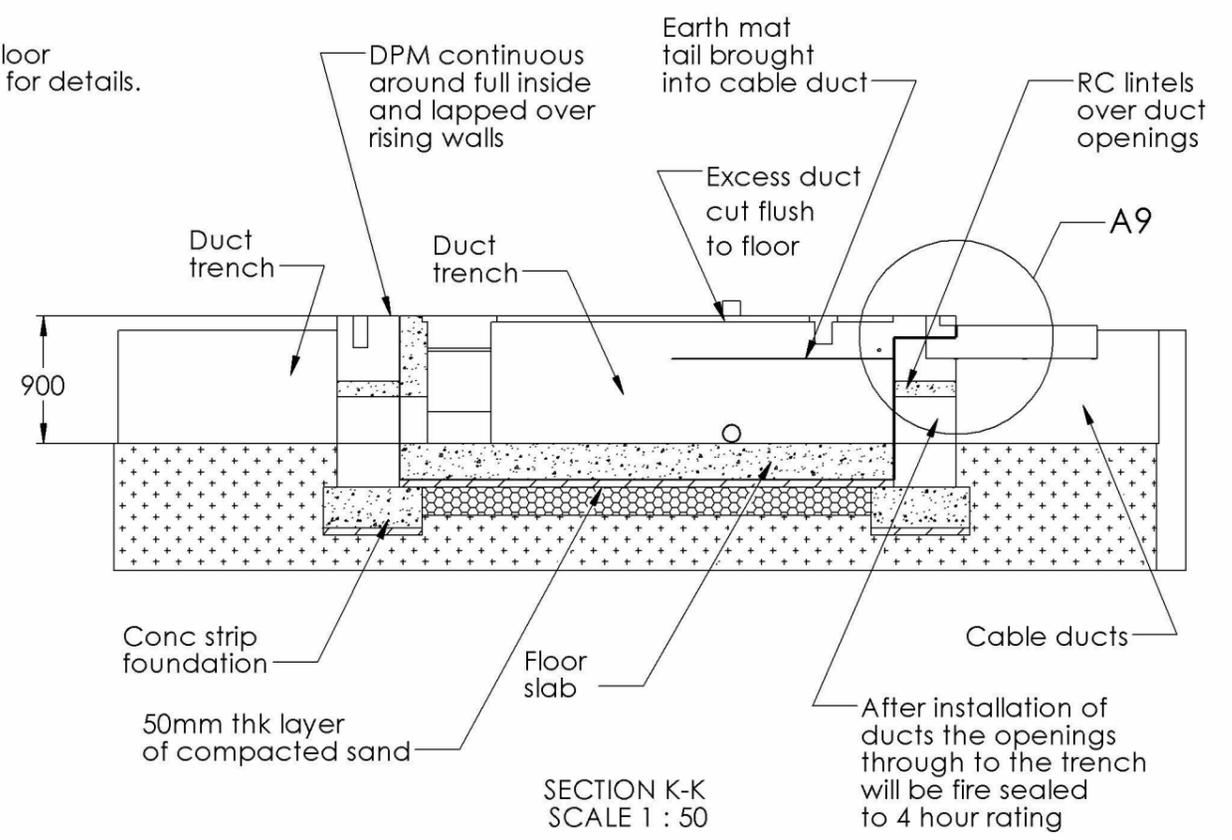
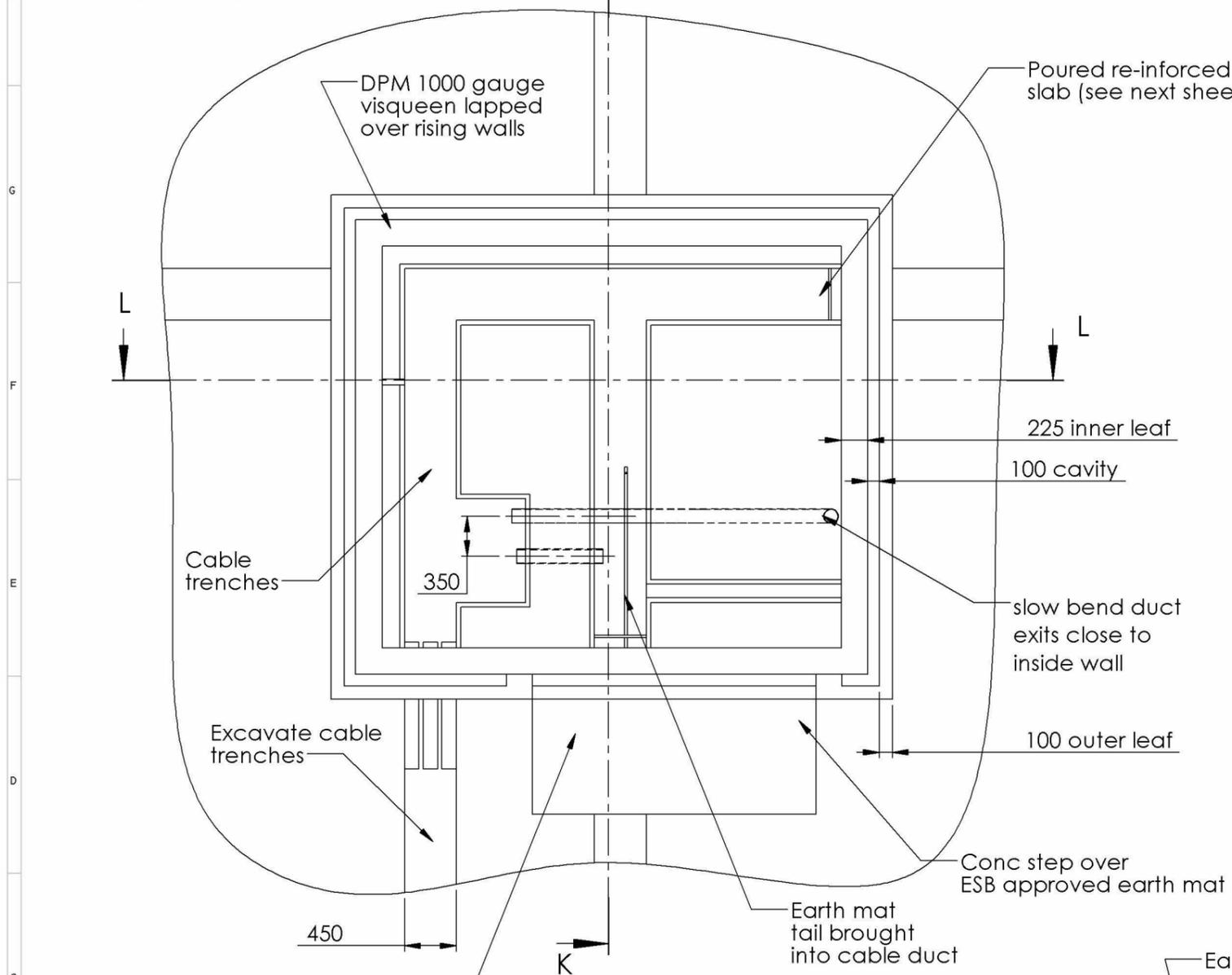


Illustration View

Refer to general notes (sheets 1 & 2) for details of steelwork and wall construction requirements.

