

Member	Mark	Type	Size	Total	Length	Shape Code	A	B	C	D
Ground beam / base	H1	B500B	12	12	2975	11	250			
	H2	B500B	12	12	450	00	450			
Base fabric top	F1	A252		1	2800	1300				
	F2	A252		1	2800	1000				

- SPECIFICATION NOTES:**
- GENERAL NOTES**
- THIS DRAWING IS NOT TO BE SCALED AND NO VARIATION TO THE STATED DIMENSIONS OR MATERIALS SPECIFIED WILL BE PERMITTED WITHOUT PRIOR WRITTEN CONSENT FROM UK POWER NETWORKS.
  - ALL DIMENSIONS ARE IN MILLIMETRES.
  - THE RUNNING OF HEATING, GAS, TELECOMS, WATER AND OTHER SERVICES THROUGH OR UNDER THE SUBSTATION AREA WILL BE NOT PERMITTED.
  - THE DEVELOPER WILL BE RESPONSIBLE FOR OBTAINING ALL PLANNING CONSENTS AND APPROVALS BEFORE CONSTRUCTION WORK COMMENCES.
- SUBSTATION LOCATION**
- IT IS IMPORTANT THAT THE POSITION AND ORIENTATION OF THE SUBSTATION IS DISCUSSED AND AGREED WITH THE UK POWER NETWORKS PRIOR TO THE COMMENCEMENT OF ANY BUILDING WORKS ON SITE.
  - SUBSTATIONS SHOULD BE LOCATED ADJACENT TO A PUBLIC HIGHWAY OR REACHED BY A PRIVATE DEDICATED ACCESS WAY WITH FULL CONTROL AND ASSOCIATED LEGAL RIGHTS.
  - 24 HOUR UNIMPEDED PERSONNEL ACCESS IS REQUIRED AT ALL TIMES. 365 DAYS OF THE YEAR. ANY DOORS OR GATES ON THE ACCESS ROUTE ARE TO BE LOCKED IN STANDARD UK POWER NETWORKS LOCKING SUITE.
  - ACCESS VIA 24HR SECURITY IS UNACCEPTABLE.
  - CONSIDERATION IS TO BE GIVEN AT THE DESIGN STAGE IF ADJACENT SOFT LANDSCAPING IS PROPOSED - PLANTING SCHEMES MUST ALLOW ADEQUATE PROVISION FOR FUTURE PLANT GROWTH WITHOUT COMPROMISING ACCESS TO DOORS OR LOUVRES.
  - SUBSTATION DOORS MUST NOT ENCRoACH OVER PUBLIC FOOTPATH.
  - NOTE: THIS DESIGN IS NOT SUITABLE IF LOCATED WITHIN 10m OF A WATERCOURSE OR WITHIN 50m OF A BOREHOLE - USE THE FULLY BUNDED VARIANT FOR THESE LOCATIONS.**
- FOUNDATIONS, CONCRETE & REINFORCEMENT**
