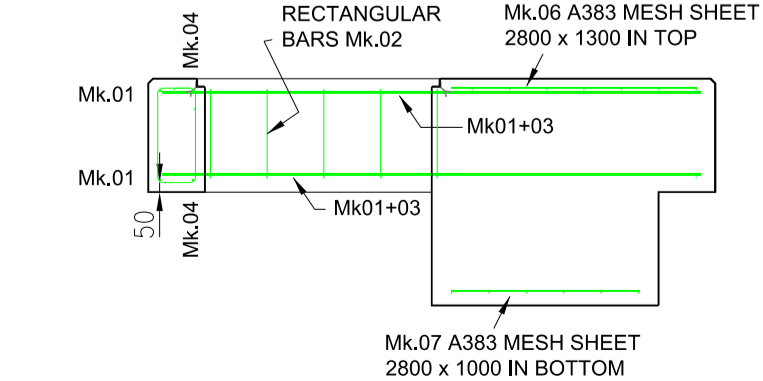
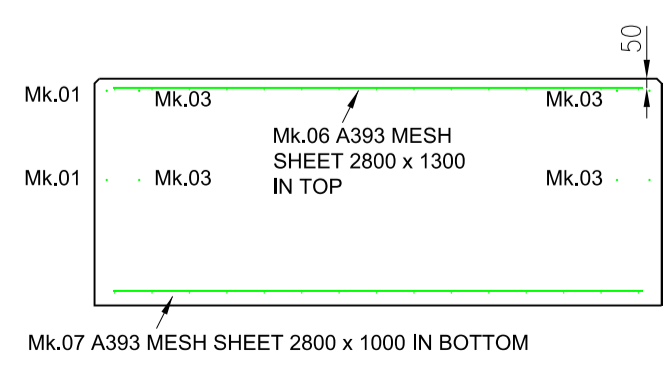
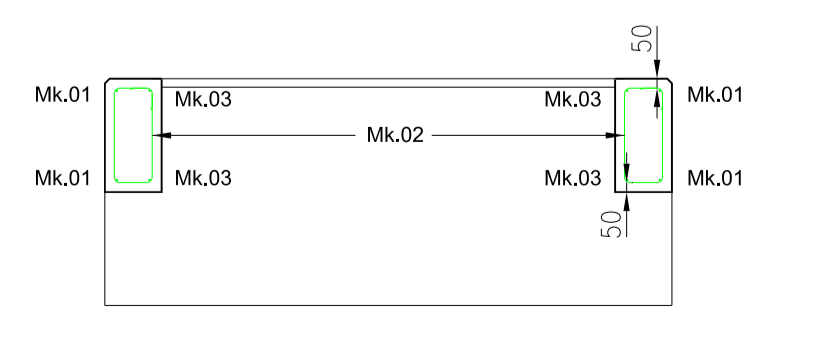


Bar Bending Schedule to BS 8666:2005

Member	Bar Mark	Type and Size	Total No	Length of each bar*	Shape Code	A mm	B mm	C mm	D mm
01	H12	6	2800	00	3500				
02	H12	18	1430	51	200	425	125		
03	H12	4	2650	00	2650				
04	H12	2	2400	00	2400				
05	H12	8	600	11	300	300			
						Length	Width		
06		A393 Mesh				2800	1300		
07		A393 Mesh				2800	1000		

* Bar length rounded to multiples of 25mm



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/m², 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 UK Power Networks GRP enclosure is 585kgs.
- Roof is supplied as a single moulding incorporating encapsulated timber, max load on roof 2.5kN/m².
- Roof is mounted on 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 1½ pairs of stainless steel built hinges.
- Doors fitted with door stays to hold each door open at 90°.
- Espagnolette locking system - secured by UK Power Networks standard padlock - provided by UK Power Networks.
- The threshold section below the doors is removable 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 handstanding 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 or similar - 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 ESI 12-24 (BS EN 50086-2-4) laid flat & level, e.g. Ridgduct.