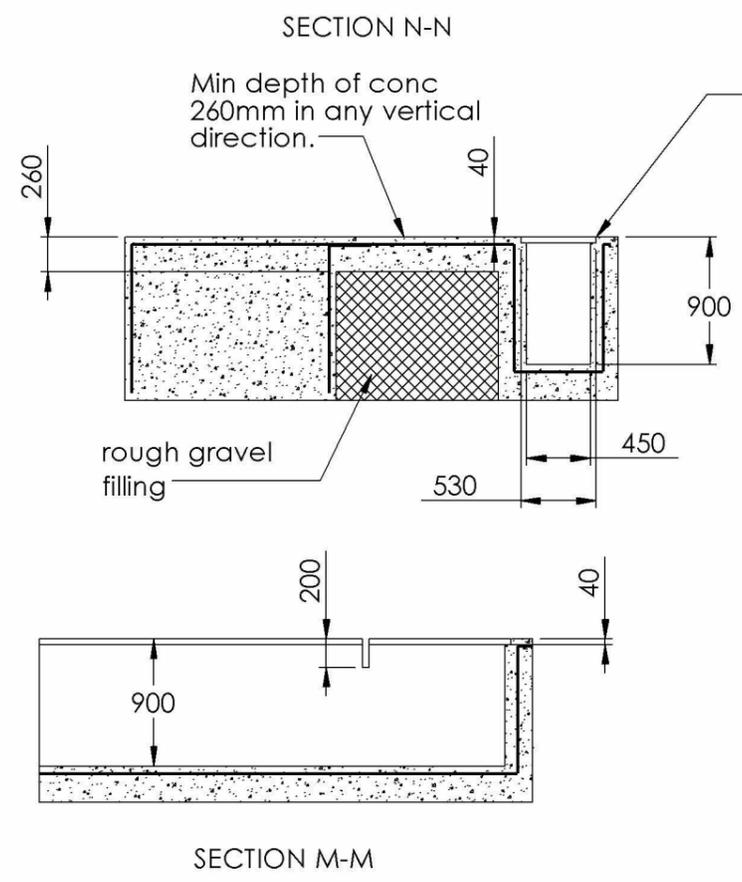
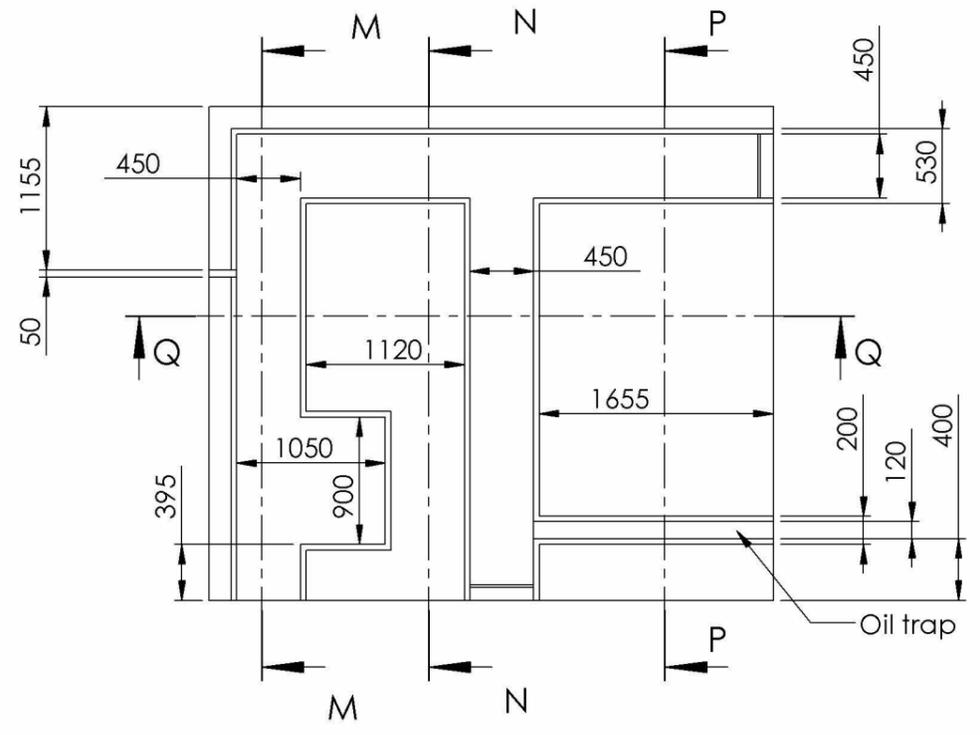
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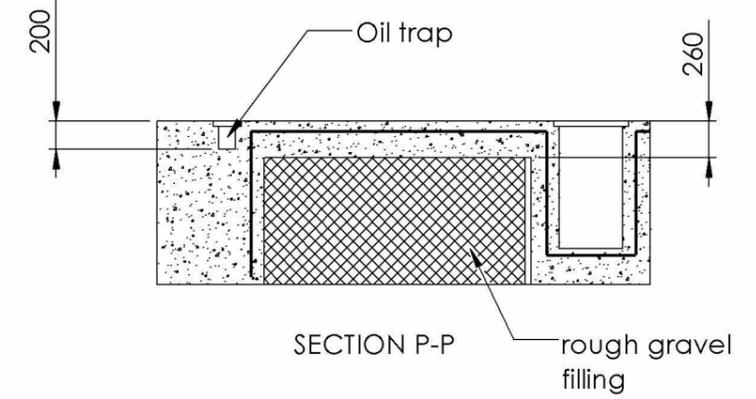
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Important Note:

Steel work inside the sub-station should not be extended outside the building



50 x 200 x 200mm deep pocket formed here to allow earth cables to exit from trenches.