- THE STANDARD DESIGN SHOWN IS BASED ON A NET INCREASE OF GROUND PRESSURE AT FORMATION LEVEL NOT EXCEEDING 25kN/m<sup>2</sup>. THIS IS CONSIDERED ADEQUATE FOR NORMAL GROUND CONDITIONS. SHOULD SPECIAL SITE CONDITIONS EXIST SUCH AS MADE UP GROUND OR VARIABLE BEARING PRESSURES THEN THE CLIENT'S STRUCTURAL ENGINEER IS TO DESIGN SUITABLE ALTERNATIVE FOUNDATIONS - ALL ALTERNATIVE PROPOSALS TO BE SUBMITTED TO UK POWER NETWORKS FOR COMMENT / APPROVAL PRIOR TO BUILDING WORKS COMMENCING ON SITE.
  - LOCAL SOFT SPOTS MUST BE EXCAVATED AND BROUGHT UP TO FOUNDATION FORMATION LEVEL WITH A DESIGNATED GEN1 MIX TO BS 8500-2 WITH A CEMENT COMBINATION TO ENSURE SULPHATE RESISTANCE OR SULPHATE RESISTING PORTLAND CEMENT TO BS 4027.
  - CONCRETE TO BE DESIGNATED RC30/37 MIX WITH 20mm AGGREGATE, TO BS 8500-2 WITH A CEMENT COMBINATION TO ENSURE SULPHATE RESISTANCE OR SULPHATE RESISTING PORTLAND CEMENT TO BS 4027.
  - ALL REINFORCEMENT TO HAVE A MINIMUM COVER OF 50mm AND A NOMINAL COVER OF 75mm. RIBBED BAR REINFORCEMENT SHALL BE TO BS 4449 - STRENGTH GRADE: B500B. FABRIC REINFORCEMENT SHALL BE TO BS 4483.
  - ALL EXTERNAL EDGES ABOVE GROUND LEVEL TO HAVE 25mm x 25mm CHAMFERS.
  - CAST IN STEEL ANGLE SUPPORT AS SHOWN IN DETAIL 'A'.
  - TOP 150mm OF ALL CONCRETE WORKS TO BE SHUTTERED TO PROVIDE A FAIR FACE FINISH.
  - TOP OF ALL CONCRETE WORKS TO BE FINISHED SMOOTH & LEVEL WITHIN ±2mm WITH A STEEL TROWEL - IT SHOULD BE NOTED THAT A HIGH STANDARD OF WORKMANSHIP IS REQUIRED.
- GRP ENCLOSURE**
- UNLESS OTHERWISE STATED, THE STANDARD GRP ENCLOSURE WILL BE PROVIDED AND INSTALLED BY UK POWER NETWORKS AS PART OF THE WORKS.
  - THE TOTAL WEIGHT OF STANDARD GRP ENCLOSURE IS 580kg.
  - ROOF IS SUPPLIED AS A SINGLE MOULDING INCORPORATING ENCAPSULATED TIMBER, MAX LOAD ON ROOF 2.5kN/m<sup>2</sup>.
  - ROOF IS MOUNTED ON AN EXPLOSION RELIEF FRAMEWORK WITH MOUNTINGS, ENCAPSULATED AND BONDED INTO THE CORNERS OF THE ENCLOSURE. THE ROOF IS CAPABLE OF RISING 1m AND RETURNING TO THE NORMAL POSITION.
  - DOORS HUNG ON 1/2 PAIRS OF STAINLESS STEEL BUTT HINGES.
  - DOORS FITTED WITH DOOR STAYS TO HOLD EACH DOOR OPEN AT 90°.