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	Drm.	Approved	Designed
E	25-11-14	Grating support assembly modified for ease of removal	M Dunk	RDH		
D	30-07-14	Notes amended. Concrete reinforcement design amended.	M Dunk	HA/RDH		
C	30-05-12	GRP grating extended. Notes amended.	M Dunk	H Amare		
B	20-10-10				PL	WM
A	22-03-10	ORIGINAL			PL	GD
					MD	GD
					PL	GD

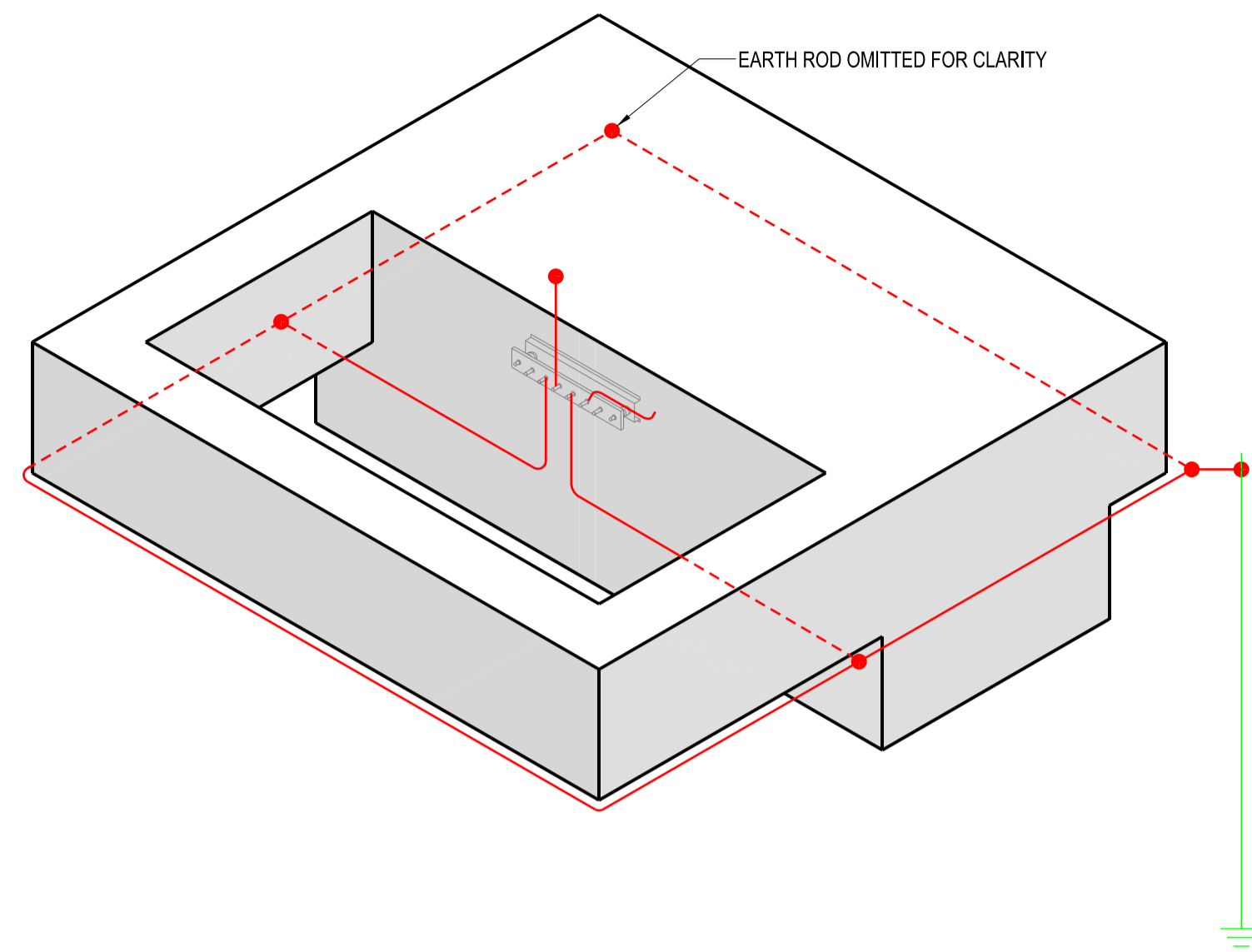
UK Power Networks