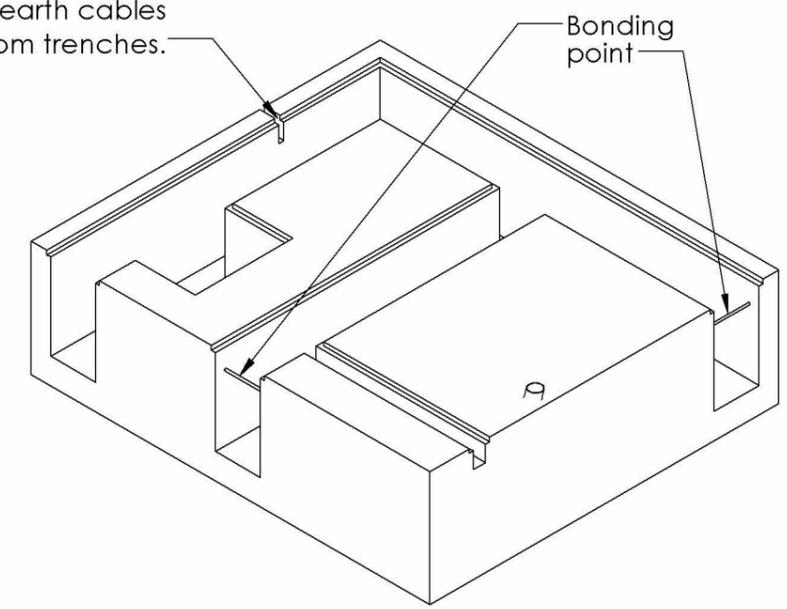
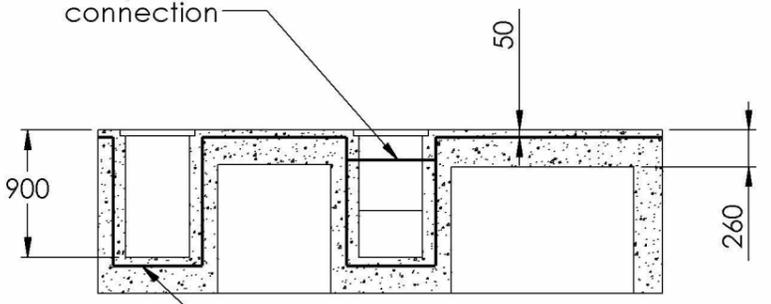


ILLUSTRATION VIEWS SHOWING FLOOR SLAB WITH DUCT IN PLACE

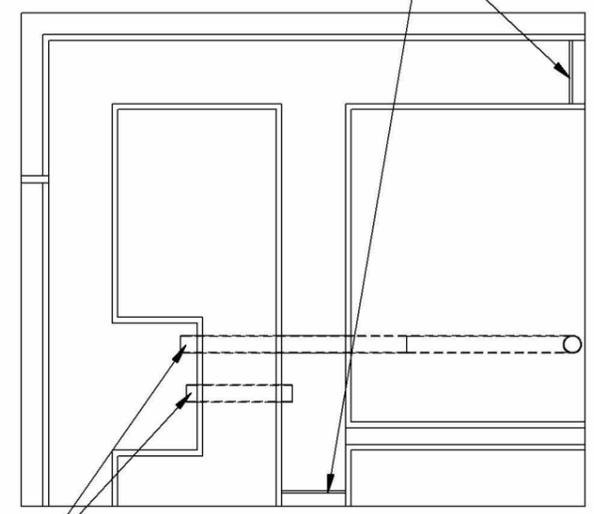
Mesh to be brought out to cable duct at one point for earth connection



SECTION Q-Q

Joints and overlaps in mesh to be welded to provide good electrical continuity

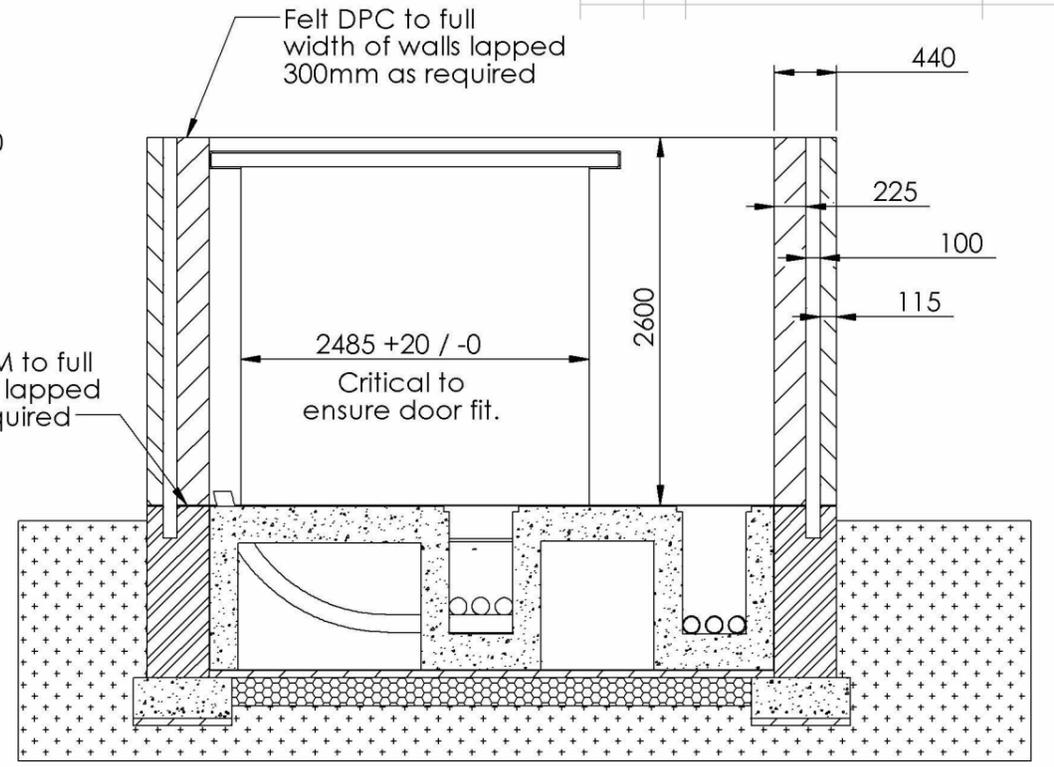
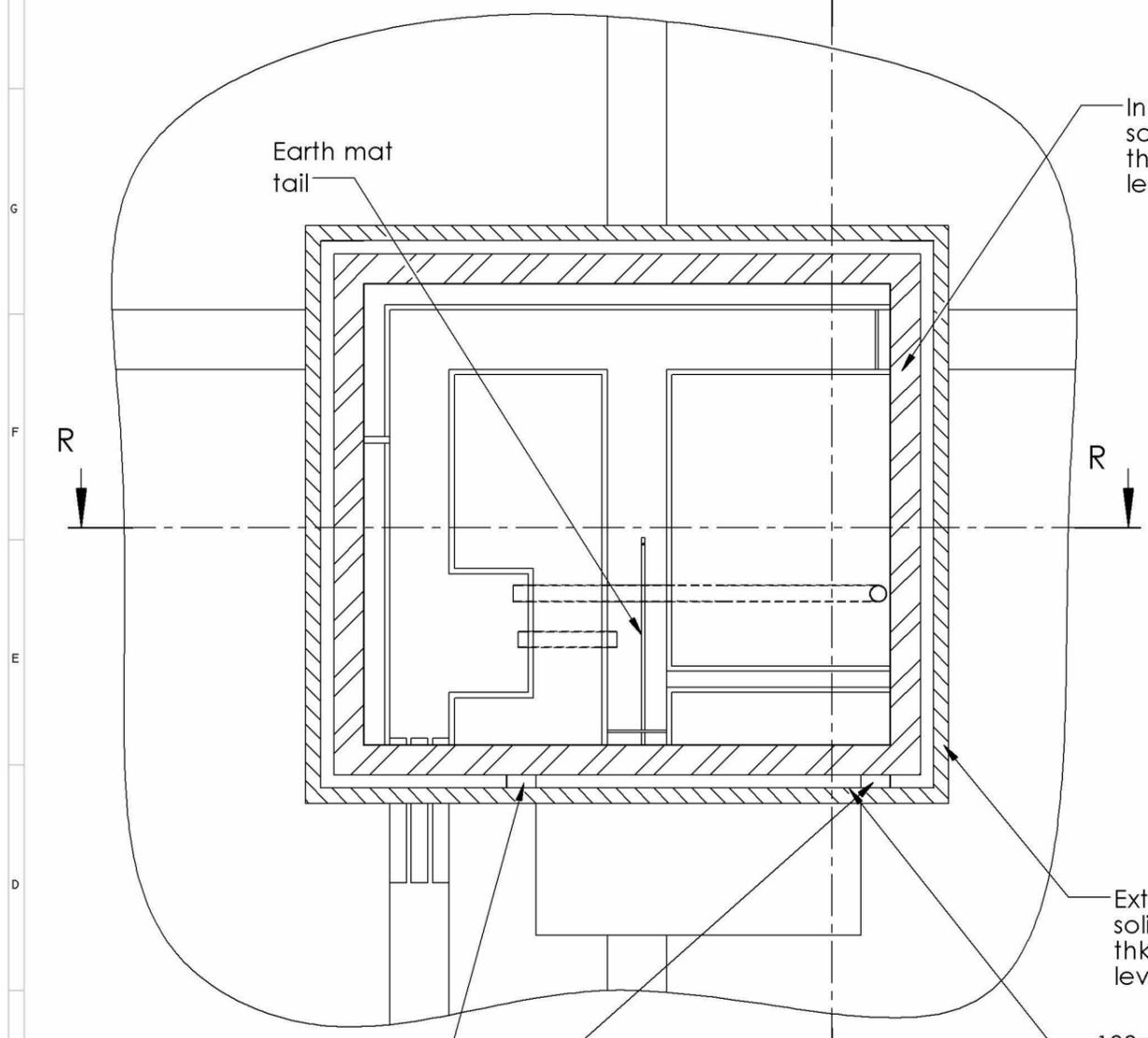
Note: The bonding pieces may be shaped as required to facilitate shuttering.