  - ESPAÑOLETTE LOCKING SYSTEM - SECURED BY UK POWER NETWORKS STANDARD PADLOCK - PROVIDED BY UK POWER NETWORKS.
  - THE THRESHOLD SECTION BELOW THE DOORS IS REMOVEABLE TO FACILITATE PLANT MOVEMENT.
- VENTILATION**
- VIA HIGH AND LOW LEVEL LOUVRED PANELS IN SIDES AND REAR OF GRP ENCLOSURE. LOUVRES MUST NOT BE OBSTRUCTED AT ANY TIME. A MINIMUM CLEAR AREA OF 500mm HARDSTANDING IS REQUIRED AROUND THE GRP ENCLOSURE.
- COLOUR**
- STANDARD EXTERIOR COLOURS ARE MID BROWN 08-B-25 OR DARK GREEN 14-C-39 TO BS 4800.
- GRATINGS & GRATING SUPPORT**
- 38mm DEEP MOULDED GRP GRATINGS BY CAPTRAD - OPEN TYPE WITH GRITTED SURFACE. COLOUR GREEN. GRATING REQUIRED IN TWO PIECES (2 No. 843 x 1185 SHEETS).
  - GRATINGS MUST BE FLUSH WITH TOP OF FOUNDATION AND SECURELY SUPPORTED USING GALVANISED STEEL SUPPORT MEMBER AS SHOWN IN DETAIL 'A'.
  - GRATINGS MUST BE SEATED LEVEL WITH NO NOTICEABLE ROCKING.
  - ALL STEELWORK TO BE GALVANISED.
- ASSEMBLY**
- THE GRP ENCLOSURE IS USUALLY DELIVERED FULLY ASSEMBLED.
  - AN OPTION FOR A FLAT PACK UNIT IS AVAILABLE - SPECIAL ORDER.
- DUCTS**
- THE EXACT NUMBER OF DUCTS AND DUCT ENTRY POSITIONS ARE TO BE VERIFIED BY UK POWER NETWORKS TO SUIT THE PROJECT.
  - PERMITTED DUCTS - 125mm INTERNAL DIAMETER TWIN WALLED HIGH DENSITY POLYETHYLENE DUCTING TO EST 12-24 (BS EN 50086-2-4) LAID FLAT & LEVEL, eg. RIDGIDUCT.
- CABLE ACCESS**
- GROUNDWORK FOR CABLE ENTRY TO BE FULLY EXCAVATED BY DEVELOPER.
- EARTHING**
- A DEDICATED EARTHING SYSTEM IS REQUIRED TO BE SUPPLIED, INSTALLED AND TESTED BY DEVELOPER'S SPECIALIST CONTRACTOR. SEE SHEET 2 FOR FULL DETAILS.
- INFILL TO AREA AROUND CABLES**
- BACKFILL WITH BUILDERS SAND AROUND CABLES TO FINISH 500mm FROM TOP OF GRATING.
  - WHERE THE DEVELOPER BUILDS THE PLINTH, IT IS THEIR RESPONSIBILITY TO BACKFILL THE VOID AROUND THE CABLES UNDER UK POWER NETWORKS SUPERVISION.
- GRATINGS**
- NOTE THAT GRATINGS ARE DESIGNED FOR PERSONNEL LOADING ONLY.