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

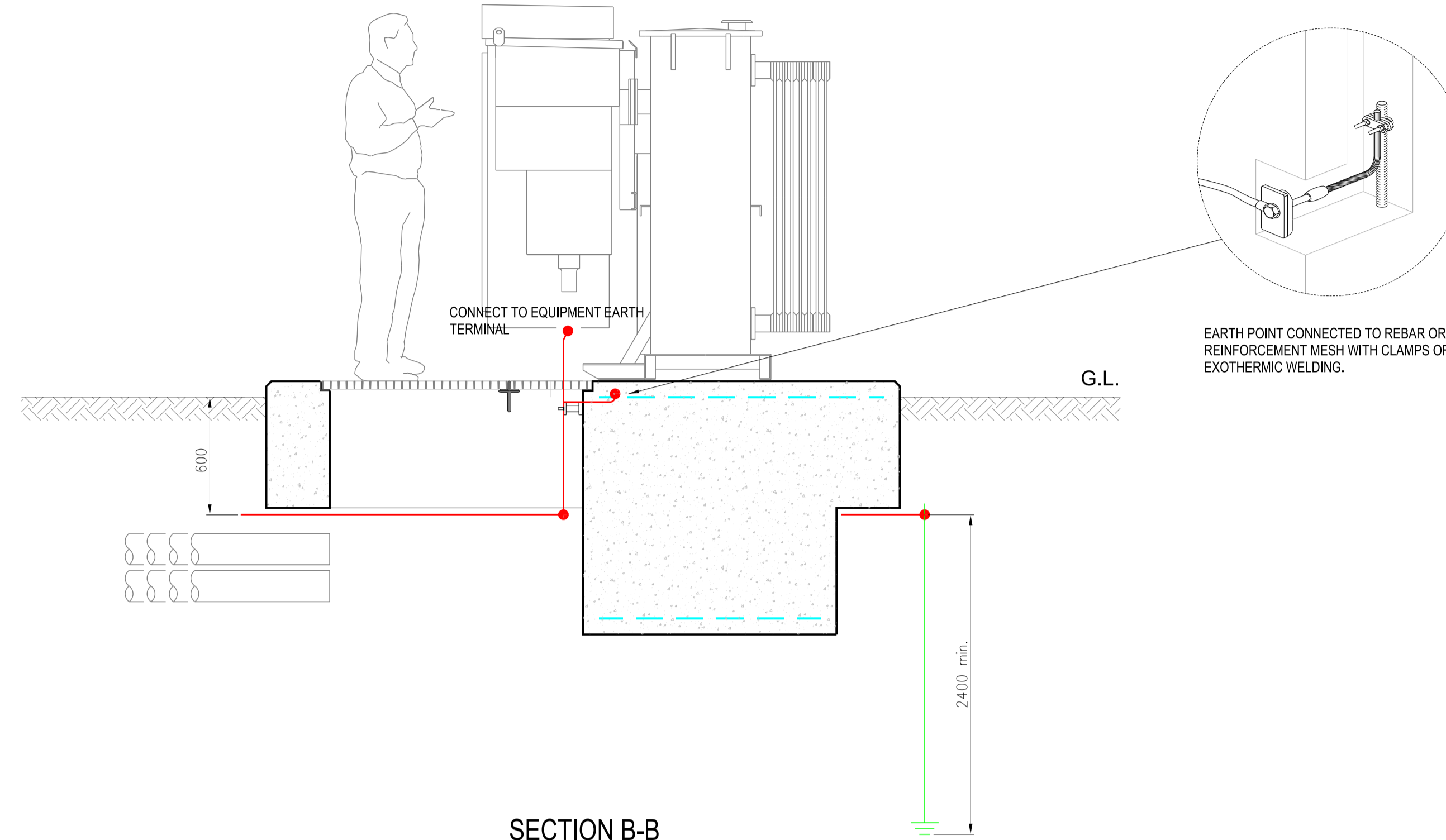
SCALE NTS @A1 **APPROVED** Version

DRAWING NO. EDS 07-0102.01 **SHEET 1 OF 3** E

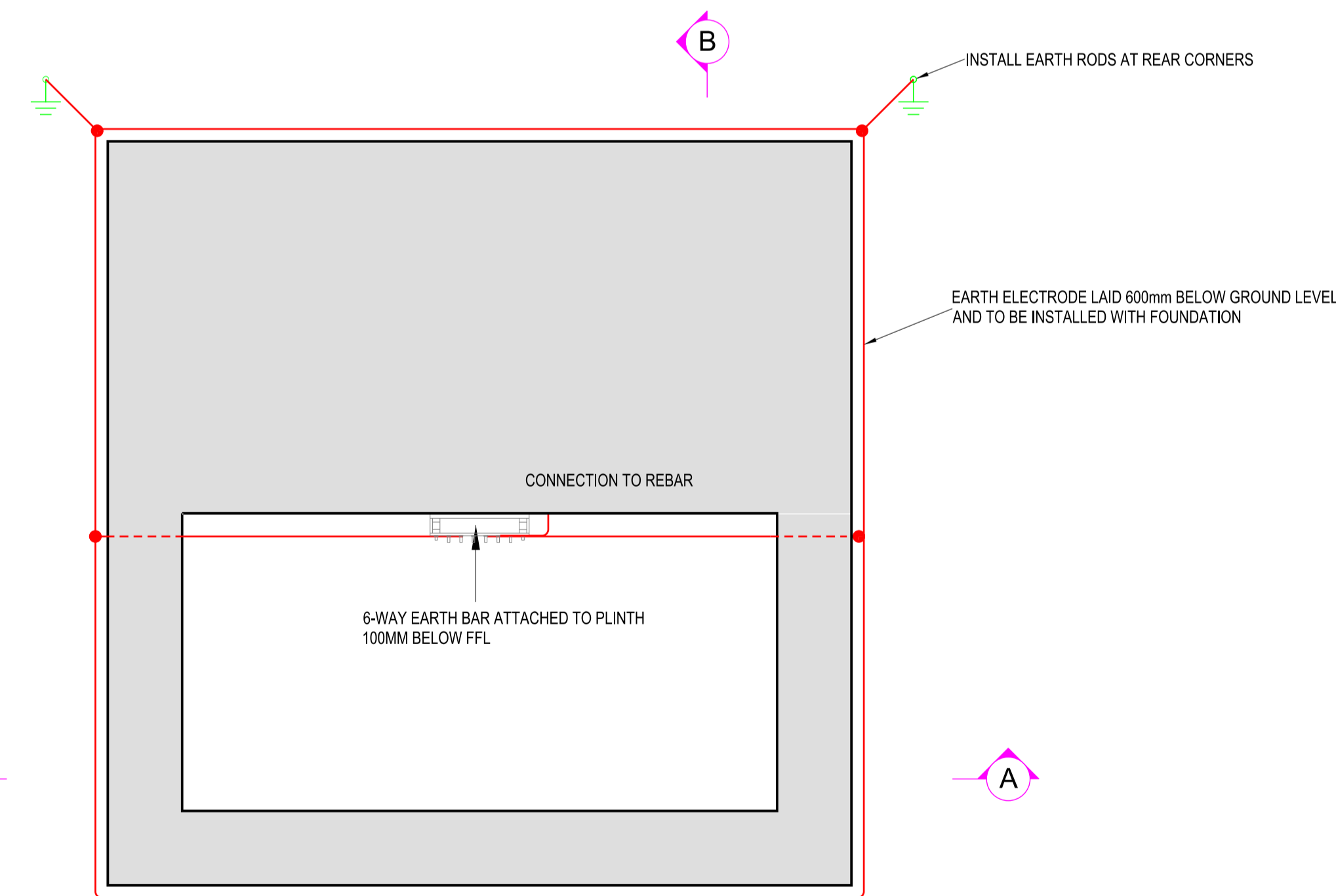
SITE SECONDARY SITES



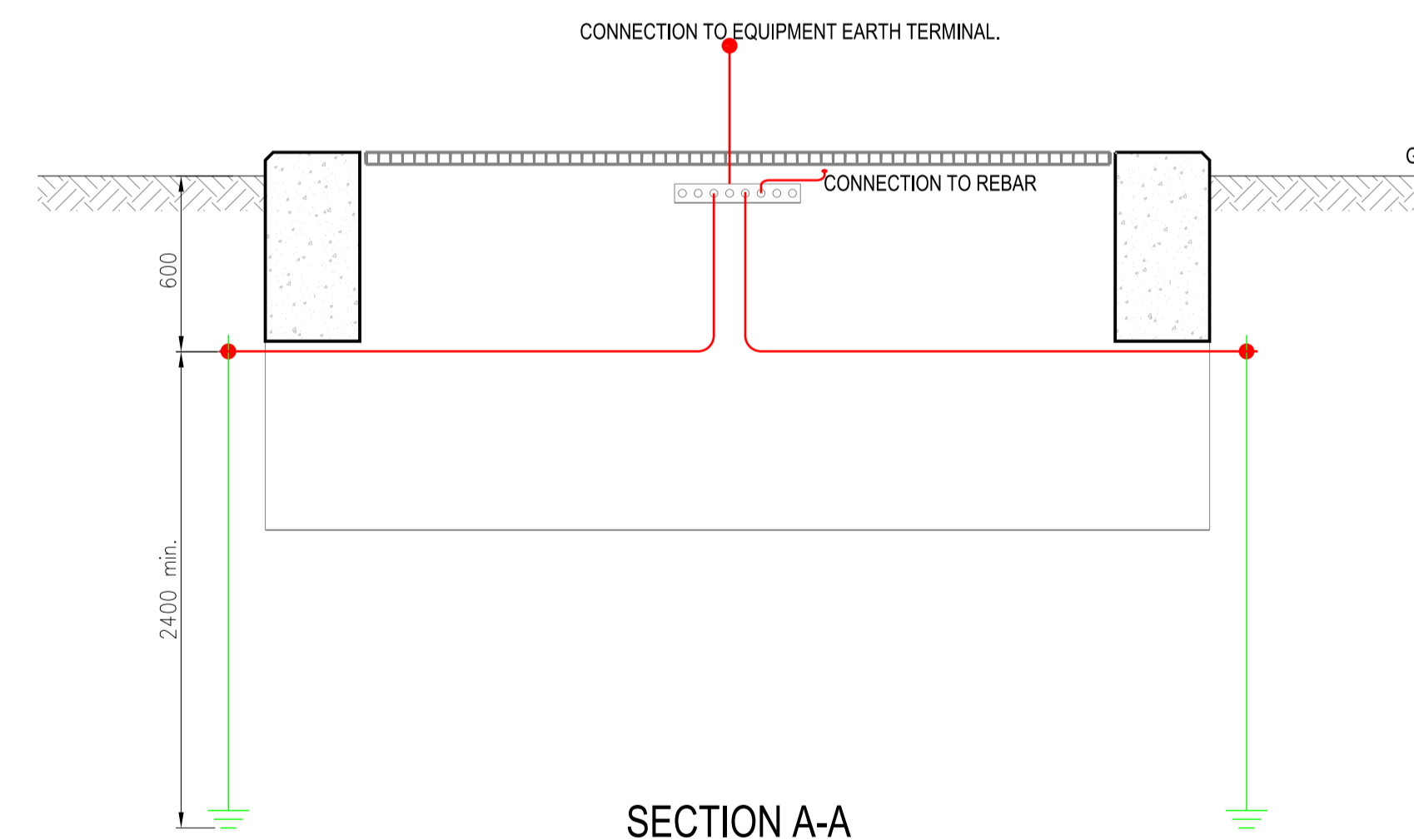
ISOMETRIC VIEW SHOWING EARTH ELECTRODES & RODS



SECTION B-B



GRP PLINTH FOUNDATION PLAN



SECTION A-A

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.