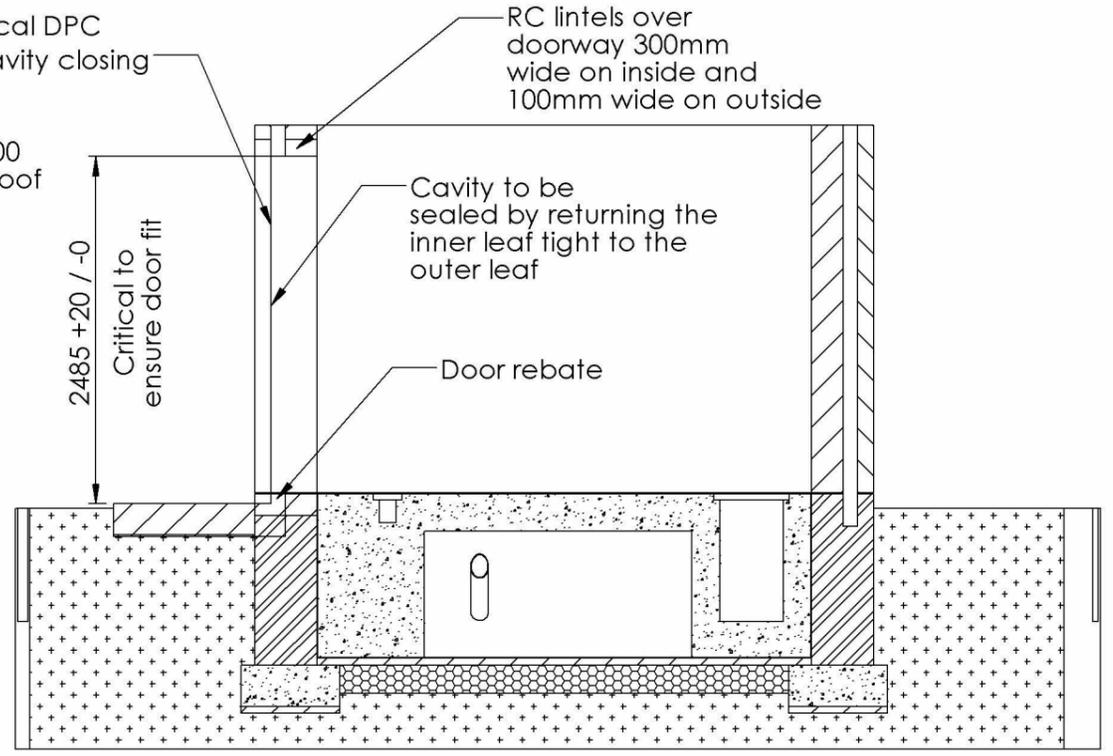
Refer to general notes (sheets 1 & 2) for details of steelwork and wall construction requirements.

IF IN DOUBT ASK

REVISION HISTORY				
ECO No.	REV.	DESCRIPTION.	DATE.	APPROVED.
10-18	B1	REVISED AND RE-ISSUED PER CM OCT 18	OCT 18	CM, ESB
05-19	C	RE-RELEASE IN LINE WITH NEW DOC-280518-DFK	MAY 19	CM - ESB

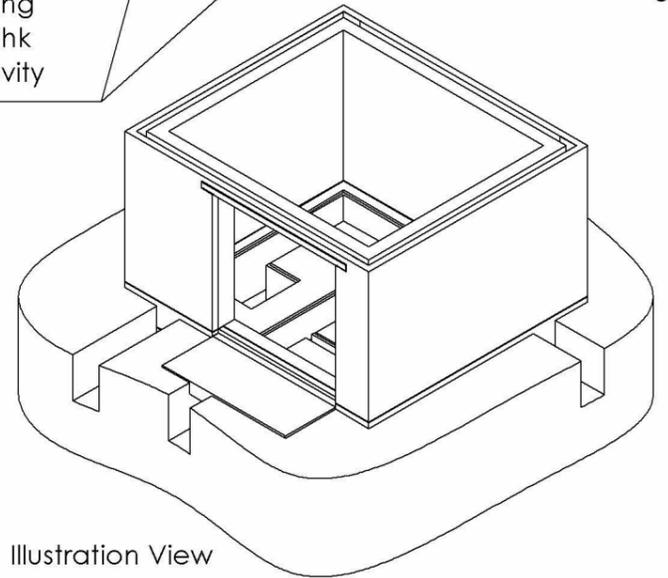


SECTION R-R



SECTION S-S

cavity closed at door opening by returning inner leaf 225mm thk vertical DPC at cavity closing