Version	Date	Description	Checked	Drn.	Approved	Designed
C	30-05-12	GRP grating extended. Notes amended.			H Amare	RDH
B	20-10-10				M Dunk	HA
A	22-03-10	ORIGINAL				

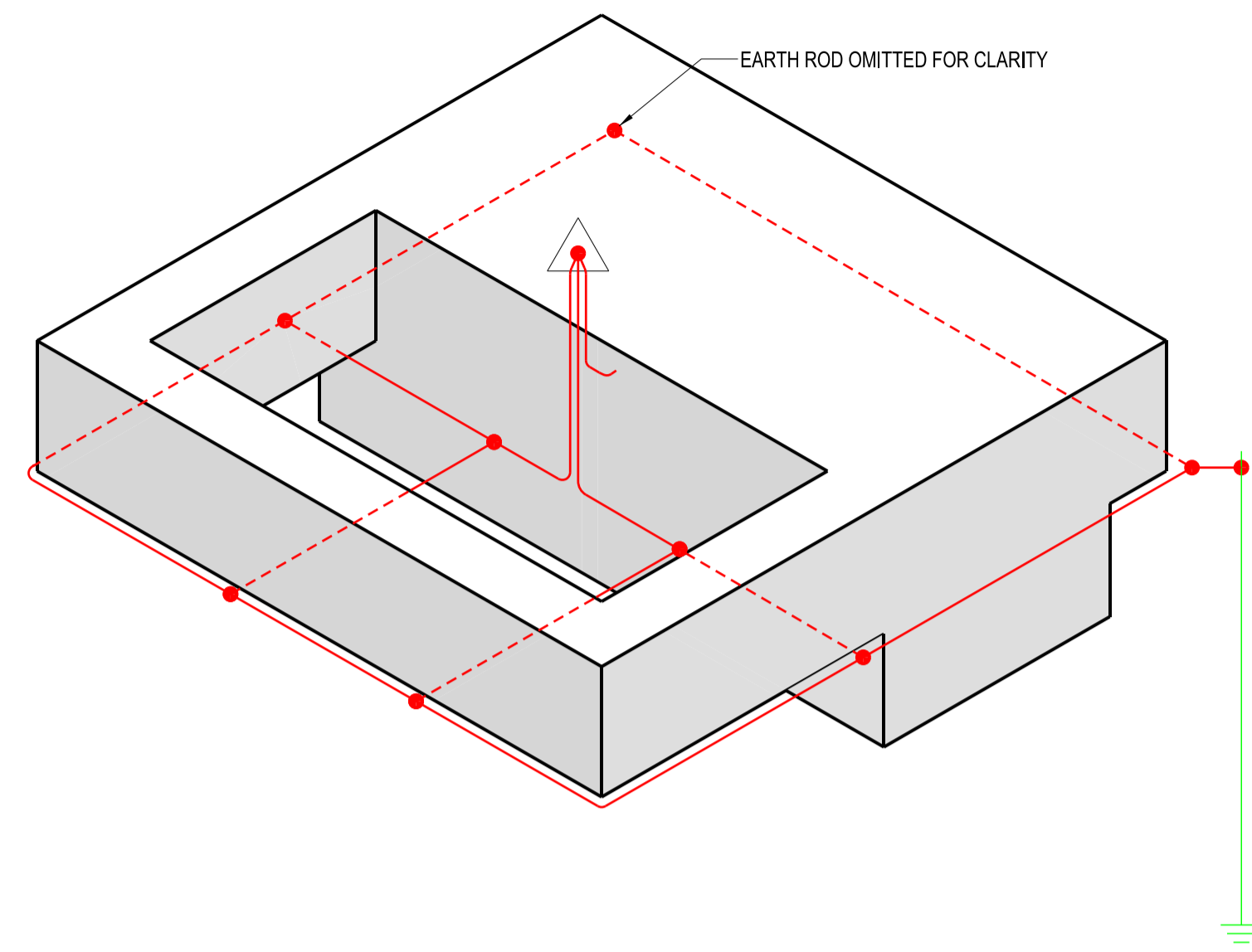
**UK Power Networks**

TITLE: UNIT/PACKAGE SUBSTATION WITH STANDARD PLINTH DETAIL & GRP ENCLOSURE

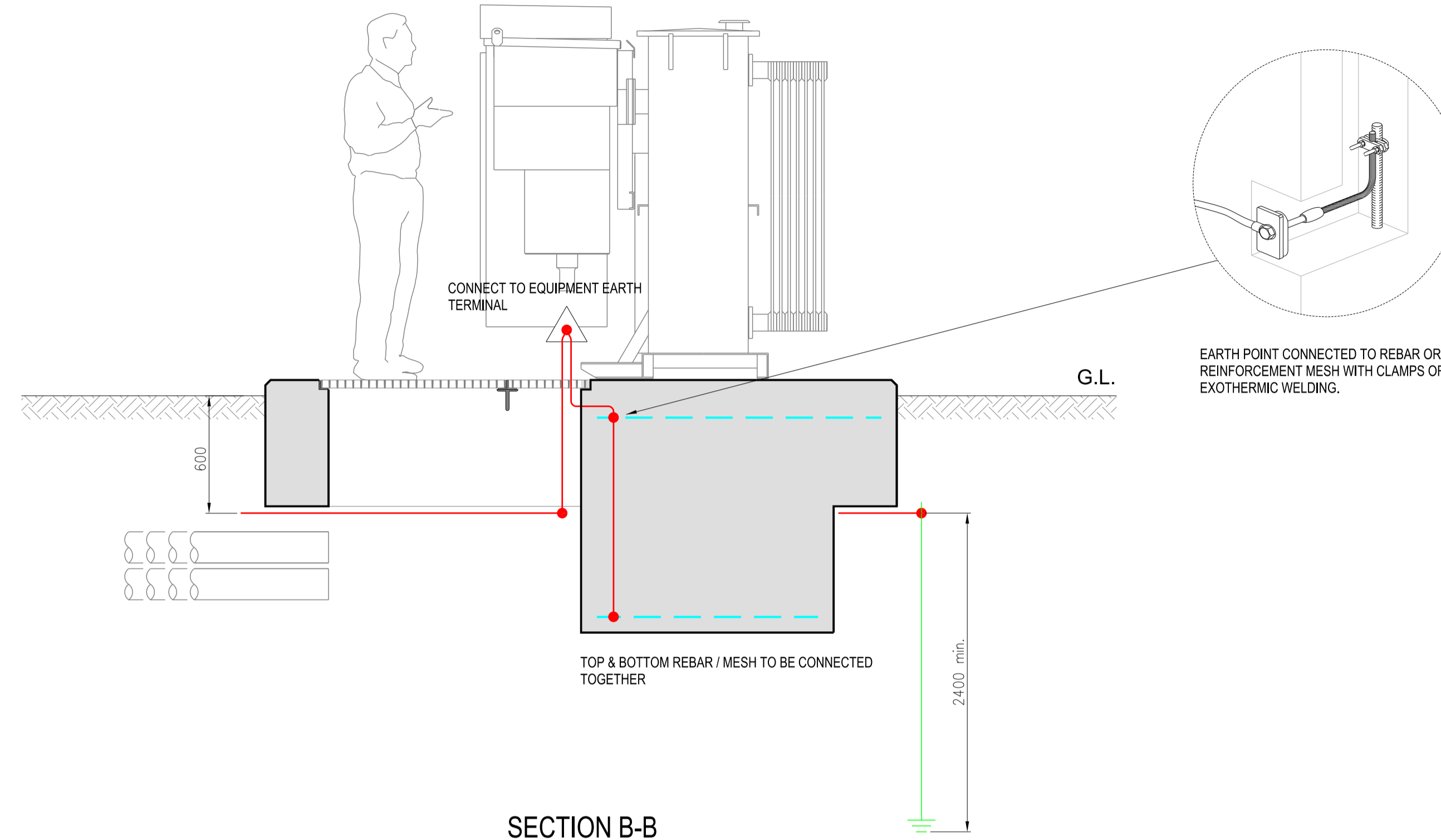
SCALE: NTS @A1 APPROVED