THE EARTHING SYSTEM SHALL BE PROVIDED BY THE DEVELOPER/CONTRACTOR UNLESS STATED OTHERWISE BY UK POWER NETWORKS.

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

ALL CONNECTIONS TO THE REINFORCEMENT SHALL USE A MINIMUM OF 70mm² STRANDED HARD DRAWN 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 70mm² BARE STRANDED HARD DRAWN COPPER CABLE OR 25mm x 3mm COPPER TAPE.
 FOR EARTH FAULT LEVELS UP TO 12kA USE 120mm² OR 2 x 70mm² BARE STRANDED HARD DRAWN COPPER CABLE OR 25mm x 4mm COPPER TAPE.
 FOR EARTH FAULT LEVELS UP TO 15kA USE 2 x 70mm² BARE STRANDED HARD DRAWN COPPER CABLE OR 25mm x 6mm COPPER TAPE.

EARTH RESISTANCE

THE MAXIMUM RESISTANCE OF THE STANDALONE EARTHING SYSTEM SHALL BE SPECIFIED BY THE UK POWER NETWORKS DESIGNER.

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

BONDING

NOT ALL EQUIPMENT BONDING IS SHOWN ON THE DRAWING. ALL EQUIPMENT SHALL BE BONDED IN ACCORDANCE WITH EGS 06-0023.