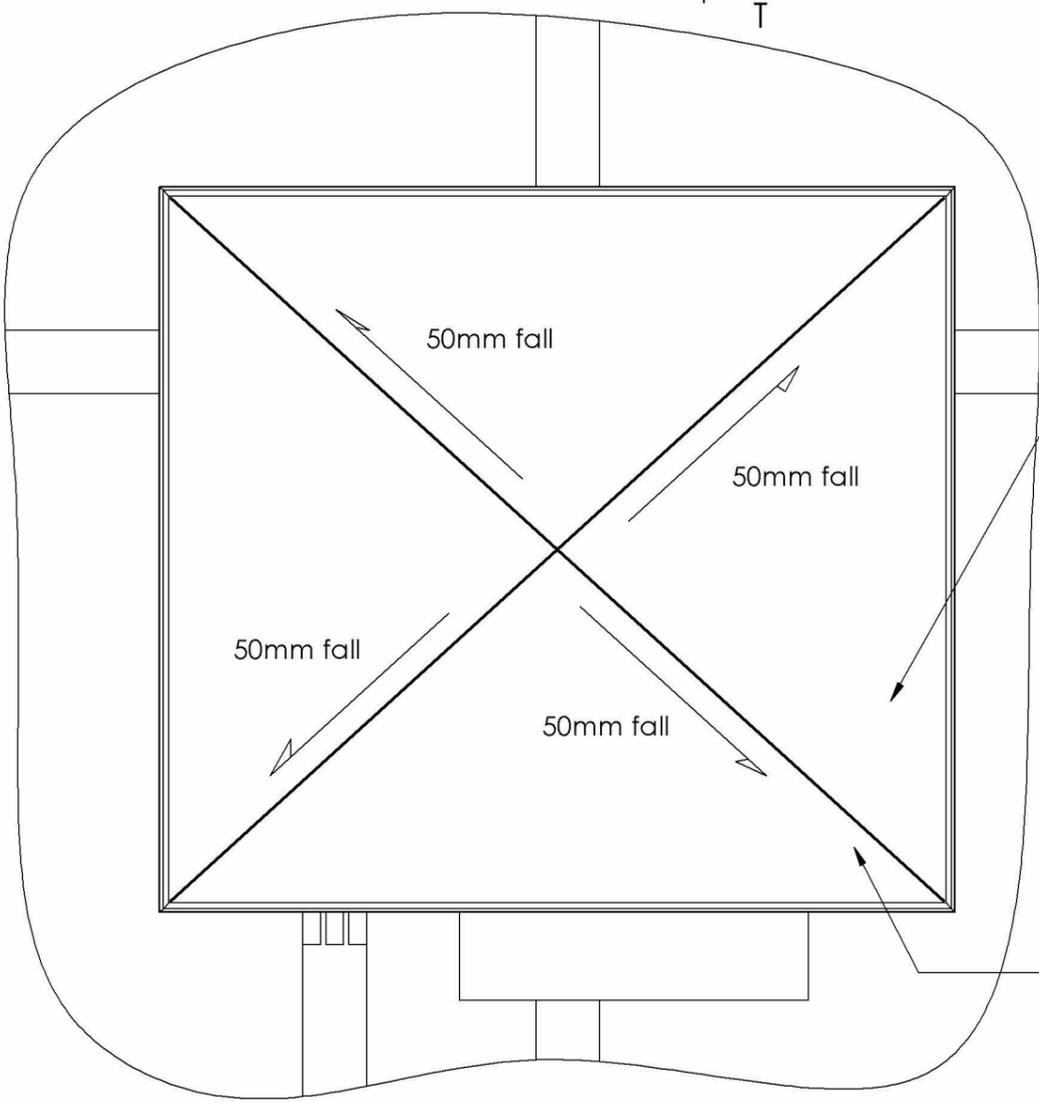
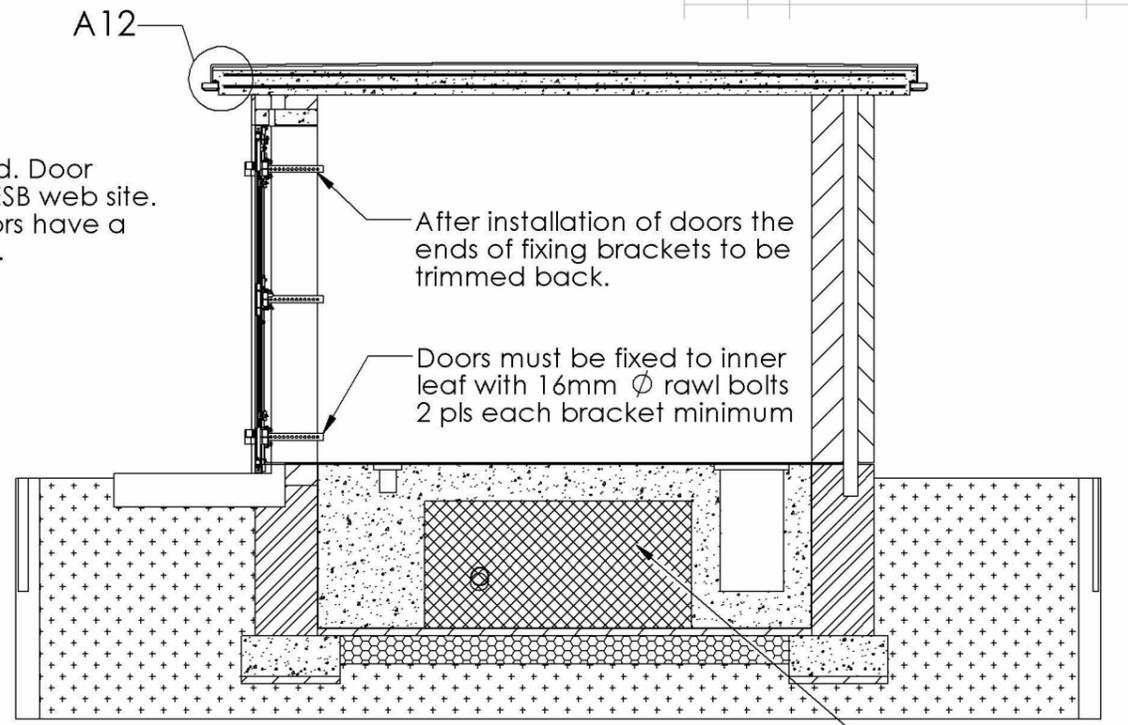
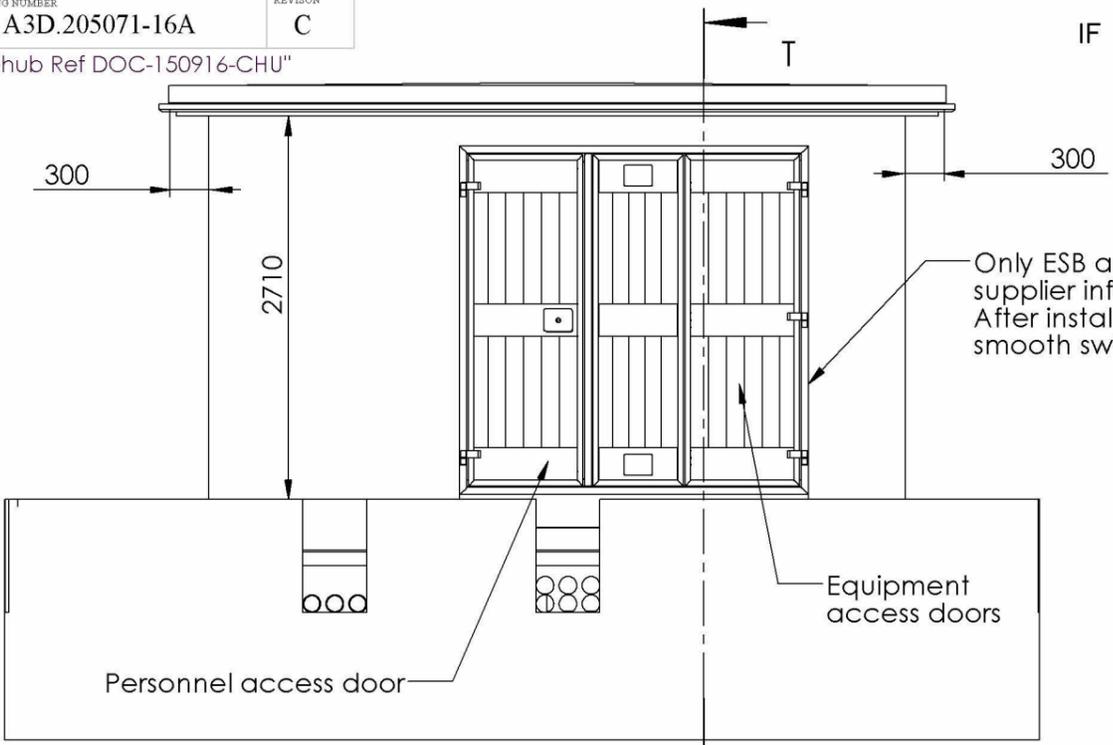