DRAWING NO: EDS 07-0102.01 SHEET 1 OF 2

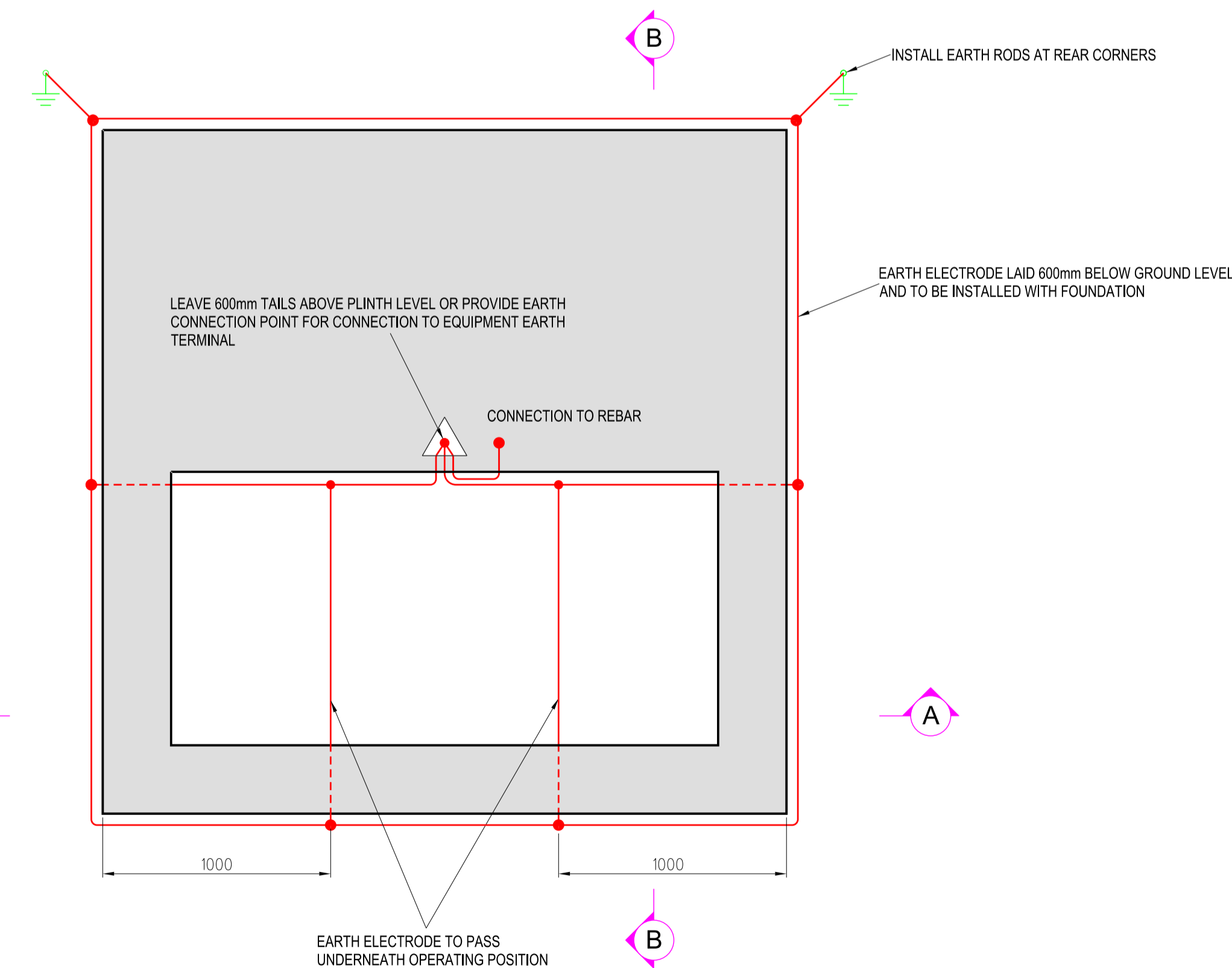
SITE: SECONDARY SITES



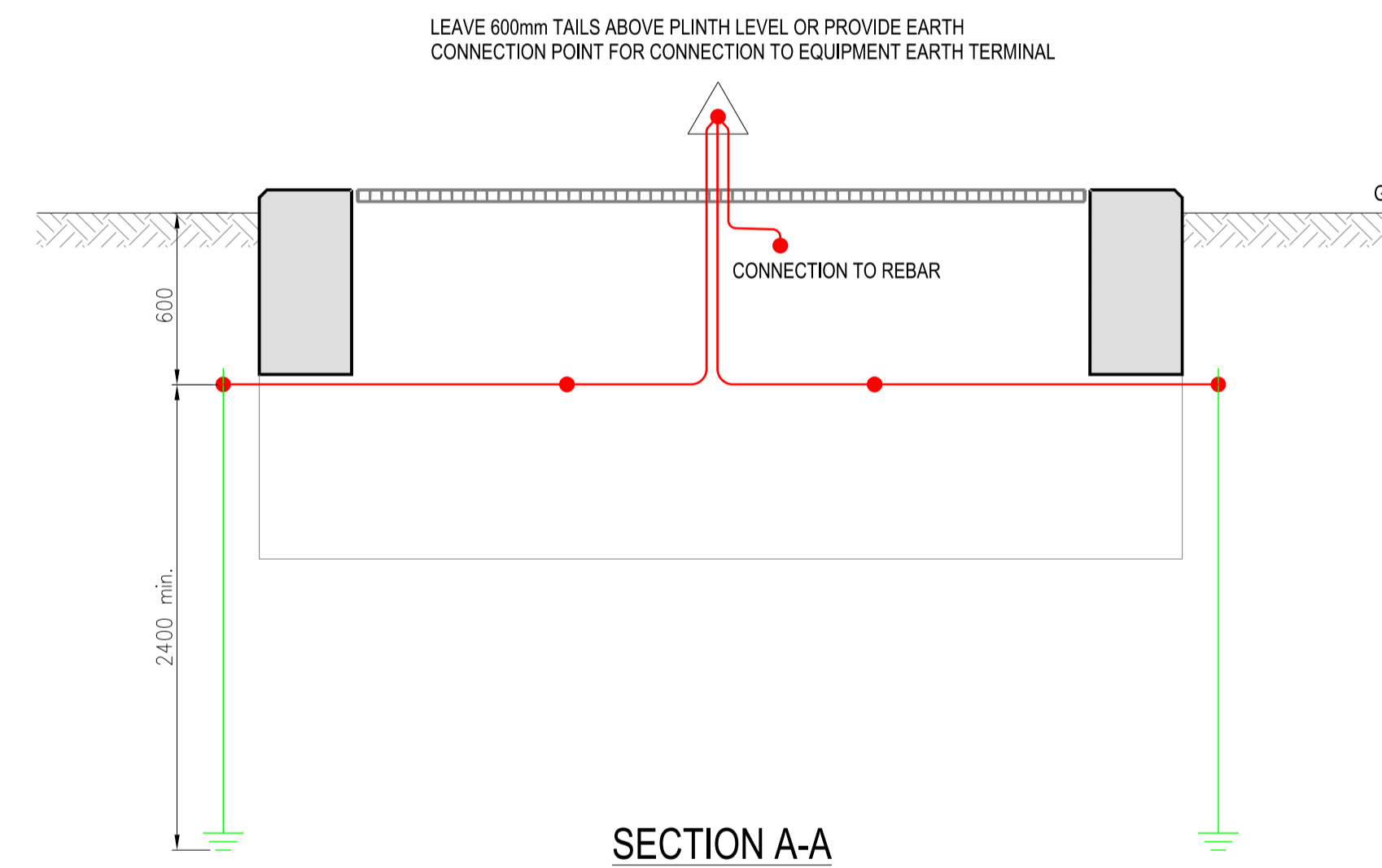
ISOMETRIC VIEW SHOWING EARTH ELECTRODES & RODS



SECTION B-B



GRP PLINTH FOUNDATION PLAN



SECTION A-A

**NOTE:** This drawing only shows the earthing associated with the ground works. Additional earthing may be required to achieve the earth resistance value and to ensure the substation is safe. Refer to the relevant earthing standard for the complete earthing and bonding requirements.

**GENERAL NOTES**

THIS DRAWING SHALL NOT BE SCALED AND NO VARIATION TO THE STATED DIMENSIONS OR MATERIALS SPECIFIED SHALL BE PERMITTED WITHOUT PRIOR WRITTEN CONSENT FROM UK POWER NETWORKS.

ALL DIMENSIONS ARE IN MILLIMETRES.

WHEREVER POSSIBLE THE EARTHING SYSTEM SHOULD BE INSTALLED IN ASSOCIATION WITH THE GROUND WORKS TO ENSURE THAT EARTH ELECTRODES ARE CORRECTLY POSITIONED PRIOR TO PLACEMENT OF CONCRETE.

**REBAR/MESH REINFORCEMENT**

THE TOP AND BOTTOM REINFORCEMENT WITHIN THE PLINTH SHALL USE EXOTHERMIC WELDING OR SUITABLE CLAMPS.