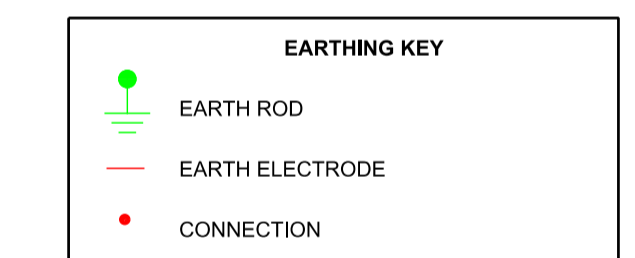
OTHER

A 6-WAY EARTH BAR SHALL BE PROVIDED IN THE POSITION SHOWN ATTACHED TO THE PLINTH AROUND 100mm BELOW FFL.

FURTHER INFORMATION

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

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.

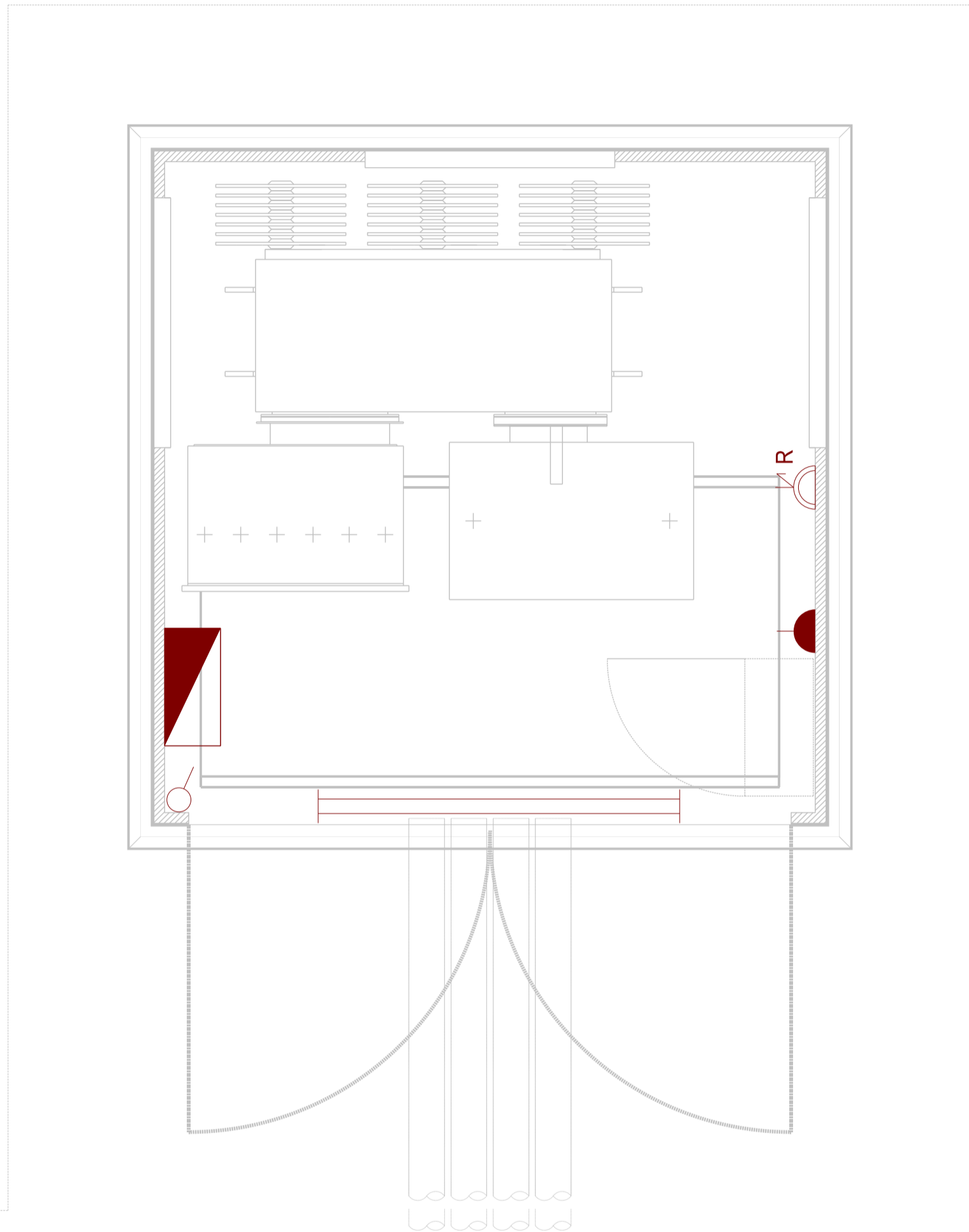


Version	Date	Description	Checked	Drn.	Approved	Designed
D	22-04-14	Revised earth connections and notes. 6-way earth bar added.	S Tucker	H Amare		
C	01-05-12	Revised earth connections and notes	S Tucker	RDH		
B	20-10-10		S Tucker	GD		
A	22-03-10	ORIGINAL	ST	WM		
			PL	GD		
			MD	GD		
			PL	GD		