Refer to general notes (sheets 1 & 2) for details of steelwork and wall construction requirements.

IF IN DOUBT ASK

REVISION HISTORY

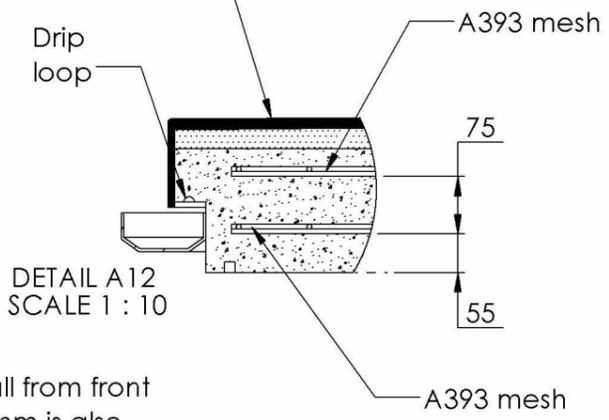
ECO No.	REV.	DESCRIPTION.	DATE.	APPROVED.
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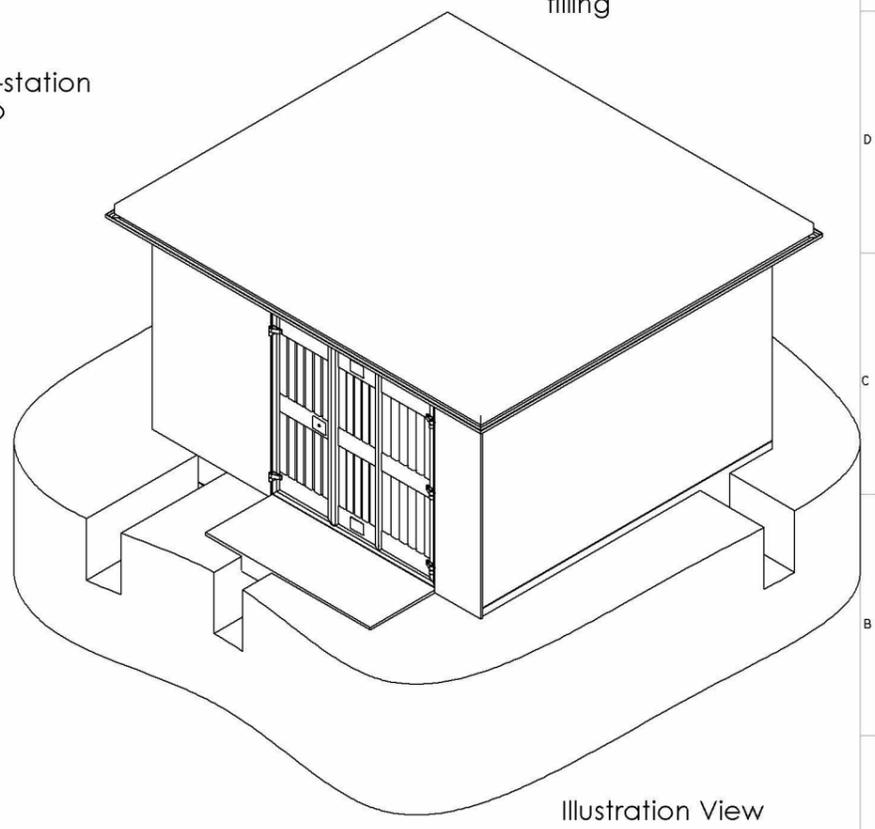
Important Note.