THE CONNECTION TO THE REINFORCEMENT WITHIN THE PLINTH SHALL USE EXOTHERMIC WELDING OR SUITABLE CLAMPS.

EITHER 600mm MINIMUM TAILS SHALL BE LEFT ABOVE PLINTH LEVEL OR AN EARTH CONNECTION POINT PROVIDED TO ENABLE THE REINFORCEMENT TO BE CONNECTED TO THE EARTH BAR/EQUIPMENT.

ALL CONNECTIONS TO THE REINFORCEMENT SHALL USE A MINIMUM OF 70mm<sup>2</sup> STRANDED COPPER CABLE OR 25mm x 3mm COPPER TAPE.

**EARTH ELECTRODE**

THE EARTH RODS SHALL BE COPPER CLAD WITH APPROPRIATE FITTINGS, DRIVEN TO A MINIMUM DEPTH OF 2.4m.

THE EARTH ELECTRODE SHALL BE AS FOLLOWS:

- FOR EARTH FAULT LEVELS UP TO 8kA USE 70mm<sup>2</sup> BARE STRANDED COPPER CABLE OR 25mm x 3mm COPPER TAPE.
- FOR EARTH FAULT LEVELS UP TO 12kA USE 120mm<sup>2</sup> OR 2 x 70mm<sup>2</sup> BARE COPPER CABLES OR 25mm x 4mm COPPER TAPE.
- FOR EARTH FAULT LEVELS UP TO 15kA USE 120mm<sup>2</sup> OR 2 x 70mm<sup>2</sup> BARE COPPER CABLES OR 25mm x 6mm COPPER TAPE.

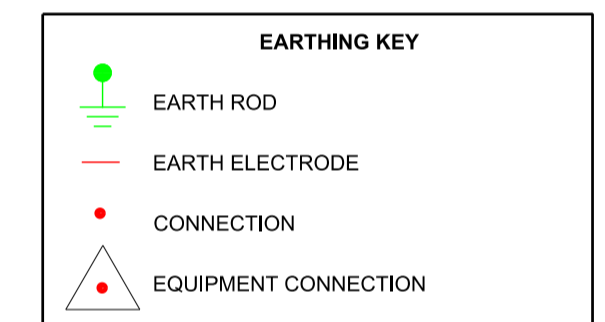
**EARTH RESISTANCE**

THE MAXIMUM RESISTANCE THE EARTHING SYSTEM SHALL BE 1 OHM UNLESS A DIFFERENT VALUE HAS BEEN SPECIFIED BY THE UK POWER NETWORKS DESIGNER.

WHERE THE EARTHING SYSTEM IS INSTALLED BY A DEVELOPER OR CONTRACTOR CERTIFICATION CONFIRMING THE RESISTANCE OF THE EARTHING SYSTEM SHALL BE PROVIDED TO UK POWER NETWORKS PRIOR TO EQUIPMENT INSTALLATION.

**FURTHER INFORMATION**

REFER TO:  
EDS 06-0014 SECONDARY SUBSTATION EARTHING DESIGN  
EDS 06-0023 SECONDARY DISTRIBUTION NETWORK EARTHING CONSTRUCTION



Version	Date	Description	Checked Approved	Drn. Designed
C	01-05-12	Revised earth connections and notes	S Tucker	RDH
B	20-10-10		S Tucker	GD
A	22-03-10	ORIGINAL	PL	WM
			MD	GD
			PL	GD



TITLE  
**EARTHING ARRANGEMENT FOR UNIT/PACKAGE SUBSTATION WITH STANDARD PLINTH DETAIL & GRP ENCLOSURE**

SCALE	NTS	@A1	APPROVED	Version
DRAWING NO.	EDS 07-0102.01 SHEET 2 OF 2			C
SITE	SECONDARY SITES			