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 3	D
SITE	SECONDARY SITES			



KEY:

-  WALL MOUNTED TWIN FLUORESCENT LIGHTING FITMENT WITH 58W TUBES MOUNTED 1800 ABOVE FFL
-  13A UNSWITCHED FUSED SPUR FOR RTU MOUNTED 1000mm ABOVE FFL
-  13A TWIN SWITCHED SOCKET IP55 WITH 30mA RCD WITH OPERATING TIME OF 30ms MOUNTED 400mm ABOVE FFL
-  LIGHT SWITCH MOUNTED 1000mm ABOVE FFL
-  60A SINGLE PHASE CONSUMER UNIT
 - 63A DOUBLE POLE DISCONNECTOR (RTU)
 - 32A MCB (SMALL POWER)
 - 6A MCB (LIGHTING)
 MOUNTED 1800mm ABOVE FFL

NOTES:

THE ELECTRICAL INSTALLATION SHALL BE INSTALLED AND TESTED TO THE CURRENT ISSUE OF BS 7671. ALL WORKS TO BE UNDERTAKEN BY A CONTRACTOR WHO IS REGISTERED WITH THE NICEIC AND/OR ECA.

INTERNAL LIGHTING

- INTERNAL LIGHTING SHALL PROVIDE A MINIMUM LUMINESCENCE OF 500 LUX IN ACCORDANCE WITH HSE GUIDE HSG38 LIGHTING AT WORK.
- GENERAL PURPOSE LUMINAIRES SHALL BE OF A FLUORESCENT TYPE COMPLYING WITH BS 4533, 1500mm LONG WITH TWIN 58W TUBES AND HAVE A MINIMUM DEGREE OF PROTECTION OF IP55 IN ACCORDANCE WITH BS EN 60529.
- A 1 GANG, 1 WAY LIGHT SWITCH WITH SURFACE BACK BOX OR SURFACE MOUNTED PULL CORD SHALL BE POSITIONED IMMEDIATELY ADJACENT TO THE ACCESS INTO THE SUBSTATION BUILDING.

POWER CIRCUIT FITTINGS

- FITTINGS SHALL BE CORROSION RESISTANT METAL CLAD SURFACE UNITS. AS A MINIMUM 1 X 13A IP55 SWITCHED TWIN SOCKET SHALL BE PROVIDED. EACH SOCKET SHALL INCLUDE A RCD WITH A TRIPPING SENSITIVITY OF 30mA AND AN OPERATING TIME OF 30ms.

CONSUMER UNIT

- AN INSULATED SPLIT LOAD CONSUMER UNIT CONFORMING TO BS EN 60439-3 AND BS 5486-12 AND PROVIDING, AS A MINIMUM, 63A DOUBLE POLE DISCONNECTOR, A 32A MCB FOR THE POWER CIRCUIT AND A 6A MCB FOR THE LIGHTING CIRCUIT SHALL BE PROVIDED.
- THE CONSUMER UNIT IS TO BE FITTED ADJACENT TO A 100A FUSED CUT-OUT RECEIVING THE LIVE, NEUTRAL AND EARTH FEEDS.