For more detailed information on the sub-station doors (availability, installation etc) refer to ESB specification DOC-280518-DFK

20mm asphalt or other approved roof covering laid in two 10mm layers on min 25mm sand / cement screed laid to falls on 175mm thk well vibrated 35N re-inforced conc slab



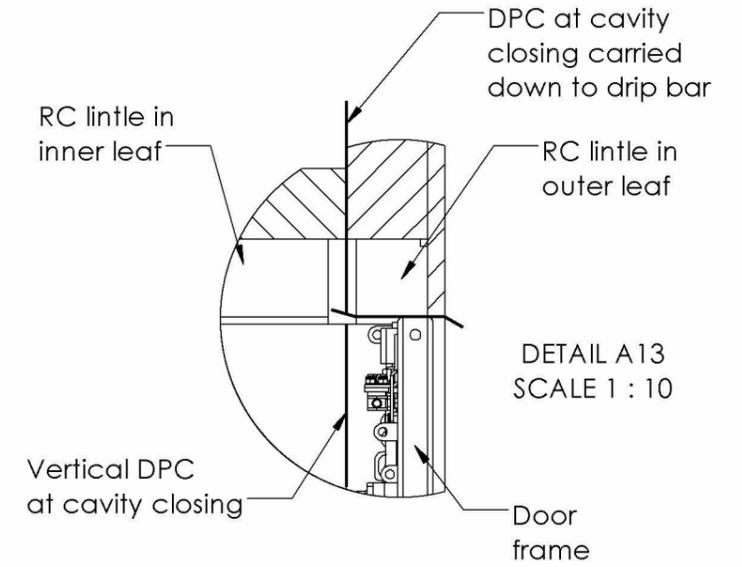
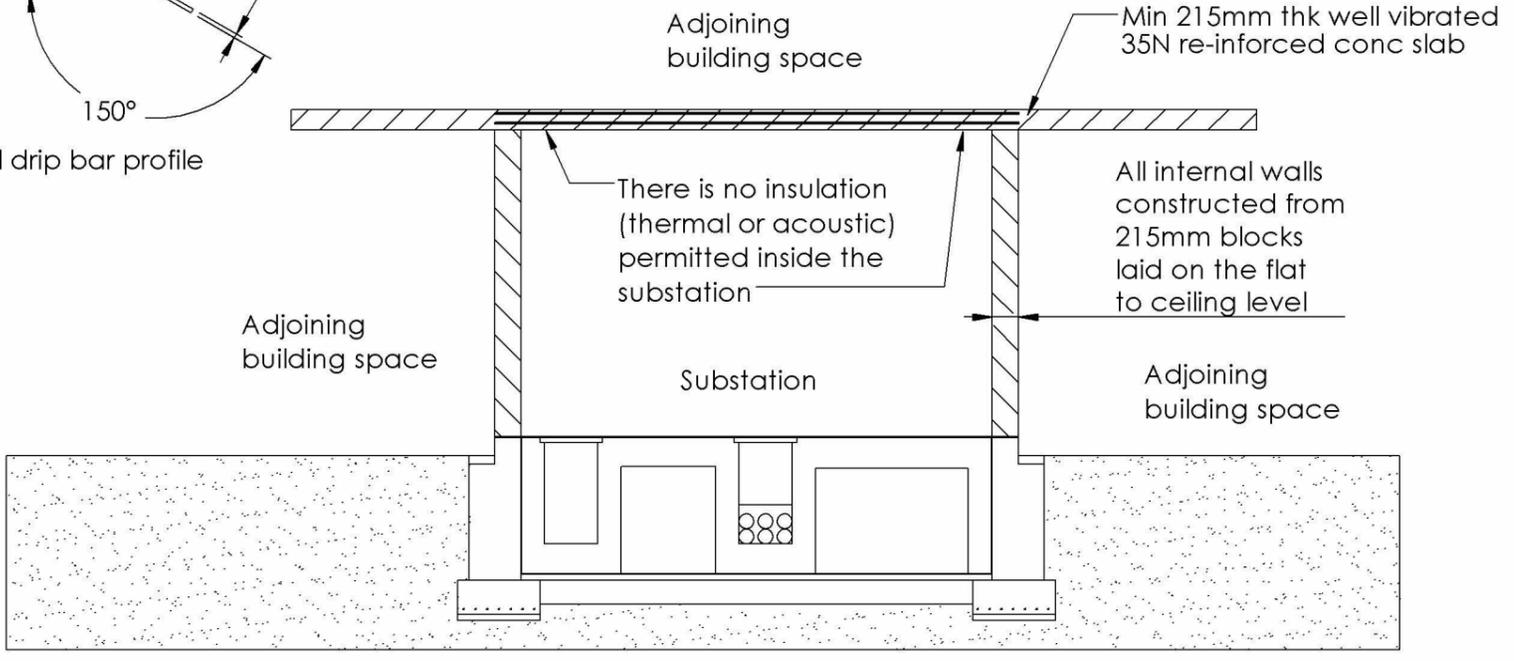
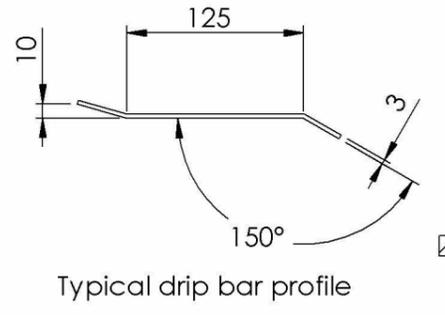
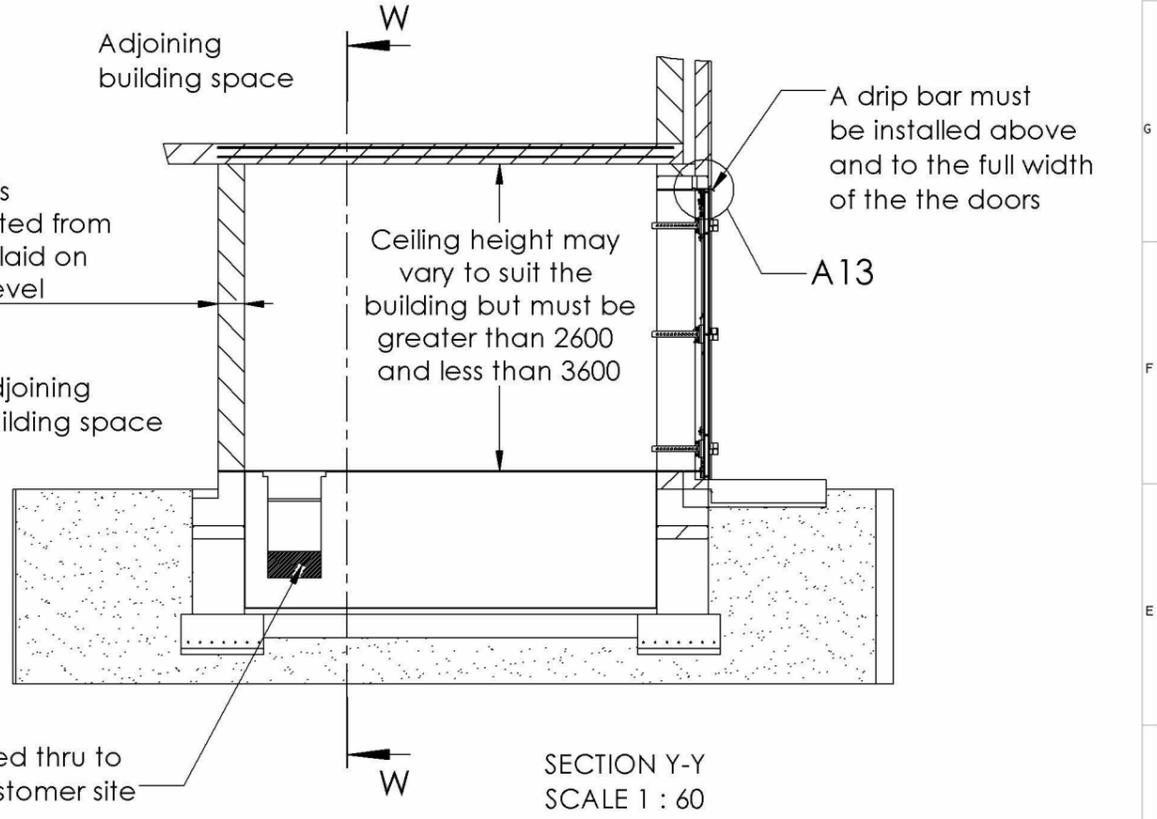
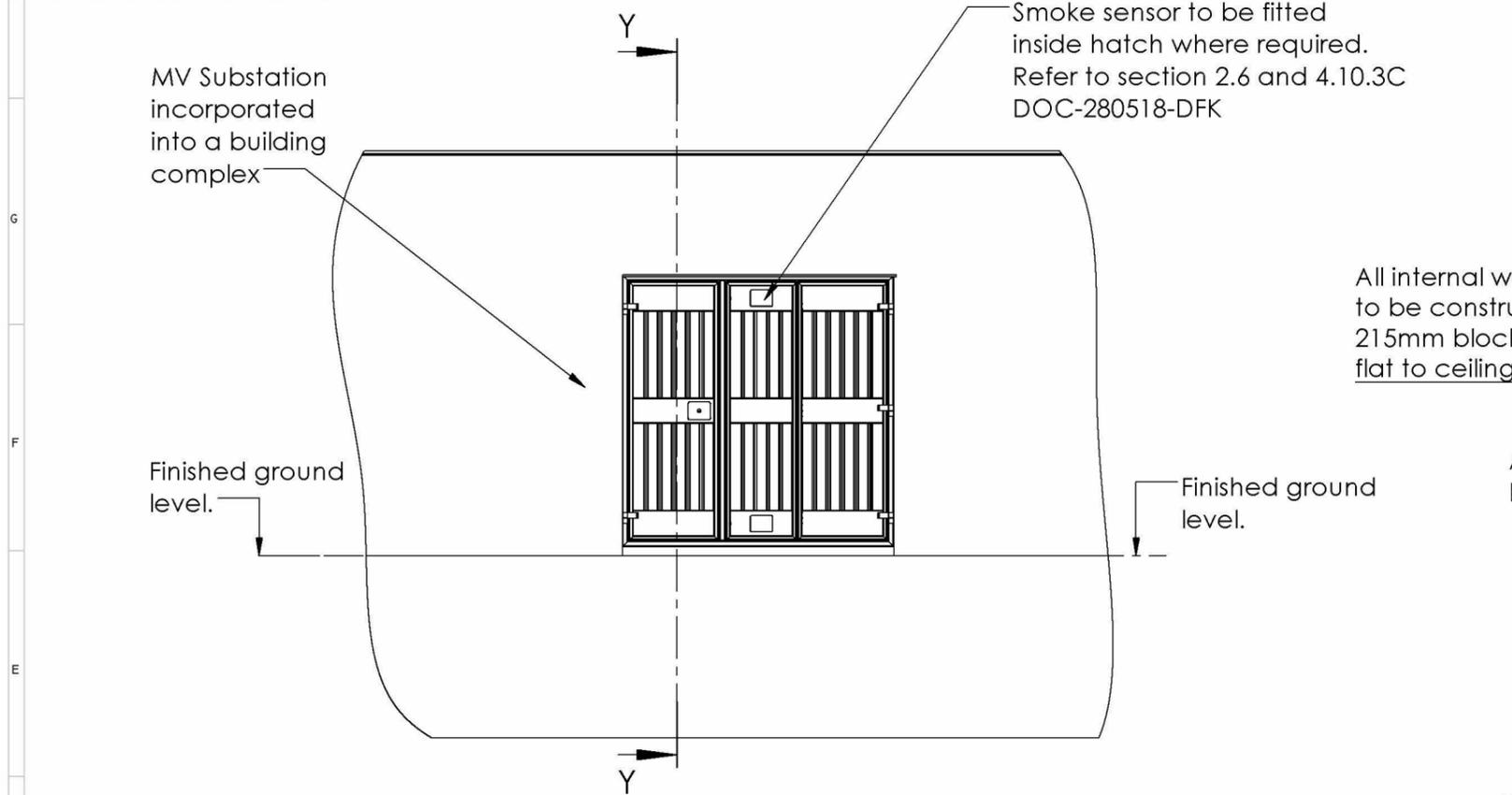
NOTE:
a continuous fall from front to back of 100mm is also deemed adequate



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Incorporated ESB MV Sub-Station Building

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"Filehub Ref DOC-150916-CHU"

Internal walls and ceiling to be coated with a polybond sealer prior to painting with two coats of an approved white emulsion paint. No other colour will be accepted.

ESB has approved suppliers for GRP (Glass re-inforced Polyester) duct covers. Duct covers will be delivered cut to size to be installed as shown opposite. It is important that the rebates in floor are correct to size to ensure the covers fit properly and do not present a trip hazard.

Trenches to be left uncovered until approved by ESB.

Illustration View
Doors and roof hidden for clarity

The floor of the sub-station will be painted with a moisture curing polyurethane coating for sealing and dust proofing the floor. The colour will be red or grey.

It is essential that the floor be non-slip finish.

Apply the finish as per detailed instructions outlined in ESB specification DOC-280518-DFK

External walls to be finished to blend with existing surrounding buildings. Selected finish to be maintenance free,

Important Note:

A formal final inspection of the completed sub-station will be made by ESB before acceptance of the building and before commencing work on the installation of the electricity connection.

This inspection requires the building to be completed in full accordance with ESB specification. The inspection will take place after the customer has provided a Certificate of Completion covering the workmanship and materials used in the construction of the building.

The certificate must be completed and signed by the chartered Engineer / Architect in charge.

A copy of the certificate is included in appendix C of the ESB specification DOC-280518-DFK