CABLING

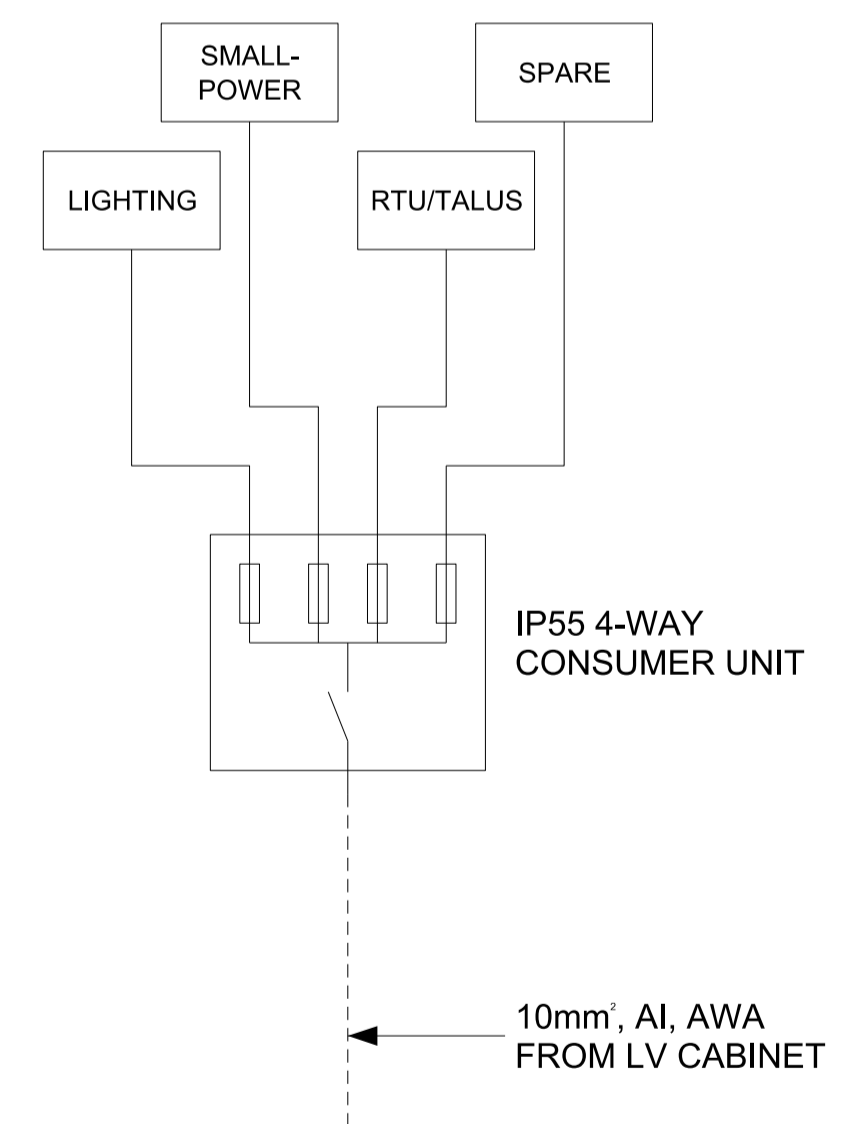
ALL CABLES SHALL HAVE STRANDED COPPER CONDUCTORS WITH A MINIMUM DIMENSIONS AS BELOW:

CUT OUT TO CONSUMER UNIT - 4mmØ
 LIGHTING - 1.5mmØ
 SMALL POWER - 2.5mmØ

TRUNKING AND CONDUITS

- ALL CABLES SHALL BE INSTALLED IN TRUNKING OR CONDUIT.
- TRUNKING AND ACCESSORIES SHALL COMPLY BS 4678 AND SHALL BE RIGID PVC SUITABLE FOR INDOOR USE, SELF EXTINGUISHING AND SHALL NOT PROPAGATE FLAMES.
- TRUNKING SHALL BE SUPPORTED AT INTERVALS OF NO MORE THAN 2m HORIZONTALLY AND 2.5m VERTICALLY AND SHALL BE ADEQUATELY SIZED FOR THE NUMBER OF CABLES INSTALLED.
- CONDUIT SHALL BE ROUND, HIGH IMPACT, NON FLAME PROPAGATING, SELF EXTINGUISHING, HEAVY DUTY PVC TO BS EN 50086.

SCHEMATIC DIAGRAM



LIGHTING - 5A RCBO -
2 x IP55 5R FLUORESCENT FITTING.

SMALL POWER - 16A FUSED -
1 x DOUBLE IP55 RCD TYPE SOCKET OUTLET
1 x DOUBLE IP55 SOCKET OUTLET NON RCD WITH LABEL TO STATE "TEST SOCKET ONLY".

A	28-07-14	ORIGINAL	M Dunk	H Amare
Version	Date	Description	Checked	Drn.
			Approved	Designed



TITLE
SMALL POWER & LIGHTING LAYOUT
 UNIT/PACKAGE SUBSTATION WITH STANDARD PLINTH DETAIL & GRP ENCLOSURE

SCALE 1:20	@A1	PRELIMINARY	Version
DRAWING NO. EDS 07-0102.01	SHEET 3 OF 3		A
SITE SECONDARY SITES			